

GL Sciences

GL SCIENCES HPLC COLUMN CATALOG
2014/2015



GL Sciences Inc.

C o n t e n t s

•Column Selection Overview	Ex3
•Reversed-Phase Column Selection Guide	Ex5
•Selectivity Comparison of Reversed-Phase Columns	Ex7
•Normal-Phase Column Selection Guide	Ex10

•Column Specifications	Ex11
•Conforming to USP	Ex13
•GL Sciences' greatest strength.....	Ex17
•QC, ISO.....	Ex19

Reversed Phase Columns

•InertSustain® C18.....	002
•InertSustainSwift™ C18	006
•Inertsil® ODS-4.....	008
•Inertsil® ODS-3.....	010
•Inertsil® ODS-4V, ODS-3V	012
•Inertsil® ODS-SP	014
•Inertsil® ODS-P.....	016
•Inertsil® ODS-EP	018
•Inertsil® ODS-80A	020
•Inertsil® ODS-2.....	022
•Inertsil® ODS.....	023
•InertSustain® C8	024
•Inertsil® C8-4	026
•Inertsil® C8-3.....	028
•Inertsil® C8	030
•Inertsil® C4	031
•InertSustain® Phenyl	032
•InertSustain® Phenylhexyl	034
•Inertsil® Ph-3.....	036
•Inertsil® Ph.....	038
•Inertsil® CN-3	040
•Inertsil® WP300 C18	042
•Inertsil® WP300 C8	044
•Inertsil® WP300 C4	045

HILIC Columns

•Inertsil® Amide	048
•Inertsil® HILIC	050
•InertSustain® NH2	052
•Inertsil® NH2	054

Normal Phase Columns

•Inertsil® Diol	058
•Inertsil® SIL-100A	060
•InertSustain® NH2	062
•Inertsil® NH2	064
•Inertsil® CN-3	066
•Inertsil® SIL-150A	068
•Inertsil® WP300 SIL	069

SEC Columns

•Inertsil® Diol	072
•Inertsil® WP300 Diol	074

Ion Exchange Columns

•Inertsil® AX	078
•Inertsil® CX	080

Application Specific Columns

•Bioptic AV-1, AV-2	084
•Inertsil® Peptides C18	085
•Inertsil® Acrolein C18	085
•InertSphere™ Sugar-1	086
•Inertsil® Sulfa C18	087
•Inertsil® AS	087
•Corresponding Pharmacopeia (JP, USP, EP) ...	088
•Corresponding SFC	090

Guard Columns

•Guard Column's selection and Use	092
•Cartridge Guard Column E.....	093
•Cartridge Guard Column Ei (Non-metal type)	094
•Guard Columns for UHPLC	096
•GL Cart	098
•Packed Guard Columns, Mini Guard Columns	099
•SILFILTER™ STD C18	104
•Filters, Impurity Remove Columns	105

Preparative Columns

- Choosing Preparative Columns 108
- Preparative Columns 109
- Guard Columns for Preparative Columns 114
- JET Columns 117
- Other Preparative Columns 117

Capillary Columns

- Capillary HPLC Columns 120
- Totally Porous Particle type Capillary HPLC Columns 121
- Connection Kits for Totally Porous Particle type Capillary Columns 126
- Totally Porous Particle type Capillary Micro Guard Columns 127
- Monolithic Capillary HPLC Columns (Available in South Asia, Middle East and Africa only) 128
- MonoSpray™ 133

Applications

- Applications 135

Index

- Cat. No. Index 146

Reversed Phase Columns **001**

HILIC Columns **047**

Normal Phase Columns **057**

SEC Columns **071**

Ion Exchange Columns **077**

Application Specific Columns **083**

Guard Columns **091**

Preparative Columns **107**

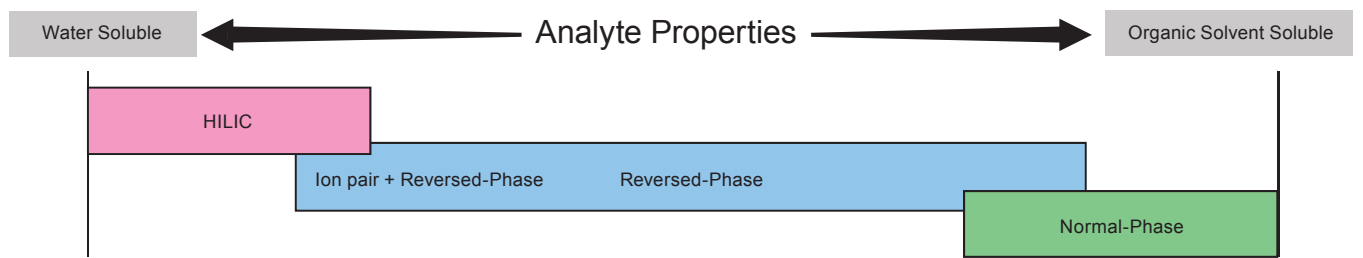
Capillary Columns **119**

Applications **135**

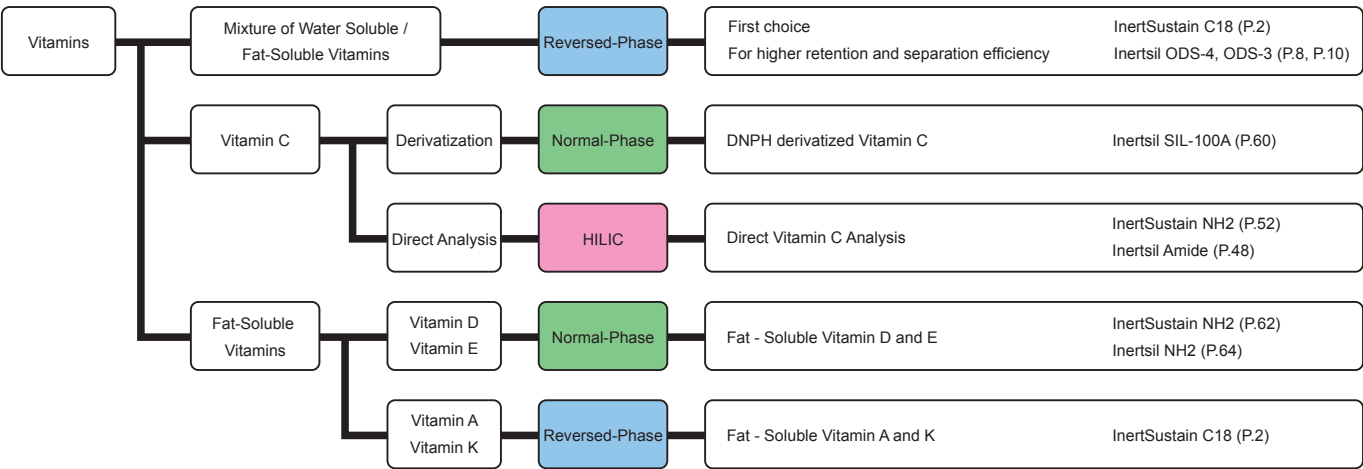
Cat. No. Index **146**

Column Selection Overview

Separation Mode Selection for Analyte Polarity



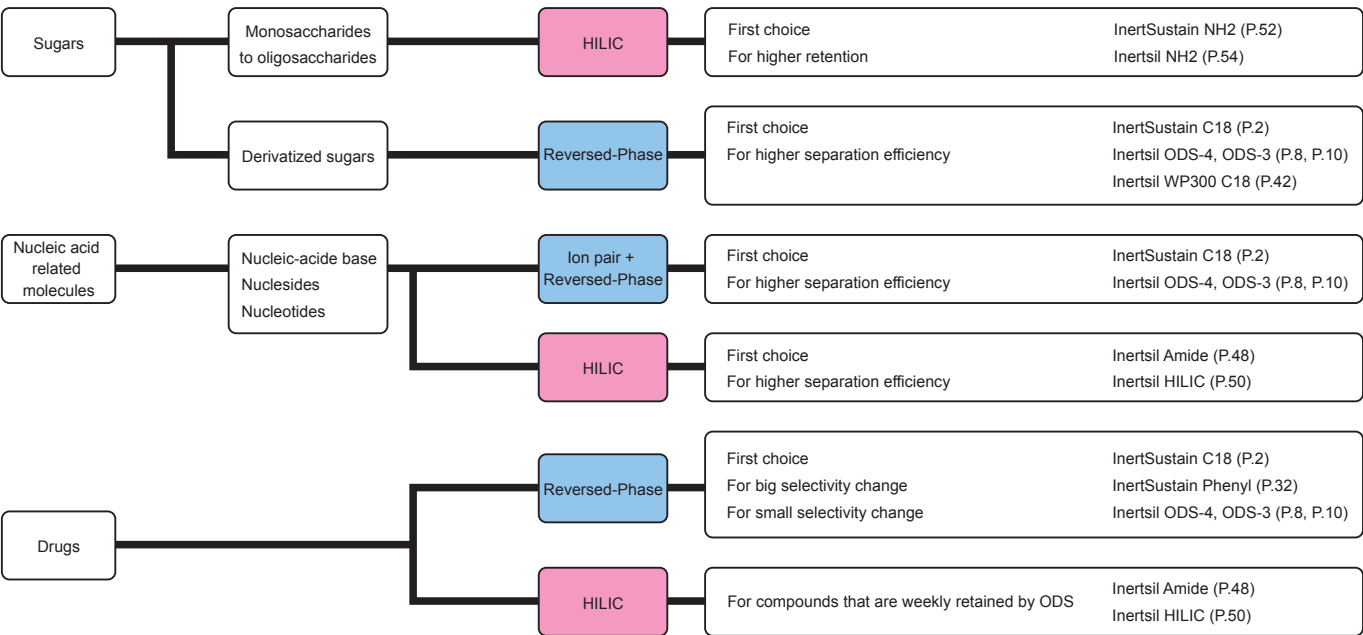
Column Selection for Analyte Properties

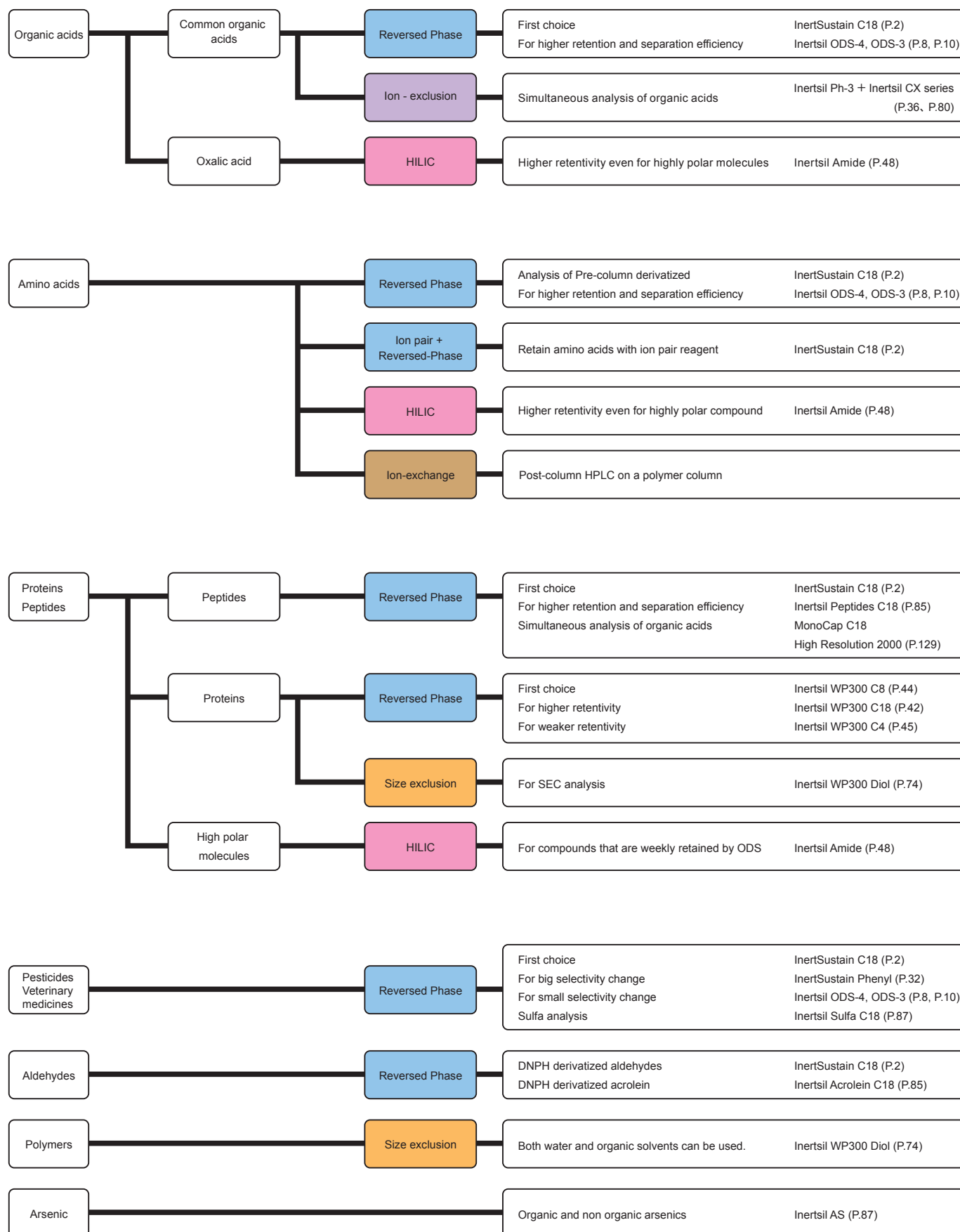


Water Soluble vitamins	Phase	Detector
Vitamin C	NH2, SIL, Amide	UV
Vitamin B ₁	ODS	UV, (FL)
Vitamin B ₂	ODS	UV, FL
Vitamin B ₆	ODS	UV
Niacin	ODS	UV
Folic acid	ODS	UV
Pantothenic acid	ODS	UV

Fat-Soluble Vitamin	Phase	Detector
Vitamin A	ODS	UV, FL
Vitamin D	ODS, NH2	UV
Vitamin E	ODS	UV, FL
Vitamin K	ODS	UV, (FL)

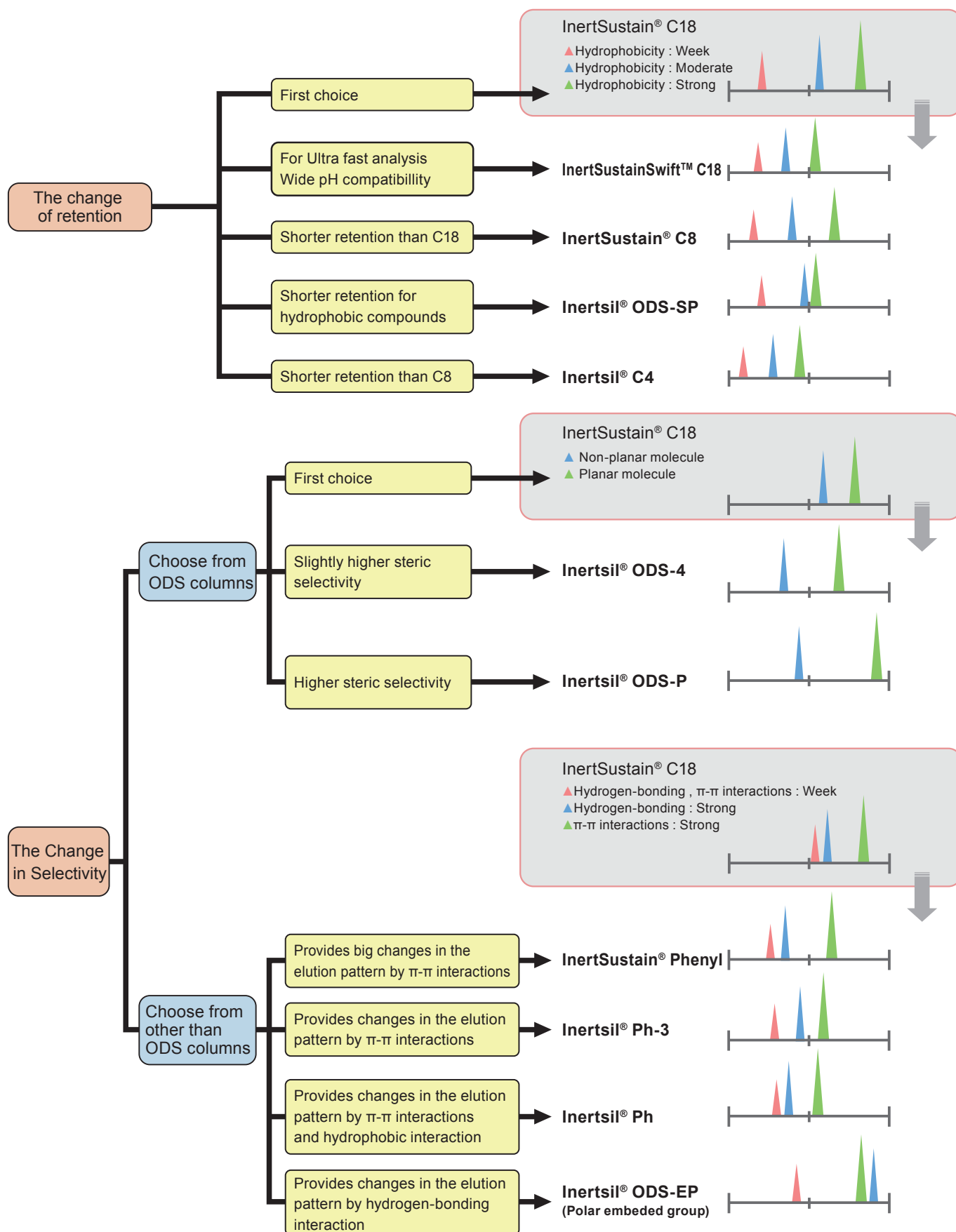
* (FL): Post-column derivatization



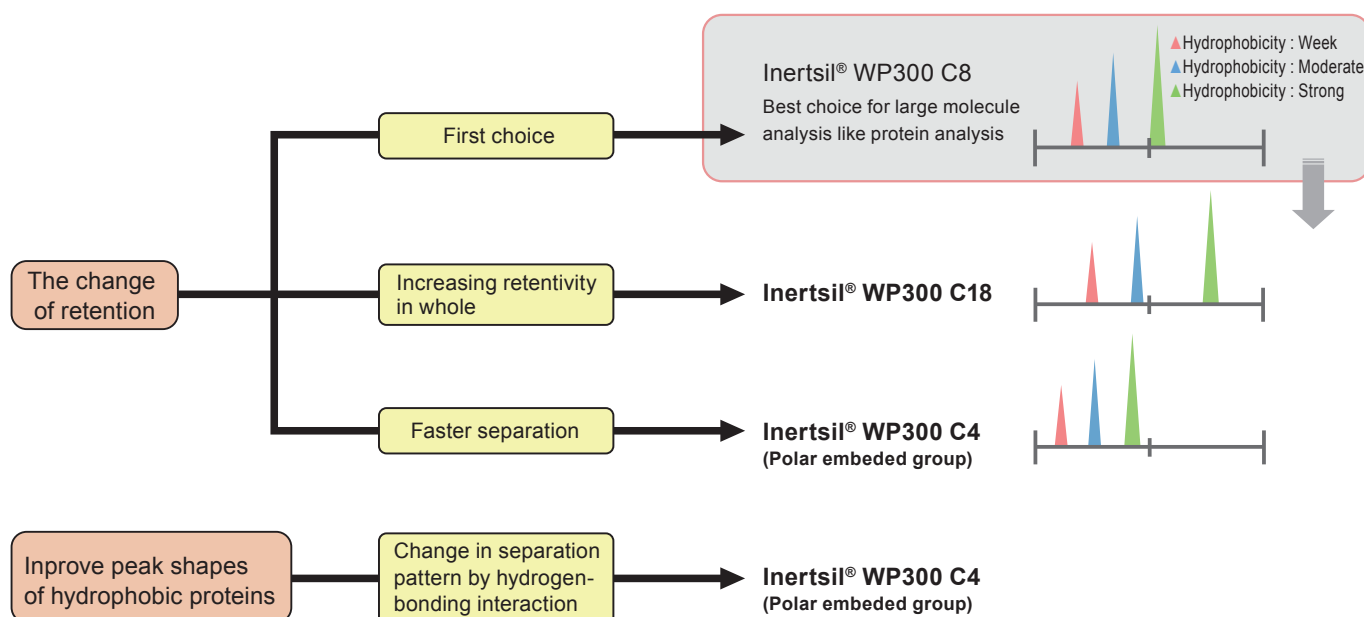


Reversed-Phase Column Selection Guide

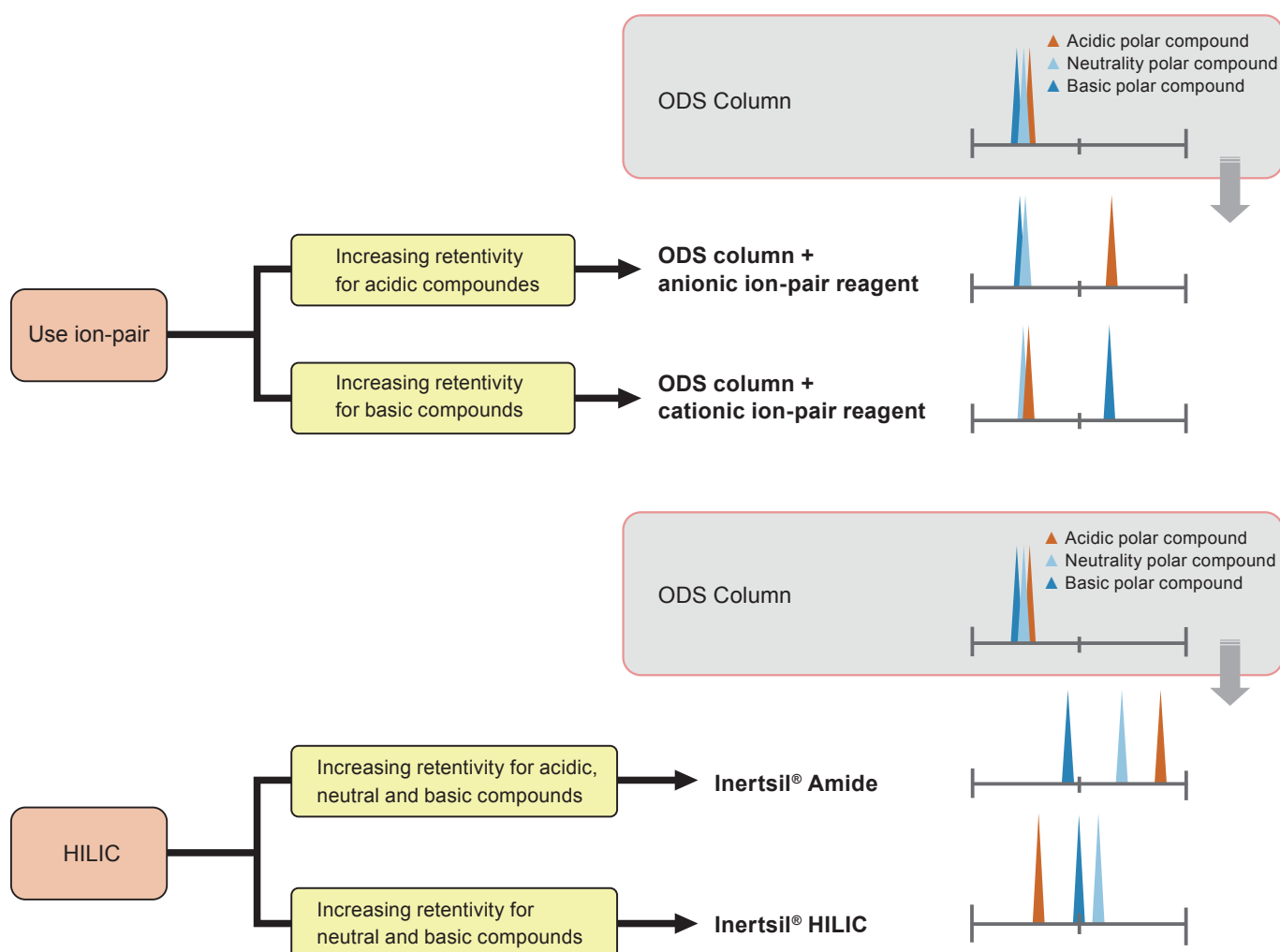
Small Molecule Analysis MW<5000



Large Molecule Analysis MW>5000



Small Molecule-Highly Polar Compound Analysis

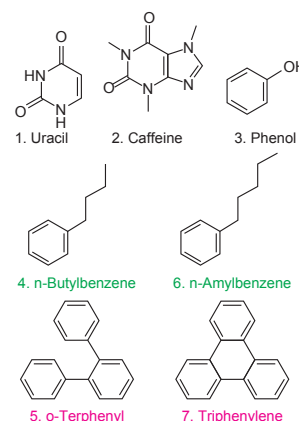


Selectivity Comparison of Reversed-Phase Columns

Selectivity of reversed-phase columns are compared under the same conditions, packing material size and column size. Chemical structural formulas used for the comparison are shown at right. Separation differences between basic compounds, acidic compounds, alkyl benzenes and polyaromatic compounds shows the differences of column selectivity. The more silanol groups on the packing material lead the later elution time of Caffeine compared with that of Phenol. The higher hydrophobicity of the column shows the later elution time of n-Amylbenzene compared with that of n-Butylbenzene. The higher steric selectivity of the column shows the later elution time of Triphenylene compared with that of o-Terphenyl

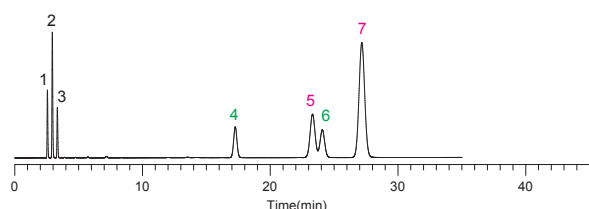
Conditions

Column : Reversed-Phase columns
(5 μ m, 250 $\times$ 4.6 mm I.D.)*
Eluent : A) CH₃OH
B) H₂O
: A/B = 80/20, v/v ,
(Inertsil Diol, CN-3)
A/B = 70/30, v/v ,
Flow Rate : 1.0 mL/min*
Col. Temp. : 40 °C
Detection : UV 254 nm
Injection Vol. : 5 μ L*

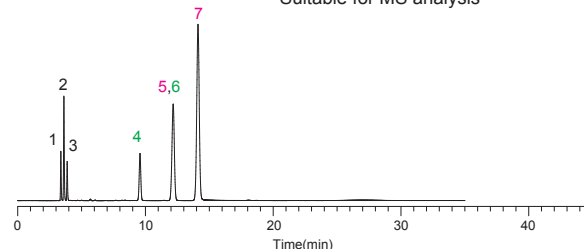


* : For Mono Clad C18-HS (3.0 mm I.D.),
0.4 mL/min of flow rate and 2 μ L of injection
volume are adopted according to the
column internal diameter.

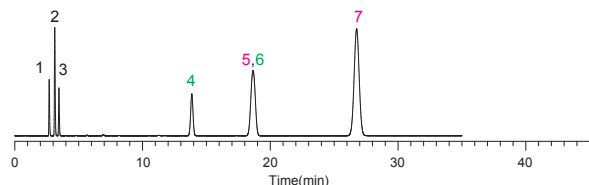
InertSustain® C18 Recommended ODS column as the first choice.



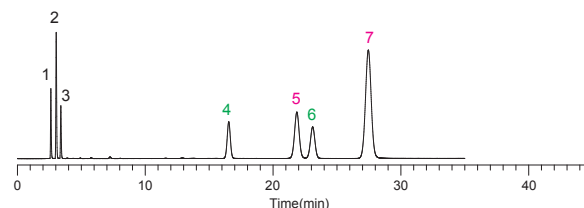
InertSustainSwift™ C18 For first elution with a sharp peak shape. Suitable for MS analysis



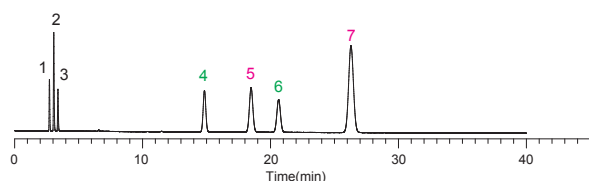
Inertsil® ODS-4 Slightly faster elution time than InertSustain C18 and slightly higher planar molecule recognition (steric selectivity).



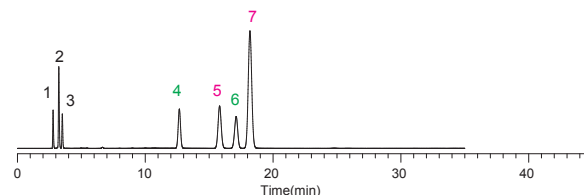
Inertsil® ODS-3 Shows similar elution pattern with InertSustain C18



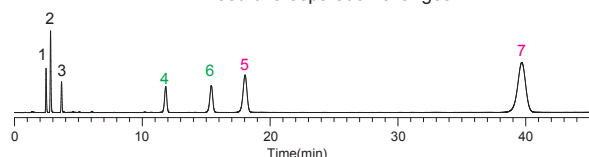
Inertsil® ODS-2 Adequate retention and steric selectivity



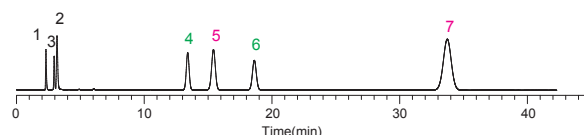
Inertsil® ODS Original version of Inertsil column



Inertsil® ODS-EP Shows a different separation pattern from other ODS columns Suitable for a ODS column being specified still in need of a separation changes



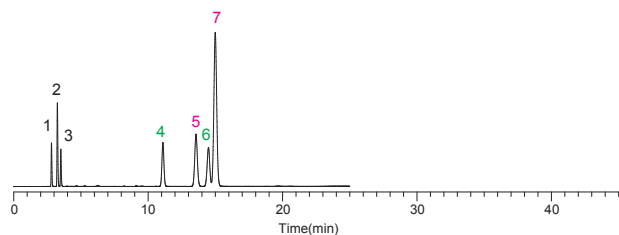
Inertsil® ODS-P High steric selectivity shows highest resolution between peak 5 and 7



Selectivity Comparison of Reversed-Phase Columns

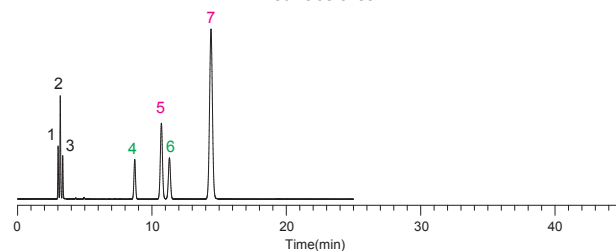
Inertsil® ODS-SP

With common retentivity for hydrophilic compounds (Peak 1,2,3,) and much less retentivity for hydrophobic compounds (Peak 4,5,6,7)



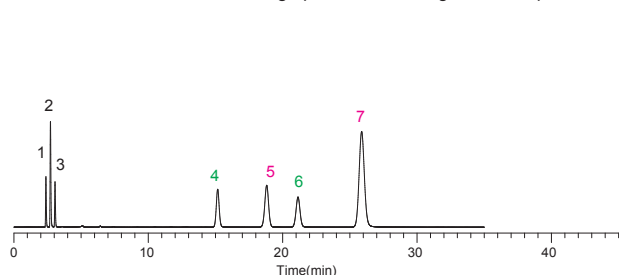
Inertsil® WP300 C18

Weakly retain both hydrophilic compounds and hydrophobic compounds by smaller surface area.



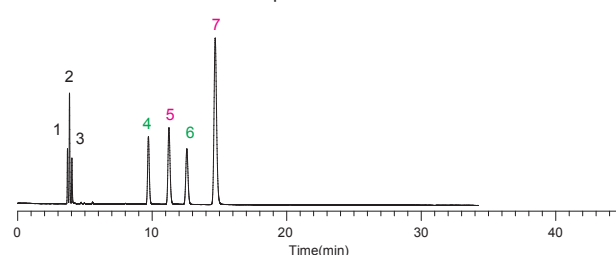
Inertsil® ODS-80A

Shows high plate count owing to narrow pore size



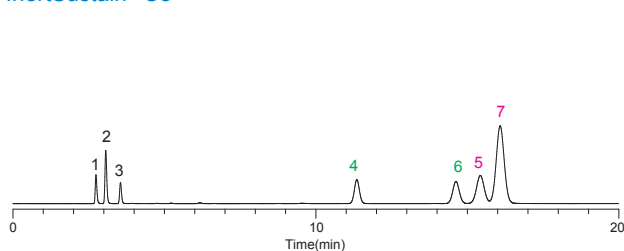
Mono Clad® C18-HS

Weakly retain compounds compared with packed columns.



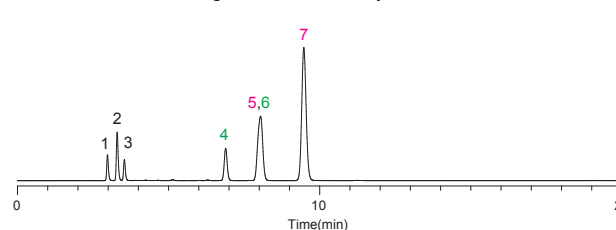
InertSustain® C8

Recommended C8 column as the first choice



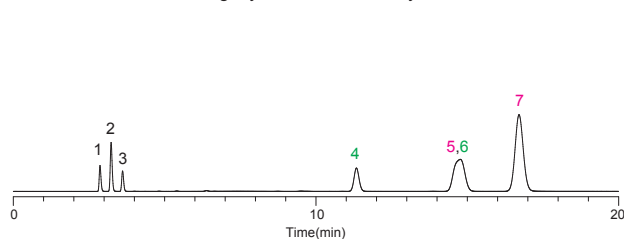
Inertsil® C8-4

Shows first elution of compounds and slightly higher steric selectivity



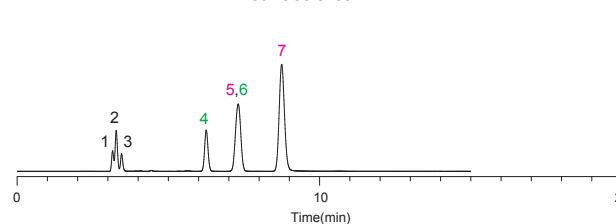
Inertsil® C8-3

Shows similar retentivity to InertSustain C8 but slightly different selectivity.



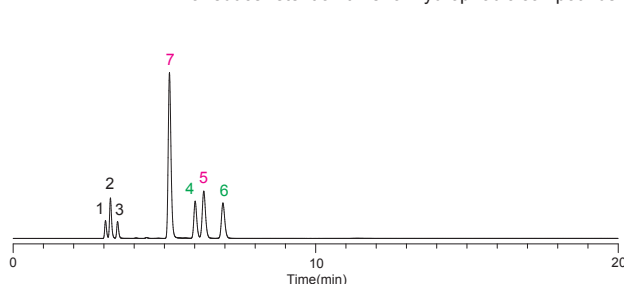
Inertsil® WP300 C8

Weakly retain both hydrophilic compounds and hydrophobic compounds by smaller surface area.



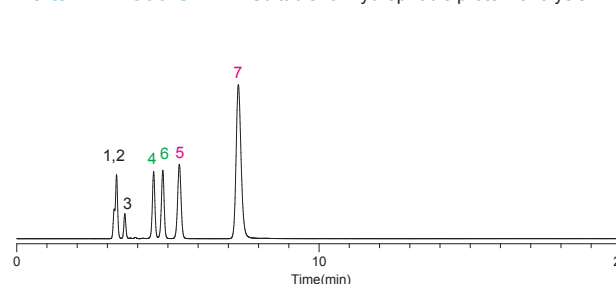
Inertsil® C4

To reduce retention time for hydrophobic compounds.

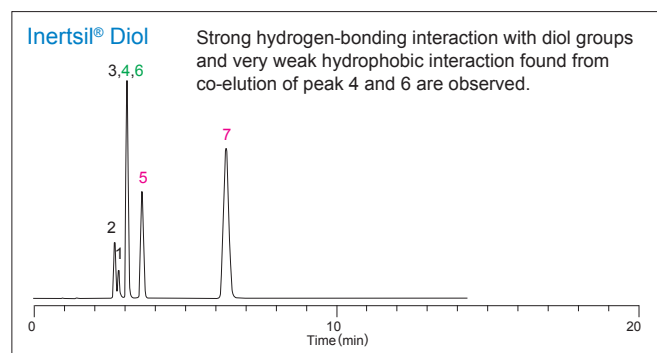
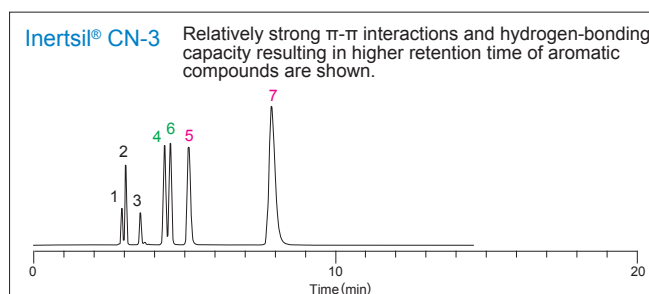
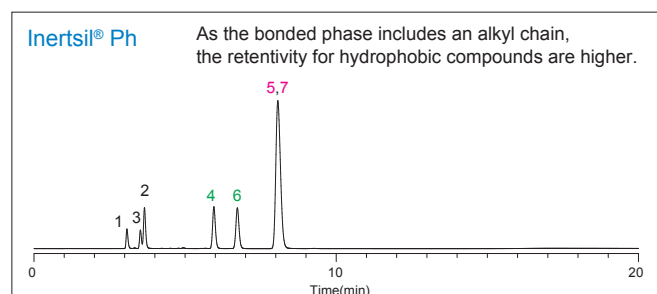
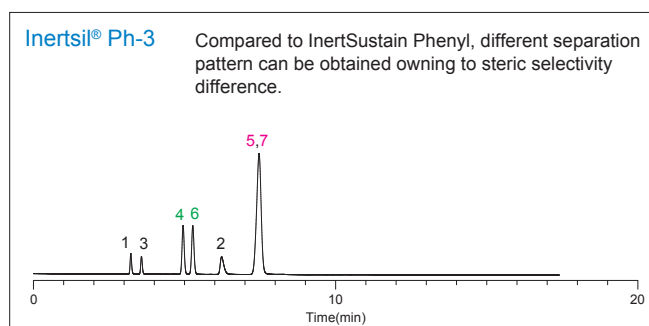
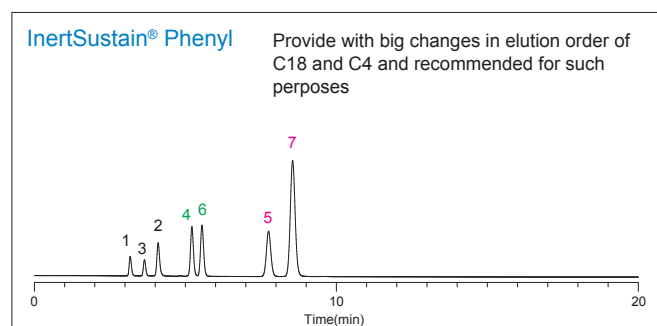


Inertsil® WP300 C4

Suitable for hydrophobic protein analysis.



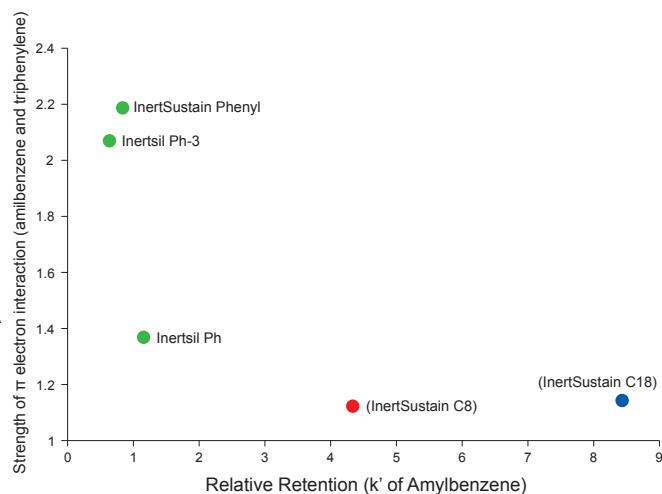
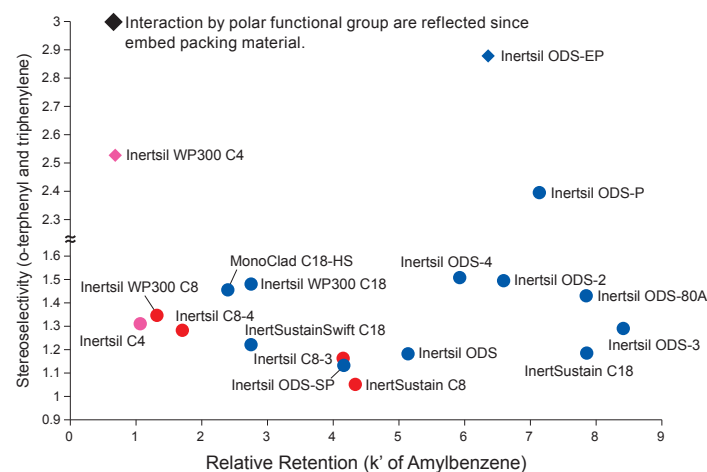
Selectivity Comparison of Reversed-Phase Columns



The strengths of stereo selectivity and π - π interaction against retention strengths of reversed phase columns are shown below. The following contents are pointed in the chart.

- Retentive factor of amil benzene as retentivity.
 - Relative retention of o-terphenyl and triphenylene as stereo selectivity.
 - Relative retention value of amilbenzene and triphenylene as strength of π - π interaction.
- ◇ type was plotted to discriminate from the other columns since polar group endohedral (embedded type) columns

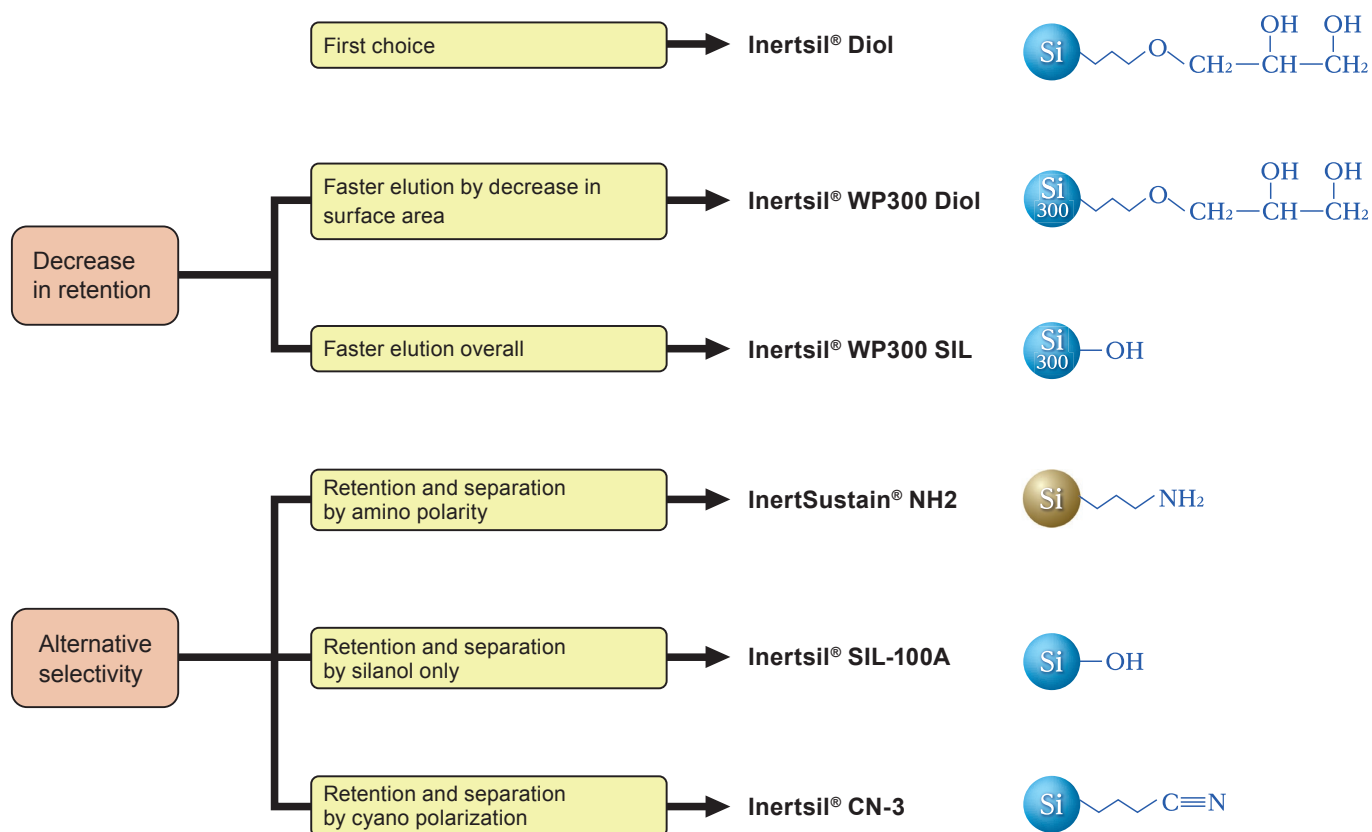
InertSustain & Inertsil Distribution Model



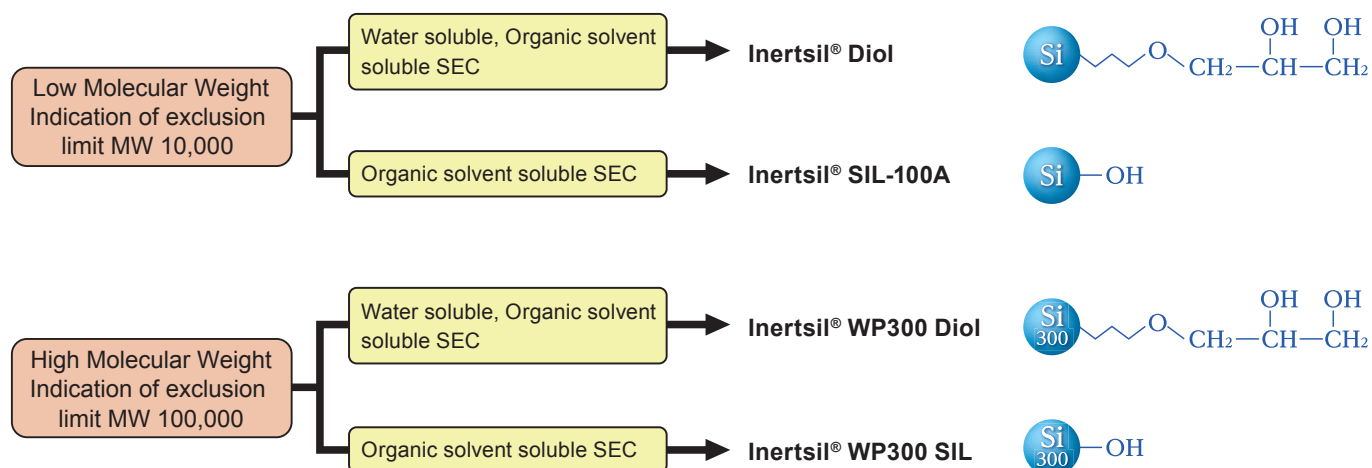
* Interaction may changes upon eluent conditions. This chart shows typical guidance.

Normal-Phase Column Selection Guide

Low Molecular Samples on Normal Distribution Mode



Size Exclusion Chromatography (SEC)



Column Specifications

	Phase	Features	USP Code	Particle Size (µm)	Pore Size (nm)	Area (m ² /g)
ODS Reversed-Phases	InertSustain C18	First choice with ultra high inertness and high durability	L1	2, 3, 5	10	350
	InertSustainSwift C18	First analysis with ultra high inertness and high durability	L1	1.9, 3, 5	20	200
	Inertsil ODS-4	Ultra high inertness, High plate count, ,Medium retentivity	L1	2, 3, 5	10	450
	Inertsil ODS-4V	Inertsil ODS-4 Validated column	L1	3, 5	10	450
	Inertsil ODS-3	Strong retentivity, Lower column backpressure, Very inert	L1	2, 3, 4, 5, 10	10	450
	Inertsil ODS-3V	Inertsil ODS-3 Validated column	L1	3, 5	10	450
	Inertsil ODS-SP	Weak retentivity, for hydrophobic compounds	L1	3, 5	10	450
	Inertsil ODS-P	High steric selectivity	L1	3, 5	10	450
	Inertsil ODS-EP	A polar functional group embedded	L1	5	10	450
	Inertsil WP300 C18	Analysis of high molecules	L1	5	30	150
	Inertsil ODS-80A	Elute low molecule with a sharp peak shape	L1	5	8	450
	Inertsil ODS-2	Ultra pure silica gel is used	L1	5	15	320
	Inertsil ODS	Inertness 1st generation	L1	5, 10	10	350
The other Reversed-Phases	InertSustain C8	First choice with ultra high inertness and high durability	L7	2, 3, 5	10	350
	Inertsil C8-4	Ultra high inertness, High plate count, , low retentivity	L7	2, 3, 5	10	450
	Inertsil C8-3	Strong retentivity, Lower column backpressure, Very inert	L7	2, 3, 5, 10	10	450
	Inertsil C8	Ultra pure silica gel is used	L7	5	15	320
	Inertsil C4	Low retentivity	L26	5	15	320
	Inertsil WP300 C8	Suitable for high molecules	L7	5	30	150
	Inertsil WP300 C4	Suitable for high molecules	L26	5	30	150
	InertSustain Phenyl	Extremely strong π-π interactions	L11	2, 3, 5	10	350
	Inertsil Ph-3	strong π-π interactions	L11	2, 3, 5	10	450
	Inertsil Ph	High inertness, weak π-π interactions	L11	5	15	320
HILIC	Inertsil HILIC	Separation of highly polar basic compounds	L20	3, 5	10	450
	Inertsil Amide	Separation of polar compounds	-	3, 5	10	450
	InertSustain NH2	Sugar analysis	L8	3, 5	10	350
	Inertsil NH2	Sugar analysis, High retentive in normal-phase mode	L8	3, 5	10	450
Normal-Phases	Inertsil Diol	First choice for normal-phase mode, For SEC	L20	3, 5	10	450
	Inertsil SIL-100A	Ultra pure silica gel with 100Å pore size	L3	3, 5	10	450
	Inertsil SIL-150A	Ultra pure silica gel with 150Å pore size	L3	5	15	320
	Inertsil WP300 SIL	Ultra pure silica gel with 300Å pore size	L3	5	30	150
	Inertsil CN-3	Can be also used in reversed-phase mode	L10	3, 5	10	450
SEC	Inertsil WP300 Diol	High molecule SEC, Can be also used in normal-phase mode	L20, L33	5	30	150
Ion-Exchanges	Inertsil AX	Anion-exchange column	-	5	10	450
	Inertsil CX	Cation - exchange column	L9	5	10	450
The others	Bioptic AV-1	Chiral separation in reversed-phase mode	-	5	10	-
	Bioptic AV-2	Inner reversed-phase separation	-	5	10	-
	Inertsil Peptides C18	Peptide analysis	L1	4	10	450
	Inertsil Acrolein C18	Acrolein analysis	L1	5	10	450
	InertSphere Sugar-1	Sugar analysis with ECD	-	5	-	-
	Inertsil Sulfa C18	Sulfa Analysis	L1	3, 5	10	450
	MonoCap Series	Monolithic silica capillary column				

	phase	Carbon loading (%)	End Cap	Inertness	Recommended pH range	Reference pages		
						Analytical columns	Preparative columns	Capillary columns
ODS Reversed-Phases	InertSustain C18	14	○	★★★★★	1~10	2	109	121
	InertSustainSwift C18	9	○	★★★★★	1~10	6	*1	*1
	Inertsil ODS-4	11	○	★★★★★	2~7.5	8	109	121
	Inertsil ODS-4V	11	○	★★★★★	2~7.5	12	*2	*2
	Inertsil ODS-3	15	○	★★★★★	2~7.5	10	109	121
	Inertsil ODS-3V	15	○	★★★★★	2~7.5	13	*2	*2
	Inertsil ODS-SP	8.5	○	★★★★★	2~7.5	14	109	122
	Inertsil ODS-P	29	—	★★★★	2~7.5	16	109	122
	Inertsil ODS-EP	9	—	★★★★★	2~7.5	18	109	122
	Inertsil WP300 C18	9	○	★★★★★	2~7.5	42	111	123
	Inertsil ODS-80A	17.5	○	★★★★★	2~7.5	20	110	*2
	Inertsil ODS-2	18.5	○	★★★★★	2~7.5	22	110	*2
	Inertsil ODS	14	○	★★★	2~7.5	23	110	*2
The other Reversed-Phases	InertSustain C8	8	○	★★★★★	1~10	24	110	122
	Inertsil C8-4	5	○	★★★★★	2~7.5	26	110	122
	Inertsil C8-3	9	○	★★★★★	2~7.5	28	110	123
	Inertsil C8	10.5	○	★★★	2~7.5	30	*1	*2
	Inertsil C4	7.5	○	★★★★★	2~7.5	31	*1	*2
	Inertsil WP300 C8	4	○	★★★★★	2~7.5	44	111	123
	Inertsil WP300 C4	3	—	★★★★★	2~7.5	45	111	123
	InertSustain Phenyl	10	—	★★★★★	2~7.5	32	111	123
	Inertsil Ph-3	9.5	—	★★★★	2~7.5	36	111	123
	Inertsil Ph	10	○	★★★★	2~7.5	38	111	*2
HILIC	Inertsil HILIC	20	—	—	2~7.5	50	112	124
	Inertsil Amide	18	—	—	2~7.5	48	112	124
	InertSustain NH2	7	—	—	2~7.5	52, 62	112	124
	Inertsil NH2	8	—	—	2~7.5	54, 64	112	124
Normal-Phases	Inertsil Diol	20	—	—	2~7.5	58, 72	112	125
	Inertsil SIL-100A	—	—	—	2~7.5	60	112	125
	Inertsil SIL-150A	—	—	—	2~7.5	68	113	*2
	Inertsil WP300 SIL	—	—	—	2~7.5	69	113	*1
	Inertsil CN-3	14	—	—	2~7.5	40, 66	111	125
SEC	Inertsil WP300 Diol	9	—	—	2~7.5	74	113	*1
Ion-Exchanges	Inertsil AX	17	—	—	2~7.5	78	*1	125
	Inertsil CX	14	—	—	2~7.5	80	*1	125
The others	Bioptrac AV-1	—	—	—	2~7.5	84	—	*2
	Bioptrac AV-2	—	—	—	2~7.5	84	—	*2
	Inertsil Peptides C18	15	○	★★★★★	2~7.5	85	113	*2
	Inertsil Acrolein C18	9	○	★★★★★	2~7.5	85	—	*2
	InertSphere Sugar-1	—	—	—	2~14	86	—	—
	Inertsil Sulfa C18	15	○	★★★★★	2~7.5	87	*2	*2
	MonoCap Series	—	—	—	—	—	—	—

* 1 : Please refer to GL Sciences website.

* 2 : Please contact us.



Conforming to USP

USP Code	PACKING	HPLC Column Name
L1	Octadecyl silane chemically bonded to porous or nonporous silica or ceramic microparticles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain C18 InertSustainSwift C18 Inertsil ODS-4 Inertsil ODS-3 Inertsil ODS-SP Inertsil ODS-P Inertsil ODS-2 Inertsil ODS-80A Inertsil ODS Inertsil WP300 C18 Unisil Q C18, NQ C18
L2	Octadecyl silane chemically bonded to silica gel of a controlled surface porosity that has been bonded to a solid spherical core, 30 to 50 µm in diameter.	ECONO PREP ODS
L3	Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	Inertsil SIL-100A Inertsil SIL-150A Inertsil WP300 SIL Unisil Q 30, Q 60, Q 100
L4	Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	ECONO PREP SIL
L5	Alumina of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	
L6	Strong cation-exchange packing-sulfonated fluorocarbon polymer coated on a solid spherical core, 30 to 50 µm in diameter.	
L7	Octylsilane chemically bonded to totally porous or superficially porous silica particles, 1.5 - 10 µm in diameter, or a monolithic silica rod.	InertSustain C8 Inertsil C8-4 Inertsil C8-3 Inertsil C8 Inertsil WP300 C8 Unisil Q C8
L8	An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter.	InertSustain NH2 Inertsil NH2 Unisil Q NH2
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.	Inertsil CX
L10	Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	Inertsil CN-3 Unisil Q CN
L11	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	InertSustain Phenyl Inertsil Ph-3 Inertsil Ph
L12	A strong anion-exchange packing made by chemically bonding a quaternary amine to a solid silica spherical core, 30 to 50 µm in diameter.	
L13	Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	Spherisorb Methyl
L14	Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.	Nucleosil 100-SB Partisil SAX Spherisorb SAX
L15	Hexylsilane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	Spherisorb C6
L16	Dimethylsilane chemically bonded to porous silica particles, 5 to 10 µm in diameter.	
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6 to 12 µm in diameter.	PRP-X200, PRP-X300 HC-75(H ⁺) SUGAR SH1011, SH1821 RSpak KC-811 IC Y-521
L18	Amino and cyano groups chemically bonded to porous silica particles, 3 to 10 µm in diameter.	Partisil 5 PAC Partisil 10 PAC
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9 µm in diameter.	HC-75(Ca ²⁺) SUGAR SC1011, SC1821 SUGAR SC1211
L20	Dihydroxypropane groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	Inertsil Diol Inertsil WP300 Diol PROTEIN KW-800 series

USP Code	PACKING	HPLC Column Name
L21	A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter.	PRP-1, PRP-3 GPC KF-801 RSpak DS-413, DS-613 RSpak RP18-415
L22	A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10 µm in size.	PRP-X200, PRP-X300 SUGAR SH1011, SH1821 RSpak KC-811 SUGAR SP0810 SUGAR SC1011, SC1821 SUGAR SZ5532 SUGAR KS800 series IC Y-521
L23	An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 7 - 12 µm in size.	PRP-X500 IEC QA-825
L24	A semi-rigid hydrophilic gel consisting of vinyl polymers with numerous hydroxyl groups on the matrix surface, 32 to 63 µm in diameter.	
L25	Packing having the capacity to separate compounds with a molecular weight range from 100-5000 (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable.	OHpak SB-802 HQ OHpak SB-802.5 HQ
L26	Butyl silane chemically bonded to totally porous silica particles, 1.5 to 10 µm in diameter.	Inertsil C4 Inertsil WP300 C4
L27	Porous silica particles, 30 to 50 µm in diameter.	
L28	A multifunctional support, which consists of a high purity, 100 Å, spherical silica substrate that has been bonded with anionic exchanger, amine functionality in addition to a conventional reversed phase C8 functionality.	
L29	Gamma alumina, reverse-phase, low carbon percentage by weight, alumina-based polybutadiene spherical particles, 5 µm in diameter with a pore volume of 80 Å.	
L30	Ethyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	
L31	A hydroxide-selective, strong anion-exchange resin-quaternary amine bonded on latex particles attached to a core of 8.5 µm macroporous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene.	
L32	A chiral ligand-exchange packing-L-proline copper complex covalently bonded to irregularly shaped silica particles, 5 to 10 µm in diameter.	CHIRALPAK WH
L33	Packing having the capacity to separate dextrans by molecular size over a range of 4,000 to 500,000 Da. It is spherical, silica-based, and processed to provide pH stability.	Inertsil WP300 Diol PROTEIN KW-800 series
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, 7 to 9 µm in diameter.	HC-75(Pb ²⁺) SUGAR SP0810
L35	A zirconium-stabilized spherical silica packing with a hydrophilic (diol-type) molecular monolayer bonded phase having a pore size of 150 Å.	
L36	A 3, 5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to 5-µm aminopropyl silica.	SUMICHIRAL OA-2000
L37	Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel.	OHpak SB-803 HQ
L38	A methacrylate-based size-exclusion packing for water-soluble samples.	OHpak SB-800 HQ series
L39	A hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin.	OHpak SB-800 HQ series RSpak DM-614
L40	Cellulose tris-3,5-dimethylphenylcarbamate coated porous silica particles, 5 to 20 µm in diameter.	CHIRALCEL OD series
L39	A hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin.	OHpak SB-800 HQ series RSpak DM-614
L40	Cellulose tris-3,5-dimethylphenylcarbamate coated porous silica particles, 5 to 20 µm in diameter.	CHIRALCEL OD series

Conforming to USP

USP Code	PACKING	HPLC Column Name
L41	Immobilized α 1-acid glycoprotein on spherical silica particles, 5 μ m in diameter.	CHIRALPAK AGP
L42	Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5 μ m in diameter.	
L43	Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 μ m in diameter.	
L44	A multifunctional support, which consists of a high purity, 60 Å, spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a conventional reversed phase C8 functionality.	
L45	Beta cyclodextrin bonded to porous silica particles, 5 to 10 μ m in diameter.	ORpak CDBS-453 SUMICHIRAL OA7000 SUMICHIRAL OA7100
L46	Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, about 9 to 11 μ m in diameter.	
L47	High-capacity anion-exchange microporous substrate, fully functionalized with trimethylamine groups, 8 μ m in diameter.	PRP-X100, PRP-X110 RCX-10, RCX-30
L48	Sulfonated, cross-linked polystyrene with an outer layer of submicron, porous, anion-exchange microbeads, 15 μ m in diameter.	
L49	A reversed-phase packing made by coating a thin layer of polybutadiene onto spherical porous zirconia particles, 3 to 10 μ m in diameter.	
L50	Multifunction resin with reversed-phase retention and strong anion-exchange functionalities. The resin consists of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 μ m in diameter, and a surface area not less than 350 m ² per g. Substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.	
L51	Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10 μ m in diameter.	CHIRALPAK AD series
L52	A strong cation-exchange resin made of porous silica with sulfopropyl groups, 5 to 10 μ m in diameter.	
L53	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 μ m diameter. Substrate is surface grafted with carboxylic acid and/or phosphoric acid functionalized monomers. Capacity not less than 500 μ Eq/column.	
L54	A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13 μ m in diameter.	
L55	A strong cation-exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5 μ m in diameter.	Spherisorb SCX
L56	Propyl silane chemically bonded to totally porous silica particles, 3 to 10 μ m in diameter.	
L57	A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5 μ m in diameter, with a pore size of 120 Å.	
L58	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the sodium form, about 6 to 30 μ m diameter.	SUGAR KS 800 series CXpak P-421S
L59	Packing for the size-exclusion separation of proteins (separation by molecular weight) over the range of 5 to 7,000 kDa. The packing is a spherical 1.5 - to 10- μ m silica of hybrid packing with a hydrophilic coating.	PROTEIN KW-803
L60	Spherical, porous silica gel, 10 μ m or less in diameter, the surface of which has been covalently modified with alkyl amide groups and endcapped.	
L61	A hydroxide selective strong anion-exchange resin consisting of a highly cross-linked core of 13- μ m microporous particles having a pore size less than 10 Å units and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 85 nm diameter microbeads bonded with alkanol quaternary ammonium ions (6 %).	

USP Code	PACKING	HPLC Column Name
L62	C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter.	
L63	Glycopeptide teicoplanin linked through multiple covalent bonds to a 100-Å units spherical silica.	SUGAR KS 800 series
L64	Strongly basic anion-exchange resin consisting of 8 % cross-linked styrene-divinylbenzene copolymer with a quaternary ammonium group in the chloride form, 45 to 180 µm in diameter.	
L65	Strongly acidic cation-exchange resin consisting of 8 % sulfonated cross-linked styrene-divinylbenzene copolymer with a sulfonic acid group in the hydrogen form, 45 to 250 µm in diameter.	
L66	A crown ether coated on a 5-µm particle size silica gel substrate. The active site is (S)-18-crown-6-ether.	Crownpak CR (+)
L67	Porous vinyl alcohol copolymer with a C18 alkyl group attached to the hydroxyl group of the polymer, 2 to 10 µm in diameter.	Asahipak ODP-40 Asahipak ODP-50 Shodex ET-RP1
L68	Spherical, porous silica, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped.	
L69	Ethylvinylbenzene/divinylbenzene substrate agglomerated with quaternary amine functionalized 130-nm latex beads, about 6.5 µm in diameter.	
L70	Cellulose tris(phenyl carbamate) coated on 5-µm silica.	CHIRALCEL OC-H SUMICHIRAL OA-3300
L71	A rigid, spherical polymetacrylate, 4 to 6 µm in diameter.	RSpak DE-213, DE-413 RSpak DE-613
L72	(S)-phenylglycine and 3,5-dinitroaniline urea linkage covalently bonded to silica.	SUMICHIRAL OA-3300
L73	A rigid spherical polydivinylbenzene particle, 5 to 10 µm in diameter.	
L74	a strong anion-exchange resin consisting of a highly cross-linked core of 7- µm macroporous particles having a 100-Å average pore size and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene and an anion-exchange layer grafted to the surface, which is functionalized with alkyl quaternary ammonium ions.	
L75	A chiral-recognition protein, bovine serum albumine (BSA), chemically bonded to silica particles, about 7 µm in diameter, with a pore size of 300 Å.	
L76	Silica based weak cation-exchange material, 5 µm in diameter. Substrate is surface polymerized polybutadiene-maleic acid to provide carboxylic acid functionalities. Capacity not less than 29 µEq/column.	
L77	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 6 to 9 µm diameter. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 500 µEq/column (4 mm × 25 cm)	
L78	A silane ligand that consists of both reversed-phase (an alkyl chain longer than C8) and anion-exchange (primary, secondary, tertiary, or quaternary amino groups) functional groups chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.0 to 50 µm in diameter, or a monolithic rod.	
L79	A chiral-recognition protein, human serum albumin (HSA), chemically bonded to silica particles, about 5 µm in diameter.	CHIRALPAK HSA
L80	Cellulose tris(4-methylbenzoate)-coated, porous, spherical, silica particles, 5 µm in diameter.	CHIRALCEL OJ CHIRALCEL OJ-H
L81	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 9 µm porous particles having a pore size of 2000 Angstroms units and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 70 nm diameter microbeads (6 % crosslinked) bonded with alkanol quaternary ammonium ions.	

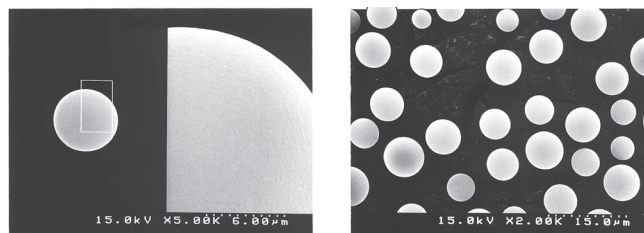
GL Sciences' greatest strength

GL Sciences supports from the use of SPE to analysis. Among them all, HPLC columns which play a major role in separation analysis are manufactured by synthesizing base silica-gels, bonding phases and being packed into columns and through demanding tests for a stable supply with the same excellent quality all over the world. Based on accumulated know-how GL Sciences' manufacturing technology keeps on evolving to supply better columns for customers

Sophisticated self-manufacturing technology for the base silica

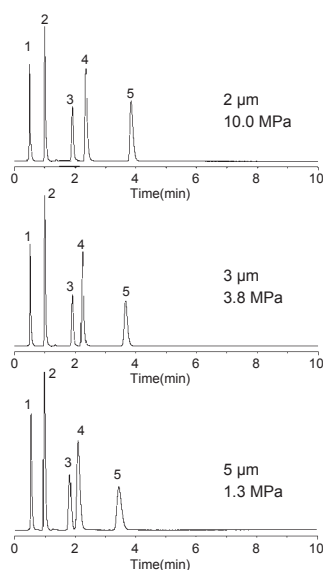
GL Sciences has been synthesizing base silica-gels, bonding phases and endcapping for column packing which enable us stable supply with exceptionally-high quality. Consequently those HPLC columns have been chosen for the method used for many years as reliable products.

Ultra pure base silica



Reliable column performance

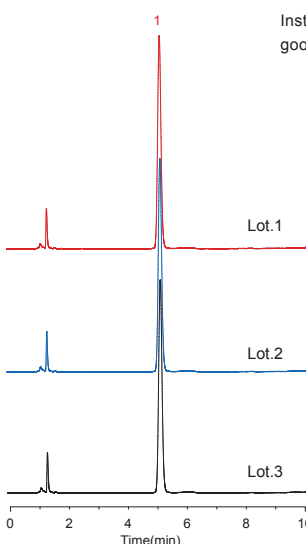
Provide the same separation patterns with the changes of particle size



Conditions

Column : InertSustain C18
(50 × 2.1 mm I.D.)
Eluent : A) CH₃OH
B) 25 mM phosphate buffer
(pH 7.0)
A/B = 30/70, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : UV 230 nm
Sample : 1. Uracil
2. Pyridine
3. Phenol
4. Berberine chloride
5. Dextromethorphan

Test by a strong basic compound



Instead of a difficult compound symmetry peak and good reproducibility are obtained

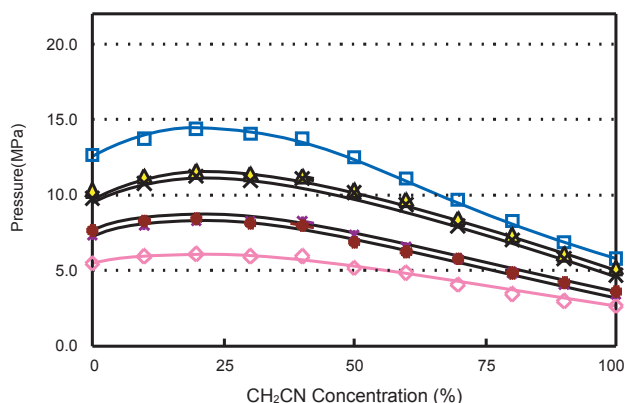
Conditions

Column : InertSustain C18
(5 μm, 250 × 4.6 mm I.D.)
Eluent : A) CH₃CN
B) 25 mM phosphate buffer
(pH 7.0)
A/B = 40/60, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 220 nm
Sample : 1. Dextromethorphan

Base silica is designed for low column back pressure to reduce the load on the system

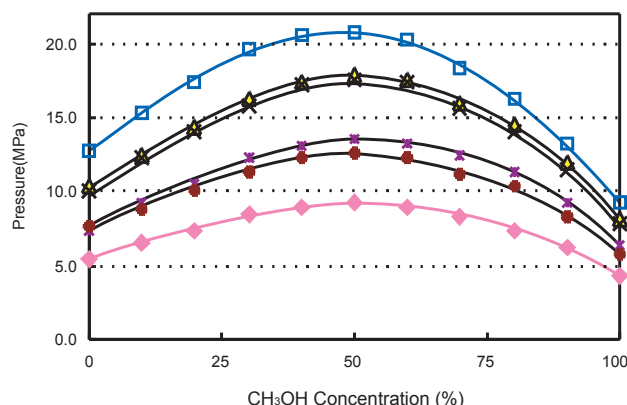
Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C

◆ Inertsil ODS-3 □ Company A
▲ Company B × Company C
✱ Company D ● Company E



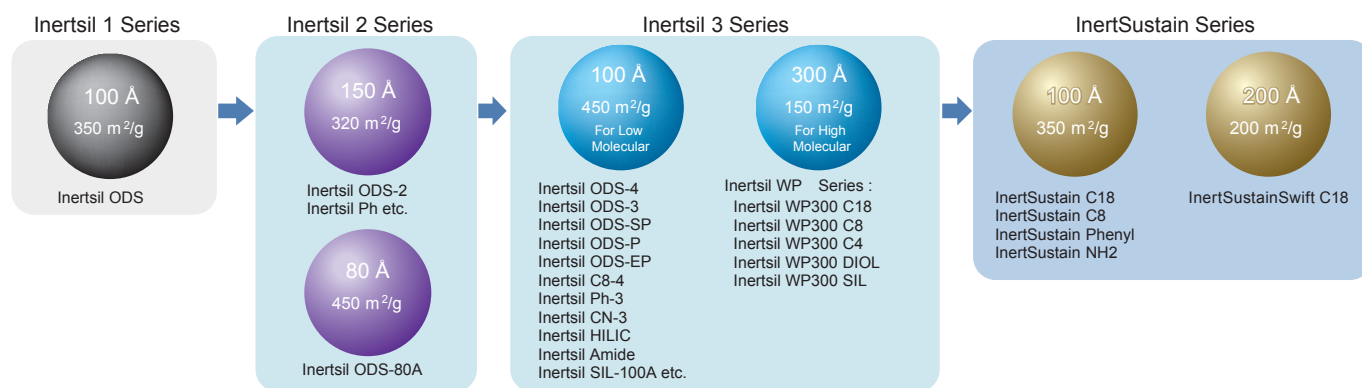
Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C

◆ Inertsil ODS-3 □ Company A
▲ Company B × Company C
✱ Company D ● Company E



The Evolving HPLC Column Packings

GL Sciences has been steadily supplying with columns from Inertsil ODS, first-generation to InertSustain series, integration of state-of-the-art technologies, and has established a very good reputation around the world. They are available with the same quality and the same performance anywhere in the world.



Base on Evolutionally Surfaced Silica (ES Silica) evolved from Inertsil, InertSustain has developed

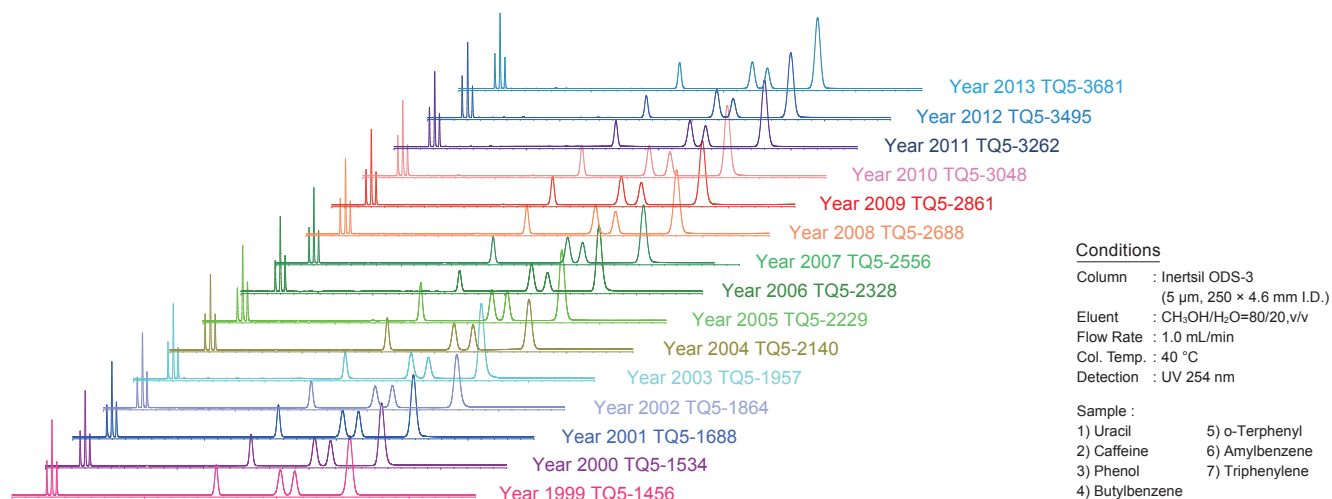
InertSustain employs a radically new type of silica, in which the surface of the silica is uniquely modified, the amount of silanols are controlled. Owing to this state-of-the-art technology ES silica allows easy surface modification including endcapping, which grants the following three favors.

1. Exceptionally improved inertness
2. Robust bonded phase
3. High reproducibility batch to batch

Owing to above benefits InertSustain is recommended as the first choice column for almost all compounds analyzed.

Batch to batch reproducibility

Keeping on stable supplies with high quality and performance, GL Sciences continues to evolve.



Quality Inspections

- ♦Sphericity and surface smoothness of Silica-gel with Scanning Electron Microscopy.
- ♦Particle size, Surface area, Pore diameter, Pore volume of Base Silica-Gel.
- ♦Trace metals impurity on Base Silica-Gel
- ♦Chemical bonding amount
- ♦Residual Silanol Groups by ^{29}Si -NMR
- ♦Chromatographic Test for each lot (4 Standard Samples)
- ♦Column Performance Tests for Individual Columns

ISO Certification



GL Sciences is ISO14001 Compliant Company

Product Ranges: Development, manufacture and sale of instruments, parts, accessories, columns, packing materials, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry



GL Sciences Fukushima Factory is ISO9001 Compliant Facility

Product Ranges: Design, manufacture and supply of instruments, parts, accessories, columns, packings, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry



General Technical Division



Fukushima Factory

Reversed Phase Columns

• InertSustain® C18	002	• Inertsil® C8-4	026
• InertSustainSwift™ C18	006	• Inertsil® C8-3	028
• Inertsil® ODS-4	008	• Inertsil® C8	030
• Inertsil® ODS-3	010	• Inertsil® C4	031
• Inertsil® ODS-4V, ODS-3V	012	• InertSustain® Phenyl	032
• Inertsil® ODS-SP	014	• InertSustain® Phenylhexyl	034
• Inertsil® ODS-P	016	• Inertsil® Ph-3	036
• Inertsil® ODS-EP	018	• Inertsil® Ph	038
• Inertsil® ODS-80A	020	• Inertsil® CN-3	040
• Inertsil® ODS-2	022	• Inertsil® WP300 C18	042
• Inertsil® ODS	023	• Inertsil® WP300 C8	044
• InertSustain® C8.....	024	• Inertsil® WP300 C4	045

InertSustain® C18

Physical Properties

- Silica : Newly Developed ES Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm
- Surface Area : 350 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Complete
- Carbon Loading : 14 %
- USP Code : L1
- pH Range : 1~10



Generally, silica based columns are mechanically stable and provide high efficiencies, however, they cannot be used under alkaline conditions and their residual silanol groups tend to adsorb organic bases. InertSustain C18 employs a radically new type of silica, in which the surface of the silica is uniquely modified, enabling precise control of the silica properties.

InertSustain C18 inherits the advantages of all the current Inertsil HPLC columns (e.g., extremely low operating back pressure, superior inertness to typically any analytes, high efficiency and compatibility with a wide range of solvents), but now can be used for wide pH analysis with consistent performance from column to column and lot to lot.

Figure 1 : Basic Compounds

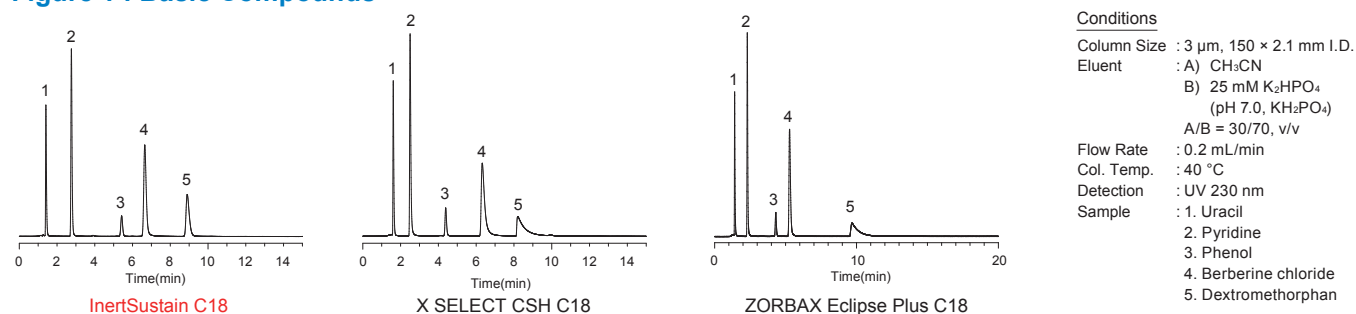


Figure 2 : Acidic Compounds

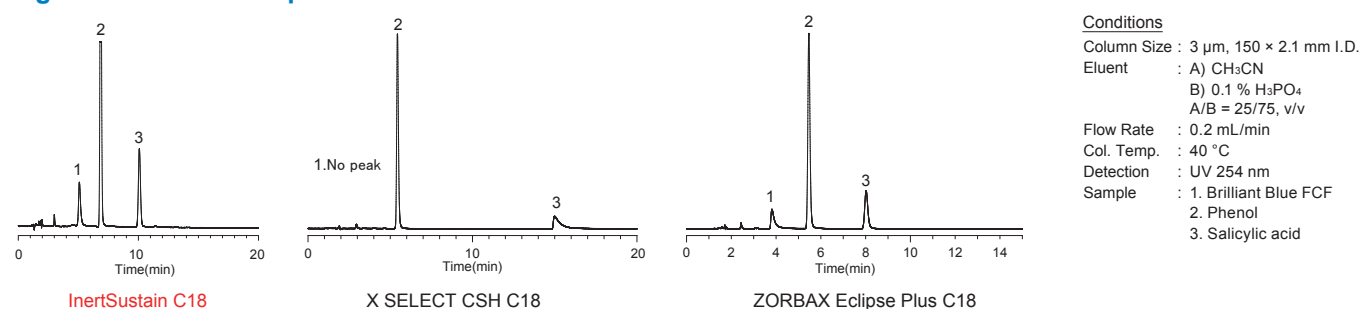
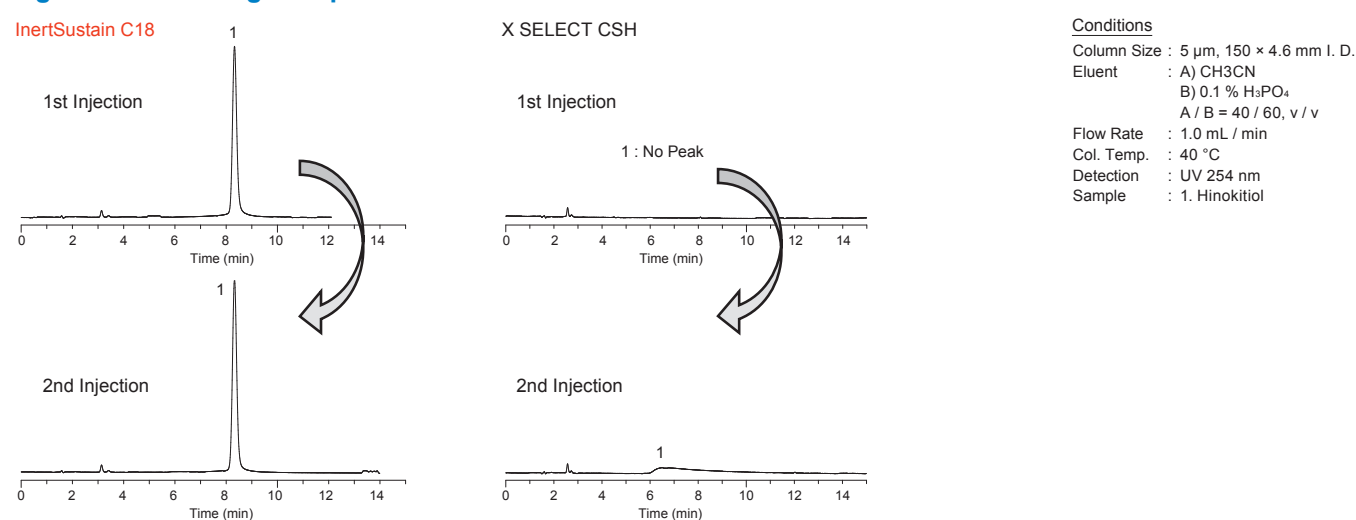
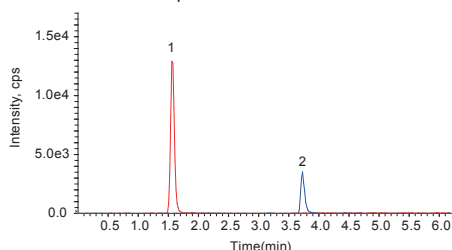
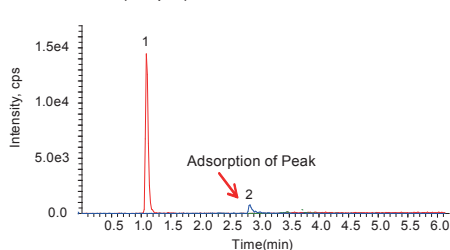


Figure 3 : Chelating Compound



Comparison of Performance to Core-Shell Columns

As shown below, core-shell columns show peak tailing due to the presence of trace metals or silanol groups in their silica gel. Quantitative and qualitative analysis will be a source of concern since the adsorption of compounds can be expected.

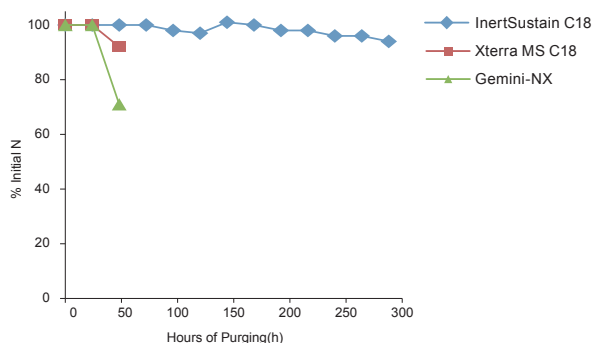
InertSustain C18 3 μm Kinetex C18 (1.7 μm)

Conditions

Column : ODS Column(100 × 2.1 mm I.D.)
 Eluent : A) 2 mM $\text{CH}_3\text{COONH}_4$ in 95 % CH_3CN
 B) 2 mM $\text{CH}_3\text{COONH}_4$ in 10 % CH_3CN
 A / B = 20 / 80 - 2 min - 100 / 0 - 2.5 min
 - 100 / 0 - 0.01 min - 20 / 80, v / v
 (Mixed by a gradient mixer)
 Flow Rate : 0.3 mL / min
 Col. Temp. : 40 °C
 Detection : LC / MS / MS
 (4000 QTRAP® : ESI, Positive, MRM)
 Injection Vol. : 10 μL
 Sample : 1. Nitrofurazone (100 μg / L)
 2. Lasalocid A (100 μg / L)

Wide pH compatibility with Long Column Lifetime

As shown in the experiment below, due to the introduction of Evolved Surface Silica, InertSustain C18 maintained high efficiency and peak shape for 300 hours while other "wide pH" column brands failed.



Purging Conditions

Column Size : 5 μm , 150 × 4.6 mm I.D.
 Eluent : A) CH_3OH
 B) 50 mM Triethylamine (pH 10.0)
 A/B = 30/70, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 50 °C

Analytical Conditions

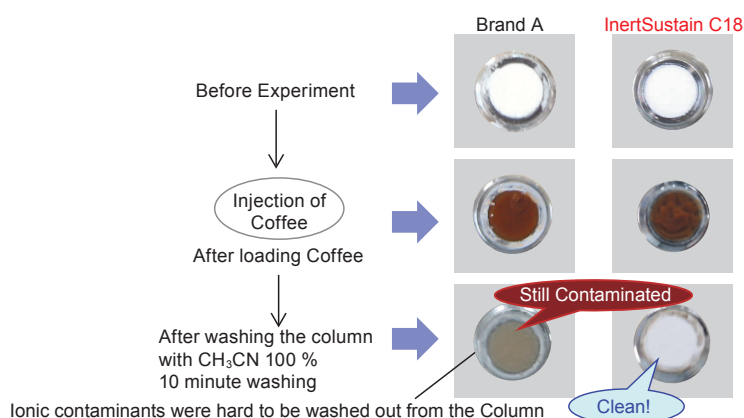
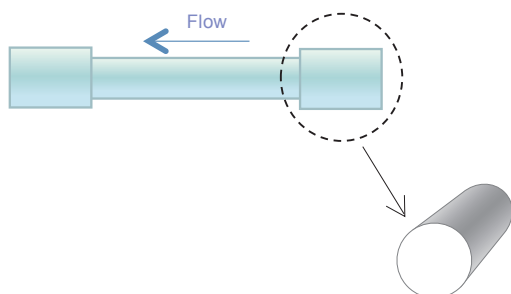
Eluent : A) CH_3CN
 B) H_2O
 A/B = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : Naphthalene

Experience the InertSustain! (Inertness and Sustainability)

Highly end-capped ODS column such as InertSustain C18 offers an opportunity to flush out contaminants from the column surface easily using an organic solvent. Coffee melanoidins are brown heterogeneous polymers contained in coffee. Its components are not clarified yet, but it is considered to contain several ionic compounds, which a poorly end-capped column will adsorb those ionic compounds leading to short column lifetime.

As for ODS column, which is commonly used for HPLC and LC/MS/MS, its inertness has an influence not only on peak shape but also detection sensitivity and durability. It is highly recommended to use highly end-capped column which provides good peak shape for both basic and acidic compounds such as InertSustain C18.

The packing material was visually confirmed by removing the column

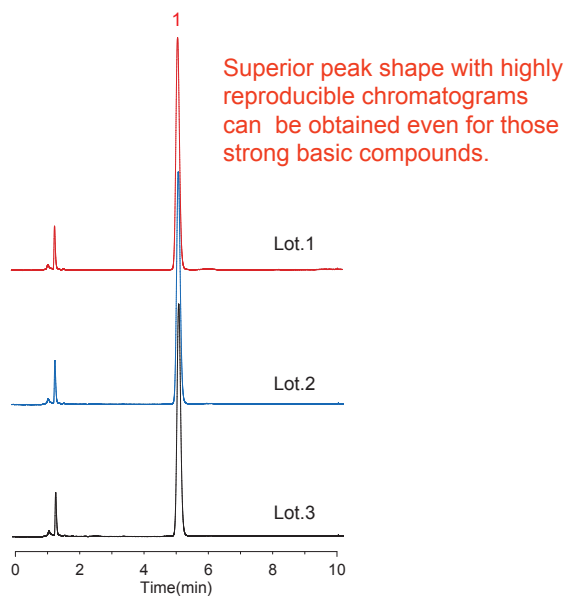


InertSustain® C18

Reliable Reproducibility, Performance and Quality

Rigorous quality control of physical properties and strict chromatographic tests for inertness and selectivity, contribute to the production of InertSustain C18 with an outstanding reproducibility and long column lifetime.

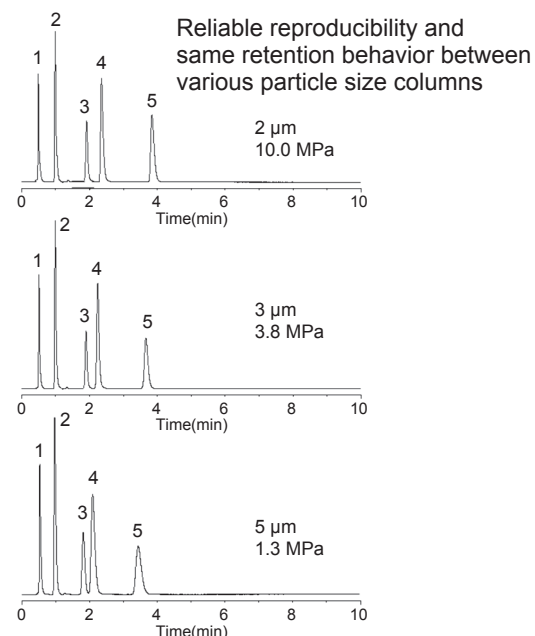
Strong Basic Compound Test



Conditions

Column Size : 5 μ m, 250 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN
 B) 25 mM phosphate buffer (pH 7.0)
 A / B = 40 / 60, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 220 nm
 Sample : 1. Dextromethorphan

Same Retention Behavior between Various Particle Sizes

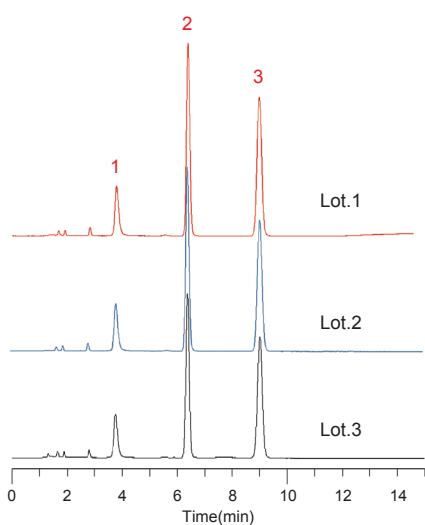


Conditions

Column Size : 50 $\times$ 2.1 mm I.D.
 Eluent : A) CH₃OH
 B) 25 mM phosphate buffer (pH 7.0)
 A / B = 30 / 70, v / v
 Flow Rate : 0.2 mL / min
 Col. Temp. : 40 °C
 Detection : UV 230 nm

Sample : 1. Uracil
 2. Pyridine
 3. Phenol
 4. Berberine chloride
 5. Dextromethorphan

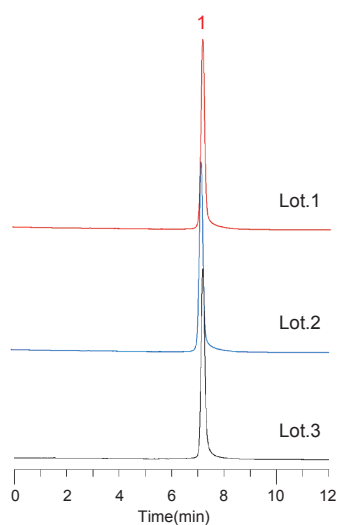
Strong Acidic Compound Test



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN B) 0.1 % H₃PO₄
 A / B = 25 / 75, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : 1. Brilliant Blue FCF
 2. Phenol
 3. Salicylic acid

Strong Chelating Compound Test



Conditions

Column Size : 5 μ m, 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH₃CN B) 0.1 % H₃PO₄
 A / B = 40 / 60, v / v
 Flow Rate : 1.0 mL / min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Sample : 1. Hinokitiol

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-14351	5020-14361	
	50	5020-14352	5020-14362	
	75	5020-14353	5020-14363	
	100	5020-14354	5020-14364	
	150	5020-14355	5020-14365	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14411	5020-14421	5020-14441
	50	5020-14412	5020-14422	5020-14442
	75	5020-14413	5020-14423	5020-14443
	100	5020-14414	5020-14424	5020-14444
	150	5020-14415	5020-14425	5020-14445
	250	5020-14416	5020-14426	5020-14446

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-14301	5020-14311		
	50	5020-14302	5020-14312		
	75	5020-14303	5020-14313		
	100	5020-14304	5020-14314		
	150	5020-14305	5020-14315		
	250	5020-14306	5020-14316		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-07411	5020-07421	5020-07431	5020-07441
	50	5020-07412	5020-07422	5020-07432	5020-07442
	75	5020-07413	5020-07423	5020-07433	5020-07443
	100	5020-07414	5020-07424	5020-07434	5020-07444
	125	5020-07417	5020-07427	5020-07437	5020-07447
	150	5020-07415	5020-07425	5020-07435	5020-07445
	250	5020-07416	5020-07426	5020-07436	5020-07446
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-14201	5020-14211		
	50	5020-14202	5020-14212		
	75	5020-14203	5020-14213		
	100	5020-14204	5020-14214		
	150	5020-14205	5020-14215		
	250	5020-14206	5020-14216		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-07311	5020-07321	5020-07331	5020-07341
	50	5020-07312	5020-07322	5020-07332	5020-07342
	75	5020-07313	5020-07323	5020-07333	5020-07343
	100	5020-07314	5020-07324	5020-07334	5020-07344
	125	5020-07317	5020-07327	5020-07337	5020-07348
	150	5020-07315	5020-07325	5020-07335	5020-07345
	250	5020-07316	5020-07326	5020-07336	5020-07346

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19250	5020-19249	5020-19300	5020-19299
1.5, 2.1		1.5	5020-19350	5020-19349	5020-19400	5020-19399
2.1, 3.0		3.0	5020-19150	5020-19149	5020-19200	5020-19199
4.0, 4.6		4.0	5020-19050	5020-19049	5020-19100	5020-19099
2.1, 3.0	20	3.0	5020-19550	5020-19549	5020-19600	5020-19599
4.0, 4.6		4.0	5020-19450	5020-19449	5020-19500	5020-19499
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

InertSustainSwift™ C18

Physical Properties

- Silica : Newly Developed ES Silica Gel
- Particle Size : 1.9 µm, 3 µm, 5 µm
- Surface Area : 200 m²/g
- Pore Size : 200 Å (20 nm)
- Pore Volume : 1.00 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Complete
- Carbon Loading : 9.0 %
- USP Code : L1
- pH Range : 1.0~10.0



As shown in figure 1, InertSustainSwift C18 maintains the same extreme inertness, wide pH range and provide rapid separations with symmetric peaks. The optimization of surface area, pore size and chemical bonding delivers superior peak shapes (Figure 2). Figure 3 proves InertSustainSwift C18 is also ideal for LC/MS/MS applications which offer highly sensitive results and enables MS compatible buffers to be used due to the extremely inert silica gel.

Figure 1 : Comparison of Retentivity

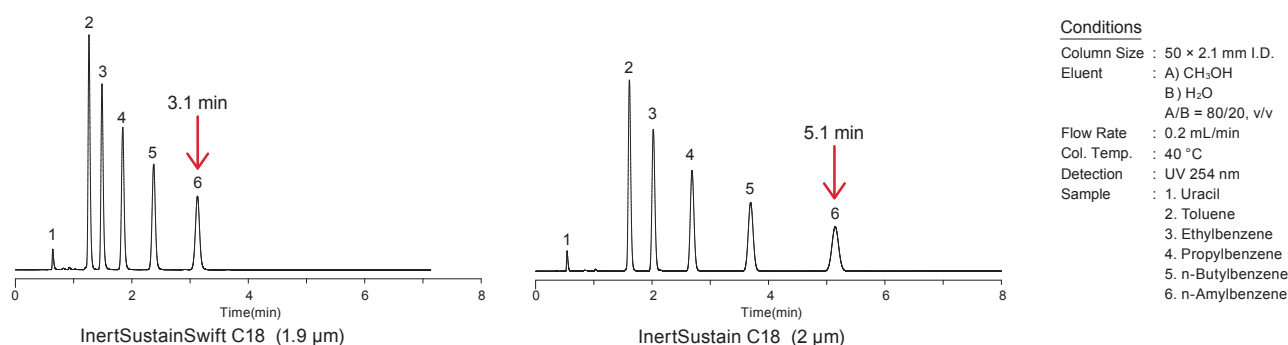


Figure 2 : Comparison of Efficiency

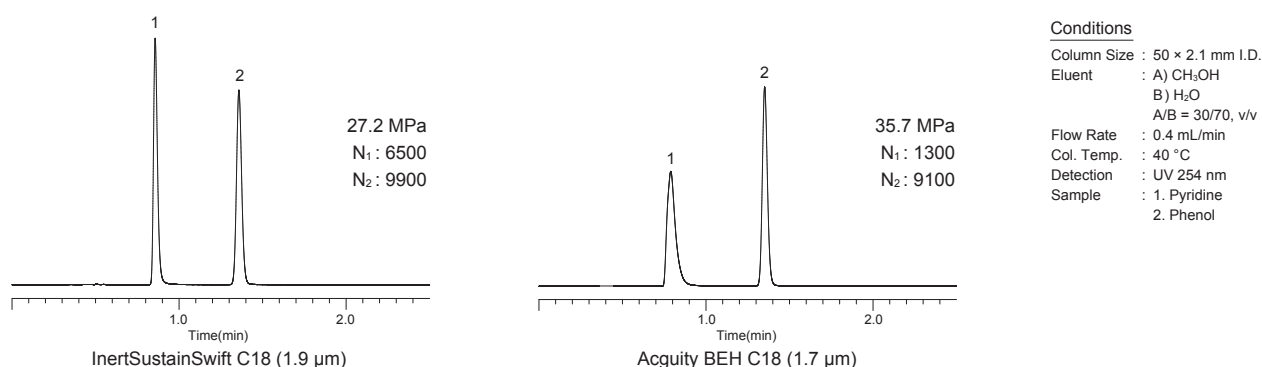
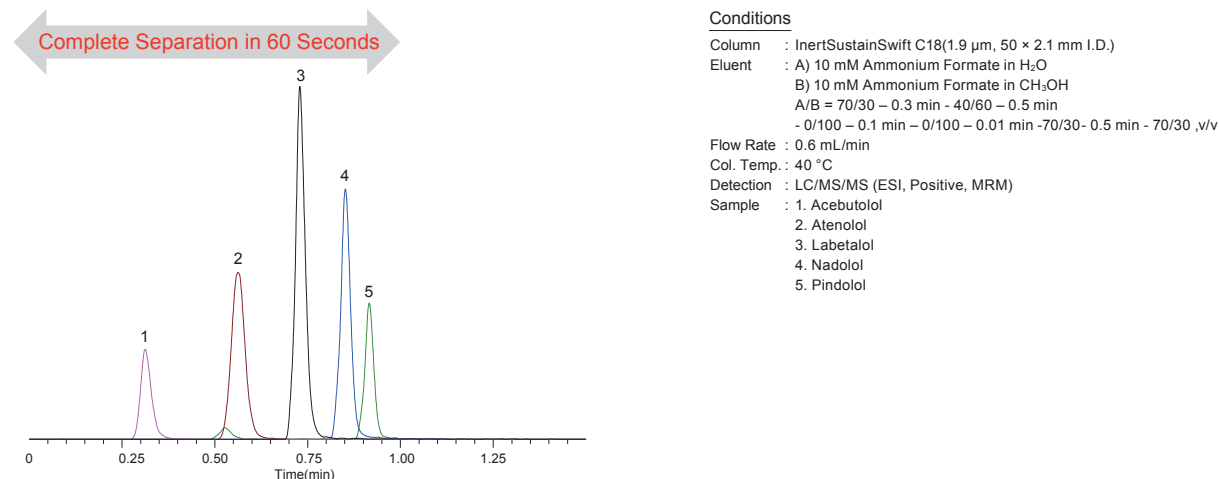


Figure 3 : Rapid LC/MS/MS Analysis of Basic Drugs



Analytical Columns

Particle Size: 1.9 µm	Length / I.D. (mm)	2.1	3.0	
	50	5020-88228	5020-88233	
	100	5020-88230	5020-88235	
	150	5020-88231	5020-88236	
HP Series Particle Size: 3 µm Max. Operating Pressure : 50 MPa (500 Bar)	Length / I.D. (mm)	2.1	3.0	4.6
	50	5020-88210	5020-88216	5020-88222
	100	5020-88212	5020-88218	5020-88224
	150	5020-88213	5020-88219	5020-88225
	250	5020-88214	5020-88220	5020-88226

* End-fittings are 1/16" Parker style.

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 µm	Length / I.D. (mm)	1.0	1.5		
	30	5020-88160	5020-88166		
	50	5020-88161	5020-88167		
	75	5020-88162	5020-88168		
	100	5020-88163	5020-88169		
	150	5020-88164	5020-88170		
	250	5020-88165	5020-88171		
	Length / I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88124	5020-88131	5020-88138	5020-88145
	50	5020-88125	5020-88132	5020-88139	5020-88146
	75	5020-88126	5020-88133	5020-88140	5020-88147
	100	5020-88127	5020-88134	5020-88141	5020-88148
	125	5020-88253	5020-88254	5020-88255	5020-88256
	150	5020-88128	5020-88135	5020-88142	5020-88149
	250	5020-88129	5020-88136	5020-88143	5020-88150
Particle Size: 5 µm	Length / I.D. (mm)	1.0	1.5		
	30	5020-88038	5020-88044		
	50	5020-88039	5020-88045		
	75	5020-88040	5020-88046		
	100	5020-88041	5020-88047		
	150	5020-88042	5020-88048		
	250	5020-88043	5020-88049		
	Length / I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88001	5020-88008	5020-88015	5020-88022
	50	5020-88002	5020-88009	5020-88016	5020-88023
	75	5020-88003	5020-88010	5020-88017	5020-88024
	100	5020-88004	5020-88011	5020-88018	5020-88025
	125	5020-88249	5020-88250	5020-88251	5020-88252
	150	5020-88005	5020-88012	5020-88019	5020-88026
	250	5020-88006	5020-88013	5020-88020	5020-88027

* End-fittings are 1/16" Parker style.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-88199	5020-88105	5020-88200	5020-88106
1.5, 2.1		1.5	5020-88201	5020-88107	5020-88202	5020-88108
2.1, 3.0		3.0	5020-88197	5020-88103	5020-88198	5020-88104
4.0, 4.6		4.0	5020-88195	5020-88101	5020-88196	5020-88102
2.1, 3.0	20	3.0	5020-88205	5020-88111	5020-88206	5020-88112
4.0, 4.6		4.0	5020-88203	5020-88109	5020-88204	5020-88110
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-4

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 11 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil ODS-4 delivers the same extreme inertness to any type of compounds just like InertSustain C18 along with unprecedented stability under 100 % aqueous mobile phases for qualitative and quantitative analysis.

However, as the base silica gel and carbon loading are different on Inertsil ODS-4, differences in selectivity can be observed for certain analytes.

Figure 1 : Comparison of Selectivity between various GL Sciences' Columns

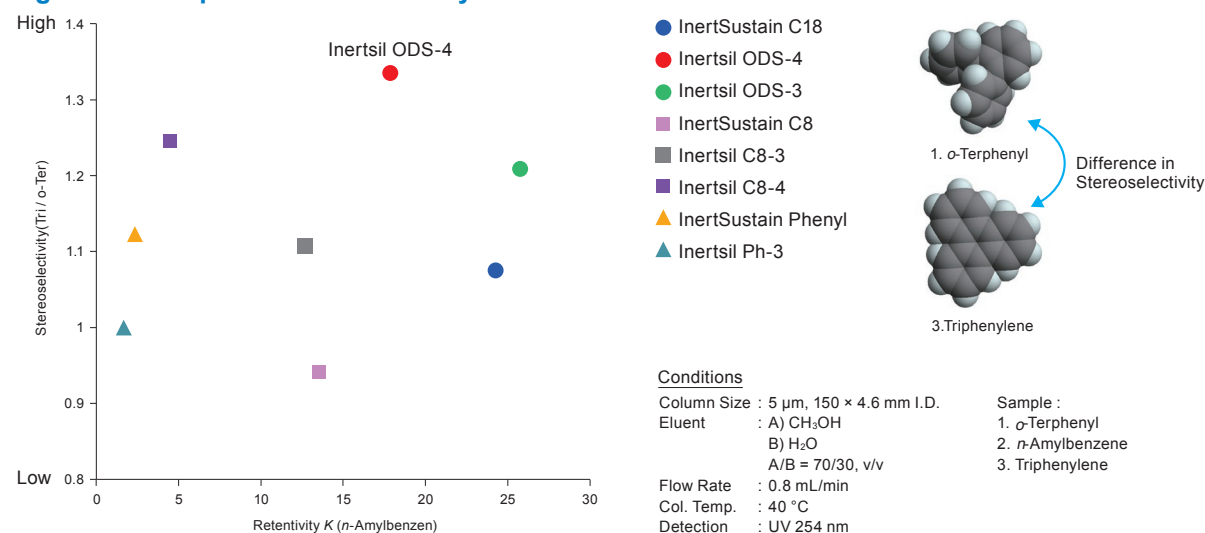
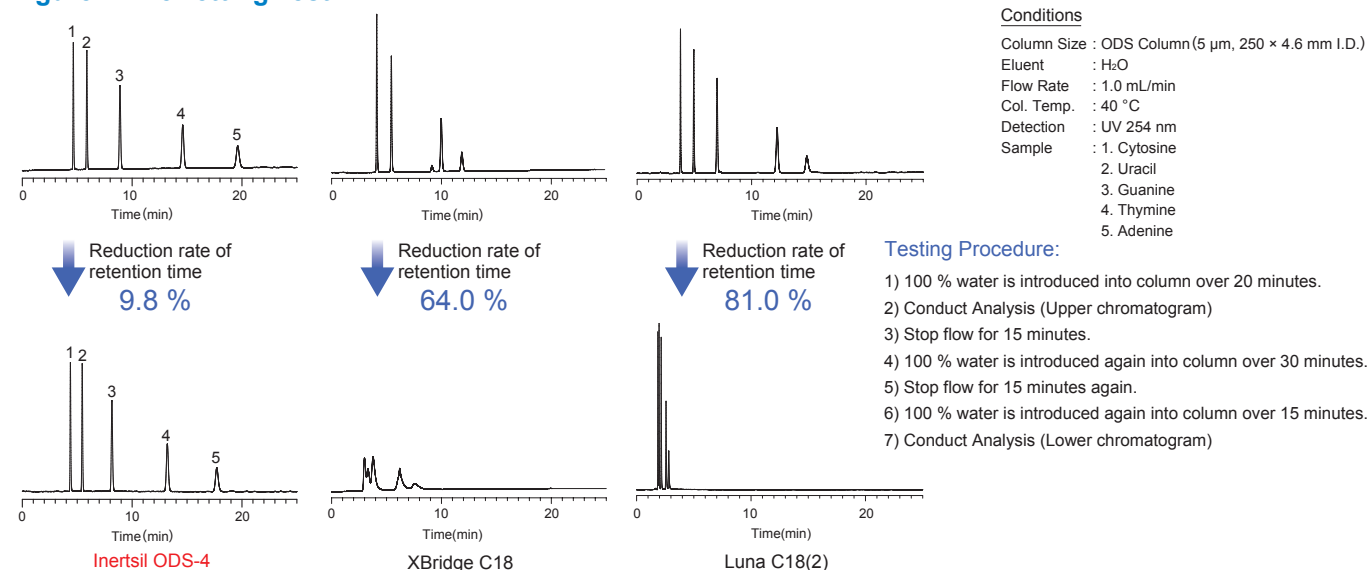


Figure 2 : Dewetting Test



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-81200	5020-81210	
	50	5020-81202	5020-81212	
	75	5020-81203	5020-81213	
	100	5020-81204	5020-81214	
	150	5020-81205	5020-81215	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14061	5020-14064	5020-14067
	50	5020-14062	5020-14065	5020-14068
	75	5020-14063	5020-14066	5020-14069
	100	5020-14001	5020-14004	5020-14007
	150	5020-14002	5020-14005	5020-14008
	250	5020-14003	5020-14006	5020-14009

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81111	5020-81121		
	50	5020-81112	5020-81122		
	75	5020-81113	5020-81123		
	100	5020-81114	5020-81124		
	150	5020-81115	5020-81125		
	250	5020-81116	5020-81126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-04011	5020-04021	5020-04031	5020-04041
	50	5020-04012	5020-04022	5020-04032	5020-04042
	75	5020-04013	5020-04023	5020-04033	5020-04043
	100	5020-04014	5020-04024	5020-04034	5020-04044
	125	5020-04017	5020-04027	5020-04037	5020-04047
	150	5020-04015	5020-04025	5020-04035	5020-04045
250	5020-04016	5020-04026	5020-04036	5020-04046	
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81011	5020-81021		
	50	5020-81012	5020-81022		
	75	5020-81013	5020-81023		
	100	5020-81014	5020-81024		
	150	5020-81015	5020-81025		
	250	5020-81016	5020-81026		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-03911	5020-03921	5020-03931	5020-03941
	50	5020-03912	5020-03922	5020-03932	5020-03942
	75	5020-03913	5020-03923	5020-03933	5020-03943
	100	5020-03914	5020-03924	5020-03934	5020-03944
	125	5020-03917	5020-03927	5020-03937	5020-03947
	150	5020-03915	5020-03925	5020-03935	5020-03945
250	5020-03916	5020-03926	5020-03936	5020-03946	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19202	5020-19201	5020-19252	5020-19251
1.5, 2.1		1.5	5020-19302	5020-19301	5020-19352	5020-19351
2.1, 3.0		3.0	5020-19102	5020-19101	5020-19152	5020-19151
4.0, 4.6		4.0	5020-19002	5020-19001	5020-19052	5020-19051
2.1, 3.0	20	3.0	5020-19502	5020-19501	5020-19552	5020-19551
4.0, 4.6		4.0	5020-19402	5020-19401	5020-19452	5020-19451
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-3

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 4 µm, 5 µm, 7 µm, 10 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 15 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil ODS-3 is still GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical, and contract research labs. As shown in figure 1, Inertsil ODS-3 has a relatively strong retentivity compared to commercially available ODS columns. In addition, the introduction of higher surface area silica provide high preparative loading capacity without sacrificing peak shape which is illustrated in figure 2.

Figure 1 : Comparison of Retentivity

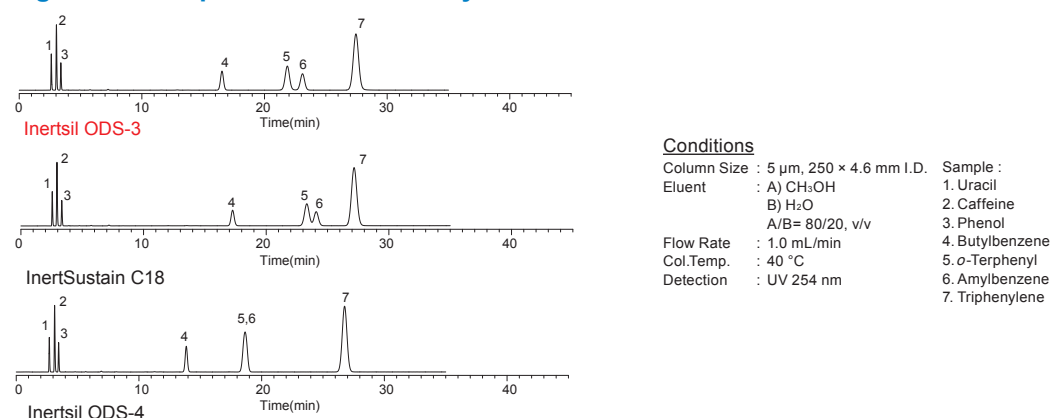
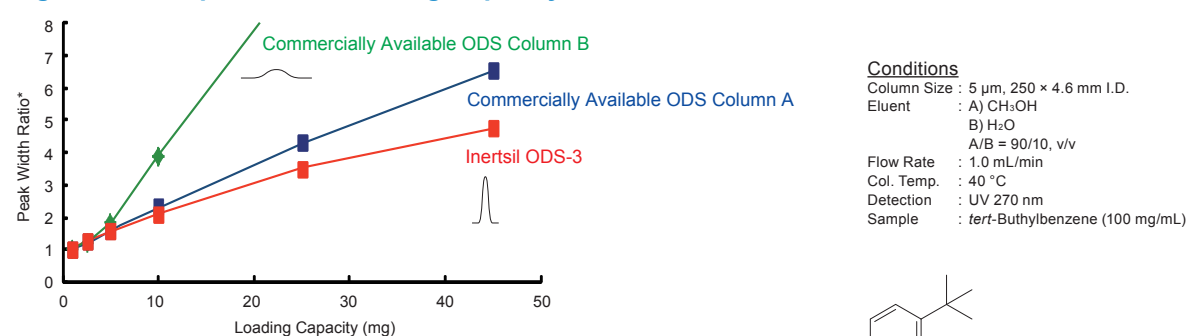


Figure 2 : Comparison of Loading Capacity



* The loading capacity varies depending on the column I.D. size and length.

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-84650	5020-84660	
	50	5020-84652	5020-84662	
	75	5020-84653	5020-84663	
	100	5020-84654	5020-84664	
	150	5020-84655	5020-84665	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14081	5020-14084	5020-14087
	50	5020-14082	5020-14085	5020-14088
	75	5020-14083	5020-14086	5020-14089
	100	5020-14011	5020-14014	5020-14017
	150	5020-14012	5020-14015	5020-14018
	250	5020-14013	5020-14016	5020-14019

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84411	5020-84421		
	50	5020-84412	5020-84422		
	75	5020-84413	5020-84423		
	100	5020-84414	5020-84424		
	150	5020-13360	5020-13350		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04411	5020-04421	5020-04431	5020-04441
	50	5020-04412	5020-04422	5020-04432	5020-01774
	75	5020-04413	5020-04423	5020-04433	5020-01770
	100	5020-04414	5020-04424	5020-01790	5020-01775
	125	5020-04417	5020-04427	5020-01791	5020-01776
	150	5020-04415	5020-04425	5020-04435	5020-01771
	250	5020-04416	5020-04426	5020-04436	5020-01772
Particle Size: 4 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04611	5020-04621	5020-04631	5020-04641
	50	5020-04612	5020-04622	5020-04632	5020-04642
	75	5020-04613	5020-04623	5020-04633	5020-04643
	100	5020-04614	5020-04624	5020-04634	5020-04644
	125	5020-04617	5020-04627	5020-04637	5020-04647
	150	5020-04615	5020-04625	5020-04635	5020-04645
	250	5020-04616	5020-04626	5020-04636	5020-04646
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84511	5020-84521		
	50	5020-84512	5020-84522		
	75	5020-84513	5020-84523		
	100	5020-84514	5020-84524		
	150	5020-13251	5020-13241		
	250	5020-13252	5020-13242		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04511	5020-04521	5020-04531	5020-04541
	50	5020-04512	5020-04522	5020-04532	5020-01763
	75	5020-04513	5020-04523	5020-04533	5020-01764
	100	5020-04514	5020-04524	5020-01766	5020-01765
	125	5020-04515	5020-04525	5020-01767	5020-01768
	150	5020-01741	5020-01751	5020-01761	5020-01731
	250	5020-01742	5020-01752	5020-01762	5020-01732
Particle Size: 10 µm	Length \ I.D. (mm)	4.6			
	150	5020-01631			
	250	5020-01632			

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)			Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)			
			Particle Size			Particle Size			
			3 µm	4 µm	5 µm	3 µm	4 µm	5 µm	
1.0	10	1.0	5020-19205	5020-19204	5020-19203	5020-19255	5020-19254	5020-19253	
1.5, 2.1		1.5	5020-19305	5020-19304	5020-19303	5020-19355	5020-19354	5020-19353	
2.1, 3.0		3.0	5020-19105	5020-19104	5020-19103	5020-19155	5020-19154	5020-19153	
4.0, 4.6		4.0	5020-19005	5020-19004	5020-19003	5020-19055	5020-19054	5020-19053	
2.1, 3.0	20	3.0	5020-19505	5020-19504	5020-19503	5020-19555	5020-19554	5020-19553	
4.0, 4.6		4.0	5020-19405	5020-19404	5020-19403	5020-19455	5020-19454	5020-19453	
Holder for Cartridge Guard Column E				For 10 mm Length					5020-08500
				For 20 mm Length					5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-4V

(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 11 %
- USP Code : L1
- pH Range : 2 ~ 7.5

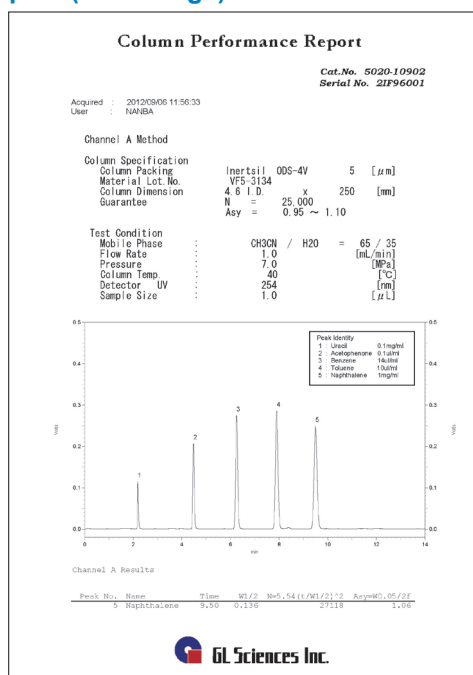


Inertsil ODS-4 columns have proven superior worldwide for analysis of strong pharmaceutical bases, acids, chelating compounds, and zwitterions. The long-awaited validated Inertsil ODS-4V has now been added to our product lineup.

Each Inertsil ODS-4V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing.

By choosing Inertsil ODS-4V, you can be assured that you are using one of the most trusted and enduring HPLC columns for validation.

Details of Column Performance Report (Front Page)



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30212	5020-30222	5020-30232	5020-30242
	75	5020-30213	5020-30223	5020-30233	5020-30243
	100	5020-30214	5020-30224	5020-30234	5020-30244
	150	5020-30215	5020-30225	5020-30235	5020-30245
	250	5020-30216	5020-30226	5020-30236	5020-30246
Particle Size: 5 µm	Length \ I.D. (mm)	3.0	4.0	4.6	
	150	5020-10921	5020-10911	5020-10901	
	250	5020-10922	5020-10912	5020-10902	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-3V

(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

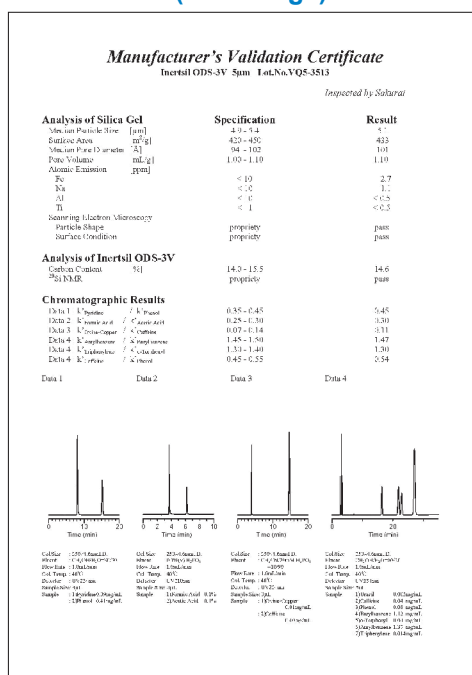
Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 15 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil ODS-3V offers all of the outstanding chromatographic benefits of Inertsil ODS-3 with the added benefit of a more thoroughly documented, validated QC procedure consistent with the demands of GLP/GMP compliance. Each Inertsil ODS-3V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing. The use of Inertsil ODS-3V columns provides an extra measure of assurance of consistent performance from column to column and batch to batch. Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies.

Details of Manufacturer's Validation Certificate (Back Page)



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30112	5020-30122	5020-30132	5020-30142
	75	5020-30113	5020-30123	5020-30133	5020-30143
	100	5020-30114	5020-30124	5020-30134	5020-30144
	150	5020-30115	5020-30125	5020-30135	5020-30145
	250	5020-30116	5020-30126	5020-30136	5020-30146
Particle Size: 5 µm	Length \ I.D. (mm)	3.0	4.0	4.6	
	150	5020-01821	5020-01811	5020-01801	
	250	5020-01822	5020-01812	5020-01802	

Validation Packs (3-Column-Sets)

Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies. Choose the column dimension and one of the following batch requirements. All three columns with single batch
 2. Two columns with single batch and other a different batch
 3. All three columns with different batches

	Length \ I.D. (mm)	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-	5020-	5020-
	250	5020-	5020-	5020-

* *End-fittings are 1/16" Waters-compatible.

* *For maximum operating pressure information, please refer to page 46.

Inertsil[®] ODS-SP

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 8.5 %
- USP Code : L1
- pH Range : 2 ~ 7.5



As shown in figure 1, Inertsil ODS-SP is super base deactivated and optimally bonded to retain hydrophilic compounds without excessive retention of hydrophobic compounds achieving better separations faster than before.

As the carbon load of Inertsil ODS-SP is relatively low, it is compatible with 100 % aqueous eluents and offer faster equilibration of column for gradient analysis.

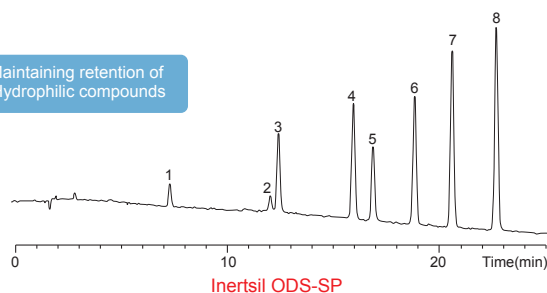
Figure 1 : Comparison of Retention Behavior between Inertsil[®] ODS-3 and Inertsil[®] ODS-SP

Conditions

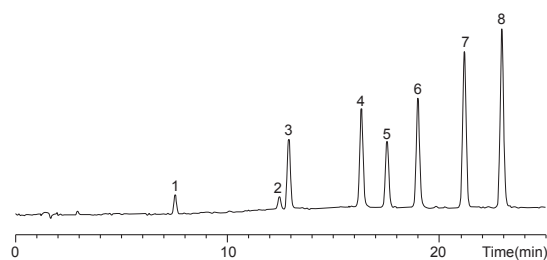
Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3OH
 B) 10 mM NaH_2PO_4
 A/B = 10/90 – 30 min – 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 280 nm

Sample : 1. Galliccatechin (GC)
 2. Epigallocatechin (EGC)
 3. Catechin (C)
 4. Epigallocatechin gallate (EGCg)
 5. Epicatechin (EC)
 6. Galliccatechin gallate (GCg)
 7. Epicatechin gallate (ECg)
 8. Catechin gallate (Cg)

Maintaining retention of
Hydrophilic compounds



Inertsil ODS-SP



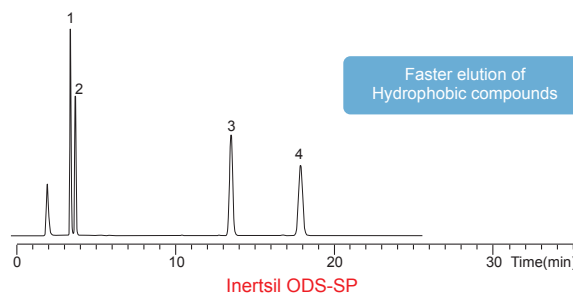
Inertsil ODS-3

Conditions

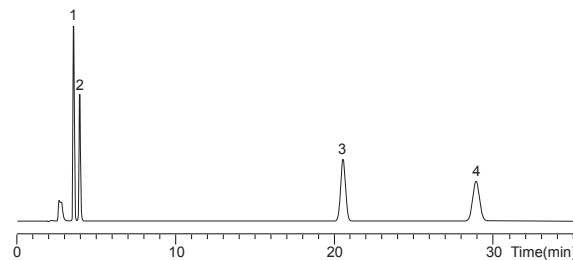
Column Size : 5 μm , 250 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN
 B) 20 mM KH_2PO_4 (pH 3.0, H_3PO_4)
 A/B = 70/30, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 280 nm

Sample : 1. Phenol
 2. Bisphenol A
 3. 4-Octylphenol
 4. 4-Nonylphenol

Faster elution of
Hydrophobic compounds

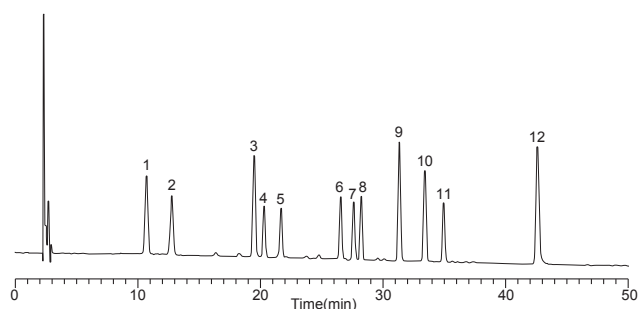


Inertsil ODS-SP



Inertsil ODS-3

Figure 2 : Simultaneous Analysis of Soybean Isoflavone



Conditions

Column : Inertsil ODS-SP
 (5 μm , 250 $\times$ 4.6 mm I.D.)
 Eluent : A) 0.1 % CH_3COOH in CH_3CN
 B) 0.1 % CH_3COOH in H_2O
 A/B = 15/85 – 8 min – 15/85 – 42 min – 35/65 – 10 min hold, v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 35 $^\circ\text{C}$
 Detection : UV 254 nm

Sample : 1. Daidzin (D)
 2. Glycitin (Gly)
 3. Genistin (Gl)
 4. 6"-O-malonyldaidzin (MD)
 5. 6"-O-malonylglycitin (MGI)
 6. 6"-O-acetyldaidzin (AD)
 7. 6"-O-acetylglycitin (AGI)
 8. 6"-O-malonylgenistin (MG)
 9. Daizein (De)
 10. Glycitein (Gle)
 11. 6"-O-acetylgenistin (AG)
 12. Genistein (Ge)

Analytical Columns

HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14091	5020-14094	5020-14097
	50	5020-14092	5020-14095	5020-14098
	75	5020-14093	5020-14096	5020-14099
	100	5020-14021	5020-14024	5020-14027
	150	5020-14022	5020-14025	5020-14028
	250	5020-14023	5020-14026	5020-14029

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	20	5020-02811	5020-02821	5020-02831	5020-02841
	50	5020-02812	5020-02822	5020-02832	5020-02842
	75	5020-02813	5020-02823	5020-02833	5020-02843
	100	5020-02814	5020-02824	5020-02834	5020-02844
	150	5020-02815	5020-02825	5020-02835	5020-02845
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	20	5020-02711	5020-02721	5020-02731	5020-02741
	50	5020-02712	5020-02722	5020-02732	5020-02742
	75	5020-02713	5020-02723	5020-02733	5020-02743
	100	5020-02714	5020-02724	5020-02734	5020-02744
	150	5020-02715	5020-02725	5020-02735	5020-02745
	250	5020-02716	5020-02726	5020-02736	5020-02746

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19207	5020-19206	5020-19257	5020-19256
1.5, 2.1		1.5	5020-19307	5020-19306	5020-19357	5020-19356
2.1, 3.0		3.0	5020-19107	5020-19106	5020-19157	5020-19156
4.0, 4.6		4.0	5020-19007	5020-19006	5020-19057	5020-19056
2.1, 3.0	20	3.0	5020-19507	5020-19506	5020-19557	5020-19556
4.0, 4.6		4.0	5020-19407	5020-19406	5020-19457	5020-19456
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® ODS-P

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : None
- Carbon Loading : 29 %
- USP Code : L1
- pH Range : 2 ~ 7.5



GL Sciences offers a polymerically bonded ODS-P phase which provide high steric selectivity for separation of planar and non-planar compounds as shown in figure 1. This polymeric type C18 column delivers complete baseline separation of structurally similar compounds such as vitamins D2 and D3 which is illustrated in figure 2. Inertsil ODS-P columns are also ideal for the HPLC analysis of 16 PAH compounds, listed as target pollutants by the U.S. EPA.

Figure 1 : Classification of Inertsil® ODS phases by Standard Reference Material 869

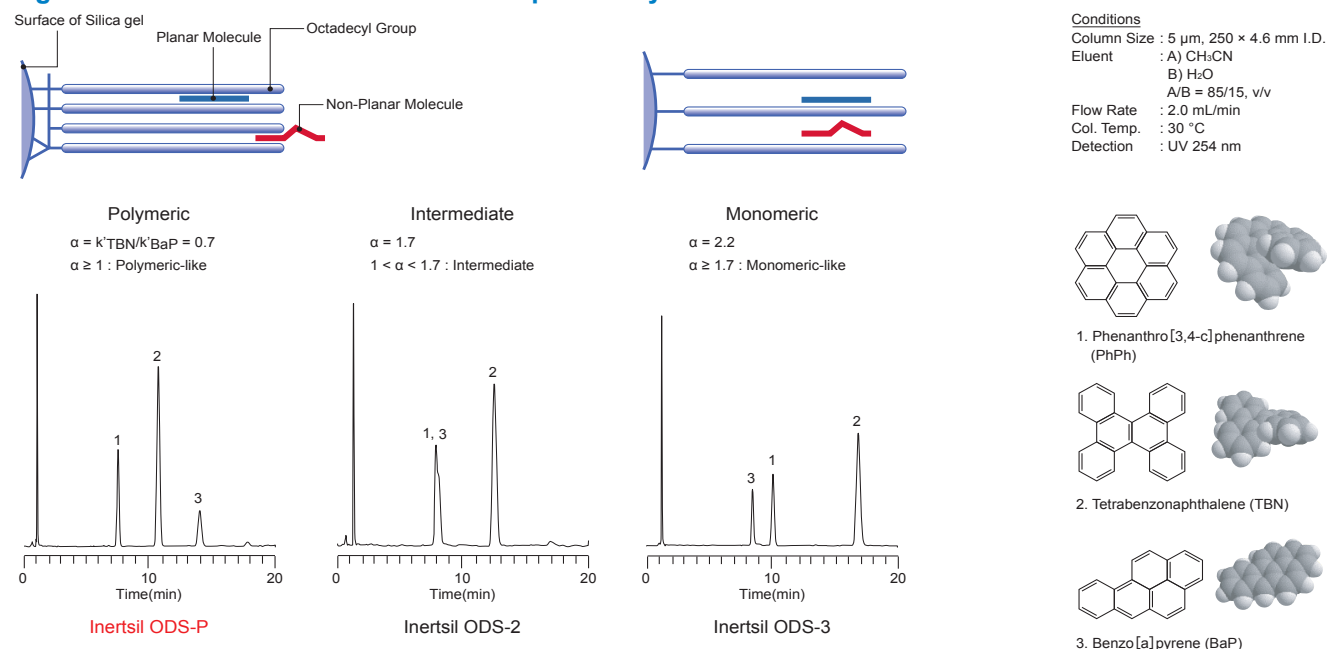
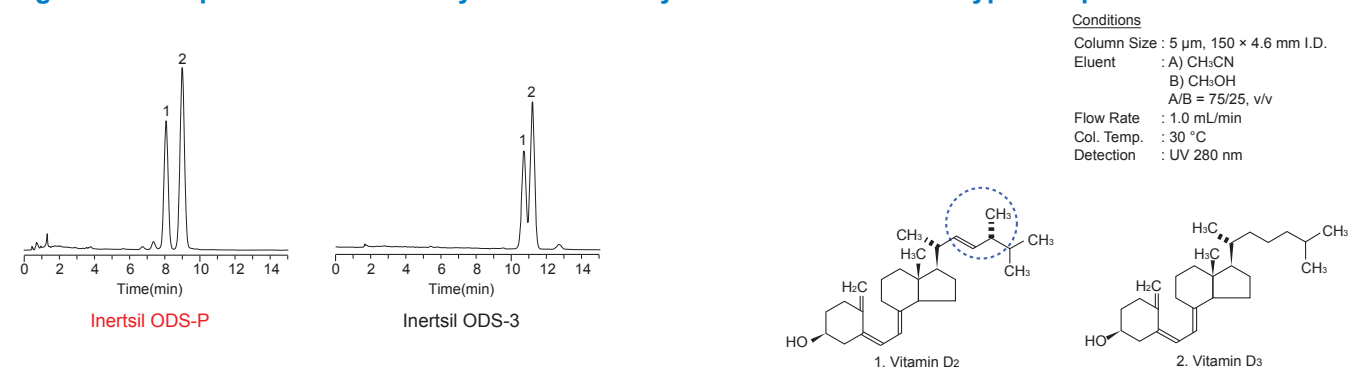


Figure 2 : Comparison of Selectivity between a Polymeric and Monomeric type C18 phase



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84731	5020-84741		
	50	5020-84732	5020-84742		
	75	5020-84733	5020-84743		
	100	5020-84734	5020-84744		
	150	5020-84735	5020-84745		
	250	5020-84736	5020-84746		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04661	5020-04671	5020-04681	5020-04691
	50	5020-04662	5020-04672	5020-04682	5020-04692
	75	5020-04663	5020-04673	5020-04683	5020-04693
	100	5020-04664	5020-04674	5020-04684	5020-04694
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84711	5020-84721		
	50	5020-84712	5020-84722		
	75	5020-84713	5020-84723		
	100	5020-84714	5020-84724		
	150	5020-84715	5020-84725		
	250	5020-84716	5020-84726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04711	5020-04721	5020-04731	5020-04741
	50	5020-04712	5020-04722	5020-04732	5020-04742
	75	5020-04713	5020-04723	5020-04733	5020-04743
	100	5020-04714	5020-04724	5020-04734	5020-04744
	150	5020-04715	5020-04725	5020-04735	5020-02001
	250	5020-04716	5020-04726	5020-04736	5020-02002

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19209	5020-19208	5020-19259	5020-19258
1.5, 2.1		1.5	5020-19309	5020-19308	5020-19359	5020-19358
2.1, 3.0		3.0	5020-19109	5020-19108	5020-19159	5020-19158
4.0, 4.6		4.0	5020-19009	5020-19008	5020-19059	5020-19058
2.1, 3.0	20	3.0	5020-19509	5020-19508	5020-19559	5020-19558
4.0, 4.6		4.0	5020-19409	5020-19408	5020-19459	5020-19458
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® ODS-EP

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : None
- Carbon Loading : 9 %
- USP Code : L1
- pH Range : 2 ~ 7.5



PG : Polar Group

Inertsil ODS-EP contains a polar functional group embedded between the silica surface and the C18 group.

The embedded polar group makes the C18 phase stable in 100 % aqueous eluents without "phase collapse."

This phase is also extremely "base deactivated" and provides superior peak shape for acids and bases in organic eluents as well as acidified eluents typically used in LC/MS.

Figure 1 : Comparison of Selectivity between various reversed phased columns

Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
 Eluent : A) CH₃OH
 B) 10 mM KH₂PO₄ (pH 7.0, K₂HPO₄)
 A/B = 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 210 nm

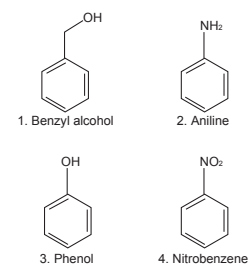
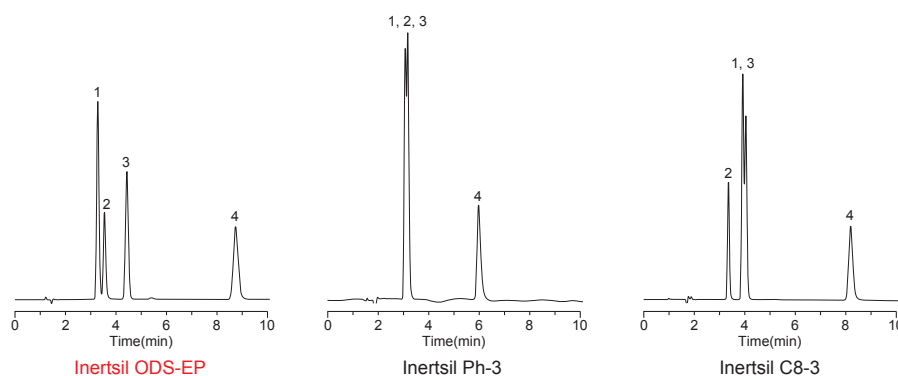
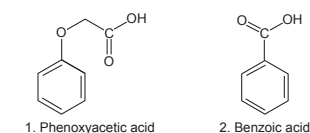
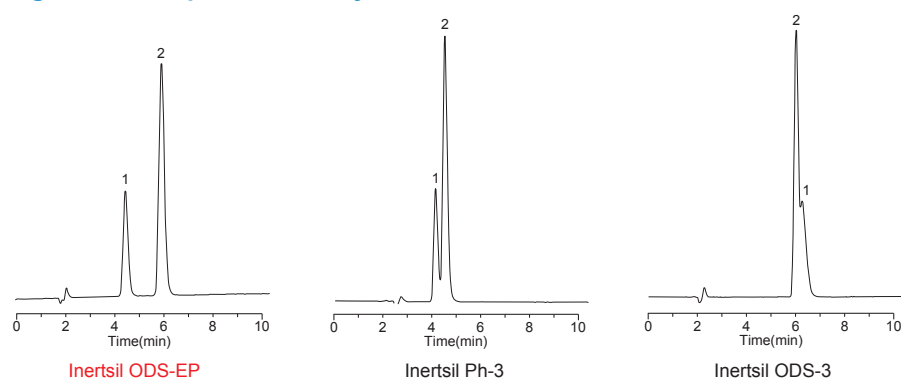


Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase

Conditions

Column Size : 5 µm, 150 × 3.0 mm I.D.
 Eluent : A) CH₃OH
 B) 0.1 % HCOOH in H₂O
 A/B = 50/50, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-18211	5020-18221		
	50	5020-18212	5020-18222		
	75	5020-18213	5020-18223		
	100	5020-18214	5020-18224		
	150	5020-18215	5020-18225		
	250	5020-18216	5020-18226		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-02611	5020-02621	5020-02631	5020-02641
	50	5020-02612	5020-02622	5020-02632	5020-02642
	75	5020-02613	5020-02623	5020-02633	5020-02643
	100	5020-02614	5020-02624	5020-02634	5020-02644
	150	5020-02615	5020-02625	5020-02635	5020-02645
	250	5020-02616	5020-02626	5020-02636	5020-02646

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19210	5020-19260
1.5, 2.1		1.5	5020-19310	5020-19360
2.1, 3.0		3.0	5020-19110	5020-19160
4.0, 4.6		4.0	5020-19010	5020-19060
2.1, 3.0	20	3.0	5020-19510	5020-19560
4.0, 4.6		4.0	5020-19410	5020-19460
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® ODS-80A

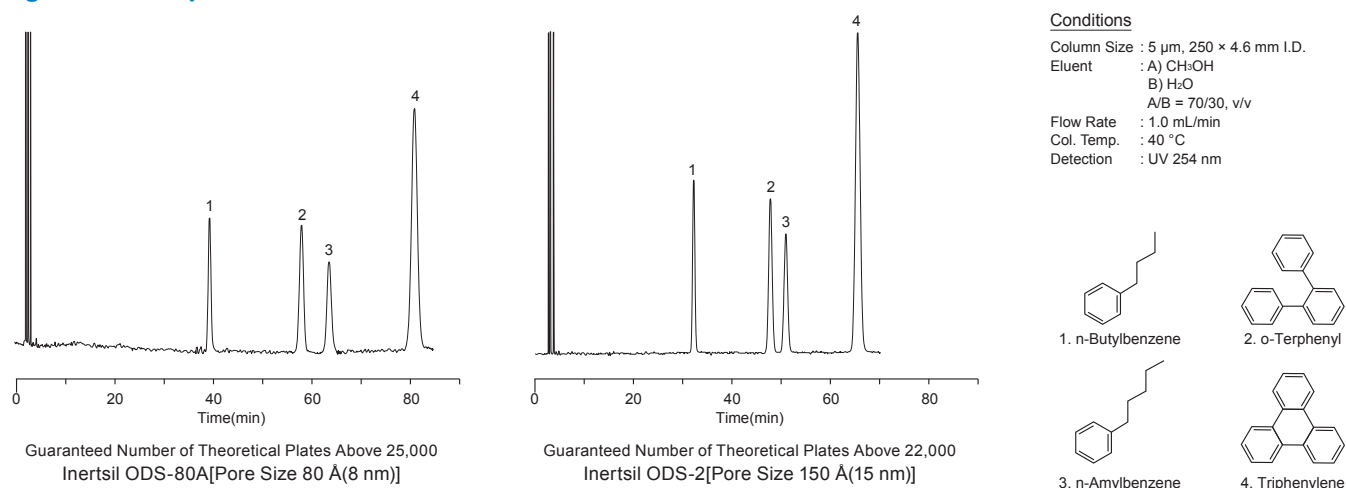
Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 80 Å (8 nm)
- Pore Volume : 0.80 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 17.5 %
- USP Code : L1
- pH Range : 2 ~ 7.5



A relatively small pore size of 80 Å with high surface area silica delivers high number of theoretical plates for small molecule samples. GL Sciences' InertSustain C18 and Inertsil ODS-4 were a major advancement on the Inertsil ODS-80A columns, and generally provide superior chromatography and alternative selectivity to the Inertsil ODS-80A. We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison With Inertsil® ODS-2



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01621	5020-01622	5020-01623	5020-01624
	250	5020-01625	5020-01626	5020-01627	5020-01628

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19140	5020-19190
4.0, 4.6		4.0	5020-19040	5020-19090
2.1, 3.0	20	3.0	5020-19540	5020-19590
4.0, 4.6		4.0	5020-19440	5020-19490
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® ODS-2

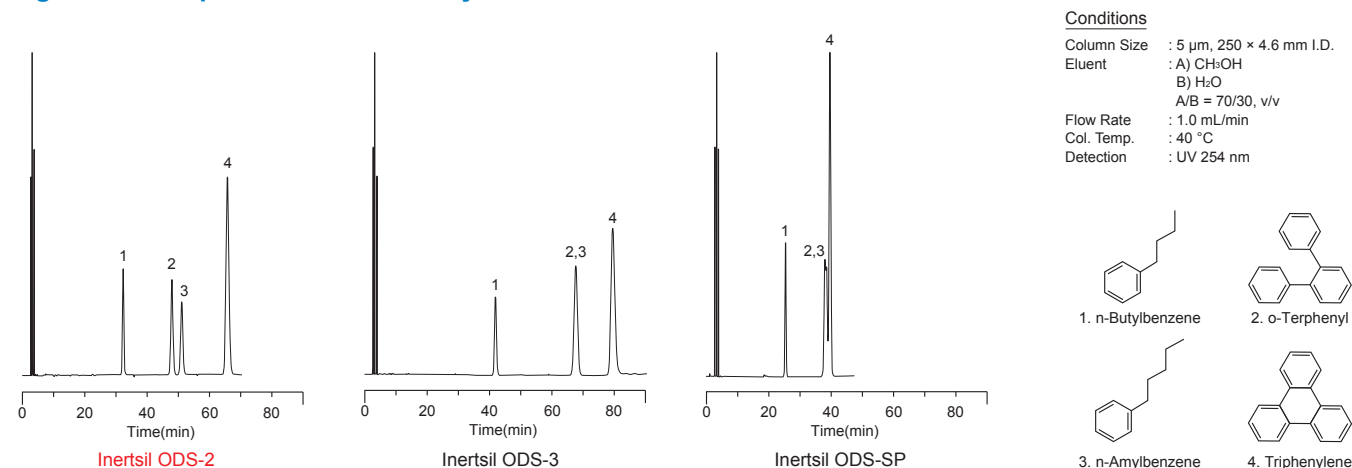
Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 320 m²/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 18.5 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil ODS-2 columns have a pore size of 150 Å offering symmetric peaks for bases, acids with low pressure. When Inertsil ODS-2 was introduced in 1987s, this HPLC transformed the entire industry. Inertsil ODS-2 was the first HPLC phase created using ultra high purity silica, which produced superior base deactivation. Until this phase was eclipsed by the performance of it's sibling Inertsil ODS-4, it was GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical and environmental labs. We recommend Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison of Retentivity with various Inertsil® ODS Bonded Phases



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01121	5020-01122	5020-01123	5020-01124
	250	5020-01125	5020-01126	5020-01127	5020-01128

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

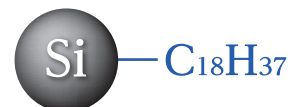
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19135	5020-19185
4.0, 4.6		4.0	5020-19035	5020-19085
2.1, 3.0	20	3.0	5020-19535	5020-19585
4.0, 4.6		4.0	5020-19435	5020-19485
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

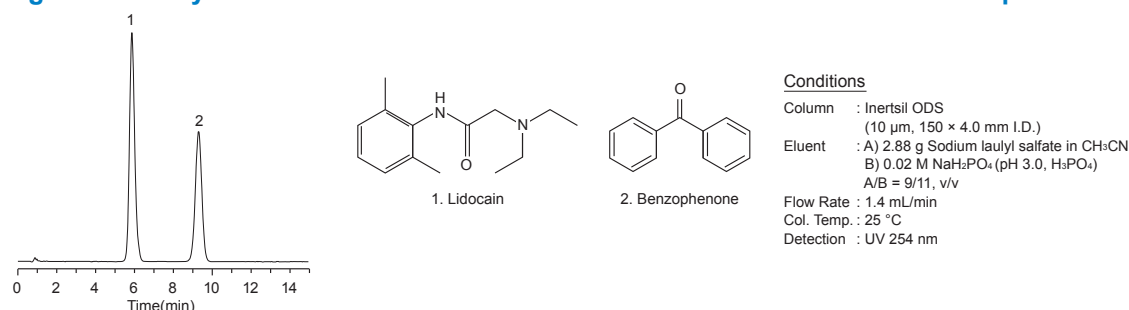
Physical Properties

- Silica : Spherical Silica Gel
- Particle Size : 5 µm, 10 µm
- Surface Area : 350 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.00 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 14 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil ODS columns are general purpose, reversed phase C18 columns available in 5 µm and 10 µm particle sizes. It was the first ODS bonded phase introduced from GL Sciences back in 1986. We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Figure 1 : Analysis of Lidocain under a condition based on the 16th Edition Japanese Pharmacopeia



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm					
	150	5020-02121	5020-02122	5020-02123	5020-02124
	250	5020-02125	5020-02126	5020-02127	5020-02128
Particle Size: 10 µm					
	150	5020-02221	5020-02222	5020-02223	5020-02224
	250	5020-02225	5020-02226	5020-02227	5020-02228

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			5 µm	10 µm	5 µm	10 µm
2.1, 3.0	10	3.0	5020-19141	5020-19142	5020-19191	5020-19192
4.0, 4.6		4.0	5020-19041	5020-19042	5020-19091	5020-19092
2.1, 3.0	20	3.0	5020-19541	5020-19542	5020-19591	5020-19592
4.0, 4.6		4.0	5020-19441	5020-19442	5020-19491	5020-19492
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

InertSustain® C8

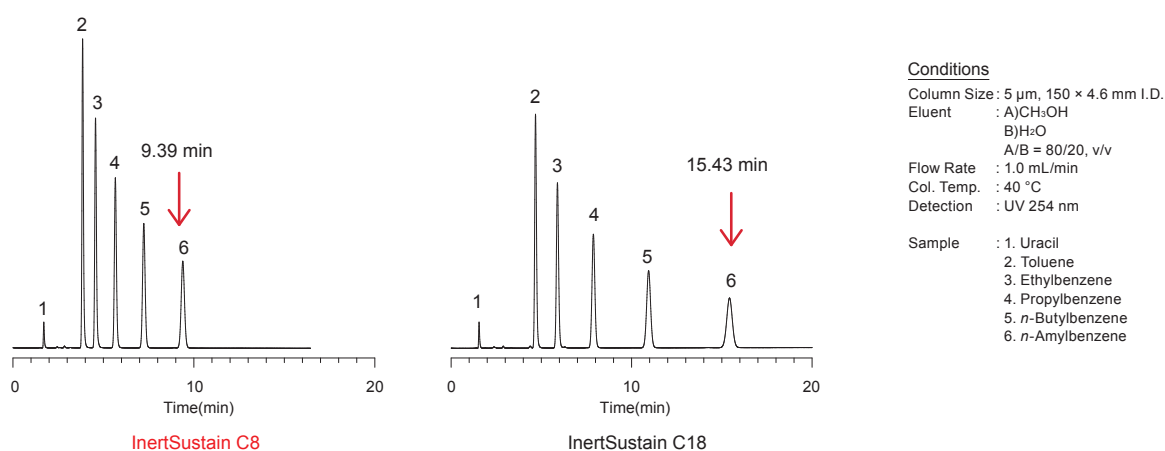
Physical Properties

- Silica : Newly Developed ES Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 350 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Bonded Phase : Octyl Groups
- End-capping : Complete
- Carbon Loading : 8 %
- USP Code : L7
- pH Range : 1 ~ 10

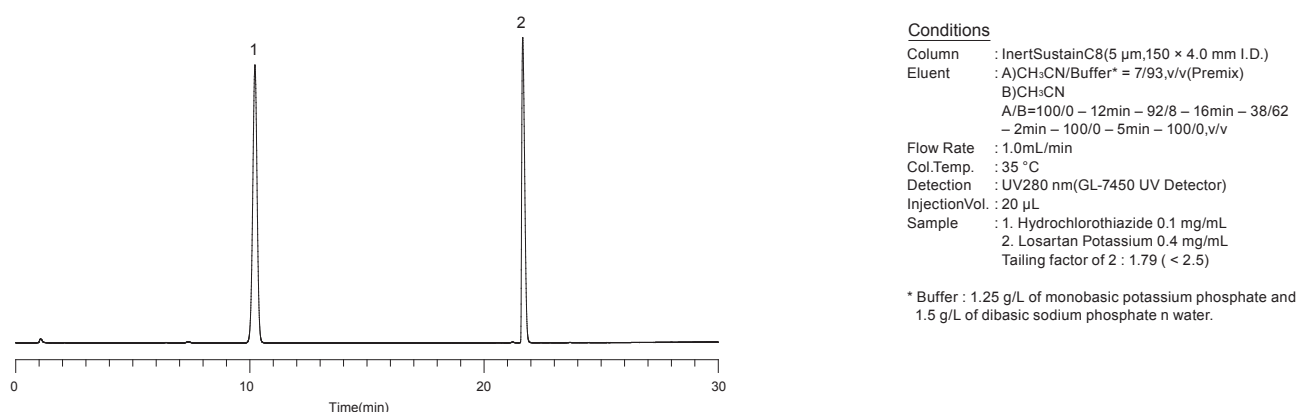


InertSustain C8 is an octyl group (C8) bonded column delivering the same extreme inertness to any type of compounds just like InertSustain C18, which enables rapid analysis of highly hydrophobic compounds delivering symmetric peaks at a wide range of pH.

Figure 1 : Comparison of Retentivity between InertSustain® C18 and InertSustain® C8



**Figure 2 : Analysis of Losartan Potassium and Hydrochlorothiazide Tablets, Assay Test
(Based on the Condition of United States Pharmacopeia 36-NF31)**



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-16235	5020-16240	
	50	5020-16236	5020-16241	
	75	5020-16237	5020-16242	
	100	5020-16238	5020-16243	
	150	5020-16239	5020-16244	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-16217	5020-16223	5020-16229
	50	5020-16218	5020-16224	5020-16230
	75	5020-16219	5020-16225	5020-16231
	100	5020-16220	5020-16226	5020-16232
	150	5020-16221	5020-16227	5020-16233
	250	5020-16222	5020-16228	5020-16234

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16168	5020-16174		
	50	5020-16169	5020-16175		
	75	5020-16170	5020-16176		
	100	5020-16171	5020-16177		
	150	5020-16172	5020-16178		
	250	5020-16173	5020-16179		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16132	5020-16139	5020-16146	5020-16153
	50	5020-16133	5020-16140	5020-16147	5020-16154
	75	5020-16134	5020-16141	5020-16148	5020-16155
	100	5020-16135	5020-16142	5020-16149	5020-16156
	125	5020-16855	5020-16856	5020-16857	5020-16858
	150	5020-16136	5020-16143	5020-16150	5020-16157
	250	5020-16137	5020-16144	5020-16151	5020-16158
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16039	5020-16045		
	50	5020-16040	5020-16046		
	75	5020-16041	5020-16047		
	100	5020-16042	5020-16048		
	150	5020-16043	5020-16049		
	250	5020-16044	5020-16050		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16002	5020-16009	5020-16016	5020-16023
	50	5020-16003	5020-16010	5020-16017	5020-16024
	75	5020-16004	5020-16011	5020-16018	5020-16025
	100	5020-16005	5020-16012	5020-16019	5020-16026
	125	5020-16851	5020-16852	5020-16853	5020-16854
	150	5020-16006	5020-16013	5020-16020	5020-16027
	250	5020-16007	5020-16014	5020-16021	5020-16028

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16207	5020-16106	5020-16208	5020-16107
1.5, 2.1		1.5	5020-16209	5020-16108	5020-16210	5020-16109
2.1, 3.0		3.0	5020-16205	5020-16104	5020-16206	5020-16105
4.0, 4.6		4.0	5020-16203	5020-16102	5020-16204	5020-16103
2.1, 3.0	20	3.0	5020-16213	5020-16112	5020-16214	5020-16113
4.0, 4.6		4.0	5020-16211	5020-16110	5020-16212	5020-16111
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® C8-4

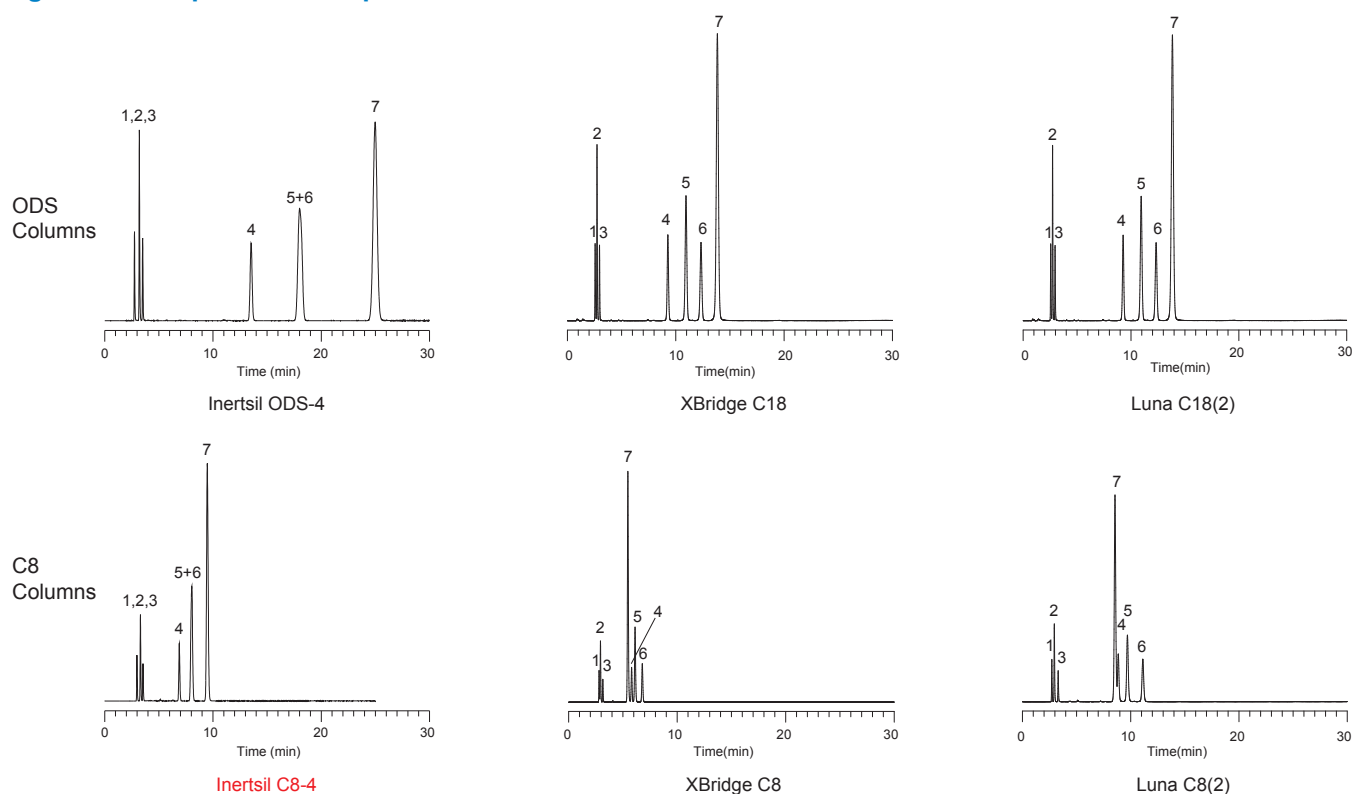
Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octyl Groups
- End-capping : Yes
- Carbon Loading : 5 %
- USP Code : L7
- pH Range : 2 ~ 7.5



Many chromatographers prefer a C8 column when an ODS phase shows excessive retention values. Inertsil C8-4 provides the same separation pattern (selectivity) and extreme inertness to any type of compounds just like Inertsil ODS-4, which enables easy method transfer from ODS-4 to C8-4 while other commercially available ODS and C8 columns can show dramatically different selectivity even though they are part of the same brand/series.

Figure 1 : Comparison of Separation Pattern between ODS and C8 Columns



Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D.

Eluent : A) CH₃OH

B) H₂O

A / B = 80/20, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 °C

Detection : UV 254 nm

Injection Vol. : 5 µL

1. Uracil (0.005 mg/mL)

2. Caffeine (0.04 mg/mL)

3. Phenol (0.08 mg/mL)

4. *n*-Butylbenzene (1.12 mg/mL)

5. *o*-Terphenyl (0.04 mg/mL)

6. *n*-Amylbenzene (1.37 mg/mL)

7. Triphenylene (0.014 mg/mL)

Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-81280	5020-81290	
	50	5020-81282	5020-81292	
	75	5020-81283	5020-81293	
	100	5020-81284	5020-81294	
	150	5020-81285	5020-81295	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14071	5020-14074	5020-14077
	50	5020-14072	5020-14075	5020-14078
	75	5020-14073	5020-14076	5020-14079
	100	5020-14051	5020-14054	5020-14057
	150	5020-14052	5020-14055	5020-14058
	250	5020-14053	5020-14056	5020-14059

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81261	5020-81271		
	50	5020-81262	5020-81272		
	75	5020-81263	5020-81273		
	100	5020-81264	5020-81274		
	150	5020-81265	5020-81275		
	250	5020-81266	5020-81276		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-03971	5020-03978	5020-03985	5020-03992
	50	5020-03972	5020-03979	5020-03986	5020-03993
	75	5020-03973	5020-03980	5020-03987	5020-03994
	100	5020-03974	5020-03981	5020-03988	5020-03995
	125	5020-03977	5020-03984	5020-03991	5020-03998
	150	5020-03975	5020-03982	5020-03989	5020-03996
250	5020-03976	5020-03983	5020-03990	5020-03997	
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81221	5020-81231		
	50	5020-81222	5020-81232		
	75	5020-81223	5020-81233		
	100	5020-81224	5020-81234		
	150	5020-81225	5020-81235		
	250	5020-81226	5020-81236		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-04051	5020-04061	5020-04071	5020-04081
	50	5020-04052	5020-04062	5020-04072	5020-04082
	75	5020-04053	5020-04063	5020-04073	5020-04083
	100	5020-04054	5020-04064	5020-04074	5020-04084
	125	5020-04057	5020-04067	5020-04077	5020-04080
	150	5020-04055	5020-04065	5020-04075	5020-04085
250	5020-04056	5020-04066	5020-04076	5020-04086	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19247	5020-19246	5020-19297	5020-19296
1.5, 2.1		1.5	5020-19347	5020-19346	5020-19397	5020-19396
2.1, 3.0		3.0	5020-19147	5020-19146	5020-19197	5020-19196
4.0, 4.6		4.0	5020-19047	5020-19046	5020-19097	5020-19096
2.1, 3.0	20	3.0	5020-19547	5020-19546	5020-19597	5020-19596
4.0, 4.6		4.0	5020-19447	5020-19446	5020-19497	5020-19496
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® C8-3

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm, 10 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octyl Groups
- End-capping : Yes
- Carbon Loading : 9 %
- USP Code : L7
- pH Range : 2 ~ 7.5

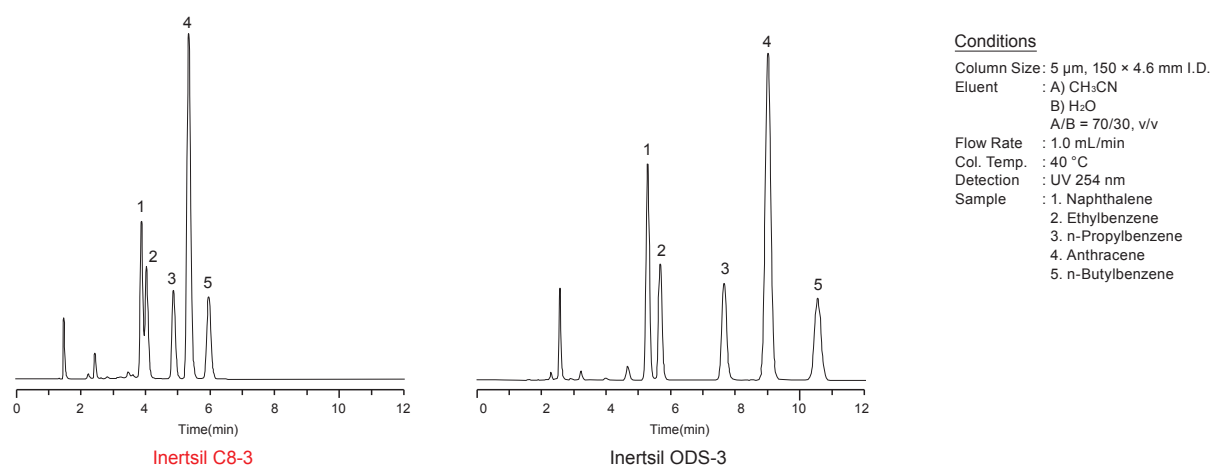


The same base silica gel and bonding technology that is used for Inertsil ODS-3 is also employed for Inertsil C8-3.

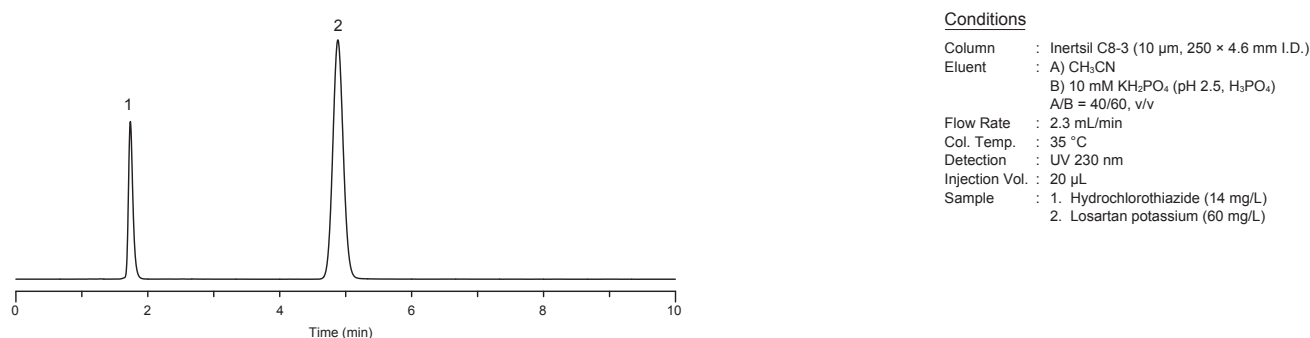
The difference between the two phases is just the length of the hydrocarbon ligands. As shown in figure 2, 10 µm particle size columns are also available to meet the requirement of various pharmacopeia methods.

We recommend InertSustain C8 columns for all new method development.

Figure 1 : Comparison of Retentivity between Inertsil® ODS-3 and Inertsil® C8-3



**Figure 2 : Analysis of Losartan Potassium and Hydrochlorothiazide Tablets, Dissolution Test
(Based on the Condition of United States Pharmacopeia 36-NF31)**



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-84930	5020-84935	
	50	5020-84931	5020-84936	
	75	5020-84932	5020-84937	
	100	5020-84933	5020-84938	
	150	5020-84934	5020-84939	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14101	5020-14104	5020-14107
	50	5020-14102	5020-14105	5020-14108
	75	5020-14103	5020-14106	5020-14109
	100	5020-14031	5020-14034	5020-14037
	150	5020-14032	5020-14035	5020-14038
	250	5020-14033	5020-14036	5020-14039

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84811	5020-84821		
	50	5020-84812	5020-84822		
	75	5020-84813	5020-84823		
	100	5020-84814	5020-84824		
	150	5020-13522	5020-13520		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04811	5020-04821	5020-04831	5020-04841
	50	5020-04812	5020-04822	5020-04832	5020-04842
	75	5020-04813	5020-04823	5020-04833	5020-01910
	100	5020-04814	5020-04824	5020-01913	5020-04844
	125	5020-04817	5020-04827	5020-04837	5020-04845
	150	5020-04815	5020-04825	5020-04835	5020-01911
250	5020-04816	5020-04826	5020-04836	5020-01912	
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84911	5020-84921		
	50	5020-84912	5020-84922		
	75	5020-84913	5020-84923		
	100	5020-84914	5020-84924		
	150	5020-13512	5020-13510		
	250	5020-84916	5020-84926		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04911	5020-04921	5020-04931	5020-04941
	50	5020-04912	5020-04922	5020-04932	5020-04942
	75	5020-04913	5020-04923	5020-04933	5020-04943
	100	5020-04914	5020-04924	5020-04934	5020-04944
	125	5020-04917	5020-04927	5020-04935	5020-04945
	150	5020-04915	5020-04925	5020-01902	5020-01900
250	5020-04916	5020-04926	5020-01903	5020-01901	
Particle Size: 10 μm	Length \ I.D. (mm)	4.6			
	150	5020-01641			
	250	5020-01642			

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19215	5020-19214	5020-19265	5020-19264
1.5, 2.1		1.5	5020-19315	5020-19314	5020-19365	5020-19364
2.1, 3.0		3.0	5020-19115	5020-19114	5020-19165	5020-19164
4.0, 4.6		4.0	5020-19015	5020-19014	5020-19065	5020-19064
2.1, 3.0	20	3.0	5020-19515	5020-19514	5020-19565	5020-19564
4.0, 4.6		4.0	5020-19415	5020-19414	5020-19465	5020-19464
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® C8

Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 320 m²/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Bonded Phase : Octyl Groups
- End-capping : Yes
- Carbon Loading : 10.5 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil C8 columns have a pore size of 150 Å and it is recommended for rapid analysis of highly hydrophobic compounds. We recommend InertSustain C8 or Inertsil C8-4 columns for all new method development.

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01221	5020-01222	5020-01223	5020-01224
	250	5020-01225	5020-01226	5020-01227	5020-01228

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19136	5020-19186
4.0, 4.6		4.0	5020-19036	5020-19086
2.1, 3.0	20	3.0	5020-19536	5020-19586
4.0, 4.6		4.0	5020-19436	5020-19486
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.



Inertsil® C4

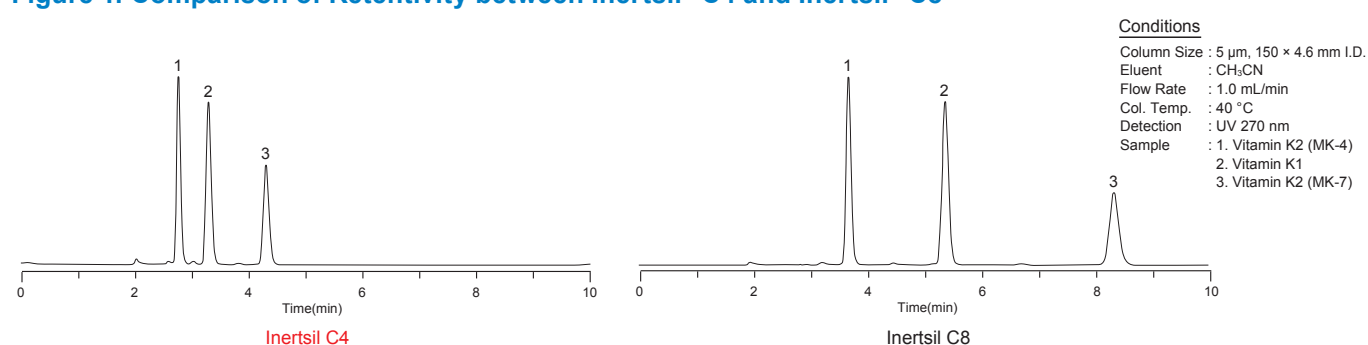
Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 320 m²/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Bonded Phase : Butyl Groups
- End-capping : Yes
- Carbon Loading : 7.5 %
- USP Code : L26
- pH Range : 2 ~ 7.5



Inertsil C4 columns have a pore size of 150 Å and is recommended for rapid analysis of highly hydrophobic compounds such as fat-soluble vitamins.

Figure 1: Comparison of Retentivity between Inertsil® C4 and Inertsil® C8



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01421	5020-01422	5020-01423	5020-01424
	250	5020-01425	5020-01426	5020-01427	5020-01428

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19138	5020-19188
4.0, 4.6		4.0	5020-19038	5020-19088
2.1, 3.0	20	3.0	5020-19538	5020-19588
4.0, 4.6		4.0	5020-19438	5020-19488
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Analytical Columns

Particle Size: 2 μm	Length \ I.D.(mm)	2.1	3.0	
	30	5020-16535	5020-16540	
	50	5020-16536	5020-16541	
	75	5020-16537	5020-16542	
	100	5020-16538	5020-16543	
	150	5020-16539	5020-16544	
HPSeries Particle Size: 3 μm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-16517	5020-16523	5020-16529
	50	5020-16518	5020-16524	5020-16530
	75	5020-16519	5020-16525	5020-16531
	100	5020-16520	5020-16526	5020-16532
	150	5020-16521	5020-16527	5020-16533
	250	5020-16522	5020-16528	5020-16534

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16468	5020-16474		
	50	5020-16469	5020-16475		
	75	5020-16470	5020-16476		
	100	5020-16471	5020-16477		
	150	5020-16472	5020-16478		
	250	5020-16473	5020-16479		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16432	5020-16439	5020-16446	5020-16453
	50	5020-16433	5020-16440	5020-16447	5020-16454
	75	5020-16434	5020-16441	5020-16448	5020-16455
	100	5020-16435	5020-16442	5020-16449	5020-16456
	150	5020-16436	5020-16443	5020-16450	5020-16457
	250	5020-16437	5020-16444	5020-16451	5020-16458
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16339	5020-16345		
	50	5020-16340	5020-16346		
	75	5020-16341	5020-16347		
	100	5020-16342	5020-16348		
	150	5020-16343	5020-16349		
	250	5020-16344	5020-16350		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16302	5020-16309	5020-16316	5020-16323
	50	5020-16303	5020-16310	5020-16317	5020-16324
	75	5020-16304	5020-16311	5020-16318	5020-16325
	100	5020-16305	5020-16312	5020-16319	5020-16326
	150	5020-16306	5020-16313	5020-16320	5020-16327
	250	5020-16307	5020-16314	5020-16321	5020-16328

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16507	5020-16406	5020-16508	5020-16407
1.5, 2.1		1.5	5020-16509	5020-16408	5020-16510	5020-16409
2.1, 3.0		3.0	5020-16505	5020-16404	5020-16506	5020-16405
4.0, 4.6		4.0	5020-16503	5020-16402	5020-16504	5020-16403
2.1, 3.0	20	3.0	5020-16513	5020-16412	5020-16514	5020-16413
4.0, 4.6		4.0	5020-16511	5020-16410	5020-16512	5020-16411
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

InertSustain® Phenylhexyl

Physical Properties

- **Silica** : Newly Developed ES Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 350 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 0.85 mL/g
- **Bonded Phase** : Phenylhexyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 9.0 %
- **USP Code** : L11
- **pH Range** : 1.0 ~ 10.0



InertSustain Phenylhexyl columns are bonded with phenylhexyl groups, which employs a phenyl ring with a hexyl (6- carbon) linker and is densely bonded to our newly developed ES silica gel delivering complementary selectivity to straight alkyl-chain columns, but with industry leading inertness, lot-to-lot reproducibility and low back pressure.

Figure 1 : Comparison of Selectivity with other brands

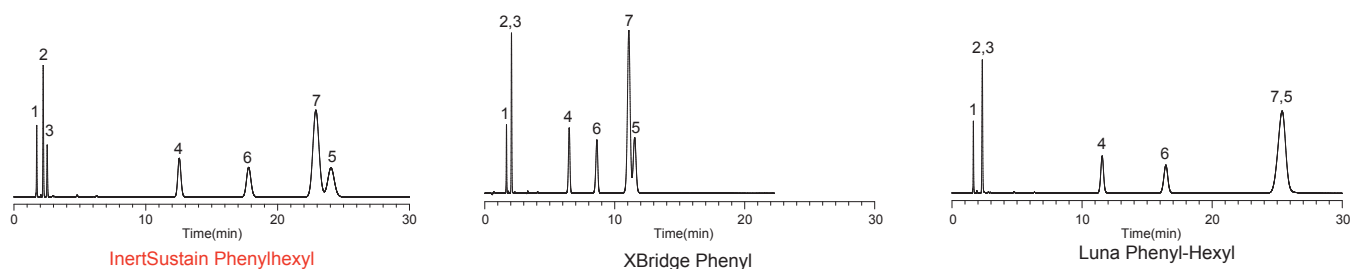
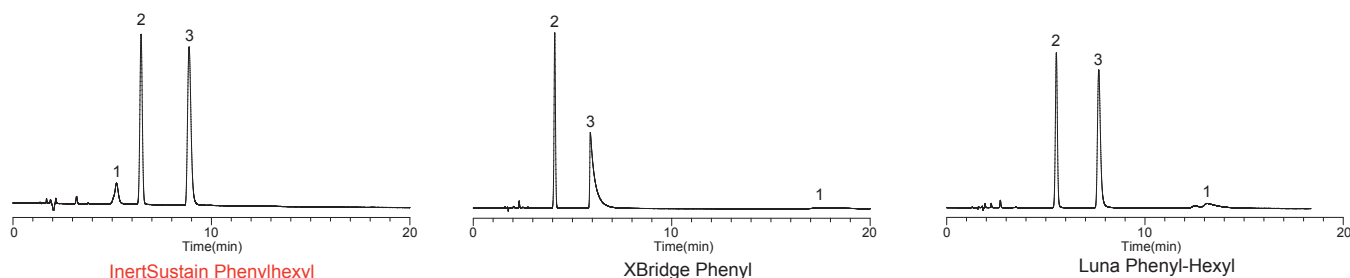


Figure 2 : Analysis of Acidic Compounds



Analytical Columns

HP Series Particle Size: 3 µm 50 Mpa(500 Bar)	Length \ I.D.(mm)	2.1	3.0	4.6
	30	5020-89209	5020-89215	5020-89221
	50	5020-89210	5020-89216	5020-89222
	75	5020-89211	5020-89217	5020-89223
	100	5020-89212	5020-89218	5020-89224
	150	5020-89213	5020-89219	5020-89225
	250	5020-89214	5020-89220	5020-89226

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89160	5020-89166		
	50	5020-89161	5020-89167		
	75	5020-89162	5020-89168		
	100	5020-89163	5020-89169		
	150	5020-89164	5020-89170		
	250	5020-89165	5020-89171		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89124	5020-89131	5020-89138	5020-89145
	50	5020-89125	5020-89132	5020-89139	5020-89146
	75	5020-89126	5020-89133	5020-89140	5020-89147
	100	5020-89127	5020-89134	5020-89141	5020-89148
	150	5020-89128	5020-89135	5020-89142	5020-89149
	250	5020-89129	5020-89136	5020-89143	5020-89150
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-89038	5020-89044		
	50	5020-89039	5020-89045		
	75	5020-89040	5020-89046		
	100	5020-89041	5020-89047		
	150	5020-89042	5020-89048		
	250	5020-89043	5020-89049		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89001	5020-89008	5020-89015	5020-89022
	50	5020-89002	5020-89009	5020-89016	5020-89023
	75	5020-89003	5020-89010	5020-89017	5020-89024
	100	5020-89004	5020-89011	5020-89018	5020-89025
	150	5020-89005	5020-89012	5020-89019	5020-89026
	250	5020-89006	5020-89013	5020-89020	5020-89027

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-89199	5020-89105	5020-89200	5020-89106
1.5, 2.1		1.5	5020-89201	5020-89107	5020-89202	5020-89108
2.1, 3.0		3.0	5020-89197	5020-89103	5020-89198	5020-89104
4.0, 4.6		4.0	5020-89195	5020-89101	5020-89196	5020-89102
2.1, 3.0	20	3.0	5020-89205	5020-89111	5020-89206	5020-89112
4.0, 4.6		4.0	5020-89203	5020-89109	5020-89204	5020-89110
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® Ph-3

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 2 µm, 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Phenyl Groups
- End-capping : None
- Carbon Loading : 9.5 %
- USP Code : L11
- pH Range : 2 ~ 7.5



Just like InertSustain Phenyl, Inertsil Ph-3 have phenyl groups directly bonded to the silica gel which provides pure reverse phase characteristics that are critical to resolving highly polar compounds like acidic and basic pharmaceuticals. The near perfect phenyl phase coverage on this material results in symmetric, narrow peaks for even the most polar compounds while using simple eluents like aqueous acetonitrile or methanol.

Figure 1 : Comparison of Selectivity with Inertsil® ODS-3

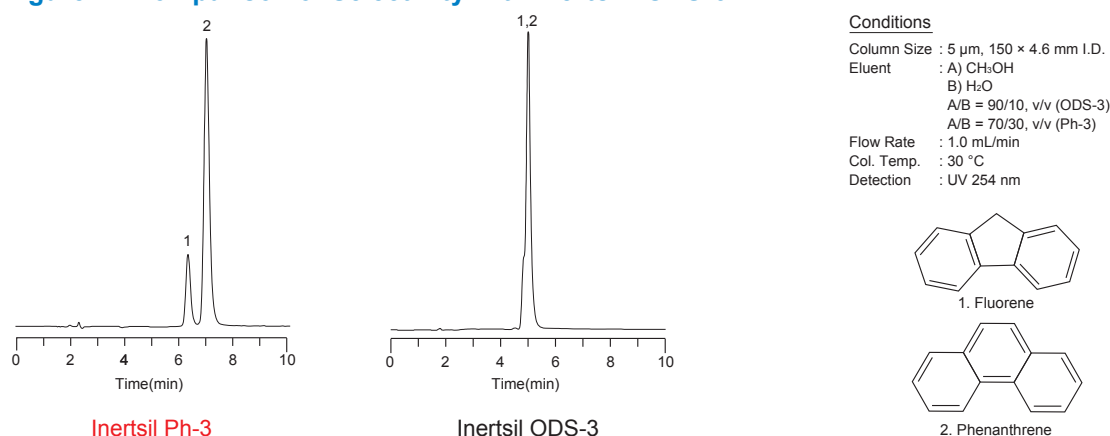
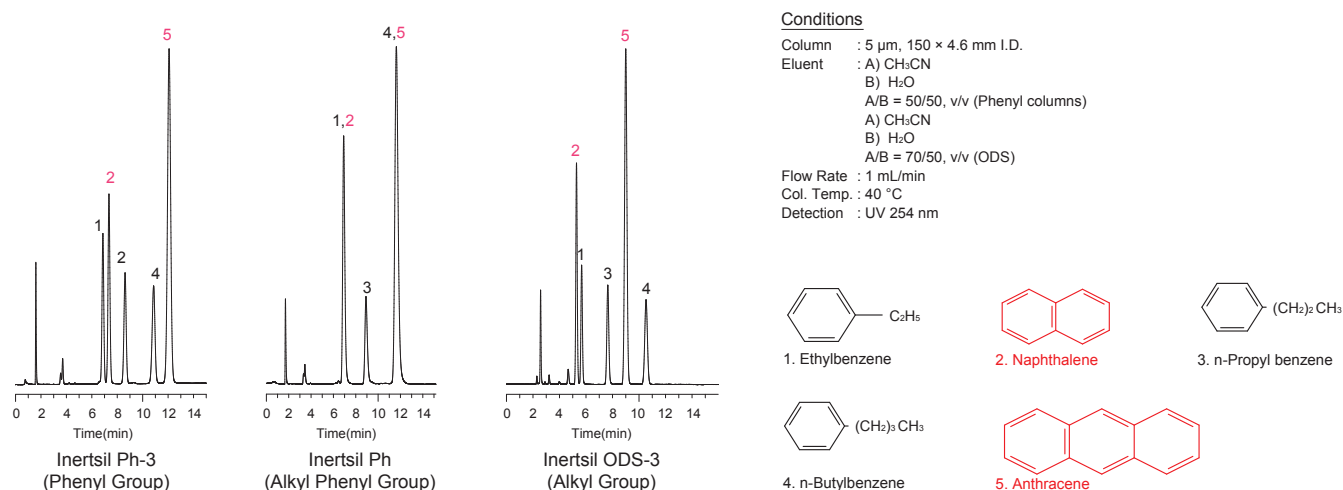


Figure 2 : Analysis of Aromatic Hydrocarbons with various Bonded Phases



Analytical Columns

Particle Size: 2 µm	Length \ I.D. (mm)	2.1	3.0	
	30	5020-85130	5020-85135	
	50	5020-85131	5020-85136	
	75	5020-85132	5020-85137	
	100	5020-85133	5020-85138	
	150	5020-85134	5020-85139	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	Length \ I.D. (mm)	2.1	3.0	4.6
	30	5020-14111	5020-14114	5020-14117
	50	5020-14112	5020-14115	5020-14118
	75	5020-14113	5020-14116	5020-14119
	100	5020-14041	5020-14044	5020-14047
	150	5020-14042	5020-14045	5020-14048
	250	5020-14043	5020-14046	5020-14049

* End-fittings are 1/16" Waters-compatible.

* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.

* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)

* For maximum operating pressure information, please refer to page 46.

Particle Size: 3 μm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85011	5020-85021		
	50	5020-85012	5020-85022		
	75	5020-85013	5020-85023		
	100	5020-85014	5020-85024		
	150	5020-13622	5020-13620		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05011	5020-05021	5020-05031	5020-05041
	50	5020-05012	5020-05022	5020-05032	5020-05042
	75	5020-05013	5020-05023	5020-05033	5020-01930
	100	5020-05014	5020-05024	5020-01933	5020-05044
	150	5020-05015	5020-05025	5020-05035	5020-01931
	250	5020-05016	5020-05026	5020-05036	5020-01932
Particle Size: 5 μm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85111	5020-85121		
	50	5020-85112	5020-85122		
	75	5020-85113	5020-85123		
	100	5020-85114	5020-85124		
	150	5020-13612	5020-13610		
	250	5020-85116	5020-85126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05111	5020-05121	5020-05131	5020-05141
	50	5020-05112	5020-05122	5020-05132	5020-05142
	75	5020-05113	5020-05123	5020-05133	5020-05143
	100	5020-05114	5020-05124	5020-05134	5020-05144
	150	5020-05115	5020-05125	5020-01922	5020-01920
	250	5020-05116	5020-05126	5020-01923	5020-01921

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19217	5020-19216	5020-19267	5020-19266
1.5, 2.1		1.5	5020-19317	5020-19316	5020-19367	5020-19366
2.1, 3.0		3.0	5020-19117	5020-19116	5020-19167	5020-19166
4.0, 4.6		4.0	5020-19017	5020-19016	5020-19067	5020-19066
2.1, 3.0	20	3.0	5020-19517	5020-19516	5020-19567	5020-19566
4.0, 4.6		4.0	5020-19417	5020-19416	5020-19467	5020-19466
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

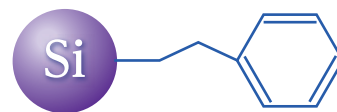
* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® Ph

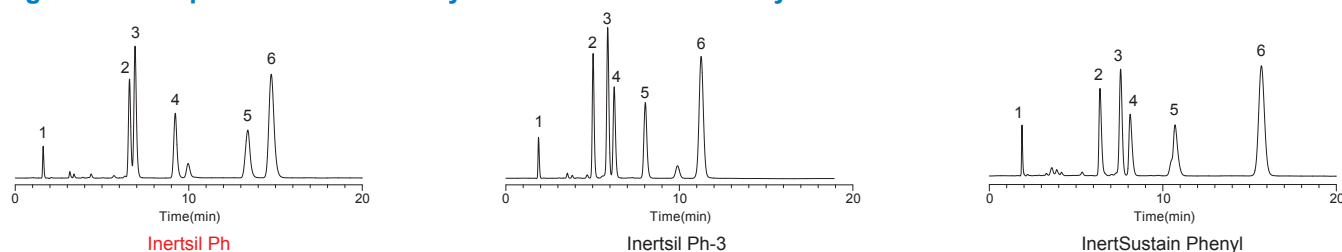
Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 μm
- Surface Area : 320 m^2/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Bonded Phase : Phenethyl Groups
- End-capping : Yes
- Carbon Loading : 10 %
- USP Code : L11
- pH Range : 2 ~ 7.5



Inertsil Ph has phenethyl groups bonded to silica gel which offers weak pi-pi interactions. As it is modified with phenethyl groups, hydrophobic interactions between alkyl chain and analytes play an important role in separation as well as pi-pi interactions. To change the selectivity or elution pattern drastically, InertSustain Phenyl is recommended as it provides strong pi-pi interactions, resulting in resolving compounds that could not be separated on a C18 or C8 phase.

Figure 1 : Comparison of Selectivity with GL Sciences' Phenyl columns

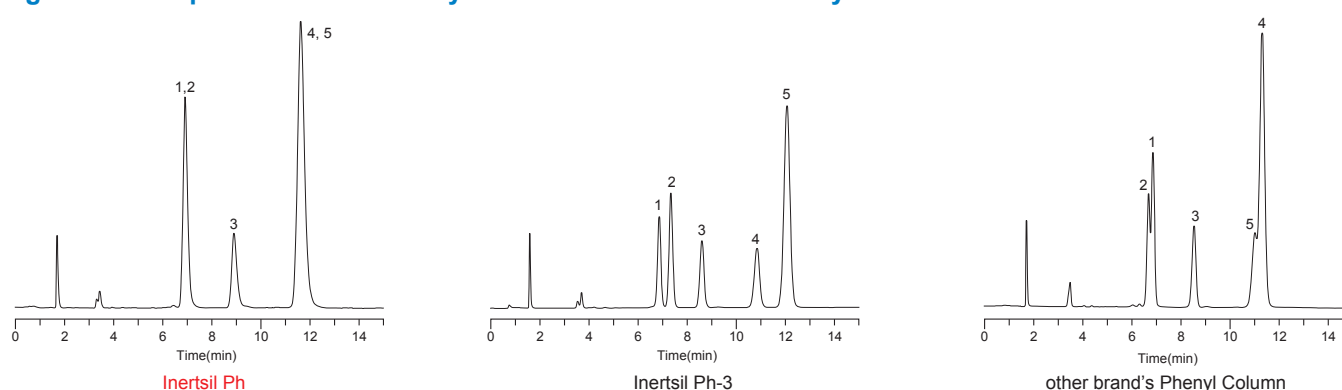


Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3OH
 B) H_2O
 A/B = 60/40, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm

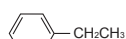
Sample :
 1. Uracil
 2. Ethylbenzene
 3. Naphthalene
 4. Propylbenzene
 5. Butylbenzene
 6. Anthracene

Figure 2 : Comparison of Selectivity between other brand's Phenyl column



Conditions

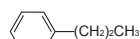
Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) CH_3CN
 B) H_2O
 A/B = 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^\circ\text{C}$
 Detection : UV 254 nm



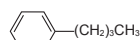
1. Ethylbenzene



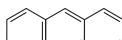
2. Naphthalene



3. n-Propylbenzene



4. n-Butylbenzene



5. Anthracene

Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01321	5020-01322	5020-01323	5020-01324
	250	5020-01325	5020-01326	5020-01327	5020-01328

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19137	5020-19187
4.0, 4.6		4.0	5020-19037	5020-19087
2.1, 3.0	20	3.0	5020-19537	5020-19587
4.0, 4.6		4.0	5020-19437	5020-19487
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.



Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® CN-3

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Cyanopropyl Groups
- End-capping : None
- Carbon Loading : 14 %
- USP Code : L10
- pH Range : 2 ~ 7.5



Inertsil CN-3 is a cyanopropyl bonded phase that provides pi-pi interactions offered by the triple bond in cyano groups. Due to its chemistry, separation can be achieved for those compounds that could not be separated on a straight-chain-alkyl columns such as C8 or C18 bonded phases (Figure. 1). Figure 2 illustrates the relative retention of each compound to n-Propylbenzene. Although Inertsil ODS-EP and Inertsil Ph-3 has the ability to recognize the electron-state, each column delivers different elution pattern.

Inertsil CN-3 column can be used for both reversed phase and normal phase separations. The column is originally shipped in a mixture of n-hexane/ethanol. When using the column for reversed phase applications, fully equilibrate the column before use.

Figure 1 : Comparison of Recognition of Electronic-State with Inertsil® ODS-3

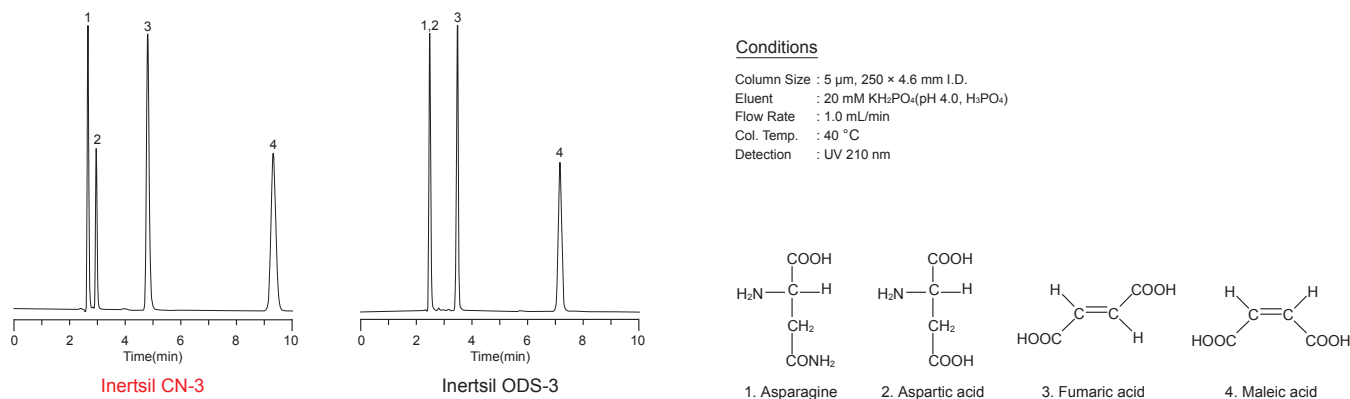
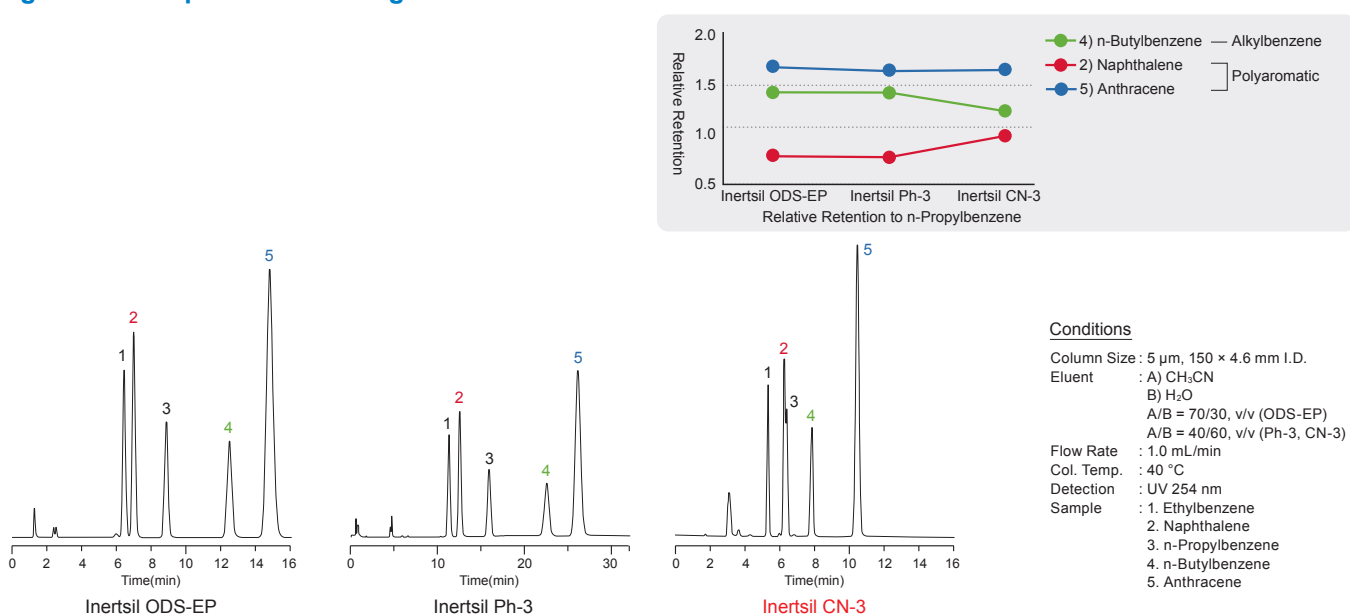


Figure 2 : Comparison of Recognition of Electronic-State between various Inertsil® columns



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85331	5020-85341		
	50	5020-85332	5020-85342		
	75	5020-85333	5020-85343		
	100	5020-85334	5020-85344		
	150	5020-85335	5020-85345		
	250	5020-85336	5020-85346		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05261	5020-05271	5020-05281	5020-05291
	50	5020-05262	5020-05272	5020-05282	5020-05292
	75	5020-05263	5020-05273	5020-05283	5020-05293
	100	5020-05264	5020-05274	5020-05284	5020-05294
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85311	5020-85321		
	50	5020-85312	5020-85322		
	75	5020-85313	5020-85323		
	100	5020-85314	5020-85324		
	150	5020-13712	5020-13710		
	250	5020-85316	5020-85326		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05311	5020-05321	5020-05331	5020-05341
	50	5020-05312	5020-05322	5020-05332	5020-05342
	75	5020-05313	5020-05323	5020-05333	5020-05343
	100	5020-05314	5020-05324	5020-05334	5020-05344
	150	5020-05315	5020-05325	5020-01942	5020-01940
	250	5020-05316	5020-05326	5020-01943	5020-01941

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19219	5020-19218	5020-19269	5020-19268
1.5, 2.1		1.5	5020-19319	5020-19318	5020-19369	5020-19368
2.1, 3.0		3.0	5020-19119	5020-19118	5020-19169	5020-19168
4.0, 4.6		4.0	5020-19019	5020-19018	5020-19069	5020-19068
2.1, 3.0	20	3.0	5020-19519	5020-19518	5020-19569	5020-19568
4.0, 4.6		4.0	5020-19419	5020-19418	5020-19469	5020-19468
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® WP300 C18

Physical Properties

- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 150 m²/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 9 %
- USP Code : L1
- pH Range : 2 ~ 7.5



Inertsil WP300 C18 (wide pore size of 300 Å) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible separations of proteins and peptides.

The results of GL Sciences' original end-capping technique are shown in figure 1, which provide high efficiency and good peak shape for proteins and peptides.

Figure 1 : Comparison with other brands

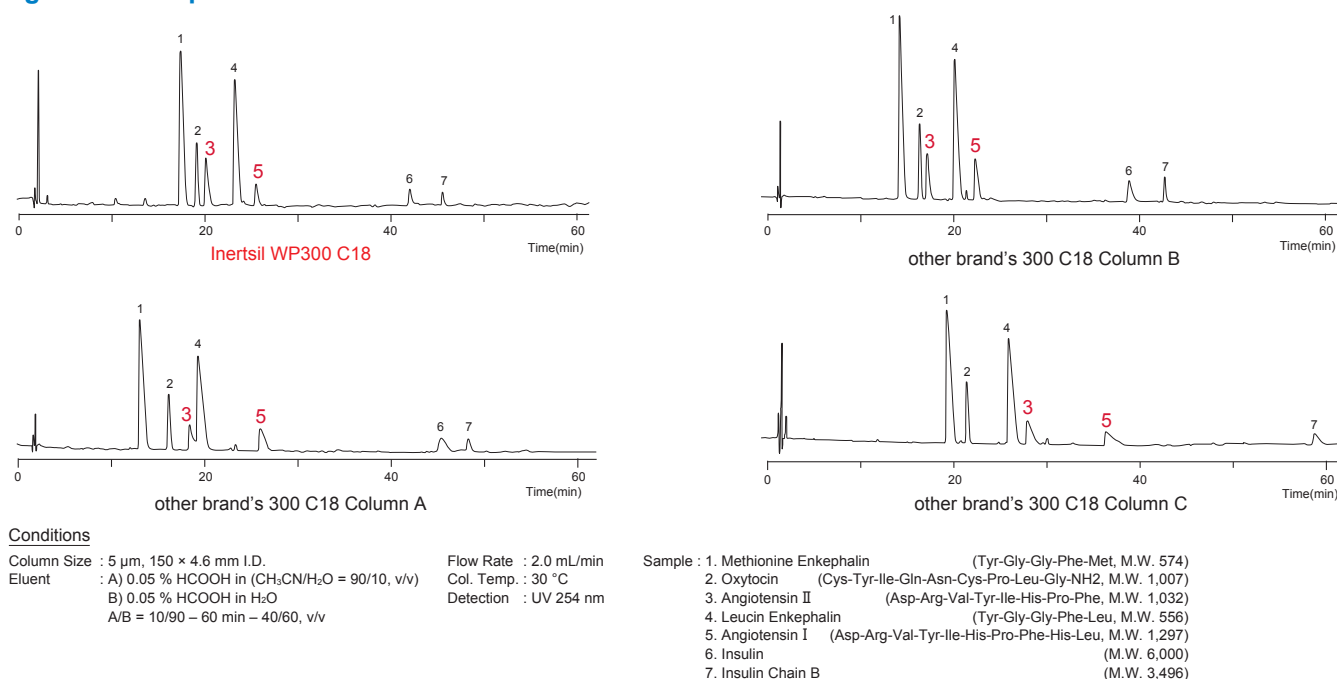
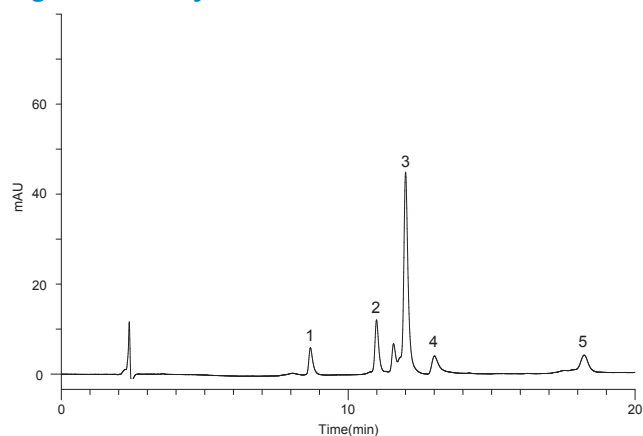


Figure 2 : Analysis of Proteins



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.6
	50	5020-41100	5020-	5020-41103
	150	5020-41101	5020-41102	5020-41104
	250	5020-	5020-	5020-41105
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5	
	33	5020-85811	5020-85821	
	50	5020-85812	5020-85822	
	75	5020-85813	5020-85823	
	100	5020-85814	5020-85824	
	150	5020-85815	5020-85825	
	250	5020-85816	5020-85826	
	Length \ I.D. (mm)	2.1	3.0	4.0
	33	5020-05811	5020-05821	5020-05831
	50	5020-05812	5020-05822	5020-05832
	75	5020-05813	5020-05823	5020-05833
	100	5020-05814	5020-05824	5020-05834
	150	5020-05815	5020-05825	5020-05835
	250	5020-05816	5020-05826	5020-05836
				4.6
				5020-05841
				5020-05842
				5020-05843
				5020-05844
				5020-05845
				5020-05846

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19228	5020-19278
1.5, 2.1		1.5	5020-19328	5020-19378
2.1, 3.0		3.0	5020-19128	5020-19178
4.0, 4.6		4.0	5020-19028	5020-19078
2.1, 3.0	20	3.0	5020-19528	5020-19578
4.0, 4.6		4.0	5020-19428	5020-19478
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® WP300 C8

Physical Properties

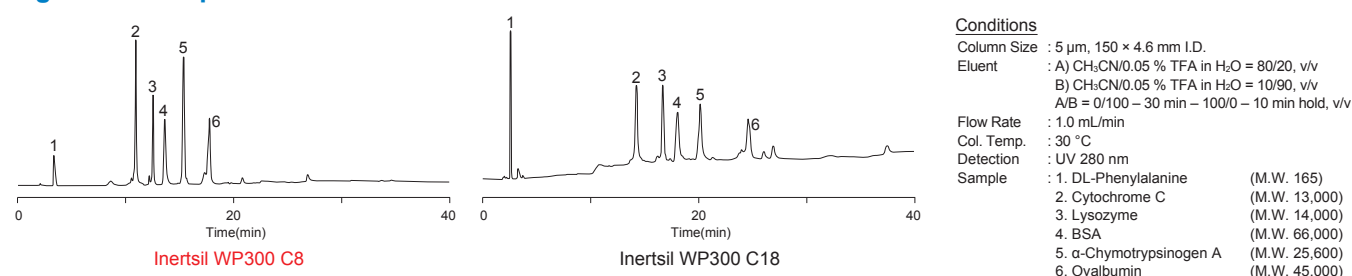
- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 150 m²/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octyl Groups
- End-capping : Yes
- Carbon Loading : 4 %
- USP Code : L7
- pH Range : 2 ~ 7.5



Inertsil WP300 C8 (wide pore size of 300 Å) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible rapid separations of proteins and peptides.

As shown in figure 1, Inertsil WP300 C8 delivers rapid analysis with sharper peaks compared to Inertsil WP300 C18.

Figure 1 : Comparison with Inertsil® WP300 C18



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85711	5020-85721		
	50	5020-85712	5020-85722		
	75	5020-85713	5020-85723		
	100	5020-85714	5020-85724		
	150	5020-85715	5020-85725		
	250	5020-85716	5020-85726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05711	5020-05721	5020-05731	5020-05741
	50	5020-05712	5020-05722	5020-05732	5020-05742
	75	5020-05713	5020-05723	5020-05733	5020-05743
	100	5020-05714	5020-05724	5020-05734	5020-05744
	150	5020-05715	5020-05725	5020-05735	5020-05745
	250	5020-05716	5020-05726	5020-05736	5020-05746

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19229	5020-19279
1.5, 2.1		1.5	5020-19329	5020-19379
2.1, 3.0		3.0	5020-19129	5020-19179
4.0, 4.6		4.0	5020-19029	5020-19079
2.1, 3.0	20	3.0	5020-19529	5020-19579
4.0, 4.6		4.0	5020-19429	5020-19479
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® WP300 C4

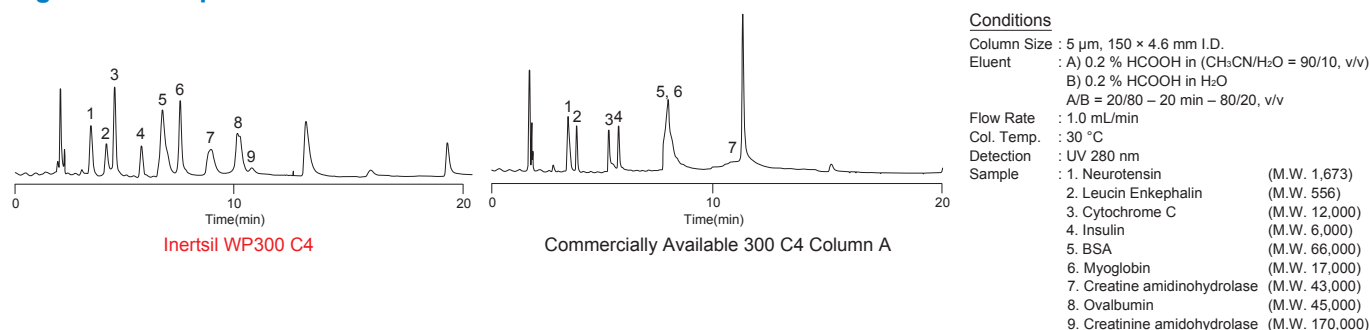
Physical Properties

- Silica : WP300 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 150 m²/g
- Pore Size : 300 Å (30 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Butyl Groups
- End-capping : None
- Carbon Loading : 3 %
- USP Code : L26
- pH Range : 2 ~ 7.5



Inertsil WP300 C4 is a butyl group bonded phase utilizing silica gel with wide pores (300 Å). Also, an optimal polar group is embedded between silica surface and butyl group, which reduces adsorption of basic compounds and fat-soluble proteins. Inertsil WP300 C4 is recommended for the analysis of large, highly fat-soluble proteins and peptides as illustrated in figure 1.

Figure 1 : Comparison of Performance between other brand's 300 C4 column



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0		1.5	
	33	5020-86111		5020-86121	
	50	5020-86112		5020-86122	
	75	5020-86113		5020-86123	
	100	5020-86114		5020-86124	
	150	5020-86115		5020-86125	
	250	5020-86116		5020-86126	
	Length \ I.D. (mm)	2.1		3.0	
	33	5020-05861		5020-05871	5020-05881
	50	5020-05862		5020-05872	5020-05882
	75	5020-05863		5020-05873	5020-05883
	100	5020-05864		5020-05874	5020-05884
	150	5020-05865		5020-05875	5020-05885
	250	5020-05866		5020-05876	5020-05886
	Length \ I.D. (mm)	4.0		4.6	
	33	5020-05881		5020-05891	
	50	5020-05882		5020-05892	
	75	5020-05883		5020-05893	
	100	5020-05884		5020-05894	
	150	5020-05885		5020-05895	
	250	5020-05886		5020-05896	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19230	5020-19280
1.5, 2.1		1.5	5020-19330	5020-19380
2.1, 3.0		3.0	5020-19130	5020-19180
4.0, 4.6		4.0	5020-19030	5020-19080
2.1, 3.0	20	3.0	5020-19530	5020-19580
4.0, 4.6		4.0	5020-19430	5020-19480
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Maximum Operating Pressure of Analytical Columns

Analytical Columns	Particle Size	Maximum Operating Pressure (MPa)
InertSustainSwift C18	1.9 µm	80
InertSustain, Inertsil	2 µm	80 *
InertSustain, Inertsil	3 µm HP	50
InertSustain, Inertsil	3 µm, 4 µm, 5 µm, 10 µm	20
Unisil	5 µm, 10 µm	20
InertSphere Sugar-1	5 µm	15
Bioptic AV-1, AV-2	5 µm	15
Capillary EX	3 µm, 5 µm	20
Capillary EX-Nano	3 µm, 5 µm	15

* The maximum operating pressure of a 50 mm length column or shorter is 50 MPa for Inertsil ODS-3, C8-3, Ph-3.

Maximum Operating Pressure of Guard Columns

Guard Columns	Maximum Operating Pressure (MPa)
Cartridge Guard Column E	20
Cartridge Guard Column Ei	20
Guard Column for UHPLC	80
SILFILTER STD C18	35
Capillary Micro Guard	20



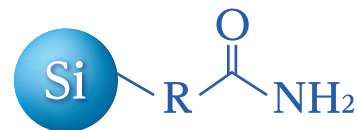
HILIC Columns

• Inertsil® Amide	048
• Inertsil® HILIC.....	050
• InertSustain® NH2	052
• Inertsil® NH2	054

Inertsil® Amide

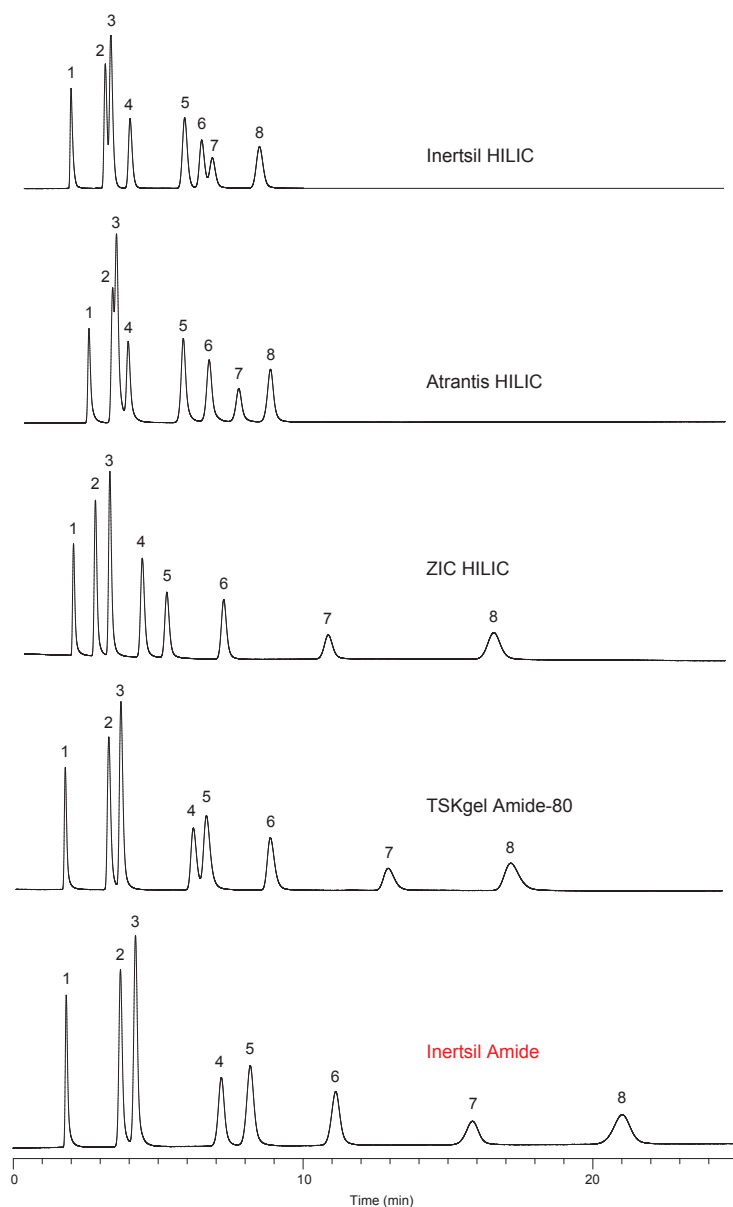
Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Carbamoyl Groups
- End-capping : None
- Carbon Loading : 18 %
- USP Code : None
- pH Range : 2 ~ 7.5



Inertsil Amide column is bonded of carbamoyl group, and it shows strong retention of highly polar compounds. As shown below, compare to other commercial columns, Inertsil Amide showed high retentivity. Inertsil Amide provides excellent performance for those hard to retain compounds using an ODS column with a long lifetime.

Figure 1 : Comparasion with other brands



Conditions

Column Size : 5 µm, 150 × 2.0 or 2.1 mm I.D.
 Eluent : A) CH₃CN
 B) 10 mM HCOONH₄
 A/B = 90/10, v/v
 Flow Rate : 0.2 mL/min
 Col.Temp. : 35 °C
 Detection : UV 254 nm



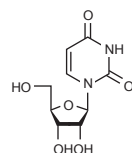
1. Toluene



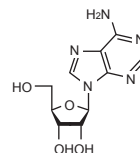
2. Thymine



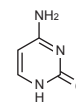
3. Uracil



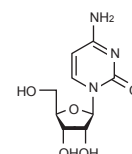
4. Uridine



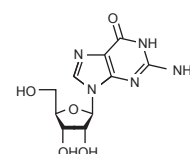
5. Adenosine



6. Cytosine



7. Cytidine



8. Guanosine

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86831	5020-86841		
	50	5020-86832	5020-86842		
	75	5020-86833	5020-86843		
	100	5020-86834	5020-86844		
	150	5020-86835	5020-86845		
	250	5020-86836	5020-86846		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07861	5020-07871	5020-07881	5020-07891
	50	5020-07862	5020-07872	5020-07882	5020-07892
	75	5020-07863	5020-07873	5020-07883	5020-07893
	100	5020-07864	5020-07874	5020-07884	5020-07894
	150	5020-07865	5020-07875	5020-07885	5020-07895
	250	5020-07866	5020-07876	5020-07886	5020-07896
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86811	5020-86821		
	50	5020-86812	5020-86822		
	75	5020-86813	5020-86823		
	100	5020-86814	5020-86824		
	150	5020-86815	5020-86825		
	250	5020-86816	5020-86826		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07801	5020-07811	5020-07821	5020-07831
	50	5020-07802	5020-07812	5020-07822	5020-07832
	75	5020-07803	5020-07813	5020-07823	5020-07833
	100	5020-07804	5020-07814	5020-07824	5020-07834
	150	5020-07805	5020-07815	5020-07825	5020-07835
	250	5020-07806	5020-07816	5020-07826	5020-07836

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-20156	5020-20155	5020-20158	5020-20157
1.5, 2.1		1.5	5020-20160	5020-20159	5020-20162	5020-20161
2.1, 3.0		3.0	5020-20152	5020-20151	5020-20154	5020-20153
4.0, 4.6		4.0	5020-20148	5020-20147	5020-20150	5020-20149
2.1, 3.0	20	3.0	5020-20168	5020-20167	5020-20170	5020-20169
4.0, 4.6		4.0	5020-20164	5020-20163	5020-20166	5020-20165
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

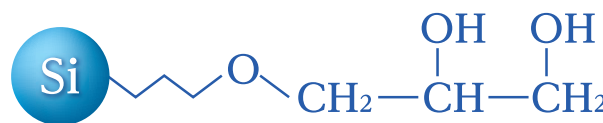
Applications

Cat. No. Index

Inertsil® HILIC

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Diol Groups (Dihydroxypropyl Groups)
- End-capping : None
- Carbon Loading : 20 %
- USP Code : L20
- pH Range : 2 ~ 7.5



HILIC is, abbreviated name for Hydrophilic Interaction Chromatography, and it was developed as an alternative to reversed phase chromatography for highly polar compounds. (figure1.) Inertsil HILIC is the column which chemically bonded with diol group, and it provides excellent peak shape for neutral and basic compounds. In HILIC mode, generally when organic concentration is raised, it shows a strong retention (figure 2.). Moreover, it can get more stable analysis by adding basic solvent to the eluate, such as ammonium acetate.

Figure 1 : Separation mode from Reverse phase to HILIC

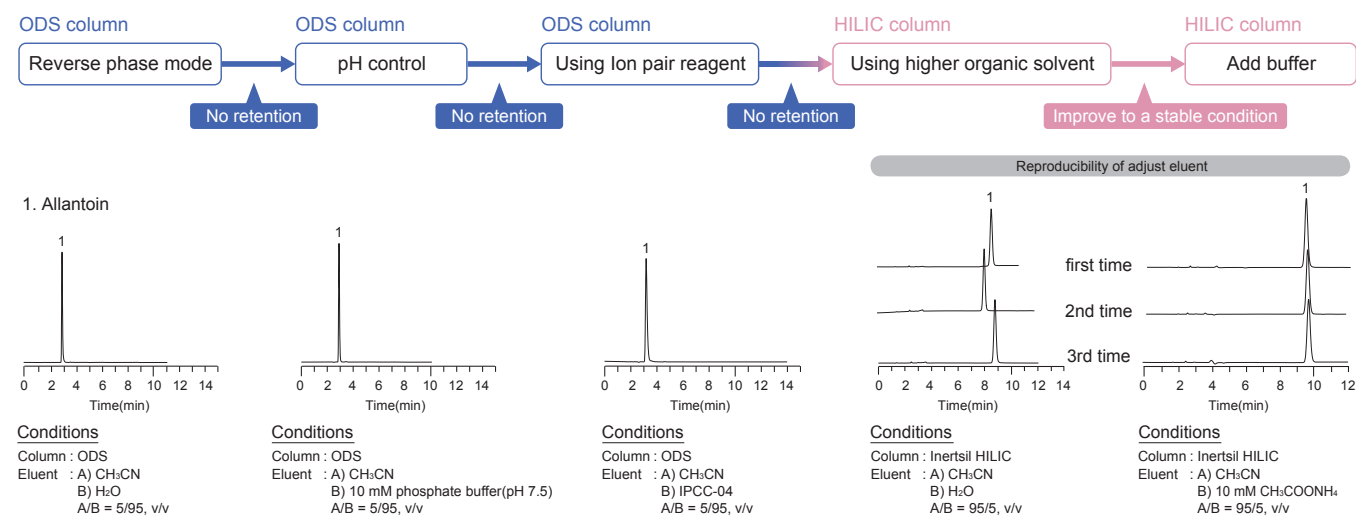
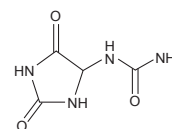
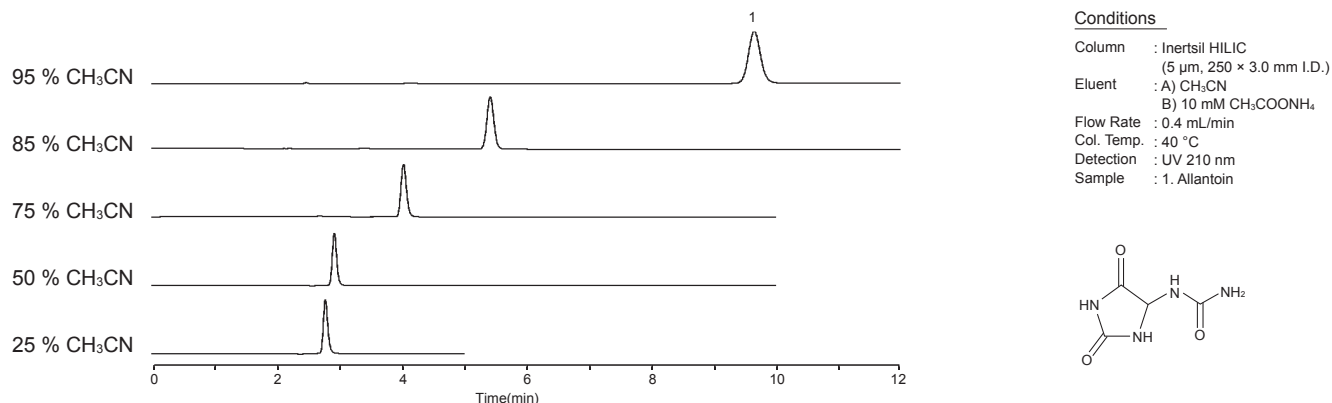


Figure 2 : Correlation between retention time and the concentration of CH₃CN in mobile phase



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86731	5020-86741		
	50	5020-86732	5020-86742		
	75	5020-86733	5020-86743		
	100	5020-86734	5020-86744		
	150	5020-86735	5020-86745		
	250	5020-86736	5020-86746		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07761	5020-07771	5020-07781	5020-07791
	50	5020-07762	5020-07772	5020-07782	5020-07792
	75	5020-07763	5020-07773	5020-07783	5020-07793
	100	5020-07764	5020-07774	5020-07784	5020-07794
	150	5020-07765	5020-07775	5020-07785	5020-07795
	250	5020-07766	5020-07776	5020-07786	5020-07796
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86711	5020-86721		
	50	5020-86712	5020-86722		
	75	5020-86713	5020-86723		
	100	5020-86714	5020-86724		
	150	5020-86715	5020-86725		
	250	5020-86716	5020-86726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07701	5020-07711	5020-07721	5020-07731
	50	5020-07702	5020-07712	5020-07722	5020-07732
	75	5020-07703	5020-07713	5020-07723	5020-07733
	100	5020-07704	5020-07714	5020-07724	5020-07734
	150	5020-07705	5020-07715	5020-07725	5020-07735
	250	5020-07706	5020-07716	5020-07726	5020-07736

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19225	5020-19224	5020-19275	5020-19274
1.5, 2.1		1.5	5020-19325	5020-19324	5020-19375	5020-19374
2.1, 3.0		3.0	5020-19125	5020-19124	5020-19175	5020-19174
4.0, 4.6		4.0	5020-19025	5020-19024	5020-19075	5020-19074
2.1, 3.0	20	3.0	5020-19525	5020-19524	5020-19575	5020-19574
4.0, 4.6		4.0	5020-19425	5020-19424	5020-19475	5020-19474
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

InertSustain® NH2

Physical Properties

- Silica : Newly Developed ES Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 350 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 0.85 mL/g
- Bonded Phase : Aminopropyl Groups
- End-capping : None
- Carbon Loading : 7 %
- USP Code : L8
- pH Range : 2 ~ 7.5



InertSustain NH2 shows far superior stability compared to other brand available aminopropyl columns, as our newly developed “Evolved Surface Silica” is chemically bonded with aminopropyl group. Generally, aminopropyl columns are used for applications that are hard to be separated in a reversed phase mode, such as simultaneous analysis of sugars or vitamin E. However, the shift in retention time has been an issue for a long time. InertSustain NH2 delivers highly reliable reproducibility and stability with accurate qualitative and quantitative results. Further more, aminopropyl columns generally can not be washed by weakly acidic eluent, however InertSustain NH2 was improved and it can be washed by weakly acidic eluent.

Figure 1 : Comparison of preventing anomer resolution of sugar analysis

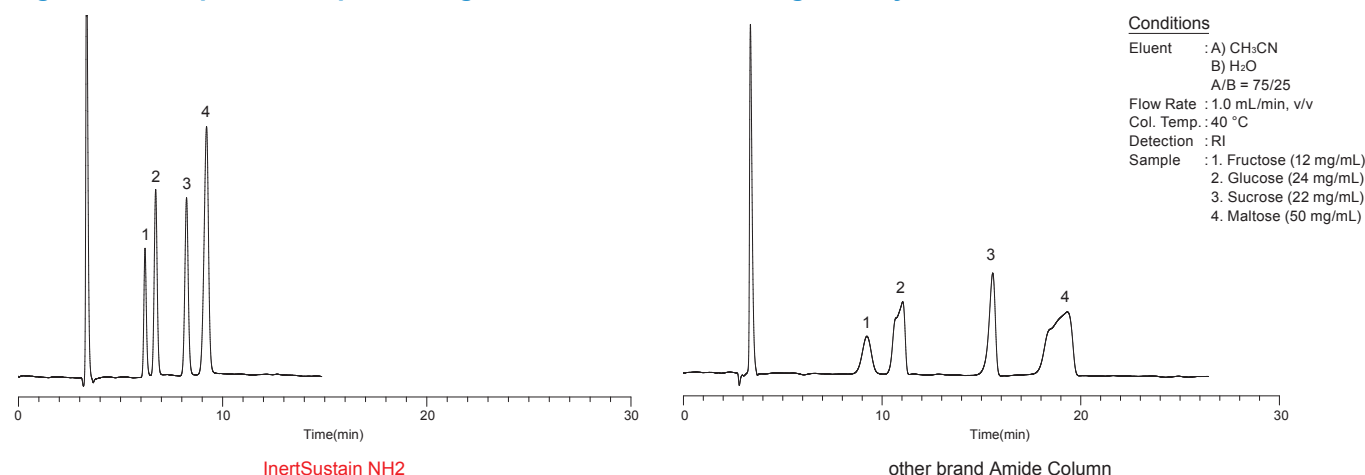
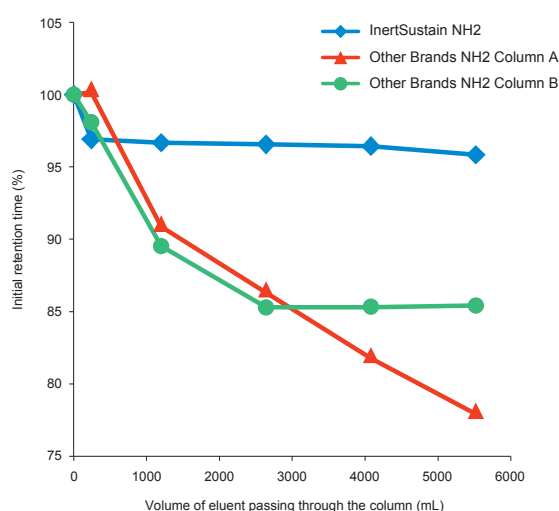


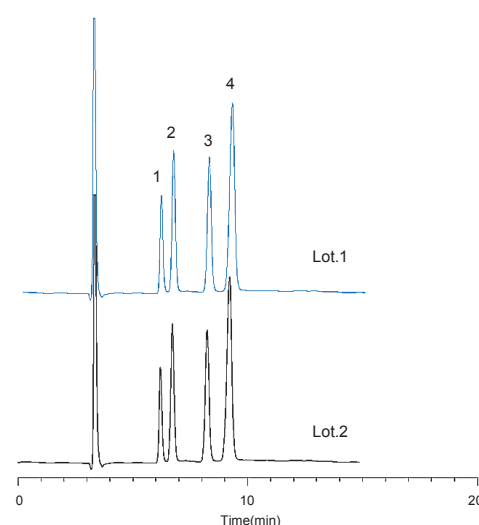
Figure 2 : Comparison of stability between various Amino column



Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D. Sample: 1. Maltose
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : RI

Figure 3 : Reliable reproducibility



Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D. Sample: 1. Fructose
Eluent : A) CH₃CN, B) H₂O, A/B = 85/15, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : RI

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16768	5020-16774		
	50	5020-16769	5020-16775		
	75	5020-16770	5020-16776		
	100	5020-16771	5020-16777		
	150	5020-16772	5020-16778		
	250	5020-16773	5020-16779		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16732	5020-16739	5020-16746	5020-16753
	50	5020-16733	5020-16740	5020-16747	5020-16754
	75	5020-16734	5020-16741	5020-16748	5020-16755
	100	5020-16735	5020-16742	5020-16749	5020-16756
	150	5020-16736	5020-16743	5020-16750	5020-16757
	250	5020-16737	5020-16744	5020-16751	5020-16758
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16639	5020-16645		
	50	5020-16640	5020-16646		
	75	5020-16641	5020-16647		
	100	5020-16642	5020-16648		
	150	5020-16643	5020-16649		
	250	5020-16644	5020-16650		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16602	5020-16609	5020-16616	5020-16623
	50	5020-16603	5020-16610	5020-16617	5020-16624
	75	5020-16604	5020-16611	5020-16618	5020-16625
	100	5020-16605	5020-16612	5020-16619	5020-16626
	150	5020-16606	5020-16613	5020-16620	5020-16627
	250	5020-16607	5020-16614	5020-16621	5020-16628

* End-fittings are 1/16" Waters-compatible.

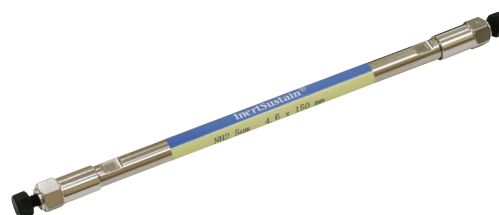
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16807	5020-16706	5020-16808	5020-16707
1.5, 2.1		1.5	5020-16809	5020-16708	5020-16810	5020-16709
2.1, 3.0		3.0	5020-16805	5020-16704	5020-16806	5020-16705
4.0, 4.6		4.0	5020-16803	5020-16702	5020-16804	5020-16703
2.1, 3.0	20	3.0	5020-16813	5020-16712	5020-16814	5020-16713
4.0, 4.6		4.0	5020-16811	5020-16710	5020-16812	5020-16711
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.



Inertsil® NH2

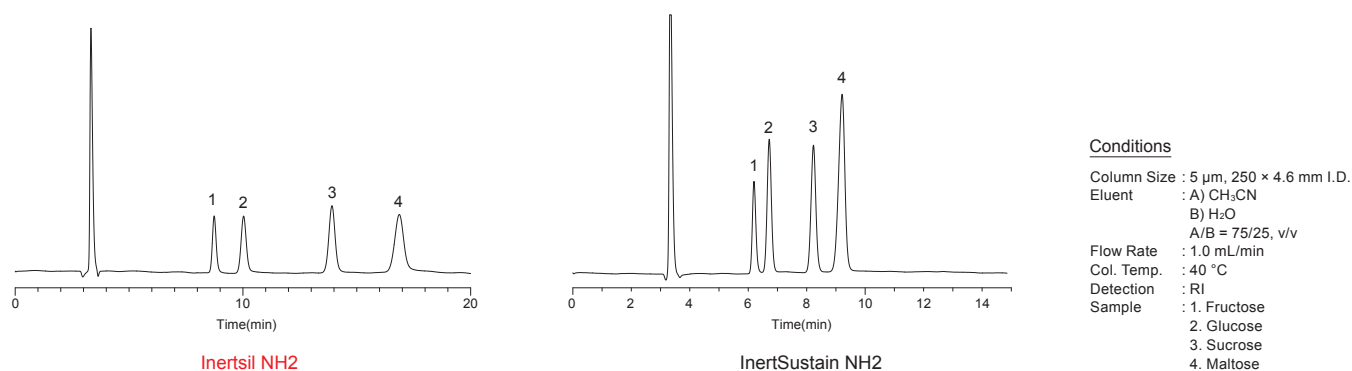
Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Aminopropyl Groups
- End-capping : None
- Carbon Loading : 8 %
- USP Code : L8
- pH Range : 2 ~ 7.5



Inertsil NH2 column is chemically bonded with Aminopropyl group. It is widely used for analyzing sugar in reversed phase mode. Compare to InertSustain NH2, InertSustain NH2 provides a better performance on durability. However, compare to other brand aminopropyl columns, Inertsil NH2 still shows excellent and strong retentivity.

Figure 1 : Comparison of Aminopropyl columns



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85531	5020-85541		
	50	5020-85532	5020-85542		
	75	5020-85533	5020-85543		
	100	5020-85534	5020-85544		
	150	5020-85535	5020-85545		
	250	5020-85536	5020-85546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05461	5020-05471	5020-05481	5020-05491
	50	5020-05462	5020-05472	5020-05482	5020-05492
	75	5020-05463	5020-05473	5020-05483	5020-05493
	100	5020-05464	5020-05474	5020-05484	5020-05494
	150	5020-05465	5020-05475	5020-05485	5020-05495
	250	5020-05466	5020-05476	5020-05486	5020-05496
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85511	5020-85521		
	50	5020-85512	5020-85522		
	75	5020-85513	5020-85523		
	100	5020-85514	5020-85524		
	150	5020-85515	5020-85525		
	250	5020-85516	5020-85526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05511	5020-05521	5020-05531	5020-05541
	50	5020-05512	5020-05522	5020-05532	5020-05542
	75	5020-05513	5020-05523	5020-05533	5020-05543
	100	5020-05514	5020-05524	5020-05534	5020-05544
	150	5020-05515	5020-05525	5020-05535	5020-05545
	250	5020-05516	5020-05526	5020-05536	5020-05546

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19221	5020-19220	5020-19271	5020-19270
1.5, 2.1		1.5	5020-19321	5020-19320	5020-19371	5020-19370
2.1, 3.0		3.0	5020-19121	5020-19120	5020-19171	5020-19170
4.0, 4.6		4.0	5020-19021	5020-19020	5020-19071	5020-19070
2.1, 3.0	20	3.0	5020-19521	5020-19520	5020-19571	5020-19570
4.0, 4.6		4.0	5020-19421	5020-19420	5020-19471	5020-19470
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Normal Phase Columns

• Inertsil® Diol	058
• Inertsil® SIL-100A	060
• InertSustain® NH2	062
• Inertsil® NH2	064
• Inertsil® CN-3	066
• Inertsil® SIL-150A	068
• Inertsil® WP300 SIL	069

Inertsil® Diol

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 μm , 5 μm
- Surface Area : 450 m^2/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Diol Groups (Dihydroxypropyl Groups)
- End-capping : None
- Carbon Loading : 20 %
- USP Code : L20
- pH Range : 2 ~ 7.5



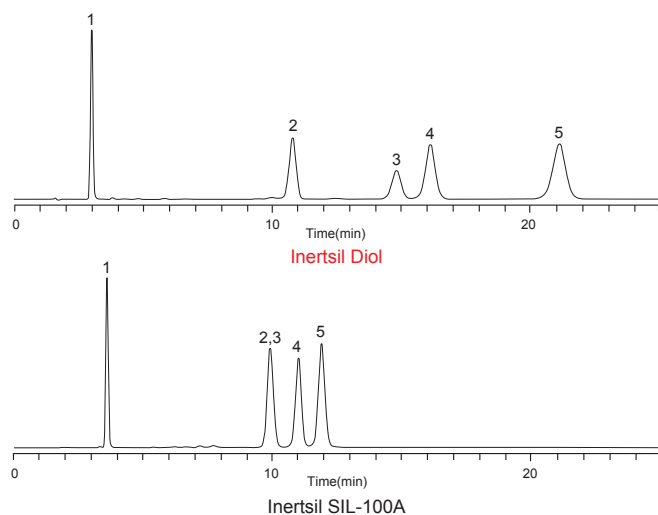
Inertsil Diol has characteristics of dihydroxypropyl group bonded phase. It shows unique selectivity normal phase mode.

The separation mechanism of diol column is featured by hydrogen bonding interactions between diol groups and polar compounds. Diol columns provide an alternative selectivity to silica columns often with increased retentivity.

Figure 1, selectivities of Inertsil Diol and Inertsil SIL-100A(a pure Silica gel column) are compared. Inertsil Diol shows higher selectivity for those compounds

Figure 2, 9 compounds are eluted by Inertsil Diol and other normal phase columns of "Inertsil series". By comparing their retention times of each compound, it is noticeable that Inertsil Diol provides stable retention for all of the compounds, including basic and acidic compounds. As non-specific adsorption of water is reduced, Inertsil Diol can be washed by 100 % water eluent.

Figure 1 : Comparison of selectivity between Diol column and Silica column



Conditions

Column Size : 5 μm , 150 $\times$ 4.6 mm I.D.
 Eluent : A) *n*-Hexane
 B) Ethanol
 A/B = 85/15, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm

Sample :

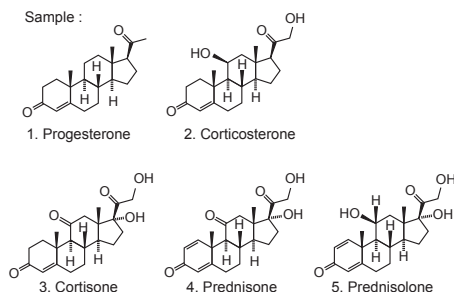
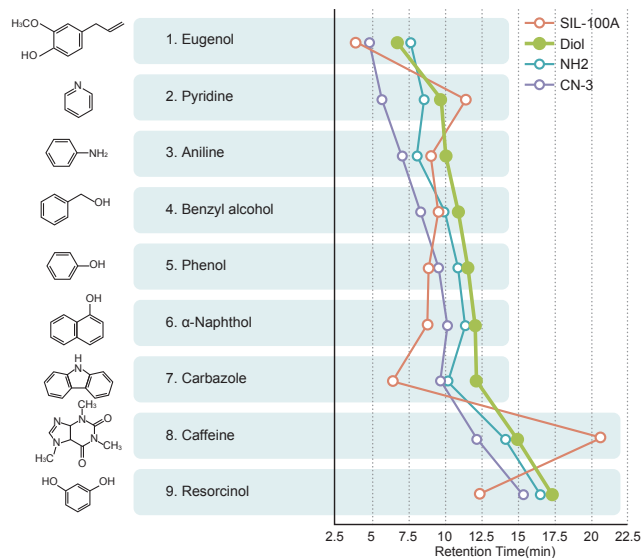
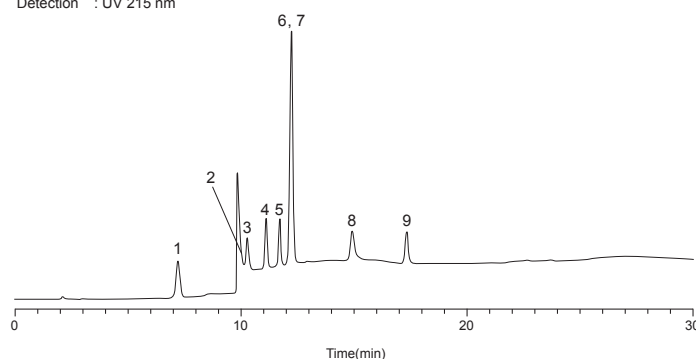


Figure 2 : Selectivity of Inertsil Diol

Conditions

Column : Inertsil Diol (5 μm , 150 $\times$ 3.0 mm I.D.)
 Eluent : A) *n*-Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 – 30 min – 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86531	5020-86541		
	50	5020-86532	5020-86542		
	75	5020-86533	5020-86543		
	100	5020-86534	5020-86544		
	150	5020-86535	5020-86545		
	250	5020-86536	5020-86546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05411	5020-05421	5020-05431	5020-05441
	50	5020-05412	5020-05422	5020-05432	5020-05442
	75	5020-05413	5020-05423	5020-05433	5020-05443
	100	5020-05414	5020-05424	5020-05434	5020-05444
Particle Size: 5 µm	150	5020-05415	5020-05425	5020-05435	5020-05445
	250	5020-05416	5020-05426	5020-05436	5020-05446
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86511	5020-86521		
	50	5020-86512	5020-86522		
	75	5020-86513	5020-86523		
	100	5020-86514	5020-86524		
	150	5020-86515	5020-86525		
	250	5020-86516	5020-86526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05611	5020-05621	5020-05631	5020-05641
	50	5020-05612	5020-05622	5020-05632	5020-05642
	75	5020-05613	5020-05623	5020-05633	5020-05643
	100	5020-05614	5020-05624	5020-05634	5020-05644
	150	5020-05615	5020-05625	5020-05635	5020-05645
	250	5020-05616	5020-05626	5020-05636	5020-05646

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19223	5020-19222	5020-19273	5020-19272
1.5, 2.1		1.5	5020-19323	5020-19322	5020-19373	5020-19372
2.1, 3.0		3.0	5020-19123	5020-19122	5020-19173	5020-19172
4.0, 4.6		4.0	5020-19023	5020-19022	5020-19073	5020-19072
2.1, 3.0	20	3.0	5020-19523	5020-19522	5020-19573	5020-19572
4.0, 4.6		4.0	5020-19423	5020-19422	5020-19473	5020-19472
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Inertsil® SIL-100A

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : None
- End-capping : None
- Carbon Loading : - %
- USP Code : L3
- pH Range : 2 ~ 7.5



Inertsil SIL-100A is a pure silica gel column available in normal phase mode. Because of the high quality of its silica gel, Inertsil SIL-100A achieves separation with sharp peaks and provides high column-to-column reproducibility. This excellent silica gel ideally designed for HPLC is the basis for "Inertsil 3-series" of GL Sciences. GL Sciences is the first company which emphasized the importance of silica-gel purity and determined the nature of the silanol impurities in the Silica gel.

GL Sciences has established a successful manufacturing process for ultra pure silica gel with smooth and rigid surface. The SEM photos of Inertsil SIL-100A and other brands' silica gel are shown as figure 1. Particles of Inertsil SIL-100A stand out by the smooth surface, uniformity in size and spherical shape. From figure 2, we can know as silanols on the silica surface interact with basic compounds, Inertsil SIL-100A retains basic compounds strongly and acidic compounds weakly.

Figure 1 : SEM photos of Inertsil SIL-100A and other brand available Silica gels

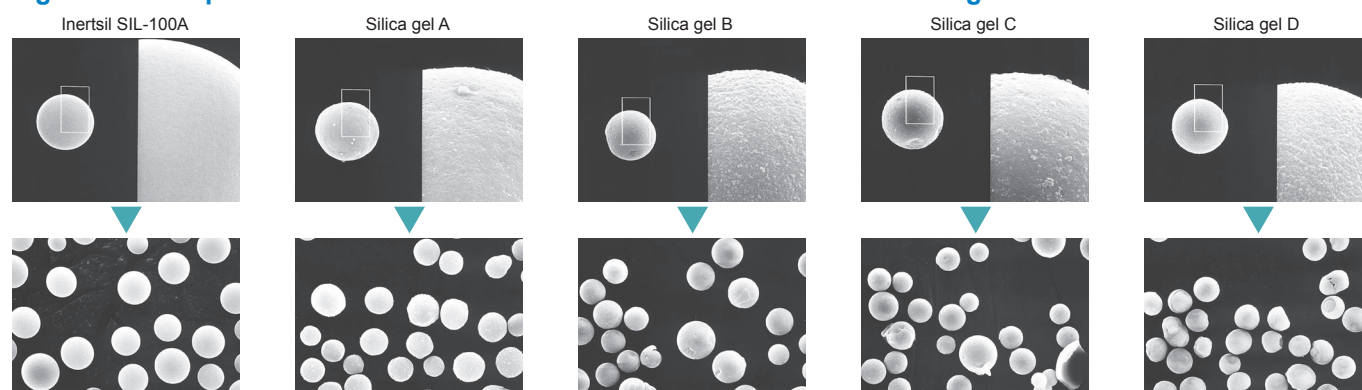
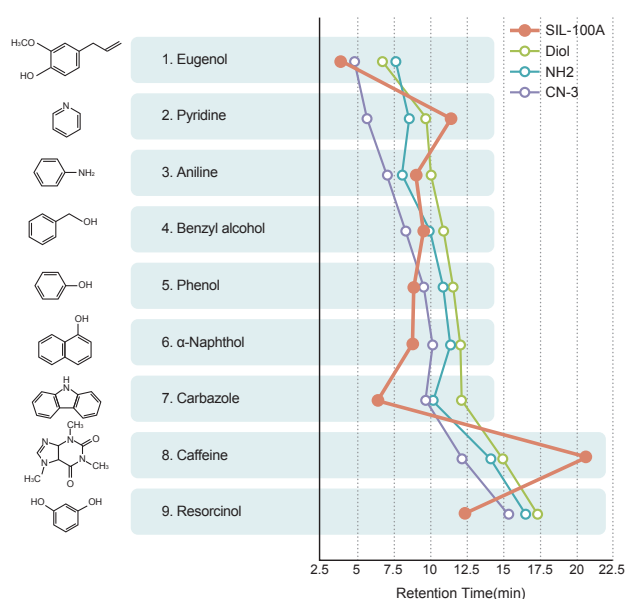
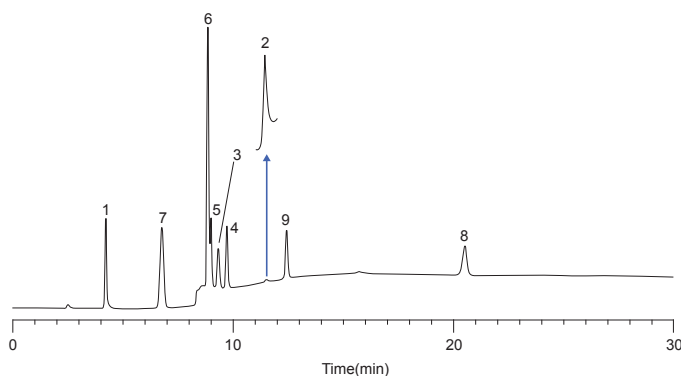


Figure 2 : Selectivity of Inertsil™ SIL-100A

Conditions

Column : Inertsil SIL-100A (5 µm, 150 × 3.0 mm I.D.)
 Eluent : A) *n*-Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 – 30 min – 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84211	5020-84221		
	50	5020-84212	5020-84222		
	75	5020-84213	5020-84223		
	100	5020-84214	5020-84224		
	150	5020-13422	5020-13420		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04211	5020-04221	5020-04231	5020-04241
	50	5020-04212	5020-04222	5020-04232	5020-04242
	75	5020-04213	5020-04223	5020-04233	5020-01700
	100	5020-04214	5020-04224	5020-01703	5020-04244
Particle Size: 5 µm	150	5020-04215	5020-04225	5020-04235	5020-01701
	250	5020-04216	5020-04226	5020-04236	5020-01702
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84311	5020-84321		
	50	5020-84312	5020-84322		
	75	5020-84313	5020-84323		
	100	5020-84314	5020-84324		
	150	5020-13412	5020-13410		
	250	5020-84316	5020-84326		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04311	5020-04321	5020-04331	5020-04341
	50	5020-04312	5020-04322	5020-04332	5020-04342
	75	5020-04313	5020-04323	5020-04333	5020-04343
	100	5020-04314	5020-04324	5020-04334	5020-04344
	150	5020-04315	5020-04325	5020-04335	5020-01711
	250	5020-04316	5020-04326	5020-04336	5020-01712

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19227	5020-19226	5020-19277	5020-19276
1.5, 2.1		1.5	5020-19327	5020-19326	5020-19377	5020-19376
2.1, 3.0		3.0	5020-19127	5020-19126	5020-19177	5020-19176
4.0, 4.6		4.0	5020-19027	5020-19026	5020-19077	5020-19076
2.1, 3.0	20	3.0	5020-19527	5020-19526	5020-19577	5020-19576
4.0, 4.6		4.0	5020-19427	5020-19426	5020-19477	5020-19476
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16768	5020-16774		
	50	5020-16769	5020-16775		
	75	5020-16770	5020-16776		
	100	5020-16771	5020-16777		
	150	5020-16772	5020-16778		
	250	5020-16773	5020-16779		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16732	5020-16739	5020-16746	5020-16753
	50	5020-16733	5020-16740	5020-16747	5020-16754
	75	5020-16734	5020-16741	5020-16748	5020-16755
	100	5020-16735	5020-16742	5020-16749	5020-16756
	150	5020-16736	5020-16743	5020-16750	5020-16757
	250	5020-16737	5020-16744	5020-16751	5020-16758
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16639	5020-16645		
	50	5020-16640	5020-16646		
	75	5020-16641	5020-16647		
	100	5020-16642	5020-16648		
	150	5020-16643	5020-16649		
	250	5020-16644	5020-16650		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16602	5020-16609	5020-16616	5020-16623
	50	5020-16603	5020-16610	5020-16617	5020-16624
	75	5020-16604	5020-16611	5020-16618	5020-16625
	100	5020-16605	5020-16612	5020-16619	5020-16626
	150	5020-16606	5020-16613	5020-16620	5020-16627
	250	5020-16607	5020-16614	5020-16621	5020-16628

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-16807	5020-16706	5020-16808	5020-16707
1.5, 2.1		1.5	5020-16809	5020-16708	5020-16810	5020-16709
2.1, 3.0		3.0	5020-16805	5020-16704	5020-16806	5020-16705
4.0, 4.6		4.0	5020-16803	5020-16702	5020-16804	5020-16703
2.1, 3.0	20	3.0	5020-16813	5020-16712	5020-16814	5020-16713
4.0, 4.6		4.0	5020-16811	5020-16710	5020-16812	5020-16711
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® NH2

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Aminopropyl Groups
- End-capping : None
- Carbon Loading : 8 %
- USP Code : L8
- pH Range : 2 ~ 7.5



Inertsil NH2 has a wide surface area, and bonded with aminopropyl groups, an amino column performs high retention time. Inertsil NH2 achieves better separation than other commercially available Amino columns as it is modified with Primary Amines. Figure 1 shows that Inertsil NH2 is able to separate isomers of Tocopherol with good peak shape in short time compared to other commercially Amino columns. Primary Amines on the surface provides Inertsil NH2 unique selectivity as a normal phase column. Inertsil NH2 retains acidic compounds strongly and basic compound weakly. (Figure 2)

Figure 1 : Analysis of Vitamin E

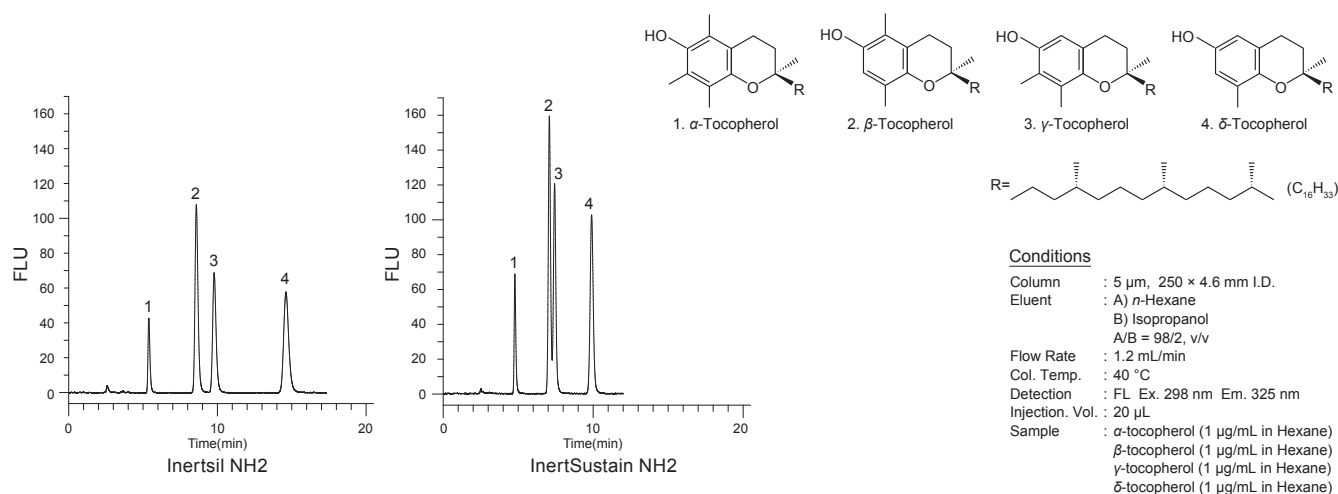
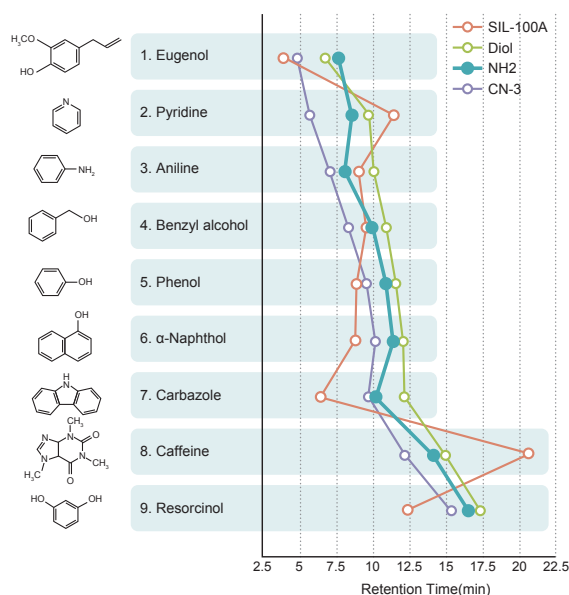
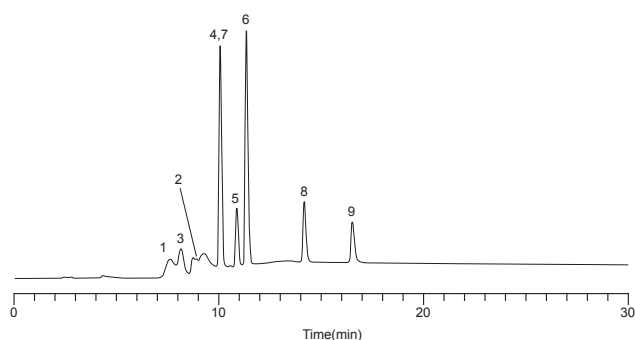


Figure 2 : Selectivity of Inertsil® NH2

Conditions

Column : 5 µm, 150 × 3.0 mm I.D.
 Eluent : A) Hexane/Ethanol = 100/1, v/v
 B) Ethanol
 A/B = 100/0 – 30 min – 25/75, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 215 nm



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85531	5020-85541		
	50	5020-85532	5020-85542		
	75	5020-85533	5020-85543		
	100	5020-85534	5020-85544		
	150	5020-85535	5020-85545		
	250	5020-85536	5020-85546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05461	5020-05471	5020-05481	5020-05491
	50	5020-05462	5020-05472	5020-05482	5020-05492
	75	5020-05463	5020-05473	5020-05483	5020-05493
	100	5020-05464	5020-05474	5020-05484	5020-05494
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85511	5020-85521		
	50	5020-85512	5020-85522		
	75	5020-85513	5020-85523		
	100	5020-85514	5020-85524		
	150	5020-85515	5020-85525		
	250	5020-85516	5020-85526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05511	5020-05521	5020-05531	5020-05541
	50	5020-05512	5020-05522	5020-05532	5020-05542
	75	5020-05513	5020-05523	5020-05533	5020-05543
	100	5020-05514	5020-05524	5020-05534	5020-05544
	150	5020-05515	5020-05525	5020-05535	5020-05545
	250	5020-05516	5020-05526	5020-05536	5020-05546

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19221	5020-19220	5020-19271	5020-19270
1.5, 2.1		1.5	5020-19321	5020-19320	5020-19371	5020-19370
2.1, 3.0		3.0	5020-19121	5020-19120	5020-19171	5020-19170
4.0, 4.6		4.0	5020-19021	5020-19020	5020-19071	5020-19070
2.1, 3.0	20	3.0	5020-19521	5020-19520	5020-19571	5020-19570
4.0, 4.6		4.0	5020-19421	5020-19420	5020-19471	5020-19470
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® CN-3

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 3 µm, 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Cyanopropyl Groups
- End-capping : None
- Carbon Loading : 14 %
- USP Code : L10
- pH Range : 2 ~ 7.5



Inertsil CN-3, Cyanopropyl groups bonded to Silica gel with high density. And it is not only increase difference recognition of hydrophilicity, but also increase the durability. It is difficult to increase the both performance with other previous cyanopropyl columns. Inertsil CN-3 can be cleaned with 100 % aqueous solvent because non-specific adsorption of water effected with silanol base is prevented.

Figure 2 shows 9 compounds analysis with Inertsil CN-3. And also it shows different selectivity of the other Inertsil series columns. Each compounds are detected adequate retentivity. And then they are easy to use as same as Inertsil Diol on normal phase mode. Regarding the reversed phase mode, please refer to page 40.

Figure1 : Comparison of selectivity between Inertsil® CN-3 and Commercially available Cyano Columns

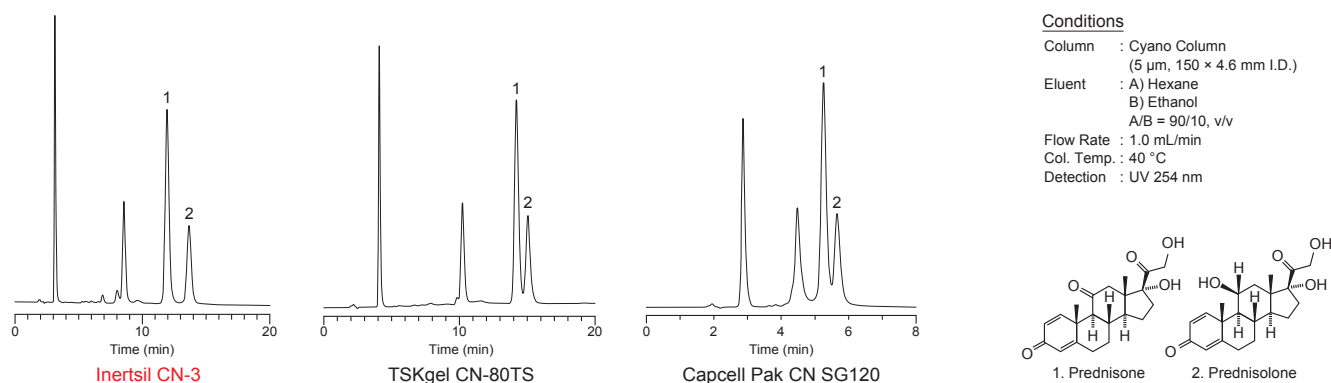
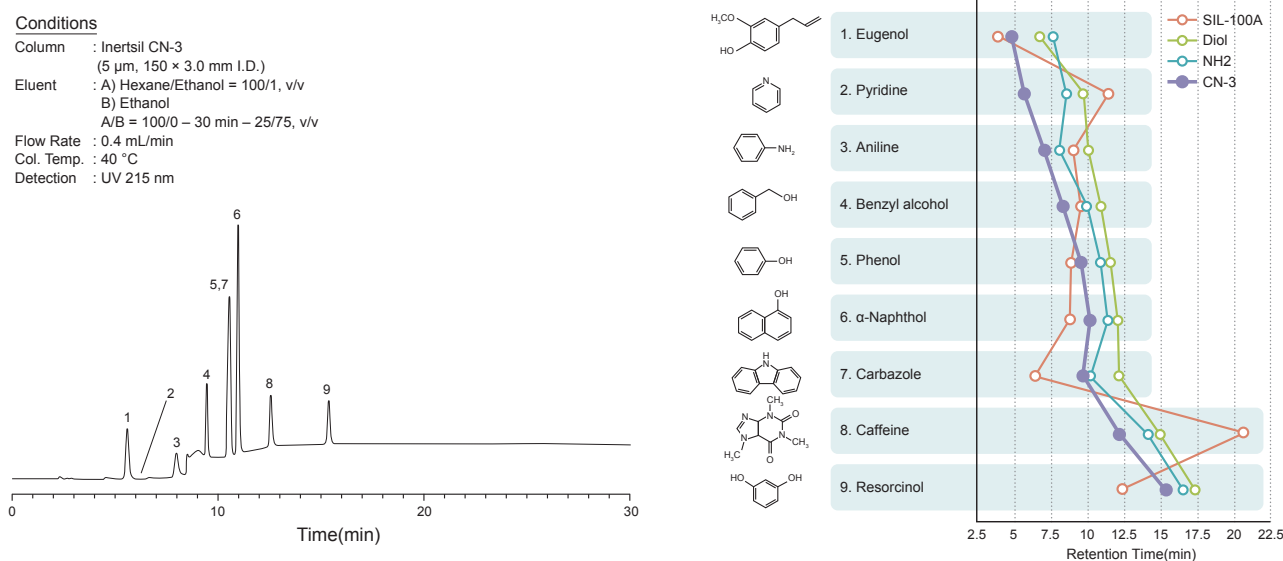


Figure2 : Selectivity of Inertsil® CN-3



Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85331	5020-85341		
	50	5020-85332	5020-85342		
	75	5020-85333	5020-85343		
	100	5020-85334	5020-85344		
	150	5020-85335	5020-85345		
	250	5020-85336	5020-85346		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05261	5020-05271	5020-05281	5020-05291
	50	5020-05262	5020-05272	5020-05282	5020-05292
	75	5020-05263	5020-05273	5020-05283	5020-05293
	100	5020-05264	5020-05274	5020-05284	5020-05294
Particle Size: 5 µm	150	5020-05265	5020-05275	5020-05285	5020-05295
	250	5020-05266	5020-05276	5020-05286	5020-05296
	Length \ I.D. (mm)	1.0	1.5		
	33	5020-85311	5020-85321		
	50	5020-85312	5020-85322		
	75	5020-85313	5020-85323		
	100	5020-85314	5020-85324		
	150	5020-13712	5020-13710		
	250	5020-85316	5020-85326		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05311	5020-05321	5020-05331	5020-05341
	50	5020-05312	5020-05322	5020-05332	5020-05342
	75	5020-05313	5020-05323	5020-05333	5020-05343
	100	5020-05314	5020-05324	5020-05334	5020-05344
	150	5020-05315	5020-05325	5020-01942	5020-01940
	250	5020-05316	5020-05326	5020-01943	5020-01941

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19219	5020-19218	5020-19269	5020-19268
1.5, 2.1		1.5	5020-19319	5020-19318	5020-19369	5020-19368
2.1, 3.0		3.0	5020-19119	5020-19118	5020-19169	5020-19168
4.0, 4.6		4.0	5020-19019	5020-19018	5020-19069	5020-19068
2.1, 3.0	20	3.0	5020-19519	5020-19518	5020-19569	5020-19568
4.0, 4.6		4.0	5020-19419	5020-19418	5020-19469	5020-19468
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® SIL-150A

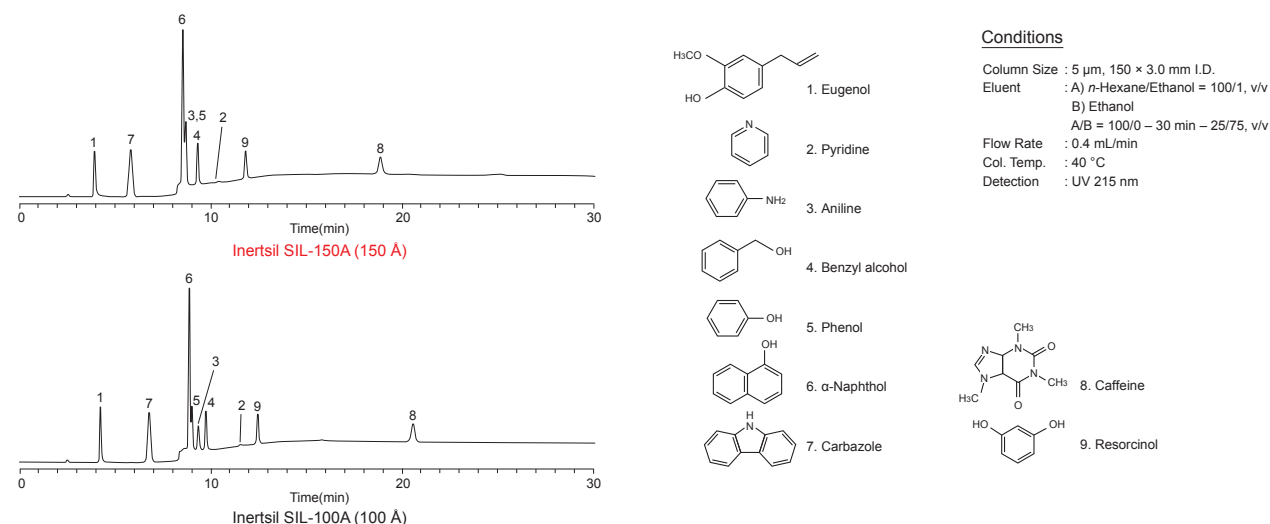
Physical Properties

- Silica : 2 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 320 m²/g
- Pore Size : 150 Å (15 nm)
- Pore Volume : 1.20 mL/g
- Bonded Phase : None
- End-capping : None
- Carbon Loading : - %
- USP Code : L3
- pH Range : 2 ~ 7.5



Inertsil SIL-150A is ultra pure silica gel column, and this ultra pure silica gel contains very low level of metal impurities and is durable and free from dents and cracks which can cause premature column failure. Compared to Inertsil SIL-100A, the silica's surface area is smaller (320 m²/g). Retentivity of Inertsil SIL-150A is weaker than that of Inertsil SIL-100A. (Figure 1)

Figure 1 : Comparison of retentivity and selectivity between Inertsil® SIL-150A and Inertsil® SIL-100A



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01021	5020-01022	5020-01023	5020-01024
	250	5020-01025	5020-01026	5020-01027	5020-01028

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19139	5020-19189
4.0, 4.6		4.0	5020-19039	5020-19089
2.1, 3.0	20	3.0	5020-19539	5020-19589
4.0, 4.6		4.0	5020-19439	5020-19489
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® WP300 SIL

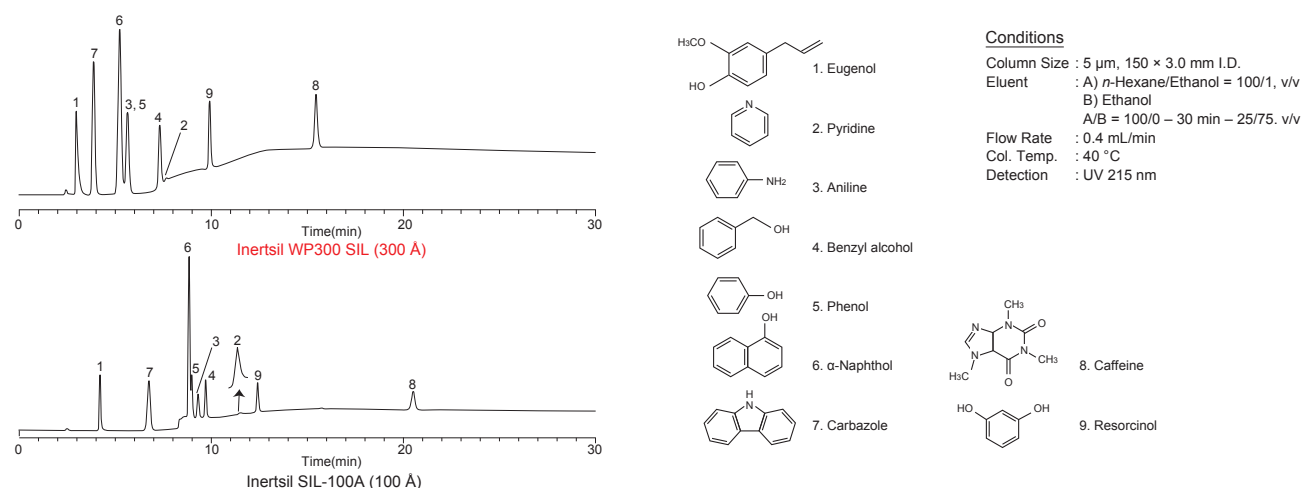
Physical Properties

- **Silica** : High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 150 m²/g
- **Pore Size** : 300 Å (30 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : None
- **End-capping** : None
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 ~ 7.5



Inertsil WP300 SIL is pure silica gel phase with wide pores(300 Å). It is available for analysing compounds including large molecules. As the pore becomes wider, the surface area of silica gel is smaller. Since the interactions between the analyte and silica gel occur on the silica surface, smaller surface area means less interactions and faster elution. In the figure below, Inertsil WP300 SIL and Inertsil SIL-100A are compared to see their separation and eluting speed. The pore size of Inertsil SIL-100A is 100 Å and the surface area is 450 m²/g. As shown, Inertsil WP300 SIL elutes faster than Inertsil SIL-100A though their separating patterns are similar.

Figure 1 : Comparison of selectivity and retentivity between Silica gel columns with different pore size.



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0		1.5	
	33	5020-86011		5020-86021	
	50	5020-86012		5020-86022	
	75	5020-86013		5020-86023	
	100	5020-86014		5020-86024	
	150	5020-86015		5020-86025	
	250	5020-86016		5020-86026	
	Length \ I.D. (mm)	2.1		3.0	
	33	5020-06011		5020-06021	
	50	5020-06012		5020-06022	
	75	5020-06013		5020-06023	
	100	5020-06014		5020-06024	
	150	5020-06015		5020-06025	
	250	5020-06016		5020-06026	
	Length \ I.D. (mm)	4.0		4.6	
	33	5020-06031		5020-06041	
	50	5020-06032		5020-06042	
	75	5020-06033		5020-06043	
	100	5020-06034		5020-06044	
	150	5020-06035		5020-06045	
	250	5020-06036		5020-06046	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19232	5020-19282
1.5, 2.1		1.5	5020-19332	5020-19382
2.1, 3.0		3.0	5020-19132	5020-19182
4.0, 4.6		4.0	5020-19032	5020-19082
2.1, 3.0	20	3.0	5020-19532	5020-19582
4.0, 4.6		4.0	5020-19432	5020-19482
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

SEC Columns

• Inertsil® Diol	072
• Inertsil® WP300 Diol	074

Inertsil® Diol

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Diol Groups (Dihydroxypropyl Groups)
- **End-capping** : None
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 ~ 7.5



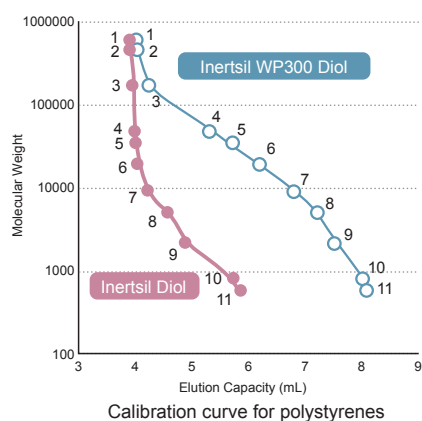
Inertsil Diol, dihydroxypropyl groups chemical bonded onto silica gel, can be used for water group SEC(GFC) or organic solvents SEC(GPC). (Figure 1).

As features of the packing material, it can analyze with several columns in series since 20 Mpa as the maximum operating pressure, and it is higher than polymer base columns.

Figure 2 shows an example of polystyrene analysis with Inertsil Diol and Inertsil WP300 Diol in series. With coupling 2 columns in different pore size in series, it can be used for broader range of molecular weight compared with figure 1 calibration curve.

General internal diameter of SEC columns are 7-8 mm. But even if 4.6 mm I.D. column, it can obtain calibration curve with smaller elution volume rather than 7.6 mm I.D. column. Therefore it can be analyzed with saving solvent, environment conservation, and low cost.

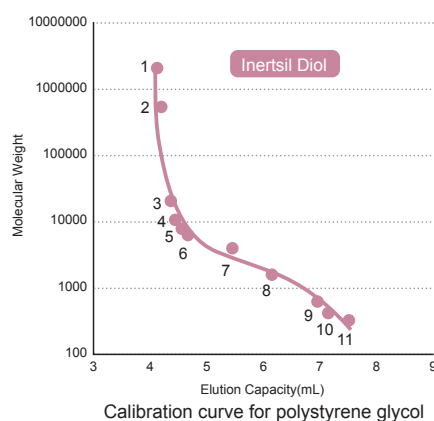
Figure1 : Calibration curve for aqueous and organic SEC analysis



Calibration curve for polystyrenes

Conditions

Column : Inertsil WP300 Diol (5 µm, 250 × 7.6 mm I.D.)
 Eluent : THF
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm

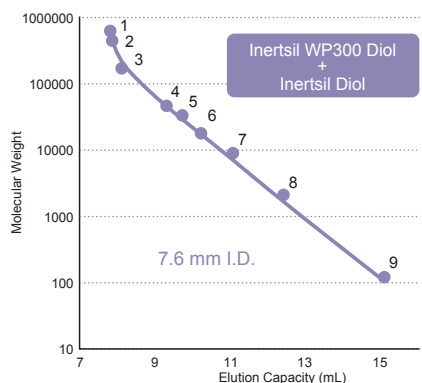


Calibration curve for polystyrene glycol

Conditions

Column : Inertsil Diol (5 µm, 250 × 7.6 mm I.D.)
 Eluent : H₂O
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : RI (Cell Temp. 35 °C)

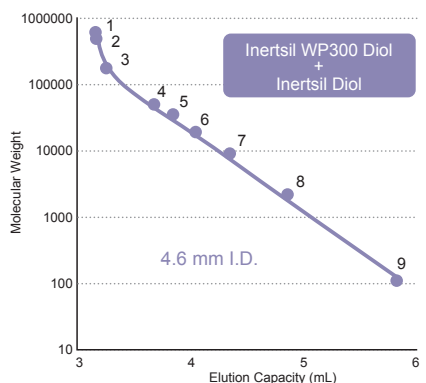
Figure2 : Calibration curve for small I.D. SEC columns



Calibration curve for polystyrene with 7.6 mm I.D. column

Conditions

Column : Inertsil WP300 Diol (5 µm, 250 × 7.6 mm I.D.)
 + Inertsil Diol (5 µm, 250 × 7.6 mm I.D.)
 Eluent : THF
 Flow Rate : 1.0 mL/min
 Col. Temp. : 35 °C
 Detection : UV 254 nm



Calibration curve for polystyrene with 4.6 mm I.D. column

Conditions

Column : Inertsil WP300 Diol (5 µm, 250 × 4.6 mm I.D.)
 + Inertsil Diol (5 µm, 250 × 4.6 mm I.D.)
 Eluent : THF
 Flow Rate : 0.3 mL/min
 Col. Temp. : 35 °C
 Detection : UV 254 nm

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86531	5020-86541		
	50	5020-86532	5020-86542		
	75	5020-86533	5020-86543		
	100	5020-86534	5020-86544		
	150	5020-86535	5020-86545		
	250	5020-86536	5020-86546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05411	5020-05421	5020-05431	5020-05441
	50	5020-05412	5020-05422	5020-05432	5020-05442
	75	5020-05413	5020-05423	5020-05433	5020-05443
	100	5020-05414	5020-05424	5020-05434	5020-05444
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86511	5020-86521		
	50	5020-86512	5020-86522		
	75	5020-86513	5020-86523		
	100	5020-86514	5020-86524		
	150	5020-86515	5020-86525		
	250	5020-86516	5020-86526		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05611	5020-05621	5020-05631	5020-05641
	50	5020-05612	5020-05622	5020-05632	5020-05642
	75	5020-05613	5020-05623	5020-05633	5020-05643
	100	5020-05614	5020-05624	5020-05634	5020-05644
	150	5020-05615	5020-05625	5020-05635	5020-05645
	250	5020-05616	5020-05626	5020-05636	5020-05646
	Length \ I.D. (mm)	6.0	7.6	10	
	50	5020-05652	5020-05662	5020-86552	
	100	5020-05654	5020-05664	5020-86554	
	150	5020-05655	5020-05665	5020-86555	
	250	5020-05656	5020-05666	5020-86556	

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19223	5020-19222	5020-19273	5020-19272
1.5, 2.1		1.5	5020-19323	5020-19322	5020-19373	5020-19372
2.1, 3.0		3.0	5020-19123	5020-19122	5020-19173	5020-19172
4.0, 4.6		4.0	5020-19023	5020-19022	5020-19073	5020-19072
2.1, 3.0	20	3.0	5020-19523	5020-19522	5020-19573	5020-19572
4.0, 4.6		4.0	5020-19423	5020-19422	5020-19473	5020-19472
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

* For the guard column I.D. over 6.0 mm. Please refer to page 115.

Inertsil® WP300 Diol

Physical Properties

- **Silica** : WP300 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 150 m²/g
- **Pore Size** : 300 Å (30 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Diol Groups (Dihydroxypropyl Groups)
- **End-capping** : None
- **Carbon Loading** : 9 %
- **USP Code** : L20, L33
- **pH Range** : 2 ~ 7.5



Inertsil WP300 Diol has dihydroxypropyl group bonded to silica gel with pore size 300 Å and is capable of analyzing large molecules. Like Inertsil Diol, Inertsil WP300 Diol can be used for both aqueous SEC (Size Exclusion Chromatography) and organic SEC. Also, as a diol column, Inertsil WP300 Diol can be used in both normal phase and reversed phase mode.

As the pore size of silica gel is wider than that of Inertsil Diol, Inertsil WP300 Diol is capable of separating compounds with a broader range of molecular weight than Inertsil Diol. (Figure 1.)

Figure 1 : Calibration curve and analysis of polystyrenes

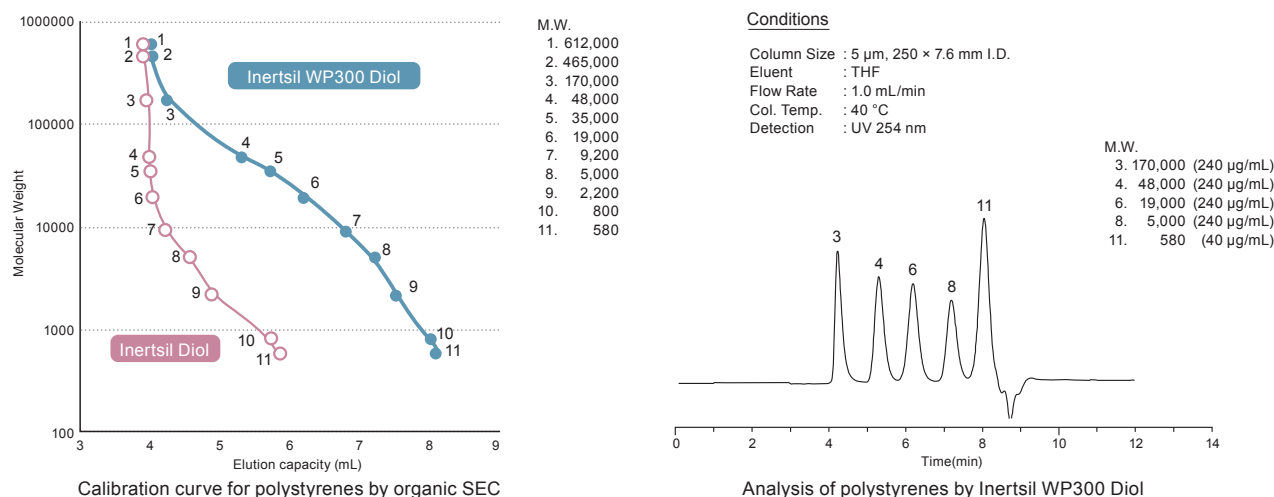
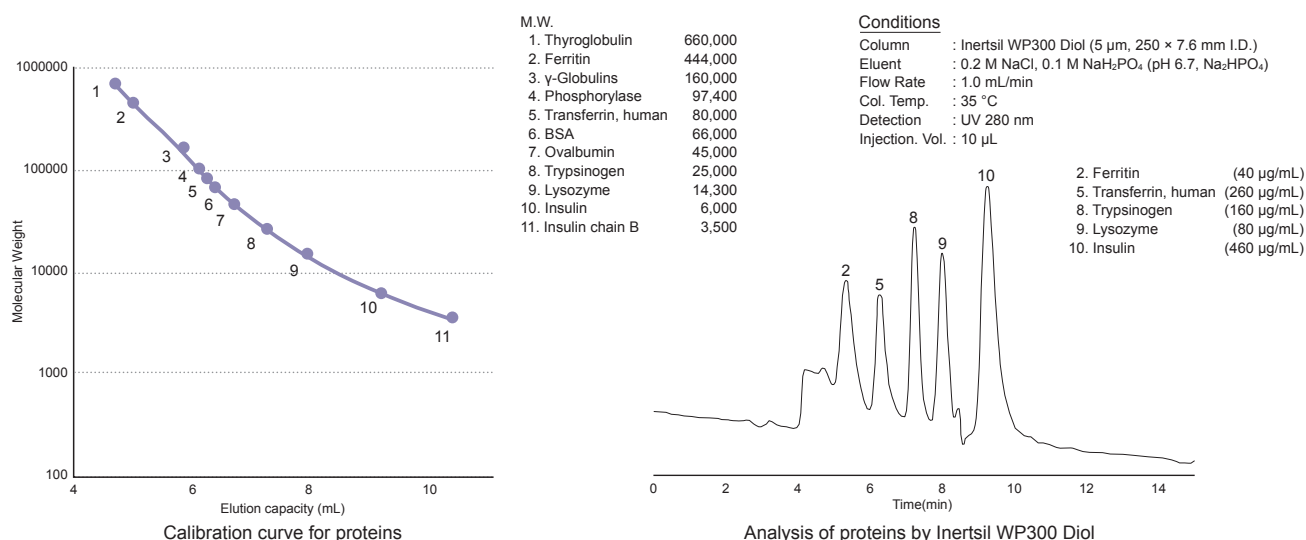


Figure 2 : Calibration curve and analysis of proteins



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5	2.1	3.0	4.0	4.6
	33	5020-85911	5020-85921	5020-05911	5020-05921	5020-05931	5020-05941
	50	5020-85912	5020-85922	5020-05912	5020-05922	5020-05932	5020-05942
	75	5020-85913	5020-85923	5020-05913	5020-05923	5020-05933	5020-05943
	100	5020-85914	5020-85924	5020-05914	5020-05924	5020-05934	5020-05944
	150	5020-85915	5020-85925	5020-05915	5020-05925	5020-05935	5020-05945
	250	5020-85916	5020-85926	5020-05916	5020-05926	5020-05936	5020-05946
	Length \ I.D. (mm)	6.0	7.6	10			
	50	5020-05980	5020-05985	5020-85932			
	100	5020-05981	5020-05986	5020-85934			
	150	5020-05982	5020-05987	5020-85935			
	250	5020-05983	5020-05988	5020-85936			

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19231	5020-19281
1.5, 2.1		1.5	5020-19331	5020-19381
2.1, 3.0		3.0	5020-19131	5020-19181
4.0, 4.6		4.0	5020-19031	5020-19081
2.1, 3.0	20	3.0	5020-19531	5020-19581
4.0, 4.6		4.0	5020-19431	5020-19481
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

* For the guard column I.D. over 6.0 mm. Please refer to page 115.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Ion Exchange Columns

• Inertsil® AX	078
• Inertsil® CX	080

Inertsil® AX

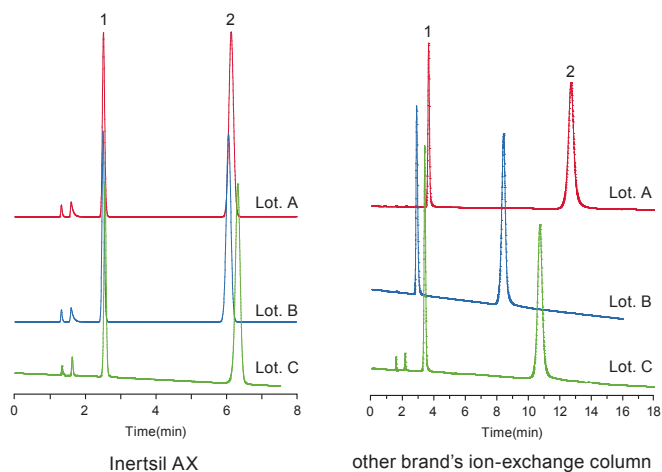
Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Diethylaminopropyl Groups
- End-capping : None
- Carbon Loading : 17 %
- AEC : 0.4 meq/g
- USP Code : -
- pH Range : 2 ~ 7.5



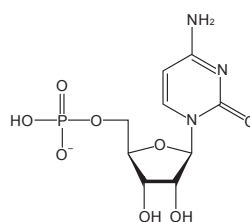
Inertsil AX has diethylamino groups bonded to silica gel by an alkyl chain. The diethylamino groups offer anionic functions required for anion exchange chromatography. It is mainly used for analyses of acidic compounds. Conventional ion-exchange columns used to show inconsistent results from lot to lot. However, Inertsil AX is manufactured under strict quality control in order to offer excellent lot-to-lot reproducibility. The retentivity of Inertsil AX is influenced by the concentration of buffer. The retention time can be adjusted by the concentration of buffer (Refer to Fig. 2).

Figure 1 : Comparison of lot-to-lot reproducibility with other brands

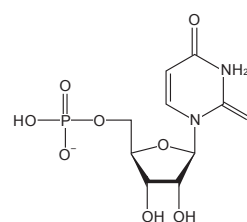


Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
 Eluent : 60 mM KH₂PO₄ (pH 3.0, H₃PO₄)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Injection Vol. : 1 µL
 Sample : 1. Cytidine 5'-monophosphate (CMP)
 2. Uridine 5'-monophosphate (UMP)

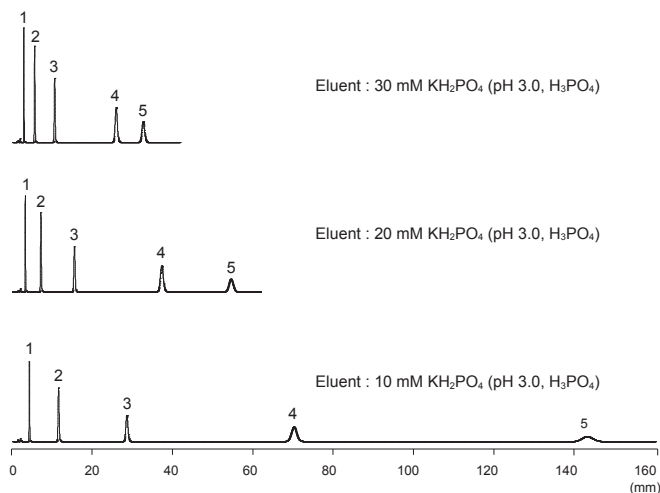


Cytidine 5'-monophosphate (CMP)



Uridine 5'-monophosphate (UMP)

Figure 2 : Effect of buffer concentration in eluent



Conditions

Column : Inertsil AX (5 µm, 150 × 4.6 mm I.D.)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 254 nm
 Injection Vol. : 10 µL
 Sample : 1. Cytidine 5'-monophosphate (CMP)
 2. Adenine 5'-monophosphate (AMP)
 3. Uridine 5'-monophosphate (UMP)
 4. Guanosine 5'-monophosphate (GMP)
 5. Xanthosine 5'-monophosphate (XMP)

Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-80111	5020-80121		
	50	5020-80112	5020-80122		
	75	5020-80113	5020-80123		
	100	5020-80114	5020-80124		
	150	5020-80115	5020-80125		
	250	5020-80116	5020-80126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07211	5020-07221	5020-07231	5020-07241
	50	5020-07212	5020-07222	5020-07232	5020-07242
	75	5020-07213	5020-07223	5020-07233	5020-07243
	100	5020-07214	5020-07224	5020-07234	5020-07244
	150	5020-07215	5020-07225	5020-07235	5020-07245
	250	5020-07216	5020-07226	5020-07236	5020-07246

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19233	5020-19283
1.5, 2.1		1.5	5020-19333	5020-19383
2.1, 3.0		3.0	5020-19133	5020-19183
4.0, 4.6		4.0	5020-19033	5020-19083
2.1, 3.0	20	3.0	5020-19533	5020-19583
4.0, 4.6		4.0	5020-19433	5020-19483
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

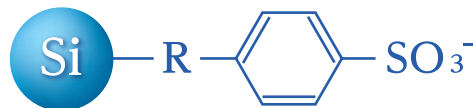
Applications

Cat. No. Index

Inertsil® CX

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Benzenesulfonyl Groups
- End-capping : None
- Carbon Loading : 14 %
- CEC : 0.5 meq/g
- USP Code : L9
- pH Range : 2 ~ 7.5



Inertsil CX has benzenesulfonyl groups bonded to silica gel by an alkyl chain. The sulfony groups at the end of the structure offer cationic functions required for the cation exchange chromatography. It is mainly used for analyses of basic compounds. Inertsil CX is manufactured under strict quality control in order to offer excellent lot-to-lot reproducibility as the same as Inertsil AX. Inertsil CX has high ion exchange capacity and provides high retentivity and selectivity. Therefore, it is also suited for analyzing amino acids and nucleobases shown in Fig. 2 and Fig. 3

Figure 1 : Comparison of lot-to-lot reproducibility with other brands

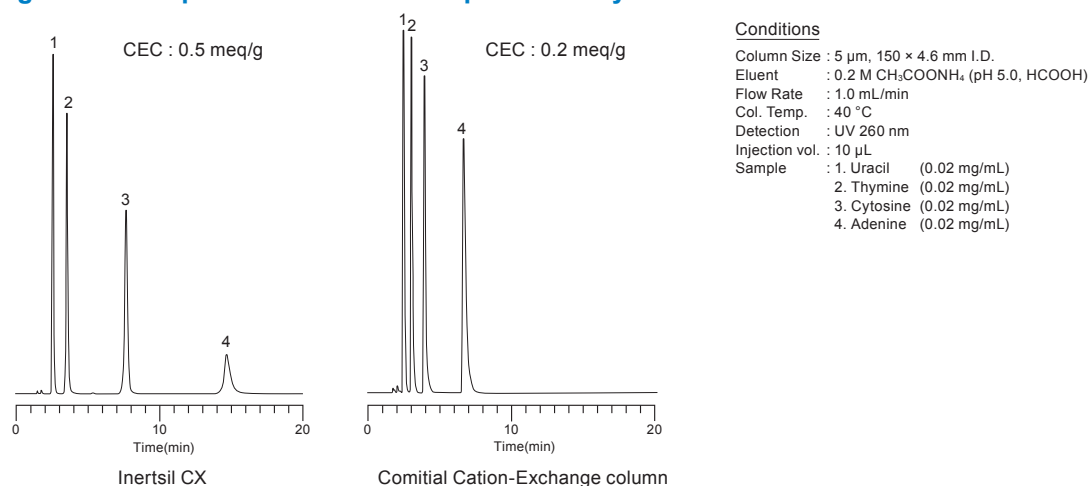


Figure 2 : Biogenic Amine Analysis

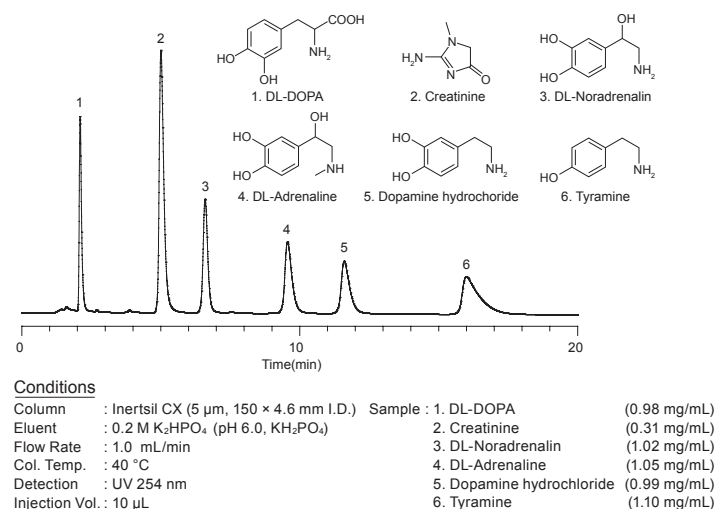
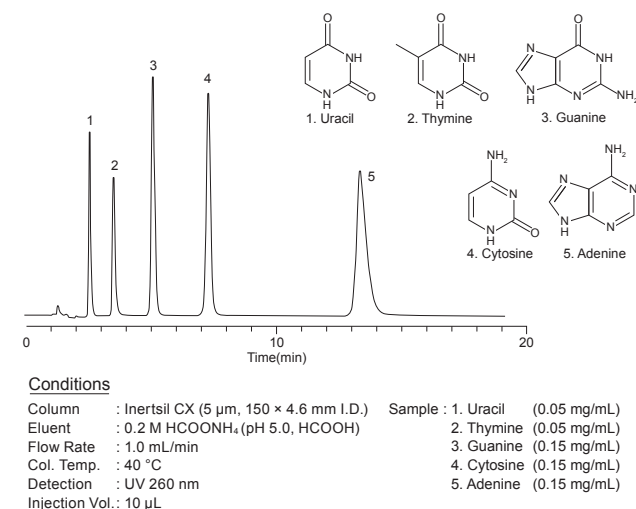


Figure 3 : Nucleoside Analysis



Analytical Columns

Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-80011	5020-80021		
	50	5020-80012	5020-80022		
	75	5020-80013	5020-80023		
	100	5020-80014	5020-80024		
	150	5020-80015	5020-80025		
	250	5020-80016	5020-80026		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07111	5020-07121	5020-07131	5020-07141
	50	5020-07112	5020-07122	5020-07132	5020-07142
	75	5020-07113	5020-07123	5020-07133	5020-07143
	100	5020-07114	5020-07124	5020-07134	5020-07144
	150	5020-07115	5020-07125	5020-07135	5020-07145
	250	5020-07116	5020-07126	5020-07136	5020-07146

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19234	5020-19284
1.5, 2.1		1.5	5020-19334	5020-19384
2.1, 3.0		3.0	5020-19134	5020-19184
4.0, 4.6		4.0	5020-19034	5020-19084
2.1, 3.0	20	3.0	5020-19534	5020-19584
4.0, 4.6		4.0	5020-19434	5020-19484
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Application Specific Columns

• Bioptic AV-1, AV-2	084
• Inertsil® Peptides C18	085
• Inertsil® Acrolein C18	085
• InertSphere® Sugar-1	086
• Inertsil® Sulfa C18	087
• Inertsil® AS	087
• Corresponding Pharmacopeia (JP, USP, EP)	088
• Corresponding SFC	090

Application Specific Columns

Bioptic AV-1, AV-2

Physical Properties

- **Silica** : Spherical shape
- **Particle Size** : 5 μm
- **Bonded Phase** : Avidin
- **Temperature Range** : 4 ~ 40 deg.C
- **pH Range** : 2 ~ 7.5
- **Max. concentration of organic solvent**
For AV-1 ; < 20 %
For AV-2 ; No restriction

Feature

- Glycoprotein bonded silica
- Protein elutes as a void volume peak
- Large sample capacity
- Analysis of drug moving state

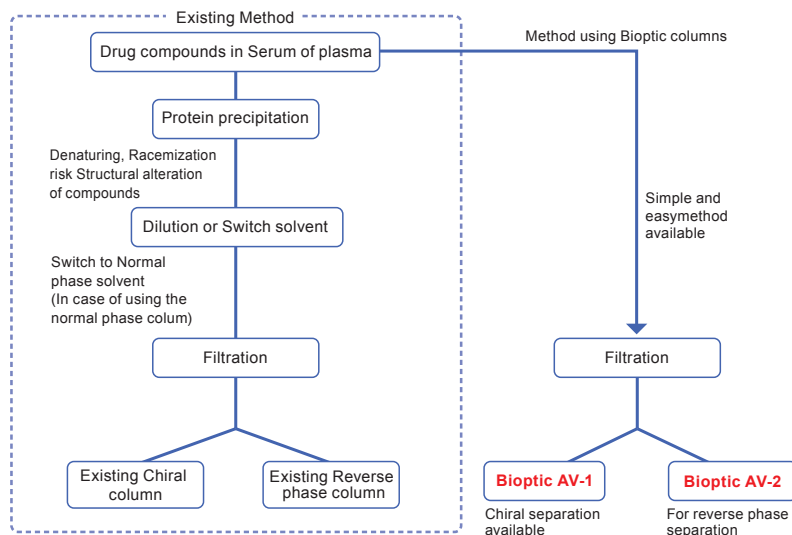
Bioptic AV-1

- Chiral separation capability
- Chiral separation in a reversed phase mode

Bioptic AV-2

- Compatible with high concentrations of organic solvents
- Similar retention behavior as reversed phase mode

Simplified method by using Bioptic columns



Analytical Columns

	Length (mm)	I.D. (mm)	Bioptic AV-1	Bioptic AV-2
			Particle Size	Particle Size
			5 μm	5 μm
Particle Size: 5 μm	150	1.5	5020-18153	5020-18154
		2.1	5020-02521	5020-02531
		3.0	5020-02522	5020-02532
		4.0	5020-02523	5020-02533
		4.6	5020-02524	5020-02534

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Bioptic AV-1		Bioptic AV-2	
			Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size	Particle Size	Particle Size
			5 µm	5 µm	5 µm	5 µm
1.5, 2.1	10	1.5	5020-19343	5020-19393	5020-19344	5020-19394
2.1, 3.0		3.0	5020-19143	5020-19193	5020-08622	5020-08623
4.0, 4.6		4.0	5020-19043	5020-19093	5020-08620	5020-08621
2.1, 3.0	20	3.0	5020-19543	5020-19593	5020-08626	5020-08627
4.0, 4.6		4.0	5020-19443	5020-19493	5020-08624	5020-08625
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® Peptides C18

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 4 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 15 %
- USP Code : L1
- pH Range : 2~7.5

The whole manufacturing process; synthesis of silica gel, chemical modification, packing, quality test, is under the strict quality control. The number of theoretical plates is as many as 100,000 plates/m.

For peptide mapping, analytical result of standard peptides obtained by each lot is attached to the column. For protein analysis, Inertsil WP300 or Inertsil WP300 C8 is recommended.

Analytical Columns

Particle Size: 4 µm	Length \ I.D. (mm)	1.0	1.5		
	50	5020-08002	5020-08012		
	100	5020-08004	5020-08014		
	150	5020-08005	5020-08015		
	250	5020-08006	5020-08016		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	50	5020-08022	5020-08032	5020-08042	5020-08052
	100	5020-08024	5020-08034	5020-08044	5020-08054
	150	5020-08025	5020-08035	5020-08045	5020-08055
	250	5020-08026	5020-08036	5020-08046	5020-08056

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			4 µm	4 µm
1.0	10	1.0	5020-19211	5020-19261
1.5, 2.1		1.5	5020-19311	5020-19361
2.1, 3.0		3.0	5020-19111	5020-19161
4.0, 4.6		4.0	5020-19011	5020-19061
2.1, 3.0	20	3.0	5020-19511	5020-19561
4.0, 4.6		4.0	5020-19411	5020-19461
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® Acrolein C18

Physical Properties

- Silica : 3 Series High Purity Silica Gel
- Particle Size : 5 µm
- Surface Area : 450 m²/g
- Pore Size : 100 Å (10 nm)
- Pore Volume : 1.05 mL/g
- Bonded Phase : Octadecyl Groups
- End-capping : Yes
- Carbon Loading : 9 %
- USP Code : L1
- pH Range : 2~7.5

Inertsil Acrolein offers rapid separation of DNPH-Acetone and DNPH-Acrolein under a general mobile phase condition such as Acetonitrile / Water.

Analytical Columns

Particle Size: 5 µm	Length(mm)	I.D.(mm)	Cat.No.
	250	4.6	5020-18051

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Application Specific Columns

InertSphere™ Sugar-1

Physical Properties

- Silica : Styrene Divinylbenzene copolymerization
- Particle size : 5 µm
- Exchange capacity : 0.7 meq/g
- Organic solvent resist : 0 ~ 100 % (Methanol only)
- Bonded Phase : Quaternary Alkylamine
- pH Range : 2~14

InertSphere Sugar-1 is a suitable anion-exchange column for sugar analysis. It is packed quaternary ammonium group binding polymer. High sensitivity sugar analysis is available using an electrochemical detector ED723. Especially InertSphere Sugar-1 is suitable for Monosaccharide and Disaccharide analysis.

Note ; Solvent Bottle with CO₂ Trap Cartridge is necessary for analysis to avoid dissolving carbonate ion in the solvent. The Solvent Bottle CO₂ Trap Cartridge contains hazardous material which requires special freight handling. Additional charges apply.

Analytical Columns

Particle Size: 5µm	Length(mm)	I.D.(mm)	Cat.No.
	150	4.6	5020-11001

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Cat.No.	Cat.No.
4.6	10	4.0	5020-19048	5020-19098

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.



Inertsil® Sulfa C18

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area**: 450 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1

As drug residues in food has become a major problem today, developing analytical methods of synthetic bacterial drugs including Sulfa drugs is important. Inertsil Sulfa C18 is a superb ODS column designed for analysis of sulfa drugs.

Each lot of Inertsil Sulfa C18 is tested for the effective separation of sulfa drugs and will be delivered to you with its analytical data.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	100	5020-07504	5020-07514	5020-07524	5020-07534
Particle Size: 5 µm	150	5020-07505	5020-07515	5020-07525	5020-07535
	250	5020-07545	5020-07555	5020-07565	5020-07575

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
2.1, 3.0	10	3.0	5020-19113	5020-19112	5020-19163	5020-19162
4.0, 4.6		4.0	5020-19013	5020-19012	5020-19063	5020-19062
2.1, 3.0	20	3.0	5020-19513	5020-19512	5020-19563	5020-19562
4.0, 4.6		4.0	5020-19413	5020-19412	5020-19463	5020-19462
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Inertsil® AS

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area**: 450 m²/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1

Inertsil AS is for analysis of Arsenic compounds which are Toxic compounds in environment water. As an Arsenic speciation analysis column, simultaneous analysis of Arsenic compounds is available with HPLC/ICP-MS.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	2.1
	150	5020-18030
	250	5020-18032

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Cat. No.	Cat. No.
2.1	10	1.5	5020-18031	5020-18035
4.6		4.0	5020-18041	5020-18045
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500

* End-fittings are 1/16" Waters-compatible.

* For maximum operating pressure information, please refer to page 46.

Corresponding Pharmacopeia (JP, USP, EP)

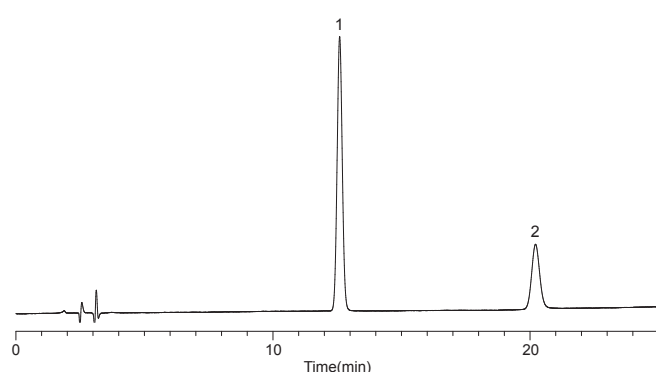
GL Sciences offers varies particle sizes and lengths corresponding to Japanese Pharmacopeias (JP), US Pharmacopeias (USP) or European Pharmacopeias (EP).

5 µm Particle Size HPLC Columns

Packing material	Column I.D.	Column length	Description	Cat. No.
C18(ODS)	3.9 mm	150 mm	InertSustain C18	5020-87030
			Inertsil ODS-4	5020-87023
			Inertsil ODS-3	5020-87008
			Inertsil WP300 C18	5020-87045
		300 mm	InertSustain C18	5020-87031
			Inertsil ODS-4	5020-87024
	4.0 mm	125 mm	Inertsil ODS-3	5020-87009
			InertSustainSwift C18	5020-88251
			Inertsil ODS-SP	5020-87043
		300 mm	Inertsil WP300 C18	5020-87037
			InertSustain C18	5020-87032
			Inertsil ODS-4	5020-87025
C8	3.0 mm	60 mm	Inertsil ODS-3	5020-87010
			InertSustain C18	5020-87033
			Inertsil ODS-4	5020-87026
			Inertsil ODS-3	5020-87011
	3.9 mm	150 mm	Inertsil C8	5020-87000
			InertSustain C8	5020-87028
			Inertsil C8-4	5020-87021
			Inertsil C8-3	5020-87005
	4.0 mm	80 mm	Inertsil WP300 C8	5020-87046
			InertSustain C8	5020-87029
			Inertsil C8-4	5020-87022
			Inertsil C8-3	5020-87006
Pre-column	4.0 mm	25 mm	Inertsil C8	5020-87001
			InertSustain C18	5020-03399
			InertSustain C8	5020-87040

* Please contact us for other sizes of columns.

Figure 1 : Crospovidone

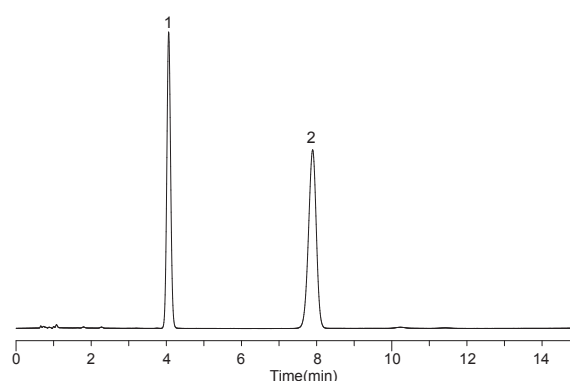


Conditions

Column : InertSustain C18 (5 µm, 250 × 4.0 mm I.D.)
Guard Column : InertSustain C18 (5 µm, 25 × 4.0 mm I.D.)
Eluent : A) CH₃CN
B) H₂O
A/B = 1/9, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 235 nm
Injection Vol. : 50 µL
Data Source : LC InertSearch No. LB167

Sample :
1. 1-Vinyl-2-pyrrolidone
2. Vinyl acetate

Figure 2 : Clopidogrel sulfate



Conditions

Column : InertSustain C18 (5 µm, 150 × 3.9 mm I.D.)
Eluent : A) 0.87 g/L IPCC-05 in H₂O (pH 2.5, H₃PO₄)
/CH₃OH = 19/1, v/v (IPCC-05: Sodium 1- Pentanesulfonate)
B) CH₃CN/CH₃OH = 19/1, v/v
A/B = 60/40, v/v
Flow Rate : 1.5 mL/min
Col. Temp. : 30 °C
Detection : UV 220 nm
Injection Vol. : 10 µL
Data Source : LC InertSearch No. LB161

Sample :
1. p-Hydroxybenzoic acid iso-propyl ester
(133 mg/L)
2. Clopidogrel sulfate (132 mg/L)

7 µm Particle Size HPLC Columns

Packing material	Column I.D.	Column length	Description	Cat. No.
C18(ODS)	4.0 mm	250 mm	Inertsil ODS-3	5020-87012
		300 mm	Inertsil ODS-3	5020-87013
	4.6 mm	120 mm	Inertsil ODS-3	5020-87041
		125 mm	Inertsil ODS-3	5020-87038
		250 mm	Inertsil ODS-3	5020-87014
		300 mm	Inertsil ODS-3	5020-87015
NH2	4.6 mm	125 mm	Inertsil NH2	5020-87044

10 µm Particle Size HPLC Columns

Packing material	Column I.D.	Column length	Description	Cat. No.
C18(ODS)	3.9 mm	300 mm	Inertsil ODS-3	5020-87016
			Inertsil ODS	5020-87002
	4.0 mm	150 mm	Inertsil ODS-3	5020-87017
		250 mm	Inertsil ODS-3	5020-87018
		300 mm	Inertsil ODS-3	5020-87019
			Inertsil ODS	5020-87003
	4.6 mm	300 mm	Inertsil ODS-3	5020-87020
			Inertsil ODS	5020-87004

Other ODS(C18)Columns

Packing material	Column I.D.	Column length	Description	Cat. No.
3 µm	4.6 mm	33 mm	Inertsil ODS-SP	5020-87035
3.5 µm	3.0 mm	150 mm	Inertsil WP300 C18	5020-87034
4 µm	3.9 mm	150 mm	Inertsil ODS-3	5020-87007

* Please contact us for other sizes of columns.

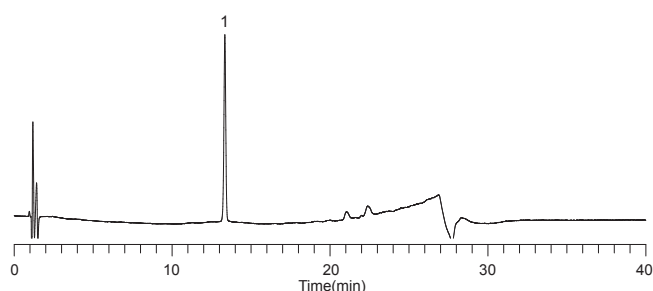
Pharmacopeias applications are available on page 137~138.

Also many other applications are available at InertSearch and Technical Note on our website.

InertSearch..... <http://www.glsciences.com/tech/inertsearch/>

LC Technical Note..... http://www.glsciences.com/tech/lc_technicalnote/

Figure 3 : Telmisartan



Conditions

Column : Inertsil ODS-SP (5 µm, 125 × 4.0 mm I.D.)
 Eluent : A) CH₃CN/CH₃OH = 4/1, v/v
 B) 2.0 g/L KH₂PO₄ + 3.4 g/L IPCC-05 (pH 3.0, 10 % H₃PO₄ in H₂O)
 (IPCC-05: Sodium 1-Pentanesulfonate)
 A/B = 30/70 - 25 min - 80/20, v/v

Flow Rate : 1.0 mL/min

Col. Temp. : 40 °C

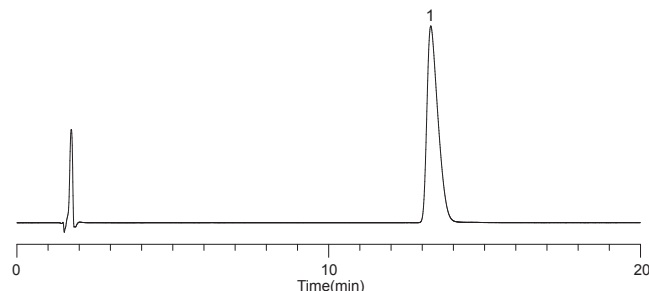
Detection : UV 230 nm

Injection Vol. : 2 µL

Data Source : LC InertSearch No. LB163

Sample :
1. Telmisartan

Figure 4 : Risperidone



Conditions

Column : Inertsil WP300 C18 (3.5 µm, 150 × 3.0 mm I.D.)
 Eluent : A) CH₃CN
 B) H₂O
 C) THF
 A/B = 200/800/1.5, v/v/v (pH 3.0, 28 % NH₄ Solution)

Flow Rate : 0.55 mL/min

Col. Temp. : 25 °C

Detection : UV 275 nm

Injection Vol. : 10 µL

Data Source : LC InertSearch No. LB125

Sample :
1. Risperidone(100 mg/L)

Corresponding SFC

Mainly supercritical CO₂ is used as mobile phase in SFC (Supercritical Fluid Chromatography). It is said suitable for high speed analysis because of lower viscosity than the general HPLC mobile phase and fast diffusion speed is fast in mobile phase. It is exceptional method for preparative and purification purpose because almost mobile phase is volatilized when back to normal pressure.

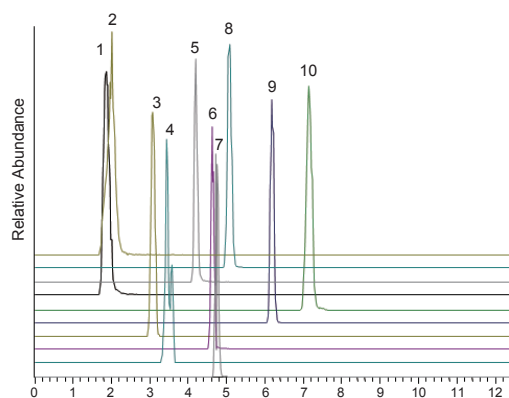
InertSustain and Inertsil series columns are available for SFC analysis.

The packing materials are the same as HPLC columns but they are packed in stainless tubes which correspond to SFC.

Various packing materials are available, and then utilize for expand the SFC application range.

Example of SFC/MS Analysis

Ten(10) kinds of pesticides are analyzed with Inertsil ODS-EP which contains a polar group embedded between the silica surface and Octadecyl group (C18) as the below. The separation patterns are different from polar group chemical bonded column like mainly used on SFC.



Conditions

Column Size : Inertsil ODS-EP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) Supercritical carbon dioxide
 B) 0.1 % ammonium formate in methanol
 A/B = 95/5 - 1 min - 95/5 - 2 min - 90/10 - 10 min - 80/20
 Flow Rate : 3 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Injection vol. : 5 μ L
 Back Pressure : 10 MPa

Sample:

1. Methamidophos	6. Chlorfluazuron
2. Acetamiprid	7. Acequinocyl
3. Carbenfentimid	8. Pyridaben
4. Dimethirimol	9. Cypermethrin
5. Emamectin benzoate (B1a)	10. Etofenprox

This data is provided by Prof. Dr. Akio Baba.

About packing materials

InertSustain and Inertsil series are available. Please contact us the details.

* Inspected with HPLC only, not with SFC.

Sizes

The following four(4) sizes are available as standard SFC columns.

Please describe the packing materials when you order.

Description	Cat.No.
Corresponding SFC column 5 μ m, 2.1 $\times$ 150 mm	5020-01007
Corresponding SFC column 5 μ m, 4.6 $\times$ 250 mm	5020-01006
Corresponding SFC column 5 μ m, 10 $\times$ 250 mm	5020-01008
Corresponding SFC column 5 μ m, 20 $\times$ 250 mm	5020-01009

* Maximum operating column pressures are 28 MPa on 2.1 $\times$ 150 mm and 25 MPa on 4.6 $\times$ 250 mm.

* End-fittings are 1/16" Waters-compatible only.

Guard Columns

• Guard Column's selection and Use	092
• Cartridge Guard Column E	093
• Cartridge Guard Column Ei (Non-metal type) ...	094
• Guard Columns for UHPLC	096
• GL Cart	098
• Packed Guard Columns, Mini Guard Columns	099
• SILFILTER™ STD C18	104
• Filters, Impurity Remove Columns	105

Guard Column's Selection and Use

Guard columns are installed between the injector and the analytical column of a HPLC system, mainly to protect analytical columns. Guard columns are widely used as a cost effective for prolong HPLC column life. Exchangeable cartridge design and unchangeable packing design are offered.

Exchangeable cartridge design contains holder and cartridge column, and the cartridge columns are disposable, easy -to-use, and you can change the guard column in seconds.

Packed design is packed as same as analytical column, using as a guard column.

Guard column design	Description	Compatible analytical columns' ID	Guard columns' length
Exchangeable Cartridge design	Cartridge Guard Column E Page 93 First choice for Guard Column	1.0~1.5 mm	10 mm
	Cartridge Guard Column Ei Page 94 Guard column with PEEK inlet and outlet	2.1~4.6 mm	10, 20 mm
	UHPLC Guard Column Page 96 For high speed, high efficiency separations	1.0~3.0 mm	10 mm
	SILFILTER STD C18 Page 104 Almightily for various ODS columns	3.0~4.6 mm	10 mm
	GL-Cart Guard Column Page 98 Direct-Connection and Indirect-Connection designs with economic cost	4.0, 4.6 mm	5 mm
Unchangeable packed design	Packed Guard Column Page 99 Packed as same as analytical column	1.0~4.6 mm	33, 50 mm
	Packed Mini Guard Column Page 103 Short length type of packed guard column	4.0, 4.6 mm	10 mm
	Preparative Guard Column Page 114 Guard columns for preparative columns	6.0~100 mm	50 mm 75 mm (for 50 mm I.D.) 100 mm (for 100 mm I.D.)

Selecting packing material

When selecting the packing material for the guard columns, we recommend to choose the same with analytical columns'. However, SILFILTER STD C18 is an monolithic guard column, it can fit different kinds of ODS columns.

Selecting dimensions

Particle size : To not alter the chromatography of the analytical column, the packing of the guard column should be the same as the analytical column. Inner diameter : Choose a guard column with an internal diameter similar to the analytical column internal diameter.

Connectors

Universal self-adjusting connector – Column Coupler, using for when connect guard columns and analytical column.



Pre-column Coupler W (PCTFE)



Pre-column Coupler SUS

Cartridge Guard Column E



Cartridge Guard Column E

Cartridge guard column E designed with an special holder and cartridge, universal self-adjusting connections, reusable by changing cartridges.

Cartridges contain the same high performance packing material that are used in our GL Sciences analytical columns. Easy-to-use, convenient, and disposable guard columns can protect your more expensive analytical columns.

Line-up list

InertSustain® C18

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19250	5020-19249	5020-19300	5020-19299
1.5, 2.1		1.5	5020-19350	5020-19349	5020-19400	5020-19399
2.1, 3.0		3.0	5020-19150	5020-19149	5020-19200	5020-19199
4.0, 4.6		4.0	5020-19050	5020-19049	5020-19100	5020-19099
2.1, 3.0	20	3.0	5020-19550	5020-19549	5020-19600	5020-19599
4.0, 4.6		4.0	5020-19450	5020-19449	5020-19500	5020-19499

Inertsil® ODS-4

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19202	5020-19201	5020-19252	5020-19251
1.5, 2.1		1.5	5020-19302	5020-19301	5020-19352	5020-19351
2.1, 3.0		3.0	5020-19102	5020-19101	5020-19152	5020-19151
4.0, 4.6		4.0	5020-19002	5020-19001	5020-19052	5020-19051
2.1, 3.0	20	3.0	5020-19502	5020-19501	5020-19552	5020-19551
4.0, 4.6		4.0	5020-19402	5020-19401	5020-19452	5020-19451

Inertsil® ODS-3

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)			Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)		
			Particle Size			Particle Size		
			3 µm	4 µm	5 µm	3 µm	4 µm	5 µm
1.0	10	1.0	5020-19205	5020-19204	5020-19203	5020-19255	5020-19254	5020-19253
1.5, 2.1		1.5	5020-19305	5020-19304	5020-19303	5020-19355	5020-19354	5020-19353
2.1, 3.0		3.0	5020-19105	5020-19104	5020-19103	5020-19155	5020-19154	5020-19153
4.0, 4.6		4.0	5020-19005	5020-19004	5020-19003	5020-19055	5020-19054	5020-19053
2.1, 3.0	20	3.0	5020-19505	5020-19504	5020-19503	5020-19555	5020-19554	5020-19553
4.0, 4.6		4.0	5020-19405	5020-19404	5020-19403	5020-19455	5020-19454	5020-19453

Inertsil® ODS-2

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)	
			Particle Size		Particle Size	
			5 µm		5 µm	
1.0	10	1.0	5020-19235		5020-19285	
1.5, 2.1		1.5	5020-19335		5020-19385	
2.1, 3.0		3.0	5020-19135		5020-19185	
4.0, 4.6		4.0	5020-19035		5020-19085	
2.1, 3.0	20	3.0	5020-19535		5020-19585	
4.0, 4.6		4.0	5020-19435		5020-19485	

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

* Other packing material of cartridge guard columns E are available, please confirm page 5~87 of each analytical columns.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Cartridge Guard Column Ei (Non-metal type)



Cartridge Guard Column Ei (Non-metal type)

Cartridge Guard column Ei is a special design for the separation which need to avoid the metal accessible surface. It is signed with a special PEEK holder and cartridge.

* Length of Cartridge Guard column Ei is 10mm

InertSustain® C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19949	5020-19999
2.1	2.1	5020-19849	5020-19899
3.0	3.0	5020-19749	5020-19799
4.0, 4.6	4.0	5020-19649	5020-19699

Inertsil® ODS-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19903	5020-19953
2.1	2.1	5020-19803	5020-19853
3.0	3.0	5020-19703	5020-19753
4.0, 4.6	4.0	5020-19603	5020-19653

Inertsil® ODS-SP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19906	5020-19956
2.1	2.1	5020-19806	5020-19856
3.0	3.0	5020-19706	5020-19756
4.0, 4.6	4.0	5020-19606	5020-19656

Inertsil® ODS-EP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19910	5020-19960
2.1	2.1	5020-19810	5020-19860
3.0	3.0	5020-19710	5020-19760
4.0, 4.6	4.0	5020-19610	5020-19660

Inertsil® C8-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19946	5020-19996
2.1	2.1	5020-19846	5020-19896
3.0	3.0	5020-19746	5020-19796
4.0, 4.6	4.0	5020-19646	5020-19696

Inertsil® ODS-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19901	5020-19951
2.1	2.1	5020-19801	5020-19851
3.0	3.0	5020-19701	5020-19751
4.0, 4.6	4.0	5020-19601	5020-19651

Inertsil® ODS-2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19935	5020-19985
2.1	2.1	5020-19835	5020-19885
3.0	3.0	5020-19735	5020-19785
4.0, 4.6	4.0	5020-19635	5020-19685

Inertsil® ODS-P

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19908	5020-19958
2.1	2.1	5020-19808	5020-19858
3.0	3.0	5020-19708	5020-19758
4.0, 4.6	4.0	5020-19608	5020-19658

InertSustain® C8

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-16120	5020-16121
2.1	2.1	5020-16118	5020-16119
3.0	3.0	5020-16116	5020-16117
4.0, 4.6	4.0	5020-16114	5020-16115

Inertsil® C8-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19914	5020-19964
2.1	2.1	5020-19814	5020-19864
3.0	3.0	5020-19714	5020-19764
4.0, 4.6	4.0	5020-19614	5020-19664

* All Cartridge Guard column Ei designed with 10 mm length.

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

InertSustain® Phenyl

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-16420	5020-16421
2.1	2.1	5020-16418	5020-16419
3.0	3.0	5020-16416	5020-16417
4.0, 4.6	4.0	5020-16414	5020-16415

Inertsil® CN-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19918	5020-19968
2.1	2.1	5020-19818	5020-19868
3.0	3.0	5020-19718	5020-19768
4.0, 4.6	4.0	5020-19618	5020-19668

Inertsil® Amide

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-20183	5020-20185
2.1	2.1	5020-20179	5020-20181
3.0	3.0	5020-20175	5020-20177
4.0, 4.6	4.0	5020-20171	5020-20173

InertSustain® NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-16720	5020-16721
2.1	2.1	5020-16718	5020-16719
3.0	3.0	5020-16716	5020-16717
4.0, 4.6	4.0	5020-16714	5020-16715

Inertsil® Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19922	5020-19972
2.1	2.1	5020-19822	5020-19872
3.0	3.0	5020-19722	5020-19772
4.0, 4.6	4.0	5020-19622	5020-19672

Inertsil® WP300 Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19931	5020-19981
2.1	2.1	5020-19831	5020-19881
3.0	3.0	5020-19731	5020-19781
4.0, 4.6	4.0	5020-19631	5020-19681

Inertsil® Ph-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19916	5020-19966
2.1	2.1	5020-19816	5020-19866
3.0	3.0	5020-19716	5020-19766
4.0, 4.6	4.0	5020-19616	5020-19666

Inertsil® WP300 C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19928	5020-19978
2.1	2.1	5020-19828	5020-19878
3.0	3.0	5020-19728	5020-19778
4.0, 4.6	4.0	5020-19628	5020-19678

Inertsil® HILIC

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19924	5020-19974
2.1	2.1	5020-19824	5020-19874
3.0	3.0	5020-19724	5020-19774
4.0, 4.6	4.0	5020-19624	5020-19674

Inertsil® NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19920	5020-19970
2.1	2.1	5020-19820	5020-19870
3.0	3.0	5020-19720	5020-19770
4.0, 4.6	4.0	5020-19620	5020-19670

Inertsil® SIL-100A

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 EA.)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
1.0, 1.5	1.0	5020-19926	5020-19976
2.1	2.1	5020-19826	5020-19876
3.0	3.0	5020-19726	5020-19776
4.0, 4.6	4.0	5020-19626	5020-19676

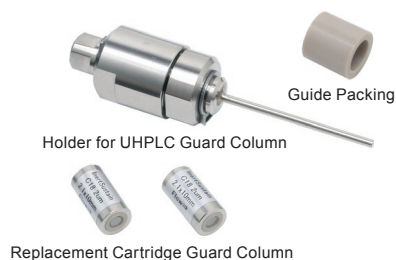
* All Cartridge Guard column Ei designed with 10 mm length.

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

* Other packing material of cartridge guard columns Ei are available, please contact your local distributor for more information.

Guard Columns for UHPLC



Guard column for UHPLC significantly extends column lifetime of your analytical column. The replacement cartridge guard column can be exchanged easily. A 1/16 inch tube is connected at the outlet of the holder for easy installation with minimized dead volume.

Specifications

- **Silica** : High Purity Silica Gel
- **Particle Size** : 2 μm , 3 μm
- **Maximum Pressure** : 80 MPa
- **Analytical column I.D.** : 1.0 ~ 3.0 mm I.D.

InertSustain® C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 μm	3 μm	2 μm	3 μm
10	1.5	5020-20314	5020-20306	5020-20365	5020-20357
	2.1	5020-20331	5020-20323	5020-20382	5020-20374
	3.0	5020-20348	5020-20340	5020-20399	5020-20391

InertSustainSwift™ C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		1.9 μm	3 μm	1.9 μm	3 μm
10	1.5	5020-88238	5020-88237	5020-88244	5020-88243
	2.1	5020-88240	5020-88239	5020-88246	5020-88245
	3.0	5020-88242	5020-88241	5020-88248	5020-88247

Inertsil® ODS-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 μm	3 μm	2 μm	3 μm
10	1.5	5020-20309	5020-20300	5020-20360	5020-20351
	2.1	5020-20326	5020-20317	5020-20377	5020-20368
	3.0	5020-20343	5020-20334	5020-20394	5020-20385

Inertsil® ODS-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 μm	3 μm	2 μm	3 μm
10	1.5	5020-20311	5020-20301	5020-20362	5020-20352
	2.1	5020-20328	5020-20318	5020-20379	5020-20369
	3.0	5020-20345	5020-20335	5020-20396	5020-20386

Inertsil® ODS-SP

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size 3 μm		Particle Size 3 μm	
10	1.5	5020-20302		5020-20353	
	2.1	5020-20319		5020-20370	
	3.0	5020-20336		5020-20387	

InertSustain® C8

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 µm	3 µm	2 µm	3 µm
10	1.5	5020-20315	5020-20307	5020-20366	5020-20358
	2.1	5020-20332	5020-20324	5020-20383	5020-20375
	3.0	5020-20349	5020-20341	5020-20400	5020-20392

Inertsil® C8-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 µm	3 µm	2 µm	3 µm
10	1.5	5020-20310	5020-20305	5020-20361	5020-20356
	2.1	5020-20327	5020-20322	5020-20378	5020-20373
	3.0	5020-20344	5020-20339	5020-20395	5020-20390

Inertsil® C8-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 µm	3 µm	2 µm	3 µm
10	1.5	5020-20312	5020-20303	5020-20363	5020-20354
	2.1	5020-20329	5020-20320	5020-20380	5020-20371
	3.0	5020-20346	5020-20337	5020-20397	5020-20388

InertSustain® Phenyl

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 µm	3 µm	2 µm	3 µm
10	1.5	5020-20316	5020-20308	5020-20367	5020-20359
	2.1	5020-20333	5020-20325	5020-20384	5020-20376
	3.0	5020-20350	5020-20342	5020-20401	5020-20393

Inertsil® Ph-3

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 EA)		Cartridge Guard column (2 EA) + Holder (1 EA) set	
		Particle Size		Particle Size	
		2 µm	3 µm	2 µm	3 µm
10	1.5	5020-20313	5020-20304	5020-20364	5020-20355
	2.1	5020-20330	5020-20321	5020-20381	5020-20372
	3.0	5020-20347	5020-20338	5020-20398	5020-20389

Holder

Description	Cat.No.
Holder for UHPLC Guard Column	5020-08630

* The tube size at the holder is 1/16 inch O.D. × 0.18 mm I.D. × 30 mm length.

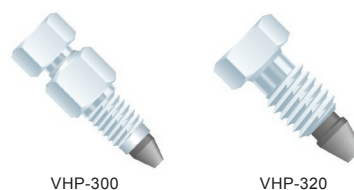
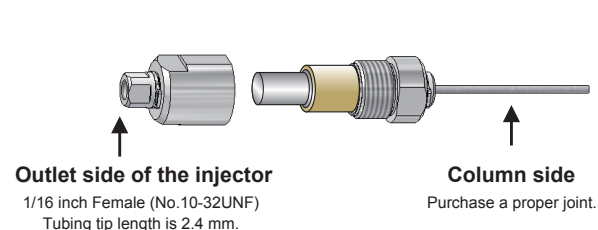
Joint

Very High Pressure Re-useable Fitting

Description	Max. Pressure	QTY	Cat.No.
VHP-300	137 MPa	1 set	6010-77001
VHP-320	172 MPa	1 set	6010-77007

* The tube size at the holder is 1/16 inch O.D. × 0.18 mm I.D. × 30 mm length.

Installation



GL Cart



GL Cart

GL Cart guard column are designed as economical type to protect your expensive analytical column. GL Cart is one dimension 5mmL × 4.6mmI.D.
(Compatible analytical columns' ID is 4.0 mm, 4.6 mm.) GL Cart holder is reusable.

Packing material	Particle size (μm)	Cartridge guard column GL Cart 10 EA.(5 × 4.6 mm I.D.)	GL Cart Set (5 GL Cart cartridge + 1 holder)
		Cat. No.	Cat. No.
InertSustain C18	3	5020-20146	5020-20246
	5	5020-20145	5020-20245
Inertsil ODS-4	3	5020-20102	5020-20202
	5	5020-20101	5020-20201
Inertsil ODS-3	3	5020-20105	5020-20205
	4	5020-20104	5020-20204
	5	5020-20103	5020-20203
Inertsil ODS-2	5	5020-20135	5020-20235
Inertsil ODS-SP	3	5020-20107	5020-20207
	5	5020-20106	5020-20206
Inertsil ODS-P	3	5020-20109	5020-20209
	5	5020-20108	5020-20208
Inertsil ODS-EP	5	5020-20110	5020-20210
InertSustain C8	3	5020-16215	5020-16216
	5	5020-16122	5020-16123
Inertsil C8-4	3	5020-20144	5020-20244
	5	5020-20143	5020-20243
Inertsil C8-3	3	5020-20115	5020-20215
	5	5020-20114	5020-20214
InertSustain Phenyl	3	5020-16515	5020-16516
	5	5020-16422	5020-16423
Inertsil Ph-3	3	5020-20117	5020-20217
	5	5020-20116	5020-20216
Inertsil CN-3	3	5020-20119	5020-20219
	5	5020-20118	5020-20218
Inertsil WP300 C18	5	5020-20128	5020-20228
Inertsil WP300 C8	5	5020-20129	5020-20229
Inertsil WP300 C4	5	5020-20130	5020-20230
Inertsil Amide	3	5020-20190	5020-20248
	5	5020-20189	5020-20247
Inertsil HILIC	3	5020-20125	5020-20225
	5	5020-20124	5020-20224
InertSustain NH2	3	5020-16815	5020-16816
	5	5020-16722	5020-16723
Inertsil NH2	3	5020-20121	5020-20221
	5	5020-20120	5020-20220
Inertsil Diol	3	5020-20123	5020-20223
	5	5020-20122	5020-20222
Inertsil SIL-100A	3	5020-20127	5020-20227
	5	5020-20126	5020-20226
Inertsil SIL-150A	5	5020-20139	5020-20239
Inertsil WP300 SIL	5	5020-20132	5020-20232
Inertsil WP300 Diol	5	5020-20131	5020-20231

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

* Other packing material of GL Cart guard columns are available , please contact your local distributor for more information.

Packed Guard Columns, Packed Mini Guard Columns



Packed Guard Column

Packed Mini Guard Column

Packed guard column and Mini guard column are designed different with cartridges' type, using a high pressure to pack it as a guard column, and also can sustain analytical column's performance.

Packed guard column has length 33 mm and 50 mm two types, and Mini guard column has length 10 mm.

Packed Guard Columns

Packing material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
InertSustain C18	1.0	5020-15996	5020-15995	5020-15896	5020-15895
	1.5	5020-15946	5020-15945	5020-15846	5020-15845
	2.1	5020-04896	5020-04895	5020-03596	5020-03595
	3.0	5020-04496	5020-04495	5020-03496	5020-03495
	4.0	5020-04296	5020-04295	5020-03396	5020-03395
Inertsil ODS-4	4.6	5020-04196	5020-04195	5020-03296	5020-03295
	1.0	5020-15952	5020-15951	5020-15852	5020-15851
	1.5	5020-15902	5020-15901	5020-15802	5020-15801
	2.1	5020-04852	5020-04851	5020-03552	5020-03551
	3.0	5020-04452	5020-04451	5020-03452	5020-03451
Inertsil ODS-3	4.0	5020-04252	5020-04251	5020-03352	5020-03351
	4.6	5020-04152	5020-04151	5020-03252	5020-03251
	1.0	5020-15955	5020-15953	5020-15855	5020-15853
	1.5	5020-15905	5020-15903	5020-15805	5020-15803
	2.1	5020-04855	5020-04853	5020-03555	5020-03553
Inertsil ODS-2	3.0	5020-04455	5020-04453	5020-03455	5020-03453
	4.0	5020-04255	5020-04253	5020-03355	5020-03353
	4.6	5020-04155	5020-04153	5020-03255	5020-03253
	1.0	-	5020-15985	-	5020-15885
	1.5	-	5020-15935	-	5020-15835
Inertsil ODS-SP	2.1	-	5020-04885	-	5020-03585
	3.0	-	5020-04485	-	5020-03485
	4.0	-	5020-04285	-	5020-03385
	4.6	-	5020-04185	-	5020-03285
	1.0	5020-15957	5020-15956	5020-15857	5020-15856
Inertsil ODS-P	1.5	5020-15907	5020-15906	5020-15807	5020-15806
	2.1	5020-04857	5020-04856	5020-03557	5020-03556
	3.0	5020-04457	5020-04456	5020-03457	5020-03456
	4.0	5020-04257	5020-04256	5020-03357	5020-03356
	4.6	5020-04157	5020-04156	5020-03257	5020-03256
Inertsil ODS-EP	1.0	5020-15959	5020-15958	5020-15859	5020-15858
	1.5	5020-15909	5020-15908	5020-15809	5020-15808
	2.1	5020-04859	5020-04858	5020-03559	5020-03558
	3.0	5020-04459	5020-04458	5020-03459	5020-03458
	4.0	5020-04259	5020-04258	5020-03359	5020-03358
	4.6	5020-04159	5020-04158	5020-03259	5020-03258
	1.0	-	5020-15960	-	5020-15860
	1.5	-	5020-15910	-	5020-15810
	2.1	-	5020-04860	-	5020-03560
	3.0	-	5020-04460	-	5020-03460
	4.0	-	5020-04260	-	5020-03360
	4.6	-	5020-04160	-	5020-03260

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Packed Guard Columns, Packed Mini Guard Columns

Packed Guard columns

Packing material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
InertSustain C8	1.0	5020-16183	5020-16054	5020-16181	5020-16052
	1.5	5020-16182	5020-16053	5020-16180	5020-16051
	2.1	5020-16167	5020-16038	5020-16162	5020-16033
	3.0	5020-16166	5020-16037	5020-16161	5020-16032
	4.0	5020-16165	5020-16036	5020-16160	5020-16031
	4.6	5020-16164	5020-16035	5020-16159	5020-16030
Inertsil C8-4	1.0	5020-15994	5020-15993	5020-15894	5020-15893
	1.5	5020-15944	5020-15943	5020-15844	5020-15843
	2.1	5020-04894	5020-04893	5020-03594	5020-03593
	3.0	5020-04494	5020-04493	5020-03494	5020-03493
	4.0	5020-04294	5020-04293	5020-03394	5020-03393
	4.6	5020-04194	5020-04193	5020-03294	5020-03293
Inertsil C8-3	1.0	5020-15965	5020-15964	5020-15865	5020-15864
	1.5	5020-15915	5020-15914	5020-15815	5020-15814
	2.1	5020-04865	5020-04864	5020-03565	5020-03564
	3.0	5020-04465	5020-04464	5020-03465	5020-03464
	4.0	5020-04265	5020-04264	5020-03365	5020-03364
	4.6	5020-04165	5020-04164	5020-03265	5020-03264
Inertsil C8	1.0	–	5020-15986	–	5020-15886
	1.5	–	5020-15936	–	5020-15836
	2.1	–	5020-04886	–	5020-03586
	3.0	–	5020-04486	–	5020-03486
	4.0	–	5020-04286	–	5020-03386
	4.6	–	5020-04186	–	5020-03286
Inertsil C4	1.0	–	5020-15988	–	5020-15888
	1.5	–	5020-15938	–	5020-15838
	2.1	–	5020-04888	–	5020-03588
	3.0	–	5020-04488	–	5020-03488
	4.0	–	5020-04288	–	5020-03388
	4.6	–	5020-04188	–	5020-03288
InertSustain Phenyl	1.0	5020-16483	5020-16354	5020-16481	5020-16352
	1.5	5020-16482	5020-16353	5020-16480	5020-16351
	2.1	5020-16467	5020-16338	5020-16462	5020-16333
	3.0	5020-16466	5020-16337	5020-16461	5020-16332
	4.0	5020-16465	5020-16336	5020-16460	5020-16331
	4.6	5020-16464	5020-16335	5020-16459	5020-16330
Inertsil Ph-3	1.0	5020-15967	5020-15966	5020-15867	5020-15866
	1.5	5020-15917	5020-15916	5020-15817	5020-15816
	2.1	5020-04867	5020-04866	5020-03567	5020-03566
	3.0	5020-04467	5020-04466	5020-03467	5020-03466
	4.0	5020-04267	5020-04266	5020-03367	5020-03366
	4.6	5020-04167	5020-04166	5020-03267	5020-03266
Inertsil Ph	1.0	–	5020-15987	–	5020-15887
	1.5	–	5020-15937	–	5020-15837
	2.1	–	5020-04887	–	5020-03587
	3.0	–	5020-04487	–	5020-03487
	4.0	–	5020-04287	–	5020-03387
	4.6	–	5020-04187	–	5020-03287

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

Packed Guard columns

Packing material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
Inertsil CN-3	1.0	5020-15969	5020-15968	5020-15869	5020-15868
	1.5	5020-15919	5020-15918	5020-15819	5020-15818
	2.1	5020-04869	5020-04868	5020-03569	5020-03568
	3.0	5020-04469	5020-04468	5020-03469	5020-03468
	4.0	5020-04269	5020-04268	5020-03369	5020-03368
	4.6	5020-04169	5020-04168	5020-03269	5020-03268
Inertsil WP300 C18	1.0	–	5020-15978	–	5020-15878
	1.5	–	5020-15928	–	5020-15828
	2.1	–	5020-04878	–	5020-03578
	3.0	–	5020-04478	–	5020-03478
	4.0	–	5020-04278	–	5020-03378
	4.6	–	5020-04178	–	5020-03278
Inertsil WP300 C8	1.0	–	5020-15979	–	5020-15879
	1.5	–	5020-15929	–	5020-15829
	2.1	–	5020-04879	–	5020-03579
	3.0	–	5020-04479	–	5020-03479
	4.0	–	5020-04279	–	5020-03379
	4.6	–	5020-04179	–	5020-03279
Inertsil WP300 C4	1.0	–	5020-15980	–	5020-15880
	1.5	–	5020-15930	–	5020-15830
	2.1	–	5020-04880	–	5020-03580
	3.0	–	5020-04480	–	5020-03480
	4.0	–	5020-04280	–	5020-03380
	4.6	–	5020-04180	–	5020-03280
Inertsil Amide	1.0	5020-15998	5020-15997	5020-15898	5020-15897
	1.5	5020-15948	5020-15947	5020-15848	5020-15847
	2.1	5020-04898	5020-04897	5020-03598	5020-03597
	3.0	5020-04498	5020-04497	5020-03498	5020-03497
	4.0	5020-04298	5020-04297	5020-03398	5020-03397
	4.6	5020-04198	5020-04197	5020-03298	5020-03297
Inertsil HILIC	1.0	5020-15975	5020-15974	5020-15875	5020-15874
	1.5	5020-15925	5020-15924	5020-15825	5020-15824
	2.1	5020-04875	5020-04874	5020-03575	5020-03574
	3.0	5020-04475	5020-04474	5020-03475	5020-03474
	4.0	5020-04275	5020-04274	5020-03375	5020-03374
	4.6	5020-04175	5020-04174	5020-03275	5020-03274
InertSustain NH2	1.0	5020-16783	5020-16654	5020-16781	5020-16652
	1.5	5020-16782	5020-16653	5020-16780	5020-16651
	2.1	5020-16767	5020-16638	5020-16762	5020-16633
	3.0	5020-16766	5020-16637	5020-16761	5020-16632
	4.0	5020-16765	5020-16634	5020-16760	5020-16631
	4.6	5020-16764	5020-16635	5020-16759	5020-16630
Inertsil NH2	1.0	5020-15971	5020-15970	5020-15871	5020-15870
	1.5	5020-15921	5020-15920	5020-15821	5020-15820
	2.1	5020-04871	5020-04870	5020-03571	5020-03570
	3.0	5020-04471	5020-04470	5020-03471	5020-03470
	4.0	5020-04271	5020-04270	5020-03371	5020-03370
	4.6	5020-04171	5020-04170	5020-03271	5020-03270

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Packed Guard Columns, Packed Mini Guard Columns

Packed Guard columns

Packing material	I.D. (mm)	Length 33 mm		Length 50 mm	
		Particle Size		Particle Size	
		3 µm	5 µm	3 µm	5 µm
Inertsil Diol	1.0	5020-15973	5020-15972	5020-15873	5020-15872
	1.5	5020-15923	5020-15922	5020-15823	5020-15822
	2.1	5020-04873	5020-04872	5020-03573	5020-03572
	3.0	5020-04473	5020-04472	5020-03473	5020-03472
	4.0	5020-04273	5020-04272	5020-03373	5020-03372
	4.6	5020-04173	5020-04172	5020-03273	5020-03272
Inertsil SIL-100A	1.0	5020-15977	5020-15976	5020-15877	5020-15876
	1.5	5020-15927	5020-15926	5020-15827	5020-15826
	2.1	5020-04877	5020-04876	5020-03577	5020-03576
	3.0	5020-04477	5020-04476	5020-03477	5020-03476
	4.0	5020-04277	5020-04276	5020-03377	5020-03376
	4.6	5020-04177	5020-04176	5020-03277	5020-03276
Inertsil SIL-150A	1.0	–	5020-15989	–	5020-15889
	1.5	–	5020-15939	–	5020-15839
	2.1	–	5020-04889	–	5020-03589
	3.0	–	5020-04489	–	5020-03489
	4.0	–	5020-04289	–	5020-03389
	4.6	–	5020-04189	–	5020-03289
Inertsil WP300 SIL	1.0	–	5020-15982	–	5020-15882
	1.5	–	5020-15932	–	5020-15832
	2.1	–	5020-04882	–	5020-03582
	3.0	–	5020-04482	–	5020-03482
	4.0	–	5020-04282	–	5020-03382
	4.6	–	5020-04182	–	5020-03282
Inertsil WP300 Diol	1.0	–	5020-15981	–	5020-15881
	1.5	–	5020-15931	–	5020-15831
	2.1	–	5020-04881	–	5020-03581
	3.0	–	5020-04481	–	5020-03481
	4.0	–	5020-04281	–	5020-03381
	4.6	–	5020-04181	–	5020-03281

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

Packed Mini Guard columns

Packing material	Particle Size(μm)	I.D.(mm)	Length(mm)	Cat. No
InertSustain C18	3	4.0	10	5020-03696
	5	4.0	10	5020-03695
Inertsil ODS-4	3	4.0	10	5020-03652
	5	4.0	10	5020-03651
Inertsil ODS-3	3	4.0	10	5020-03655
	4	4.0	10	5020-03654
	5	4.0	10	5020-03653
Inertsil ODS-2	5	4.0	10	5020-03685
Inertsil ODS-SP	3	4.0	10	5020-03657
	5	4.0	10	5020-03656
Inertsil ODS-P	3	4.0	10	5020-03659
	5	4.0	10	5020-03658
Inertsil ODS-EP	5	4.0	10	5020-03660
Inertsil ODS-80A	5	4.0	10	5020-03690
InertSustain C8	3	4.0	10	5020-16163
	5	4.0	10	5020-16034
Inertsil C8-4	3	4.0	10	5020-03694
	5	4.0	10	5020-03693
Inertsil C8-3	3	4.0	10	5020-03665
	5	4.0	10	5020-03664
Inertsil C8	5	4.0	10	5020-03686
Inertsil C4	5	4.0	10	5020-03688
InertSustain Phenyl	3	4.0	10	5020-16463
	5	4.0	10	5020-16334
Inertsil Ph-3	3	4.0	10	5020-03667
	5	4.0	10	5020-03666
Inertsil Ph	5	4.0	10	5020-03687
Inertsil CN-3	3	4.0	10	5020-03669
	5	4.0	10	5020-03668
Inertsil WP300 C18	5	4.0	10	5020-03678
Inertsil WP300 C8	5	4.0	10	5020-03679
Inertsil WP300 C4	5	4.0	10	5020-03680
Inertsil Amide	3	4.0	10	5020-03698
	5	4.0	10	5020-03697
Inertsil HILIC	3	4.0	10	5020-03675
	5	4.0	10	5020-03674
InertSustain NH2	3	4.0	10	5020-16763
	5	4.0	10	5020-16634
Inertsil NH2	3	4.0	10	5020-03671
	5	4.0	10	5020-03670
Inertsil Diol	3	4.0	10	5020-03673
	5	4.0	10	5020-03672
Inertsil SIL-100A	3	4.0	10	5020-03677
	5	4.0	10	5020-03676
Inertsil SIL-150A	5	4.0	10	5020-03689
Inertsil WP300 SIL	5	4.0	10	5020-03682
Inertsil WP300 Diol	5	4.0	10	5020-03681

* All the guard columns are Waters type end-fitting.

* Recommend Max. Operating Pressure is 20 MPa.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

SILFILTER™ STD C18

SILFILTER STD C18 is a guard column with cartridge size 3.0 mm I.D. × 10 mm. The cartridge is packed with a monolithic silica, chemically bonded with a C18 and uniquely end-capped based on our 45 years of experience. SILFILTER STD C18 can be installed and used for all C18 columns available in the market without interfering and influencing the elution or separation patterns. Also, deterioration of the packing in the cartridge can be confirmed visually.

• Feature

- Can be installed for all C18 columns available in the market .
- Deterioration of the packing in the cartridge can be confirmed visually.
- Easy to replace the cartridges.
- Effectively removes particulate and strongly retained sample compounds
- Delivers the lowest dead-volume.

• Specification

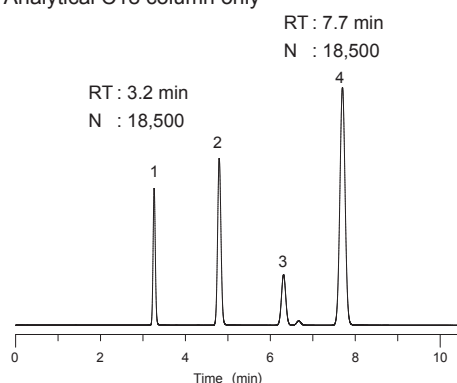
- Base Material : High Purity Monolithic Silica
- Max. Operating Pressure : 35 MPa (350 Bar)
- Bonded Phase : Octadecyl Groups
- Size : 10 × 3.0 mm I.D.
- End-capping : Yes
- pH Range : 1~7.5
- Max. Temperature : 50 °C
- Compatible analytical Columns' ID : 3.0~4.6 mm I.D.

No Sacrifice in Separation Efficiency

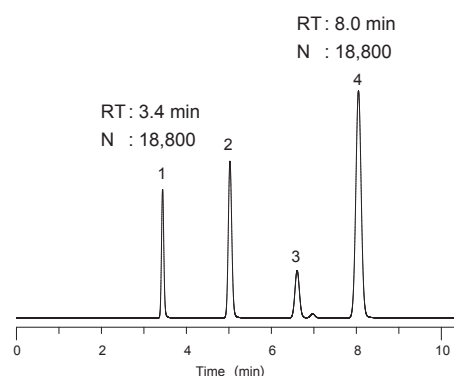
The following test was conducted to confirm the efficiency of SILFILTER STD C18.

As shown below, the efficiency didn't decrease even for those fast eluting samples when installing SILFILTER STD C18.

Analytical C18 column only

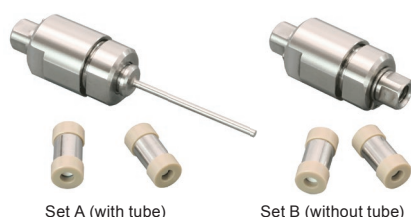


With SILFILTER STD C18



Conditions

Column : C18 Column
(3 μm, 150 × 3.0 mm I.D.)
Eluent : A) CH₃CN
B) H₂O
A/B = 65/35, v/v
Flow Rate : 0.4 mL/min
Col. Temp.: 40 °C
Detection : UV 254 nm
Sample : Acetaminophen
Benzene
Toluene
Naphthalene



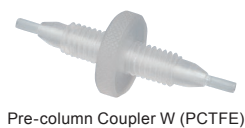
Item	Cat.No.
SILFILTER STD C18, Set A* ¹ 2 Cartridges with 1 Holder and Tubes	5020-10404
SILFILTER STD C18, Set B * ² 2 Cartridges with 1 Holder, without Tubes	5020-10405
SILFILTER(with Tubes) Holder for A type* ¹	5020-10402
SILFILTER(without Tubes) Holder for B type* ²	5020-10403
Replaceable Cartridge, 2 ea	5020-10401
PEEK Tough Connector, 5 pcs	6010-48600

* 1: Tube size is, 1/16 inch O.D. × 0.18 mm I.D. × 30 mmL

* 2: Tubing tip length is 2.4 mm

Filters, Impurity Remove Columns

Pre-Column Coupler



Pre-column Coupler W (PCTFE)



Pre-column Coupler SUS

Precolumn Coupler is an easy-to-use tool to connect guard columns and analytical columns. Pre-column Coupler has two designs, one is using PCTFE material, except common organic solvents, acidic solvent and basic solvent also can be used. And another one is stainless design, it can be used as high pressure.

• Specification

Max. operation pressure: 14.7 MPa (PCTFE), 80 MPa (stainless)

Tube O.D.: 1/16"

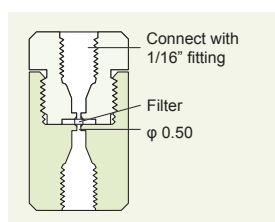
Item	Material	Connection	Cat.No.
Pre-column Coupler W	PCTFE	Waters type	6010-49211
Pre-column Coupler SUS	Stainless	—*	6010-49210

* Product Pre-column Coupler SUS does not fixed with Ferrules, therefore columns with 10-32UNF specification all can be used.

Pre-Column Filter



Pre-column filter



• Specification

Fit in tube O.D. : 1/16"

Screw specification : 10-32UNF

Filter pore size : 2 µm

Max. operation pressure : 41.4 MPa(SUS) 34.5 MPa(PEEK)

Item	Jacket material	P/N	Qty. (pc)	Cat.No.
Pre-column filter 2 µm	Stainless	A-315	1	6010-55100
Replacement pre-column filter 2 µm	—	A-101	1	6010-55110
PEEK pre-column filter 2 µm	PEEK	A-355	1	6010-55300
Replacement PEEK pre-column filter 2 µm	—	A-700	1	6010-55310

Pre-Clean ORG



Pre-clean ORG

- A guard column to install between the pump and injector, to remove the impurity in aqueous eluent.
- Protect analytical LC columns, and prolong analytical columns lifetime.
- Easy-to-replace.
- Also can be used as an in-line filter, semimicro columns are most appropriate for column clog.
- 2 types for two different flow rates.

Item	I.D.(mm)	Length(mm)	Recommend flow rate (mL/min)	Cat.No.
Pre-clean ORG replacement cartridge 2ea	7.6	30	1.0~20 mL/min	5020-12755
Pre-clean ORG holder and cartridgex2ea	7.6	30	1.0~20 mL/min	5020-12760
Pre-clean ORG holder	—	—	—	5020-12750
Pre-clean ORG semi replacement cartridge 2ea	4.0	10	0.1~2.0 mL/min	5020-12780
Pre-clean ORG semi holder and cartridgex2ea	4.0	10	0.1~2.0 mL/min	5020-12790
Pre-clean ORG semi holder	—	—	—	5020-12770



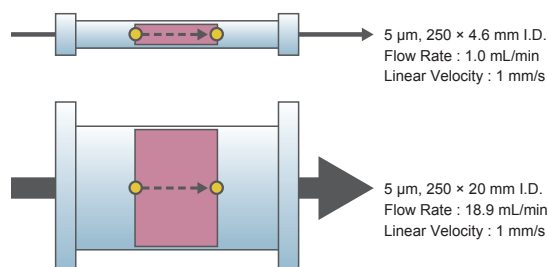
Preparative Columns

•Choosing Preparative Columns	108
•Preparative Columns.....	109
•Guard Columns for Preparative Columns	114
•JET Columns	117
•Other Preparative Columns	117

Choosing Preparative Columns

Relationship between Column I.D. , Sample Loading Volume and Flow Rate

In preparative operations, column internal diameter sizes from 6.0 to 100 mm are widely used. When the analytical conditions along with the column packing material and length were the same between the analytical and preparative run, nearly the same chromatograms can be achieved by simply adjusting the flow rate and sample loading volume in proportion to the column cross-section area. The following table illustrates the appropriate flow rate against each column internal diameter sizes.



Column I.D. (mm)	Scale-Up Factor	Appropriate Flow Rate (mL/min) ^{*1}				Remarks
		Reversed/Normal Phases	SEC	HILIC	Chiral	
4.6	1	1	0.2~0.3	0.5	1	Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns.
6.0	1.7	1.7	0.3~0.5	0.8	1.7	Semi-preparative HPLC columns can be used in standard HPLC systems. Column I.D. sizes from 7.6-8.0 mm are generally used when scaling-up in SEC.
7.6~8.0	2.7	2.7	0.5~1.0	1.4	2.7	
10	5	5	1.0~1.5	2.4	5	
14	9	9	1.8~2.5	4.6	–	
20	19	19	3.8~5.4	9.5	19	Column I.D. sizes dominantly used in preparative HPLC researches. Dedicated preparative HPLC systems are required as a wide flow rate range is required.
30	43	43	9.0~14	21	45	
50	120	120	24~36	60	50 ^{*3}	
100	470	235 ^{*2}	47~71 ^{*2}	120 ^{*2}	200 ^{*3}	

* 1 : When the particle size of the packing material is a 5 µm.

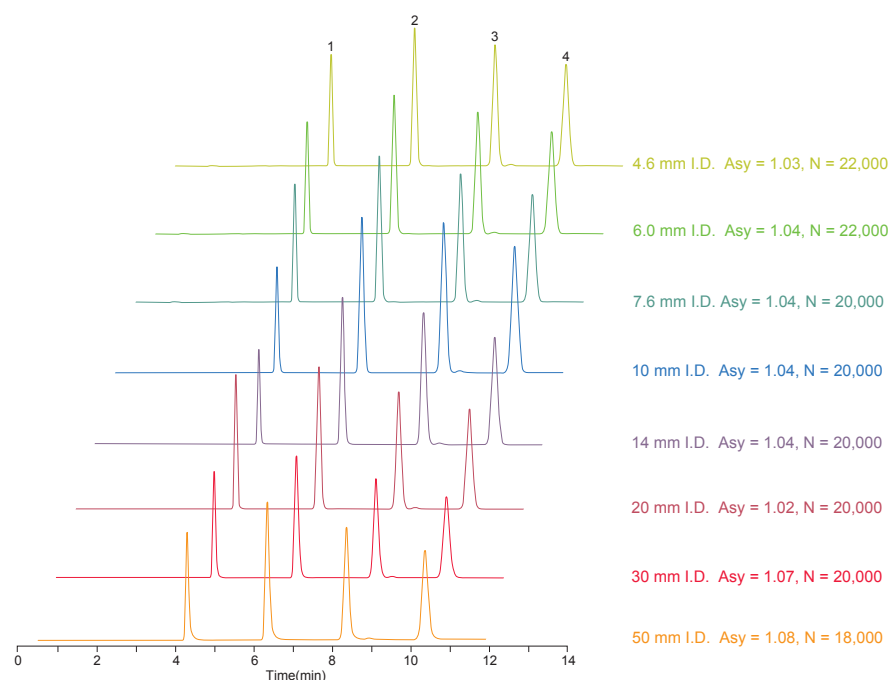
* 2 : When the particle size of the packing material is a 10 µm.

* 3 : When the particle size of the packing material is a 20 µm.

Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

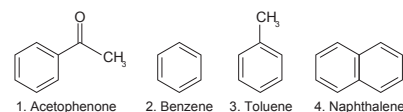
Generally, analytical scale columns are used initially to determine and optimize separation conditions between the target peak and unwanted contaminants with various bonded phases. Efficient scale-up of methods from analytical to preparative dimensions requires the use of a packing material offering identical selectivity, otherwise methods would not scale as expected.

Inertsil and Inertsil preparative HPLC columns offer asymmetry factor of nearly 1.0 delivering symmetric peaks maintaining efficiency of approximately 20,000 (N) when the column length is a 250 mm. As shown below, the scalability of Inertsil and Inertsil preparative HPLC columns provides smooth, easy and highly efficient purification and isolation results.



Conditions

System : PLC 761 System
 Column : Inertsil ODS-3 (5 µm, 250 mm)
 Eluent : A) CH₃CN
 B) H₂O
 A/B = 65/35, v/v
 Flow Rate : Linear Velocity at 1 mm/s
 Col. Temp. : 40 °C
 Col. Pres. : Approx. 5.0 MPa
 Detection : UV 254 nm
 Sample : 1. Acetophenone
 2. Benzene
 3. Toluene
 4. Naphthalene



Preparative Columns



Preparative Columns

InertSustain and Inertsil preparative columns are available in a broad range of column sizes to answer and meet all demands in preparative chromatography.

Phase	Length(mm)	50	100	150	250
	I.D.(mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
InertSustain C18 5 µm	6.0	5020-07352	5020-07354	5020-07355	5020-07356
	7.6	5020-07362	5020-07364	5020-07365	5020-07366
	10	5020-14252	5020-14254	5020-14255	5020-14256
	14	5020-14262	5020-14264	5020-14265	5020-14266
	20	5020-14272	5020-14274	5020-14275	5020-14276
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil ODS-4 5 µm	6.0	5020-03953	5020-03954	5020-03955	5020-03956
	7.6	5020-03963	5020-03964	5020-03965	5020-03966
	10	5020-81053	5020-81054	5020-81055	5020-81056
	14	5020-79001	5020-79002	5020-79003	5020-79004
	20	5020-81063	5020-81064	5020-81065	5020-81066
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil ODS-3 5 µm	6.0	5020-07011	5020-04554	5020-01733	5020-01734
	7.6	5020-07012	5020-06803	5020-06804	5020-06802
	10	5020-07013	5020-06813	5020-06814	5020-06812
	14	5020-79011	5020-79012	5020-79013	5020-79014
	20	5020-07014	5020-06823	5020-06824	5020-06822
	30	5020-07015	5020-06833	5020-06834	5020-06832
	50	5020-	5020-	5020-	5020-06852
	100	5020-	5020-	5020-	5020-
Inertsil ODS-3 10 µm	10	5020-79100	5020-79101	5020-79102	5020-79103
	14	5020-79105	5020-79106	5020-79107	5020-79108
	20	5020-79110	5020-79111	5020-79112	5020-79113
	30	5020-79115	5020-79116	5020-79117	5020-79118
	50	5020-	5020-	5020-	5020-79120
	100	5020-	5020-	5020-	5020-
Inertsil ODS-SP 5 µm	6.0	5020-02752	5020-02754	5020-02755	5020-02756
	7.6	5020-02762	5020-02764	5020-02765	5020-02766
	10	5020-85252	5020-85254	5020-85255	5020-85256
	14	5020-79016	5020-79017	5020-79018	5020-79019
	20	5020-85262	5020-85264	5020-85265	5020-85266
Inertsil ODS-P 5 µm	6.0	5020-04752	5020-04754	5020-04755	5020-04756
	7.6	5020-04762	5020-04764	5020-04765	5020-04766
	10	5020-84752	5020-84754	5020-84755	5020-84756
	14	5020-79026	5020-79027	5020-79028	5020-79029
	20	5020-84762	5020-84764	5020-84765	5020-84766
	30	5020-84772	5020-	5020-	5020-84776
Inertsil ODS-EP 5 µm	50	5020-	5020-	5020-	5020-84786
	6.0	5020-02652	5020-02654	5020-02655	5020-02656
	7.6	5020-02662	5020-02664	5020-02665	5020-02666
	10	5020-18252	5020-18254	5020-18255	5020-18256
	14	5020-79021	5020-79022	5020-79023	5020-79024
	20	5020-18262	5020-18264	5020-18265	5020-18266
	30	5020-18272	5020-	5020-	5020-18276
	50	5020-	5020-	5020-	5020-18286

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Preparative Columns

Phase	Length(mm)	50	100	150	250
	I.D.(mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil ODS-80A 5 µm	6.0	5020-	5020-	5020-01603	5020-01604
	7.6	5020-	5020-	5020-	5020-06146
	10	5020-	5020-	5020-	5020-15616
	20	5020-	5020-	5020-	5020-15646
Inertsil ODS-2 5 µm	6.0	5020-	5020-	5020-01103	5020-01104
	7.6	5020-	5020-	5020-	5020-06142
	10	5020-	5020-	5020-	5020-15612
	20	5020-	5020-	5020-	5020-15642
Inertsil ODS 5 µm	6.0	5020-	5020-	5020-02103	5020-02104
	7.6	5020-	5020-	5020-	5020-31503
	10	5020-	5020-	5020-	5020-31513
	20	5020-	5020-	5020-	5020-31523
Inertsil ODS 10 µm	6.0	5020-	5020-	5020-02203	5020-02204
	7.6	5020-	5020-	5020-	5020-31603
	10	5020-	5020-	5020-	5020-31613
	20	5020-	5020-	5020-	5020-31623
InertSustain C8 5 µm	6.0	5020-16055	5020-16056	5020-16057	5020-16058
	7.6	5020-16059	5020-16060	5020-16061	5020-16062
	10	5020-16063	5020-16064	5020-16065	5020-16066
	14	5020-16067	5020-16068	5020-16069	5020-16070
	20	5020-16071	5020-16072	5020-16073	5020-16074
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil C8-4 5 µm	6.0	5020-04087	5020-04088	5020-04089	5020-04090
	7.6	5020-04092	5020-04093	5020-04094	5020-04095
	10	5020-81243	5020-81244	5020-81245	5020-81246
	14	5020-79006	5020-79007	5020-79008	5020-79009
	20	5020-81253	5020-81254	5020-81255	5020-81256
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil C8-3 5 µm	6.0	5020-04952	5020-04954	5020-04955	5020-04956
	7.6	5020-04962	5020-04964	5020-04965	5020-04966
	10	5020-84952	5020-84954	5020-84955	5020-84956
	14	5020-79031	5020-79032	5020-79033	5020-79034
	20	5020-84962	5020-84964	5020-84965	5020-84966
	30	5020-84972	5020-	5020-	5020-84976
	50	5020-	5020-	5020-	5020-84986
	100	5020-	5020-	5020-	5020-
Inertsil C8-3 10 µm	10	5020-79300	5020-79301	5020-79302	5020-79303
	14	5020-79305	5020-79306	5020-79307	5020-79308
	20	5020-79310	5020-79311	5020-79312	5020-79313
	30	5020-79315	5020-79316	5020-79317	5020-79318
	50	5020-	5020-	5020-	5020-79320
	100	5020-	5020-	5020-	5020-
Inertsil C8 5 µm	6.0	5020-	5020-	5020-01203	5020-01204
	7.6	5020-	5020-	5020-	5020-06143
	10	5020-	5020-	5020-	5020-15613
	20	5020-	5020-	5020-	5020-15643

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Preparative Columns

Phase	Length(mm)	50	100	150	250
	I.D.(mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
InertSustain Phenyl 5 µm	6.0	5020-16355	5020-16356	5020-16357	5020-16358
	7.6	5020-16359	5020-16360	5020-16361	5020-16362
	10	5020-16363	5020-16364	5020-16365	5020-16366
	14	5020-16367	5020-16368	5020-16369	5020-16370
	20	5020-16371	5020-16372	5020-16373	5020-16374
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil Ph-3 5 µm	6.0	5020-05152	5020-05154	5020-05155	5020-05156
	7.6	5020-05162	5020-05164	5020-05165	5020-05166
	10	5020-85152	5020-85154	5020-85155	5020-85156
	14	5020-79036	5020-79037	5020-79038	5020-79039
	20	5020-85162	5020-85164	5020-85165	5020-85166
	30	5020-85172	5020-	5020-	5020-85176
	50	5020-	5020-	5020-	5020-85186
	100	5020-	5020-	5020-	5020-
Inertsil Ph 5 µm	6.0	5020-	5020-	5020-01303	5020-01304
	7.6	5020-	5020-	5020-	5020-06144
	10	5020-	5020-	5020-	5020-15614
	20	5020-	5020-	5020-	5020-15644
Inertsil CN-3 5 µm	6.0	5020-05352	5020-05354	5020-05355	5020-05356
	7.6	5020-05362	5020-05364	5020-05365	5020-05366
	10	5020-85352	5020-85354	5020-85355	5020-85356
	14	5020-79041	5020-79042	5020-79043	5020-79044
	20	5020-85362	5020-85364	5020-85365	5020-85366
	30	5020-85372	5020-	5020-	5020-85376
	50	5020-	5020-	5020-	5020-85386
	100	5020-	5020-	5020-	5020-
Inertsil WP300 C18 5 µm	6.0	5020-05950	5020-05951	5020-05952	5020-05953
	7.6	5020-05955	5020-05956	5020-05957	5020-05958
	10	5020-85832	5020-85834	5020-85835	5020-85836
	14	5020-79071	5020-79072	5020-79073	5020-79074
	20	5020-85842	5020-85844	5020-85845	5020-85846
	30	5020-85852	5020-	5020-	5020-85856
	50	5020-	5020-	5020-	5020-85866
	100	5020-	5020-	5020-	5020-
Inertsil WP300 C8 5 µm	6.0	5020-05960	5020-05961	5020-05962	5020-05963
	7.6	5020-05965	5020-05966	5020-05967	5020-05968
	10	5020-85732	5020-85734	5020-85735	5020-85736
	14	5020-79076	5020-79077	5020-79078	5020-79079
	20	5020-85742	5020-85744	5020-85745	5020-85746
	30	5020-85752	5020-	5020-	5020-85756
	50	5020-	5020-	5020-	5020-85766
	100	5020-	5020-	5020-	5020-
Inertsil WP300 C4 5 µm	6.0	5020-05970	5020-05971	5020-05972	5020-05973
	7.6	5020-05975	5020-05976	5020-05977	5020-05978
	10	5020-86132	5020-86134	5020-86135	5020-86136
	14	5020-79081	5020-79082	5020-79083	5020-79084
	20	5020-86142	5020-86144	5020-86145	5020-86146
	30	5020-86152	5020-	5020-	5020-86156
	50	5020-	5020-	5020-	5020-86166
	100	5020-	5020-	5020-	5020-

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Preparative Columns

Phase	Length(mm)	50	100	150	250
	I.D.(mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil Amide 5 µm	6.0	5020-07842	5020-07844	5020-07845	5020-07846
	7.6	5020-07852	5020-07854	5020-07855	5020-07856
	10	5020-86852	5020-86854	5020-86855	5020-86856
	14	5020-79066	5020-79067	5020-79068	5020-79069
	20	5020-86862	5020-86864	5020-86865	5020-86866
	30	5020-86872	5020-	5020-	5020-86876
	50	5020-	5020-	5020-	5020-86886
	100	5020-	5020-	5020-	5020-
Inertsil HILIC 5 µm	6.0	5020-07742	5020-07744	5020-07745	5020-07746
	7.6	5020-07752	5020-07754	5020-07755	5020-07756
	10	5020-86752	5020-86754	5020-86755	5020-86756
	14	5020-79061	5020-79062	5020-79063	5020-79064
	20	5020-86762	5020-86764	5020-86765	5020-86766
	30	5020-86772	5020-	5020-	5020-86776
	50	5020-	5020-	5020-	5020-86786
	100	5020-	5020-	5020-	5020-
InertSustain NH2 5 µm	6.0	5020-16655	5020-16656	5020-16657	5020-16658
	7.6	5020-16659	5020-16660	5020-16661	5020-16662
	10	5020-16663	5020-16664	5020-16665	5020-16666
	14	5020-16667	5020-16668	5020-16669	5020-16670
	20	5020-16671	5020-16672	5020-16673	5020-16674
	30	5020-	5020-	5020-	5020-
	50	5020-	5020-	5020-	5020-
	100	5020-	5020-	5020-	5020-
Inertsil NH2 5 µm	6.0	5020-05552	5020-05554	5020-05555	5020-05556
	7.6	5020-05562	5020-05564	5020-05565	5020-05566
	10	5020-85552	5020-85554	5020-85555	5020-85556
	14	5020-79046	5020-79047	5020-79048	5020-79049
	20	5020-85562	5020-85564	5020-85565	5020-85566
	30	5020-85572	5020-	5020-	5020-85576
	50	5020-	5020-	5020-	5020-85586
	100	5020-	5020-	5020-	5020-
Inertsil Diol 5 µm	6.0	5020-05652	5020-05654	5020-05655	5020-05656
	7.6	5020-05662	5020-05664	5020-05665	5020-05666
	10	5020-86552	5020-86554	5020-86555	5020-86556
	14	5020-79051	5020-79052	5020-79053	5020-79054
	20	5020-86562	5020-86564	5020-86565	5020-86566
	30	5020-86572	5020-	5020-	5020-86576
	50	5020-	5020-	5020-	5020-86586
	100	5020-	5020-	5020-	5020-
Inertsil SIL-100A 5 µm	6.0	5020-04352	5020-04354	5020-01713	5020-01714
	7.6	5020-04362	5020-04364	5020-04365	5020-04366
	10	5020-84352	5020-84354	5020-84355	5020-84356
	14	5020-79056	5020-79057	5020-79058	5020-79059
	20	5020-84362	5020-84364	5020-84365	5020-84366
	30	5020-84372	5020-	5020-	5020-84376
	50	5020-	5020-	5020-	5020-84386
	100	5020-	5020-	5020-	5020-

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Preparative Columns

Phase	Length(mm)	50	100	150	250
	I.D.(mm)	Cat.No.	Cat.No.	Cat.No.	Cat.No.
Inertsil SIL-150A 5 µm	6.0	5020-	5020-	5020-01013	5020-01014
	7.6	5020-	5020-	5020-	5020-06141
	10	5020-	5020-	5020-	5020-15611
	20	5020-	5020-	5020-	5020-15641
Inertsil WP300 SIL 5 µm	6.0	5020-05990	5020-05991	5020-05992	5020-05993
	7.6	5020-05995	5020-05996	5020-05997	5020-05998
	10	5020-86032	5020-86034	5020-86035	5020-86036
	14	5020-79091	5020-79092	5020-79093	5020-79094
	20	5020-86042	5020-86044	5020-86045	5020-86046
	30	5020-86052	5020-	5020-	5020-86056
	50	5020-	5020-	5020-	5020-86066
Inertsil WP300 Diol 5 µm	6.0	5020-05980	5020-05981	5020-05982	5020-05983
	7.6	5020-05985	5020-05986	5020-05987	5020-05988
	10	5020-85932	5020-85934	5020-85935	5020-85936
	14	5020-79086	5020-79087	5020-79088	5020-79089
	20	5020-85942	5020-85944	5020-85945	5020-85946
	30	5020-85952	5020-	5020-	5020-85956
	50	5020-	5020-	5020-	5020-85966
Inertsil Peptides C18 4 µm	6.0	5020-08062	5020-08064	5020-08065	5020-08066
	7.6	5020-08081	5020-	5020-	5020-08082
	10	5020-08083	5020-	5020-	5020-08084
	20	5020-08085	5020-	5020-	5020-08086
	30	5020-08087	5020-	5020-	5020-08088
	50	5020-	5020-	5020-	5020-08089

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

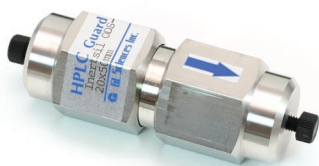
Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Guard Columns for Preparative Columns



GL Sciences highly recommends the use of guard columns to protect and maximize the lifetime of your InertSustain or Inertsil preparative columns.

Guard Columns for Preparative Columns

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
InertSustain C18	5 µm	6.0 × 50	5020-07357
		7.6 × 50	5020-07367
		10 × 50	5020-14257
		14 × 50	5020-14267
		20 × 50	5020-14277
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
Inertsil ODS-4	5 µm	6.0 × 50	5020-03957
		7.6 × 50	5020-03967
		10 × 50	5020-81057
		14 × 50	5020-79005
		20 × 50	5020-81067
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
Inertsil ODS-3	5 µm	6.0 × 50	5020-04557
		7.6 × 50	5020-06801
		10 × 50	5020-06811
		14 × 50	5020-79015
		20 × 50	5020-06821
		30 × 50	5020-06831
		50 × 75	5020-06851
		100 × 100	5020-
	10 µm	10 × 50	5020-79104
		14 × 50	5020-79109
		20 × 50	5020-79114
		30 × 50	5020-79119
Inertsil ODS-SP	5 µm	6.0 × 50	5020-02757
		7.6 × 50	5020-02767
		10 × 50	5020-85257
		14 × 50	5020-79020
		20 × 50	5020-85267
		30 × 50	5020-85267
Inertsil ODS-P	5 µm	6.0 × 50	5020-04757
		7.6 × 50	5020-04767
		10 × 50	5020-84757
		14 × 50	5020-79030
		20 × 50	5020-84767
		30 × 50	5020-84777
		50 × 75	5020-84787
Inertsil ODS-EP	5 µm	6.0 × 50	5020-02657
		7.6 × 50	5020-02667
		10 × 50	5020-18257
		14 × 50	5020-79025
		20 × 50	5020-18267
		30 × 50	5020-18277
		50 × 75	5020-18287
		100 × 100	5020-
Inertsil ODS-80A	5 µm	7.6 × 50	5020-06136
		10 × 50	5020-15606
		20 × 50	5020-15636
Inertsil ODS-2	5 µm	7.6 × 50	5020-06132
		10 × 50	5020-15602
		20 × 50	5020-15632

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil ODS	5 µm	7.6 × 50	5020-31501
		10 × 50	5020-31511
		20 × 50	5020-31521
	10 µm	7.6 × 50	5020-31601
		10 × 50	5020-31611
		20 × 50	5020-31621
InertSustain C8	5 µm	6.0 × 50	5020-16075
		7.6 × 50	5020-16076
		10 × 50	5020-16077
		14 × 50	5020-16078
		20 × 50	5020-16079
		30 × 50	5020-84977
		50 × 75	5020-84987
Inertsil C8-4	5 µm	100 × 100	5020-
		6.0 × 50	5020-04091
		7.6 × 50	5020-04096
		10 × 50	5020-81247
		14 × 50	5020-79010
		20 × 50	5020-81257
		30 × 50	5020-84977
		50 × 75	5020-84987
Inertsil C8-3	5 µm	100 × 100	5020-
		6.0 × 50	5020-04957
		7.6 × 50	5020-04967
		10 × 50	5020-84957
		14 × 50	5020-79035
		20 × 50	5020-84967
		30 × 50	5020-84977
		50 × 75	5020-84987
	10 µm	100 × 100	5020-
		10 × 50	5020-79304
		14 × 50	5020-79309
		20 × 50	5020-79314
Inertsil C8	5 µm	30 × 50	5020-79319
		50 × 75	5020-79321
		100 × 100	5020-
InertSustain Phenyl	5 µm	7.6	5020-06133
		10	5020-15603
		20	5020-15633
		6.0 × 50	5020-16375
Inertsil Ph-3	5 µm	7.6 × 50	5020-16376
		10 × 50	5020-16377
		14 × 50	5020-16378
		20 × 50	5020-16379
		30 × 50	5020-
		50 × 75	5020-
		100 × 100	5020-
		6.0 × 50	5020-05157
Inertsil Ph	5 µm	7.6 × 50	5020-05167
		10 × 50	5020-85157
		14 × 50	5020-79040
		20 × 50	5020-85167
		30 × 50	5020-85177
		50 × 75	5020-85187
Inertsil Ph	5 µm	100 × 100	5020-
		7.6 × 50	5020-06134
		10 × 50	5020-15604
		20 × 50	5020-15634

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

Guard Columns for Preparative Columns

Phase	Particle Size	I.D.×Length (mm)	Cat.No.	Phase	Particle Size	I.D.×Length (mm)	Cat.No.	Reversed Phase Columns	HILIC Columns	Normal Phase Columns	SEC Columns	Ion Exchange Columns	Application Specific Columns	Guard Columns	Preparative Columns	Capillary Columns	Applications	Cat. No. Index
Inertsil CN-3	5 µm	6.0 × 50	5020-05357	Inertsil Diol	5 µm	6.0 × 50	5020-05657											
		7.6 × 50	5020-05367			7.6 × 50	5020-05667											
		10 × 50	5020-85357			10 × 50	5020-86557											
		14 × 50	5020-79045			14 × 50	5020-79055											
		20 × 50	5020-85367			20 × 50	5020-86567											
		30 × 50	5020-85377			30 × 50	5020-86577											
		50 × 75	5020-85387			50 × 75	5020-86587											
		100 × 100	5020-			100 × 100	5020-											
Inertsil WP300 C18	5 µm	6.0 × 50	5020-05954	Inertsil SIL-100A	5 µm	6.0 × 50	5020-04357											
		7.6 × 50	5020-05959			7.6 × 50	5020-04367											
		10 × 50	5020-85837			10 × 50	5020-84357											
		14 × 50	5020-79075			14 × 50	5020-79060											
		20 × 50	5020-85847			20 × 50	5020-84367											
		30 × 50	5020-85857			30 × 50	5020-84377											
		50 × 75	5020-85867			50 × 75	5020-84387											
		100 × 100	5020-			100 × 100	5020-											
Inertsil WP300 C8	5 µm	6.0 × 50	5020-05964	Inertsil SIL-150A	5 µm	7.6 × 50	5020-06131											
		7.6 × 50	5020-05969			10 × 50	5020-15601											
		10 × 50	5020-85737			20 × 50	5020-15631											
		14 × 50	5020-79080	Inertsil WP300 SIL	5 µm	6.0 × 50	5020-05994											
		20 × 50	5020-85747			7.6 × 50	5020-05999											
		30 × 50	5020-85757			10 × 50	5020-86037											
		50 × 75	5020-85767			14 × 50	5020-79095											
		100 × 100	5020-			20 × 50	5020-86047											
						30 × 50	5020-86057											
						50 × 75	5020-86067											
						100 × 100	5020-											
Inertsil WP300 C4	5 µm	6.0 × 50	5020-05974	Inertsil WP300 Diol	5 µm	6.0 × 50	5020-05984											
		7.6 × 50	5020-05979			7.6 × 50	5020-05989											
		10 × 50	5020-86137			10 × 50	5020-85937											
		14 × 50	5020-79085			14 × 50	5020-79090											
		20 × 50	5020-86147			20 × 50	5020-85947											
		30 × 50	5020-86157			30 × 50	5020-85957											
		50 × 75	5020-86167			50 × 75	5020-85967											
		100 × 100	5020-			100 × 100	5020-											
Inertsil Amide	5 µm	6.0 × 50	5020-07847	Inertsil Peptides C18	4 µm	6.0 × 50	5020-08071											
		7.6 × 50	5020-07857			7.6 × 50	5020-08072											
		10 × 50	5020-86857			10 × 50	5020-08073											
		14 × 50	5020-79070			20 × 50	5020-08074											
		20 × 50	5020-86867			30 × 50	5020-08075											
		30 × 50	5020-86877			50 × 75	5020-08076											
		50 × 75	5020-															
		100 × 100	5020-															
Inertsil HILIC	5 µm	6.0 × 50	5020-07747															
		7.6 × 50	5020-07757															
		10 × 50	5020-86757															
		14 × 50	5020-79065															
		20 × 50	5020-86767															
		30 × 50	5020-86777															
		50 × 75	5020-86787															
		100 × 100	5020-															
InertSustain NH2	5 µm	6.0 × 50	5020-16675															
		7.6 × 50	5020-16676															
		10 × 50	5020-16677															
		14 × 50	5020-16678															
		20 × 50	5020-16679															
		30 × 50	5020-															
		50 × 75	5020-															
		100 × 100	5020-															
Inertsil NH2	5 µm	6.0 × 50	5020-05557															
		7.6 × 50	5020-05567															
		10 × 50	5020-85557															
		14 × 50	5020-79050															
		20 × 50	5020-85567															
		30 × 50	5020-85577															
		50 × 75	5020-85587															
		100 × 100	5020-															

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure of 6.0 to 50 mm I.D. columns are 20 MPa, 200 Bar.

* The maximum operating pressure of 100 mm I.D. column is 10 MPa, 100 Bar.

PREP Guard Cartridges



PREP Guard Cartridges

PREP guard cartridges offer economic and effective protection for extending the lifetime of your InertSustain or Inertsil preparative columns. Protection available for 7.6, 10 and 20 mm I.D. preparative columns.

Phase	Length (mm)	I.D. (mm)	Replacement Cartridge (2 EA.)	Holder/Replacement Cartridge Set (2 Cartridges & 1 Holder)
			Cat. No.	Cat. No.
InertSustain C18	30	7.6	5020-15744	5020-15794
Inertsil ODS-4	30	7.6	5020-15701	5020-15751
Inertsil ODS-3	30	7.6	5020-15703	5020-15753
Inertsil ODS-SP	30	7.6	5020-15706	5020-15756
Inertsil ODS-P	30	7.6	5020-15708	5020-15758
Inertsil ODS-EP	30	7.6	5020-15710	5020-15760
Inertsil ODS-80A	30	7.6	5020-15740	5020-15790
Inertsil ODS-2	30	7.6	5020-15735	5020-15785
Inertsil ODS	30	7.6	5020-15741	5020-15791
InertSustain C8	30	7.6	5020-16080	5020-16081
Inertsil C8-4	30	7.6	5020-15702	5020-15752
Inertsil C8-3	30	7.6	5020-15714	5020-15764
Inertsil C8	30	7.6	5020-15736	5020-15786
Inertsil C4	30	7.6	5020-15738	5020-15788
InertSustain Phenyl	30	7.6	5020-16380	5020-16381
Inertsil Ph-3	30	7.6	5020-15716	5020-15766
Inertsil Ph	30	7.6	5020-15737	5020-15787
Inertsil CN-3	30	7.6	5020-15718	5020-15768
Inertsil WP300 C18	30	7.6	5020-15728	5020-15778
Inertsil WP300 C8	30	7.6	5020-15729	5020-15779
Inertsil WP300 C4	30	7.6	5020-15730	5020-15780
Inertsil Amide	30	7.6	5020-15745	5020-15795
Inertsil HILIC	30	7.6	5020-15724	5020-15774
InertSustain NH2	30	7.6	5020-16680	5020-16681
Inertsil NH2	30	7.6	5020-15720	5020-15770
Inertsil Diol	30	7.6	5020-15722	5020-15772
Inertsil SIL-100A	30	7.6	5020-15726	5020-15776
Inertsil SIL-150A	30	7.6	5020-15739	5020-15789
Inertsil WP300 Diol	30	7.6	5020-15731	5020-15781
Inertsil WP300 SIL	30	7.6	5020-15732	5020-15782
Inertsil Peptides C18	30	7.6	5020-15711	5020-15761

Holder for PREP Guard Cartridges

Description	Cat. No.
Holder for PREP Guard Cartridges	5020-06920

*End-fittings are 1/16" Waters-compatible.

*The above dedicated holder must be purchased once to use the PREP Guard Cartridges.

Other Preparative Columns

JET Columns



JET Columns

JET columns have been designed specifically to work with rapid purification and isolation for preparative HPLC offering 20 % higher efficiency compared to general preparative columns.

Phese	Length(mm)	50
	I.D.(mm)	Cat.No.
Inertsil ODS-3	6.0	5020-07021
	7.6	5020-07022
	10	5020-07023
	20	5020-07024
	30	5020-07025
	50	5020-

* End-fittings are 1/16" Waters-compatible.
 * The maximum operating pressure is 20 MPa, 200 Bar.

Other Preparative Columns



Inertsil PREP



Econo Prep

Other preparative HPLC columns such as Inertsil Prep using a 10 µm packing material and cost-effective Econo Prep series preparative columns are available using 40 µm particle size packing materials.

Reversed Phase Columns

HILIC Columns

Normal Phase Columns

SEC Columns

Ion Exchange Columns

Application Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index



Capillary Columns

● Capillary HPLC Columns	120
● Totally Porous Particle type Capillary HPLC Columns	121
● Connection Kits for Totally Porous Particle type Capillary Columns	126
● Totally Porous Particle type Capillary Micro Guard Columns	127
● Monolithic Capillary HPLC Columns (Available in South Asia, Middle East and Africa only)	128
● MonoSpray™	133

Capillary HPLC Columns

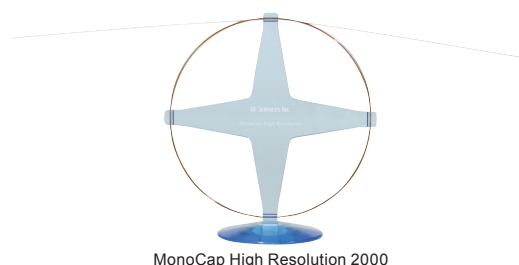
Capillary EX and Capillary EX-Nano HPLC columns are excellent in analyzing trace amounts of samples in proteomic and bioanalytical analysis with high sensitivity and high resolution. Capillary EX and Capillary EX-Nano columns are totally porous particle type columns, which the flow rate is generally set under 100 $\mu\text{L}/\text{min}$.

MonoCap is another capillary column, however, uses the monolithic silica technology offering high throughput, high sensitivity and high resolution separation of peptides and protein digests.

MonoCap Fast-Flow provides high throughput analysis at half of the operating pressure compared to totally porous particle type columns. MonoCap Nano-flow deliver extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes. Electrospray emitter for ESI-LC/MS, MonoSpray offer minimized sample diffusion resulting in high sensitivity. MonoCap Trap columns are also available for on-line preconcentration or desalting of

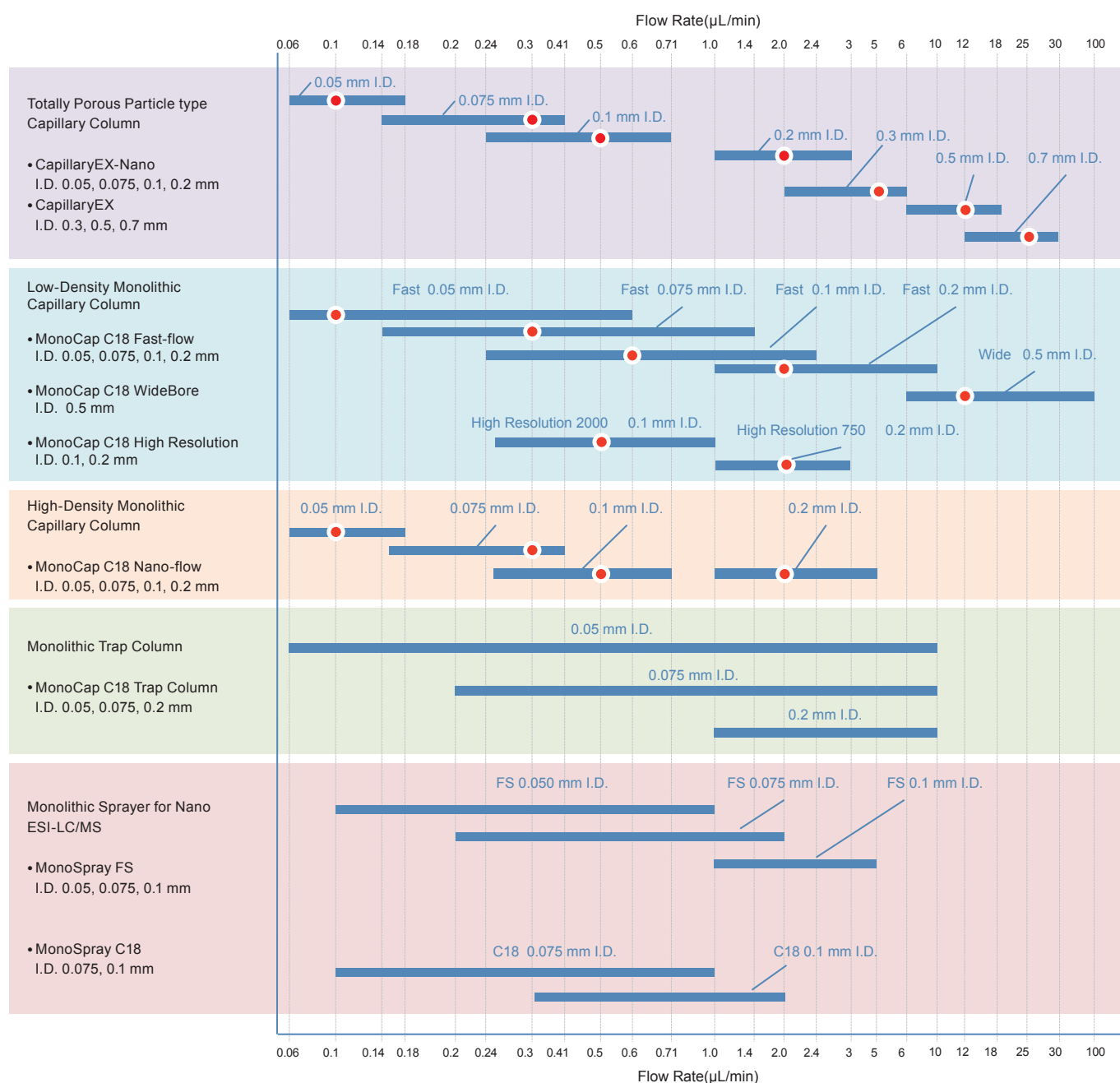
protein and peptide samples prior to HPLC separation with mass spectrometry detection.

The chart below illustrates the recommended use and flow rate ranges when using a 150 mm length column. The red circle indicates the linear velocity at 1 mm/s.

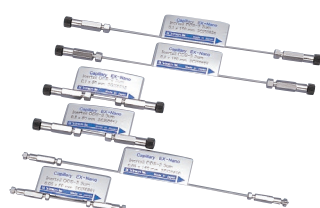


MonoCap High Resolution 2000

Figure 1 : Recommended Use and Flow Rate Ranges



Totally Porous Particle type Capillary HPLC Columns



Capillary EX-Nano



Capillary EX

Columns with I.D. sizes of 0.05, 0.075, 0.1 and 0.2 mm are Capillary EX-Nano columns. I.D. sizes of 0.3, 0.5 and 0.7 mm are Capillary EX columns. Capillary EX-Nano columns introduces a fused silica capillary tube having a very smooth and clean inner surface resulting in high theoretical plates.

Capillary EX columns employs the same column hardware used in analytical columns, which is very easy to use.

Phase	I.D. (mm)	Particle Size (µm)	Length50 mm	Length150 mm	Length250 mm
			Cat.No.	Cat.No.	Cat.No.
InertSustain C18	0.05	3	5020-15038	5020-15088	5020-15138
		5	5020-15037	5020-15087	5020-15137
	0.075	3	5020-15188	5020-15238	5020-15288
		5	5020-15187	5020-15237	5020-15287
	0.1	3	5020-15338	5020-15388	5020-15438
		5	5020-15337	5020-15387	5020-15437
	0.2	3	5020-15488	5020-15538	5020-15588
		5	5020-15487	5020-15537	5020-15587
	0.3	3	5020-11539	5020-11589	-
		5	5020-11538	5020-11588	-
	0.5	3	5020-11639	5020-11689	-
		5	5020-11638	5020-11688	-
	0.7	3	5020-11739	5020-11789	-
		5	5020-11738	5020-11788	-
Inertsil ODS-4	0.05	3	5020-15002	5020-15052	5020-15102
		5	5020-15001	5020-15051	5020-15101
	0.075	3	5020-15152	5020-15202	5020-15252
		5	5020-15151	5020-15201	5020-15251
	0.1	3	5020-15302	5020-15352	5020-15402
		5	5020-15301	5020-15351	5020-15401
	0.2	3	5020-15452	5020-15502	5020-15552
		5	5020-15451	5020-15501	5020-15551
	0.3	3	5020-11502	5020-11552	-
		5	5020-11501	5020-11551	-
	0.5	3	5020-11602	5020-11652	-
		5	5020-11601	5020-11651	-
	0.7	3	5020-11702	5020-11752	-
		5	5020-11701	5020-11751	-
Inertsil ODS-3	0.05	3	5020-15005	5020-15055	5020-15105
		4	5020-15004	5020-15054	5020-15104
		5	5020-15003	5020-15053	5020-15103
	0.075	3	5020-15155	5020-15205	5020-15255
		4	5020-15154	5020-15204	5020-15254
		5	5020-15153	5020-15203	5020-15253
	0.1	3	5020-15305	5020-15355	5020-15405
		4	5020-15304	5020-15354	5020-15404
		5	5020-15303	5020-15353	5020-15403
	0.2	3	5020-15455	5020-15505	5020-15555
		4	5020-15454	5020-15504	5020-15554
		5	5020-15453	5020-15503	5020-15553
	0.3	3	5020-11505	5020-11555	-
		4	5020-11504	5020-11554	-
		5	5020-11503	5020-11553	-
	0.5	3	5020-11605	5020-11655	-
		4	5020-11604	5020-11654	-
		5	5020-11603	5020-11653	-
	0.7	3	5020-11705	5020-11755	-
		4	5020-11704	5020-11754	-
		5	5020-11703	5020-11753	-

* End-fittings are Valco 1/16" (10-32 UNF).

* Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.

* The maximum operating pressure of 0.05 to 0.2 mm I.D. columns are 15 MPa, 150 Bar.

* The maximum operating pressure of 0.3 to 0.7 mm I.D. columns are 20 MPa, 200 Bar.

Totally Porous Particle type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil ODS-SP	0.05	3	5020-15007	5020-15057	5020-15107
		5	5020-15006	5020-15056	5020-15106
	0.075	3	5020-15157	5020-15207	5020-15257
		5	5020-15156	5020-15206	5020-15256
	0.1	3	5020-15307	5020-15357	5020-15407
		5	5020-15306	5020-15356	5020-15406
	0.2	3	5020-15457	5020-15507	5020-15557
		5	5020-15456	5020-15506	5020-15556
	0.3	3	5020-11507	5020-11557	–
		5	5020-11506	5020-11556	–
	0.5	3	5020-11607	5020-11657	–
		5	5020-11606	5020-11656	–
	0.7	3	5020-11707	5020-11757	–
		5	5020-11706	5020-11756	–
Inertsil ODS-P	0.05	3	5020-15009	5020-15059	5020-15109
		5	5020-15008	5020-15058	5020-15108
	0.075	3	5020-15159	5020-15209	5020-15259
		5	5020-15158	5020-15208	5020-15258
	0.1	3	5020-15309	5020-15359	5020-15409
		5	5020-15308	5020-15358	5020-15408
	0.2	3	5020-15459	5020-15509	5020-15559
		5	5020-15458	5020-15508	5020-15558
	0.3	3	5020-11509	5020-11559	–
		5	5020-11508	5020-11558	–
	0.5	3	5020-11609	5020-11659	–
		5	5020-11608	5020-11658	–
	0.7	3	5020-11709	5020-11759	–
		5	5020-11708	5020-11758	–
Inertsil ODS-EP	0.05	5	5020-15010	5020-15060	5020-15110
	0.075	5	5020-15160	5020-15210	5020-15260
	0.1	5	5020-15310	5020-15360	5020-15410
	0.2	5	5020-15460	5020-15510	5020-15560
	0.3	5	5020-11510	5020-11560	–
	0.5	5	5020-11610	5020-11660	–
	0.7	5	5020-11710	5020-11760	–
InertSustain C8	0.05	3	5020-16191	5020-16192	5020-16193
		5	5020-16090	5020-16091	5020-16092
	0.075	3	5020-16194	5020-16195	5020-16196
		5	5020-16093	5020-16094	5020-16095
	0.1	3	5020-16197	5020-16198	5020-16199
		5	5020-16096	5020-16097	5020-16098
	0.2	3	5020-16200	5020-16201	5020-16202
		5	5020-16099	5020-16100	5020-16101
	0.3	3	5020-16184	5020-16185	–
		5	5020-16082	5020-16083	–
	0.5	3	5020-16186	5020-16187	–
		5	5020-16084	5020-16085	–
	0.7	3	5020-16188	5020-16189	–
		5	5020-16086	5020-16087	–
Inertsil C8-4	0.05	3	5020-15036	5020-15086	5020-15136
		5	5020-15035	5020-15085	5020-15135
	0.075	3	5020-15186	5020-15236	5020-15286
		5	5020-15185	5020-15235	5020-15285
	0.1	3	5020-15336	5020-15386	5020-15436
		5	5020-15335	5020-15385	5020-15435
	0.2	3	5020-15486	5020-15536	5020-15586
		5	5020-15485	5020-15535	5020-15585
	0.3	3	5020-11536	5020-11586	–
		5	5020-11535	5020-11585	–
	0.5	3	5020-11636	5020-11686	–
		5	5020-11635	5020-11685	–
	0.7	3	5020-11736	5020-11786	–
		5	5020-11735	5020-11785	–

* End-fittings are Valco 1/16" (10-32 UNF).

* Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.

* The maximum operating pressure of 0.05 to 0.2 mm I.D. columns are 15 MPa, 150 Bar.

* The maximum operating pressure of 0.3 to 0.7 mm I.D. columns are 20 MPa, 200 Bar.

Totally Porous Particle type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil C8-3	0.05	3	5020-15015	5020-15065	5020-15115
		5	5020-15014	5020-15064	5020-15114
	0.075	3	5020-15165	5020-15215	5020-15265
		5	5020-15164	5020-15214	5020-15264
	0.1	3	5020-15315	5020-15365	5020-15415
		5	5020-15314	5020-15364	5020-15414
	0.2	3	5020-15465	5020-15515	5020-15565
		5	5020-15464	5020-15514	5020-15564
	0.3	3	5020-11515	5020-11565	-
		5	5020-11514	5020-11564	-
	0.5	3	5020-11615	5020-11665	-
		5	5020-11614	5020-11664	-
	0.7	3	5020-11715	5020-11765	-
		5	5020-11714	5020-11764	-
Inertsil WP300 C18	0.05	5	5020-15028	5020-15078	5020-15128
	0.075	5	5020-15178	5020-15228	5020-15278
	0.1	5	5020-15328	5020-15378	5020-15428
	0.2	5	5020-15478	5020-15528	5020-15578
	0.3	5	5020-11528	5020-11578	-
	0.5	5	5020-11628	5020-11678	-
	0.7	5	5020-11728	5020-11778	-
Inertsil WP300 C8	0.05	5	5020-15029	5020-15079	5020-15129
	0.075	5	5020-15179	5020-15229	5020-15279
	0.1	5	5020-15329	5020-15379	5020-15429
	0.2	5	5020-15479	5020-15529	5020-15579
	0.3	5	5020-11529	5020-11579	-
	0.5	5	5020-11629	5020-11679	-
	0.7	5	5020-11729	5020-11779	-
Inertsil WP300 C4	0.05	5	5020-15030	5020-15080	5020-15130
	0.075	5	5020-15180	5020-15230	5020-15280
	0.1	5	5020-15330	5020-15380	5020-15430
	0.2	5	5020-15480	5020-15530	5020-15580
	0.3	5	5020-11530	5020-11580	-
	0.5	5	5020-11630	5020-11680	-
	0.7	5	5020-11730	5020-11780	-
InertSustain Phenyl	0.05	3	5020-16491	5020-16492	5020-16493
		5	5020-16390	5020-16391	5020-16392
	0.075	3	5020-16494	5020-16495	5020-16496
		5	5020-16393	5020-16394	5020-16395
	0.1	3	5020-16497	5020-16498	5020-16499
		5	5020-16396	5020-16397	5020-16398
	0.2	3	5020-16500	5020-16501	5020-16502
		5	5020-16399	5020-16400	5020-16401
	0.3	3	5020-16484	5020-16485	-
		5	5020-16382	5020-16383	-
	0.5	3	5020-16486	5020-16487	-
		5	5020-16384	5020-16385	-
	0.7	3	5020-16488	5020-16489	-
		5	5020-16386	5020-16387	-
Inertsil Ph-3	0.05	3	5020-15017	5020-15067	5020-15117
		5	5020-15016	5020-15066	5020-15116
	0.075	3	5020-15167	5020-15217	5020-15267
		5	5020-15166	5020-15216	5020-15266
	0.1	3	5020-15317	5020-15367	5020-15417
		5	5020-15316	5020-15366	5020-15416
	0.2	3	5020-15467	5020-15517	5020-15567
		5	5020-15466	5020-15516	5020-15566
	0.3	3	5020-11517	5020-11567	-
		5	5020-11516	5020-11566	-
	0.5	3	5020-11617	5020-11667	-
		5	5020-11616	5020-11666	-
	0.7	3	5020-11717	5020-11767	-
		5	5020-11716	5020-11766	-

* End-fittings are Valco 1/16" (10-32 UNF).

* Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.

* The maximum operating pressure of 0.05 to 0.2 mm I.D. columns are 15 MPa, 150 Bar.

* The maximum operating pressure of 0.3 to 0.7 mm I.D. columns are 20 MPa, 200 Bar.

Totally Porous Particle type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil Amide	0.05	3	5020-15040	5020-15090	5020-15140
		5	5020-15039	5020-15089	5020-15139
	0.075	3	5020-15190	5020-15240	5020-15290
		5	5020-15189	5020-15239	5020-15289
	0.1	3	5020-15340	5020-15390	5020-15440
		5	5020-15339	5020-15389	5020-15439
	0.2	3	5020-15490	5020-15540	5020-15590
		5	5020-15489	5020-15539	5020-15589
	0.3	3	5020-11541	5020-11591	–
		5	5020-11540	5020-11590	–
	0.5	3	5020-11641	5020-11691	–
		5	5020-11640	5020-11690	–
	0.7	3	5020-11741	5020-11791	–
		5	5020-11740	5020-11790	–
Inertsil HILIC	0.05	3	5020-15025	5020-15075	5020-15125
		5	5020-15024	5020-15074	5020-15124
	0.075	3	5020-15175	5020-15225	5020-15275
		5	5020-15174	5020-15224	5020-15274
	0.1	3	5020-15325	5020-15375	5020-15425
		5	5020-15324	5020-15374	5020-15424
	0.2	3	5020-15475	5020-15525	5020-15575
		5	5020-15474	5020-15524	5020-15574
	0.3	3	5020-11525	5020-11575	–
		5	5020-11524	5020-11574	–
	0.5	3	5020-11625	5020-11675	–
		5	5020-11624	5020-11674	–
	0.7	3	5020-11725	5020-11775	–
		5	5020-11724	5020-11774	–
InertSustain NH2	0.05	3	5020-16791	5020-16792	5020-16793
		5	5020-16690	5020-16691	5020-16692
	0.075	3	5020-16794	5020-16795	5020-16796
		5	5020-16693	5020-16694	5020-16695
	0.1	3	5020-16797	5020-16798	5020-16799
		5	5020-16696	5020-16697	5020-16698
	0.2	3	5020-16800	5020-16801	5020-16802
		5	5020-16699	5020-16700	5020-16701
	0.3	3	5020-16784	5020-16785	–
		5	5020-16682	5020-16683	–
	0.5	3	5020-16786	5020-16787	–
		5	5020-16684	5020-16685	–
	0.7	3	5020-16788	5020-16789	–
		5	5020-16686	5020-16687	–
Inertsil NH2	0.05	3	5020-15021	5020-15071	5020-15121
		5	5020-15020	5020-15070	5020-15120
	0.075	3	5020-15171	5020-15221	5020-15271
		5	5020-15170	5020-15220	5020-15270
	0.1	3	5020-15321	5020-15371	5020-15421
		5	5020-15320	5020-15370	5020-15420
	0.2	3	5020-15471	5020-15521	5020-15571
		5	5020-15470	5020-15520	5020-15570
	0.3	3	5020-11521	5020-11571	–
		5	5020-11520	5020-11570	–
	0.5	3	5020-11621	5020-11671	–
		5	5020-11620	5020-11670	–
	0.7	3	5020-11721	5020-11771	–
		5	5020-11720	5020-11770	–

* End-fittings are Valco 1/16" (10-32 UNF).

* Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.

* The maximum operating pressure of 0.05 to 0.2 mm I.D. columns are 15 MPa, 150 Bar.

* The maximum operating pressure of 0.3 to 0.7 mm I.D. columns are 20 MPa, 200 Bar.

Totally Porous Particle type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (µm)	Length 50 mm	Length 150 mm	Length 250 mm
			Cat.No.	Cat.No.	Cat.No.
Inertsil CN-3	0.05	3	5020-15019	5020-15069	5020-15119
		5	5020-15018	5020-15068	5020-15118
	0.075	3	5020-15169	5020-15219	5020-15269
		5	5020-15168	5020-15218	5020-15268
	0.1	3	5020-15319	5020-15369	5020-15419
		5	5020-15318	5020-15368	5020-15418
	0.2	3	5020-15469	5020-15519	5020-15569
		5	5020-15468	5020-15518	5020-15568
	0.3	3	5020-11519	5020-11569	-
		5	5020-11518	5020-11568	-
	0.5	3	5020-11619	5020-11669	-
		5	5020-11618	5020-11668	-
Inertsil Diol	0.05	3	5020-15023	5020-15073	5020-15123
		5	5020-15022	5020-15072	5020-15122
	0.075	3	5020-15173	5020-15223	5020-15273
		5	5020-15172	5020-15222	5020-15272
	0.1	3	5020-15323	5020-15373	5020-15423
		5	5020-15322	5020-15372	5020-15422
	0.2	3	5020-15473	5020-15523	5020-15573
		5	5020-15472	5020-15522	5020-15572
	0.3	3	5020-11523	5020-11573	-
		5	5020-11522	5020-11572	-
	0.5	3	5020-11623	5020-11673	-
		5	5020-11622	5020-11672	-
Inertsil SIL-100A	0.05	3	5020-15027	5020-15077	5020-15127
		5	5020-15026	5020-15076	5020-15126
	0.075	3	5020-15177	5020-15227	5020-15277
		5	5020-15176	5020-15226	5020-15276
	0.1	3	5020-15327	5020-15377	5020-15427
		5	5020-15326	5020-15376	5020-15426
	0.2	3	5020-15477	5020-15527	5020-15577
		5	5020-15476	5020-15526	5020-15576
	0.3	3	5020-11527	5020-11577	-
		5	5020-11526	5020-11576	-
	0.5	3	5020-11627	5020-11677	-
		5	5020-11626	5020-11676	-
Inertsil AX	0.05	5	5020-15033	5020-15083	5020-15133
	0.075	5	5020-15183	5020-15233	5020-15283
	0.1	5	5020-15333	5020-15383	5020-15433
	0.2	5	5020-15483	5020-15533	5020-15583
	0.3	5	5020-11533	5020-11583	-
	0.5	5	5020-11633	5020-11683	-
Inertsil CX	0.05	5	5020-15034	5020-15084	5020-15134
	0.075	5	5020-15184	5020-15234	5020-15284
	0.1	5	5020-15334	5020-15384	5020-15434
	0.2	5	5020-15484	5020-15534	5020-15584
	0.3	5	5020-11534	5020-11584	-
	0.5	5	5020-11634	5020-11684	-
Titansphere TiO	0.3	5	5020-11734	5020-11784	-
	0.5	5	5020-11537	5020-11587	-
	0.7	5	5020-11637	5020-11687	-
	0.7	5	5020-11737	5020-11787	-

* End-fittings are Valco 1/16" (10-32 UNF).

* Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.

* The maximum operating pressure of 0.05 to 0.2 mm I.D. columns are 15 MPa, 150 Bar.

* The maximum operating pressure of 0.3 to 0.7 mm I.D. columns are 20 MPa, 200 Bar.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

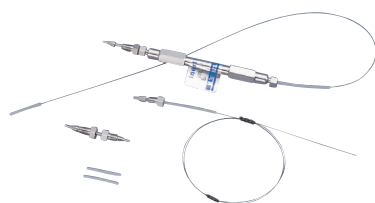
Preparative Columns

Capillary Columns

Applications

Cat. No. Index

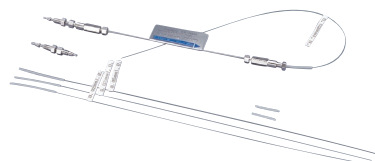
Connection Kits for Totally Porous Particle type Capillary Columns



Connection Kit for Capillary EX Columns
(Top Image: Installed view, Bottom Image: Contents of Kit)

Connection Kit for Capillary EX Columns (0.3, 0.5, 0.7 I.D. mm)

Contents of Kit	Cat.No.
- Column Coupler 40 × 0.1 mm I.D. 1/16" O.D. Tubing (Both ends with male nuts including PEEK ferrules)	5020-01880
- Capillary Tubing Connector 500 × 0.075 mm I.D. 0.375 mm O.D. Tubing (Male nut, PEEK ferrule, 1/16" O.D. PTFE with sleeve)	
PTFE Tubing 20 mm 2 pcs 1/16" O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

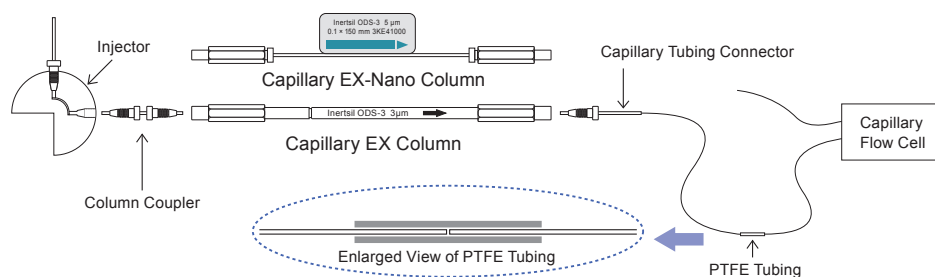


Connection Kit for Capillary EX-Nano Columns
(Top Image: Installed view, Bottom Image: Contents of Kit)

Connection Kit for Capillary EX-Nano Columns (0.05, 0.075, 0.1, 0.2 I.D. mm)

Contents of Kit	Cat.No.
- Column Coupler 40 × 0.05 mm I.D. 1/16" O.D. Tubing (Both ends with male nuts including PEEK ferrules)	5020-01881
- Capillary Tubing Connector 300 × 0.05 mm I.D. 0.375 mm O.D. Tubing 300 × 0.03 mm I.D. 0.375 mm O.D. Tubing 300 × 0.02 mm I.D. 0.375 mm O.D. Tubing (Male nut, PEEK ferrule, 1/16" O.D. PTFE with sleeve)	
PTFE Tubing 20 mm 2 pcs 1/16" O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

How To Connect



Totally Porous Particle type Capillary Micro Guard Columns



Capillary EX Micro Guard Columns

Capillary EX Micro Guard columns are available in 2 mm length which are ideal for the use of sample preconcentration and sample cleanup. Non-metal hardware is also available to eliminate metal contamination from the column hardware.

Phase	I.D. (mm)	Particle Size (µm)	Length (mm)	Wetted Part	
				Metal	Non-Metal
				Cat.No.	Cat.No.
InertSustain C18	0.3	3	2	5020-11847	-
		5	2	5020-11846	5020-11896
Inertsil ODS-4	0.3	3	2	5020-11802	-
		5	2	5020-11801	5020-11851
Inertsil ODS-3	0.3	3	2	5020-11805	-
		5	2	5020-11803	5020-11853
Inertsil ODS-SP	0.3	3	2	5020-11807	-
		5	2	5020-11806	5020-11856
Inertsil ODS-P	0.3	3	2	5020-11809	-
		5	2	5020-11808	5020-11858
Inertsil ODS-EP	0.3	5	2	5020-11810	5020-11860
InertSustain C8	0.3	3	2	5020-16190	-
		5	2	5020-16088	5020-16089
Inertsil C8-4	0.3	3	2	5020-11836	-
		5	2	5020-11835	5020-11885
Inertsil C8-3	0.3	3	2	5020-11815	-
		5	2	5020-11814	5020-11864
Inertsil WP300 C18	0.3	5	2	5020-11828	5020-11878
Inertsil WP300 C8	0.3	5	2	5020-11829	5020-11879
Inertsil WP300 C4	0.3	5	2	5020-11830	5020-11880
InertSustain Phenyl	0.3	3	2	5020-16490	-
		5	2	5020-16388	5020-16389
Inertsil Ph-3	0.3	3	2	5020-11817	-
		5	2	5020-11816	5020-11866
Inertsil WP300 C18	0.3	5	2	5020-11828	5020-11878
Inertsil WP300 C8	0.3	5	2	5020-11829	5020-11879
Inertsil WP300 C4	0.3	5	2	5020-11830	5020-11880
Inertsil Amide	0.3	3	2	5020-11849	-
		5	2	5020-11848	5020-11897
Inertsil HILIC	0.3	3	2	5020-11825	-
		5	2	5020-11824	5020-11874
InertSustain NH2	0.3	3	2	5020-16790	-
		5	2	5020-16688	5020-16689
Inertsil NH2	0.3	3	2	5020-11821	-
		5	2	5020-11820	5020-11870
Inertsil CN-3	0.3	3	2	5020-11819	-
		5	2	5020-11818	5020-11868
Inertsil Diol	0.3	3	2	5020-11823	-
		5	2	5020-11822	5020-11872
Inertsil SIL 100A	0.3	3	2	5020-11827	-
		5	2	5020-11826	5020-11876
Inertsil AX	0.3	5	2	5020-11833	5020-11883
Inertsil CX	0.3	5	2	5020-11834	5020-11884
Titanspher TiO	0.3	5	2	5020-11845	5020-11895

* End-fittings are 1/16" Waters-compatible.

* The maximum operating pressure is 20 MPa, 200 Bar.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

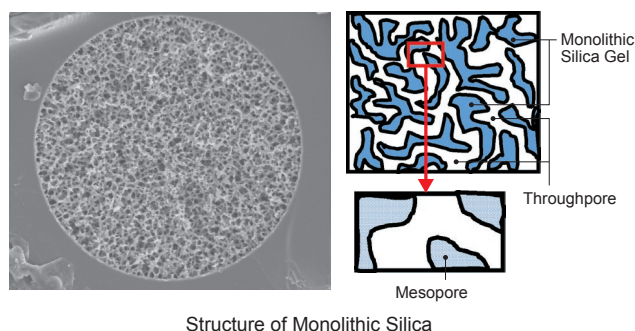
Applications

Cat. No. Index

Monolithic Capillary HPLC Columns

(Available in South Asia, Middle East and Africa only)

MonoCap Series



GL Sciences' MonoCap series, created synthetically via sol-gel method, and an octadecyl silane chemically bonded, has a very uniform three dimensional structure that shows excellent reproducibility from batch-to-batch. The solid structure of GL Sciences' monolithic silica eliminates the need for frits or filters at the ends of the column, thereby reducing dead volume that might otherwise lead to band broadening or sample recovery. The high porosity of our monolithic silica allows high flow rates to be used without loss of resolution or creation of high operating pressure. An optimized balance of throughpores and mesopores provides the critically important combination of efficiency, separation speed, large volume sample-loading, and small volume sample-recovery.

MonoCap High Resolution provide extremely high efficiency, delivering over 200,000 plates for a 2,000 mm length column. The High Resolution Ultra type deliver over 300,000 plates.

The Fast-flow type is compatible with high flow rate analysis due to its' low flow resistance. In addition, the equilibration time can be minimized further by setting the flow rate high.

MonoCap Nano-flow is a high-density monolithic capillary column offering extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes.

MonoCap Trap columns have a relatively big throughpore, which are available for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

Physical Properties of MonoCap Series

Description	Monolithic Silica	Skeleton	Throughpore	Mesopore	Porosity	Bonded Phase	End-capping	Max. Operating Pressure
MonoCap C18 High Resolution 750	High Purity Silica Gel	1 µm	2 µm	15 nm	85 %	Octadecyl Groups	Yes	22 MPa
MonoCap C18 High Resolution 2000		1 µm	2 µm	15 nm	85 %	Octadecyl Groups	Yes	35 MPa
MonoCap C18 High Resolution Ultra 2000		1 µm	2 µm	11 nm	85 %	Octadecyl Groups	Yes	35 MPa
MonoCap C18 Fast-flow		1 µm	2 µm	15 nm	85 %	Octadecyl Groups	Yes	22 MPa
MonoCap C18 Nano-flow		1 µm	1 µm	11 nm	85 %	Octadecyl Groups	Yes	22 MPa
MonoCap C18 WideBore		1 µm	2 µm	11 nm	85 %	Octadecyl Groups	Yes	22 MPa
MonoCap C18 Trap Column		2 µm	5 µm	11 nm	85 %	Octadecyl Groups	Yes	20 MPa
MonoCap Amide		1 µm	2 µm	15 nm	85 %	Carbamoyl Groups	None	22 MPa
MonoCap SCX		2 µm	5 µm	11 nm	85 %	Benzenesulfonyl Groups	None	20 MPa

* Based on monolithic technology, Merck KGaA, Darmstadt, Germany.

End-fittings of MonoCap Monolithic Capillary HPLC Columns

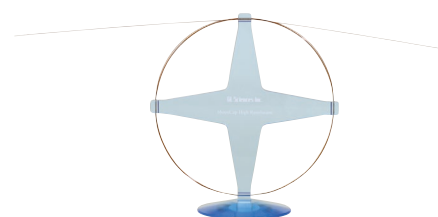
MonoCap C18 High Resolution 750
MonoCap C18 fast-flow
MonoCap Nano-flow
MonoCap C18 WideBore
MonoCap Amide
MonoCap SCX

1. Metal Hardware
End-fittings are Valco 1/16" (10-32 UNF).
Valco 1/32" (6-40 UNF) end-fittings can also be arranged upon request, indicate "1/32" when ordering.
2. PEEK Hardware
1/16" male nut, ferrule and PTFE sleeve are included.

MonoCap C18 High Resolution 2000
MonoCap C18 High Resolution Ultra 2000

End-fittings are not included.
The connection kits shown at page 132 must be purchased separately once.

MonoCap™ C18 High Resolution/MonoCap™ C18 High Resolution Ultra



MonoCap High Resolution 2000



PEEK Metal

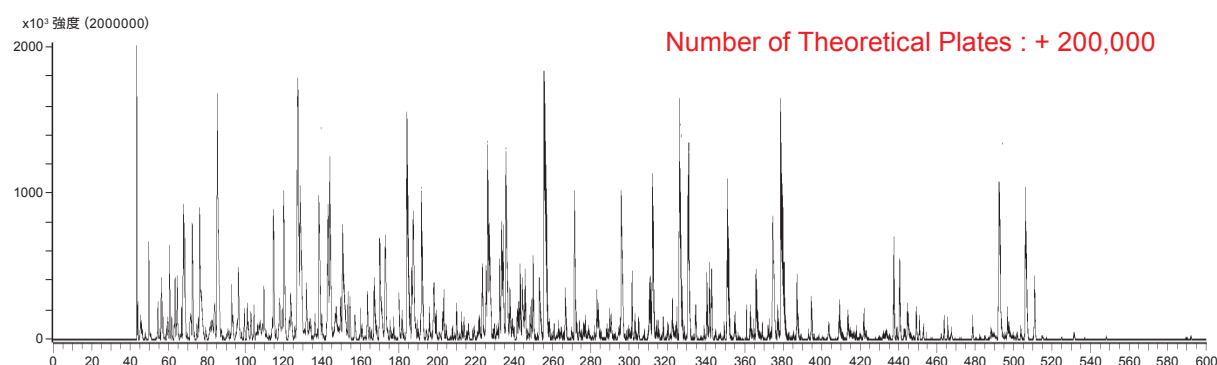
MonoCap High Resolution 750

Maximizing all the benefits and advantages of monolithic technology, MonoCap High Resolution and High Resolution Ultra are appropriate for the efficient separation of peptides and protein digests.

MonoCap High Resolution 750 deliver over 60,000 plates, while 2000 deliver over 300,000 plates.

The newly-introduced High Resolution Ultra type deliver over 300,000 plates.

Figure 1 : Analysis of Tryptic Digests



Conditions

Column : MonoCap C18 High Resolution 2000 (2000 mm × 0.1 mm I.D.)
Trap column : MonoCap C18 Trap Column (50 mm × 0.075 mm I.D.)
Eluent : A) 0.1 % HCOOH in CH₃CN
B) 0.1 % HCOOH in H₂O
A/B = 10/90 - 600 min - 45/55, v/v

Flow Rate : 0.5 µL/min
Injection Vol : 5 µL
Detection : MS (TIC m/z 500 - 1500)
Sample : Tryptic digest of proteins

MonoCap™ C18 High Resolution Ultra 2000

I.D.(mm)	Length(mm)	Cat.No.
0.1	2000	5020-10018

- * A column stand is included.
- * End-fittings are not included.
- * The connection kits shown at page 132 must be purchased separately once.

MonoCap™ C18 High Resolution 2000

I.D.(mm)	Length(mm)	Cat.No.
0.1	2000	5020-10015

- * A column stand is included.
- * End-fittings are not included.
- * The connection kits shown at page 132 must be purchased separately once.

MonoCap™ C18 High Resolution 750

I.D.(mm)	Length(mm)	Material of Hardware	Cat.No.
0.2	750	Metal	5020-10123
		PEEK	5020-10023

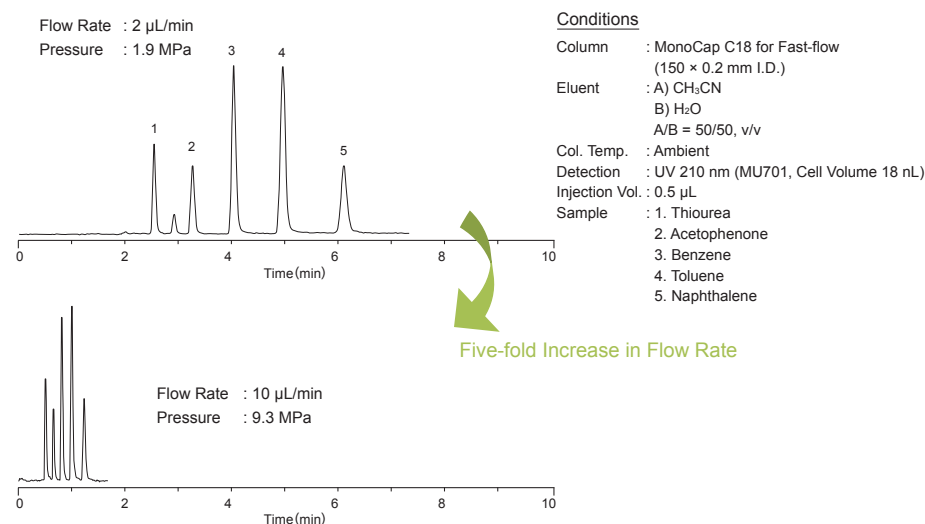
- * For end-fittings information, please refer to page 128.
- * For maximum operating pressure information, please refer to page 128.

Monolithic Capillary HPLC Columns

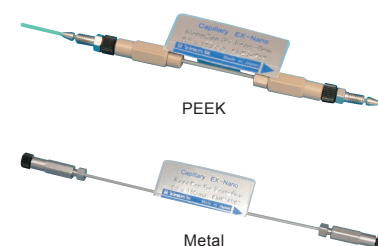
(Available in South Asia, Middle East and Africa only)

MonoCap™ C18 Fast-flow

Figure 1 : Workable at High Flow Rates without Sacrificing Efficiency



Workable at a broad range of linear velocity from 0.5 to 5 mm/s without sacrificing efficiency and separation at high speed. The number of theoretical plates produced by MonoCap C18 Fast-flow is nearly equivalent to a totally porous particle type capillary column packed with a 5 µm packing material. Columns are protected by either metal or PEEK hardware.



I.D.(mm)	Length(mm)	50	150	250
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.
0.05	Metal	5020-10102	5020-10101	5020-10100
	PEEK*	5020-10002	5020-10001	5020-10000
0.075	Metal	5020-10211	5020-10212	5020-10213
	PEEK*	5020-10221	5020-10222	5020-10223
0.1	Metal	5020-10112	5020-10111	5020-10110
	PEEK*	5020-10012	5020-10011	5020-10010
0.2	Metal	5020-10122	5020-10121	5020-10120
	PEEK*	5020-10022	5020-10021	5020-10020

* For end-fittings information, please refer to page 128.

* For maximum operating pressure information, please refer to page 128.

* All 50 mm length PEEK columns does not come with a hardware and will be supplied with 3 pcs of columns only.

MonoCap™ C18 Nano-flow



MonoCap C18 Nano-flow produces higher number of theoretical plates compared to a totally porous particle type capillary column packed with a 3 µm packing material. It can be operated at a wide range of flow rate with low back pressure and achieve very high sensitive results in Nano-LC-ESI/MS applications. Columns are protected by either metal or PEEK hardware.

I.D.(mm)	Length(mm)	50	150
	Material of Hardware	Cat.No.	Cat.No.
0.05	Metal	5020-10143	5020-10141
	PEEK*	5020-10043	5020-10041
0.075	Metal	5020-10231	5020-10232
	PEEK*	5020-10241	5020-10242
0.1	Metal	5020-10153	5020-10151
	PEEK*	5020-10053	5020-10051
0.2	Metal	5020-10163	5020-10161
	PEEK*	5020-10063	5020-10061

* For end-fittings information, please refer to page 128.

* For maximum operating pressure information, please refer to page 128.

* All 50 mm length PEEK columns does not come with a hardware and will be supplied with 3 pcs of columns only.

MonoCap™ C18 WideBore



The MonoCap C18 Fast-flow is also available in 0.5 mm I.D. size, which can be used at a wide range of flow rate from 6 to 100 µL/min without sacrificing efficiency. The number of theoretical plates produced by MonoCap C18 WideBore is nearly equivalent to a totally porous particle type capillary column packed with a 5 µm packing material. Columns are protected by metal hardware.

I.D.(mm)	Length(mm)	50	150	250
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.
0.5	Metal	5020-10202	5020-10201	5020-10200

* For end-fittings information, please refer to page 128.

* For maximum operating pressure information, please refer to page 128.

MonoCap™ C18 Trap Column



MonoCap C18 Trap Column with Hardware
(Top Image: 1/16" End-fittings, Bottom Image: 1/32" End-fittings)

MonoCap Trap columns have a relatively big throughpore and workable at a high flow rate such as 10 µL/min. This benefit makes MonoCap Trap columns to be appropriate for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

End-fittings are 1/16" (10-32 UNF). 1/32" end-fittings are also available upon request.

I.D.(mm)	Length(mm)	50	100	150
	Hardware	Cat.No.	Cat.No.	Cat.No.
0.05	With Hardware	5020-10026	5020-10038	-
	Without Hardware	5020-10027	5020-10039	
0.075	With Hardware	5020-10028	5020-10036	
	Without Hardware	5020-10029	5020-10037	
0.2	With Hardware	5020-10033	-	5020-10031
	Without Hardware	5020-10034		

MonoCap™ Amide



Amide groups are chemically bonded to the monolithic silica and makes it suitable for the analysis of sugars via HILIC mode. As the back pressure is significantly low, a 500 mm length MonoCap Amide column deliver over 40,000 plates offering high efficiency. Generally, HILIC mode uses acetonitrile at a concentration between 65-95 % in an aqueous buffer such as ammonium acetate or ammonium formate, which have high solubility in organic solvents. Columns are protected by either metal or PEEK hardware.

I.D.(mm)	Length(mm)	150	250	500
	Hardware	Cat.No.	Cat.No.	Cat.No.
0.075	Metal	5020-10191	5020-10192	5020-10193
	PEEK	5020-10091	5020-10092	5020-10093
0.1	Metal	5020-10181	5020-10182	5020-10183
	PEEK	5020-10081	5020-10082	5020-10083
0.2	Metal	5020-10171	5020-10172	5020-10173
	PEEK	5020-10071	5020-10072	5020-10073

* For end-fittings information, please refer to page 128.

* For maximum operating pressure information, please refer to page 128.

MonoCap™ SCX

MonoCap SCX is bonded with benzene sulfonic acid groups (strong cation exchange) and appropriate for 2D LC applications for the separation of biomolecules such as peptides and proteins.

I.D.(mm)	Length(mm)	50	150	250	500
	Material of Hardware	Cat.No.	Cat.No.	Cat.No.	Cat.No.
0.2	Metal	5020-10174	5020-10175	5020-10176	5020-10177
	PEEK	5020-10074	5020-10075	5020-10076	5020-10077

* For end-fittings information, please refer to page 128.

* For maximum operating pressure information, please refer to page 128.

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
Columns

Application
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Consumables and Accessories for Monolithic Capillary HPLC Columns

Connection Kit for MonoCap™ C18 High Resolution



Connection Kit for MonoCap™ C18 High Resolution 2000

A dedicated connection kit for MonoCap C18 High Resolution 2000. Use this connection kit when connecting the column directly to the system.

Description	Contents of Kit	Cat.No.
Connection Kit for MonoCap C18 High Resolution 2000	1/16" PEEK Ferrule, SUS Nut, Sleeve 2 pcs each 1/32" PEEK Ferrule, SUS Nut, Sleeve 2 pcs each	5020-10017

Zero Dead Volume Union

Connect the tubing from the system to this union and install the column to achieve zero dead volume.

Description	P/N	Orifice	Remarks	Cat.No.
Zero Dead Volume Union	U-435	0.25 mm	1/16"Tubing SUS Male Nut,	6010-72352
	U-411	178 μm	Ferrule 2 pcs each	6010-72351

Connection Kit for MonoCap™ C18 Trap Column

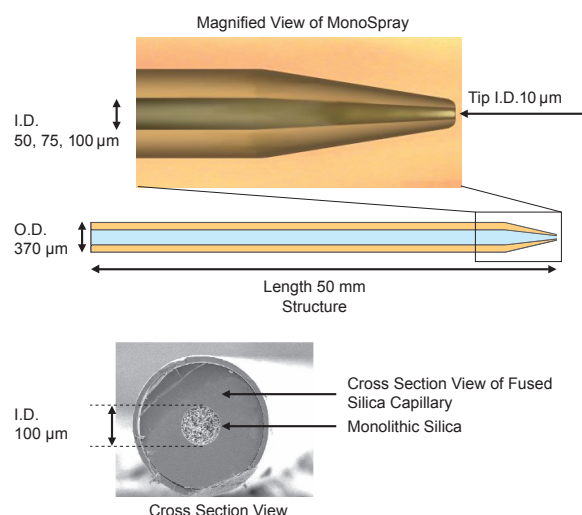


Description	Cat.No.
MonoCap C18 Trap Column Connection Kit 1/16" (Union-Sleeve-Capillary Tubing 2 pcs each Nut-Ferrule4 pcs each)	5020-10044
MonoCap C18 Trap Column Connection Kit 1/32" (Union-Sleeve-Capillary Tubing 2 pcs each Nut-Ferrule4 pcs each)	5020-10045
MonoCap C18 Trap Column Assembly Parts 1/16" (Nut-Ferrule4 pcs each)	5020-10046
MonoCap C18 Trap Column Assembly Parts 1/32" (Nut-Ferrule4 pcs each)	5020-10047

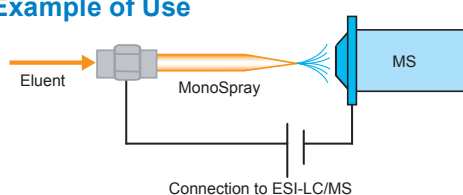
MonoSpray™

MonoSpray™

MonoSpray is an electrospray emitter for ESI-LC/MS which a monolithic packing is packed into a fused silica sprayer offering numbers of benefits compared to those traditional sprayers packed with particle based packings.



Example of Use



• Ordering Information

MonoSpray™ FS

For online Nano-ESI-LC/MS.

I.D. : 50, 75, 100 µm

MonoSpray™ C18

Nano sprayer packed with octadecylated silica monolith offering reversed phased separation.

I.D. : 75, 100 µm

MonoSpray™ FS

Description	Length (mm)	O.D. (µm)	I.D. (µm)	Qty (pcs)	Cat.No.
Mono Spray FS	50	370	50	5	5010-20001
				20	5010-20006
			75	5	5010-20002
				20	5010-20007
			100	5	5010-20003
				20	5010-20008

* Please inquire for other sizes.

• Benefits

High Sensitivity Analysis

The introduction of a monolithic packing into the sprayer deliver minimized sample diffusion resulting in high sensitivity.

High Chemical Stability

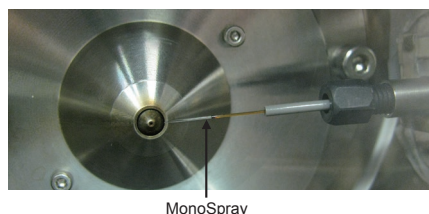
The optimized surface treatment to the silica monolith eliminates non-specific adsorption issues.

High Physical Stability

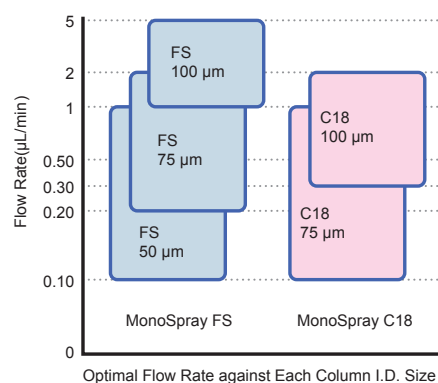
Frits are not installed in MonoSpray to keep the monolithic packing in place, which results in offering simply longer lifetime and avoiding bed splitting problems compared to those traditional sprayers packed with particle based packings.

Wide Range of Operational Flow Rates

The very high porosity of monolithic packing allows a wide range of operational flow rates, even at high flow rates.



Change in Spray Shape at Different Flow Rates



MonoSpray™ C18

Description	Length (mm)	O.D. (µm)	I.D. (µm)	Qty (pcs)	Cat.No.
Mono Spray C18 Nano	50	370	75	1	5010-20012
				4	5010-20017
			100	1	5010-20013
				4	5010-20018

* Please inquire for other sizes.

Based on monolithic technology, Merck KGaA, Darmstadt, Germany.



Applications

• Visit our website	136
• Pharmacopeia	137
• Pharmaceuticals	138
• Biochemicals	139
• Foods	140
• Environmental	142
• Pesticides	143
• Vitamins	144
• Others	145

Applications

Visit our website

Provided a number of applications in various fields on our website.
Please visit our website.

<http://www.gls.co.jp/>

Top of our website

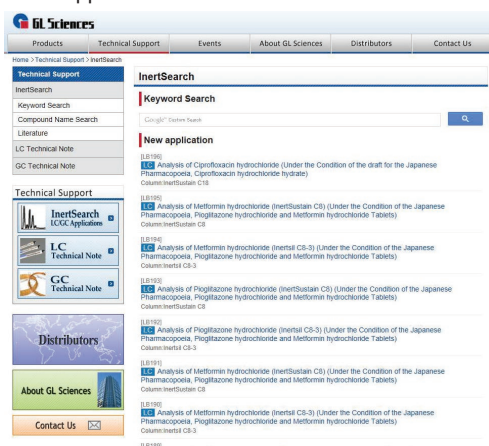


[Click here](#)

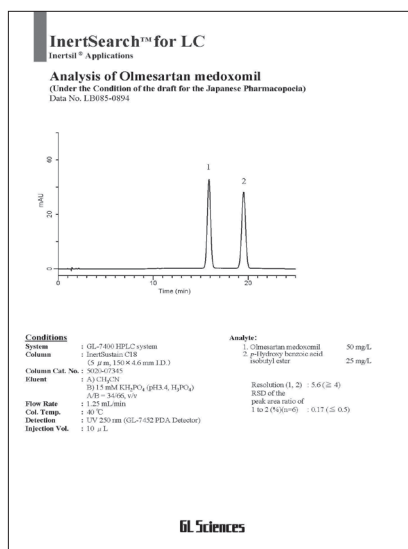
InertSearch

<http://www.glsciences.com/tech/inertsearch/>

Various HPLC applications are available.



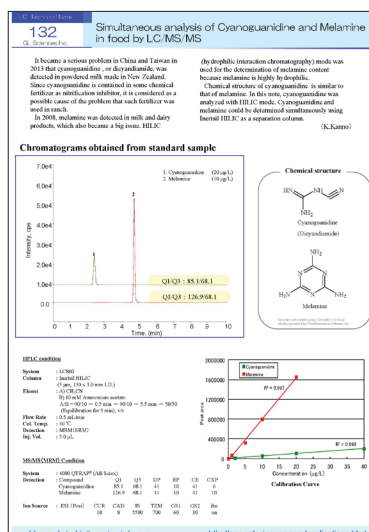
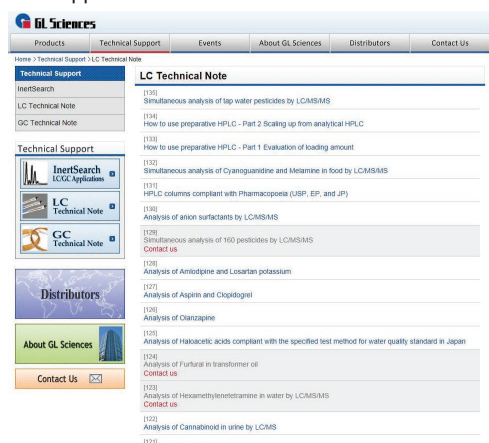
The latest application is uploaded.



LC Technical Note

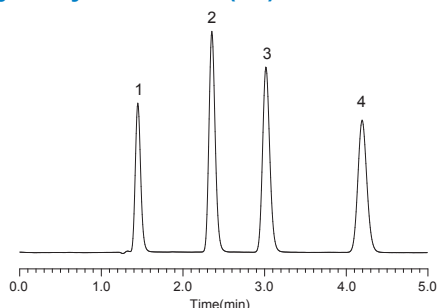
http://www.glsciences.com/tech/lc_technicalnote/

More detailed applications are available.



Pharmacopeia

Para-Hydroxybenzoate (JP)



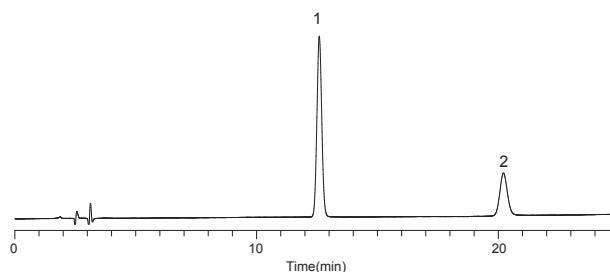
Conditions

Column : Inertsil ODS-4 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 50 mM KH₂PO₄
 A/B = 13/7, v/v

Flow Rate : 1.3 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : UV 272 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB097, LB098

Sample :
 1. *p*-Hydroxybenzoic acid
 2. *p*-Hydroxybenzoic acid methyl ester
 3. *p*-Hydroxybenzoic acid ethyl ester
 4. *p*-Hydroxybenzoic acid *n*-propyl ester

Crospovidone (JP)



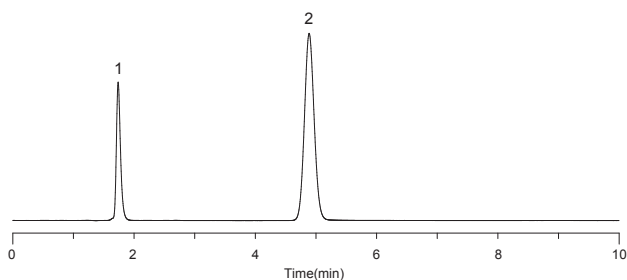
Conditions

Column : InertSustain C18 (5 μ m, 250 $\times$ 4.0 mm I.D.)
 Guard Column : InertSustain C18 (5 μ m, 25 $\times$ 4.0 mm I.D.)
 Eluent : A) CH₃CN
 B) H₂O
 A/B = 1/9, v/v

Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 235 nm
 Injection Vol. : 50 μ L
 Data Source : LC InertSearch No. LB167

Sample :
 1. 1-Vinyl-2-pyrrolidone
 2. Vinyl acetate

Losartan potassium and Hydrochlorothiazide (USP)



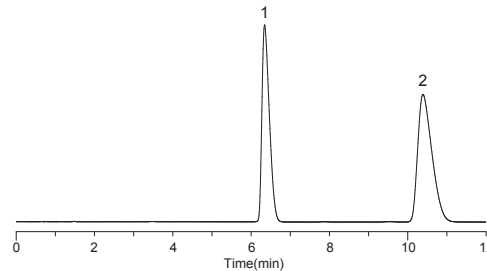
Conditions

Column : Inertsil C8-3 (10 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM KH₂PO₄ in H₂O (pH 2.5, H₃PO₄)
 A/B = 40/60, v/v

Flow Rate : 2.3 mL/min
 Col. Temp. : 35 $^{\circ}$ C
 Detection : UV 230 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LB200

Sample :
 1. Hydrochlorothiazide (14 mg/L)
 2. Losartan potassium (55 mg/L)

Carumonam Sodium (JP)



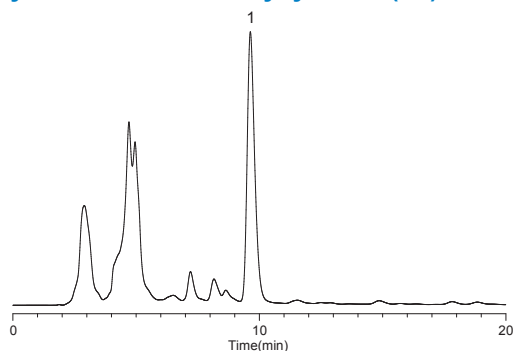
Conditions

Column : Inertsil ODS-2 (5 μ m, 150 $\times$ 4.0 mm I.D.)
 Eluent : A) 0.1 g/L (NH₄)₂SO₄
 B) CH₃OH
 C) CH₃COOH
 A/B = 97/2/1, v/v/v

Flow Rate : 1.4 mL/min
 Col. Temp. : 25 $^{\circ}$ C
 Detection : UV 254 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA994

Sample :
 1. Resorcinol (1.8 mg/L)
 2. Carumonam sodium (0.4 mg/L)

Glycyrrhetic acid in Glycyrrhiza (JP)



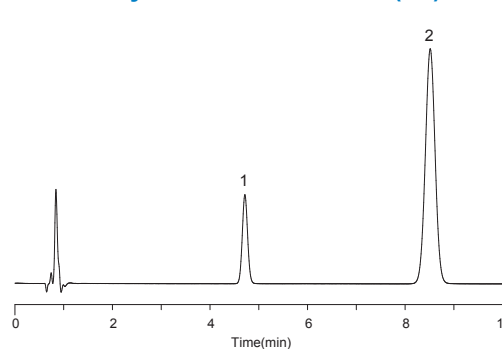
Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 2.1 % CH₃COOH in H₂O
 A/B = 40/60, v/v

Flow Rate : 0.45 mL/min
 Col. Temp. : 20 $^{\circ}$ C
 Detection : UV 254 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LB182

Sample :
 1. Glycyrrhizic acid

Terbinafine Hydrochloride Cream (JP)



Conditions

Column : InertSustainSwift C18 (5 μ m, 125 $\times$ 4.0 mm I.D.)
 Eluent : A) CH₃CN
 B) 0.45 % Tetramethylammonium hydroxide in H₂O (pH 8.0, 4 % H₃PO₄ in H₂O)
 C) THF
 A/B/C = 2/2/1, v/v/v

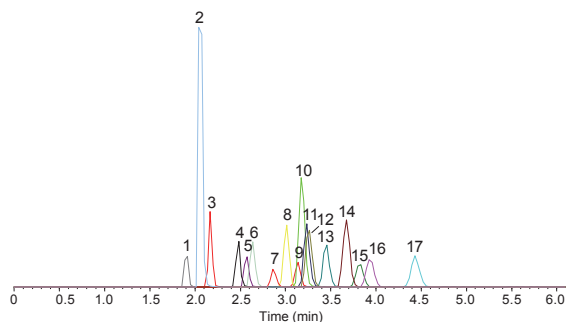
Flow Rate : 1.46 mL/min
 Col. Temp. : 25 $^{\circ}$ C
 Detection : UV 282 nm
 Injection Vol. : 10 μ L

Sample :
 1. *p*-Terphenyl (17.5 mg/L)
 2. Terbinafine hydrochloride (200 mg/L)

Applications

Pharmaceuticals

17 Anti-Depressant Drugs

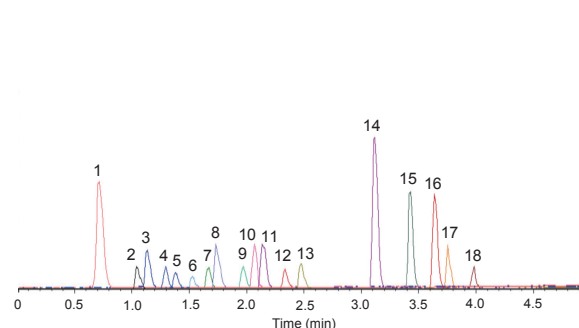


Conditions

Column : InertSustain C18 HP
(3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) 0.1 % HCOOH in CH₃CN
B) 0.1 % HCOOH in H₂O
A/B = 2/98 - 0.5 min - 40/60
- 5.5 min - 40/60, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS
(4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 5 μ L
Data Source : LC InertSearch No. LA908

Sample :
1. Sulpiride
2. Milnacipran
3. Trazodone
4. Mianserin
5. Amoxapine
6. Doxepin
7. Paroxetine
8. Desipramine
9. Fluvoxamine
10. Imipramine
11. Nortriptyline
12. Maprotiline
13. Amitriptyline
14. Trimipramine
15. Fluoxetine
16. Sertraline
17. Clomipramine
(100 ng/mL each)

18 Drugs

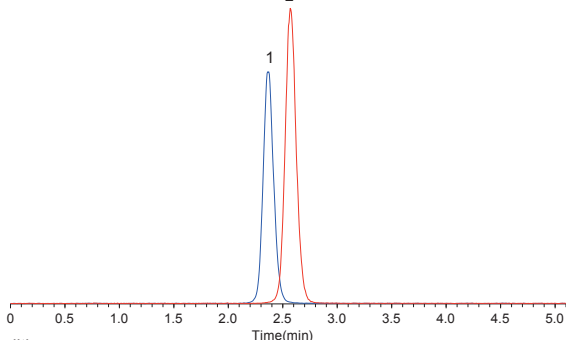


Conditions

Column : Inertsil ODS-3
(2 μ m, 50 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃CN
B) 0.05 % HCOOH in H₂O
A/B = 5/95 - 5 min - 95/5, v/v
Flow Rate : 500 μ L/min
Col. Temp. : 40 °C
Detection : LC/MS/MS
(4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 10 μ L

Sample :
1. Ranitidine
2. Scopolamine
3. Naltrexone
4. Acetaminophen
5. Theophylline
6. Metoprolol
7. Caffeine
8. Chlorpheniramine
9. Propranolol
10. Diphenhydramine
11. Doxepin
12. Amitriptyline
13. Reserpine
14. Isopropylantipyrene
15. Ketoprofen
16. Warfarin
17. Capsaicin
18. Dihydrocapsaicin

Anti-inflammatory Drug

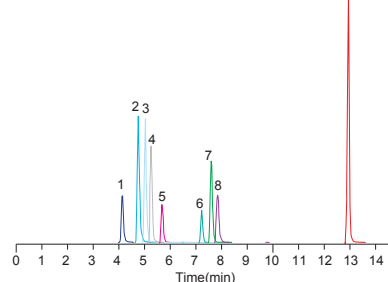


Conditions

Column : InertSustain Phenyl (2 μ m, 50 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃OH/HCOOH = 100/0.05, v/v
B) H₂O/HCOOH = 100/0.05, v/v
A/B = 40/60, v/v
Flow Rate : 0.6 mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS (4000 QTRAP:ESI, Positive, MRM)
Injection Vol. : 5 μ L
Data Source : LC InertSearch No. LB198

Sample :
1. Hydrocortisone
2. Prednisolone
(0.1 mg/L each)

Histamine Antagonist

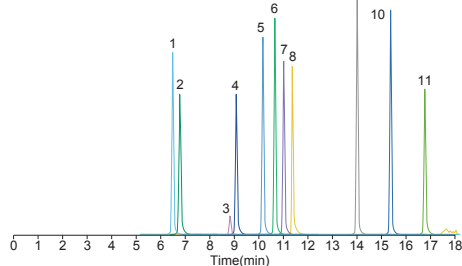


Conditions

Column : Inertsil ODS-4 (3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃OH
B) 2 mM CH₃COONH₄
A/B = 40/60 - 10 min - 95/5
- 2 min - 95/5, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS
(4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA678

Sample :
1. Chlorpheniramine
2. Cinnarizine
3. Clemastine
4. Difenedol
5. Diphenhydramine
6. Diphenylpyraline
7. Hydroxyzine
8. Promethazine
9. Triprolidine
(0.1 mg/L each)

11 Drugs

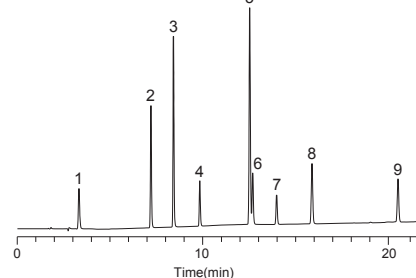


Conditions

Column : Inertsil ODS-3 (3 μ m, 100 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃CN
B) 0.1 % HCOOH in H₂O
A/B = 0/100 - 6 min - 10/90
- 12 min - 100/0, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS
(4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA610

Sample :
1. Salbutamol (7.5 μ g/L)
2. Ranitidine (15.0 μ g/L)
3. Acetaminophen (15.0 μ g/L)
4. Theophylline (20.0 μ g/L)
5. Metoprolol (22.5 μ g/L)
6. Caffeine (15.0 μ g/L)
7. Propranolol (12.5 μ g/L)
8. Doxepin (5.0 μ g/L)
9. Carbamazepine (5.0 μ g/L)
10. Ketoprofen (15.0 μ g/L)
11. Indomethacin (20.0 μ g/L)

Cold Medication



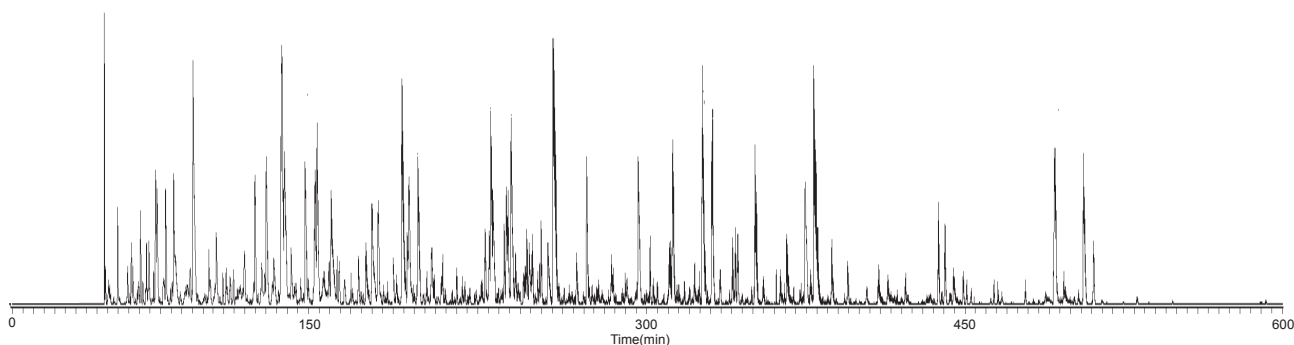
Conditions

Column : Inertsil ODS-4 (5 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃CN
B) 0.1 % H₃PO₄ in H₂O
A/B = 3/97 - 20 min
- 75/25, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA616

Sample :
1. Maleic acid
2. Acetaminophen
3. Caffeine
4. Chlorpheniramine
5. Ethenzamide
6. Bromovalerylurea
7. Apronalide
8. Isopropylantipyrene
9. Ibuprofen
(50 mg/L each)

Biochemicals

Trypsin Digest of the Protein

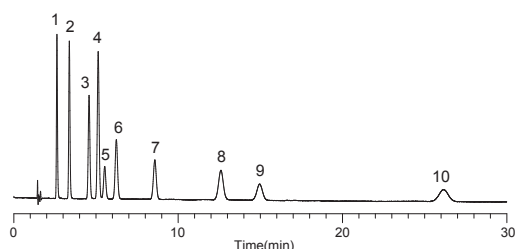


Conditions

Column : MonoCap C18 High Resolution 2000 (2000 mm × 0.1 mm I.D.)
 Trap Column : MonoCap C18 Trap Column (50 mm × 0.075 mm I.D.)
 Eluent : A) 0.1 % HCOOH in CH₃CN, B) 0.1 % HCOOH in H₂O
 A/B=10/90 - 600 min - 45/55, v/v
 Flow Rate : 0.5 µL/min

Col. Temp. : ambient
 Detection : LC/MS/MS (JMS-T100-LC, JEOL, m/z 500-1500)
 Injection Vol. : 5 µL
 Sample : tryptic digest of proteins

Nucleoside and Nucleic acid base

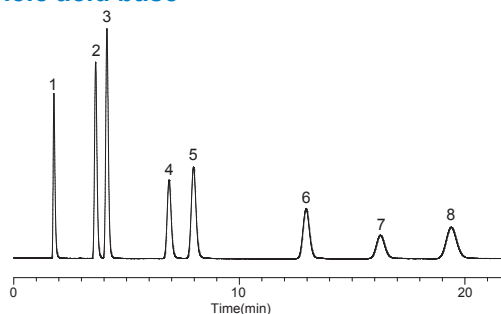


Conditions

Column : InertSustain C18 (5 µm, 150 × 4.6 mm I.D.)
 Eluent : 0.1 M NH₂PO₄, 0.2 M NaClO₄ (pH 2.03, H₃PO₄)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 260 nm
 Injection Vol. : 1 µL
 Data Source : LC InertSearch No. LA895

Sample :
 1. Cytosine
 2. Uracil
 3. Guanine
 4. Adenine
 5. Cytidine
 6. Uridine
 7. Thymine
 8. Adenosine
 9. Guanosine
 10. Thymidine

Nucleic acid base

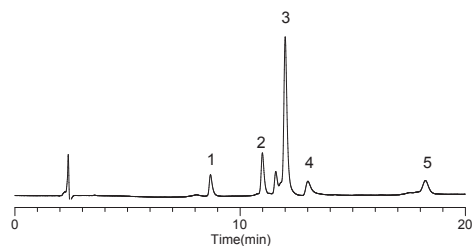


Conditions

Column : Inertsil Amide (5 µm, 250 × 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) 10 mM HCOONH₄
 A/B = 90/10, v/v
 Flow Rate : 0.2 mL/min
 Col. Temp. : 35 °C
 Detection : UV 254 nm
 Injection Vol. : 1 µL
 Data Source : LC InertSearch No. LB001

Sample :
 1. Toluene
 2. Thymine
 3. Uracil
 4. Uridine
 5. Adenosine
 6. Cytosine
 7. Cytidine
 8. Guanosine
 (10 mg/L each)

Protein

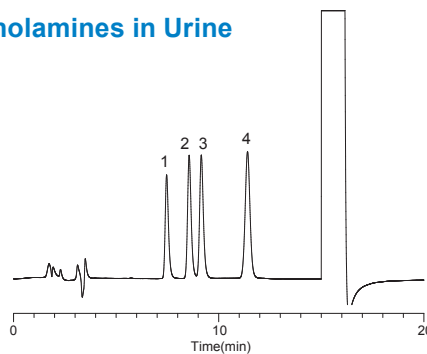


Conditions

Column : Inertsil WP300 C18 (5 µm, 150 × 3.0 mm I.D.)
 Eluent : A) 0.1 % TFA in CH₃CN
 B) 0.1 % TFA in H₂O
 A/B = 20/80 - 20 min - 70/30, v/v
 Flow Rate : 0.4 mL/min
 Col. Temp. : 40 °C
 Detection : UV 280 nm
 Injection Vol. : 10 µL
 Data Source : LC Technical Note No. 116

Sample :
 1. Ribonuclease B
 2. Cytochrome c
 3. Lysozyme
 4. BSA
 5. Ovalbumin

Catecholamines in Urine



Conditions

Column : Inertsil ODS-4
 (5 µm, 250 × 3.0 mm I.D.)
 Eluent : A) Acetate-citrate buffer *
 B) CH₃CN
 A/B = 100/16, v/v
 Flow Rate : 0.5 mL/min
 Col. Temp. : 35 °C
 Detection : ECD 800 mV vs. Ag/AgCl
 Injection Vol. : 20 µL
 Data Source : LC Technical Note No. 93

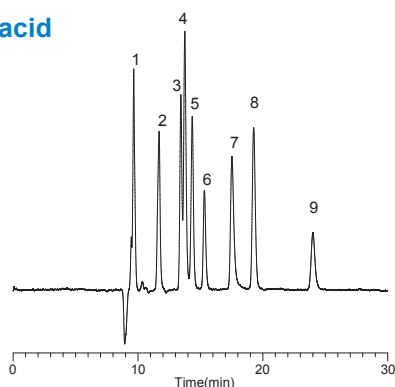
Sample :
 1. Norepinephrine (NE)
 2. Epinephrine (E)
 3. 3,4-dihydroxybenzylamine (DHBA, I.S.)
 4. Dopamine (DA)
 (100 ng/mL in 0.1 % Acetic acid solution each)

* : Acetate-citrate buffer :
 Dissolve 0.82 g of anhydrous sodium acetate, 2.10 g of citric acid monohydrate and 0.50 g of sodium 1-octanesulfonate in 500mL of H₂O.

Applications

Foods

Organic acid

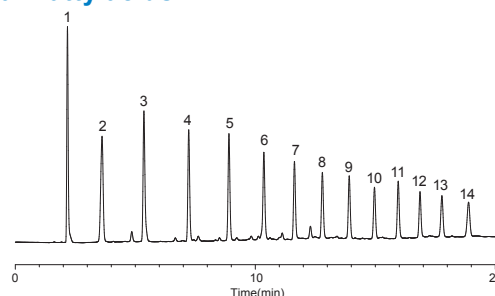


Conditions

Column : Inertsil Ph-3 (5 μ m, 250 $\times$ 4.6 mm I.D.)
+ Inertsil CX (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : 3 mM HClO₄ in H₂O
Reaction Reagent : 0.1 mM BTB + 30 mM Na₂HPO₄ in H₂O
Flow Rate : 0.5 mL/min
Col. Temp. : 35 °C
Detection : VIS 440 nm
Injection Vol. : 10 μ L
Data Source : LC Technical Note No. 24

Sample :
1. Phosphoric acid 6. Lactic acid
2. Tartaric acid 7. Acetic acid
3. Malic acid 8. Succinic acid
4. Formic acid 9. Pyroglutamic acid
5. Citric acid (1 mg/mL each)

Linear Fatty acids

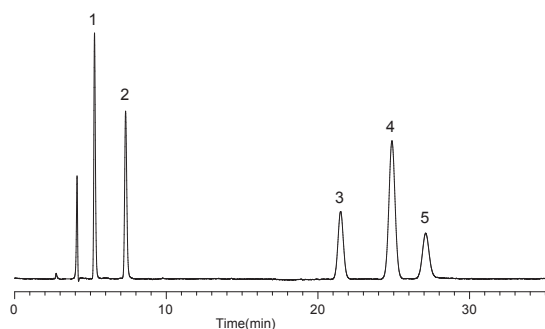


Conditions

Column : InertSustain C18
(5 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : A) 0.1 % H₃PO₄ in CH₃CN
B) 0.1 % H₃PO₄ in H₂O
A/B = 10/90 -15 min
- 90/10 -10 min - 90/10, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA901

Sample :
1. Acetic acid (C2) 9. Capric acid (C10)
2. Propionic acid (C3) 10. Undecanoic acid (C11)
3. Butyric acid (C4) 11. Lauric acid (C12)
4. Valeric acid (C5) 12. Tridecanoic acid (C13)
5. Caproic acid (C6) 13. Myristic acid (C14)
6. Enanthic acid (C7) 14. Pentadecanoic acid (C15)
7. Caprylic acid (C8) (1 mg/mL each)
8. Pelargonic acid (C9)

Preservatives and Sweetener

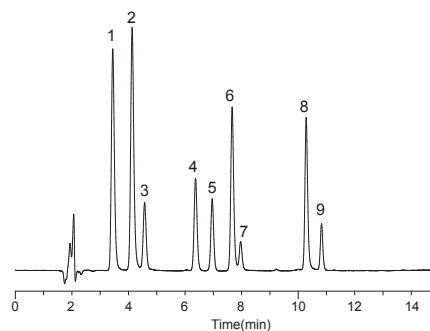


Conditions

Column : InertSustain Phenyl (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃CN
B) 0.2 % HCOOH in H₂O
A/B = 15/85, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 25 °C
Detection : UV 230 nm
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LB031

Sample :
1. Acesulfame potassium
2. Saccharin
3. Sorbic acid
4. Benzoic acid
5. Dehydroacetic acid
(10 mg/L each)

Phenolic Antioxidants

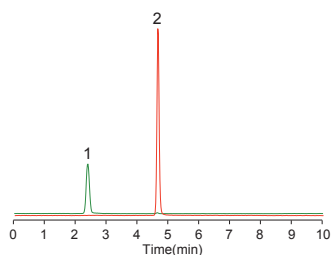


Conditions

Column : Inertsil Ph-3 (5 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃OH B) CH₃CN
C) 5 % Acetic acid
A/B/C = 20/20/60 - 15 min
- 50/50/0, v/v/v
(Mixed by a gradient mixer)
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Injection : 10 μ L
Data Source : LC Technical Note No. 65

Sample :
1. Propyl gallate (PG)
2. 2,4,5-Trihydroxybutyrophenone (THBP)
3. tert-Butylhydroquinone (TBHQ)
4. Nordihydroguaiaretic acid (NDGA)
5. Butylated Hydroxyanisole (BHA)
6. Octyl gallate (OG)
7. 4-Hydroxymethyl-2,6-di-tert-butylphenol (HMBP)
8. Dodecyl gallate (DG)
9. Butylated hydroxytoluene (BHT)
(10 mg/L each)

Cyanoguanidine and Melamine in Food

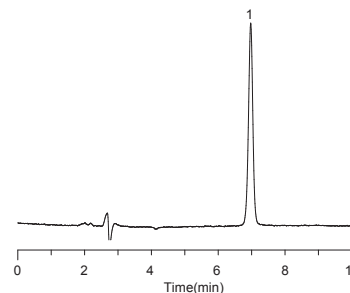


Conditions

Column : Inertsil HILIC (5 μ m, 150 $\times$ 3.0 mm I.D.)
Eluent : A) CH₃CN
B) 10 mM Ammonium acetate
A/B = 90/10 - 0.5 min - 90/10
- 5.5 min - 50/50, v/v
Flow Rate : 0.5 mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 5.0 μ L
Data Source : LC Technical Note No.132

Sample :
1. Cyanoguanidine (20 μ g/L)
2. Melamine (10 μ g/L)

Oxalic acid in Food



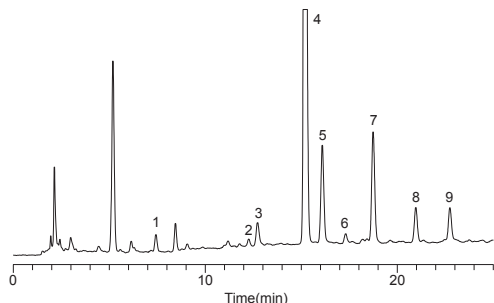
Conditions

Column : Inertsil Amide (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃CN
B) 30 mM Na₂HPO₄ in H₂O (pH 6.8, H₃PO₄)
A/B = 65/35, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 50 °C
Detection : UV 220 nm
Injection : 5 μ L
Data Source : LC Technical Note No.109

Sample :
1. Oxalic acid
(100 mg/L)

Foods

Canthaxanthin in Tea

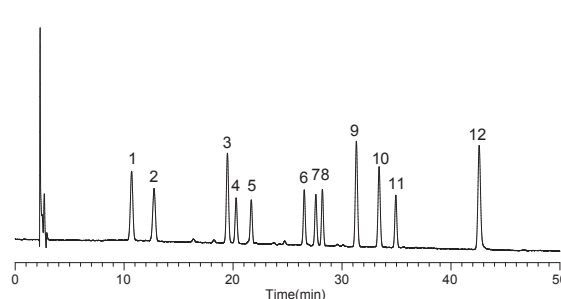


Conditions

Column : Inertsil ODS-3(4 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 10 mM NaH₂PO₄ in H₂O
 A/B = 10/90 - 30 min - 50/50, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 280 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA684

Sample :
 1. Galliccatechin (GC)
 2. Epigallocatechin (EGC)
 3. Catechin (C)
 4. Caffeine
 5. Epigallocatechin gallate (EGCg)
 6. Epicatechin (EC)
 7. Galliccatechin gallate (GCg)
 8. Epicatechin gallate (ECg)
 9. Catechin gallate (Cg)

Isoflavones

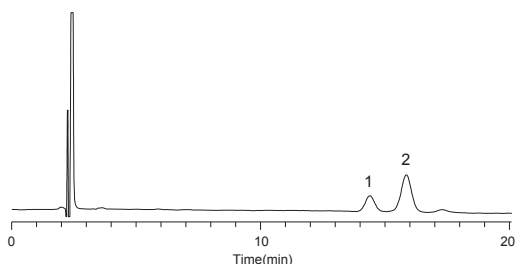


Conditions

Column : Inertsil ODS-SP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) 0.1 % CH₃COOH in CH₃CN
 B) 0.1 % CH₃COOH in H₂O
 A/B = 15/85 - 8 min
 - 15/85 - 42 min - 35/65, v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 35 °C
 Detection : PDA 254 nm
 Injection : 10 μ L
 Data Source : LC Technical Note No. 66

Sample :
 1. Daidzin (D)
 2. Glycitin (GI)
 3. Genistin (G)
 4. 6"-O-Malonyldaidzin (MD)
 5. 6"-O-Malonylglycitin (MGI)
 6. 6"-O-Acetyldaidzin (AD)
 7. 6"-O-Acetylglycitin (AGI)
 8. 6"-O-Malonylgenistin (MG)
 9. Daizein (De)
 10. Glycitein (Gle)
 11. 6"-O-Acetylgenistin (AG)
 12. Genistein (Ge)
 (10 mg/L each)

Carotene in Food



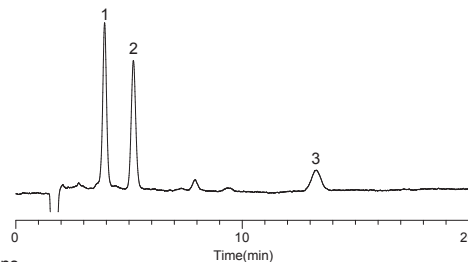
Conditions

Column : Inertsil ODS-P
 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) Ethanol
 A/B = 90/10, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C

Detection : VIS 455 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No.28

Sample :
 1. α -Carotene
 2. β -Carotene

Tetracycline



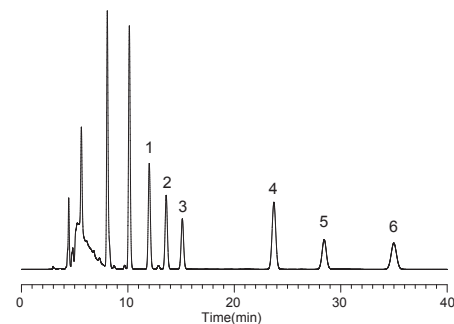
Conditions

Column : InertSustain C18
 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) Imidazole buffer*
 B) CH₃OH
 A/B = 80/20, v/v (Premix)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : FL Ex 380 nm Em 520 nm
 Injection Vol. : 20 μ L

Sample :
 1. Oxytetracycline
 2. Tetracycline
 3. Chlortetracycline
 (1 mg/L each)

* Imidazole buffer :
 Dissolve 68.08 g of imidazole, 0.37 g of sodium ethylenediaminetetraacetate and 10.72 g of magnesium acetate in 800 mL of H₂O.
 Adjust to pH 7.2 with acetic acid and dilute this solution to 1,000 mL with H₂O.

Putrefactive Non-Volatile Amines in Food by Pre-column HPLC



Conditions

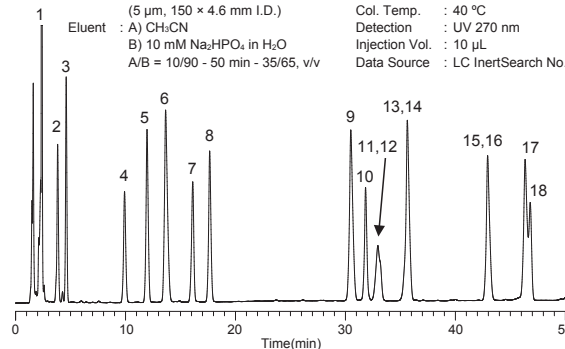
Column : Inertsil ODS-SP (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Guard Column : Inertsil ODS-SP (5 μ m, 10 $\times$ 4.0 mm I.D.)
 Eluent : A) CH₃CN B) H₂O A/B = 65/35, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : FL Ex 325 nm Em 525 nm
 Injection : 10 μ L
 Data Source : LC Technical Note No. 48

Sample :
 1. Putrescine (5 mg/L)
 2. Cadaverine (5 mg/L)
 3. Histamine (100 mg/L)
 4. 1,8-Diaminooctane (10 mg/L)
 5. Tyramine (25 mg/L)
 6. Spermidine (5 mg/L)

Food Dyes

Conditions

Column : Inertsil ODS-3
 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN B) 10 mM Na₂HPO₄ in H₂O
 A/B = 10/90 - 50 min - 35/65, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : UV 270 nm
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LA509



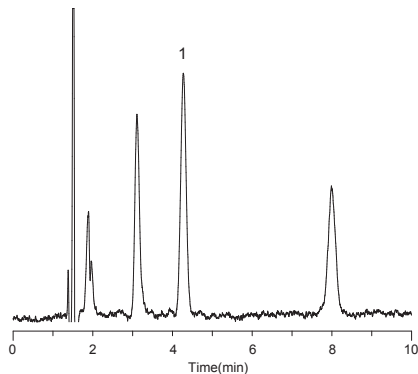
Sample :

1. Tartrazine (Food Yellow No. 4, 7.6 mg/L)
 2. Amaranth (Food Red No. 2, 3.8 mg/L)
 3. Inglicarmine (Food Blue No. 2, 7.6 mg/L)
 4. New cocine (Food Red No. 102, 3.8 mg/L)
 5. Sunset Yellow FCF (Food Yellow No. 5, 5.3 mg/L)
 6. Naphthol Yellow S (7.6 mg/L)
 7. Uranine (3.8 mg/L)
 8. Allura red AC (5.3 mg/L)
 9. Ponceau R (7.6 mg/L)
 10. Ponceau SX (5.3 mg/L)
 11. Orange I (5.3 mg/L)
 12. Fast green FCF (Food Green No. 3, 3.0 mg/L)
 13. Brilliant blue FCF (Food Blue No. 1, 3.0 mg/L)
 14. Ponceau 3R (7.6 mg/L)
 15. Erythrosine (Food Red No. 3, 5.3 mg/L)
 16. Azure Blue VX (Sulfan blue, 3.0 mg/L)
 17. Orange II (7.6 mg/L)
 18. Acid red (Food Red No. 106, 3.0 mg/L)

Applications

Environmental

Non-ionic Surfactant

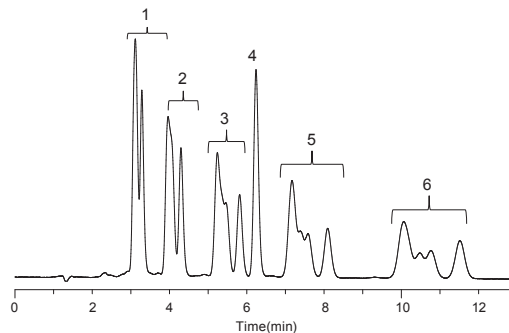


Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃OH B) 10 mM Na₂B₄O₇ in H₂O A/B = 38/62, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 510 nm
Injection Vol. : 20 μ L
Data Source : LC InertSearch No. LA974

Sample :
1. Heptaoxyethylene dodecyl ether
[Deriv.](0.002 mg/L)

Anion Surfactant (Toluene addition sample)

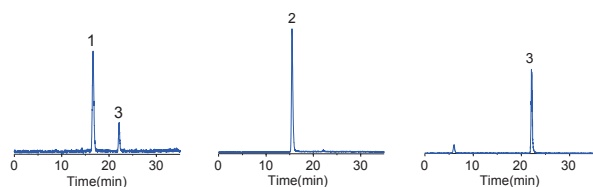


Conditions

Column : Inertsil ODS-3 (5 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : 0.1 M NaClO₄ in CH₃CN/H₂O = 65/35, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : FL Ex 221 nm Em 284 nm
Injection Vol. : 10 μ L
Data Source : LC Technical Note No. 102

Sample :
1. Sodium Decylbenzenesulfonate(C10)
2. Sodium Undecylbenzenesulfonate(C11)
3. Sodium Dodecylbenzenesulfonate(C12)
4. Toluene
5. Sodium Tridecylbenzenesulfonate(C13)
6. Sodium Tetradecylbenzenesulfonate(C14)
(1 mg/L each)

Haloacetic acids

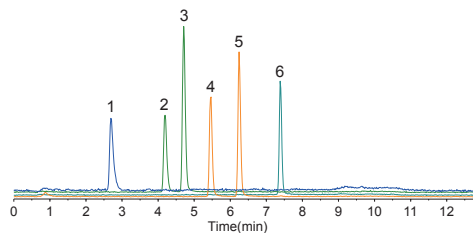


Conditions

Column : InertSustain C18 (3 μ m, 150 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃OH B) 0.2 % HCOOH in H₂O A/B = 5/95 - 38 min - 100/0 - 12 min - 100/0, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 30 °C
Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
Injection Vol. : 100 μ L
Data Source : LC Technical Note No. 125

Sample :
1. Monochloroacetic acid (MCAA)(2 μ g/L)
2. Dichloroacetic acid (DCAA)(4 μ g/L)
3. Trichloroacetic acid (TCAA)(20 μ g/L)

Chlorophenol

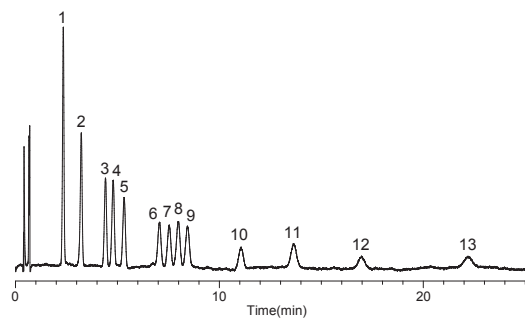


Conditions

Column : InertSustain C18 HP (3 μ m, 100 $\times$ 2.1 mm I.D.)
Eluent : A) CH₃OH B) CH₃OH/H₂O = 10/90, v/v A/B = 40/60 - 8 min - 90/10 - 0.5 min - 90/10 - 0.1 min - 40/60 - 5 min - 40/60, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 °C
Detection : LC/MS (4000 QTRAP : APCI, Neg, SIM)
Injection Vol. : 25 μ L

Sample :
1. Phenol
2. 2-Chlorophenol
3. 4-Chlorophenol
4. 2,6-Chlorophenol
5. 2,4-Chlorophenol
6. 2,4,6-Chlorophenol
(0.83 μ g/L in H₂O each)

13 Kinds of Aldehydes

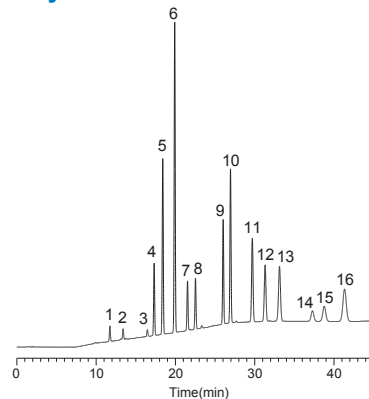


Conditions

Column : InertSustain C18 HP (3 μ m, 150 $\times$ 3.0 mm I.D.)
Eluent : A) CH₃CN B) H₂O C) THF A/B/C = 35/55/10, v/v/v
Flow Rate : 1.5 mL/min
Col. Temp. : 40 °C
Detection : UV 360 nm
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA962

Sample :
1. DNPH-Formaldehyde
2. DNPH-Acetaldehyde
3. DNPH-Acetone
4. DNPH-Acrolein
5. DNPH-Propionaldehyde
6. DNPH-Crotonaldehyde
7. DNPH-Methylethylketone
8. DNPH-Methacrolein
9. DNPH-n-Butyraldehyde
10. DNPH-Benzaldehyde
11. DNPH-n-Valeraldehyde
12. DNPH-m-Tolualdehyde
13. DNPH-Hexanal
(150 μ g/L each)

Aromatic Hydrocarbons



Conditions

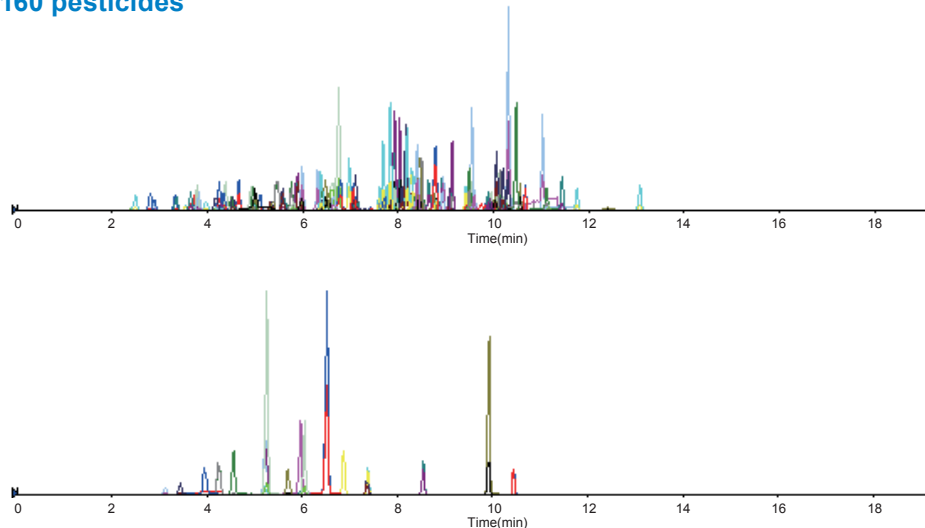
Column : Inertsil ODS-P (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) CH₃OH B) CH₃OH/H₂O = 70/30, v/v A/B = 0/100 - 5 min - 0/100 - 20 min - 100/0, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm
Data Source : InertSearch for LC No. LA336

Sample :
1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluorene
8. Pyrene
9. Benzo-[a]-anthracene
10. Chrysene
11. Benzo-[b]-fluoranthene
12. Benzo-[k]-fluoranthene
13. Benzo-[a]-pyrene
14. Dibenzo-[a]-pyrene
15. Benzo-[ghi]-pyrene
16. Indeno-[1,2,3-cd]-pyrene
(10 ng/mL in CH₃OH each)

Pesticides

160 pesticides

Provided by AB SCIEX

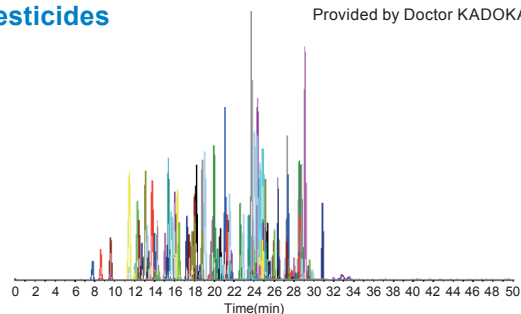


Conditions

Column : InertSustain C18
(2 μ m, 100 $\times$ 2.1 mm I.D.)
Eluent : A) 2 mM $\text{CH}_3\text{COONH}_4$
B) CH_3OH
A/B = 5/95 - 0.5 min - 30/70 - 9.5 min
- 95/5 - 5 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col.Temp. : 40 $^\circ\text{C}$
Detection : LC/MS/MS
(4000 QTRAP : ESI, MRM)
Injection Vol. : 10 μ L
Data Source : LC Technical Note No. 129

118 Pesticides

Provided by Doctor KADOKAMI

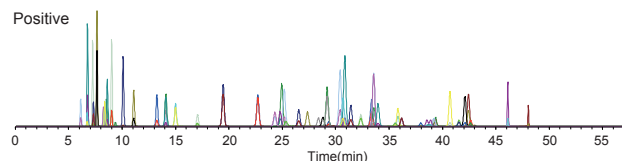


Conditions

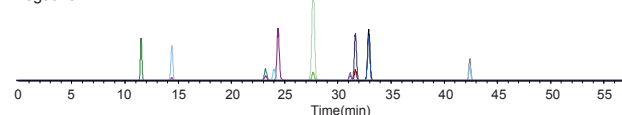
Column : Inertsil ODS-4 HP (3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) 5 mM $\text{CH}_3\text{COONH}_4$ in CH_3OH
B) 5 mM $\text{CH}_3\text{COONH}_4$ in H_2O
A/B = 5/95 - 30 min - 95/5 - 20 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 $^\circ\text{C}$
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 2.5 μ L
Data Source : LC InertSearch No. LA 843

Tap Water Pesticides

Positive



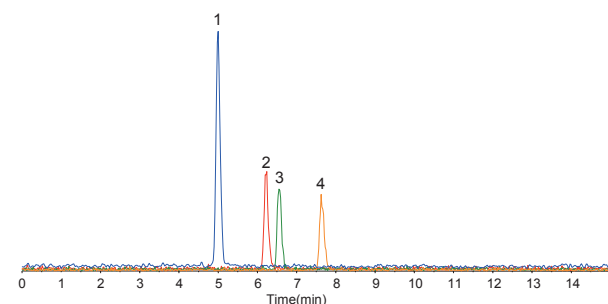
Negative



Conditions

Column : InertSustain C18 (3 μ m, 75 $\times$ 2.1 mm I.D.)
Eluent : A) 5 mM $\text{CH}_3\text{COONH}_4$ in H_2O B) 5 mM $\text{CH}_3\text{COONH}_4$ in CH_3OH
A/B = 95/5 - 4 min - 60/40 - 35 min - 25/75 - 5 min - 0/100 - 6 min - 0/100, v/v
Flow Rate : 0.15 mL/min
Col.Temp. : 40 $^\circ\text{C}$
Sample.Temp. : 5 $^\circ\text{C}$
Detection : LC/MS/MS (4000 QTRAP : ESI, MRM)
Injection Vol. : 100 μ L
Data Source : LC Technical Note No. 135

4 Pesticides

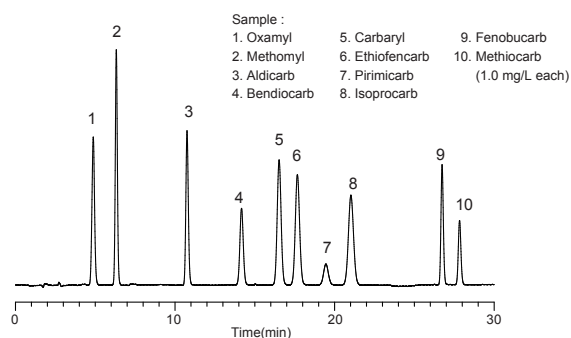


Conditions

Column : InertSustain Phenyl (3 μ m, 150 $\times$ 2.1 mm I.D.)
Eluent : A) 0.1 % HCOOH in CH_3CN
B) 0.1 % HCOOH in H_2O
A/B = 40/60 - 10 min - 70/30 - 0.01 min - 40/60
- 5 min - 40/60, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 $^\circ\text{C}$
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 5 μ L
Data Source : LC InertSearch No. LB077

Sample :
1. Paclobutrazole
2. Diniconazole
3. Propiconazole
4. Difencconazole
(1 μ g/L each)

Carbamate Insecticides



Conditions

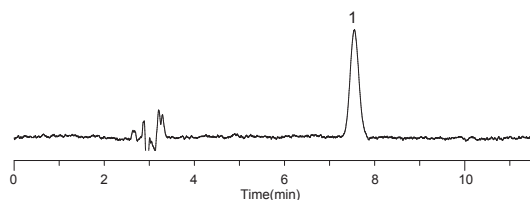
Column : InertSustain C18 (5 μ m, 250 $\times$ 4.6 mm I.D.)
Eluent : A) CH_3OH B) H_2O
A/B = 35/65 - 2 min - 35/65 - 0.1 min - 53/47 - 18.4 min - 53/47 - 0.1 min
- 70/30 - 9.4 min - 70/30 - 0.1 min - 35/65 - 9.9 min - 35/65, v/v
Reaction Reagent : OPA reagent
Flow Rate : 1.0 mL/min
Col. Temp. : 40 $^\circ\text{C}$
Detection : FL Ex 339 nm Em 455 nm(0 - 18.5 min), Ex 312 nm Em 382 nm(18.6 - 20.1 min),
Ex 339 nm Em 455 nm(20.2 - 30 min)
Injection Vol. : 10 μ L
Data Source : LC InertSearch No. LA916

Sample :
1. Oxamyl 5. Carbaryl 9. Fenobucarb
2. Methomyl 6. Ethiofencarb 10. Methiocarb
3. Aldicarb 7. Pirimicarb (1.0 mg/L each)
4. Bendiocarb 8. Isoprocarb

Applications

Vitamins

Vitamin A in Food

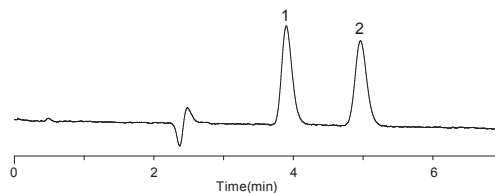


Conditions

Column : Inertsil ODS-3 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) H₂O
 A/B = 95/5, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 325 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No. 32

Sample :
 1. Retinol (50 μ g/L)

Vitamin B1

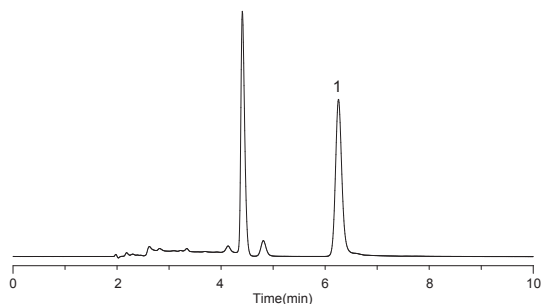


Conditions

Column : Inertsil ODS-3 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH
 B) 0.01 M NaH₂PO₄,
 0.15 M NaClO₄ in H₂O (pH2.2)
 A/B = 1/9, v/v
 Reaction Reagent : 0.05 w/v % K₃[Fe(CN)₆]
 +15 w/v % NaOH, 0.4 mL/min
 Flow Rate : 0.8 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 375 nm Em 440 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No. 10

Sample :
 1. Thiamine
 2. Hydroxyethyl thiamine (HET)
 (10 μ g/L each)

Vitamin C in Food

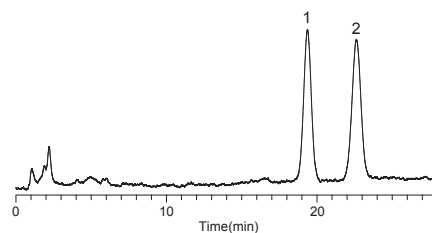


Conditions

Column : Inertsil SIL-100A (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃COOC₂H₅
 B) n-Hexane
 C) CH₃COOH
 A/B/C = 50/40/10, v/v/v
 Flow Rate : 1.5 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : VIS 495 nm
 Injection Vol. : 20 μ L
 Data Source : LC Technical Note No. 9

Sample :
 1. Ascorbic acid

Vitamin D2, D3

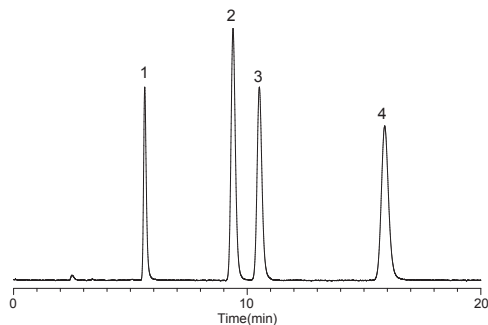


Conditions

Column : Inertsil ODS-P (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : CH₃CN
 Flow Rate : 1.5 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 265 nm
 Injection Vol. : 200 μ L
 Data Source : LC Technical Note No. 33

Sample :
 1. Vitamin D2 (Ergocalciferol)
 2. Vitamin D3 (Cholecalciferol)
 (0.1 mg/L each)

Vitamin E

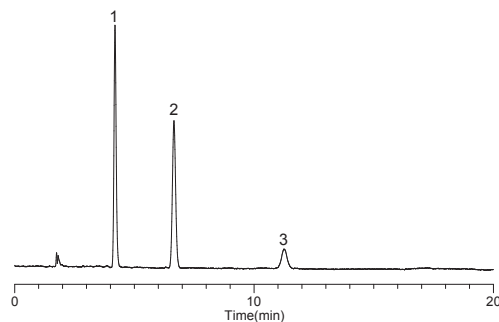


Conditions

Column : Inertsil NH2 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) 2-Propanol
 B) n-Hexane
 A/B = 2/98, v/v
 Flow Rate : 1.2 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : FL Ex 298 nm Em 330 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LB199

Sample :
 1. α -Tocopherol
 2. β -Tocopherol
 3. γ -Tocopherol
 4. δ -Tocopherol
 (1.0 mg/L each)

Vitamin K



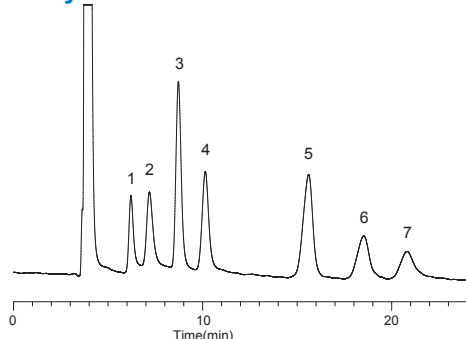
Conditions

Column : InertSustain C8 (5 μ m, 150 $\times$ 3.0 mm I.D.)
 Eluent : CH₃CN
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 $^{\circ}$ C
 Detection : UV 270 nm
 Injection Vol. : 5 μ L
 Data Source : LC InertSearch No. LB030

Sample :
 1. Vitamin K2 (MK-4)
 2. Vitamin K1
 3. Vitamin K2 (MK-7)
 (5 mg/L each)

Others

Sugar Analysis

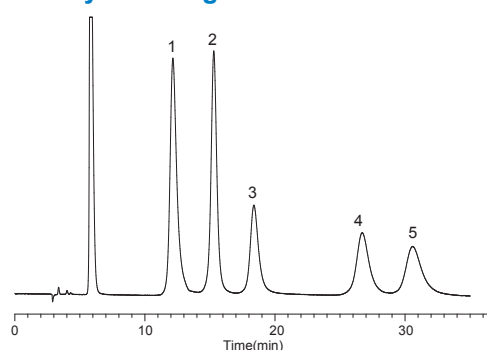


Conditions

Column : InertSustain NH2 (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃CN
 B) H₂O
 A/B = 85/15, v/v
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : RI
 Injection Vol. : 10 μ L
 Data Source : LC InertSearch No. LB180

Sample :
 1. Rhamnose
 2. Fucose
 3. Fructose
 4. Glucose
 5. Sucrose
 6. Maltose
 7. Lactose
 (10 mg/mL each)

Sugar Analysis Using HPLC-ECD

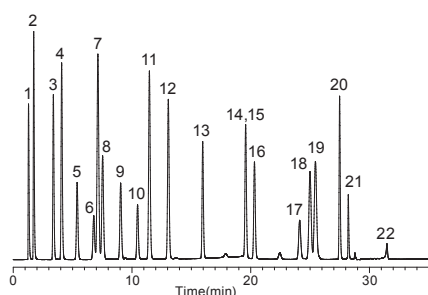


Conditions

Column : InertSphere Sugar-1 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : 100 mM NaOH
 Flow Rate : 0.5 mL/min
 Col. Temp. : 25 °C
 Detection : ECD Pulse Mode
 Injection Vol. : 10 μ L
 Data Source : LC Technical Note No. 101

Sample :
 1. Fucose
 2. Glucose
 3. Fructose
 4. Lactose
 5. Sucrose
 (10 mg/L each)

Analysis of Pre-column Derivatized Amino Acids

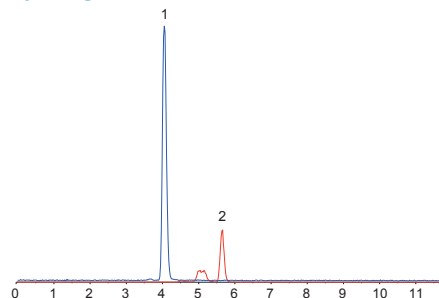


Conditions

Column : Inertsil ODS-4 (3 μ m, 150 $\times$ 3.0 mm I.D.)
 Eluent : A) CH₃CN/CH₃OH/H₂O = 45/40/15, v/v/v
 B) 20 mM KH₂PO₄ (pH 6.9, H₃PO₄)
 A/B = 11/89 - 3 min - 11/89 - 9 min
 - 22/78 - 2 min - 28/72 - 9 min - 30/70
 - 4 min - 65/35 - 7 min - 75/25 - 1 min
 - 100/0, v/v
 Flow Rate : 0.7 mL/min
 Col. Temp. : 35 °C
 Detection : FL Ex 350 nm Em 450 nm (0-29 min)
 Ex 266 nm Em 305 nm (29-35 min)
 Injection Vol. : 1 μ L
 Sample : Derivatized Amino Acids
 Data Source : LC InertSearch No. LB088

Sample :
 1. OPA-Aspartic Acid
 2. OPA-Glutamic Acid
 3. OPA-Asparagine
 4. OPA-Serine
 5. OPA-Glutamine
 6. OPA-Histidine
 7. OPA-Glycine
 8. OPA-Threonine
 9. OPA-Citrulline
 10. OPA-Arginine
 11. OPA-Alanine
 12. OPA-GABA
 (4-aminobutanoic acid)
 13. OPA-Tyrosine
 14. OPA-Cys-Cys
 15. OPA-Valine
 16. OPA-Methionine
 17. OPA-Tryptophan
 18. OPA-Phenylalanine
 19. OPA-Isoleucine
 20. OPA-Leucine
 21. OPA-Lysine
 22. Fmoc-Proline
 (10 μ g/mL each)

PFOS and PFOA

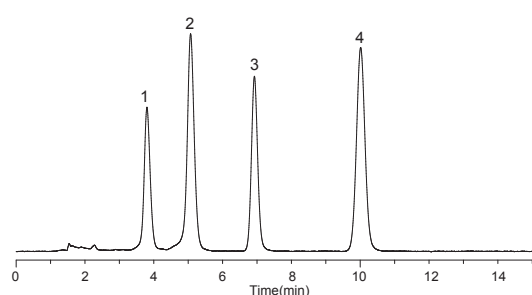


Conditions

Column : Inertsil ODS-4
 (3 μ m, 100 $\times$ 2.1 mm I.D.)
 Eluent : A) 5 mM CH₃COONH₄ in H₂O
 B) 5 mM CH₃COONH₄ in CH₃OH
 A/B = 40/60 - 8 min - 25/75 - 0.1 min
 - 10/90 - 1.9 min - 10/90 - 0.1 min
 - 40/60 - 4.9 min - 10/90, v/v
 Flow Rate : 0.6 mL/min
 Col. Temp. : 40 °C
 Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
 Injection Vol. : 2 μ L
 Data Source : LC InertSearch No. LA864

Sample :
 1. PFOA (Perfluorooctanoic acid)
 2. PFOS (Perfluorooctanesulfonic acid)
 (1 mg/L each)

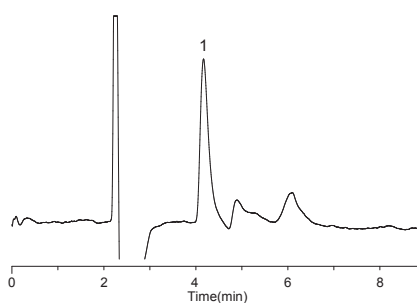
Analysis of Pre-column Derivatized Aflatoxin



Conditions

Column : InertSustain C18 (5 μ m, 150 $\times$ 4.6 mm I.D.)
 Eluent : A) CH₃OH B) CH₃CN C) H₂O
 A/B/C = 30/10/60, v/v/v (Premix)
 Flow Rate : 1.0 mL/min
 Col. Temp. : 40 °C
 Detection : FL Ex 365 nm Em 450 nm
 Injection Vol. : 20 μ L
 Data Source : LC InertSearch No. LB107

Sample :
 1. Aflatoxin G1
 2. Aflatoxin B1
 3. Aflatoxin G2
 4. Aflatoxin B2
 (5 ng/mL each)

Hydrogen Peroxide (H₂O₂)

Conditions

Column : Inertsil CX (5 μ m, 250 $\times$ 4.6 mm I.D.)
 Flow Rate : 0.8 mL/min
 Detection : ECD
 Injection Vol. : 100 μ L
 Data Source : LC Technical Note No. 49

Sample :
 1. Hydrogen peroxide(H₂O₂)
 (10 μ g/L)

Cat.No. INDEX

5020

-00072	113	-01752	11	-02635	19	-03270	101	-03496	99
-00074	113	-01761	11	-02636	19	-03271	101	-03497	101
-00075	113	-01762	11	-02641	19	-03273	102	-03498	101
-00076	113	-01763	11	-02642	19	-03274	101	-03551	99
-00081	113	-01764	11	-02643	19	-03275	101	-03552	99
-00082	113	-01765	11	-02644	19	-03276	102	-03553	99
-00083	113	-01766	11	-02645	19	-03278	101	-03555	99
-00084	113	-01767	11	-02646	19	-03279	101	-03556	99
-00085	113	-01768	11	-02652	109	-03280	101	-03557	99
-00086	113	-01769	11	-02654	109	-03281	102	-03558	99
-01006	90	-01770	11	-02655	109	-03282	102	-03559	99
-01007	90	-01771	11	-02656	109	-03285	99	-03560	99
-01008	90	-01772	11	-02657	114	-03286	100	-03564	100
-01009	90	-01773	11	-02662	109	-03287	100	-03567	100
-01021	68	-01774	11	-02664	109	-03288	100	-03568	101
-01022	68	-01776	11	-02665	109	-03289	102	-03569	101
-01023	68	-01790	11	-02666	109	-03293	100	-03570	101
-01024	68	-01791	11	-02667	114	-03294	100	-03571	101
-01025	68	-01801	13	-02671	15	-03295	99	-03573	102
-01026	68	-01802	13	-02711	15	-03296	99	-03574	101
-01027	68	-01811	13	-02712	15	-03297	101	-03575	101
-01028	68	-01812	13	-02713	15	-03298	101	-03576	102
-01103	110	-01821	13	-02715	15	-03351	99	-03578	101
-01104	110	-01822	13	-02716	15	-03352	99	-03579	101
-01121	22	-01880	126	-02721	15	-03353	99	-03580	101
-01122	22	-01881	126	-02722	15	-03355	99	-03581	102
-01123	22	-01900	29	-02723	15	-03356	99	-03582	102
-01124	22	-01901	29	-02724	15	-03357	99	-03585	99
-01125	22	-01902	29	-02725	15	-03359	99	-03586	100
-01126	22	-01903	29	-02726	15	-03360	99	-03587	100
-01127	22	-01910	29	-02731	15	-03364	100	-03588	100
-01128	22	-01911	29	-02732	15	-03365	100	-03589	102
-01203	110	-01912	29	-02733	15	-03366	100	-03593	100
-01204	110	-01913	29	-02734	15	-03367	100	-03594	100
-01221	30	-01920	37	-02735	15	-03368	101	-03595	99
-01222	30	-01921	37	-02736	15	-03369	101	-03596	99
-01223	30	-01922	37	-02741	15	-03370	101	-03597	101
-01224	30	-01923	37	-02742	15	-03371	101	-03598	101
-01225	30	-01930	37	-02743	15	-03373	102	-03651	103
-01226	30	-01931	37	-02744	15	-03374	101	-03652	103
-01227	30	-01932	37	-02745	15	-03375	101	-03653	103
-01228	30	-01933	37	-02746	15	-03376	102	-03654	103
-01303	111	-01940	41/67	-02752	109	-03378	101	-03655	103
-01304	111	-01941	41/67	-02754	109	-03379	101	-03656	103
-01321	39	-01942	41/67	-02755	109	-03380	101	-03657	103
-01322	39	-01943	41/67	-02756	109	-03381	102	-03658	103
-01323	39	-02001	17	-02757	114	-03382	102	-03659	103
-01324	39	-02002	17	-02762	15	-03385	99	-03660	103
-01325	39	-02103	110	-02764	15	-03386	100	-03664	103
-01326	39	-02104	110	-02765	15	-03388	100	-03665	103
-01327	39	-02121	23	-02766	15	-03389	102	-03667	103
-01328	39	-02122	23	-02767	114	-03393	100	-03668	103
-01421	31	-02123	23	-02811	15	-03394	100	-03669	103
-01422	31	-02124	23	-02812	15	-03395	99	-03670	103
-01423	31	-02125	23	-02813	15	-03396	99	-03671	103
-01424	31	-02126	23	-02814	15	-03397	101	-03672	103
-01425	31	-02127	23	-02815	15	-03398	101	-03673	103
-01426	31	-02128	23	-02816	15	-03399	88	-03674	103
-01427	31	-02203	110	-02821	15	-03451	99	-03675	103
-01428	31	-02204	110	-02822	15	-03452	99	-03676	103
-01603	110	-02221	23	-02823	15	-03453	99	-03677	103
-01604	110	-02222	23	-02824	15	-03455	99	-03678	103
-01621	21	-02223	23	-02825	15	-03456	99	-03679	103
-01622	21	-02225	23	-02826	15	-03457	99	-03680	103
-01623	21	-02226	23	-02831	15	-03458	99	-03681	103
-01624	21	-02227	23	-02832	15	-03459	99	-03682	103
-01625	21	-02228	23	-02833	15	-03460	99	-03685	103
-01626	21	-02521	84	-02834	15	-03464	100	-03686	103
-01627	21	-02522	84	-02835	15	-03465	100	-03687	103
-01628	21	-02523	84	-02836	15	-03467	100	-03688	103
-01631	11	-02524	84	-02841	15	-03468	101	-03689	103
-01632	11	-02531	84	-02842	15	-03469	101	-03690	103
-01641	29	-02532	84	-02843	15	-03470	101	-03693	103
-01642	29	-02533	84	-02844	15	-03471	101	-03694	103
-01700	61	-02534	84	-02845	15	-03473	102	-03695	103
-01701	61	-02611	19	-02846	15	-03474	101	-03696	103
-01702	61	-02612	19	-03251	99	-03475	101	-03697	103
-01703	61	-02613	19	-03252	99	-03476	102	-03698	103
-01711	61	-02614	19	-03253	99	-03478	101	-03911	9
-01712	61	-02615	19	-03255	99	-03479	101	-03912	9
-01713	112	-02616	19	-03256	99	-03480	101	-03913	9
-01714	112	-02621	19	-03257	99	-03481	102	-03914	9
-01731	11	-02622	19	-03258	99	-03482	102	-03915	9
-01732	11	-02623	19	-03259	99	-03485	99	-03916	9
-01733	109	-02624	19	-03260	99	-03486	100	-03917	9
-01734	109	-02625	19	-03264	100	-03487	100	-03921	9
-01741	11	-02626	19	-03265	100	-03488	100	-03922	9
-01742	11	-02631	19	-03266	100	-03489	102	-03923	9
-01751	11	-02632	19	-03267	100	-03493	100	-03924	9
		-02633	19	-03268	101	-03494	100	-03925	9
		-02634	19	-03269	101	-03495	99	-03926	9

5020

-03927.....9	-04062.....27	-04253.....99	-04456.....99	-04682.....17
-03931.....9	-04063.....27	-04255.....99	-04457.....99	-04683.....17
-03932.....9	-04064.....27	-04256.....99	-04458.....99	-04684.....17
-03933.....9	-04065.....27	-04257.....99	-04459.....99	-04685.....17
-03934.....9	-04066.....27	-04258.....99	-04460.....99	-04686.....17
-03935.....9	-04067.....27	-04259.....99	-04464.....100	-04691.....17
-03936.....9	-04071.....27	-04260.....99	-04465.....100	-04692.....17
-03937.....9	-04072.....27	-04264.....100	-04466.....100	-04693.....17
-03941.....9	-04073.....27	-04265.....100	-04467.....100	-04694.....17
-03942.....9	-04074.....27	-04266.....100	-04468.....101	-04695.....17
-03943.....9	-04075.....27	-04267.....100	-04469.....101	-04696.....17
-03944.....9	-04076.....27	-04268.....101	-04470.....101	-04711.....17
-03945.....9	-04077.....27	-04269.....101	-04471.....101	-04712.....17
-03946.....9	-04080.....27	-04270.....101	-04472.....102	-04713.....17
-03947.....9	-04081.....27	-04271.....101	-04473.....102	-04714.....17
-03953.....109	-04082.....27	-04272.....102	-04474.....101	-04715.....17
-03954.....109	-04083.....27	-04273.....102	-04475.....101	-04716.....17
-03955.....109	-04084.....27	-04274.....101	-04476.....102	-04721.....17
-03956.....109	-04085.....27	-04275.....101	-04477.....102	-04722.....17
-03957.....114	-04086.....27	-04276.....102	-04478.....101	-04723.....17
-03963.....109	-04087.....110	-04277.....102	-04479.....101	-04724.....17
-03964.....109	-04088.....110	-04278.....101	-04480.....101	-04725.....17
-03965.....109	-04089.....110	-04279.....101	-04481.....102	-04726.....17
-03966.....109	-04090.....110	-04280.....101	-04482.....102	-04731.....17
-03967.....114	-04091.....114	-04281.....102	-04485.....99	-04732.....17
-03971.....114	-04092.....114	-04282.....102	-04486.....100	-04733.....17
-03972.....110	-04093.....110	-04283.....99	-04487.....100	-04734.....17
-03973.....110	-04094.....110	-04286.....100	-04488.....100	-04735.....17
-03974.....110	-04095.....110	-04287.....100	-04489.....102	-04736.....17
-03975.....110	-04096.....110	-04288.....100	-04493.....100	-04741.....17
-03976.....114	-04151.....114	-04289.....102	-04494.....100	-04742.....17
-03977.....27	-04152.....99	-04293.....100	-04496.....99	-04743.....17
-03978.....27	-04153.....99	-04294.....100	-04497.....101	-04744.....17
-03979.....27	-04155.....99	-04295.....99	-04498.....101	-04752.....109
-03980.....27	-04156.....99	-04296.....99	-04511.....11	-04754.....109
-03981.....27	-04157.....99	-04297.....101	-04512.....11	-04755.....109
-03982.....27	-04158.....99	-04298.....101	-04513.....11	-04756.....109
-03983.....27	-04159.....99	-04311.....61	-04514.....9	-04757.....114
-03984.....27	-04160.....99	-04312.....61	-04515.....9	-04762.....109
-03985.....27	-04164.....100	-04313.....61	-04521.....9	-04764.....109
-03986.....27	-04165.....100	-04314.....61	-04522.....9	-04765.....109
-03987.....27	-04166.....100	-04315.....61	-04523.....9	-04766.....109
-03988.....27	-04167.....100	-04316.....61	-04524.....9	-04767.....114
-03989.....27	-04168.....101	-04321.....61	-04525.....9	-04811.....29
-03990.....27	-04169.....101	-04322.....61	-04531.....9	-04812.....114
-03991.....27	-04170.....101	-04323.....61	-04532.....9	-04813.....114
-03992.....27	-04171.....101	-04324.....61	-04533.....9	-04814.....29
-03993.....27	-04172.....102	-04325.....61	-04541.....9	-04815.....29
-03994.....27	-04173.....102	-04326.....61	-04554.....109	-04816.....29
-03995.....27	-04174.....101	-04331.....61	-04557.....114	-04817.....29
-03996.....27	-04175.....101	-04332.....61	-04611.....11	-04821.....29
-03997.....27	-04176.....102	-04333.....61	-04612.....11	-04822.....114
-03998.....27	-04177.....102	-04334.....61	-04613.....11	-04823.....29
-04001.....9	-04178.....101	-04335.....61	-04614.....9	-04824.....29
-04012.....9	-04179.....101	-04336.....61	-04615.....9	-04825.....29
-04013.....9	-04180.....101	-04341.....61	-04616.....9	-04826.....29
-04014.....9	-04181.....102	-04342.....61	-04617.....9	-04827.....114
-04015.....9	-04182.....102	-04343.....61	-04621.....9	-04831.....29
-04016.....9	-04185.....99	-04344.....61	-04622.....9	-04832.....29
-04017.....9	-04186.....100	-04352.....112	-04623.....9	-04833.....29
-04021.....9	-04187.....100	-04354.....112	-04624.....9	-04835.....29
-04022.....9	-04188.....100	-04357.....115	-04625.....9	-04836.....29
-04023.....9	-04189.....102	-04362.....112	-04626.....9	-04837.....29
-04024.....9	-04193.....100	-04364.....112	-04627.....9	-04841.....29
-04025.....9	-04194.....100	-04365.....112	-04631.....9	-04842.....29
-04026.....9	-04195.....99	-04366.....112	-04632.....9	-04844.....29
-04027.....9	-04196.....99	-04367.....115	-04633.....9	-04845.....29
-04031.....9	-04197.....101	-04411.....11	-04634.....9	-04851.....99
-04032.....9	-04198.....101	-04412.....11	-04635.....9	-04852.....99
-04033.....9	-04211.....61	-04413.....11	-04636.....9	-04853.....99
-04034.....9	-04212.....61	-04414.....9	-04637.....9	-04855.....99
-04035.....9	-04213.....61	-04415.....9	-04641.....9	-04856.....99
-04036.....9	-04214.....61	-04416.....9	-04642.....9	-04857.....99
-04037.....9	-04215.....61	-04417.....9	-04643.....9	-04858.....99
-04041.....9	-04216.....61	-04421.....9	-04644.....9	-04859.....99
-04042.....9	-04221.....61	-04422.....9	-04645.....9	-04860.....99
-04043.....9	-04222.....61	-04423.....9	-04646.....9	-04864.....100
-04044.....9	-04223.....61	-04424.....9	-04647.....9	-04865.....100
-04045.....9	-04224.....61	-04425.....9	-04661.....17	-04866.....100
-04046.....9	-04225.....61	-04426.....9	-04662.....11	-04867.....100
-04047.....9	-04226.....61	-04427.....9	-04663.....11	-04868.....101
-04051.....27	-04231.....61	-04431.....9	-04664.....17	-04869.....101
-04052.....27	-04232.....61	-04432.....9	-04665.....17	-04870.....101
-04053.....27	-04233.....61	-04433.....9	-04666.....17	-04871.....101
-04054.....27	-04235.....61	-04435.....9	-04671.....17	-04872.....102
-04055.....27	-04236.....61	-04436.....9	-04672.....17	-04873.....102
-04056.....27	-04241.....61	-04441.....9	-04673.....17	-04874.....101
-04057.....27	-04242.....61	-04451.....99	-04674.....17	-04875.....101
-04061.....27	-04244.....61	-04452.....99	-04675.....17	-04876.....102
	-04251.....99	-04453.....99	-04676.....17	-04877.....102
	-04252.....99	-04455.....99	-04681.....17	-04878.....101

Reversed Phase
Columns

HILIC Columns

Normal Phase
Columns

SEC Columns

Ion Exchange
ColumnsApplication
Specific Columns

Guard Columns

Preparative Columns

Capillary Columns

Applications

Cat. No. Index

Cat.No. INDEX

5020

-04879	101	-05152	111	-05464	53/63	-05713	44	-05945	75
-04880	101	-05154	111	-05465	53/63	-05714	44	-05946	75
-04881	102	-05155	111	-05466	53/63	-05715	44	-05950	111
-04882	102	-05156	111	-05471	53/63	-05716	44	-05951	111
-04885	99	-05157	114	-05472	53/63	-05721	44	-05952	111
-04886	100	-05162	111	-05473	53/63	-05723	44	-05953	111
-04887	100	-05164	111	-05474	53/63	-05724	44	-05954	115
-04888	100	-05165	111	-05475	53/63	-05725	44	-05955	111
-04889	102	-05166	111	-05476	53/63	-05726	44	-05956	111
-04893	100	-05167	114	-05481	53/63	-05731	44	-05957	111
-04894	100	-05261	41/67	-05482	53/63	-05732	44	-05958	111
-04895	99	-05262	41/67	-05483	53/63	-05733	44	-05959	115
-04896	99	-05263	41/67	-05484	53/63	-05734	44	-05960	111
-04897	101	-05264	41/67	-05485	53/63	-05735	44	-05961	111
-04898	101	-05265	41/67	-05486	53/63	-05736	44	-05962	111
-04911	29	-05266	41/67	-05491	53/63	-05741	44	-05963	111
-04912	29	-05271	41/67	-05492	53/63	-05742	44	-05964	115
-04913	29	-05272	41/67	-05493	53/63	-05743	44	-05965	111
-04914	29	-05273	41/67	-05494	53/63	-05744	44	-05966	111
-04915	29	-05274	41/67	-05495	53/63	-05745	44	-05967	111
-04916	29	-05275	41/67	-05496	53/63	-05746	44	-05968	111
-04917	29	-05276	41/67	-05511	53/63	-05811	43	-05969	115
-04921	29	-05281	41/67	-05512	53/63	-05812	43	-05970	111
-04922	29	-05282	41/67	-05513	53/63	-05813	43	-05971	111
-04923	29	-05283	41/67	-05514	53/63	-05814	43	-05972	111
-04924	29	-05284	41/67	-05515	53/63	-05815	43	-05973	111
-04925	29	-05285	41/67	-05516	53/63	-05816	43	-05974	115
-04926	29	-05286	41/67	-05521	53/63	-05821	43	-05975	111
-04927	29	-05291	41/67	-05522	53/63	-05822	43	-05976	111
-04931	29	-05292	41/67	-05523	53/63	-05823	43	-05977	111
-04932	29	-05293	41/67	-05524	53/63	-05824	43	-05978	111
-04933	29	-05294	41/67	-05525	53/63	-05825	43	-05979	115
-04934	29	-05295	41/67	-05526	53/63	-05826	43	-05980	75/113
-04935	29	-05296	41/67	-05531	53/63	-05831	43	-05981	75/113
-04941	29	-05311	41/67	-05532	53/63	-05832	43	-05982	75/113
-04942	29	-05312	41/67	-05533	53/63	-05833	43	-05983	75/113
-04943	29	-05313	41/67	-05534	53/63	-05834	43	-05984	115
-04944	29	-05314	41/67	-05535	53/63	-05835	43	-05985	75/113
-04945	29	-05315	41/67	-05536	53/63	-05836	43	-05986	75/113
-04952	110	-05316	41/67	-05541	53/63	-05841	43	-05987	75/113
-04954	110	-05321	41/67	-05542	53/63	-05842	43	-05988	75/113
-04955	110	-05322	41/67	-05543	53/63	-05843	43	-05989	115
-04956	110	-05323	41/67	-05544	53/63	-05844	43	-05990	111
-04957	114	-05324	41/67	-05545	53/63	-05845	43	-05991	111
-04962	114	-05325	41/67	-05546	53/63	-05846	43	-05992	111
-04964	110	-05326	41/67	-05552	112	-05861	45	-05993	111
-04965	110	-05331	41/67	-05554	112	-05862	45	-05994	115
-04966	110	-05332	41/67	-05555	112	-05863	45	-05995	113
-04967	114	-05333	41/67	-05556	112	-05864	45	-05996	113
-05011	37	-05334	41/67	-05557	115	-05865	45	-05997	113
-05012	37	-05341	41/67	-05562	112	-05866	45	-05998	113
-05013	37	-05342	41/67	-05564	112	-05871	45	-05999	115
-05014	37	-05343	41/67	-05565	112	-05872	45	-06011	69
-05015	37	-05344	41/67	-05566	112	-05873	45	-06012	69
-05016	37	-05352	111	-05567	115	-05874	45	-06013	69
-05021	37	-05354	111	-05611	59/73	-05875	45	-06014	69
-05022	37	-05355	111	-05612	59/73	-05876	45	-06015	69
-05023	37	-05356	111	-05613	59/73	-05881	45	-06016	69
-05024	37	-05357	115	-05614	59/73	-05882	45	-06021	69
-05025	37	-05362	111	-05615	59/73	-05883	45	-06022	69
-05026	37	-05364	111	-05616	59/73	-05884	45	-06023	69
-05031	37	-05365	111	-05621	59/73	-05885	45	-06024	69
-05032	37	-05366	111	-05622	59/73	-05886	45	-06025	69
-05033	37	-05367	115	-05623	59/73	-05891	45	-06026	69
-05035	37	-05411	59/73	-05624	59/73	-05892	45	-06031	69
-05036	37	-05412	59/73	-05625	59/73	-05893	45	-06032	69
-05041	37	-05413	59/73	-05626	59/73	-05894	45	-06033	69
-05042	37	-05414	59/73	-05631	59/73	-05895	45	-06034	69
-05044	37	-05415	59/73	-05632	59/73	-05896	45	-06035	69
-05111	37	-05416	59/73	-05633	59/73	-05911	75	-06036	69
-05112	37	-05421	59/73	-05634	59/73	-05912	75	-06041	69
-05113	37	-05422	59/73	-05635	59/73	-05913	75	-06042	69
-05114	37	-05423	59/73	-05636	59/73	-05914	75	-06043	69
-05115	37	-05424	59/73	-05641	59/73	-05915	75	-06044	69
-05116	37	-05425	59/73	-05642	59/73	-05916	75	-06045	69
-05121	37	-05426	59/73	-05643	59/73	-05921	75	-06046	69
-05122	37	-05431	59/73	-05644	59/73	-05922	75	-06132	114
-05123	37	-05432	59/73	-05645	59/73	-05923	75	-06133	114
-05124	37	-05433	59/73	-05646	59/73	-05924	75	-06136	114
-05125	37	-05434	59/73	-05652	73/112	-05925	75	-06142	110
-05126	37	-05435	59/73	-05654	73/112	-05926	75	-06143	110
-05131	37	-05436	59/73	-05655	73/112	-05931	75	-06144	111
-05132	37	-05441	59/73	-05656	73/112	-05932	75	-06146	110
-05133	37	-05442	59/73	-05657	115	-05933	75	-06801	114
-05134	37	-05443	59/73	-05662	73/112	-05934	75	-06802	109
-05141	37	-05444	59/73	-05664	73/112	-05935	75	-06803	109
-05142	37	-05445	59/73	-05665	73/112	-05936	75	-06804	109
-05143	37	-05446	59/73	-05666	73/112	-05941	75	-06811	114
-05144	37	-05461	53/63	-05667	115	-05942	75	-06812	109
		-05462	53/63	-05711	44	-05943	75	-06813	109
		-05463	53/63	-05712	44	-05944	75	-06814	109

5020

-06821	114	-07341	5	-07754	112	-08015	85	-10071	131
-06822	109	-07342	5	-07755	112	-08016	85	-10072	131
-06823	109	-07343	5	-07756	112	-08022	85	-10073	131
-06824	109	-07344	5	-07757	115	-08024	85	-10081	131
-06831	114	-07345	5	-07761	51	-08025	85	-10082	131
-06832	109	-07346	5	-07762	51	-08026	85	-10083	131
-06833	109	-07348	5	-07763	51	-08032	85	-10091	131
-06834	109	-07352	109	-07764	51	-08034	85	-10092	131
-06851	114	-07354	109	-07765	51	-08035	85	-10093	131
-06852	109	-07355	109	-07766	51	-08036	85	-10100	130
-06920	116	-07356	109	-07771	51	-08042	85	-10101	130
-07011	109	-07357	114	-07772	51	-08044	85	-10102	130
-07012	109	-07362	109	-07773	51	-08045	85	-10110	130
-07013	109	-07364	109	-07774	51	-08046	85	-10111	130
-07014	109	-07365	109	-07775	51	-08052	85	-10112	130
-07015	109	-07366	109	-07776	51	-08054	85	-10120	130
-07021	117	-07367	114	-07781	51	-08055	85	-10121	130
-07022	117	-07411	5	-07782	51	-08056	85	-10122	130
-07023	117	-07412	5	-07783	51	-08062	113	-10123	129
-07024	117	-07413	5	-07784	51	-08064	113	-10141	130
-07025	117	-07414	5	-07785	51	-08065	113	-10143	130
-07111	81	-07415	5	-07786	51	-08066	113	-10151	130
-07112	81	-07416	5	-07791	51	-08071	115	-10153	130
-07113	81	-07417	5	-07792	51	-08072	115	-10161	130
-07114	81	-07421	5	-07793	51	-08073	115	-10163	130
-07115	81	-07422	5	-07794	51	-08074	115	-10171	131
-07116	81	-07423	5	-07795	51	-08075	115	-10172	131
-07117	81	-07424	5	-07796	51	-08076	115	-10173	131
-07118	81	-07425	5	-07801	49	-08081	113	-10181	131
-07119	81	-07426	5	-07802	49	-08082	113	-10182	131
-07120	81	-07427	5	-07803	49	-08083	113	-10183	131
-07121	81	-07431	5	-07804	49	-08084	113	-10191	131
-07122	81	-07432	5	-07805	49	-08085	113	-10192	131
-07123	81	-07433	5	-07806	49	-08086	113	-10193	131
-07124	81	-07434	5	-07811	49	-08087	113	-10200	131
-07125	81	-07435	5	-07812	49	-08088	113	-10201	131
-07126	81	-07436	5	-07813	49	-08089	113	-10202	131
-07127	81	-07437	5	-07814	49	-08500	5/7/9/11/15/ 17/19/21/22/23/25/27/2/ 9/30/31/33/35/37/39/41 /43/44/45/49/51/53/55/ 59/61/63/65/67/69/7/ 3/75/79/81/84/85/87	-10211	130
-07128	81	-07441	5	-07815	49	-08550	5/7/9/11/15/ 17/19/21/22/23/25/27/2/ 9/30/31/33/35/37/39/41 /43/44/45/49/51/53/55/ 59/61/63/65/67/69/7/ 3/75/79/81/84/85/87	-10212	130
-07129	81	-07442	5	-07816	49	-08620	84	-10213	130
-07130	81	-07443	5	-07821	49	-08621	84	-10221	130
-07131	81	-07444	5	-07822	49	-08622	84	-10222	130
-07132	81	-07445	5	-07823	49	-08623	84	-10223	130
-07133	81	-07446	5	-07824	49	-08624	84	-10231	130
-07134	81	-07447	5	-07825	49	-08625	84	-10232	130
-07135	81	-07504	87	-07826	49	-08626	84	-10233	130
-07136	81	-07505	87	-07831	49	-08627	84	-10241	130
-07137	81	-07514	87	-07832	49	-08630	97	-10242	130
-07138	81	-07515	87	-07833	49	-10000	130	-10401	104
-07139	81	-07524	87	-07834	49	-10001	130	-10402	104
-07140	81	-07525	87	-07835	49	-10002	130	-10403	104
-07141	81	-07534	87	-07836	49	-10010	130	-10404	104
-07142	81	-07535	87	-07842	112	-10011	130	-10405	104
-07143	81	-07545	87	-07844	112	-10012	130	-10901	12
-07144	81	-07546	87	-07845	112	-10015	129	-10902	12
-07145	81	-07555	87	-07846	112	-10017	132	-10911	12
-07146	81	-07556	87	-07847	115	-10020	130	-10912	12
-07147	81	-07565	87	-07852	112	-10021	130	-10921	12
-07148	81	-07566	87	-07854	112	-10022	130	-10922	12
-07149	81	-07575	87	-07856	112	-10023	129	-10923	12
-07150	81	-07576	87	-07857	115	-10026	131	-11001	86
-07151	81	-07701	51	-07861	49	-10027	131	-11503	121
-07152	81	-07702	51	-07862	49	-10028	131	-11504	121
-07153	81	-07703	51	-07863	49	-10029	131	-11505	121
-07154	81	-07704	51	-07864	49	-10031	131	-11514	123
-07155	81	-07705	51	-07865	49	-10033	131	-11515	123
-07156	81	-07706	51	-07866	49	-10034	131	-11516	123
-07157	81	-07711	51	-07871	49	-10036	131	-11517	123
-07158	81	-07712	51	-07872	49	-10037	131	-11518	125
-07159	81	-07713	51	-07873	49	-10038	131	-11519	125
-07160	81	-07714	51	-07874	49	-10039	131	-11520	124
-07161	81	-07715	51	-07875	49	-10041	130	-11521	124
-07162	81	-07716	51	-07876	49	-10043	130	-11522	125
-07163	81	-07722	51	-07881	49	-10044	130	-11523	125
-07164	81	-07723	51	-07882	49	-10045	130	-11524	124
-07165	81	-07724	51	-07883	49	-10046	130	-11525	124
-07166	81	-07725	51	-07884	49	-10047	130	-11526	125
-07167	81	-07726	51	-07885	49	-10051	130	-11527	125
-07168	81	-07731	51	-07886	49	-10053	130	-11528	122
-07169	81	-07732	51	-07887	49	-10061	130	-11529	122
-07170	81	-07733	51	-07888	49	-10063	130	-11530	123
-07171	81	-07734	51	-07889	49			-11535	122
-07172	81	-07735	51	-07891	49			-11536	122
-07173	81	-07736	51	-07892	49			-11537	125
-07174	81	-07742	112	-07893	49			-11538	121
-07175	81	-07744	112	-07894	49			-11539	121
-07176	81	-07745	112	-07895	49			-11540	124
-07177	81	-07746	112	-07896	49			-11541	124
-07178	81	-07747	115	-08002	85			-11551	121
-07179	81	-07752	112	-08004	85			-11552	121
-07180	81			-08005	85			-11553	121
-07181	81			-08006	85			-11554	121
-07182	81			-08012	85				
-07183	81			-08014	85				

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Cat.No. INDEX

5020

-11555.....	121	-11714.....	123	-11880.....	127	-14063.....	9	-14351.....	5
-11564.....	123	-11715.....	123	-11885.....	127	-14064.....	9	-14352.....	5
-11565.....	123	-11716.....	123	-11895.....	127	-14065.....	9	-14353.....	5
-11566.....	123	-11717.....	123	-11896.....	127	-14066.....	9	-14354.....	5
-11567.....	123	-11718.....	125	-11897.....	127	-14067.....	9	-14355.....	5
-11568.....	125	-11719.....	125	-12750.....	105	-14068.....	9	-14361.....	5
-11568.....	125	-11720.....	124	-12755.....	105	-14069.....	9	-14362.....	5
-11569.....	125	-11721.....	124	-12755.....	105	-14071.....	27	-14363.....	5
-11570.....	124	-11722.....	125	-12755.....	105	-14072.....	27	-14364.....	5
-11571.....	124	-11723.....	125	-12760.....	105	-14073.....	27	-14365.....	5
-11572.....	125	-11724.....	124	-12760.....	105	-14074.....	27	-14411.....	5
-11573.....	125	-11725.....	124	-12770.....	105	-14075.....	27	-14412.....	5
-11574.....	124	-11726.....	125	-12770.....	105	-14076.....	27	-14413.....	5
-11575.....	124	-11727.....	125	-12780.....	105	-14077.....	27	-14414.....	5
-11576.....	125	-11728.....	123	-12790.....	105	-14078.....	27	-14415.....	5
-11577.....	125	-11729.....	123	-13241.....	11	-14079.....	27	-14416.....	5
-11578.....	123	-11730.....	123	-13242.....	11	-14081.....	10	-14421.....	5
-11579.....	123	-11735.....	122	-13251.....	11	-14082.....	10	-14422.....	5
-11580.....	123	-11736.....	122	-13252.....	11	-14083.....	10	-14423.....	5
-11585.....	122	-11737.....	125	-13350.....	11	-14084.....	10	-14424.....	5
-11586.....	122	-11738.....	121	-13360.....	11	-14085.....	10	-14425.....	5
-11587.....	125	-11739.....	121	-13410.....	61	-14086.....	10	-14426.....	5
-11588.....	121	-11740.....	124	-13412.....	61	-14087.....	10	-14441.....	5
-11589.....	121	-11741.....	124	-13420.....	61	-14088.....	10	-14442.....	5
-11590.....	124	-11751.....	121	-13422.....	61	-14089.....	10	-14443.....	5
-11591.....	124	-11752.....	121	-13510.....	29	-14091.....	15	-14444.....	5
-11601.....	121	-11753.....	121	-13512.....	29	-14092.....	15	-14445.....	5
-11602.....	121	-11754.....	121	-13520.....	29	-14093.....	15	-14446.....	5
-11603.....	121	-11755.....	121	-13522.....	29	-14094.....	15	-15001.....	121
-11604.....	121	-11764.....	123	-13610.....	37	-14095.....	15	-15002.....	121
-11605.....	121	-11765.....	123	-13612.....	37	-14096.....	15	-15003.....	121
-11614.....	123	-11768.....	125	-13620.....	37	-14097.....	15	-15004.....	121
-11615.....	123	-11769.....	125	-13622.....	37	-14098.....	15	-15005.....	121
-11616.....	123	-11770.....	124	-13710.....	41/67	-14099.....	15	-15014.....	123
-11617.....	123	-11771.....	124	-13712.....	41/67	-14101.....	29	-15015.....	123
-11618.....	125	-11772.....	125	-14001.....	9	-14102.....	29	-15016.....	123
-11619.....	125	-11773.....	125	-14002.....	9	-14103.....	29	-15017.....	123
-11620.....	124	-11774.....	124	-14003.....	9	-14104.....	29	-15018.....	125
-11621.....	125	-11775.....	124	-14004.....	9	-14105.....	29	-15019.....	125
-11622.....	125	-11776.....	125	-14005.....	9	-14106.....	29	-15020.....	125
-11623.....	125	-11777.....	125	-14006.....	9	-14107.....	29	-15021.....	125
-11624.....	124	-11778.....	123	-14007.....	9	-14108.....	29	-15022.....	125
-11625.....	124	-11779.....	123	-14008.....	9	-14109.....	29	-15023.....	125
-11626.....	125	-11780.....	123	-14009.....	9	-14111.....	37	-15024.....	124
-11627.....	125	-11785.....	122	-14011.....	11	-14112.....	37	-15025.....	124
-11628.....	123	-11786.....	122	-14012.....	11	-14113.....	37	-15026.....	125
-11629.....	123	-11787.....	125	-14013.....	11	-14114.....	37	-15027.....	125
-11630.....	123	-11788.....	121	-14014.....	11	-14115.....	37	-15028.....	123
-11635.....	122	-11789.....	121	-14015.....	11	-14116.....	37	-15029.....	123
-11636.....	122	-11790.....	124	-14016.....	11	-14117.....	37	-15030.....	123
-11637.....	125	-11791.....	124	-14017.....	11	-14118.....	37	-15035.....	122
-11638.....	121	-11801.....	127	-14018.....	11	-14119.....	37	-15036.....	122
-11639.....	121	-11802.....	127	-14019.....	11	-14201.....	5	-15037.....	121
-11640.....	124	-11803.....	127	-14021.....	15	-14202.....	5	-15038.....	121
-11641.....	124	-11805.....	127	-14022.....	15	-14203.....	5	-15039.....	124
-11651.....	121	-11811.....	127	-14023.....	15	-14204.....	5	-15040.....	124
-11652.....	121	-11814.....	127	-14024.....	15	-14205.....	5	-15051.....	121
-11653.....	121	-11815.....	127	-14025.....	15	-14206.....	5	-15052.....	121
-11654.....	121	-11816.....	127	-14026.....	15	-14211.....	5	-15053.....	121
-11655.....	121	-11817.....	127	-14027.....	15	-14212.....	5	-15054.....	121
-11664.....	123	-11818.....	127	-14028.....	15	-14213.....	5	-15055.....	121
-11665.....	123	-11819.....	127	-14029.....	15	-14214.....	5	-15064.....	123
-11666.....	123	-11820.....	127	-14031.....	29	-14215.....	5	-15065.....	123
-11667.....	123	-11821.....	127	-14032.....	29	-14216.....	5	-15066.....	123
-11668.....	125	-11822.....	127	-14033.....	29	-14252.....	109	-15067.....	123
-11669.....	125	-11823.....	127	-14034.....	29	-14254.....	109	-15068.....	125
-11670.....	124	-11824.....	127	-14035.....	29	-14255.....	109	-15069.....	125
-11671.....	124	-11825.....	127	-14036.....	29	-14256.....	109	-15070.....	125
-11672.....	125	-11826.....	127	-14037.....	29	-14257.....	114	-15071.....	125
-11673.....	125	-11827.....	127	-14038.....	29	-14262.....	109	-15072.....	125
-11674.....	124	-11828.....	127	-14039.....	29	-14264.....	109	-15073.....	125
-11675.....	124	-11829.....	127	-14041.....	37	-14265.....	109	-15074.....	124
-11676.....	125	-11830.....	127	-14042.....	37	-14266.....	109	-15075.....	124
-11677.....	125	-11833.....	127	-14043.....	37	-14267.....	114	-15076.....	125
-11678.....	123	-11834.....	127	-14044.....	37	-14272.....	109	-15077.....	125
-11679.....	123	-11835.....	127	-14045.....	37	-14274.....	109	-15078.....	123
-11680.....	123	-11836.....	127	-14046.....	37	-14275.....	109	-15079.....	123
-11685.....	122	-11845.....	127	-14047.....	37	-14276.....	109	-15080.....	123
-11686.....	122	-11846.....	127	-14048.....	37	-14277.....	114	-15085.....	122
-11687.....	125	-11847.....	127	-14049.....	37	-14301.....	5	-15086.....	122
-11688.....	121	-11848.....	127	-14051.....	27	-14302.....	5	-15087.....	121
-11689.....	121	-11849.....	127	-14052.....	27	-14303.....	5	-15088.....	121
-11690.....	124	-11851.....	127	-14053.....	27	-14304.....	5	-15089.....	124
-11691.....	124	-11853.....	127	-14054.....	27	-14305.....	5	-15090.....	124
-11702.....	121	-11861.....	127	-14055.....	27	-14306.....	5	-15101.....	121
-11703.....	121	-11864.....	127	-14056.....	27	-14311.....	5	-15102.....	121
-11704.....	121	-11866.....	127	-14057.....	27	-14312.....	5	-15103.....	121
-11705.....	121	-11874.....	127	-14058.....	27	-14313.....	5	-15104.....	121
		-11876.....	127	-14059.....	27	-14314.....	5	-15105.....	121
		-11878.....	127	-14061.....	9	-14315.....	5	-15114.....	123
		-11879.....	127	-14062.....	9	-14316.....	5	-15115.....	123

5020

-15116	123	-15275	124	-15451	121	-15642	110	-15848	101
-15117	123	-15276	125	-15452	121	-15643	110	-15851	99
-15118	125	-15277	125	-15453	121	-15644	111	-15852	99
-15119	125	-15278	123	-15454	121	-15646	110	-15853	99
-15122	125	-15279	123	-15455	121	-15701	116	-15855	99
-15123	125	-15280	123	-15464	123	-15702	116	-15856	99
-15124	124	-15285	122	-15465	123	-15706	116	-15857	99
-15125	124	-15286	122	-15466	123	-15708	116	-15858	99
-15126	125	-15287	121	-15467	123	-15710	116	-15859	99
-15127	125	-15288	121	-15468	125	-15711	116	-15860	99
-15128	123	-15289	124	-15469	125	-15714	116	-15864	100
-15129	123	-15290	124	-15470	124	-15716	116	-15865	100
-15130	123	-15301	121	-15471	124	-15718	116	-15866	100
-15135	122	-15302	121	-15472	125	-15720	116	-15867	100
-15136	122	-15303	121	-15473	125	-15722	116	-15868	101
-15137	121	-15304	121	-15474	124	-15724	116	-15869	101
-15138	121	-15305	121	-15475	124	-15726	116	-15870	101
-15139	124	-15314	123	-15476	125	-15728	116	-15871	101
-15140	124	-15315	123	-15477	125	-15729	116	-15873	102
-15151	121	-15316	123	-15478	123	-15730	116	-15874	101
-15152	121	-15317	123	-15479	123	-15731	116	-15875	101
-15153	121	-15318	125	-15480	123	-15732	116	-15876	102
-15154	121	-15319	125	-15485	122	-15735	116	-15878	101
-15155	121	-15320	124	-15486	122	-15736	116	-15879	101
-15164	123	-15321	124	-15487	121	-15737	116	-15880	101
-15165	123	-15322	125	-15488	121	-15738	116	-15881	102
-15166	123	-15323	125	-15489	124	-15739	116	-15882	102
-15167	123	-15325	124	-15490	124	-15740	116	-15885	99
-15168	125	-15326	125	-15501	121	-15741	116	-15886	100
-15169	125	-15327	125	-15502	121	-15744	116	-15887	100
-15170	124	-15328	123	-15503	121	-15745	116	-15888	100
-15171	124	-15330	123	-15504	121	-15751	116	-15889	102
-15172	125	-15335	122	-15505	121	-15752	116	-15893	100
-15173	125	-15336	122	-15514	123	-15753	116	-15894	100
-15174	124	-15337	121	-15515	123	-15756	116	-15895	99
-15175	124	-15338	121	-15516	123	-15758	116	-15896	99
-15176	125	-15339	124	-15517	123	-15760	116	-15897	101
-15177	125	-15340	124	-15518	125	-15761	116	-15898	101
-15178	123	-15351	121	-15519	125	-15764	116	-15901	99
-15179	123	-15352	121	-15520	124	-15766	116	-15902	99
-15180	123	-15353	121	-15521	124	-15768	116	-15903	99
-15185	122	-15354	121	-15522	125	-15770	116	-15905	99
-15186	122	-15355	121	-15523	125	-15772	116	-15906	99
-15187	121	-15364	123	-15524	124	-15774	116	-15907	99
-15188	121	-15365	123	-15525	124	-15776	116	-15908	99
-15189	124	-15366	123	-15526	125	-15778	116	-15909	99
-15190	124	-15367	123	-15527	125	-15779	116	-15910	99
-15201	121	-15368	125	-15528	123	-15781	116	-15914	100
-15202	121	-15369	125	-15529	123	-15782	116	-15915	100
-15203	121	-15370	124	-15530	123	-15785	116	-15916	100
-15204	121	-15371	124	-15535	122	-15786	116	-15917	100
-15205	121	-15372	125	-15536	122	-15787	116	-15919	101
-15214	123	-15373	125	-15537	121	-15788	116	-15920	101
-15215	123	-15374	125	-15538	121	-15789	116	-15923	102
-15216	123	-15375	125	-15539	124	-15790	116	-15924	101
-15217	123	-15376	125	-15540	124	-15791	116	-15925	101
-15218	125	-15378	125	-15551	121	-15794	116	-15926	102
-15219	125	-15379	125	-15552	121	-15795	116	-15927	101
-15220	124	-15380	125	-15553	121	-15801	99	-15928	101
-15221	124	-15385	124	-15554	121	-15802	99	-15929	101
-15222	125	-15386	124	-15555	121	-15803	99	-15931	102
-15223	125	-15387	125	-15564	123	-15805	99	-15935	99
-15224	124	-15388	125	-15565	123	-15806	99	-15936	100
-15225	124	-15389	125	-15566	123	-15807	99	-15937	100
-15226	124	-15390	125	-15567	123	-15808	99	-15938	100
-15227	125	-15401	124	-15569	125	-15809	99	-15939	102
-15228	123	-15402	124	-15572	125	-15810	99	-15943	100
-15229	123	-15403	125	-15573	125	-15814	100	-15944	100
-15230	123	-15404	125	-15574	124	-15815	100	-15945	99
-15235	122	-15405	125	-15575	124	-15816	100	-15946	99
-15236	122	-15414	125	-15576	125	-15817	100	-15951	99
-15237	121	-15415	125	-15577	125	-15818	101	-15952	99
-15238	121	-15416	123	-15578	123	-15819	101	-15953	99
-15239	124	-15417	123	-15579	123	-15820	101	-15955	99
-15240	124	-15418	125	-15580	123	-15821	101	-15956	99
-15251	121	-15419	125	-15585	122	-15823	102	-15957	99
-15252	121	-15422	125	-15586	122	-15824	101	-15958	99
-15253	121	-15423	125	-15587	121	-15826	102	-15959	99
-15254	121	-15424	124	-15588	121	-15828	101	-15960	99
-15255	121	-15425	124	-15589	124	-15829	101	-15964	100
-15264	123	-15426	125	-15590	124	-15830	101	-15965	100
-15265	123	-15427	125	-15602	114	-15831	102	-15966	100
-15266	123	-15428	123	-15603	114	-15835	99	-15967	100
-15267	123	-15429	123	-15604	114	-15836	100	-15968	101
-15268	125	-15430	123	-15606	114	-15837	100	-15969	101
-15269	125	-15435	122	-15614	111	-15838	100	-15970	101
-15272	125	-15436	122	-15616	110	-15843	100	-15971	101
-15273	125	-15437	121	-15632	114	-15844	100	-15972	102
-15274	124	-15438	121	-15633	114	-15845	99	-15973	102
		-15439	124	-15634	114	-15846	99	-15974	101
		-15440	124	-15636	114	-15847	101	-15975	101

Cat.No. INDEX

5020

-15976	102	-16077	114	-16180	100	-16332	100	-16423	98
-15977	102	-16078	114	-16181	100	-16333	100	-16432	33
-15978	101	-16079	114	-16182	100	-16334	103	-16433	33
-15979	101	-16080	116	-16183	100	-16335	100	-16434	33
-15980	101	-16081	116	-16184	122	-16336	100	-16435	33
-15981	102	-16082	122	-16185	122	-16337	100	-16436	33
-15982	102	-16083	122	-16186	122	-16338	100	-16437	33
-15985	99	-16085	122	-16187	122	-16339	33	-16439	33
-15986	100	-16086	122	-16188	122	-16340	33	-16440	33
-15987	100	-16087	122	-16189	122	-16341	33	-16441	33
-15988	100	-16088	127	-16190	122	-16342	33	-16442	33
-15989	102	-16089	127	-16191	122	-16343	33	-16443	33
-15993	100	-16090	122	-16192	122	-16344	33	-16444	33
-15994	100	-16091	122	-16193	122	-16345	33	-16446	33
-15995	99	-16092	122	-16194	122	-16346	33	-16447	33
-15996	99	-16093	122	-16195	122	-16347	33	-16448	33
-15997	101	-16094	122	-16196	122	-16348	33	-16449	33
-15998	101	-16095	122	-16197	122	-16349	33	-16450	33
-16002	25	-16096	122	-16198	122	-16350	33	-16451	33
-16003	25	-16097	122	-16199	122	-16351	100	-16453	33
-16004	25	-16098	122	-16200	122	-16352	100	-16454	33
-16005	25	-16099	122	-16201	122	-16353	100	-16455	33
-16006	25	-16100	122	-16202	122	-16354	100	-16456	33
-16007	25	-16101	122	-16203	25	-16355	111	-16457	33
-16009	25	-16102	25	-16204	25	-16356	111	-16458	33
-16010	25	-16103	25	-16205	25	-16357	111	-16459	100
-16011	25	-16104	25	-16206	25	-16358	111	-16460	100
-16012	25	-16105	25	-16207	25	-16359	111	-16461	100
-16013	25	-16106	25	-16208	25	-16360	111	-16462	100
-16014	25	-16107	25	-16209	25	-16361	111	-16463	103
-16016	25	-16108	25	-16210	25	-16362	111	-16464	100
-16017	25	-16109	25	-16211	25	-16363	111	-16465	100
-16018	25	-16110	25	-16212	25	-16364	111	-16466	100
-16019	25	-16111	25	-16213	25	-16365	111	-16467	100
-16020	25	-16112	25	-16214	25	-16366	111	-16468	33
-16021	25	-16113	25	-16215	98	-16367	111	-16469	33
-16022	25	-16114	94	-16216	98	-16368	111	-16470	33
-16023	25	-16115	94	-16217	94	-16369	111	-16471	33
-16024	25	-16116	94	-16218	25	-16370	111	-16472	33
-16025	25	-16117	94	-16219	25	-16371	111	-16473	33
-16026	25	-16118	94	-16220	25	-16372	111	-16474	33
-16027	25	-16119	94	-16221	25	-16373	111	-16475	33
-16028	25	-16120	94	-16222	25	-16374	111	-16476	33
-16030	100	-16121	94	-16223	25	-16375	114	-16477	33
-16031	100	-16122	98	-16224	25	-16376	114	-16478	33
-16032	100	-16123	98	-16225	25	-16377	114	-16479	33
-16033	100	-16132	25	-16226	25	-16378	114	-16481	100
-16034	103	-16133	25	-16227	25	-16379	114	-16482	100
-16035	100	-16134	25	-16228	25	-16380	116	-16483	100
-16036	100	-16135	25	-16229	25	-16381	116	-16484	123
-16037	100	-16136	25	-16230	25	-16382	123	-16485	123
-16038	100	-16137	25	-16231	25	-16383	123	-16486	123
-16039	25	-16139	25	-16232	25	-16384	123	-16487	123
-16040	25	-16140	25	-16233	25	-16385	123	-16488	123
-16041	25	-16141	25	-16234	25	-16386	123	-16489	123
-16042	25	-16142	25	-16235	25	-16387	123	-16490	127
-16043	25	-16143	25	-16236	25	-16388	127	-16491	123
-16044	25	-16144	25	-16237	25	-16389	127	-16492	123
-16045	25	-16146	25	-16238	25	-16390	123	-16493	123
-16046	25	-16147	25	-16239	25	-16391	123	-16494	123
-16047	25	-16148	25	-16240	25	-16392	123	-16495	123
-16048	25	-16149	25	-16241	25	-16393	123	-16496	123
-16049	25	-16150	25	-16242	25	-16394	123	-16497	123
-16050	25	-16151	25	-16243	25	-16395	123	-16498	123
-16051	100	-16153	25	-16244	25	-16396	123	-16499	123
-16052	100	-16154	25	-16302	33	-16397	123	-16500	123
-16053	100	-16155	25	-16303	33	-16398	123	-16501	123
-16054	100	-16156	25	-16304	33	-16399	123	-16502	123
-16055	110	-16157	25	-16305	33	-16400	123	-16503	33
-16056	110	-16158	25	-16306	33	-16401	123	-16504	33
-16057	110	-16159	100	-16307	33	-16402	33	-16505	33
-16058	110	-16160	100	-16309	33	-16403	33	-16506	33
-16059	110	-16161	100	-16310	33	-16404	33	-16507	33
-16060	110	-16162	100	-16311	33	-16405	33	-16508	33
-16061	110	-16163	103	-16312	33	-16406	33	-16509	33
-16062	110	-16164	100	-16313	33	-16407	33	-16510	33
-16063	110	-16165	100	-16314	33	-16408	33	-16511	33
-16064	110	-16166	100	-16316	33	-16409	33	-16512	33
-16065	110	-16167	100	-16317	33	-16410	33	-16513	33
-16066	110	-16168	25	-16318	33	-16411	33	-16514	33
-16067	110	-16169	25	-16319	33	-16412	33	-16515	98
-16068	110	-16170	25	-16320	33	-16413	33	-16516	98
-16069	110	-16171	25	-16321	33	-16414	95	-16517	33
-16070	110	-16172	25	-16323	33	-16415	95	-16518	33
-16071	110	-16173	25	-16324	33	-16416	95	-16519	33
-16072	110	-16174	25	-16325	33	-16417	95	-16520	33
-16073	110	-16175	25	-16326	33	-16418	95	-16521	33
-16074	110	-16176	25	-16327	33	-16419	95	-16522	33
-16075	114	-16177	25	-16328	33	-16420	95	-16523	33
-16076	114	-16178	25	-16330	100	-16421	95	-16524	33
		-16179	25	-16331	100	-16422	98	-16525	33

5020

-16526..... 33	-16679..... 115	-16782..... 101	-19014..... 29	-19110..... 19
-16527..... 33	-16680..... 116	-16783..... 101	-19015..... 29	-19111..... 85
-16528..... 33	-16681..... 116	-16784..... 124	-19016..... 37	-19112..... 87
-16529..... 33	-16682..... 124	-16785..... 124	-19017..... 37	-19113..... 87
-16530..... 33	-16683..... 124	-16786..... 124	-19018..... 41/67	-19114..... 29
-16531..... 33	-16684..... 124	-16787..... 124	-19019..... 41/67	-19115..... 29
-16532..... 33	-16685..... 124	-16788..... 124	-19020..... 53/63	-19116..... 37
-16533..... 33	-16686..... 124	-16789..... 124	-19021..... 53/63	-19117..... 37
-16534..... 33	-16687..... 124	-16790..... 127	-19022..... 59/73	-19118..... 41/67
-16535..... 33	-16688..... 127	-16791..... 124	-19023..... 59/73	-19119..... 41/67
-16536..... 33	-16689..... 124	-16792..... 124	-19024..... 51	-19120..... 53/63
-16537..... 33	-16690..... 124	-16793..... 124	-19025..... 51	-19121..... 53/63
-16538..... 33	-16691..... 124	-16794..... 124	-19026..... 61	-19122..... 59/73
-16539..... 33	-16692..... 124	-16795..... 124	-19027..... 61	-19123..... 59/73
-16540..... 33	-16693..... 124	-16796..... 124	-19028..... 43	-19124..... 51
-16541..... 33	-16694..... 124	-16797..... 124	-19029..... 44	-19125..... 51
-16542..... 33	-16695..... 124	-16798..... 124	-19030..... 45	-19126..... 61
-16543..... 33	-16696..... 124	-16799..... 124	-19031..... 75	-19127..... 61
-16544..... 33	-16697..... 124	-16800..... 124	-19032..... 69	-19128..... 43
-16602..... 53/63	-16698..... 124	-16801..... 124	-19033..... 79	-19129..... 44
-16603..... 53/63	-16699..... 124	-16802..... 124	-19034..... 81	-19130..... 45
-16604..... 53/63	-16700..... 124	-16803..... 53/63	-19035..... 22/93	-19131..... 75
-16605..... 53/63	-16701..... 124	-16804..... 53/63	-19036..... 30	-19132..... 69
-16606..... 53/63	-16702..... 53/63	-16805..... 53/63	-19037..... 39	-19133..... 81
-16607..... 53/63	-16703..... 53/63	-16806..... 53/63	-19038..... 31	-19134..... 81
-16609..... 53/63	-16704..... 53/63	-16807..... 53/63	-19039..... 68	-19135..... 22/93
-16610..... 53/63	-16705..... 53/63	-16808..... 53/63	-19040..... 21	-19136..... 30
-16611..... 53/63	-16706..... 53/63	-16809..... 53/63	-19041..... 23	-19137..... 39
-16612..... 53/63	-16707..... 53/63	-16810..... 53/63	-19042..... 23	-19138..... 31
-16613..... 53/63	-16708..... 53/63	-16811..... 53/63	-19043..... 84	-19139..... 68
-16614..... 53/63	-16709..... 53/63	-16812..... 53/63	-19046..... 27	-19140..... 21
-16616..... 53/63	-16710..... 53/63	-16813..... 53/63	-19047..... 27	-19141..... 23
-16617..... 53/63	-16711..... 53/63	-16814..... 53/63	-19048..... 86	-19142..... 23
-16618..... 53/63	-16712..... 53/63	-16815..... 98	-19049..... 5/93	-19143..... 84
-16619..... 53/63	-16713..... 53/63	-16816..... 98	-19050..... 5/93	-19146..... 27
-16620..... 53/63	-16714..... 95	-16851..... 25	-19051..... 9/93	-19147..... 27
-16621..... 53/63	-16715..... 95	-16852..... 25	-19052..... 9/93	-19149..... 5/93
-16622..... 53/63	-16716..... 95	-16853..... 25	-19053..... 11/93	-19150..... 5/93
-16623..... 53/63	-16717..... 95	-16854..... 25	-19054..... 11/93	-19151..... 9/93
-16624..... 53/63	-16718..... 95	-16855..... 25	-19056..... 15	-19152..... 9/93
-16625..... 53/63	-16719..... 95	-16856..... 25	-19057..... 15	-19153..... 11/93
-16626..... 53/63	-16720..... 95	-16857..... 25	-19058..... 17	-19154..... 11/93
-16627..... 53/63	-16721..... 95	-16858..... 25	-19059..... 17	-19155..... 11/93
-16628..... 53/63	-16722..... 98	-18030..... 87	-19060..... 19	-19156..... 15
-16630..... 101	-16723..... 98	-18031..... 87	-19061..... 85	-19157..... 15
-16631..... 101	-16732..... 53/63	-18032..... 87	-19062..... 87	-19158..... 17
-16632..... 101	-16733..... 53/63	-18035..... 87	-19063..... 87	-19159..... 17
-16633..... 101	-16734..... 53/63	-18041..... 87	-19064..... 29	-19160..... 19
-16635..... 101	-16735..... 53/63	-18045..... 87	-19065..... 29	-19161..... 85
-16637..... 101	-16736..... 53/63	-18051..... 85	-19066..... 37	-19162..... 87
-16638..... 101	-16737..... 53/63	-18153..... 84	-19067..... 37	-19163..... 87
-16639..... 53/63	-16739..... 53/63	-18154..... 84	-19068..... 41/67	-19165..... 29
-16640..... 53/63	-16740..... 53/63	-18211..... 19	-19069..... 41/67	-19166..... 37
-16641..... 53/63	-16741..... 53/63	-18212..... 19	-19070..... 53/63	-19167..... 37
-16642..... 53/63	-16742..... 53/63	-18213..... 19	-19071..... 53/63	-19168..... 41/67
-16643..... 53/63	-16743..... 53/63	-18214..... 19	-19072..... 59/73	-19169..... 41/67
-16644..... 53/63	-16744..... 53/63	-18215..... 19	-19073..... 59/73	-19170..... 53/63
-16645..... 53/63	-16746..... 53/63	-18216..... 19	-19074..... 51	-19171..... 53/63
-16646..... 53/63	-16747..... 53/63	-18221..... 19	-19075..... 51	-19172..... 59/73
-16647..... 53/63	-16748..... 53/63	-18222..... 19	-19076..... 61	-19173..... 59/73
-16648..... 53/63	-16749..... 53/63	-18223..... 19	-19077..... 61	-19174..... 51
-16649..... 53/63	-16750..... 53/63	-18224..... 19	-19078..... 43	-19175..... 51
-16650..... 53/63	-16751..... 53/63	-18225..... 19	-19079..... 44	-19176..... 61
-16651..... 101	-16753..... 53/63	-18226..... 19	-19080..... 45	-19177..... 61
-16652..... 101	-16754..... 53/63	-18252..... 109	-19081..... 75	-19178..... 43
-16654..... 101	-16755..... 53/63	-18254..... 109	-19082..... 69	-19179..... 44
-16655..... 112	-16756..... 53/63	-18255..... 109	-19083..... 79	-19180..... 45
-16656..... 112	-16757..... 53/63	-18256..... 109	-19084..... 81	-19181..... 75
-16657..... 112	-16758..... 53/63	-18257..... 114	-19085..... 22/93	-19182..... 69
-16658..... 112	-16759..... 101	-18262..... 109	-19086..... 30	-19183..... 79
-16659..... 112	-16760..... 101	-18264..... 109	-19087..... 39	-19184..... 81
-16660..... 112	-16761..... 101	-18265..... 109	-19088..... 31	-19185..... 22/93
-16661..... 112	-16762..... 101	-18266..... 109	-19089..... 68	-19186..... 30
-16662..... 112	-16763..... 103	-18267..... 114	-19090..... 21	-19187..... 39
-16663..... 112	-16764..... 101	-18272..... 109	-19091..... 23	-19188..... 31
-16664..... 112	-16765..... 101	-18276..... 109	-19092..... 23	-19189..... 68
-16665..... 112	-16766..... 101	-18277..... 114	-19093..... 84	-19190..... 21
-16666..... 112	-16767..... 101	-18286..... 109	-19096..... 27	-19191..... 23
-16667..... 112	-16768..... 53/63	-19001..... 9	-19097..... 27	-19192..... 23
-16668..... 112	-16769..... 53/63	-19002..... 9	-19098..... 86	-19193..... 84
-16669..... 112	-16770..... 53/63	-19003..... 11	-19099..... 5/93	-19196..... 27
-16670..... 112	-16771..... 53/63	-19004..... 11	-19100..... 5/93	-19197..... 27
-16671..... 112	-16772..... 53/63	-19005..... 11	-19101..... 9/93	-19199..... 5/93
-16672..... 112	-16773..... 53/63	-19006..... 15	-19102..... 9/93	-19200..... 5/93
-16673..... 112	-16774..... 53/63	-19007..... 15	-19103..... 11/93	-19201..... 9/93
-16674..... 112	-16775..... 53/63	-19008..... 17	-19104..... 11/93	-19202..... 9/93
-16675..... 115	-16776..... 53/63	-19009..... 17	-19105..... 11/93	-19203..... 11/93
-16676..... 115	-16777..... 53/63	-19010..... 19	-19106..... 15	-19204..... 11/93
-16677..... 115	-16778..... 53/63	-19011..... 85	-19107..... 15	-19205..... 11/93
-16678..... 115	-16779..... 53/63	-19012..... 87	-19108..... 17	-19206..... 15
	-16780..... 101	-19013..... 87	-19109..... 17	-19207..... 15
	-16781..... 101			

Reversed Phase Columns
HILIC Columns
Normal Phase Columns
SEC Columns
Ion Exchange Columns
Application Specific Columns
Guard Columns
Preparative Columns
Capillary Columns
Applications
Cat. No. Index

Cat.No. INDEX

5020

-19208	17	-19325	51	-19436	30	-19536	30	-19701	94
-19209	17	-19326	61	-19437	39	-19537	39	-19703	94
-19210	19	-19327	61	-19438	31	-19538	31	-19706	94
-19211	85	-19328	43	-19439	68	-19539	68	-19708	94
-19214	29	-19329	44	-19440	21	-19540	21	-19710	94
-19215	29	-19330	45	-19441	23	-19541	23	-19716	95
-19216	37	-19331	75	-19442	23	-19542	23	-19718	95
-19217	37	-19332	69	-19443	84	-19543	84	-19720	95
-19218	41/67	-19333	79	-19447	27	-19546	27	-19722	95
-19219	41/67	-19334	81	-19449	5/93	-19547	27	-19724	95
-19220	53/63	-19335	22/93	-19450	5/93	-19549	5/93	-19726	95
-19221	53/63	-19343	84	-19451	9/93	-19550	5/93	-19728	95
-19222	59/73	-19344	84	-19452	9/93	-19551	9/93	-19731	95
-19223	59/73	-19346	27	-19453	11/93	-19552	9/93	-19735	94
-19224	51	-19347	27	-19454	11/93	-19553	11/93	-19746	94
-19225	51	-19349	5/93	-19455	11/93	-19554	11/93	-19749	94
-19226	61	-19350	5/93	-19456	15	-19555	11/93	-19751	94
-19227	61	-19351	9/93	-19457	15	-19556	15	-19753	94
-19228	43	-19352	9/93	-19458	17	-19557	15	-19756	94
-19229	44	-19353	11/93	-19459	17	-19558	17	-19758	94
-19230	45	-19354	11/93	-19460	19	-19559	17	-19760	94
-19231	75	-19355	11/93	-19461	85	-19560	19	-19766	95
-19232	69	-19356	15	-19462	87	-19561	85	-19768	95
-19233	79	-19357	15	-19463	87	-19562	87	-19770	95
-19234	81	-19358	17	-19464	29	-19563	87	-19772	95
-19235	22/93	-19359	17	-19465	29	-19564	29	-19774	95
-19246	27	-19360	19	-19466	37	-19565	29	-19776	95
-19247	27	-19361	85	-19467	37	-19566	37	-19778	95
-19249	5/93	-19364	29	-19468	41/67	-19567	37	-19781	95
-19250	5/93	-19365	29	-19469	41/67	-19568	41/67	-19785	94
-19251	9/93	-19366	37	-19470	53/63	-19569	41/67	-19796	94
-19252	9/93	-19367	37	-19471	53/63	-19570	53/63	-19799	94
-19253	11/93	-19368	41/67	-19472	59/73	-19571	53/63	-19801	94
-19254	11/93	-19369	41/67	-19473	59/73	-19572	59/73	-19803	94
-19255	11/93	-19370	53/63	-19474	51	-19573	59/73	-19806	94
-19256	15	-19371	53/63	-19475	51	-19574	51	-19808	94
-19257	15	-19372	59/73	-19476	61	-19575	51	-19810	94
-19258	17	-19373	59/73	-19477	61	-19576	61	-19816	95
-19259	17	-19374	51	-19478	43	-19577	61	-19818	95
-19260	19	-19375	51	-19479	44	-19578	43	-19820	95
-19261	85	-19376	61	-19480	45	-19579	44	-19822	95
-19264	29	-19377	61	-19482	69	-19580	45	-19824	95
-19265	29	-19378	43	-19483	79	-19581	75	-19826	95
-19266	37	-19379	44	-19484	81	-19582	69	-19828	95
-19267	37	-19380	45	-19485	22/93	-19583	79	-19831	95
-19268	41/67	-19381	75	-19486	30	-19584	81	-19835	94
-19269	41/67	-19382	69	-19487	39	-19585	22/93	-19846	94
-19270	53/63	-19383	79	-19488	31	-19586	30	-19849	94
-19271	53/63	-19384	81	-19489	68	-19587	39	-19851	94
-19272	59/73	-19385	22/93	-19490	21	-19588	31	-19853	94
-19273	59/73	-19393	84	-19491	23	-19589	68	-19856	94
-19274	51	-19394	84	-19492	23	-19590	21	-19858	94
-19275	51	-19396	27	-19493	84	-19591	23	-19860	94
-19276	61	-19397	27	-19496	27	-19592	23	-19866	95
-19277	61	-19399	5/93	-19499	5/93	-19593	84	-19868	95
-19278	43	-19400	5/93	-19500	5/93	-19596	27	-19870	95
-19279	44	-19401	9/93	-19501	9/93	-19597	27	-19872	95
-19280	45	-19402	9/93	-19502	9/93	-19599	5/93	-19874	95
-19281	75	-19403	11/93	-19503	11/93	-19600	5/93	-19876	95
-19282	69	-19404	11/93	-19504	11/93	-19601	94	-19878	95
-19283	79	-19405	11/93	-19505	11/93	-19603	94	-19881	95
-19284	79	-19406	15	-19506	15	-19606	94	-19885	94
-19285	22/93	-19407	15	-19507	15	-19608	94	-19896	94
-19296	27	-19408	17	-19508	17	-19610	94	-19901	94
-19297	27	-19409	17	-19509	17	-19616	95	-19903	94
-19299	5/93	-19410	19	-19510	19	-19618	95	-19906	94
-19300	5/93	-19411	85	-19511	85	-19620	95	-19908	94
-19301	9/93	-19412	87	-19512	87	-19622	95	-19910	94
-19302	9/93	-19413	87	-19513	87	-19624	95	-19916	95
-19303	11/93	-19414	29	-19514	29	-19626	95	-19918	95
-19304	11/93	-19415	29	-19515	29	-19628	95	-19920	95
-19305	11/93	-19416	37	-19516	37	-19631	95	-19922	95
-19306	15	-19417	37	-19517	37	-19635	94	-19924	95
-19307	15	-19418	41/67	-19518	41/67	-19646	94	-19926	95
-19308	17	-19419	41/67	-19519	41/67	-19649	94	-19928	95
-19309	17	-19420	53/63	-19520	53/63	-19651	94	-19931	95
-19310	19	-19421	53/63	-19521	53/63	-19653	94	-19935	94
-19311	85	-19422	59/73	-19522	59/73	-19656	94	-19946	94
-19314	29	-19423	59/73	-19523	59/73	-19658	94	-19949	94
-19315	29	-19424	51	-19524	51	-19660	94	-19953	94
-19316	37	-19425	51	-19525	51	-19666	95	-19956	94
-19317	37	-19426	61	-19526	61	-19668	95	-19958	94
-19318	41/67	-19427	61	-19527	61	-19670	95	-19960	94
-19319	41/67	-19428	43	-19528	43	-19672	95	-19966	95
-19320	53/63	-19429	44	-19529	44	-19674	95	-19968	95
-19321	53/63	-19430	45	-19530	45	-19676	95	-19970	95
-19322	59/73	-19431	75	-19531	75	-19678	95	-19972	95
-19323	59/73	-19432	69	-19532	69	-19681	95	-19974	95
-19324	51	-19433	79	-19533	79	-19685	94	-19976	95
		-19434	81	-19534	81	-19696	94	-19978	95
		-19435	19	-19535	22/93	-19699	94	-19981	95

-19985	94
-19996	94
-19999	94
-20101	98
-20102	98
-20103	98
-20104	98
-20105	98
-20106	98
-20107	98
-20108	98
-20109	98
-20110	98
-20114	98
-20115	98
-20116	98
-20117	98
-20118	98
-20119	98
-20120	98
-20121	98
-20122	98
-20123	98
-20124	98
-20125	98
-20126	98
-20127	98
-20128	98
-20129	98
-20130	98
-20131	98
-20132	98
-20135	98
-20139	98
-20143	98
-20144	98
-20145	98
-20146	98
-20147	49
-20148	49
-20149	49
-20150	49
-20151	49
-20152	49
-20153	49
-20154	49
-20155	49
-20156	49
-20157	49
-20158	49
-20159	49
-20160	49
-20161	49
-20162	49
-20163	49
-20164	49
-20165	49
-20166	49
-20167	49
-20168	49
-20169	49
-20170	49
-20171	95
-20173	95
-20175	95
-20177	95
-20179	95
-20181	95
-20183	95
-20185	95
-20189	98
-20190	98
-20201	98
-20202	98
-20203	98
-20204	98
-20205	98
-20206	98
-20207	98
-20208	98
-20209	98
-20210	98
-20214	98
-20215	98
-20216	98
-20217	98
-20218	98
-20219	98
-20220	98

HPLC Column Catalog 155

Cat.No. INDEX

5020

-81204.....	9	-84422.....	11	-84957.....	114	-85362.....	111	-85846.....	111
-81205.....	9	-84423.....	11	-84962.....	110	-85364.....	111	-85847.....	115
-81210.....	9	-84424.....	11	-84964.....	110	-85365.....	111	-85852.....	111
-81212.....	9	-84511.....	11	-84965.....	110	-85366.....	111	-85856.....	111
-81213.....	9	-84512.....	11	-84966.....	110	-85367.....	115	-85857.....	115
-81214.....	9	-84513.....	11	-84967.....	114	-85372.....	111	-85866.....	111
-81215.....	9	-84514.....	11	-84972.....	110	-85376.....	111	-85911.....	75
-81221.....	27	-84521.....	11	-84976.....	110	-85377.....	115	-85912.....	75
-81222.....	27	-84522.....	11	-84977.....	114	-85511.....	53/63	-85913.....	75
-81223.....	27	-84523.....	11	-84986.....	110	-85512.....	53/63	-85914.....	75
-81224.....	27	-84524.....	11	-84987.....	114	-85513.....	53/63	-85915.....	75
-81225.....	27	-84650.....	10	-85011.....	37	-85514.....	53/63	-85916.....	75
-81226.....	27	-84652.....	10	-85012.....	37	-85515.....	53/63	-85921.....	75
-81231.....	27	-84653.....	10	-85013.....	37	-85516.....	53/63	-85922.....	75
-81232.....	27	-84654.....	10	-85014.....	37	-85521.....	53/63	-85923.....	75
-81233.....	27	-84655.....	10	-85021.....	37	-85522.....	53/63	-85924.....	75
-81234.....	27	-84660.....	10	-85022.....	37	-85523.....	53/63	-85925.....	75
-81235.....	27	-84662.....	10	-85023.....	37	-85524.....	53/63	-85926.....	75
-81236.....	27	-84663.....	10	-85024.....	37	-85525.....	53/63	-85932.....	113
-81243.....	110	-84664.....	10	-85111.....	37	-85526.....	53/63	-85934.....	113
-81244.....	110	-84665.....	10	-85112.....	37	-85531.....	53/63	-85935.....	113
-81245.....	110	-84711.....	17	-85113.....	37	-85532.....	53/63	-85936.....	113
-81246.....	110	-84712.....	17	-85114.....	37	-85533.....	53/63	-85937.....	115
-81247.....	114	-84713.....	17	-85116.....	37	-85534.....	53/63	-85942.....	113
-81253.....	110	-84714.....	17	-85121.....	37	-85535.....	53/63	-85944.....	113
-81254.....	110	-84715.....	17	-85122.....	37	-85536.....	53/63	-85945.....	113
-81255.....	110	-84716.....	17	-85123.....	37	-85541.....	53/63	-85946.....	113
-81256.....	110	-84721.....	17	-85124.....	37	-85542.....	53/63	-85947.....	115
-81257.....	114	-84722.....	17	-85126.....	37	-85543.....	53/63	-85952.....	113
-81261.....	27	-84723.....	17	-85130.....	37	-85544.....	53/63	-85956.....	113
-81262.....	27	-84724.....	17	-85131.....	37	-85545.....	53/63	-85957.....	115
-81263.....	27	-84725.....	17	-85132.....	37	-85546.....	53/63	-85966.....	113
-81264.....	27	-84726.....	17	-85133.....	37	-85552.....	112	-85967.....	115
-81265.....	27	-84731.....	17	-85134.....	37	-85554.....	112	-86011.....	69
-81266.....	27	-84732.....	17	-85135.....	37	-85555.....	112	-86012.....	69
-81271.....	27	-84733.....	17	-85136.....	37	-85556.....	112	-86013.....	69
-81272.....	27	-84734.....	17	-85137.....	37	-85557.....	115	-86014.....	69
-81273.....	27	-84735.....	17	-85138.....	37	-85562.....	112	-86015.....	69
-81274.....	27	-84736.....	17	-85139.....	37	-85564.....	112	-86016.....	69
-81275.....	27	-84741.....	17	-85152.....	111	-85565.....	112	-86021.....	69
-81276.....	27	-84742.....	17	-85154.....	111	-85566.....	112	-86022.....	69
-81280.....	27	-84743.....	17	-85155.....	111	-85567.....	115	-86023.....	69
-81282.....	27	-84744.....	17	-85156.....	111	-85572.....	112	-86024.....	69
-81283.....	27	-84745.....	17	-85157.....	114	-85576.....	112	-86025.....	69
-81284.....	27	-84746.....	17	-85162.....	111	-85577.....	115	-86026.....	69
-81285.....	27	-84752.....	109	-85164.....	111	-85711.....	44	-86032.....	113
-81290.....	27	-84754.....	109	-85165.....	111	-85712.....	44	-86034.....	113
-81292.....	27	-84755.....	109	-85166.....	111	-85713.....	44	-86035.....	113
-81293.....	27	-84756.....	109	-85167.....	114	-85714.....	44	-86036.....	113
-81294.....	27	-84757.....	114	-85172.....	111	-85715.....	44	-86037.....	115
-81295.....	27	-84762.....	109	-85176.....	111	-85716.....	44	-86042.....	113
-84211.....	61	-84764.....	109	-85177.....	114	-85721.....	44	-86044.....	113
-84212.....	61	-84765.....	109	-85186.....	111	-85722.....	44	-86045.....	113
-84213.....	61	-84766.....	109	-85187.....	114	-85723.....	44	-86046.....	113
-84214.....	61	-84767.....	114	-85252.....	109	-85724.....	44	-86047.....	115
-84221.....	61	-84772.....	109	-85254.....	109	-85725.....	44	-86052.....	113
-84222.....	61	-84776.....	109	-85255.....	109	-85726.....	44	-86056.....	113
-84223.....	61	-84777.....	114	-85256.....	109	-85732.....	111	-86057.....	115
-84224.....	61	-84786.....	109	-85257.....	114	-85734.....	111	-86066.....	113
-84311.....	61	-84811.....	29	-85262.....	109	-85735.....	111	-86111.....	45
-84312.....	61	-84812.....	29	-85264.....	109	-85736.....	111	-86112.....	45
-84313.....	61	-84813.....	29	-85265.....	109	-85737.....	115	-86113.....	45
-84314.....	61	-84814.....	29	-85266.....	109	-85742.....	111	-86114.....	45
-84316.....	61	-84821.....	29	-85267.....	114	-85744.....	111	-86115.....	45
-84321.....	61	-84822.....	29	-85311.....	41/67	-85745.....	111	-86116.....	45
-84322.....	61	-84823.....	29	-85312.....	41/67	-85746.....	111	-86121.....	45
-84323.....	61	-84824.....	29	-85313.....	41/67	-85747.....	115	-86122.....	45
-84324.....	61	-84911.....	29	-85314.....	41/67	-85752.....	111	-86123.....	45
-84326.....	61	-84912.....	29	-85316.....	41/67	-85756.....	111	-86124.....	45
-84352.....	112	-84913.....	29	-85321.....	41/67	-85757.....	115	-86125.....	45
-84354.....	112	-84914.....	29	-85322.....	41/67	-85766.....	111	-86126.....	45
-84355.....	112	-84916.....	29	-85323.....	41/67	-85767.....	115	-86132.....	111
-84356.....	112	-84921.....	29	-85324.....	41/67	-85811.....	43	-86134.....	111
-84357.....	115	-84922.....	29	-85326.....	41/67	-85812.....	43	-86135.....	111
-84362.....	112	-84923.....	29	-85331.....	41/67	-85813.....	43	-86136.....	111
-84364.....	112	-84924.....	29	-85332.....	41/67	-85814.....	43	-86137.....	115
-84365.....	112	-84926.....	29	-85333.....	41/67	-85815.....	43	-86142.....	111
-84366.....	112	-84930.....	29	-85334.....	41/67	-85816.....	43	-86144.....	111
-84367.....	115	-84931.....	29	-85335.....	41/67	-85821.....	43	-86145.....	111
-84372.....	112	-84932.....	29	-85336.....	41/67	-85822.....	43	-86146.....	111
-84376.....	112	-84933.....	29	-85341.....	41/67	-85823.....	43	-86147.....	115
-84377.....	115	-84934.....	29	-85342.....	41/67	-85824.....	43	-86152.....	111
-84386.....	112	-84935.....	29	-85343.....	41/67	-85825.....	43	-86156.....	111
-84387.....	115	-84936.....	29	-85344.....	41/67	-85826.....	43	-86157.....	115
-84411.....	11	-84937.....	29	-85345.....	41/67	-85832.....	111	-86166.....	111
-84412.....	11	-84938.....	29	-85346.....	41/67	-85834.....	111	-86167.....	115
-84413.....	11	-84939.....	29	-85352.....	111	-85835.....	111	-86511.....	59/73
-84414.....	11	-84952.....	110	-85354.....	111	-85836.....	111	-86512.....	59/73
-84421.....	11	-84954.....	110	-85355.....	111	-85837.....	115	-86513.....	59/73
-84422.....	11	-84955.....	110	-85356.....	111	-85844.....	111	-86514.....	59/73
		-84956.....	110	-85357.....	115	-85845.....	111	-86515.....	59/73

5020

-86516	59/73
-86521	59/73
-86522	59/73
-86523	59/73
-86524	59/73
-86525	59/73
-86526	59/73
-86531	59/73
-86532	59/73
-86533	59/73
-86534	59/73
-86535	59/73
-86536	59/73
-86541	59/73
-86542	59/73
-86543	59/73
-86544	59/73
-86545	59/73
-86546	59/73
-86552	73/112
-86554	73/112
-86555	73/112
-86556	73/112
-86557	115
-86562	112
-86564	112
-86565	112
-86566	112
-86567	115
-86572	112
-86576	112
-86577	115
-86586	112
-86587	115
-86711	51
-86712	51
-86713	51
-86714	51
-86715	51
-86716	51
-86721	51
-86722	51
-86723	51
-86724	51
-86725	51
-86726	51
-86731	51
-86732	51
-86733	51
-86734	51
-86735	51
-86736	51
-86741	51
-86742	51
-86743	51
-86744	51
-86745	51
-86746	51
-86752	112
-86754	112
-86755	112
-86756	112
-86757	115
-86762	112
-86764	112
-86765	112
-86766	112
-86767	115
-86772	112
-86776	112
-86777	115
-86811	112
-86812	112
-86813	112
-86814	112
-86815	112
-86816	112
-86821	112
-86822	112
-86823	112
-86824	112
-86825	112
-86826	112
-86831	112
-86832	112
-86833	112
-86834	112
-86835	112
-86836	112

-86841	112
-86842	112
-86843	112
-86844	112
-86845	112
-86846	112
-86852	112
-86854	112
-86855	112
-86856	112
-86857	115
-86862	112
-86864	112
-86865	112
-86866	112
-86867	115
-86872	112
-86876	112
-86877	115
-87000	88
-87001	88
-87002	89
-87003	89
-87004	89
-87005	88
-87006	88
-87007	89
-87008	88
-87009	88
-87010	88
-87011	88
-87012	89
-87013	89
-87014	89
-87015	89
-87016	89
-87017	89
-87018	89
-87019	89
-87020	89
-87021	88
-87022	88
-87023	88
-87024	88
-87025	88
-87026	88
-87028	88
-87029	88
-87030	88
-87031	88
-87032	88
-87033	88
-87034	89
-87035	89
-87037	88
-87038	89
-87040	88
-87043	88
-87045	88
-87046	88
-88001	7
-88002	7
-88003	7
-88004	7
-88005	7
-88006	7
-88008	7
-88009	7
-88010	7
-88011	7
-88012	7
-88013	7
-88015	7
-88016	7
-88017	7
-88018	7
-88019	7
-88020	7
-88022	7
-88023	7
-88024	7
-88025	7
-88026	7
-88027	7
-88038	7
-88039	7
-88040	7
-88041	7
-88042	7
-88043	7
-88044	7

-88045	7
-88046	7
-88047	7
-88048	7
-88049	7
-88101	7
-88102	7
-88103	7
-88104	7
-88105	7
-88106	7
-88107	7
-88108	7
-88109	7
-88110	7
-88111	7
-88112	7
-88123	7
-88124	7
-88125	7
-88126	7
-88128	7
-88129	7
-88131	7
-88132	7
-88133	7
-88134	7
-88135	7
-88136	7
-88138	7
-88139	7
-88140	7
-88141	7
-88142	7
-88143	7
-88145	7
-88146	7
-88147	7
-88148	7
-88149	7
-88150	7
-88160	7
-88161	7
-88162	7
-88163	7
-88164	7
-88165	7
-88166	7
-88167	7
-88168	7
-88169	7
-88170	7
-88171	7
-88195	7
-88196	7
-88198	7
-88199	7
-88200	7
-88201	7
-88202	7
-88203	7
-88204	7
-88205	7
-88206	7
-88210	7
-88212	7
-88213	7
-88214	7
-88216	7
-88218	7
-88219	7
-88220	7
-88222	7
-88224	7
-88225	7
-88226	7
-88228	7
-88230	7
-88231	7
-88233	7
-88235	7
-88236	7
-88249	7
-88250	7
-88251	7
-88252	7
-88253	7
-88254	7
-88255	7
-88256	7
-89001	35

-89002	35
-89003	35
-89004	35
-89005	35
-89006	35
-89008	35
-89009	35
-89010	35
-89011	35
-89012	35
-89013	35
-89015	35
-89016	35
-89017	35
-89018	35
-89019	35
-89020	35
-89022	35
-89023	35
-89024	35
-89025	35
-89026	35
-89027	35
-89038	35
-89039	35
-89040	35
-89041	35
-89042	35
-89043	35
-89044	35
-89045	35
-89046	35
-89047	35
-89048	35
-89049	35
-89101	35
-89102	35
-89103	35
-89104	35
-89105	35
-89106	35
-89107	35
-89108	35
-89109	35
-89110	35
-89111	35
-89112	35
-89124	35
-89125	35
-89128	35
-89129	35
-89131	35
-89132	35
-89133	35
-89134	35
-89135	35
-89136	35
-89138	35
-89139	35
-89140	35
-89141	35
-89142	35
-89143	35
-89145	35
-89146	35
-89147	35
-89148	35
-89149	35
-89150	35
-89160	35
-89161	35
-89162	35
-89163	35
-89164	35
-89165	35
-89166	35
-89167	35
-89168	35
-89170	35
-89171	35
-89195	35
-89196	35
-89197	35
-89198	35
-89199	35
-89200	35
-89201	35
-89202	35
-89203	35
-89204	35

-89205	35
-89206	35
-89209	35
-89210	35
-89211	35
-89212	35
-89213	35
-89214	35
-89215	35
-89216	35
-89217	35
-89218	35
-89219	35
-89220	35
-89221	35
-89222	35
-89223	35
-89224	35
-89225	35
-89226	35

6010

-49210	105
-49211	105
-55100	105
-55110	105
-55300	105
-55310	105
-72351	132
-72352	132
-77001	97
-77007	97

Trademarks

The following trademarks are the property of the listed company and/or its affiliates.

- **GL Sciences Inc. in Japan**

Inertsil
InertSustain
InertSphere
MonoCap
MonoSpray
SILFILTER

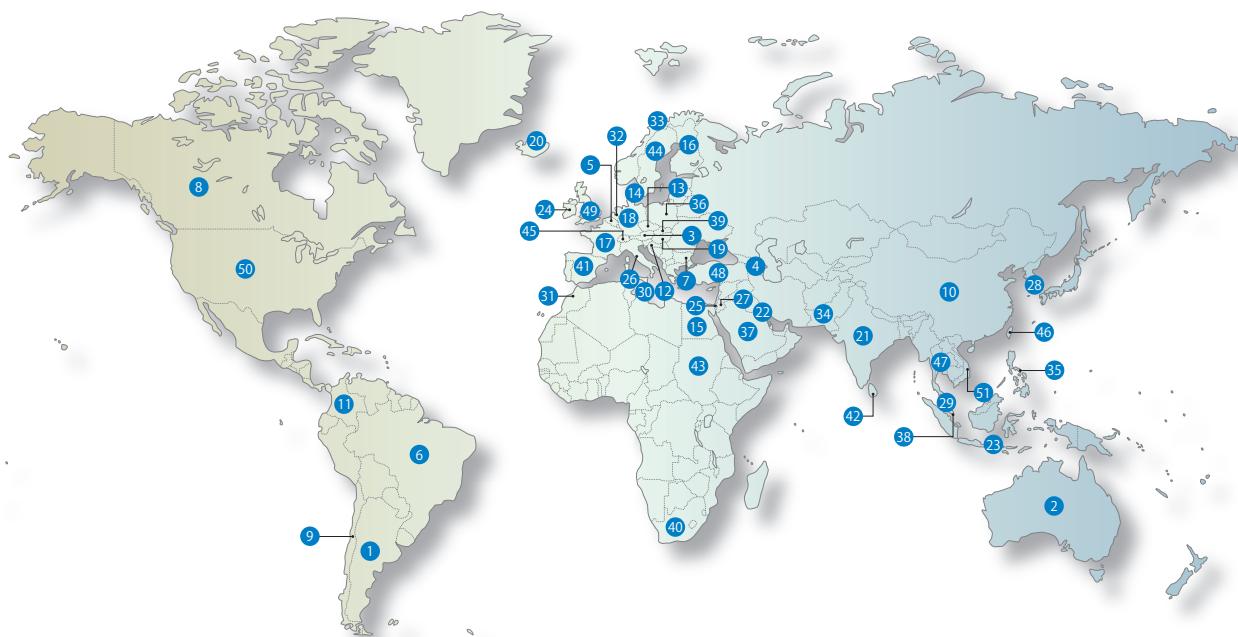
- **AB SCIEX**

QTRAP

- **Waters Technologies Corporation**

UPLC

InertSustain®, Inertsil®, Sales Network



1 ARGENTINA



14 DENMARK



27 JORDAN



40 SOUTH AFRICA



2 AUSTRALIA



15 EGYPT



28 KOREA



41 SPAIN



3 AUSTRIA



16 FINLAND



29 MALAYSIA



42 SRI LANKA



4 AZERBAIJAN



17 FRANCE



30 MALTA



43 SUDAN



5 BELGIUM



18 GERMANY



31 MOROCCO



44 SWEDEN



6 BRAZIL



19 HUNGARY



32 The NETHERLANDS



45 SWITZERLAND



7 BULGARIA



20 ICELAND



33 NORWAY



46 TAIWAN



8 CANADA



21 INDIA



34 PAKISTAN



47 THAILAND



9 CHILE



22 IRAQ



35 PHILIPPINES



48 TURKEY



10 CHINA



23 INDONESIA



36 POLAND



49 UNITED KINGDOM



11 COLOMBIA



24 IRELAND



37 SAUDI-ARABIA



50 UNITED STATES



12 CROATIA



25 ISRAEL



38 SINGAPORE



51 VIETNAM



13 CZECH REPUBLIC



26 ITALY



39 SLOVAKIA



Worldwide Ordering Information

GL Sciences Inc. Japan
22-1 Nishishinjuku 6-Chome
Shinjuku-ku, Tokyo, 163-1130, Japan
Phone: +81-3-5323-6620
Fax: +81-3-5323-6621
Web: www.glsciences.com
Email: world@gl.co.jp

GL Sciences B.V.
De Sleutel 9, 5652 AS Eindhoven
The Netherlands
Phone: +31 (0)40-2549531
Orders: orders@glsciences.eu
Web: www.glsciences.eu
Email: info@glsciences.eu

GL Sciences Inc. USA
4733 Torrance Blvd. Suite 255
Torrance, CA 90503
Phone: 310-265-4424
Fax: 310-265-4425
Web: www.glsciencesinc.com
Email: info@glsciencesinc.com

Distributor:
www.glsciences.com/distributors