HPLC · LC/MS Columns

General Catalog



CHROMATOGRAPHIC SPECIALTIES INC.

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- InertSustain C18 002
- InertSustain AQ-C18 006
- InertSustainSwift C18 008
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- InertCore Plus C18 012
- Inertsil ODS-HL 014
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- InertSustain PFP 040
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- Inertsil Ph-3 046
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- InertSustain Cyano 050
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- InertSustain NH2 064
- Inertsil NH2 066

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- Inertsil Diol 072
- Inertsil SIL-100A 074
- InertSustain NH2 076
- Inertsil NH2 078
- InertSustain Cyano 080
- Inertsil CN-3 082
- Inertsil SIL-150A 084
- Inertsil WP300 SIL 085

SEC Columns

- Inertsil Diol 088
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GL Sciences HPLC Columns Specification

	Column	Features	USP Code	Particle Size (µm)	Pore Size (nm)	Surface Area (m^2/g)
C18 Phases	InertSustain C18	First choice with ultra high inertness and high durability	L1	2, 3, 5, 10	10	350
	InertSustain AQ-C18	First choice for high polar compounds	L1, L96	1.9, 3, 5	10	350
	InertSustainSwift C18	First analysis with ultra high inertness and high durability	L1	1.9, 3, 5	20	200
	InertSustain AX-C18	Analysis of anionic highly polar compounds	L1, L78	3, 5	20	200
	InertCore Plus C18	Ideal for analyses requiring a high number of theoretical stages	L1	2.6	9	200
	Inertsil ODS-HL	Ultra high retentivity, High-density bonding of C18 phase	L1	3, 5	10	450
	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-2	Ultra pure silica gel is used	L1	5	15	320
	Inertsil ODS	Inertness 1st generation	L1	5, 10	10	350
Other Reversed Phases	InertSustain C8	First choice with ultra high inertness and high durability	L7	2, 3, 5	10	350
	InertSustainSwift C8	High inertness and high durability C8 column	L7	1.9, 3, 5	20	200
	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		L26	5	30	150
	InertSustain PFP	Extremely Strong retention of highly polar basic compounds.	L43	3, 5	10	350
	InertSustain Phenylhexyl	Strong π-π interactions and hydrophobic interactions	L11	3, 5	10	350
	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
	InertSustain Cyano	Ultra inertness and can be used in reversed phase mode	L10	3, 5	10	350
HILIC	InertSustain Amide	First choice for HILIC mode	L68	3, 5	10	350
	Inertsil HILIC	Separation of highly polar basic compounds	L20	3, 5	10	450
	InertSustain NH2	First choice for 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-Exchange	Inertsil AX	Anion-exchange column	—	5	10	450
	Inertsil CX	Cation-exchange column	L9	5	10	450
Application Specific Columns	InertSustainBio C18	Using for the peptides and protein with 200Å pore size	L1	1.9, 3	20	200
	MonoSelect C18 for HTS	Ideal for high-throughput screening	L1	monolith	12	340
	MonoTower C18	Cartridge type silica monolith	L1	monolith	11	200
	SYPRON AX-1	Ion exchange column for bromate analysis by LC/MS	—	5	—	—
	SYPRON AX-2	Ion exchange column for organic acid analysis by LC/MS	—	5	—	—
	InertSphere Sugar-1	Sugar analysis with ECD	—	5	—	—
	InertSphere Sugar-2	Sugar analysis with SEC and ligand exchange mode	L19	9	—	—
	Inertsil Acrolein C18	Acrolein analysis	L1	5	10	450
	Inertsil Sulfa C18	Sulfa analysis	L1	3, 5	10	450
	InertSphere FA-1	Povidone impurity analysis column	L17	9	—	—
	MonoCap Series	Monolithic silica capillary column				
	MonoSelect nPEC	Ideal for rapid evaluation of inclusion rate of low-molecular-weight compounds encapsulated in nanoparticles	—	monolith	11	110
	MonoSelect RP-mAb	Specializing in the analysis of monoclonal antibodies	—	monolith	60	50

	Column	Carbon Loading (%)	End-Capping	Inertness	Recommended pH range
C18 Phases	InertSustain C18	14	Yes	★★★★★	1 - 10
	InertSustain AQ-C18	13	Yes	★★★★★	1 - 10
	InertSustainSwift C18	9	Yes	★★★★★	1 - 10
	InertSustain AX-C18	8	Yes	★★★★	1 - 9
	InertCore Plus C18	15	Yes	★★★★	1 - 10
	Inertsil ODS-HL	23	Yes	★★★★★	2 - 7.5
	Inertsil ODS-4	11	Yes	★★★★★	2 - 7.5
	Inertsil ODS-4V	11	Yes	★★★★★	2 - 7.5
	Inertsil ODS-3	15	Yes	★★★★	2 - 7.5
	Inertsil ODS-3V	15	Yes	★★★★	2 - 7.5
	Inertsil ODS-SP	8.5	Yes	★★★★	2 - 7.5
	Inertsil ODS-P	29	None	★★★	2 - 7.5
	Inertsil ODS-EP	9	None	★★★★	2 - 7.5
	Inertsil WP300 C18	9	Yes	★★★★	2 - 7.5
	Inertsil ODS-2	18.5	Yes	★★★★	2 - 7.5
	Inertsil ODS	14	Yes	★★	2 - 7.5
Other Reversed Phases	InertSustain C8	8	Yes	★★★★★	1 - 10
	InertSustainSwift C8	6	Yes	★★★★★	1 - 10
	Inertsil C8-4	5	Yes	★★★★★	2 - 7.5
	Inertsil C8-3	9	Yes	★★★★	2 - 7.5
	Inertsil C8	10.5	Yes	★★	2 - 7.5
	Inertsil C4	7.5	Yes	★★★★	2 - 7.5
	Inertsil WP300 C8	4	Yes	★★★★	2 - 7.5
	Inertsil WP300 C4	3	None	★★★★	2 - 7.5
	InertSustain PFP	10	Yes	★★★★★	2 - 7.5
	InertSustain Phenylhexyl	9	Yes	★★★★★	1 - 10
	InertSustain Phenyl	10	None	★★★★	2 - 7.5
	Inertsil Ph-3	9.5	None	★★★	2 - 7.5
	Inertsil Ph	10	Yes	★★★	2 - 7.5
	InertSustain Cyano	8	Yes	★★★★	2 - 7.5
HILIC	InertSustain Amide	15	None	—	2 - 8.5
	Inertsil HILIC	20	None	—	2 - 7.5
	InertSustain NH2	7	None	—	2 - 7.5
	Inertsil NH2	8	None	—	2 - 7.5
Normal Phase	Inertsil Diol	20	None	—	2 - 7.5
	Inertsil SIL-100A	—	None	—	2 - 7.5
	Inertsil SIL-150A	—	None	—	2 - 7.5
	Inertsil WP300 SIL	—	None	—	2 - 7.5
	Inertsil CN-3	14	None	—	2 - 7.5
SEC	Inertsil WP300 Diol	9	None	—	2 - 7.5
Ion-Exchange	Inertsil AX	17	None	—	2 - 7.5
	Inertsil CX	14	None	—	2 - 7.5
Application Specific Columns	InertSustainBio C18	9	Yes	★★★★★	1 - 10
	MonoSelect C18 for HTS	7	Yes	★★★★	2 - 7.5
	MonoTower C18	18	Yes	★★★★	2 - 7.5
	SYPRON AX-1	—	None	—	3 - 7
	SYPRON AX-2	—	None	—	
	InertSphere Sugar-1	—	None	—	2 - 14
	InertSphere Sugar-2	—	None	—	
	Inertsil Acrolein C18	9	Yes	★★★★	2 - 7.5
	Inertsil Sulfa C18	15	Yes	★★★★	2 - 7.5
	InertSphere FA-1	—	None	—	—
	MonoCap Series				
	MonoSelect nPEC	—	None	—	2 - 7.5
	MonoSelect RP-mAb	—	None	—	2 - 7.5



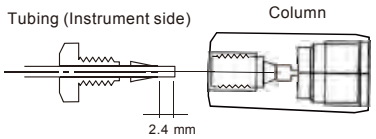
General Precautions

Columns End-fitting

The specitication of columns end-fitting style is described below.

Column Type	End-fitting
InertSustain Series, InertSustainSwift Series, Inertsil Serises, InertSphere Series, SYPRON Series, Mono Series	Parker Style (UP Type)
UHPLC PEEK Columns, PEEK Columns	
Capillary EX Columns	
Capillary EX Nano Columns	
Cartridge Guard Column E, Cartridge Guard Column Ei	
Guard Column for UHPLC, GL Cart	
Packed Guard Column, Packed Mini Guard Column	
Preparative Guard Column, PREP Guard Column	

●Parker Style (UP type)



Operating Pressure

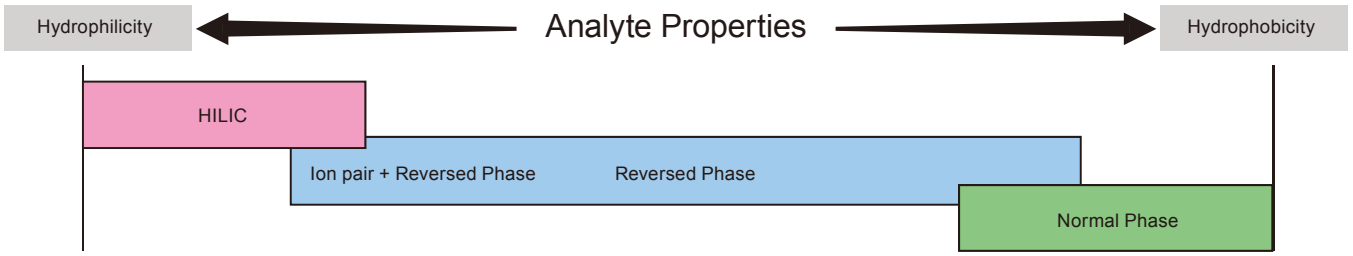
The maximum pressure of an HPLC column depends on its size and type. Please see the table below or check the appropriate instructions manual before use.

Columns	I.D.	Particle Size	Maximum Operating Pressure
Analytical Columns InertSustain Series InertSustainSwift Series Inertsil Series	2.1 - 3.0 mm	1.9 , 2 µm	80 MPa(800 bar)
	2.1 - 4.6 mm	3 µm HP	50 MPa(500 bar)
	1.0 - 4.6 mm	3 , 4 , 5 , 10 µm	20 MPa(200 bar)
Preparative Columns InertSustain Series InertSustainSwift Series Inertsil Series	6.0 - 50 mm	5 , 10 µm	20 MPa(200 bar)
	100 mm	5 , 10 µm	10 MPa(100 bar)
Capillary Columns InertSustain Series InertSustainSwift Series Inertsil Series	0.05 - 0.2 mm	3 , 5 µm	15 MPa(150 bar)
	0.3 - 0.7 mm	3 , 5 µm	20 MPa(200 bar)

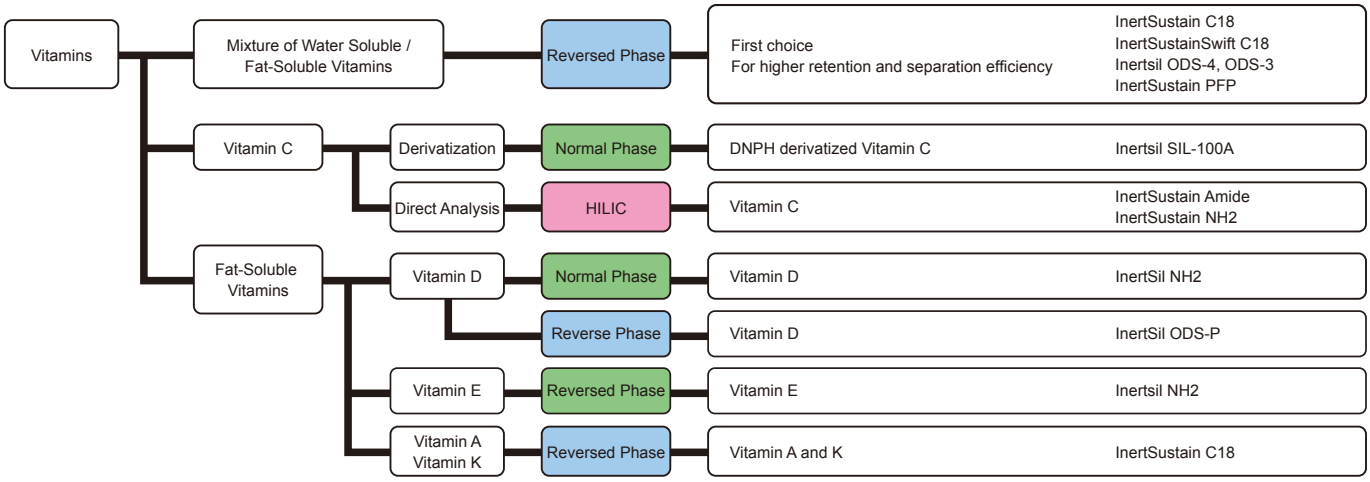
Guard Columns	Maximum Operating Pressure
Guard Column for UHPLC	80 MPa (800 bar)
Cartridge Guard Column E Cartridge Guard Column Ei GL Cart, Pre-clean ORG PREP Guard Cartridge	20 MPa (200 bar)
Packed Guard Columns Packed Mini Guard Columns Preparative Guard Columns	20 MPa (200 bar)

Column Selection Overview

Separation Mode Selection for Analyte Polarity



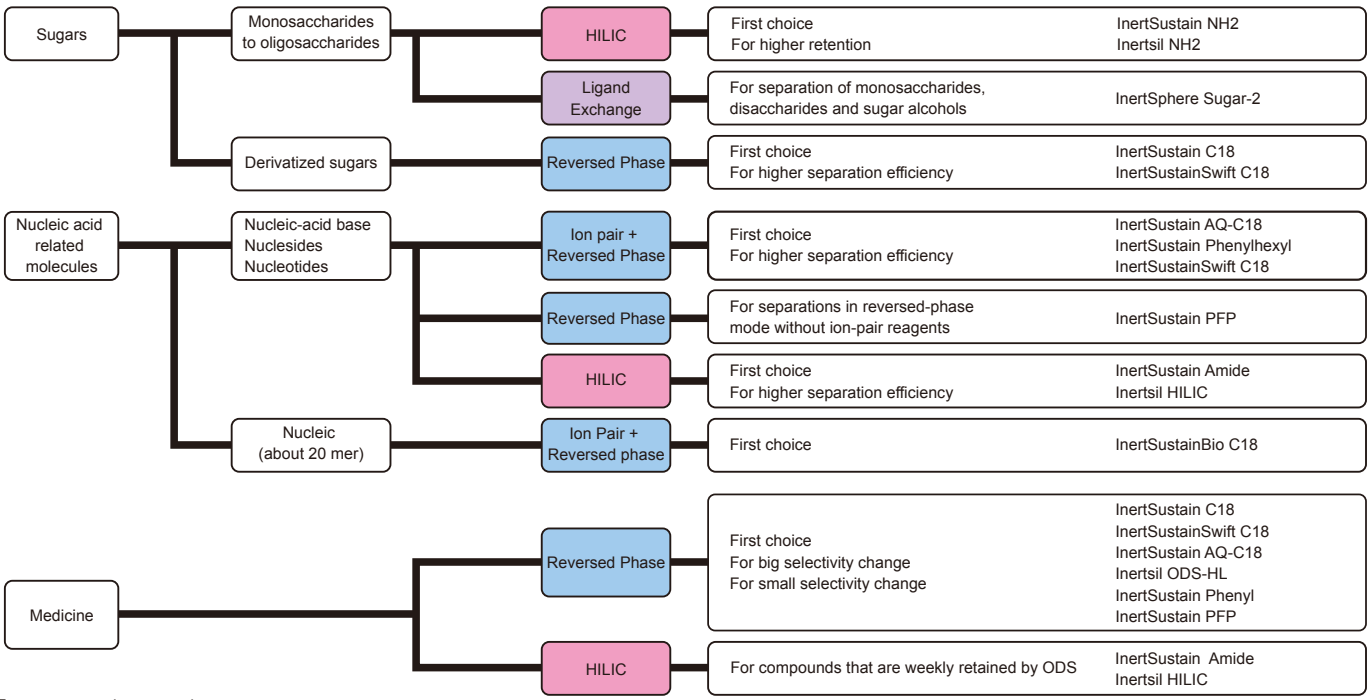
Column Selection for Analyte Properties

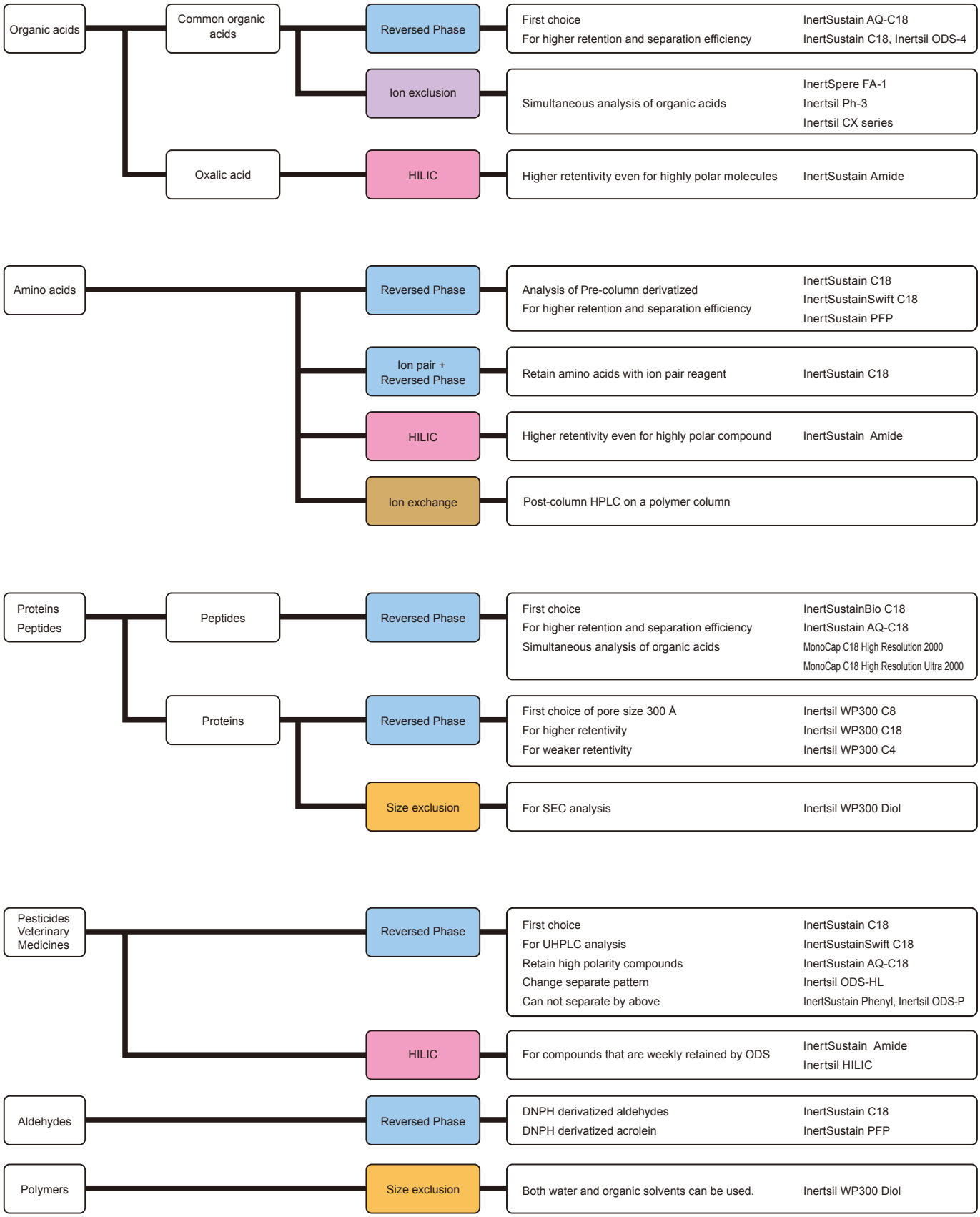


Water Soluble Vitamins	Phase	Detector
Vitamin C	NH_2, SIL, Amide	UV
Vitamin B_1	ODS	UV, (FL)
Vitamin B_2	ODS	UV, FL
Vitamin B_6	ODS	UV
Niacin	ODS	UV
Folic acid	ODS	UV
Pantothenic acid	ODS	UV

Fat-Soluble Vitamin	Phase	Detector
Vitamin A	ODS	UV, FL
Vitamin D	ODS, NH_2	UV
Vitamin E	ODS	UV, FL
Vitamin K	ODS	UV, (FL)

* (FL): Post-column derivatization




Organic acids
Common organic acids
Reversed Phase
First choice
For higher retention and separation efficiency
InertSustain AQ-C18
InertSustain C18, Inertsil ODS-4
Ion exclusion
Simultaneous analysis of organic acids
InertSpere FA-1
Inertsil Ph-3
Inertsil CX series
Oxalic acid
HILIC
Higher retentivity even for highly polar molecules
InertSustain Amide
Amino acids
Reversed Phase
Analysis of Pre-column derivatized
For higher retention and separation efficiency
InertSustain C18
InertSustainSwift C18
InertSustain PFP
Ion pair + Reversed Phase
Retain amino acids with ion pair reagent
InertSustain C18
HILIC
Higher retentivity even for highly polar compound
InertSustain Amide
Ion exchange
Post-column HPLC on a polymer column
Proteins
Peptides
Peptides
Reversed Phase
First choice
For higher retention and separation efficiency
Simultaneous analysis of organic acids
InertSustainBio C18
InertSustain AQ-C18
MonoCap C18 High Resolution 2000
MonoCap C18 High Resolution Ultra 2000
Proteins
Reversed Phase
First choice of pore size 300 Å
For higher retentivity
For weaker retentivity
Inertsil WP300 C8
Inertsil WP300 C18
Inertsil WP300 C4
Size exclusion
For SEC analysis
Inertsil WP300 Diol
Pesticides
Veterinary
Medicines
Reversed Phase
First choice
For UHPLC analysis
Retain high polarity compounds
Change separate pattern
Can not separate by above
InertSustain C18
InertSustainSwift C18
InertSustain AQ-C18
Inertsil ODS-HL
InertSustain Phenyl, Inertsil ODS-P
HILIC
For compounds that are weekly retained by ODS
InertSustain Amide
Inertsil HILIC
Aldehydes
Reversed Phase
DNPH derivatized aldehydes
DNPH derivatized acrolein
InertSustain C18
InertSustain PFP
Polymers
Size exclusion
Both water and organic solvents can be used.
Inertsil WP300 Diol

HPLC Column Selection by USP

USP Code	Description	Brand
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 InertSustain AQ-C18 InertSustainSwift C18 InertSustain AX-C18 Inertsil ODS-HL Inertsil ODS-4 Inertsil ODS-3 Inertsil ODS-SP Inertsil ODS-P Inertsil ODS-2 Inertsil ODS Inertsil WP300 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.	
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
L4	Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter.	
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 to 10 µm in diameter, or a monolithic silica rod.	InertSustain C8 InertSustainSwift C8 Inertsil C8-4 Inertsil C8-3 Inertsil C8 Inertsil WP300 C8
L8	An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain NH2 Inertsil NH2
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to10 µm in diameter.	Inertsil CX
L10	Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain Cyano Inertsil CN-3
L11	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	InertSustain Phenylhexyl InertSustain Phenyl Inertsil Ph-3 Inertsil Ph
L12	A strong anion-exchange packing made by chemically bonding a quartenary 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 Inertsil TMS
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.	InertSphere FA-1 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.	InertSphere Sugar-2 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, or a monolithic silica rod.	Inertsil Diol Inertsil WP300 Diol PROTEIN KW-800 series
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	Polyvinylalcohol chemically bonded to porous silica particle, 5 µm in diameter.	

USP Code	Description	Brand
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 or superficially 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
L41	Immobilized α1-acid glycoprotein on spherical silica particles, 5 µm in diameter.	CHIRALPAK AGP
L42	Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5 µm in diameter.	
L43	Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 µm in diameter.	InertSustain PFP
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, R,S-hydroxypropyl ether derivative, bonded to porous silica particles, 3 to 10 µm in diameter.	ORpak CDBS-453 SUMICHIRAL OA7000 SUMICHIRAL OA7100
L46	Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, about 9 to 11 µm in diameter.	
L47	High capacity anion-exchange microporous substrate, fully functionalized with trimethylamine groups, 8 µm 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, 5 to 15 µm in diameter.	
L49	A reversed phase packing made by coating a thin layer of polybutadiene onto spherical porous zirconia particles, 3 to 10 µm 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 µm in diameter, and a surface area not less than 350 m^2/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 µm in diameter.	CHIRALPAK AD series
L52	A strong cation-exchange resin made of porous silica with sulfopropyl groups, 5 to 10 µm in diameter.	
L53	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 µm diameter. Substrate is surface grafted with carboxylic acid and/or phosphoric acid functionalized monomers. Capacity not less than 500 µEq/column.	
L54	A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13 µm in diameter.	
L55	A strong cation-exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5 µm in diameter.	IC-Pak Cation M/D
L56	Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	
L57	A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5 µm 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 µm 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 µm silica of hybrid packing with a hydrophilic coating.	PROTEIN KW-803
L60	Spherical, porous silica gel, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and endcapped.	

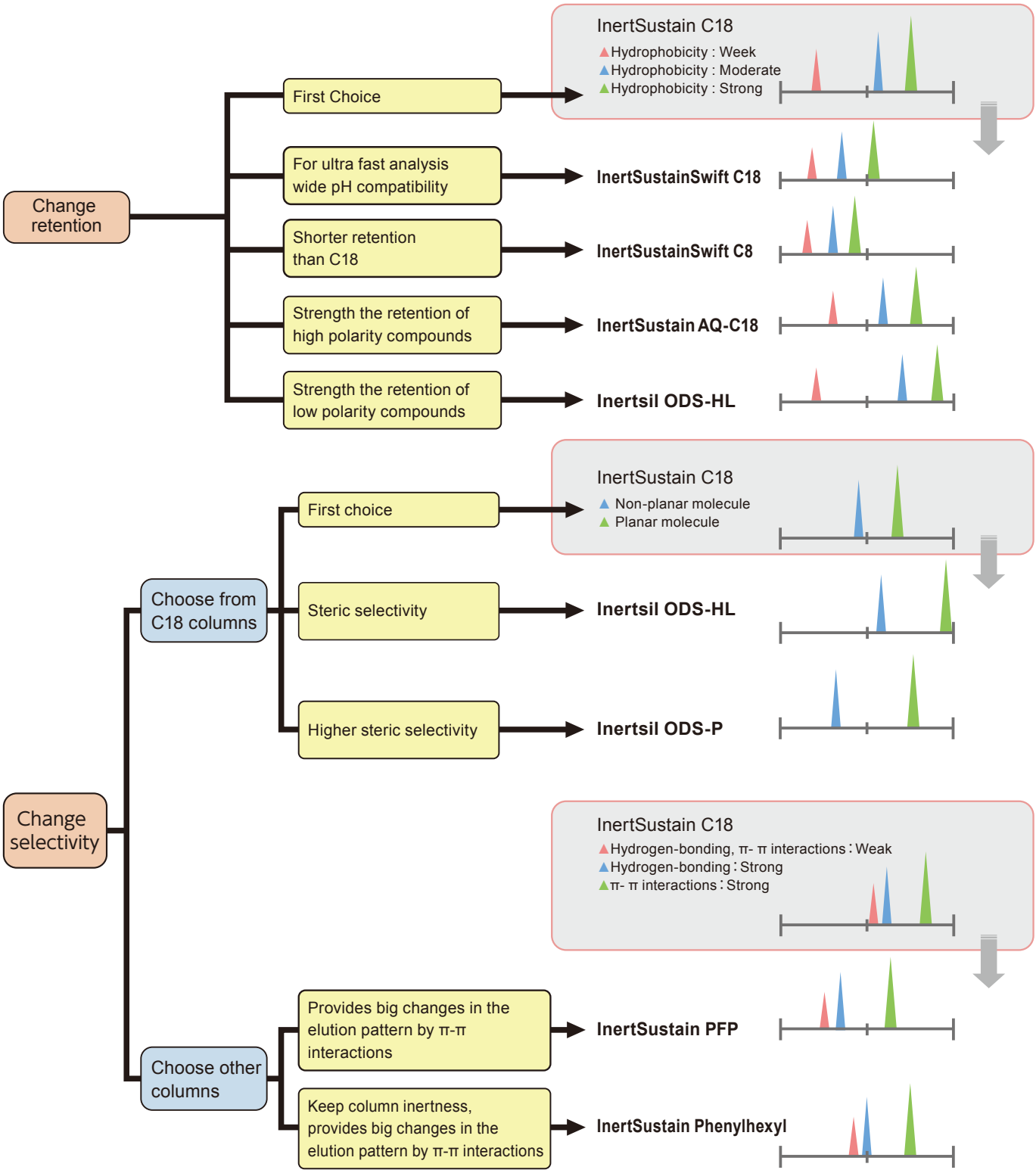
HPLC Column Selection by USP

USP Code	Description	Brand
L61	A hydroxide selective strong anion-exchange resin consisting of a highly cross-linked core of 13 µm 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 %).	
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 2 % 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.	InertSustain Amide
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-dinitroanaline 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 funcionalized 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, or tertiary 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.	InertSustain AX-C18
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 to 20 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 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 70 nm diameter microbeads (6 % crosslinked) bonded with alkanol quartenary ammonium ions.	
L82	Polyamine chemically bonded to cross-linked polyvinyl alcohol polymer, 5 µm in diameter.	Asahipak NH2P-40 Asahipak NH2P-50 apHera NH2 Amino
L83	A hydroxide-selective, strong anion-exchange resin-quartenary amine bonded on latex particles attached to a core of 10.5 µm microporous particles of 10 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene.	
L84	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 5 µm in diameter. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 8400 µ Eq/column (5 mm x 25 cm).	
L85	A silane ligand that consists of both reversed phase (an alkyl chain longer than C8) and weak cation-exchange (carboxyl groups) functional groups chemically bonded to porous or non-porous particles, 1.0 to 50 µm in diameter.	
L86	A 5 µm fused core particle with a highly polar ligand possessing 5 hydroxyl groups tethered to the silica gel outer layer.	
L87	Dodecyl silane chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	
L88	Glycopeptide vancomycin linked through multiple covalent bonds to 100 Å spherical silica.	
L89	Packing having the capacity to separate compounds with a molecular weight range from 100 - 3000 (as determined by polyethylene oxide), applied to neutral and anionic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contains some residual cationic functional groups).	
L90	Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter.	
L91	Strong anion-exchange resin consisting of monodisperse porous polystyrene/divinyl benzene beads coupled with quartenary amine. Bead size is 3 to 10 µm.	
L92	A strong anion-exchange resin consisting of highly cross-linked 5 to 9 µm macroporous particles having a 100- Å average pore size and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene and an anion-ex-change layer grafted to the surface, which is functionalized with alkanol quarternary ammonium ions.	
L93	Cellulose tris(3,5-dimethylphenylcarbamate) reversed phase chiral stationary phase coated on 3 or 5 µm silica gel particles.	CHIRALCEL OD-3R CHIRALCEL OD-RH
L94	A strong anion-exchange resin consisting of a highly crosslinked 15 µm microporous particles functionalized with very low crosslinked latex (0.5 %) to provide alkanol quartenary ammonium ion exchange sites.	
L95	A highly polar alkyl ligand comprising five hydroxyl groups that are chemically bonded to totally porous or superficially porous silica or a monolithic silica rod.	

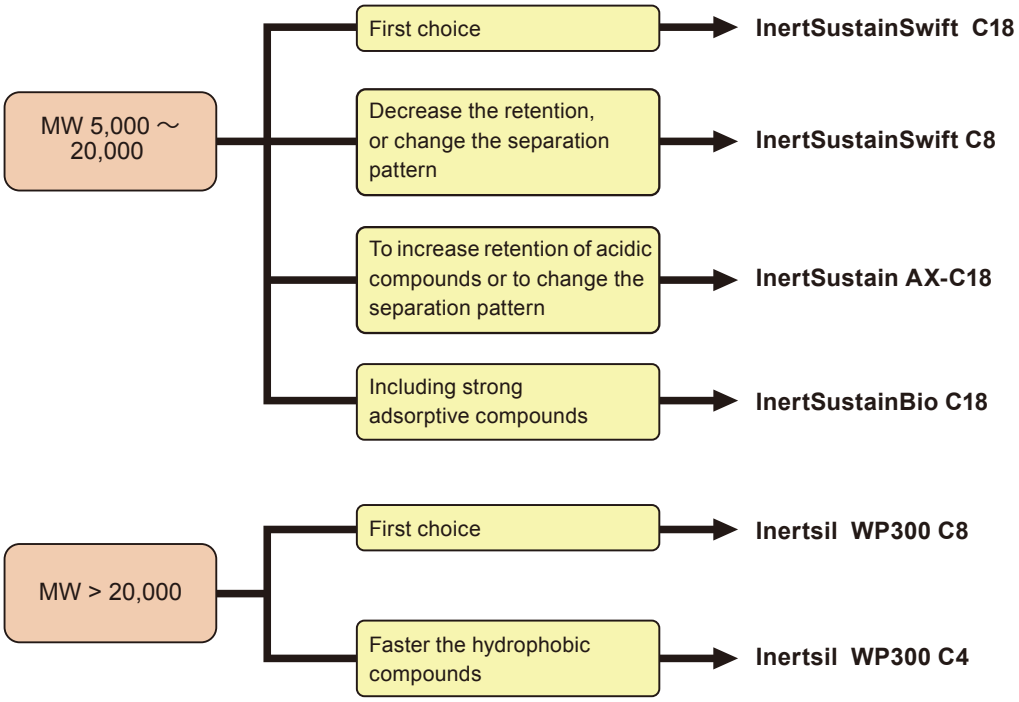
USP Code	Description	Brand
L96	Alkyl chain, reversed-phase bonded totally or superficially porous silica designed to retain hydrophilic and other polar compounds when using highly aqueous mobile phases, including 100 % aqueous, 1.5 µm to 10 µm.	InertSustain AQ-C18 InertSustain Swift C18 InertSustain Swift C8
L97	Weak cation-exchange resin consisting of a highly cross-linked core of 5.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene. Substrate is surface grafted with carboxylic acid functionalized groups. Capacity not less than 2400 µ Eq/column (4 mm x 25 cm).	
L98	Weak cation-exchange resin consisting of a highly cross-linked core of 8.0- µm microporous particles having an average pore size of 10 Å and consisting ofethylvinylbenzene cross-linked with 55 % divinylbenzene.Substrate is surface grafted with carboxylic acid functional-ized groups. Capacity of NLT 46 µEq/column (4-mm ×5-cm).	
L99	Amylose tris-(3,5)-dimethylphenylcarbamate), immobilized on porous, spherical, silica particles, 3 to 5 µm in diameter.	CHIRALPAK IA CHIRALPAK IA-3
L100	A 55 % crosslinked, microporous, hydrophobic resin core (9 µm microporous particles having a pore size of 10 Å) that consists of a bilayer of anion and cation exchange latex. The first layer is fully sulfonated latex (140 nm) and the second layer is fully aminated latex (76 nm).	
L101	Cholesteryl groups chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod.	
L102	(Naproxen, [S,S] Whelk-O 1) - 1-(3,5-dinitrobenzamido)-1,2,3,4-tetrahydrophenanthrene covalently bonded to porous spherical silica particles, 5 to 10 µm in diameter.	
L103	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 7.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene electrostatically bonded with hyperbranched alkanol quaternary ammonium ions.	
L104	Triazole groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.	
L105	A strong anion-exchange resin consisting of a highly cross-linked 9 µm supermacroporous (2000 Å) particles functionalized with very low cross-linked latex (0.2 %) to provide alkyl quaternary ammonium ion sites.	
L106	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked wiht divinylbenzene copolymer, 5 to 8 µm diameter, macroporous particles having an average pore size of 100 Å. Substrate is surface grafted with carboxylic acid and phosphonic acid functional groups. Capacity not less than 2800 µEq/column (4 mm x 25 cm).	
L107	Cellulose tris(4-methylbenzoate)-coated porous spherical particles, 3 to 5 µm in diameter, for use with reversed phase mobile phases.	CHIRALCEL OJ-RH
L108	A chiral-recognition protein, cellobiohydrolase (CBH), chemically bonded to silica particles, about 5 µm in diameter.	CHIRALPAK CBH
L109	Spherical particles of porous graphitic carbon, 3 to 30 µm in diameter.	
L110	A strong anion-exchange resin consisting of a highly cross-linked 13 µm microporous (less than 10 Å) particles coated with very low cross-linked latex (0.5 %) to provide alkanol quaternary ammonium ion exchange sites.	
L111	Polyamine chemically bonded to porous spherical silica particles, 5 µm in diameter.	
L112	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 8.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene with a latex coating composed of 65 nm diameter microbeads (5 % cross-linked) bonded with alkanol quaternary ammonium ions.	
L113	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 7.5 µm porous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 65 nm diameter microbeads (8 % cross-linked) bonded with alkanol quaternary ammonium ions.	
L114	Sulfobetaine graft-polymerized to totally or superficially porous silica, 1.5 to 10 µ m in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.	
L115	Ethylvinylbenzene/divinylbenzene substrate (55 % cross-linked) agglomerated with quaternary amine functionalized 275 nm latex microbeads (6 % cross-linked), about 8.5 µm in diameter.	
L116	Sulfonated ethylvinylbenzene/divinylbenzene substrate agglomerated with hydrophilic quaternary amine functionalized glycidyl-derivative methacrylate microbeads, approximately 2 to 50 µ m in diameter.	
L117	A crown ether coated on a 5 µm particle size silica gel substrate. The active site is (R)-18-crown-6-ether	CROWNPAK CR(-)
L118	Aqueous polymerized C18 groups on silica particles, 1.2 to 5 µ m in diameter	Inertsil ODS-P
L119	Cellulose tris-(3,5-dichlorophenylcarbamate), immobilized on porous, spherical, silica particles, 3 to 5 µm in diameter.	CHIRALPAK IC CHIRALPAK IC-3
L120	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 13 µ m microporous particles having a pore size of less than 10 Angstroms units and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene with a latex coating composed of 65 nm diameter microbeads (8% crosslinked) bonded with alkanol quartenary ammonium ions. Capacity not less than 10 µ Eq/column (4 mm x 5 cm).	
L121	A hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 11 µ m porous particles having a pore size of less than 10 angstroms units and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene electrostatically bonded with hyperbranched alkanol quaternary ammonium ions	
L122	Sulfobetaine graft-polymerized to totally or superficially porous hydrophilic polymer particles, 1.0 to 10 µ m in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.	
L123	Cellulose tris(3-chloro-4-methylphenylcarbamate) coated porous silica particles, 3–20 µ m in diameter.	CHIRALCEL OZ-3 CHIRALCEL OZ-H
L124	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the silver form, average 9 µ m in diameter.	
L125	Polyvinyl alcohol polymer gel weak cation-exchange packing material, 3 - 7 um porous particles. The surface is polymerized with polybutadiene-maleic acid to provide carboxylic acid functionalities. The Capacity is not less than 1 mEq/column.	Shodex IC YS-50
L127	A crown ether chemically bonded to a 5 µm particle size silica gel substrate. The active site is (S)- pseudo-18-crown-6-ether.	SUMICHIRAL OA-8000
L128	Porous particles of polystyrene divinyl benzene with linear molecular weight operating range from 200 to 2,000,000 g/mol (polystyrene equivalent), 5 µ m in diameter.	

Reversed Phase Column Selection Guide

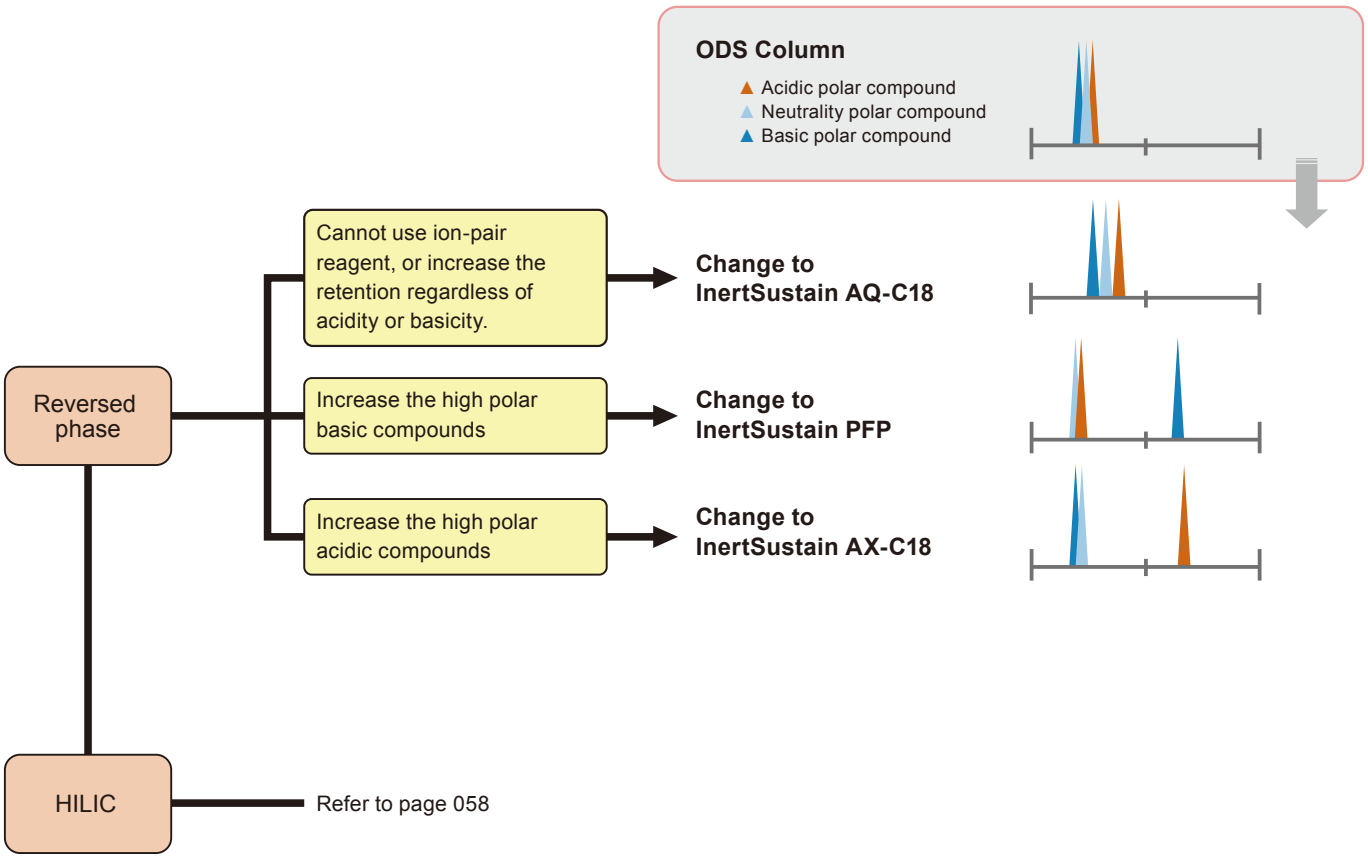
Molecular Weight <5,000



Molecular Weight >5,000



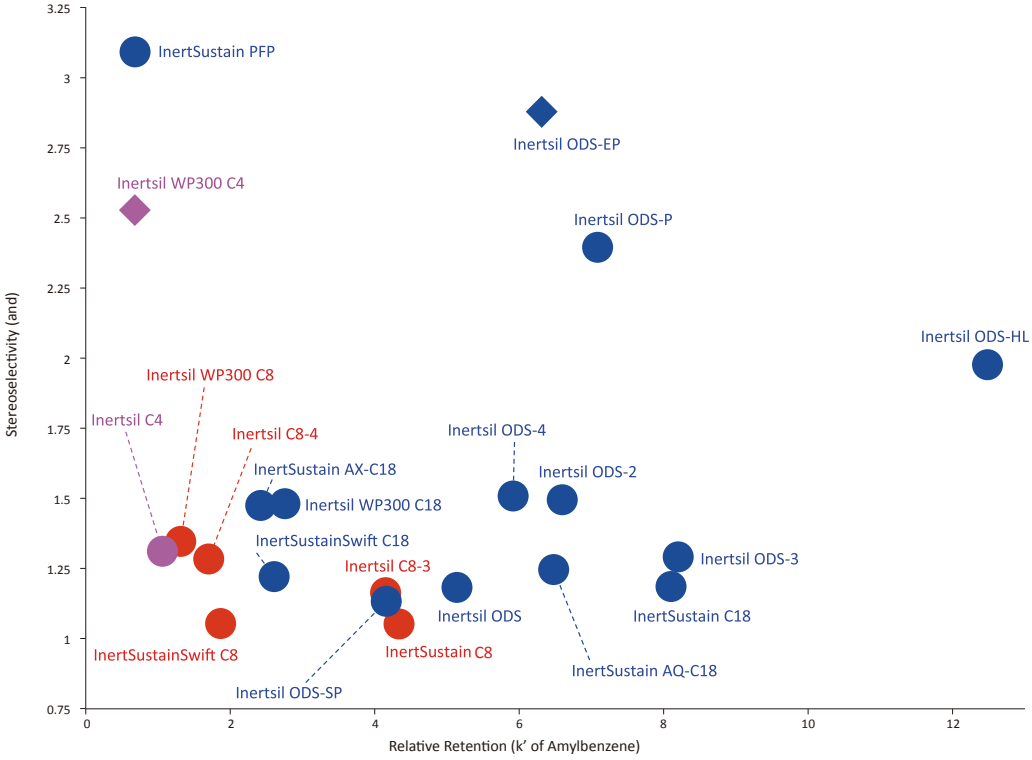
Analyze High Polar Compounds

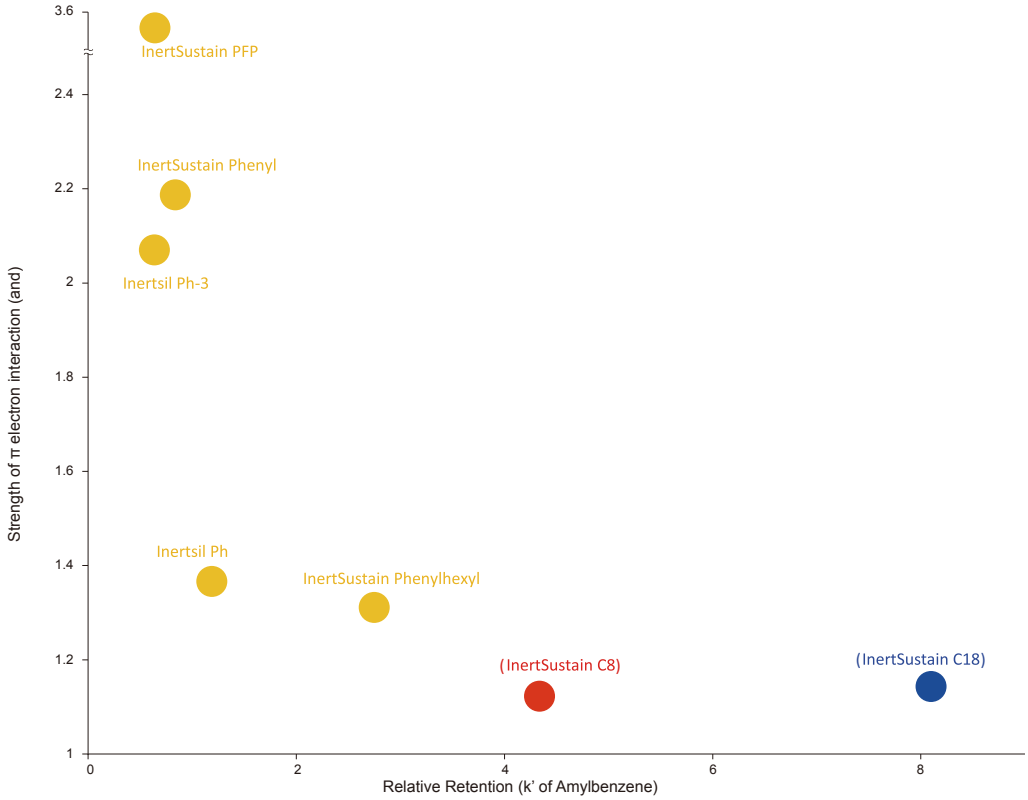


Reversed Phase Columns

The figure below shows the strength of the stereoselectivity and the pi-interaction with respect to the holding strength of the reversed-phase column. The retention strength, stereoselection system, and strength of pi-interaction are based on the retention coefficient of amylbenzene, retention ratio of o-terphenyl and triphenylene, and retention ratio of amylbenzene and triphenylene, respectively. These are plotted below.
In addition, the polar group-encapsulating (embed) type column provides a large effect on other interactions;thus, it was plotted in the type in order to distinguish it from the other columns.

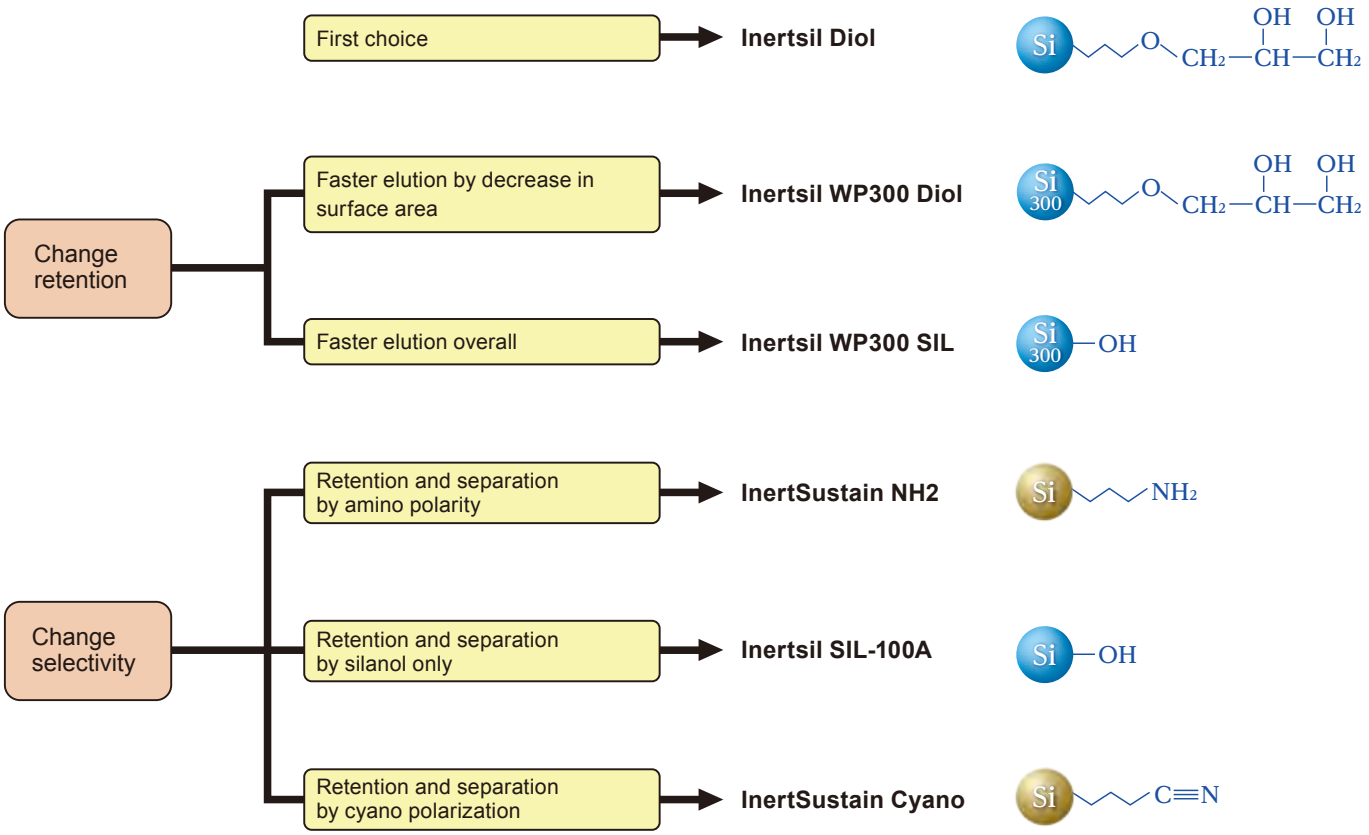
InertSustain, Inertsil Distribution Model



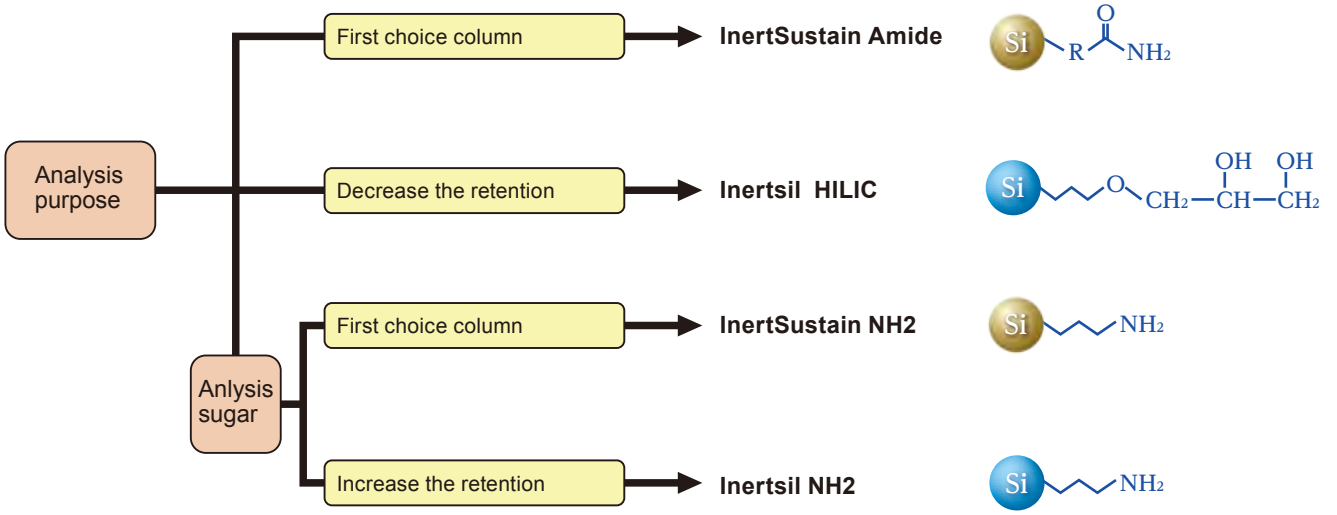


Normal Phase Column Selection Guide

Molecular Weight < 5,000 Samples on Normal Phase Mode



Selecting HILIC Mode Columns

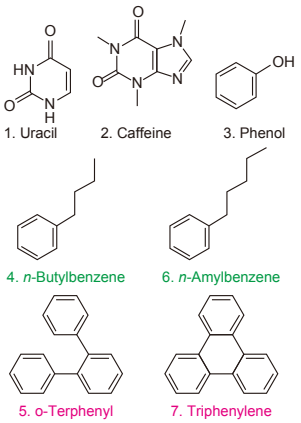


Selectivity Comparison of Reversed Phase Columns

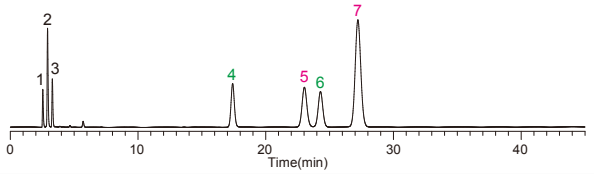
Selectivities of reversed phase columns are compared under the same conditions, packing material size, and column size.
Chemical structural formulas used for the comparison are shown at right. The separation differences between basic compounds, acidic compounds, alkyl benzenes, and polyaromatic compounds result from different column selectivities. Increasing the number of silanol groups on the packing material lengthens the elution time of caffeine from that of phenol. Increasing the hydrophobicity of the column lengthens the elution time of n-Amylbenzene from that of n-Butylbenzene. Increasing the steric selectivity of the column lengthens the elution time of triphenylene from that of o-Terphenyl.

Conditions

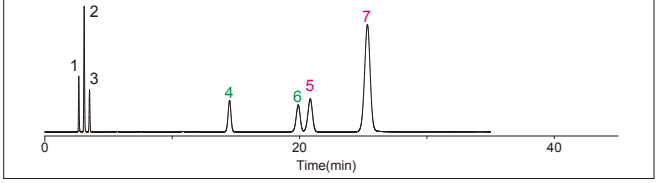
Column	: Reversed Phase Column (5 µm, 250 × 4.6 mm I.D.)*
Eluent	: A) CH_3OH
	B) H_2O
	: A/B = 80/20, v/v , (InertSustain Cyano A/B = 60/40, v/v ,)
Flow Rate	: 1.0 mL/min*
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Injection Vol.	: 5 µL



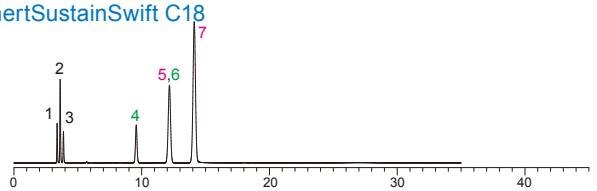
InertSustain C18



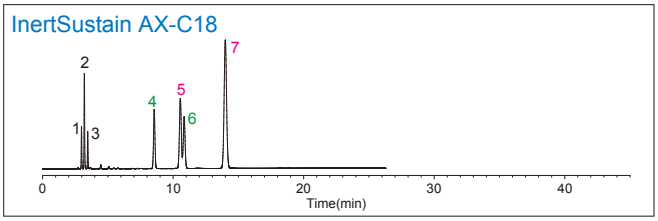
InertSustain AQ-C18



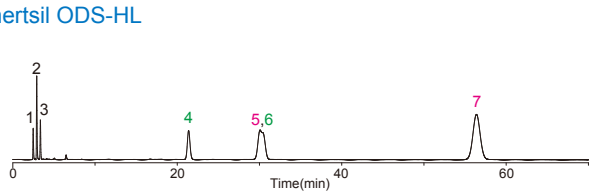
InertSustainSwift C18



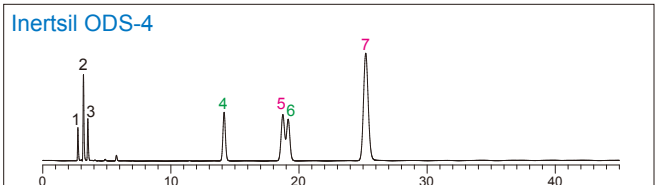
InertSustain AX-C18



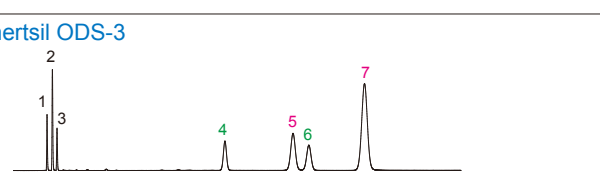
Inertsil ODS-HL



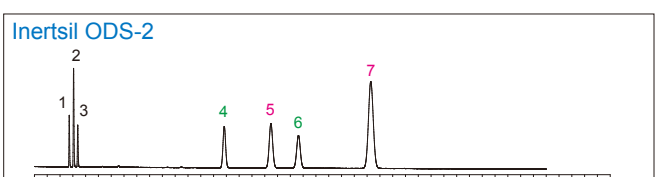
Inertsil ODS-4



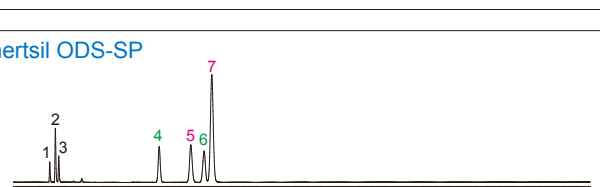
Inertsil ODS-3



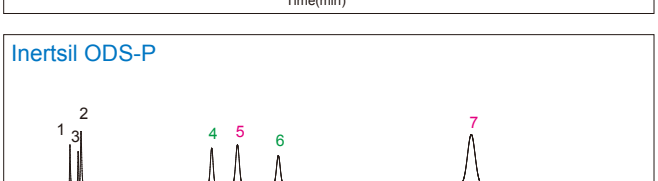
Inertsil ODS-2



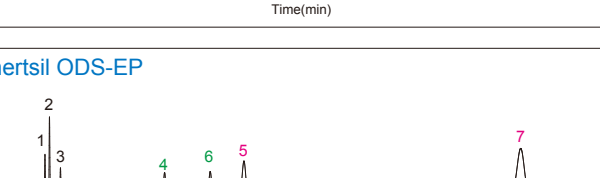
Inertsil ODS-SP



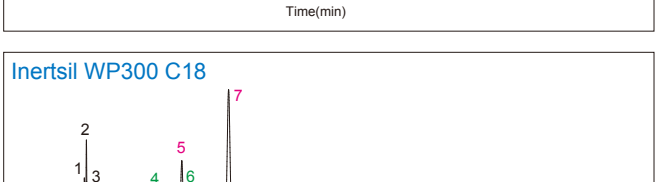
Inertsil ODS-P



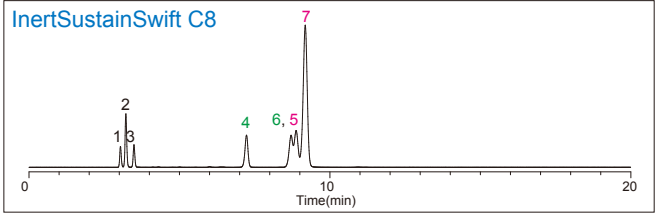
Inertsil ODS-EP



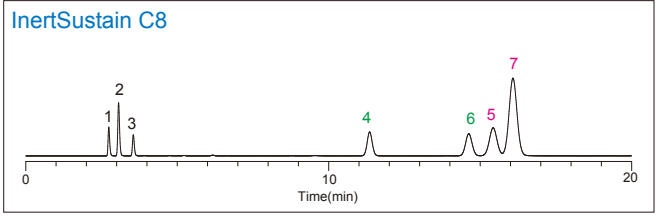
Inertsil WP300 C18



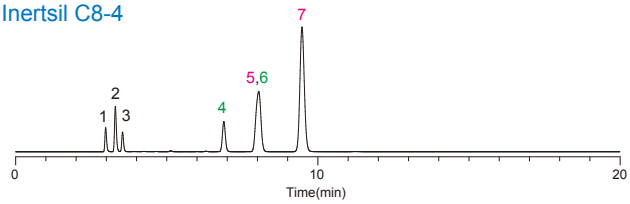
InertSustainSwift C8



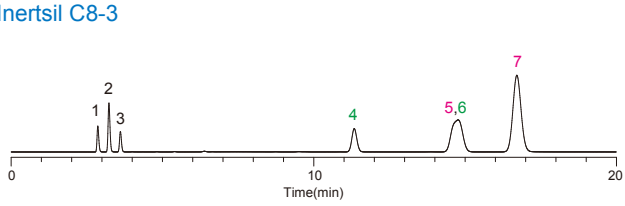
InertSustain C8



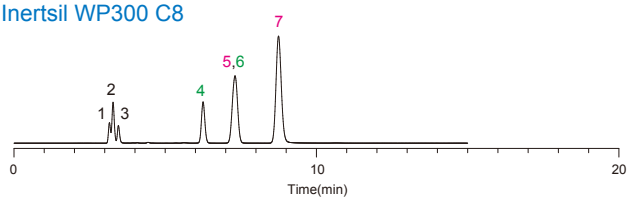
Inertsil C8-4



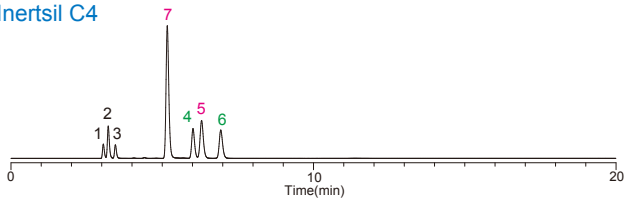
Inertsil C8-3



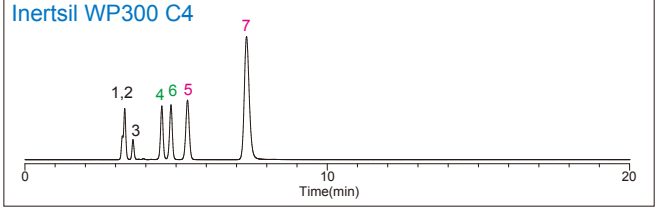
Inertsil WP300 C8



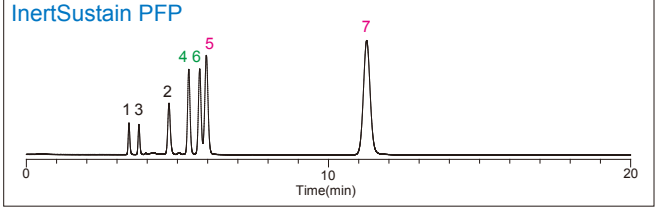
Inertsil C4



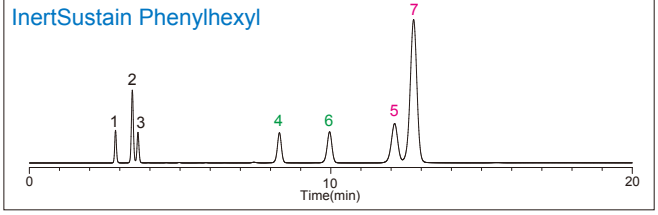
Inertsil WP300 C4



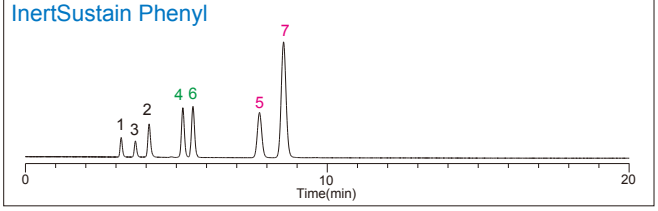
InertSustain PFP



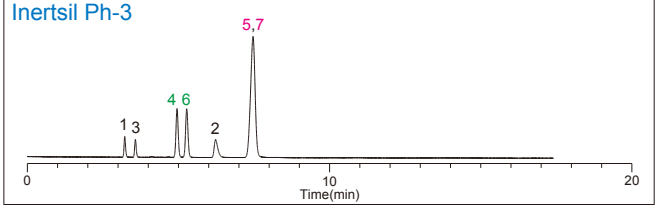
InertSustain Phenylhexyl



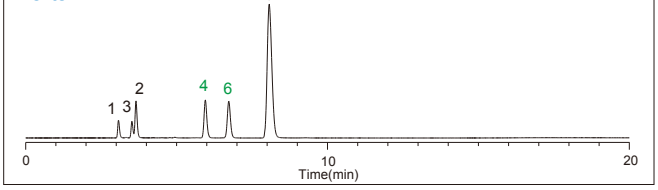
InertSustain Phenyl



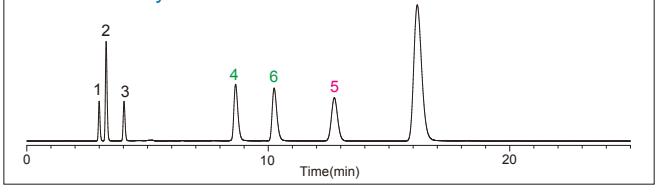
Inertsil Ph-3



Inertsil Ph



InertSustain Cyano



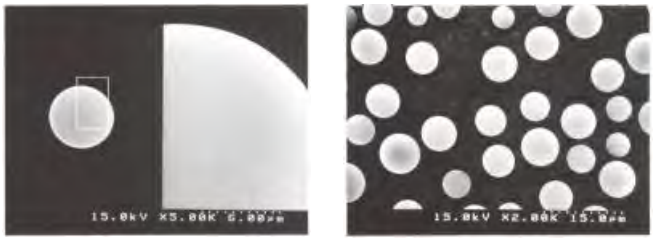
GL Sciences State-of-the-art HPLC Technology

To ensure that our HPLC columns are always of the same quality and consistently supplied worldwide, we conduct all processes such as matrix synthesis, chemical treatment, column packing, and column quality inspections in house.
We evolve continuously based on our accumulated know-how, which enables us to provide better HPLC columns for our customers.

Our High Technological Capability Enables Us to Synthesize Carriers In-house

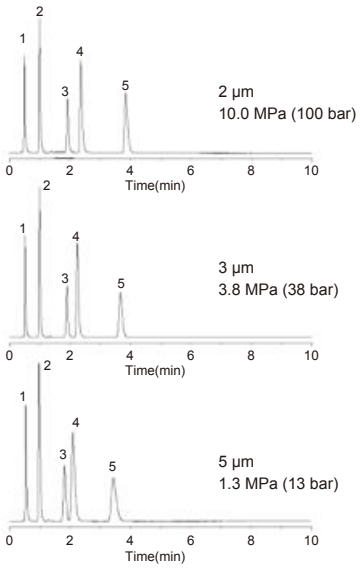
Aside from chemical modification of functional groups and end-cap processing, we also synthesize silica gel, which is a major factor in column performance.

Ultra pure base silica



Reliable Column Performance

The same separation patterns are obtained for different particle sizes.

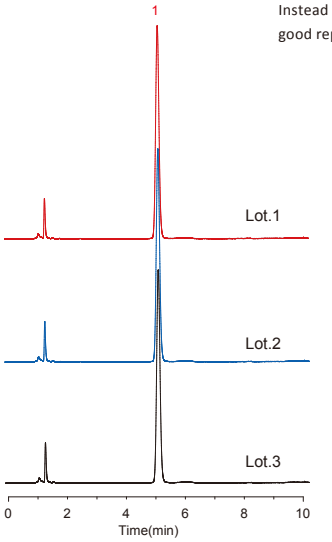


Conditions

Column : InertSustain C18 (50 × 2.1 mm I.D.)
Eluent : A) CH_3OH
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 Basic Compound Test

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

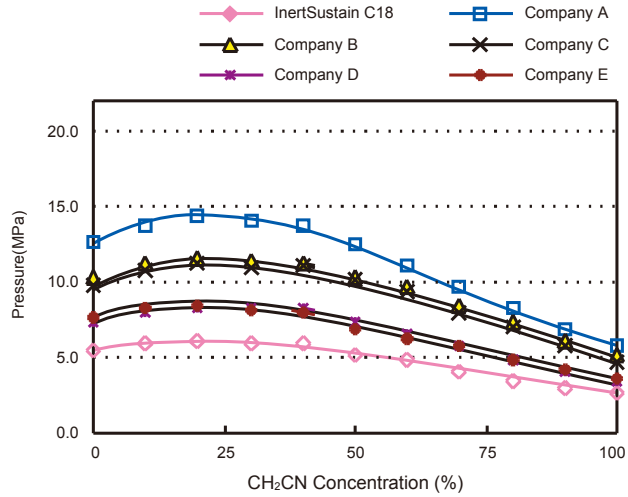


Conditions

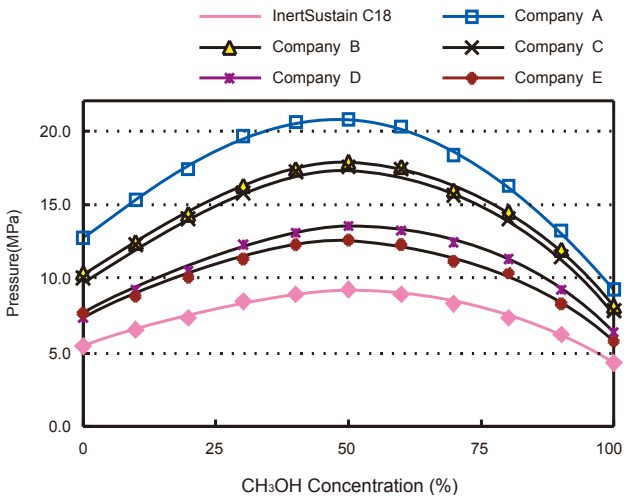
Column : InertSustain C18 (5 µm, 250 × 4.6 mm I.D.)
Eluent : A) CH_3CN
B) 25 mM phosphate buffer (pH 7.0)
A/B = 40/60, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 220 nm
Sample : 1. Dextromethorphan

Base Silica is Designed to Lower the Column Back Pressure and Hence Reduce the Load on the System

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



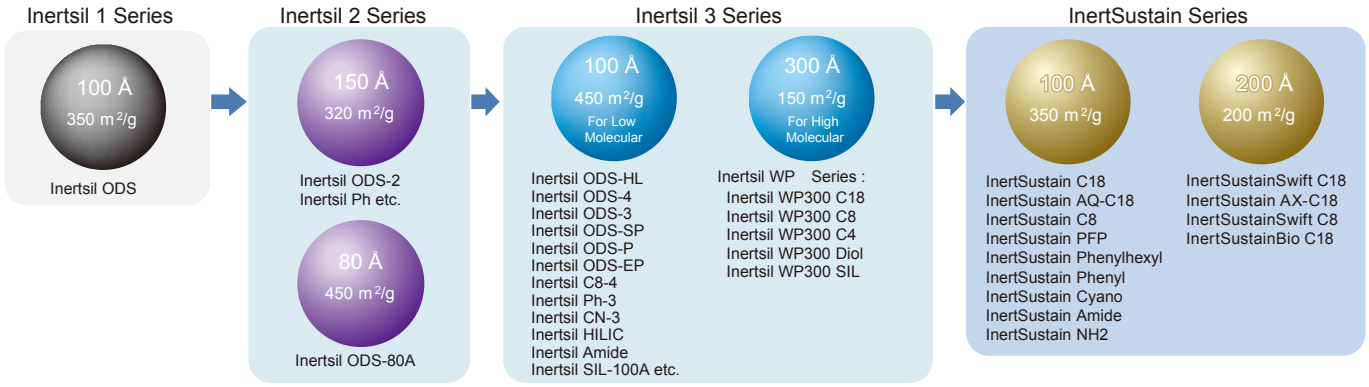
Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C



Evolving HPLC Column Packings

We have been steadily supplying columns from first-generation Inertsil ODS to the latest InertSustain series integrating state-of-the-art technologies, thus establishing an excellent reputation worldwide. The same high-quality, high-performance columns are provided to all customers.





InertSustain Columns are an Evolutionally Surfaced Silica (ES Silica), Which Were Evolved from Inertsil Columns.

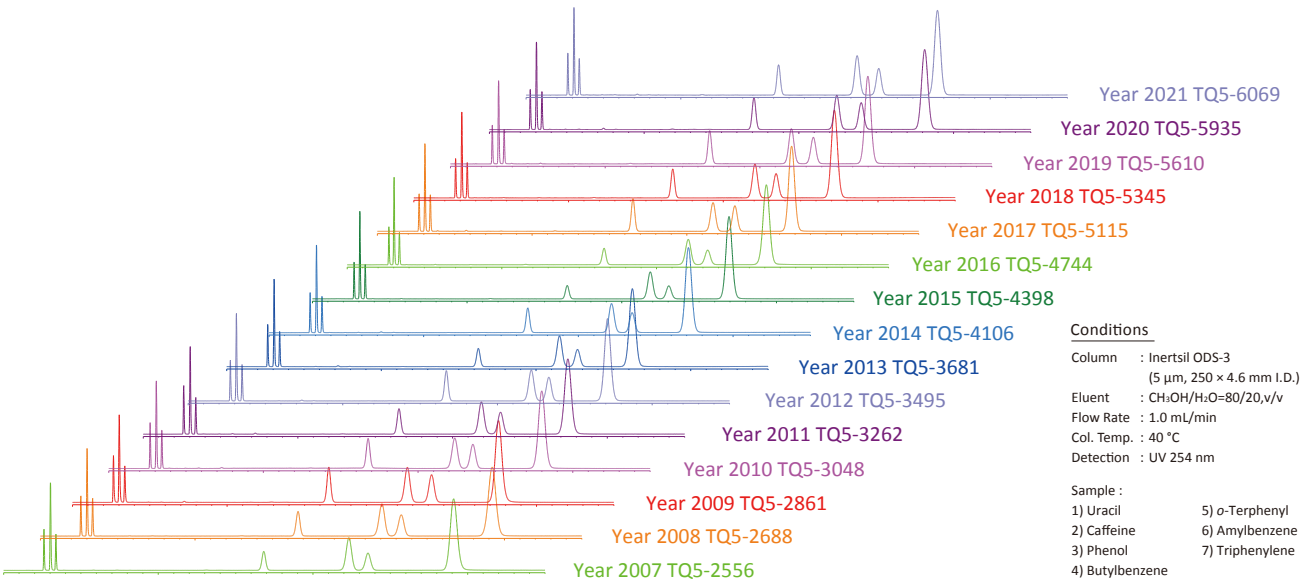
InertSustain columns employ a radically new type of silica with a uniquely modified surface that have a controllable amount of silanols. This state-of-the-art ES silica allows easy surface modification (e.g., endcapping.). The three main advantages of this technology are:

1. Exceptionally improved inertness
2. Robustly bonded phase
3. High lot-to-lot reproducibility

Owing to the above advantages, the InertSustain column is recommended for almost all compounds of interest.

Lot-to-lot Reproducibility

We continue to evolve while maintaining stable supplies with high quality and performance.



QC, ISO

Quality Inspections

- Check the sphericity and surface smoothness of silica-gel with Scanning Electron Microscopy.
- Evaluate the particle size, surface area, pore diameter, pore volume of the base silica gel.
- Tracing of metal impurities on the base silica gel
- Determine the amount of chemical bonding
- Determine the number of residual silanol groups
- Chromatographic test of each lot
- Column performance tests of individual columns

ISO Certification

GL Sciences Fukushima Factory and General Technical Center are ISO14001 - Compliant Facility

Product Ranges:Design & Development, manufacture, stocking and selling of instruments, parts, accessories, columns, packing materials, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry.

GL Sciences Fukushima Factory and R&D Dept. are ISO9001 Compliant Facility

Product Ranges:Design & Development, manufacture, stocking and selling of instruments, parts, accessories, columns, packing materials, reagents relating to gas chromatography, liquid chromatography and cells for spectrometry.



General Technical Center



Fukushima Factory

Reversed Phase Columns

- InertSustain C18 002
- InertSustain AQ-C18 006
- InertSustainSwift C18 008
- InertSustain AX-C18 010
- InertCore Plus C18 012
- Inertsil ODS-HL 014
- Inertsil ODS-4 016
- Inertsil ODS-3 018
- Inertsil ODS-4V 020
- Inertsil ODS-3V 021
- Inertsil ODS-SP 022
- Inertsil ODS-P 024
- Inertsil ODS-EP 026
- Inertsil ODS-2 028
- Inertsil ODS 029
- InertSustain C8 030
- InertSustainSwift C8 032
- Inertsil C8-4 034
- Inertsil C8-3 036
- Inertsil C8 038
- Inertsil C4 039
- InertSustain PFP 040
- InertSustain Phenylhexyl 042
- InertSustain Phenyl 044
- Inertsil Ph-3 046
- Inertsil Ph 048
- InertSustain Cyano 050
- Inertsil WP300 C18 052
- Inertsil WP300 C8 054
- Inertsil WP300 C4 055

InertSustain C18

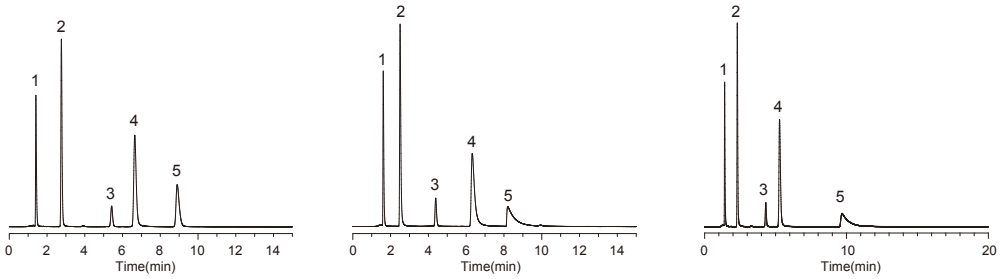
- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **2 µm, 3 µm, 5 µm, 10 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **14 %**
- **USP Code** : **L1**
- **pH Range** : **1 - 10**



In general, silica based columns are mechanically stable and highly efficient but cannot be used under alkaline conditions as their residual silanol groups tend to adsorb organic bases. InertSustain C18 employs a radically new type of silica that is uniquely surface-modified for precise control of the silica properties.

InertSustain C18 inherits the advantages of all current Inertsil HPLC columns (e.g., extremely low operating back pressure, superior inertness to almost all analytes, high efficiency, and compatibility with a wide range of solvents) while additionally enabling wide pH analysis with consistent column-to-column and lot-to-lot performance.

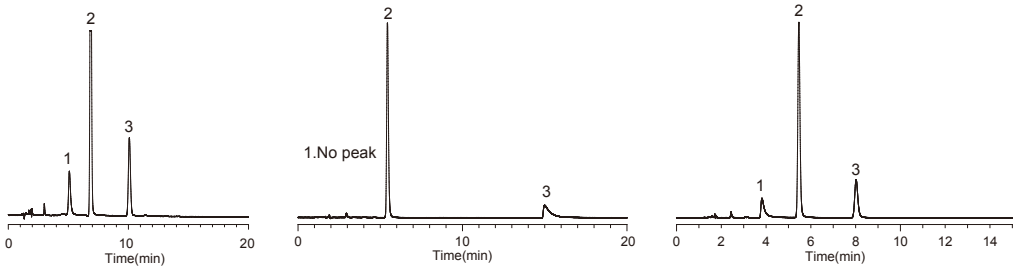
Figure 1 : Basic Compounds



Conditions

Column Size	: 3 µm, 150 × 2.1 mm I.D.
Eluent	: A) CH_3CN
	B) 25 mM K_2HPO_4
	(pH 7.0, KH_2PO_4)
	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

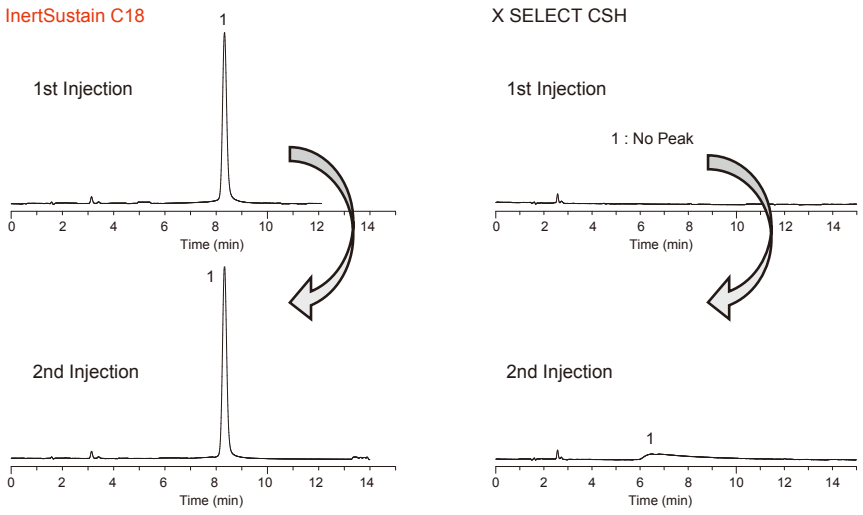
Figure 2 : Acidic Compounds



Conditions

Column Size	: 3 µm, 150 × 2.1 mm I.D.
Eluent	: A) CH_3CN
	B) 0.1 % H_3PO_4
	A/B = 25/75, v/v
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Sample	: 1. Brilliant Blue FCF
	2. Phenol
	3. Salicylic acid

Figure 3 : Chelating Compounds



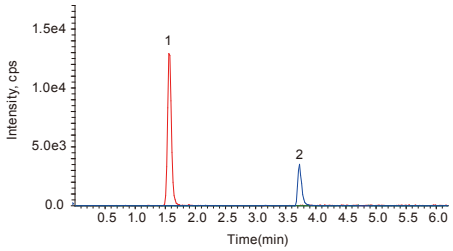
Conditions

Column Size	: 5 µm, 150 × 4.6 mm I. D.
Eluent	: A) CH_3CN
	B) 0.1 % H_3PO_4
	A / B = 40 / 60, v / v
Flow Rate	: 1.0 mL / min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Sample	: 1. Hinokitiol

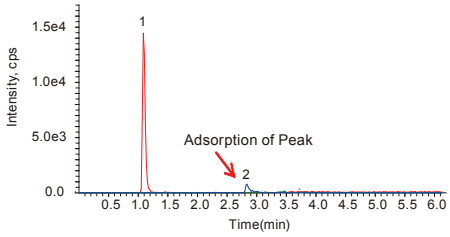
Comparison of Performance to Core-Shell Columns

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)

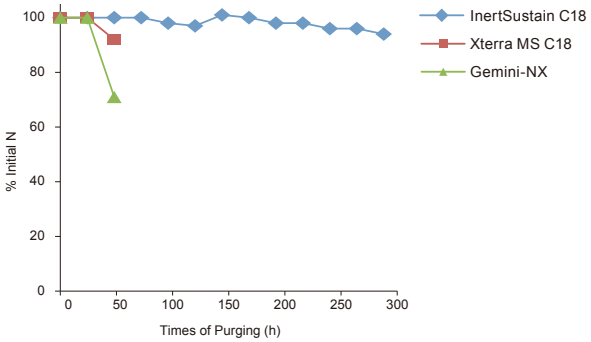


Conditions

Column	:	ODS Column(100 × 2.1 mm I.D.)
Eluent	:	A) 2 mM CH_3COONH_4 in 95 % CH_3CN B) 2 mM CH_3COONH_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

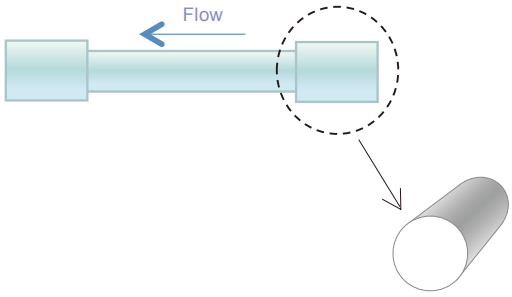
Eluent	:	A) CH_3CN B) H_2O A/B = 65/35, v/v
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 254 nm
Sample	:	Naphthalene

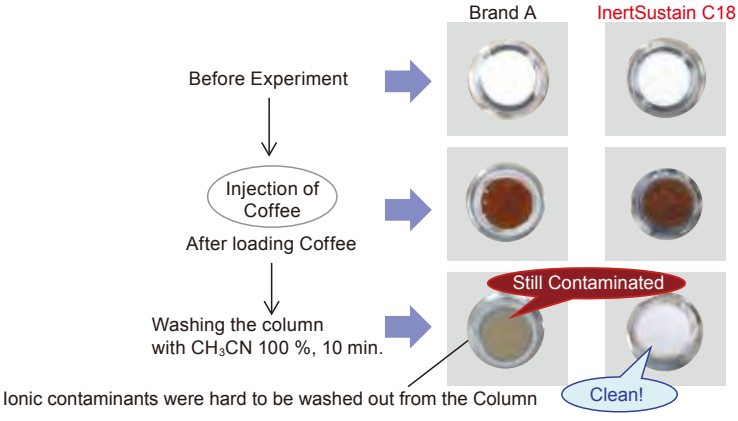
Experience the InertSustain! (Inertness and Sustainability)

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



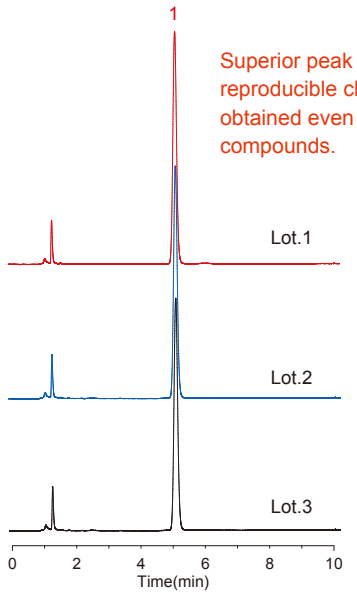


InertSustain C18

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.

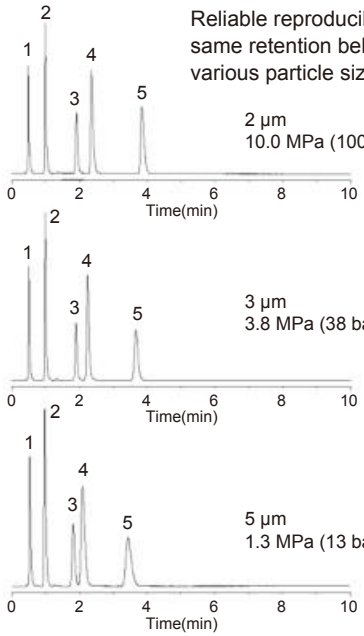
Figure 1 : Strong Basic Compound Test



Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) CH_3CN
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

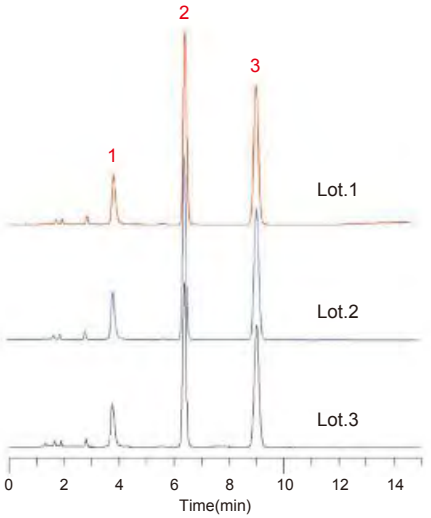
Same Retention Behavior between Various Particle Sizes



Conditions

Column Size : 50 × 2.1 mm I.D.
Eluent : A) CH_3OH
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

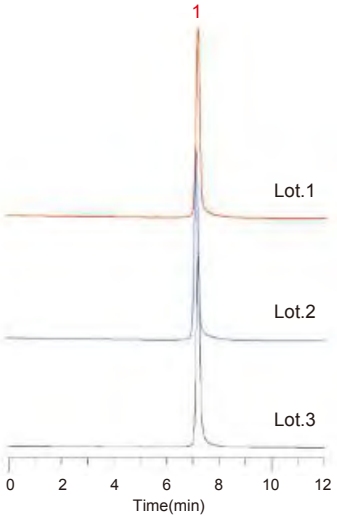
Figure 2 : Strong Acidic Compound Test



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) 0.1 % H_3PO_4
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

Figure 3 : Strong Chelating Compound Test



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) 0.1 % H_3PO_4
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

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	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		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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	

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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
	Length \ I.D. (mm)	3.9	4.0	4.6	
Particle Size: 10 µm	100	-	5020-90557	-	
	150	-	5020-90622	5020-90623	
	200	-	-	5020-90532	
	250	5020-90621	5020-90522	5020-90624	
	300	5020-90556	5020-90558	5020-90625	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)		
			Particle Size			Particle Size		
			3 µm	5 µm	10 µm	3 µm	5 µm	10 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	5020-90626	5020-19100	5020-19099	5020-90627
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	5020-90628	5020-19500	5020-19499	5020-90629
Holder for Cartridge Guard Column E				For 10 mm Length				5020-08500
				For 20 mm Length				5020-08550

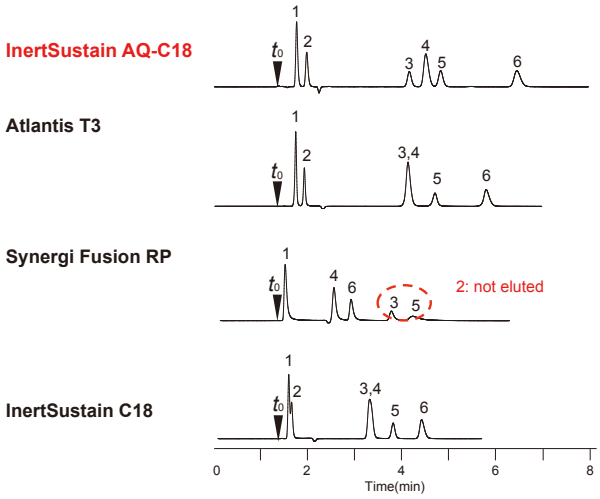
InertSustain AQ-C18

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **13%**
- **USP Code** : **L1, L96**
- **pH Range** : **1 - 10**



InertSustain AQ-C18 column is designed to achieve strong retention for highly polar compounds, which is the most challenging goal in developing reversed phase methods. The optimization of bonding of the C18 groups at equal distance to the silica gel enables InertSustain AQC18 to offer considerable retention for highly polar compounds even under water-rich mobile phases.

Figure 1 : Superior Retention for Highly Polar Compound



Conditions

Column : 5 µm, 150 × 4.6 mm I.D.
Eluent : 0.1 % HCOOH in H_2O
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm

Sample :
1. Pyridoxamine (Vitamin B6)
2. Thiamin (Vitamin B1)
3. Nicotinic acid (Vitamin B3)
4. Pyridoxal (Vitamin B6)
5. Nicotinamide (Vitamin B3)
6. Pyridoxine (Vitamin B6)

Figure 2: InertSustain AQ-C18 Provided Strong Retention for all Basic, Neutral and Acidic Compounds under 100% Water Mobile Phase

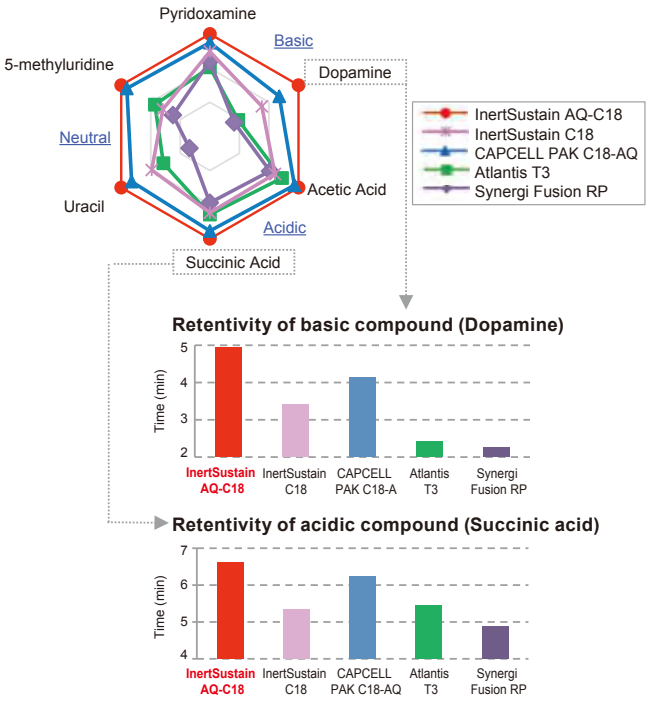
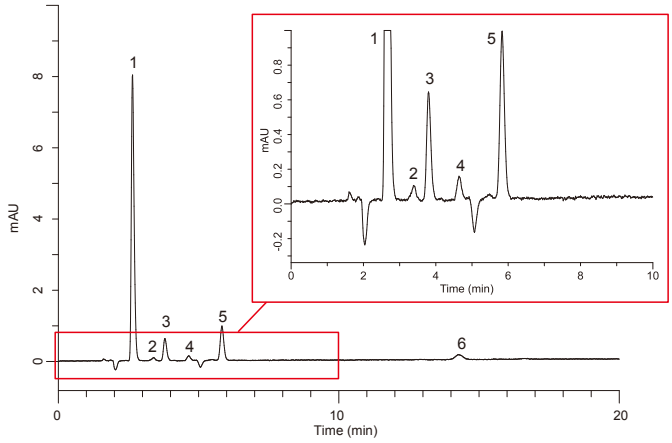


Figure 3 : Analysis of Nucleotide in Fish Meat



Conditions

Column : InertSustain AQ-C18 (5 µm, 150 × 4.6 mm I.D.)
Eluent : 50 mM K_2HPO_4 in H_2O (pH 7.0, H_3PO_4)*
Flow Rate : 1.0 mL/min
Col.Temp. : 40 °C
Detection : UV 260 nm
Injection Vol. : 1 µL

Sample :
1. IMP
2. ATP
3. ADP
4. AMP
5. Hyp
6. Ino

(each 5 mg/L)

* Wash the column with CH_3CN/H_2O=1/1,v/v after the analysis.
When storing the column for a long period of time, store it with 100% CH_3CN 100%.

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0
Particle Size: 1.9 µm	50	5020-89938	5020-89941
	100	5020-89939	5020-89942
	150	5020-89940	5020-89943

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	30	5020-89920	5020-89926	5020-89932
	50	5020-89921	5020-89927	5020-89933
	75	5020-89922	5020-89928	5020-89934
	100	5020-89923	5020-89929	5020-89935
	150	5020-89924	5020-89930	5020-89936
	250	5020-89925	5020-89931	5020-89937

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	30	5020-89871	5020-89877		
	50	5020-89872	5020-89878		
	75	5020-89873	5020-89879		
	100	5020-89874	5020-89880		
	150	5020-89875	5020-89881		
	250	5020-89876	5020-89882		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89831	5020-89839	5020-89847	5020-89855
	50	5020-89832	5020-89840	5020-89848	5020-89856
	75	5020-89833	5020-89841	5020-89849	5020-89857
	100	5020-89834	5020-89842	5020-89850	5020-89858
	125	5020-89835	5020-89843	5020-89851	5020-89859
	150	5020-89836	5020-89844	5020-89852	5020-89860
	250	5020-89837	5020-89845	5020-89853	5020-89861

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	30	5020-89741	5020-89747		
	50	5020-89742	5020-89748		
	75	5020-89743	5020-89749		
	100	5020-89744	5020-89750		
	150	5020-89745	5020-89751		
	250	5020-89746	5020-89752		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89701	5020-89709	5020-89717	5020-89725
	50	5020-89702	5020-89710	5020-89718	5020-89726
	75	5020-89703	5020-89711	5020-89719	5020-89727
	100	5020-89704	5020-89712	5020-89720	5020-89728
	125	5020-89705	5020-89713	5020-89721	5020-89729
	150	5020-89706	5020-89714	5020-89722	5020-89730
	250	5020-89707	5020-89715	5020-89723	5020-89731

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)		
			Particle Size			Particle Size		
			3 µm	5 µm	10 µm	3 µm	5 µm	10 µm
1.0	10	1.0	5020-89910	5020-89808	-	5020-89911	5020-89809	-
1.5, 2.1		1.5	5020-89912	5020-89810	-	5020-89913	5020-89811	-
2.1, 3.0		3.0	5020-89908	5020-89806	-	5020-89909	5020-89807	-
4.0, 4.6		4.0	5020-89906	5020-89804	5020-90626	5020-89907	5020-89805	5020-90627
2.1, 3.0	20	3.0	5020-89916	5020-89814	-	5020-89917	5020-89815	-
4.0, 4.6		4.0	5020-89914	5020-89812	5020-90628	5020-89915	5020-89813	5020-90629
Holder for Cartridge Guard Column E				For 10 mm Length			5020-08500	5020-08500
				For 20 mm Length			5020-08550	5020-08550

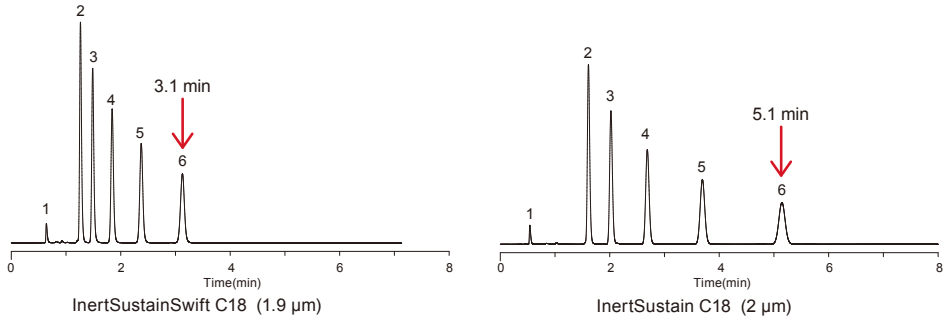
InertSustainSwift C18

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm, 5 µm**
- **Surface Area** : **200 m^2/g**
- **Pore Size** : **200 Å (20 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **9.0 %**
- **USP Code** : **L1**
- **pH Range** : **1.0 - 10**



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

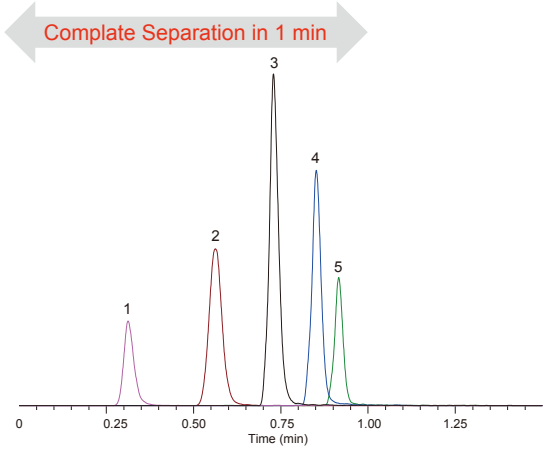
Figure 1 : Comparison of Retentivity



Conditions

Column Size	:	50 × 2.1 mm I.D.
Eluent	:	A) CH_3OH
		B) H_2O
		A/B = 80/20, v/v
Flow Rate	:	0.2 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 254 nm
Sample	:	1. Uracil
		2. Toluene
		3. Ethylbenzene
		4. Propylbenzene
		5. *n*-Butylbenzene
		6. *n*-Amylbenzene

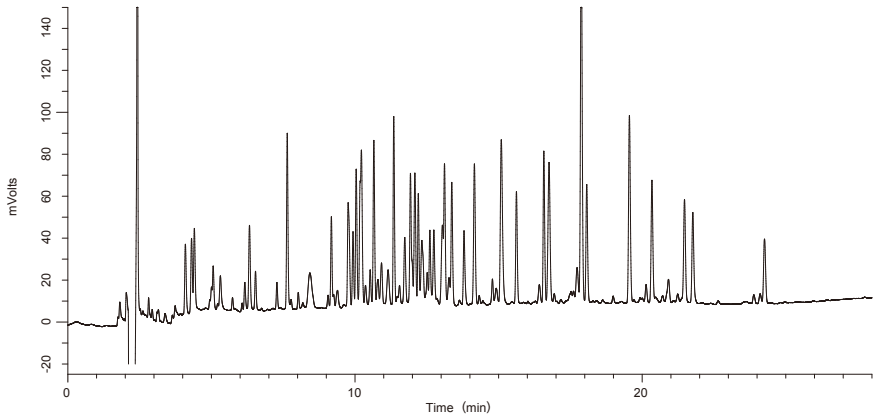
Figure 2 : Rapid LC/MS/MS Analysis of Basic Drugs



Conditions

Column Size	:	InertSustainSwift C18(1.9 µm, 50 × 2.1 mm I.D.)
Eluent	:	A) 10 mM Ammonium Formate in H_2O
		B) 10 mM Ammonium Formate in CH_3OH
		A/B = 70/30 – 0.3 min - 40/60 – 0.5 min
		- 0/100 – 0.1 min – 0/100 – 0.01 min -70/30- 0.5 min - 70/30 ,v/v
Flow Rate	:	0.6 mL/min
Col. Temp.	:	40 °C
Detection	:	LC/MS/MS (ESI, Positive, MRM)
Sample	:	1. Acebutolol
		2. Atenolol
		3. Labetalol
		4. Nadolol
		5. Pindolol

Figure 3 : Analysis of BSA Digests



Conditions

Column Size	: 1.9 µm, 150 × 2.1 mm I.D.
Eluent	: A) 0.1 % TFA in CH_3CN
	B) 0.1 % TFA in H_2O
	A/B = 10/90 - 30 min - 50/50 - 0.1 min - 90/10
	- 5 min - 90/10 - 0.1 min - 10/90 - 15 min
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 °C
Detection	: UV 210 nm
Injection Vol.	: 10 µL
Sample	: Tryptic Digest of BSA (0.5 mg/mL)

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 1.9 µm	50	5020-88228	5020-88233		
	100	5020-88230	5020-88235		
	150	5020-88231	5020-88236		

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

	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		
Particle Size: 3 µm	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
	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		
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

InertSustain AX-C18

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **200 m^2/g**
- **Pore Size** : **200 Å (20 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Functional Group** : **Octadecyl group + tertiary amino group**
- **End-capping** : **Yes**
- **Carbon Loading** : **8.0 %**
- **USP Code** : **L1, L78**
- **pH Range** : **1 - 9**



InertSustain AX-C18 is a mixed-mode column in which C18 groups and tertiary amino groups are chemically bonded to silica gel. It provides hydrophobic and electrostatic interactions via AX groups. By controlling the quantity of AX groups, acidic compounds can be eluted even over the range of buffer concentrations used in LC/MS, achieving excellent reproducibility and stability.

Figure 1 : Analysis of Nucleobases and Monophosphates

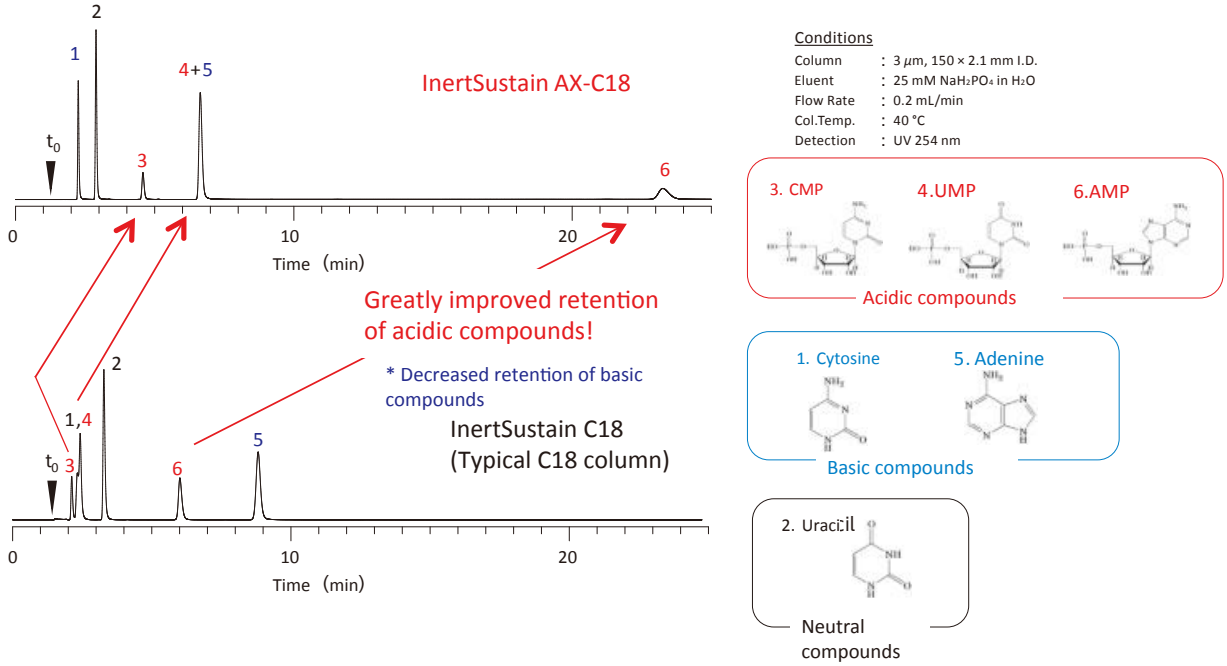
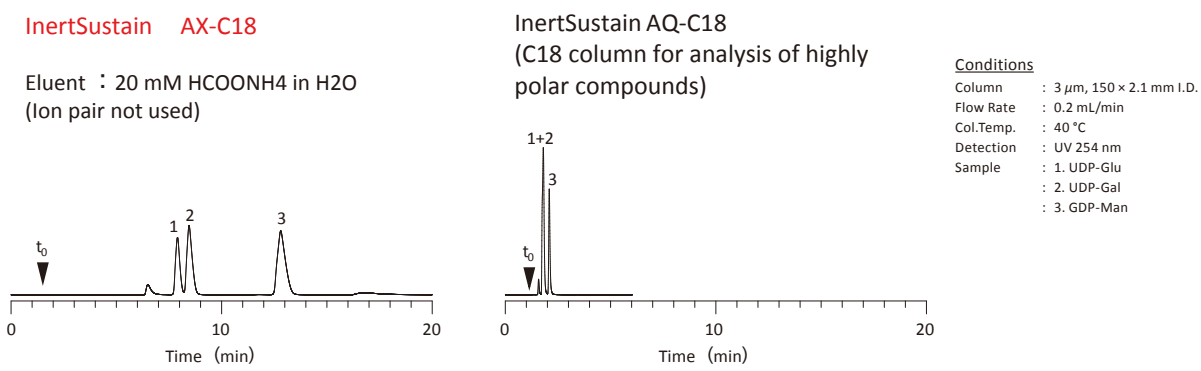


Figure 2 : Analysis of Sugar-nucleotides



Strongly retains highly polar acidic compounds which cannot be retained by InertSustain AQ-C18

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle size : 3 µm	150	5020-91053	5020-91055	5020-91057
	250	5020-91054	5020-91056	5020-91058

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle size : 3 µm	50	5020-91037	5020-91041	5020-91045	5020-91049
	100	5020-91038	5020-91042	5020-91046	5020-91050
	150	5020-91039	5020-91043	5020-91047	5020-91051
	250	5020-91040	5020-91044	5020-91048	5020-91052
Particle size : 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	50	5020-91000	5020-91004	5020-91008	5020-91012
	100	5020-91001	5020-91005	5020-91009	5020-91013
	150	5020-91002	5020-91006	5020-91010	5020-91014
	250	5020-91003	5020-91007	5020-91011	5020-91015

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.5、2.1	10	1.5	5020-91076	5020-91029	5020-91077	5020-91030
2.1、3.0		3.0	5020-91074	5020-91027	5020-91075	5020-91028
4.0、4.6		4.0	5020-91072	5020-91025	5020-91073	5020-91026
2.1、3.0	20	3.0	5020-91080	5020-91033	5020-91081	5020-91034
4.0、4.6		4.0	5020-91078	5020-91031	5020-91079	5020-91032
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

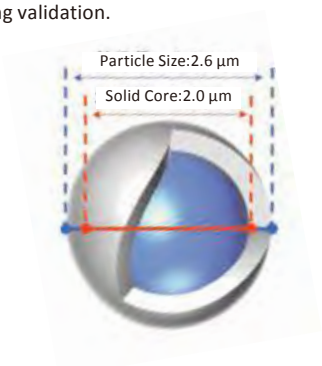
InertCore Plus C18

- **Base Material** : Core-shell type silica gel
- **Particle Size** : 2.6 µm
- **Surface Area** : 200 m²/g
- **Pore Size** : 90 Å (9 nm)
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1
- **pH Range** : 1 - 10
- **Max Pressure** : 100 MPa (2.1 mm I.D.)
  60 MPa (3.0 mm I.D., 4.6 mm I.D.)

InertCore Plus C18 is a core-shell (surface porous) column with exceptional performance. It can operate at relatively low pressures with separation performance comparable to that of a fully porous sub-2-µm column, enabling convenient and effective separation performance in various instrumental environments (general-purpose HPLC, UHPLC, and LC/MS). All processes, including manufacture of the packing material, are performed in-house and strict shipping standards are established. Unlike conventional commercial core-shell columns, the InertCore Plus C18 columns achieve excellent lot-to-lot reproducibility and can be used with confidence in analyses requiring validation.

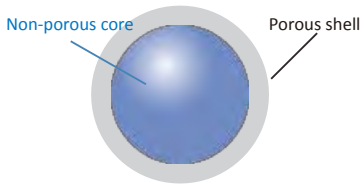
Features

- **Superior Reproducibility**
- **High Durability**

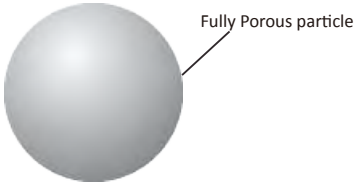


The molecules of the target analyses pass through the fine pores in the particles of the packing material. Core-shell particles form around a solid non-porous core, reducing the diffusion inside the fine-pore structure. This behavior differs from that in traditional fully porous particles. A core-shell column gives a narrower distribution of molecules around the peak of the eluted target than a porous column, thus increasing the number of theoretical plates.

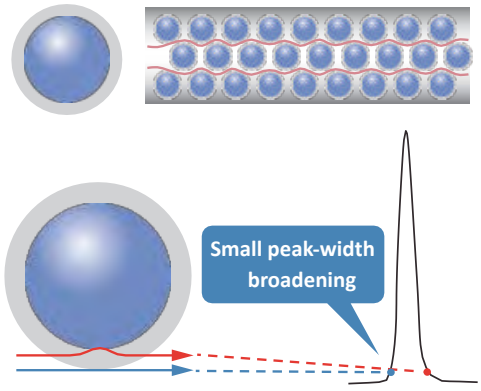
Core-Shell Type Packing Material

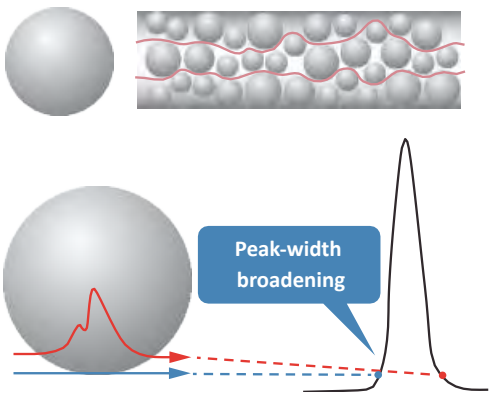


Conventional Fully Porous Packing Material



- The effect of multiple-path diffusion is significantly reduced by maximizing (as far as possible) the homogeneity of the particle-size distribution.
- A 2.6-µm core-shell packing material achieves a comparable number of theroetical plates to a 2-µm-sized fully porous packing material and comparable back-pressure to a 3-µm-sized fully porous packing material.
- The number of theoretical plates is increased by reducing diffusion inside the particle.



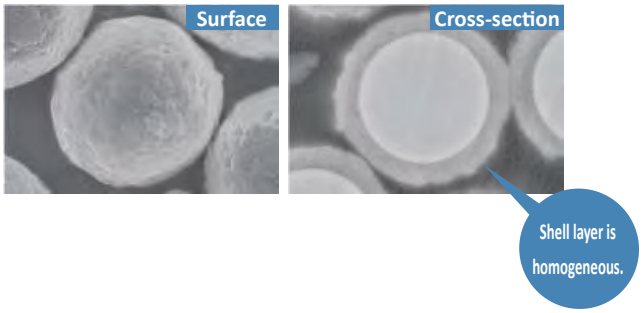


Comparison with Products from Other Brands

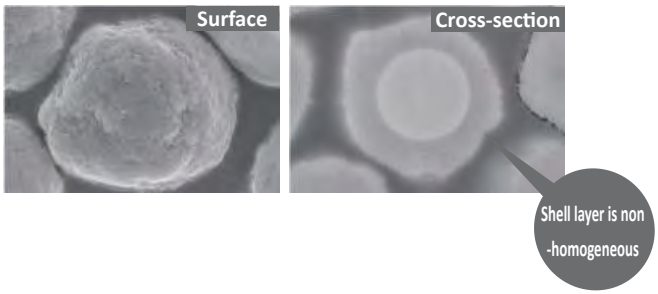
InertCore Plus C18 columns are subjected to rigorous internal quality control from bare silica manufacturing to inspection, resulting in superior reproducibility due to shell layer homogeneity

SEM image

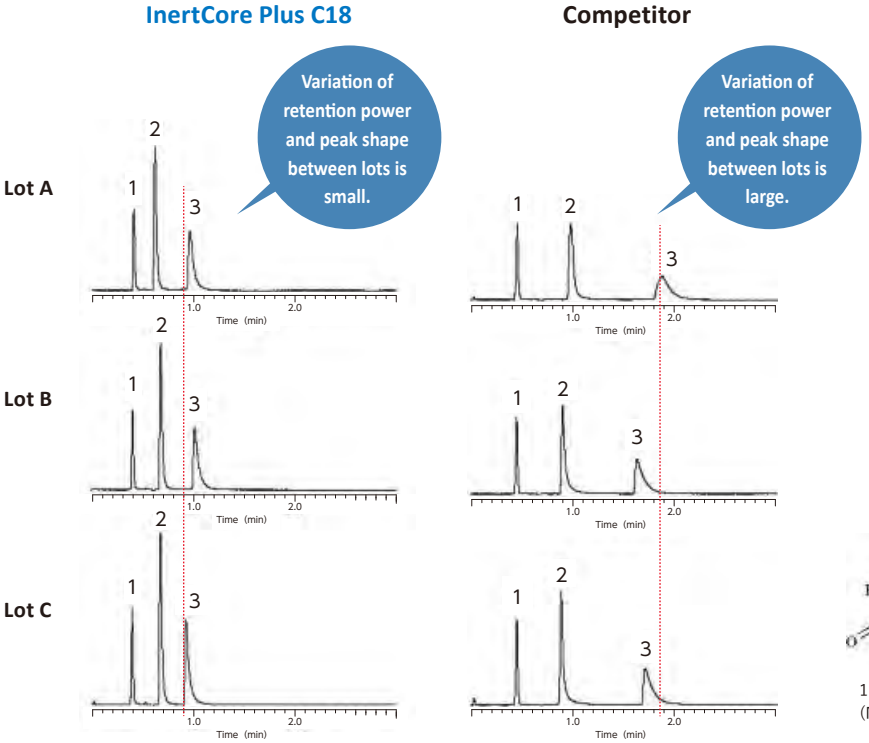
InertCore Plus C18



Core-shell Columns from Other Brands



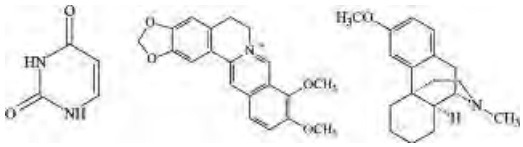
Superior Reproducibility



2 Strongly Basic Compounds Adsorption Test

Conditions

Column Size	:	2.6 μm,100×2.1 mm I.D.
Eluent	:	A) CH_3CN
		B) 25 mM K_2HPO_4(pH7.0,KH_2PO_4)
		A/B=40/60,v/v
Flow Rate	:	0.4 mL/min
Col.Temp.	:	40 °C
Detec:on	:	UV 220 nm
Injec:on Vol.	:	0.2 μL
Sample	:	1.Uracil 2.Berberine chloride
		3.Dextromethorphan



1:Uracil (Neutrality)

2:Berberine chloride (Basicity)

3:Dextromethorphan (Basicity)

Analytical Columns

Particle Size (μm)	Length \ I.D. (mm)	2.1	3.0	4.6
2.6	50	5020-17510	5020-17515	5020-17520
	75	5020-17513	5020-17518	5020-17523
	100	5020-17511	5020-17516	5020-17521
	150	5020-17512	5020-17517	5020-17522

Guard Columns

Particle Size (μm)	I.D. (mm)	Length (mm)	Cat. No
2.6	2.1	5020-17506	5020-17515
	3.0	5020-17507	5020-17516
	4.6	5020-17508	5020-17517

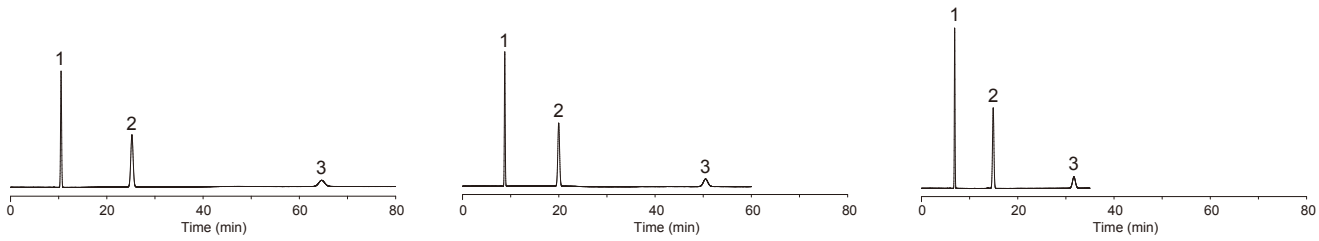
Inertsil ODS-HL

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 1.9 µm, 3 µm, 5 µm, 10 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 23%
- **USP Code** : L1
- **pH Range** : 2 - 7.5



Inertsil ODS-HL employs a highly inert packing material which provides pure hydrophobic interaction between analytes without generating any secondary interaction delivering sharp peaks.

Figure 1 : Comparison of Retentivety



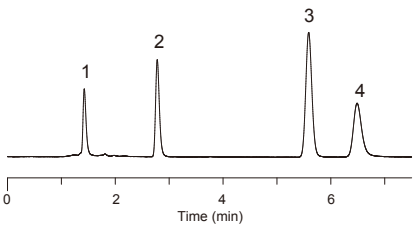
Inertsil ODS-HL | Inertsil ODS-3 | InertSustain C18

Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	Sample :	1. Vitamin K2 (MK-4)
Eluent	: CH_3CN		2. Vitamin K1
Flow Rate	: 1.0 mL/min		3. Vitamin K2 (MK-7)
Col. Temp.	: 40 °C		(50 mg/L each)
Detection	: UV 270 nm		
Injection Vol.	: 5 µL		

Figure 2 : Benefits of Highly Inert Packing Material

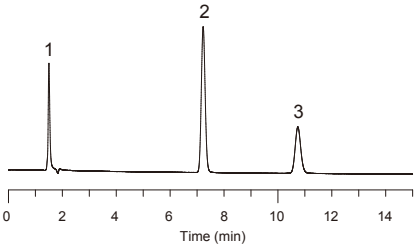
Bisic Compound Test



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	Sample :	1. Uracil
Eluent	: A) CH_3CN		2. Pyridine
	B) 25 mM K_2HPO_4 (pH 7.0)		3. Phenol
	A/B = 30/70, v/v		4. Berberine
Flow Rate	: 1.0 mL/min		
Col.Temp.	: 40 °C		
Detection	: UV 230 nm		

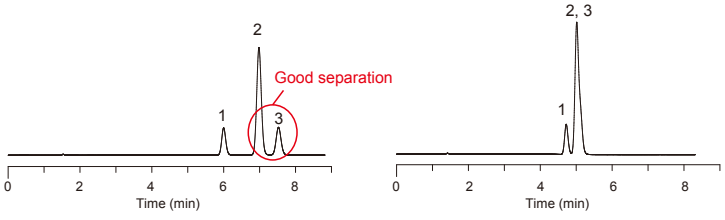
Acidic Compound Test



Conditions

Column Size	: 5 µm,150 × 4.6 mm I.D.	Sample :	1. Uracil
Eluent	: A) CH_3CN		2. Phenol
	B) 0.1 % H_3PO_4		3. Salicylic acid
	A/B = 25/75, v/v		
Flow Rate	: 1.0 mL/min		
Col.Temp.	: 40 °C		
Detection	: UV 230 nm		

Figure 3 : High - Density Bouding of C18 Phase Delivers Alternative Selectifity to Conventional C18 Columns

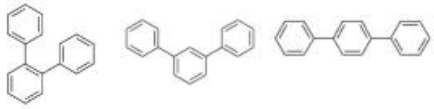


Inertsil ODS-HL (Carbon Loading 23 %) | InertSustain C18 (Carbon Loading 14 %)

Conditions

Column Size	: 5 µm,150 × 4.6 mm I.D.
Eluent	: A) CH_3CN
	B) H_2O
	A/B = 85/15, v/v
Flow Rate	: 1.0 mL/min
Col.Temp.	: 40 °C
Detection	: UV 254 nm

Sample:



1. *o*-Terphenyl 2. *m*-Terphenyl 3. *p*-Terphenyl

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 1.9 µm	30	5020-87340	5020-87345		
	50	5020-87341	5020-87346		
	75	5020-87342	5020-87347		
	100	5020-87343	5020-87348		
	150	5020-87344	5020-87349		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	30	5020-87315	5020-87321	5020-87327	
	50	5020-87316	5020-87322	5020-87328	
	75	5020-87317	5020-87323	5020-87329	
	100	5020-87318	5020-87324	5020-87330	
	150	5020-87319	5020-87325	5020-87331	
	250	5020-87320	5020-87326	5020-87332	

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	30	5020-87266	5020-87272		
	50	5020-87267	5020-87273		
	75	5020-87268	5020-87274		
	100	5020-87269	5020-87275		
	150	5020-87270	5020-87276		
	250	5020-87271	5020-87277		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87226	5020-87234	5020-87242	5020-87250
	50	5020-87227	5020-87235	5020-87243	5020-87251
	75	5020-87228	5020-87236	5020-87244	5020-87252
	100	5020-87229	5020-87237	5020-87245	5020-87253
	125	5020-87230	5020-87238	5020-87246	5020-87254
	150	5020-87231	5020-87239	5020-87247	5020-87255
	250	5020-87232	5020-87240	5020-87248	5020-87256
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	30	5020-87142	5020-87148		
	50	5020-87143	5020-87149		
	75	5020-87144	5020-87150		
	100	5020-87145	5020-87151		
	150	5020-87146	5020-87152		
	250	5020-87147	5020-87153		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87102	5020-87110	5020-87118	5020-87126
	50	5020-87103	5020-87111	5020-87119	5020-87127
	75	5020-87104	5020-87112	5020-87120	5020-87128
	100	5020-87105	5020-87113	5020-87121	5020-87129
	125	5020-87106	5020-87114	5020-87122	5020-87130
	150	5020-87107	5020-87115	5020-87123	5020-87131
	250	5020-87108	5020-87116	5020-87124	5020-87132
	Length \ I.D. (mm)	4.6			
Particle Size: 10 µm	150	5020-89550			
	250	5020-89551			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-87305	5020-87209	5020-87306	5020-87210
1.5, 2.1		1.5	5020-87307	5020-87211	5020-87308	5020-87212
2.1, 3.0		3.0	5020-87303	5020-87207	5020-87304	5020-87208
4.0, 4.6		4.0	5020-87301	5020-87205	5020-87302	5020-87206
2.1, 3.0	20	3.0	5020-87311	5020-87215	5020-87312	5020-87216
4.0, 4.6		4.0	5020-87309	5020-87213	5020-87310	5020-87214
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

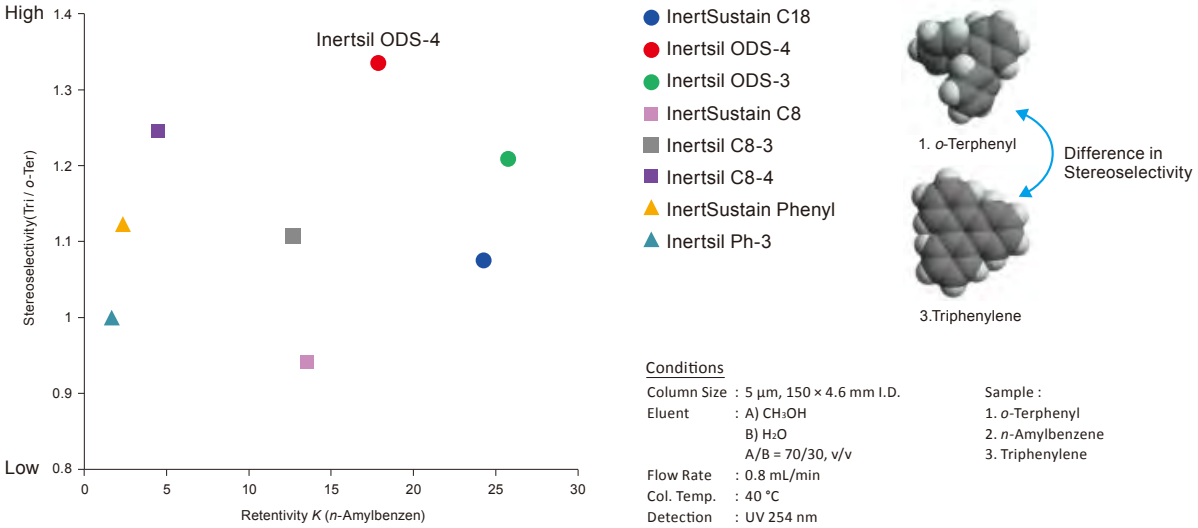
Inertsil ODS-4

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 2 µm, 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **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

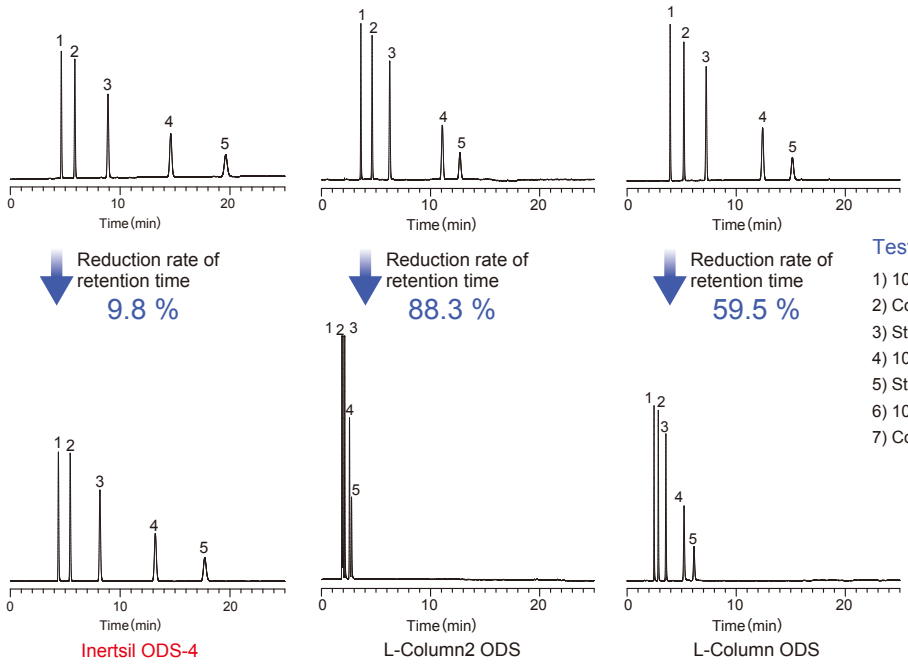


Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.
Eluent	: A) CH_3OH B) H_2O A/B = 70/30, v/v
Flow Rate	: 0.8 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

Sample :
1. *o*-Terphenyl
2. *n*-Amylbenzene
3. Triphenylene

Figure 2 : Dewetting Test



Conditions

Column Size	: ODS Column(5 µm, 250 × 4.6 mm I.D.)
Eluent	: H_2O
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Sample	: 1. Cytosine 2. Uracil 3. Guanine 4. Thymine 5. Adenine

Testing Procedure:

1) 100 % water is introduced into column over 20 minutes.
2) Conduct Analysis (Upper chromatogram)
3) Stop flow for 15 minutes.
4) 100 % water is introduced again into column over 30 minutes.
5) Stop flow for 15 minutes again.
6) 100 % water is introduced again into column over 15 minutes.
7) Conduct Analysis (Lower chromatogram)

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	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		

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

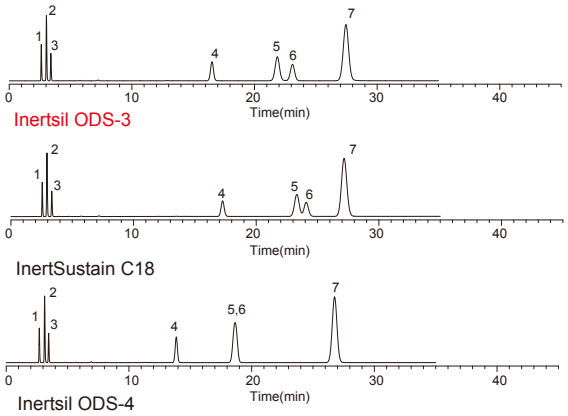
Inertsil ODS-3

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



Inertsil ODS-3 is the most popular phase marketed by GL Sciences. It is widely and reliably employed in long-established methods of pharmaceutical and contract research laboratories. Inertsil ODS-3 has a stronger retentivity than commercially available ODS columns. High-surface-area silica provides a high preparative loading capacity without sacrificing the peak shape.

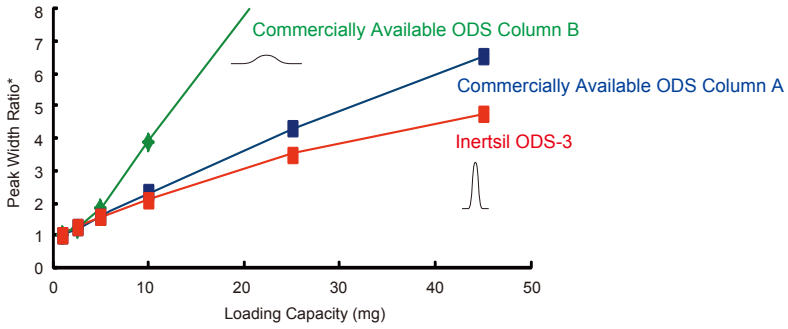
Figure 1 : Comparison of Retentivity



Conditions

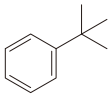
Column Size	: 5 µm, 250 × 4.6 mm I.D.	Sample :
Eluent	: A) CH_3OH	1. Uracil
	B) H_2O	2. Caffeine
	A/B= 80/20, v/v	3. Phenol
Flow Rate	: 1.0 mL/min	4. Butylbenzene
Col.Temp.	: 40 °C	5. *o*-Terphenyl
Detection	: UV 254 nm	6. Amylbenzene
		7. Triphenylene

Figure 2 : Comparison of Loading Capacity



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3OH
	B) H_2O
	A/B = 90/10, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 270 nm
Sample	: *tert*-Buthylbenzene (100 mg/mL)



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

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	
Particle Size: 2 µm	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	
	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

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			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			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

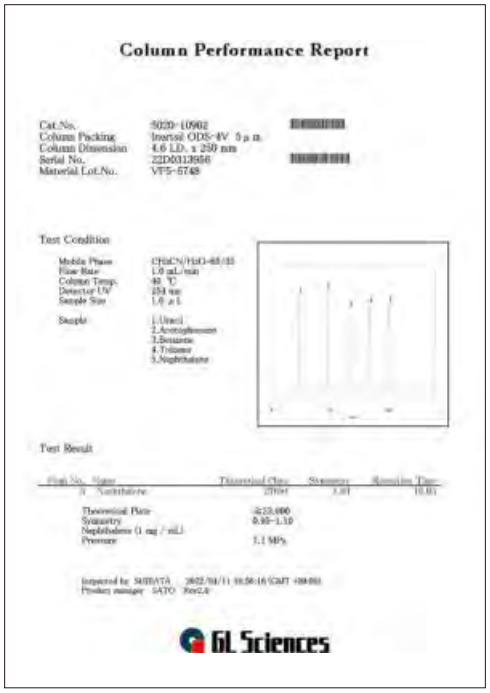
Inertsil ODS-4V
(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- **Base Material** : 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
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 11 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5



Inertsil ODS-4 columns have proven superior worldwide for analyzing 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 will be employing one of the most trusted and enduring HPLC columns for validation.

Details of Column Performance Report (Front Page)


Column Performance Report

Test Condition

Test Result

GL Sciences

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
	Length \ I.D. (mm)	3.0	4.0	4.6	
Particle Size: 5 µm	150	5020-10921	5020-10911	5020-10901	
	250	5020-10922	5020-10912	5020-10902	

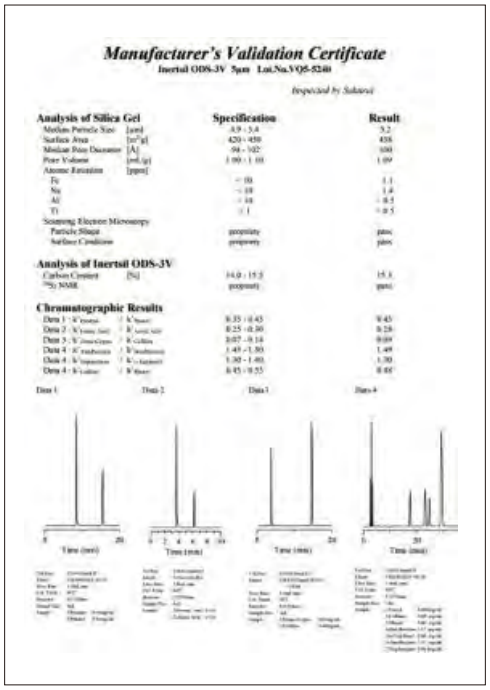
Inertsil ODS-3V
(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- **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
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5



Inertsil ODS-3V columns offer all the outstanding chromatographic benefits of Inertsil ODS-3 plus 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 Inertsil ODS-3V columns provide additional assurance of consistent column-to-column and batch-to-batch performance. Inertsil ODS-3V columns are also available in 3-column sets packed with your choice of three different silica batches or a single silica batch to assist your reproducibility studies.

Details of Manufacturer's Validation Certificate (Back Page)


Manufacturer's Validation Certificate

Inertsil ODS-3V 5µm Lot.No.YQ5-5240

Inspected by Sakurai

Analysis of Silica Gel — Specification — Result

Analysis of Inertsil ODS-3V

Chromatographic Results

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
	Length \ I.D. (mm)	3.0	4.0	4.6	
Particle Size: 5 µm	150	5020-01821	5020-01811	5020-01801	
	250	5020-01822	5020-01812	5020-01802	

Inertsil ODS-SP

- **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
- **Functional Group** : Octadecyl
- **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 excessively retaining hydrophobic compounds. Therefore, it achieves better and faster separations than its predecessors.
With its relatively low carbon load, Inertsil ODS-SP is compatible with 100% aqueous eluents and quickly equilibrates the column for gradient analysis.

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

Conditions
Column Size : 5 µm, 150 × 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 °C
Detection : UV 280 nm

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

Conditions
Column Size : 5 µm, 250 × 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 °C
Detection : UV 280 nm

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

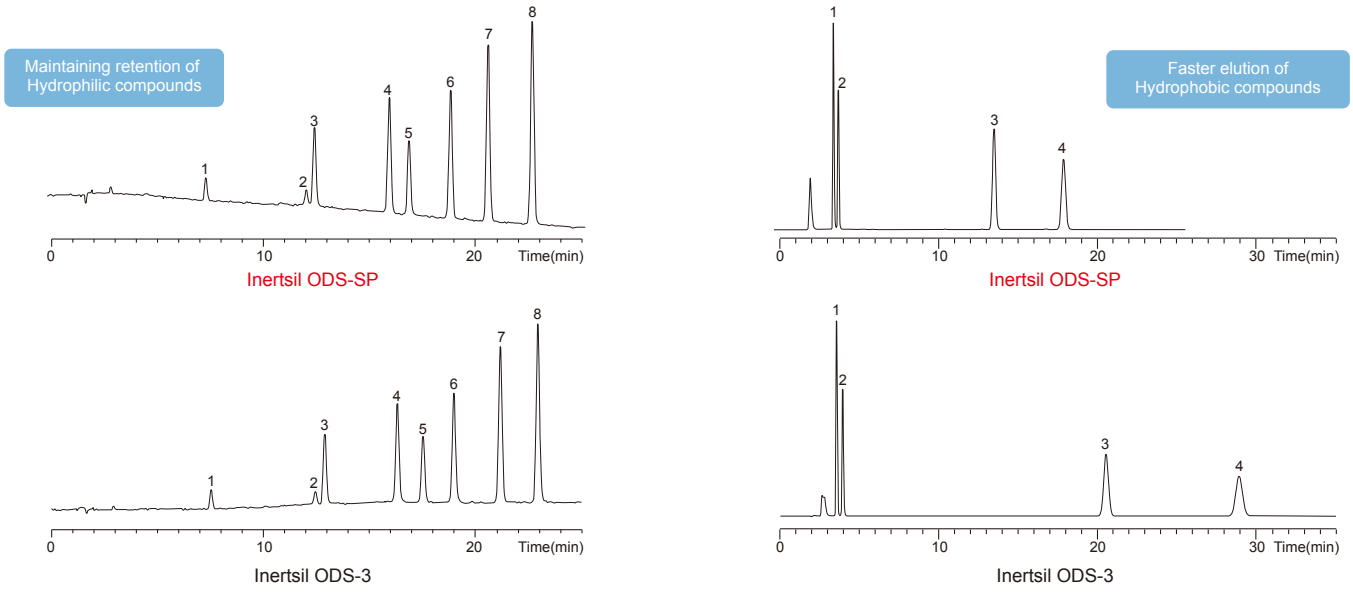
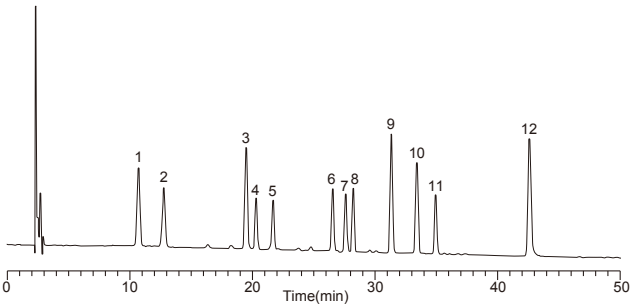


Figure 2 : Simultaneous Analysis of Soybean Isoflavone



Conditions
Column : Inertsil ODS-SP
(5 µm, 250 × 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 °C
Detection : UV 254 nm
Sample : 1. Daidzin (D)
2. Glycitin (Gly)
3. Genistin (GI)
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

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	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
	250	5020-02816	5020-02826	5020-02836	5020-02846
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

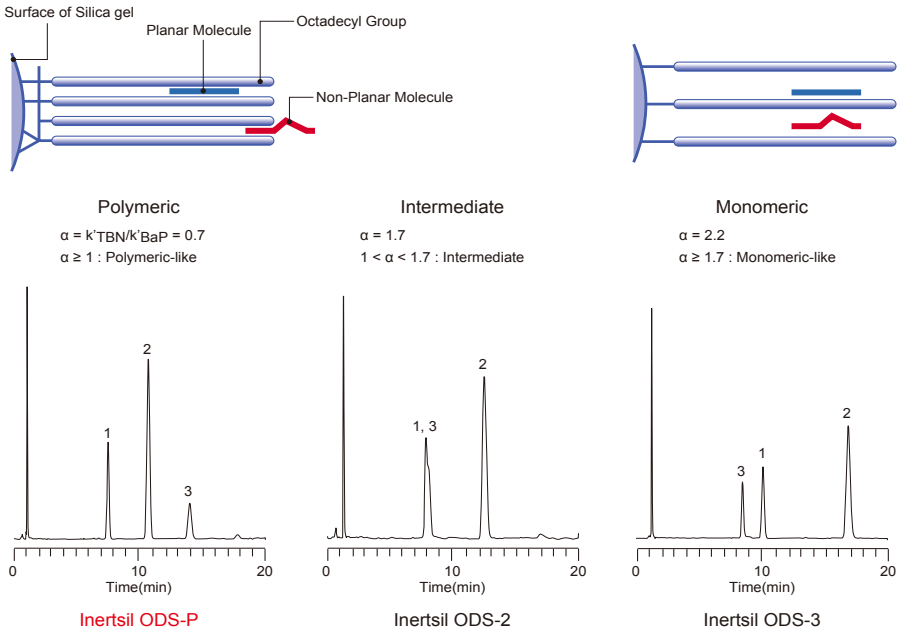
Inertsil ODS-P

- **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
- **Functional Group** : Octadecyl
- **End-capping** : None
- **Carbon Loading** : 29 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5

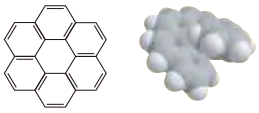


GL Sciences offers a polymerically bonded ODS-P phase with high steric selectivity for separating planar and non-planar compounds (see Figure 1). This polymeric type C18 column delivers complete baseline separation of structurally similar compounds, such as vitamins D2 and D3 (see Figure 2). Inertsil ODS-P column is also ideal for the HPLC analysis of 16 PAH compounds, which are listed as target pollutants by the US EPA.

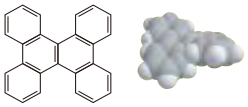
Figure 1 : Classification of Inertsil ODS Phases by Standard Reference Material 869



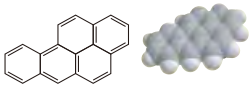
Conditions
Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) H_2O
A/B = 85/15, v/v
Flow Rate : 2.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm



1. Phenanthro[3,4-c]phenanthrene (PhPh)

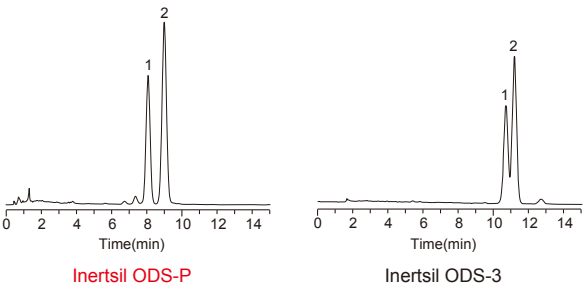


2. Tetrabenzonaphthalene (TBN)

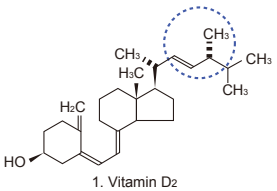


3. Benzo[a]pyrene (BaP)

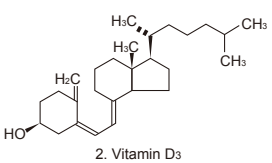
Figure 2 : Comparison of Selectivity Between a Polymeric and Monomeric Type C18 Phase



Conditions
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) CH_3OH
A/B = 75/25, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 30 °C
Detection : UV 280 nm



1. Vitamin D_2



2. Vitamin D_3

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
	150	5020-04665	5020-04675	5020-04685	5020-04695
	250	5020-04666	5020-04676	5020-04686	5020-04696
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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

Inertsil ODS-EP

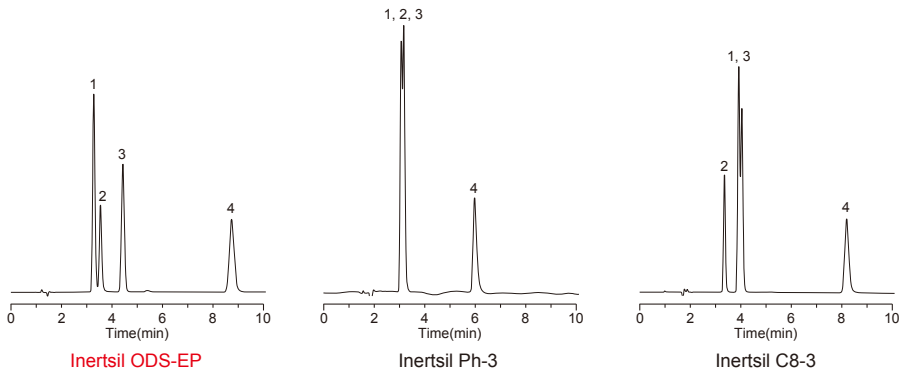
- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : None
- **Carbon Loading** : 9 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5



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



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) 10 mM KH_2PO_4(pH 7.0, K_2HPO_4)
A/B = 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm

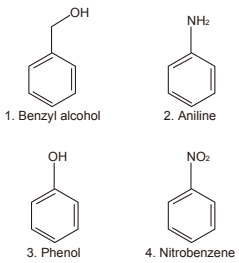
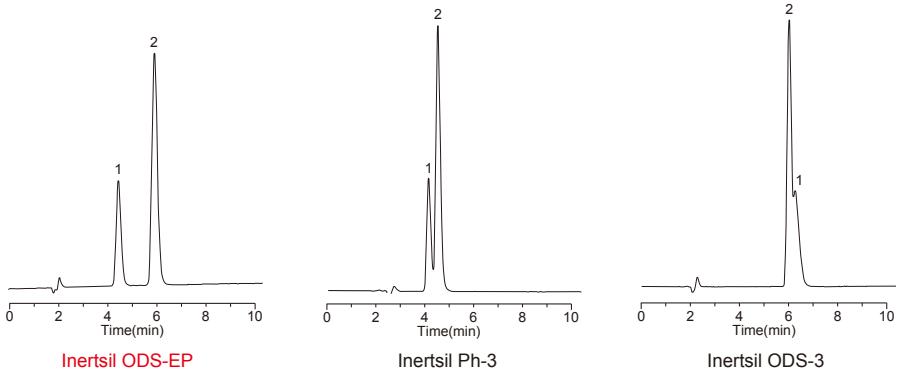
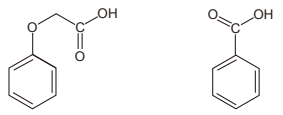


Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase



Conditions

Column Size : 5 µm, 150 × 3.0 mm I.D.
Eluent : A) CH_3OH
B) 0.1 % HCOOH in H_2O
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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

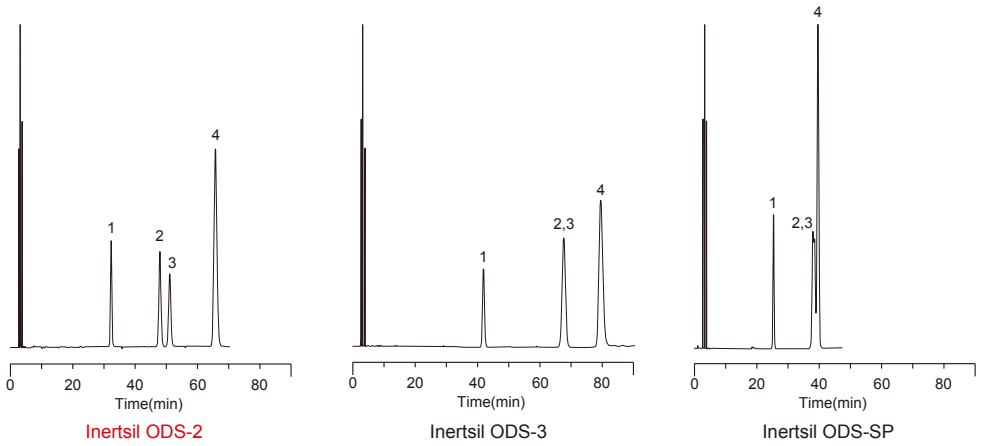
Inertsil ODS-2

- **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**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **18.5 %**
- **USP Code** : **L1**
- **pH Range** : **2 - 7.5**



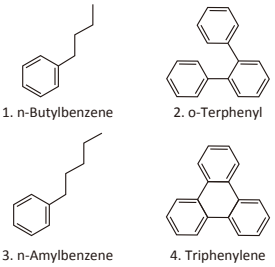
Inertsil ODS-2 has a highly inert filler in which a spherical silica gel with a pore diameter of 150 Å was chemically modified and end-capped with an octadecyl group and silanol group, respectively.

Figure 1 : Comparison of Retentivity



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3OH
	B) H_2O
	A/B = 70/30, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm



Analytical Columns

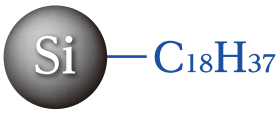
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01121	5020-01122	5020-01123	5020-01124
	250	5020-01125	5020-01126	5020-01127	5020-01128

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

Inertsil ODS

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



Inertsil ODS is a general purpose, reversed phase C18 column available in 5 µm and 10 µm particle sizes.

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
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 10 µm	150	5020-02221	5020-02222	5020-02223	5020-02224
	250	5020-02225	5020-02226	5020-02227	5020-02228

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

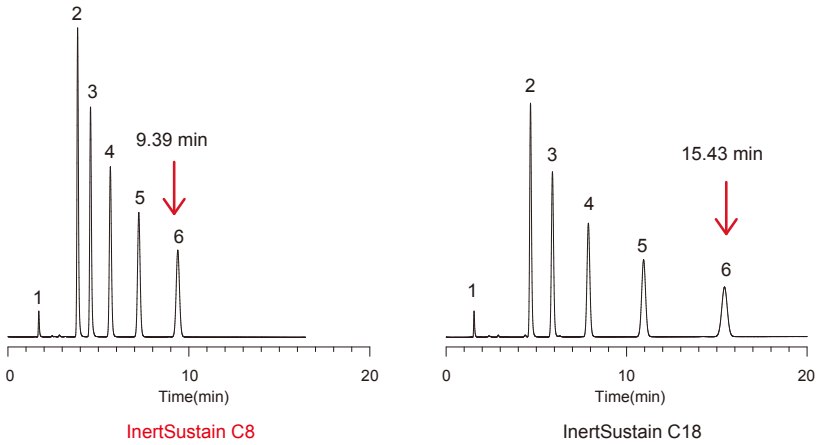
InertSustain C8

- **Silica** : **High Purity ES Silica Gel**
- **Particle Size** : **2 µm, 3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Octyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **8 %**
- **USP Code** : **L7**
- **pH Range** : **1 - 10**



InertSustain C8 is an octyl group (C8) bonded column. Like InertSustain C18, InertSustain C8 is extremely inert to any type of compound, enabling rapid analysis of highly hydrophobic compounds and ensuring symmetric peaks over a wide pH range.

Figure 1 : Comparison of Retentivity

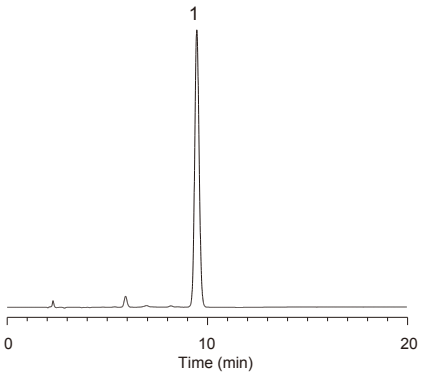


Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) H_2O
A/B = 80/20, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm

Sample : 1. Uracil
2. Toluene
3. Ethylbenzene
4. Propylbenzene
5. *n*-Butylbenzene
6. *n*-Amylbenzene

Figure 2 : Analysis of Lincomycin under Basic Condition



Conditions

Column : InertSustain C8 (5 µm, 250 × 4.6 mm I.D.)
Eluent : A) CH_3CN
B) CH_3OH
C) 0.1 % Ammonia solution in H_2O (pH 9.5, H_3PO_4)
A/B/C = 225/225/550, v/v
Flow Rate : 1.2 mL/min
Col. Temp. : 25 °C
Detection : UV 210 nm
Sample : 1. Lincomycin

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	
Particle Size: 2 µm	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	
	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

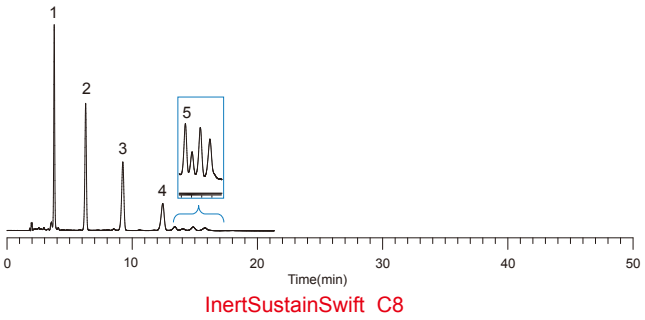
InertSustainSwift C8

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm, 5 µm**
- **Surface Area** : **200 m^2/g**
- **Pore Size** : **200 Å (20 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Functional Group** : **Octyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **6%**
- **USP Code** : **L7**
- **pH Range** : **1 - 10**

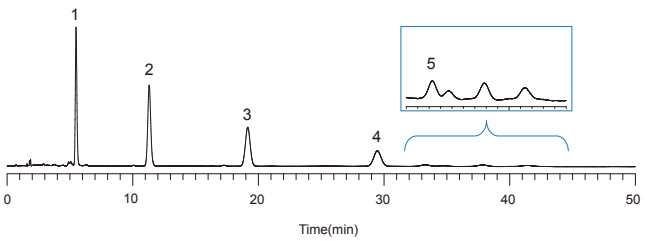


InertSustainSwift C8 is an octyl group (C8) bonded column. Like InertSustainSwift C18, InertSustainSwift C8 is extremely inert to any type of compound and is ideal for analyzing low-polarity analytes. In addition, the pore size (200 Å) of the silica is optimized for analyzing and retaining peptides and oligonucleotides with molecular weights from several kDa to several dozen kDa.

Figure 1 : Comparison of Retentivity



InertSustainSwift C8

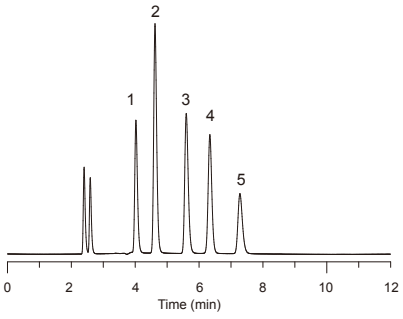


InertSustain C8

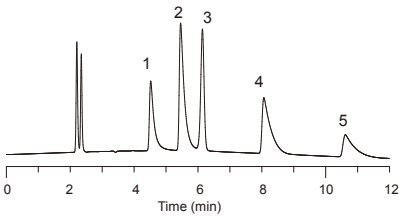
Conditions

Column Size	:	5 µm 150 × 4.6 mm I.D.
Eluent	:	A) H_2O
		B) CH_3CN
		A/B = 10/90,v/v
Flow Rate	:	1.0 mL/min
Col. Temp	:	40 ˚C
Detection	:	UV 300 nm
Sample	:	1. Retinol (Vitamin A)
		2. Cholecalciferol (Vitamin D3)
		3. α-tocopherol (Vitamin E)
		4. Phylloquinone (Vitamin K1)
		5. Impurities of 1

Figure 2 : Analysis of Antihistamines



InertSustainSwift C8



Hypersil BDS C8

Conditions

Column Size	:	5 µm 250 × 4.6 mm I.D.
Eluent	:	A) CH_3CN
		B) 25 mM K_2HPO_4 (pH 7.0, KH_2PO_4)
		A/B = 60/40, v/v
Flow Rate	:	1.0 mL/min
Col. Temp	:	40 °C
Detection	:	230 nm
Injection.Vol.	:	5 µL
Sample	:	1. Chlorpheniramine
		2. Triprolidine
		3. Homochlorcyclizine
		4. Hydroxyzine
		5. Clemastine

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0
Particle Size: 1.9 µm	50	5020-88533	5020-88536
	100	5020-88534	5020-88537
	150	5020-88535	5020-88538

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	50	5020-88515	5020-88519	5020-88523
	100	5020-88516	5020-88520	5020-88524
	150	5020-88517	5020-88521	5020-88525
	250	5020-88518	5020-88522	5020-88526

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	30	5020-88466	5020-88472		
	50	5020-88467	5020-88473		
	75	5020-88468	5020-88474		
	100	5020-88469	5020-88475		
	150	5020-88470	5020-88476		
	250	5020-88471	5020-88477		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88426	5020-88434	5020-88442	5020-88450
	50	5020-88427	5020-88435	5020-88443	5020-88451
	75	5020-88428	5020-88436	5020-88444	5020-88452
	100	5020-88429	5020-88437	5020-88445	5020-88453
	125	5020-88430	5020-88438	5020-88446	5020-88454
	150	5020-88431	5020-88439	5020-88447	5020-88455
	250	5020-88432	5020-88440	5020-88448	5020-88456
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88342	5020-88348		
	50	5020-88343	5020-88349		
	75	5020-88344	5020-88350		
	100	5020-88345	5020-88351		
	150	5020-88346	5020-88352		
	250	5020-88347	5020-88353		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88302	5020-88310	5020-88318	5020-88326
	50	5020-88303	5020-88311	5020-88319	5020-88327
	75	5020-88304	5020-88312	5020-88320	5020-88328
	100	5020-88305	5020-88313	5020-88321	5020-88329
	125	5020-88306	5020-88314	5020-88322	5020-88330
	150	5020-88307	5020-88315	5020-88323	5020-88331
	250	5020-88308	5020-88316	5020-88324	5020-88332

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-88505	5020-88409	5020-88506	5020-88410
1.5, 2.1		1.5	5020-88507	5020-88411	5020-88508	5020-88412
2.1, 3.0		3.0	5020-88503	5020-88407	5020-88504	5020-88408
4.0, 4.6		4.0	5020-88501	5020-88405	5020-88502	5020-88406
2.1, 3.0	20	3.0	5020-88511	5020-88415	5020-88512	5020-88416
4.0, 4.6		4.0	5020-88509	5020-88413	5020-88510	5020-88414
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

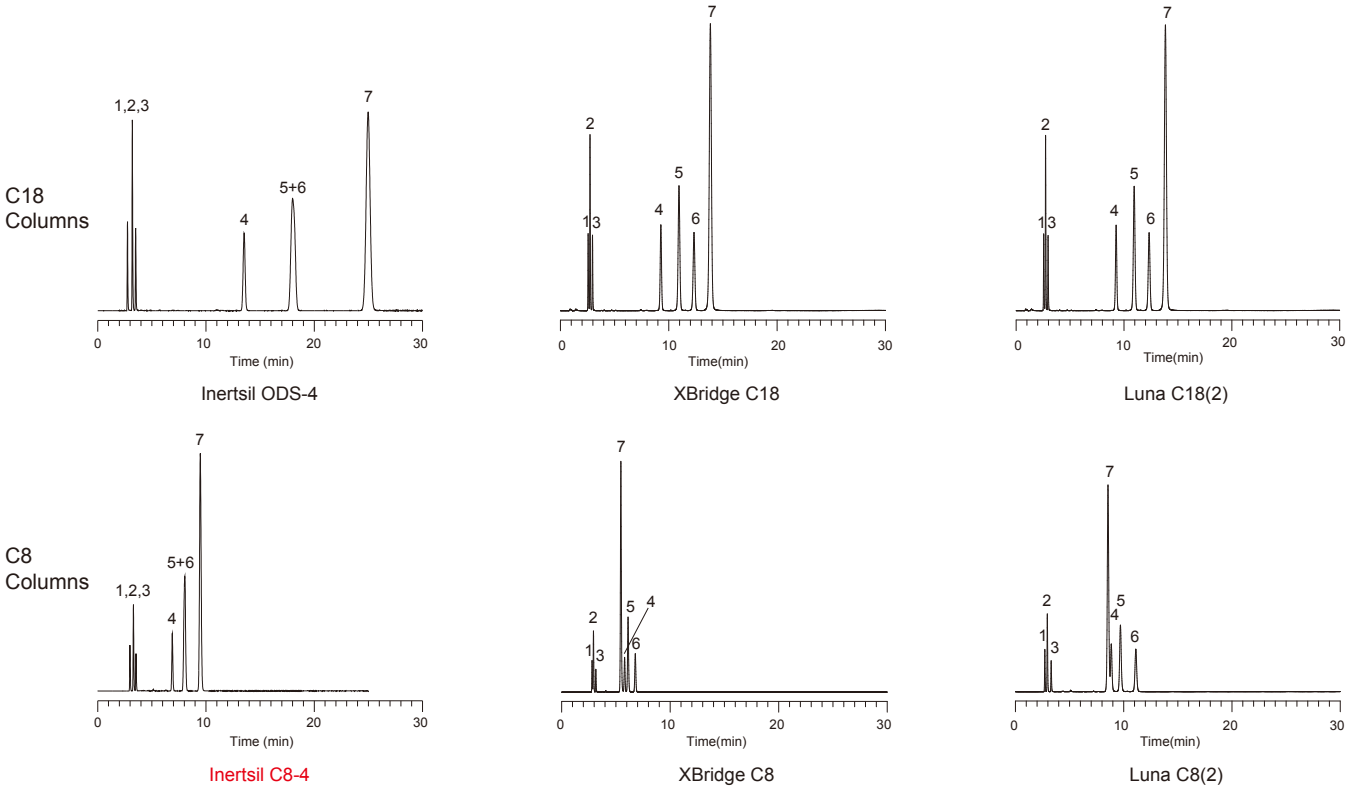
Inertsil C8-4

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



Inertsil C8-4 reproduces effectively the functional group binding state, binding density, and inertness of Inertsil ODS-4.
Therefore, it is a C8 column that is unlikely to change the separation pattern, which is often a challenge when migrating a method from a C18 to a C8 column. It is also suitable for the analysis of samples where hydrophobic interaction is extremely weak due to a small carbon content of 5%. It is applicable to analytes with strong retention that causes an increase in the analysis time.

Figure 1 : Comparison of Separation Pattern between C18 and C8 Columns



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.	1. Uracil	(0.005 mg/mL)
Eluent	: A) CH_3OH	2. Caffeine	(0.04 mg/mL)
	B) H_2O	3. Phenol	(0.08 mg/mL)
	A/B = 80/20, v/v	4. *n*-Butylbenzene	(1.12 mg/mL)
Flow Rate	: 1.0 mL/min	5. *o*-Terphenyl	(0.04 mg/mL)
Col. Temp.	: 40 °C	6. *n*-Amylbenzene	(1.37 mg/mL)
Detection	: UV 254 nm	7. Triphenylene	(0.014 mg/mL)
Injection Vol.	: 5 µL		

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	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		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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	

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

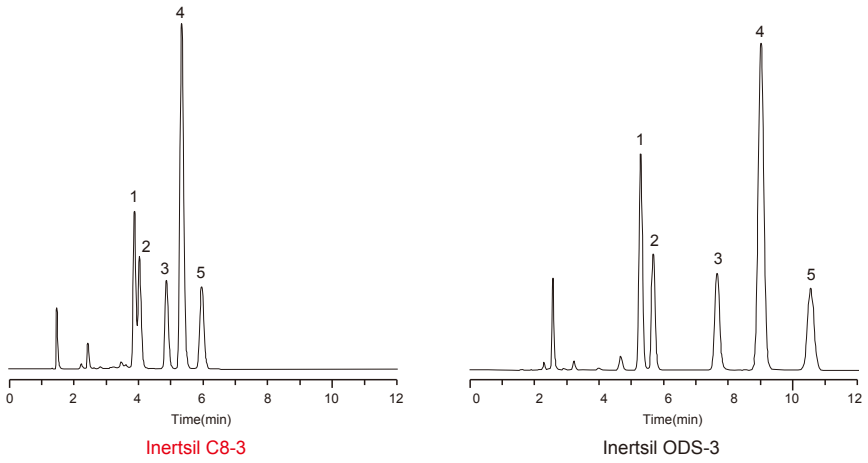
Inertsil C8-3

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



Inertsil C8-3 uses the same base silica gel and bonding technology as Inertsil ODS-3.
The two phases differ only by the lengths of their hydrocarbon ligands. As shown in Figure 2, 10-µm particle size columns are also available for various pharmacopeia methods. We recommend InertSustain C8 columns for all new method developments.

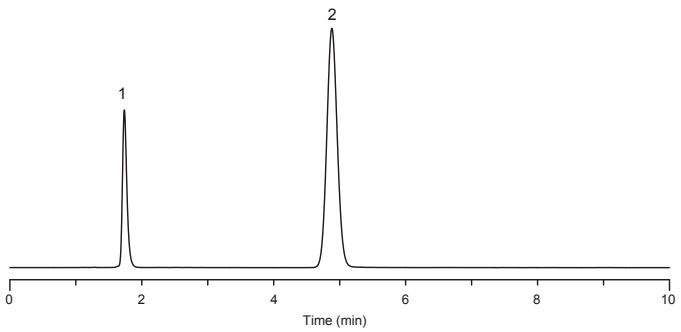
Figure 1 : Comparison of Retentivity



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.
Eluent	: A) CH_3CN
	B) H_2O
	A/B = 70/30, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Sample	: 1. Naphthalene
	2. Ethylbenzene
	3. *n*-Propylbenzene
	4. Anthracene
	5. *n*-Butylbenzene

Figure 2 : Analysis of Losartan Potassium and Hydrochlorothiazide Tablets, Dissolution Test (Based on the Condition of United States Pharmacopeia 36-NF 31)



Conditions

Column	: Inertsil C8-3 (10 µm, 250 × 4.6 mm I.D.)
Eluent	: A) CH_3CN
	B) 10 mM KH_2PO_4 (pH 2.5, H_3PO_4)
	A/B = 40/60, v/v
Flow Rate	: 2.3 mL/min
Col. Temp.	: 35 °C
Detection	: UV 230 nm
Injection Vol.	: 20 µL
Sample	: 1. Hydrochlorothiazide (14 mg/L)
	2. Losartan potassium (60 mg/L)

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	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		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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	

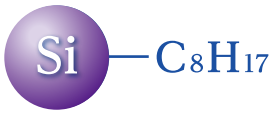
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	33	5020-84811	5020-84821		
	50	5020-84812	5020-84822		
	75	5020-84813	5020-84823		
	100	5020-84814	5020-84824		
	150	5020-13522	5020-13520		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04811	5020-04821	5020-04831	5020-04841
	50	5020-04812	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			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

Inertsil C8

- **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**
- **Functional Group** : **Octyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **10.5 %**
- **USP Code** : **L7**
- **pH Range** : **2 - 7.5**



Inertsil C8 has a pore size of 150 Å and is recommended for the rapid analysis of highly hydrophobic compounds. We recommend InertSustain C8 or Inertsil C8-4 column for all new method developments.

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

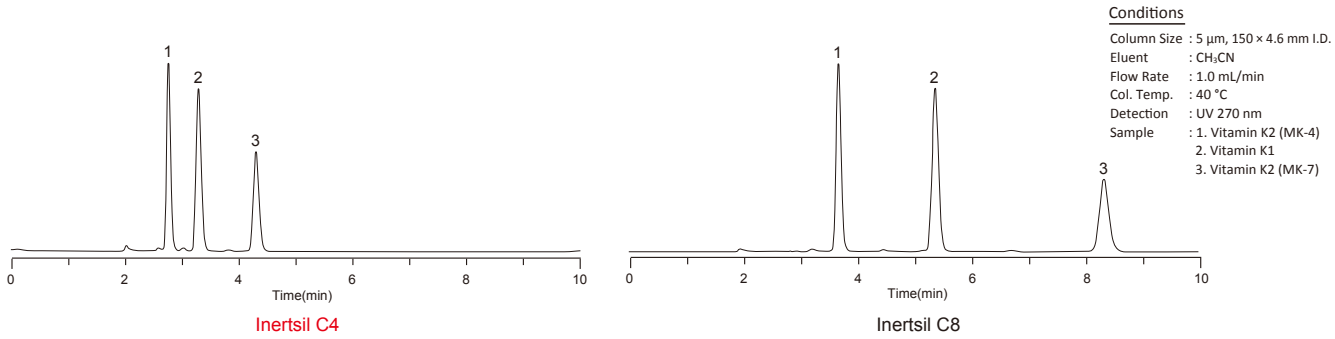
Inertsil C4

- **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
- **Functional Group** : Butyl
- **End-capping** : Yes
- **Carbon Loading** : 7.5 %
- **USP Code** : L26
- **pH Range** : 2 - 7.5



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

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



Analytical Columns

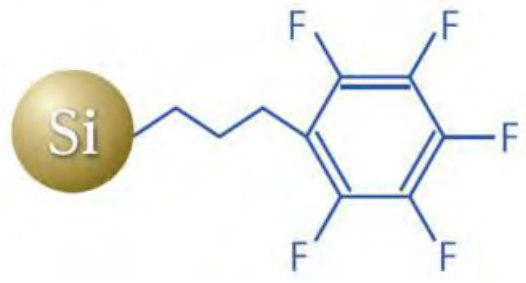
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-01421	5020-01422	5020-01423	5020-01424
	250	5020-01425	5020-01426	5020-01427	5020-01428

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

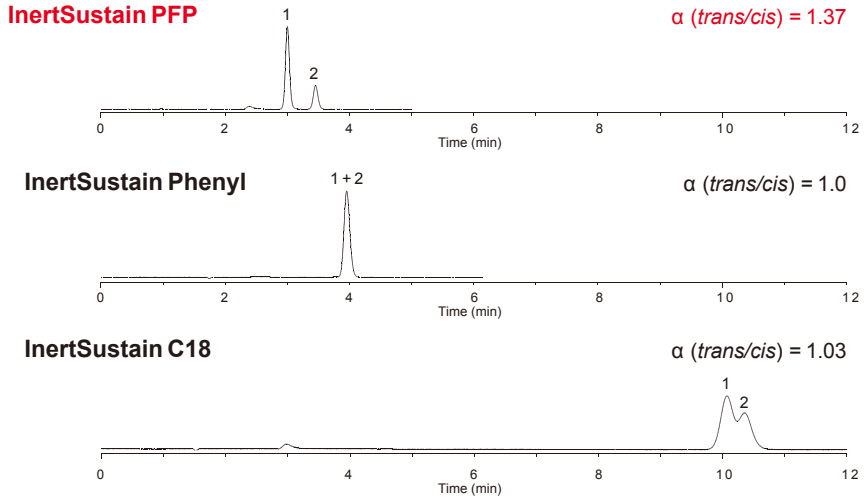
InertSustain PFP

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 m2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85mL/g**
- **Functional Group** : **Pentafluorophenyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **10%**
- **USP Code** : **L43**
- **pH Range** : **2 - 7.5**



Inertsil PFP is a column with a pentafluorophenyl group that is chemically bonded to silica gel.
Since various interactions such as hydrophobic interaction, dipole interaction, and pi-interaction interaction are involved, the column exhibits a unique separation behavior that is different from ODS and phenyl columns. It also provides an excellent three-dimensional structure recognition performance.
Another feature is the extremely strong retention performance against highly polar or hydrophilic basic compounds.
In addition, the advanced end-capping treatment allows for the sharp elution of compounds that are prone to adsorption.

Figure 1 : Comparison of Selectivity Between Reversed Phase Columns



Conditions

Eluent	: A) CH_3OH
	B) H_2O
	A/B = 80/20, v/v
Column Size	: 5 µm,150 × 4.6 mm I.D.
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 210 nm
Sample	: 1. *cis*-Stilbene
	2. *trans*-Stilbene

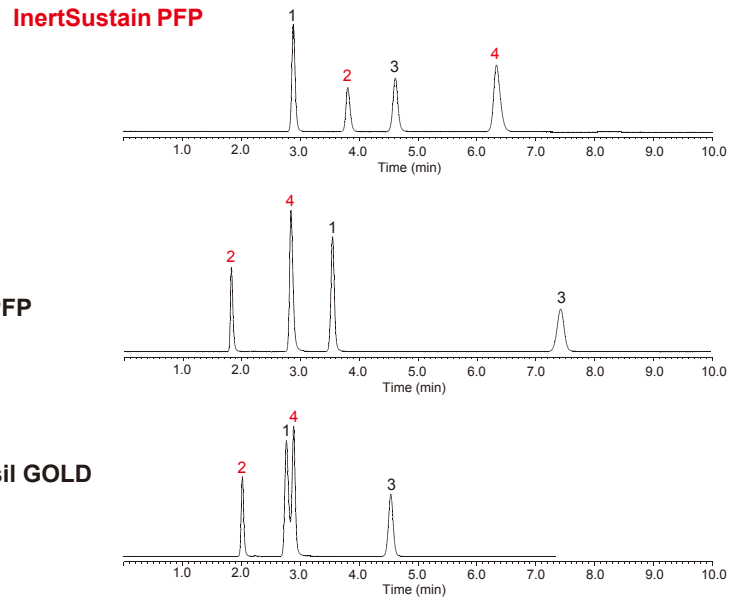
*α (*trans/cis*) : The ratio of retention factor of *cis*-Stilbene and *trans*-Stilbene



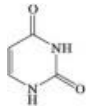
1. *cis*-Stilbene (*cis*)

2. *trans*-Stilbene (*trans*)

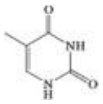
Figure 2: Comparison of High Polarity Compounds Analysis



Middle Compound Compound

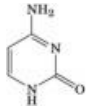


1 : Uracil

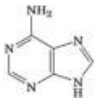


3 : Thymine

Basic Compound



2 : Cytosine



4 : Adenine

Conditions

Column	: 3 µm, 150 × 2.1 mm I.D.
Eluent	: 0.1 % HCOOH in H_2O
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	30	5020-87917	5020-87923	5020-87929
	50	5020-87918	5020-87924	5020-87930
	75	5020-87919	5020-87925	5020-87931
	100	5020-87920	5020-87926	5020-87932
	150	5020-87921	5020-87927	5020-87933
	250	5020-87922	5020-87928	5020-87934

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	30	5020-87868	5020-87874		
	50	5020-87869	5020-87875		
	75	5020-87870	5020-87876		
	100	5020-87871	5020-87877		
	150	5020-87872	5020-87878		
	250	5020-87873	5020-87879		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87828	5020-87836	5020-87844	5020-87852
	50	5020-87829	5020-87837	5020-87845	5020-87853
	75	5020-87830	5020-87838	5020-87846	5020-87854
	100	5020-87831	5020-87839	5020-87847	5020-87855
	125	5020-87832	5020-87840	5020-87848	5020-87856
	150	5020-87833	5020-87841	5020-87849	5020-87857
	250	5020-87834	5020-87842	5020-87850	5020-87858
	Length \ I.D. (mm)	1.0	1.5		
	30	5020-87741	5020-87747		
	50	5020-87742	5020-87748		
	75	5020-87743	5020-87749		
	100	5020-87744	5020-87750		
	150	5020-87745	5020-87751		
	250	5020-87746	5020-87752		
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-87701	5020-87709	5020-87717	5020-87725
	50	5020-87702	5020-87710	5020-87718	5020-87726
	75	5020-87703	5020-87711	5020-87719	5020-87727
	100	5020-87704	5020-87712	5020-87720	5020-87728
	125	5020-87705	5020-87713	5020-87721	5020-87729
	150	5020-87706	5020-87714	5020-87722	5020-87730
	250	5020-87707	5020-87715	5020-87723	5020-87731

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-87907	5020-87807	5020-87908	5020-87808
1.5, 2.1		1.5	5020-87909	5020-87809	5020-87910	5020-87810
2.1, 3.0		3.0	5020-87905	5020-87805	5020-87906	5020-87806
4.0, 4.6		4.0	5020-87903	5020-87803	5020-87904	5020-87804
2.1, 3.0	20	3.0	5020-87913	5020-87813	5020-87914	5020-87814
4.0, 4.6		4.0	5020-87911	5020-87811	5020-87912	5020-87812
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

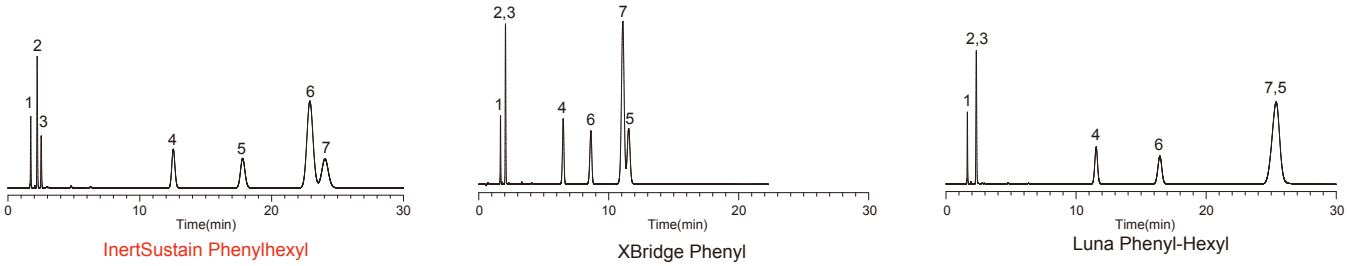
InertSustain Phenylhexyl

- **Silica** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Phenylhexyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **9.0 %**
- **USP Code** : **L11**
- **pH Range** : **1 - 10**



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

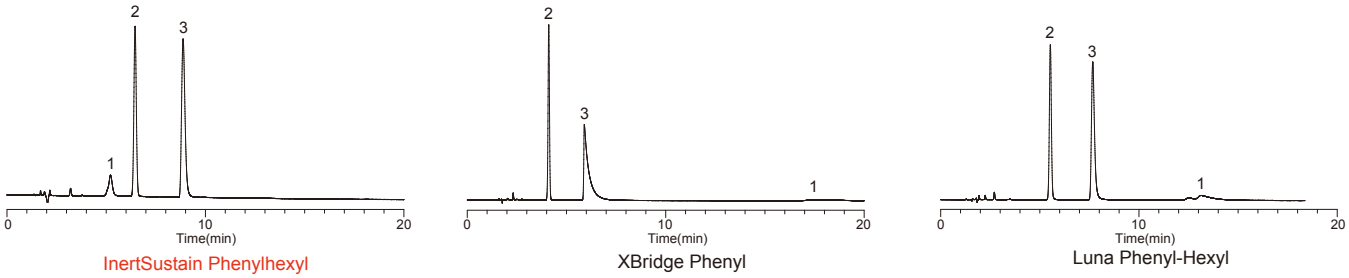
Figure 1 : Comparison of Selectivity



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	Sample	: 1. Uracil
Eluent	: A) CH_3OH		2. Caffeine
	B) H_2O		3. Phenol
	A/B = 70/30, v/v		4. Butylbenzene
Flow Rate	: 1.0 mL / min		5. *o*-Terphenyl
Col. Temp.	: 40 °C		6. Amylbenzene
Detection	: UV 254 nm		7. Triphenylene

Figure 2 : Analysis of Acidic Compounds



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	Sample	: 1. Brilliant Blue FCF
Eluent	: A) CH_3CN		2. Phenol
	B) 0.1% H_3PO_4		3. Salicylic acid
	A/B = 25/75, v/v		
Flow Rate	: 1.0 mL/min		
Col. Temp.	: 40 °C		
Detection	: UV 254 nm		

Analytical Columns

	Length \ I.D.(mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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

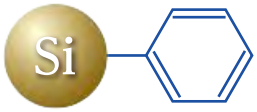
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	30	5020-89160	5020-89166		
	50	5020-89161	5020-89167		
	75	5020-89162	5020-89168		
	100	5020-89163	5020-89169		
	150	5020-89164	5020-89170		
	250	5020-89165	5020-89171		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89124	5020-89131	5020-89138	5020-89145
	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

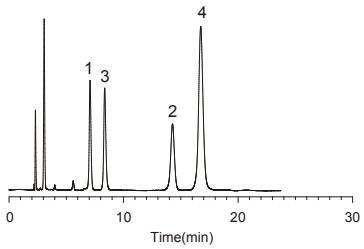
InertSustain Phenyl

- **Silica** : **High Purity ES Silica Gel**
- **Particle Size** : **2 µm, 3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Phenyl**
- **End-capping** : **None**
- **Carbon Loading** : **10 %**
- **USP Code** : **L11**
- **pH Range** : **2 - 7.5**

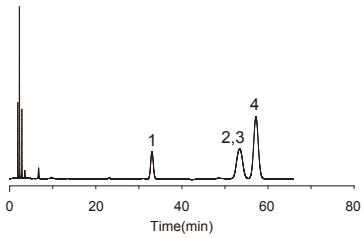


InertSustain Phenyl is a direct phenyl group bond type with a phenyl group that is bonded directly to silica gel. It provides significantly different separation compared with ODS columns and better separation performance. it recognizes the differences among the electronic states of aromatic compounds more than a general phenyl column (alkyl phenyl group bonded column).
Phenyl group is chemically modified at a high density, and it provides the best pi-pi interaction among phenyl columns and exhibits unprecedented separation performance.

Figure 1 : Comparison of Selectivity



InertSustain Phenyl



InertSustain C18

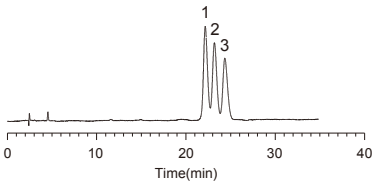
Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) H_2O
A/B = 70/30, v/v
Flow Rate : 0.8 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm

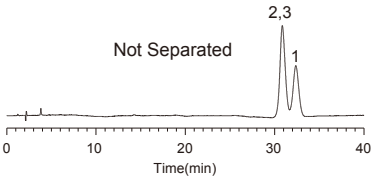


1. Butylbenzene
2. *o* -Terphenyl (Non - Planar Structure)
3. Amylbenzene
4. Triphenylene (Planar Structure)

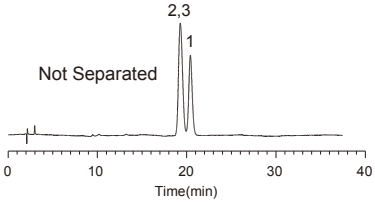
Figure 2 : Analysis of Structural Isomers (Positional Isomers of Cresol)



InertSustain Phenyl



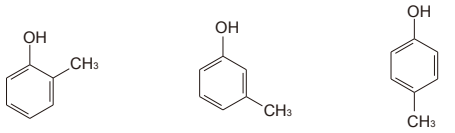
Ascentis Phenyl



XBridge Phenyl

Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) H_2O
A/B = 20/80, v/v
Col. Temp. : 40 °C
Flow Rate : 0.8 mL/min
Detection : UV 254 nm



1. *o*-Cresol
2. *m*-Cresol
3. *p*-Cresol

Analytical Columns

	Length \ I.D.(mm)	2.1	3.0		
Particle Size: 2 µm	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		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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	

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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

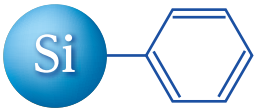
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	30	5020-16339	5020-16345		
	50	5020-16340	5020-16346		
	75	5020-16341	5020-16347		
	100	5020-16342	5020-16348		
	150	5020-16343	5020-16349		
	250	5020-16344	5020-16350		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16302	5020-16309	5020-16316	5020-16323
	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

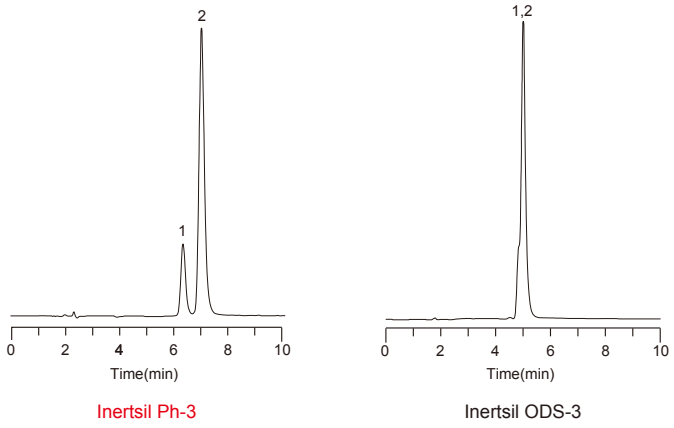
Inertsil Ph-3

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



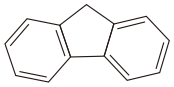
Like InertSustain Phenyl, Inertsil Ph-3 contains phenyl groups that directly bond to the silica gel, providing pure reverse-phase characteristics that are critical for resolving highly polar compounds such as acidic and basic pharmaceuticals. The near-perfect phenyl phase coverage on this material results in symmetric, narrow peaks of even the most polar compounds when eluted with aqueous acetonitrile, methanol, and other simple eluents.

Figure 1 : Comparison of Selectivity with Inertsil ODS-3

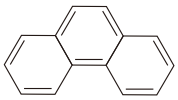


Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) H_2O
A/B = 90/10, v/v (ODS-3)
A/B = 70/30, v/v (Ph-3)
Flow Rate : 1.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm

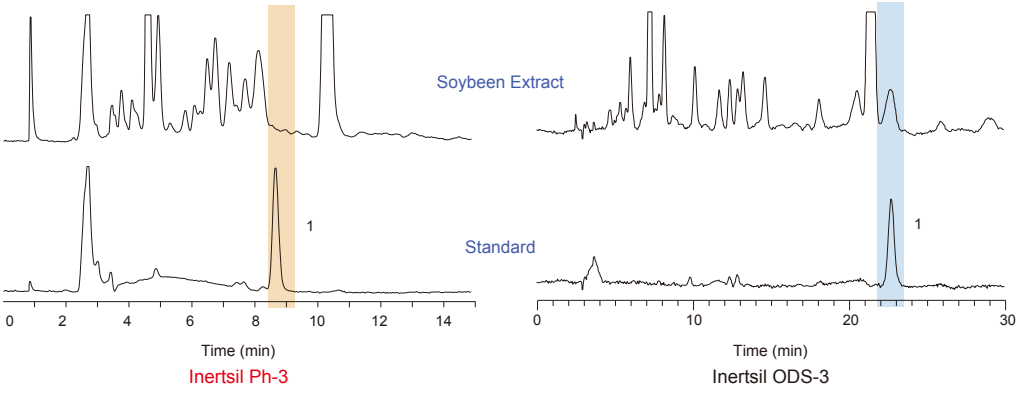


1. Fluorene



2. Phenanthrene

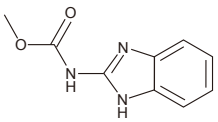
Figure 2 : Application on Pesticide Detection Test



Conditions

Column : Inertsil Ph-3
(5 µm, 250 × 4.6 mm I.D.)
Inertsil ODS-3
(5 µm, 150 × 4.6 mm I.D.)
Eluent : A) CH_3CN
B) H_2O
A/B = 25/75, v/v
Flow Rate : 0.7 mL/min
Col. Temp. : 40 °C
Detection : FL Ex 285 nm Em 315 nm

Sample :



1. Carbendazim

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	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		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HP Series Particle Size: 3 µm 50 MPa (500 bar)	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	

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	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
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

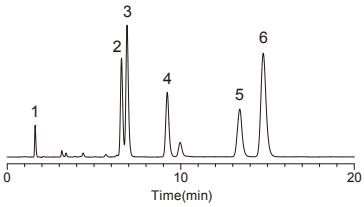
Inertsil Ph

- **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**
- **Functional Group** : **Phenethyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **10 %**
- **USP Code** : **L11**
- **pH Range** : **2 - 7**

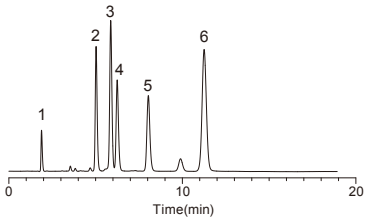


Inertsil Ph has phenethyl groups bonded to silica gel which offers weak pi-pi interactions. As it is modified with phenethyl groups, hydrophobic interactions between alkyl chain and analytes play an important role in separation as well as π-π interactions. To change the selectivity or elution pattern 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.

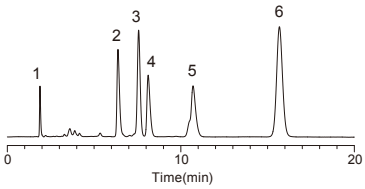
Figure 1 : Comparison of Selectivity



Inertsil Ph



Inertsil Ph-3

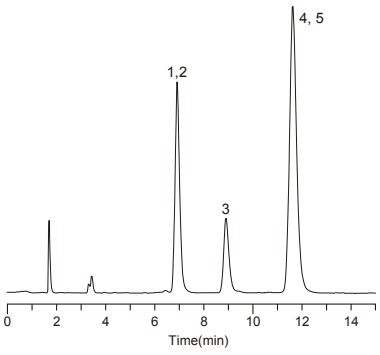


InertSustain Phenyl

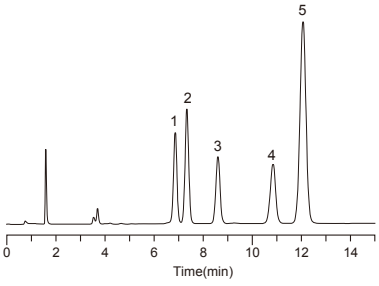
Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	Sample :
Eluent	: A) CH_3OH	1. Uracil
	B) H_2O	2. Ethylbenzene
	A/B = 60/40, v/v	3. Naphthalene
Flow Rate	: 1.0 mL/min	4. Propylbenzene
Col. Temp.	: 40 °C	5. Butylbenzene
Detection	: UV 254 nm	6. Anthracene

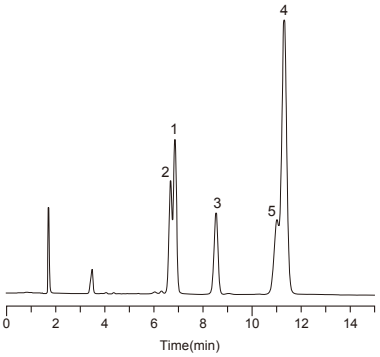
Figure 2 : Comparison of Selectivity



Inertsil Ph



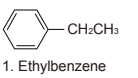
Inertsil Ph-3



other brand's Phenyl Column

Conditions

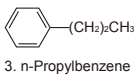
Column Size	: 5 µm, 150 × 4.6 mm I.D.
Eluent	: A) CH_3CN
	B) H_2O
	A/B = 50/50, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm



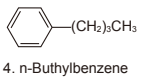
1. Ethylbenzene



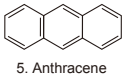
2. Naphthalene



3. n-Propylbenzene



4. n-Buthylbenzene



5. Anthracene

Analytical Columns

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

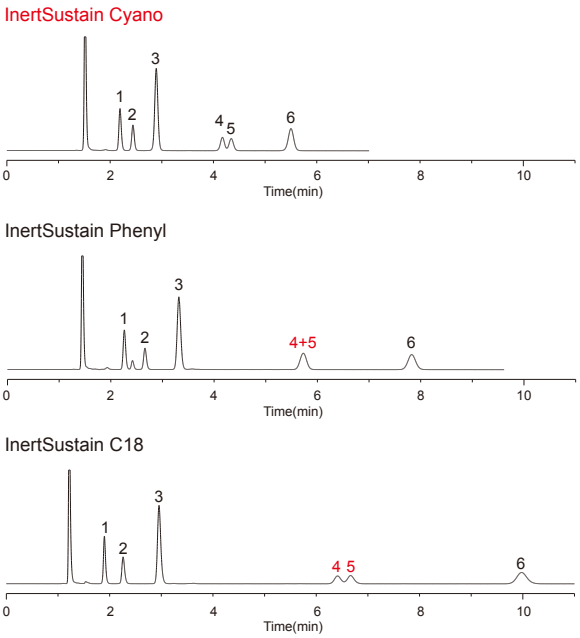
InertSustain Cyano

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85mL/g**
- **Functional Group** : **Cyanopropyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **8%**
- **USP Code** : **L10**
- **pH Range** : **2 - 7.5**



The stability and reproducibility of the marketed Cyano phase is generally poor. Low batch-to-batch or lot-to-lot reproducibility are common problems in laboratories.The InertSustain Cyano columns were developed to resolve these problems. Fabricated using the latest available LC column technology, they are extremely inert, stable, and reproducible.
The InertSustain Cyano columns are highly recommended for all pharmacopeia methods requiring a Cyano phase (Ex: USP L10)

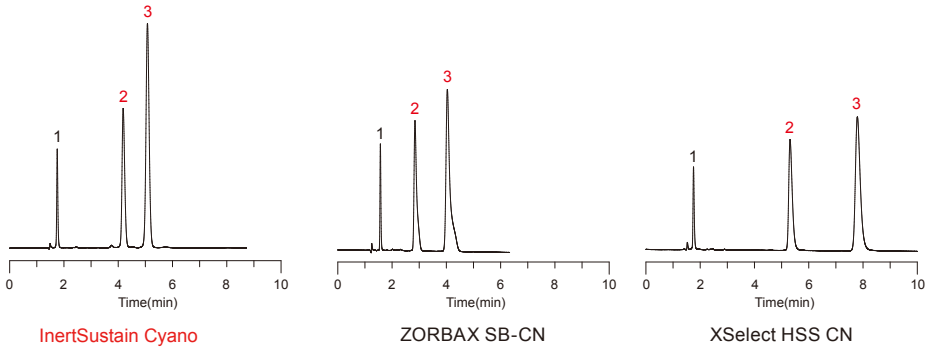
Figure 1 : Comparison of Selectivity



Conditions

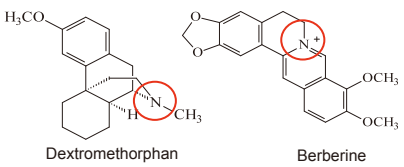
Column Size : 5 µm,150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) 0.1 % H_3PO_4
A/B = 25/75, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Sample : 1. 4-Hydroxybenzamide
2. Hydroquinone
3. 4-Hydoroxybenzoic acid
4. Phenol
5. 4-Hydoroxybenzonitoril
6. *p*-Nitrophenol

Figure 2 : Comparison of Basic Compounds Analysis



Conditions

Column Size : 5 µm,150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) 0.1% H_3PO_4
A/B = 25/75, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 230 nm
Sample : 1. Uracil
2. Dextromethorphan
3. Berberine



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size: 3 µm 50 MPa (500 bar)	30	5020-89459	5020-89465	5020-89471
	50	5020-89460	5020-89466	5020-89472
	75	5020-89461	5020-89467	5020-89473
	100	5020-89462	5020-89468	5020-89474
	150	5020-89463	5020-89469	5020-89475
	250	5020-89464	5020-89470	5020-89476

	Length \ I.D. (mm)	1.0	1.5
Particle Size: 3 µm	30	5020-89410	5020-89416
	50	5020-89411	5020-89417
	75	5020-89412	5020-89418
	100	5020-89413	5020-89419
	150	5020-89414	5020-89420
	250	5020-89415	5020-89421

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89374	5020-89381	5020-89388	5020-89395
	50	5020-89375	5020-89382	5020-89389	5020-89396
	75	5020-89376	5020-89383	5020-89390	5020-89397
	100	5020-89377	5020-89384	5020-89391	5020-89398
	150	5020-89378	5020-89385	5020-89392	5020-89399
	250	5020-89379	5020-89386	5020-89393	5020-89400

	Length \ I.D. (mm)	1.0	1.5
Particle Size: 5 µm	30	5020-89288	5020-89294
	50	5020-89289	5020-89295
	75	5020-89290	5020-89296
	100	5020-89291	5020-89297
	150	5020-89292	5020-89298
	250	5020-89293	5020-89299

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-89251	5020-89258	5020-89265	5020-89272
	50	5020-89252	5020-89259	5020-89266	5020-89273
	75	5020-89253	5020-89260	5020-89267	5020-89274
	100	5020-89254	5020-89261	5020-89268	5020-89275
	150	5020-89255	5020-89262	5020-89269	5020-89276
	250	5020-89256	5020-89263	5020-89270	5020-89277

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-89449	5020-89355	5020-89450	5020-89356
1.5, 2.1		1.5	5020-89451	5020-89357	5020-89452	5020-89358
2.1, 3.0		3.0	5020-89447	5020-89353	5020-89448	5020-89354
4.0, 4.6		4.0	5020-89445	5020-89351	5020-89446	5020-89352
2.1, 3.0	20	3.0	5020-89455	5020-89361	5020-89456	5020-89362
4.0, 4.6		4.0	5020-89453	5020-89359	5020-89454	5020-89360
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

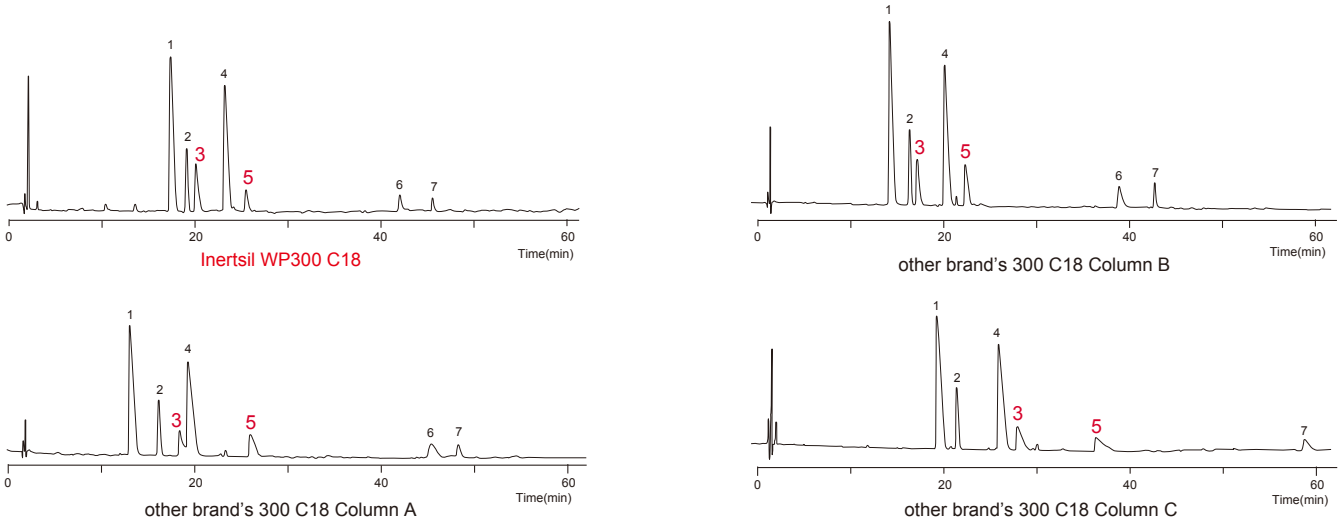
Inertsil WP300 C18

- **Silica** : **WP300 Series High Purity Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **150 m^2/g**
- **Pore Size** : **300 Å (30 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **9 %**
- **USP Code** : **L1**
- **pH Range** : **2 - 7.5**



Inertsil WP300 C18 (wide pore size of 300 Å) brings the same legendary performance of Inertsil's narrow-pore HPLC products to the 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



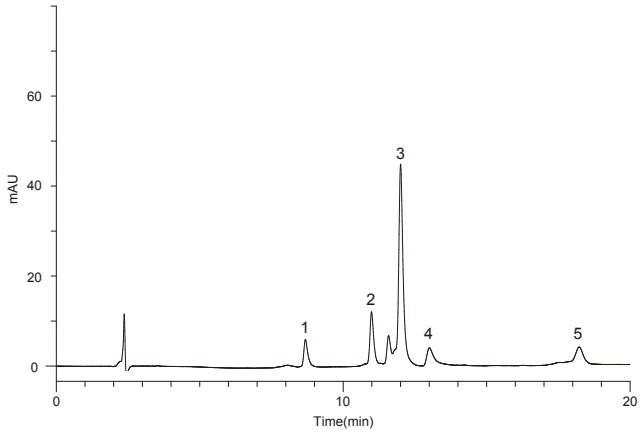
Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) 0.05 % HCOOH in (CH_3CN/H_2O = 90/10, v/v)
B) 0.05 % HCOOH in H_2O
A/B = 10/90 – 60 min – 40/60, v/v

Flow Rate : 2.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm

Sample : 1. Methionine Enkephalin (Tyr-Gly-Gly-Phe-Met, MW 574)
2. Oxytocin (Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-Gly-NH2, MW 1,007)
3. Angiotensin Ⅱ (Asp-Arg-Val-Tyr-Ile-His-Pro-Phe, MW 1,032)
4. Leucin Enkephalin (Tyr-Gly-Gly-Phe-Leu, MW 556)
5. Angiotensin Ⅰ (Asp-Arg-Val-Tyr-Ile-His-Pro-Phe-His-Leu, MW 1,297)
6. Insulin (MW 6,000)
7. Insulin Chain B (MW 3,496)

Figure 2 : Analysis of Proteins



Conditions

Column : Inertsil WP300 C18 (5 µm, 150 × 3.0 mm I.D.)
Eluent : A) 0.1 % TFA in CH_3CN
B) 0.1 % TFA in H_2O
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
Sample : 1. Ribonuclease B
2. Cytochrome C
3. Lysozyme
4. BSA
5. Ovalbumin

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	4.6
	33	5020-05811	5020-05821	5020-05831	5020-05841
	50	5020-05812	5020-05822	5020-05832	5020-05842
	75	5020-05813	5020-05823	5020-05833	5020-05843
	100	5020-05814	5020-05824	5020-05834	5020-05844
	150	5020-05815	5020-05825	5020-05835	5020-05845
	250	5020-05816	5020-05826	5020-05836	5020-05846

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

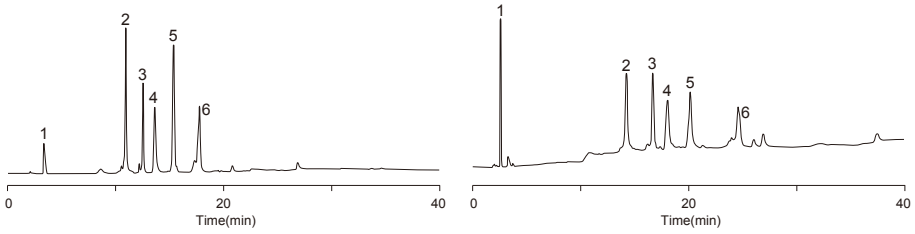
Inertsil WP300 C8

- **Silica** : **WP300 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **150 m^2/g**
- **Pore Size** : **300 Å (30 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Octcyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **4 %**
- **USP Code** : **L7**
- **pH Range** : **2 - 7.5**



Inertsil WP300 C8 (wide pore size of 300 Å) brings 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



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	
Eluent	: A) CH_3CN/0.05 % TFA in H_2O = 80/20, v/v	
	B) CH_3CN/0.05 % TFA in H_2O = 10/90, v/v	
	A/B = 0/100 – 30 min – 100/0 – 10 min hold, v/v	
Flow Rate	: 1.0 mL/min	
Col. Temp.	: 30 °C	
Detection	: UV 280 nm	
Sample	: 1. DL-Phenylalanine	(MW 165)
	2. Cytochrome C	(MW 13,000)
	3. Lysozyme	(MW 14,000)
	4. BSA	(MW 66,000)
	5. α-Chymotrypsinogen A	(MW 25,600)
	6. Ovalbumin	(MW 45,000)

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

Inertsil WP300 C4

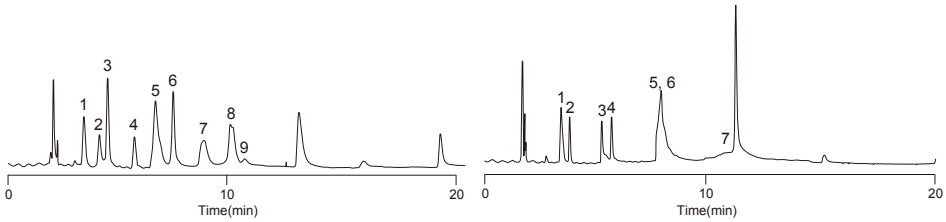
- **Silica** : **WP300 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **150 m^2/g**
- **Pore Size** : **300 Å (30 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Butyl**
- **End-capping** : **None**
- **Carbon Loading** : **3 %**
- **USP Code**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



PG : Polar Group

Inertsil WP300 C4 is a butyl-group bonded phase utilizing silica gel with wide pores (300 Å). An optimal polar group embedded between the silica surface and butyl group reduces the adsorption of basic compounds and fat-soluble proteins. Inertsil WP300 C4 is recommended for analyzing large, highly fat-soluble proteins and peptides.

Figure 1 : Comparison of Performance



Inertsil WP300 C4

Commercially Available 300 C4 Column A

Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) 0.2 % HCOOH in (CH_3CN/H_2O = 90/10, v/v)
B) 0.2 % HCOOH in H_2O
A/B = 20/80 – 20 min – 80/20, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 30 °C
Detection : UV 280 nm
Sample : 1. Neurotensin (MW 1,673)
2. Leucin Enkephalin (MW 556)
3. Cytochrome C (MW 12,000)
4. Insulin (MW 6,000)
5. BSA (MW 66,000)
6. Myoglobin (MW 17,000)
7. Creatine amidinohydrolase (MW 43,000)
8. Ovalbumin (MW 45,000)
9. Creatinine amidohydrolase (MW 170,000)

Analytical Columns

	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		
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05861	5020-05871	5020-05881	5020-05891
	50	5020-05862	5020-05872	5020-05882	5020-05892
	75	5020-05863	5020-05873	5020-05883	5020-05893
	100	5020-05864	5020-05874	5020-05884	5020-05894
	150	5020-05865	5020-05875	5020-05885	5020-05895
	250	5020-05866	5020-05876	5020-05886	5020-05896

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

HILIC Columns

- About HILIC Columns 058
- InertSustain Amide 060
- Inertsil HILIC 062
- InertSustain NH2 064
- Inertsil NH2 066

About HILIC Columns

As an alternative to reversed-phase chromatography, Hydrophilic Interaction Chromatography (HILIC) was developed for analyses of highly polar compounds. An Inertsil HILIC column chemically bonds to the diol group, providing excellent peak shape for neutral and basic compounds. The retention in HILIC mode usually increases with increasing concentration of an organic compound. Moreover, the stability is improved by adding a basic solvent (such as ammonium acetate) to the eluent.

Figure 1 : Separation Mode from Reversed Phase to HILIC

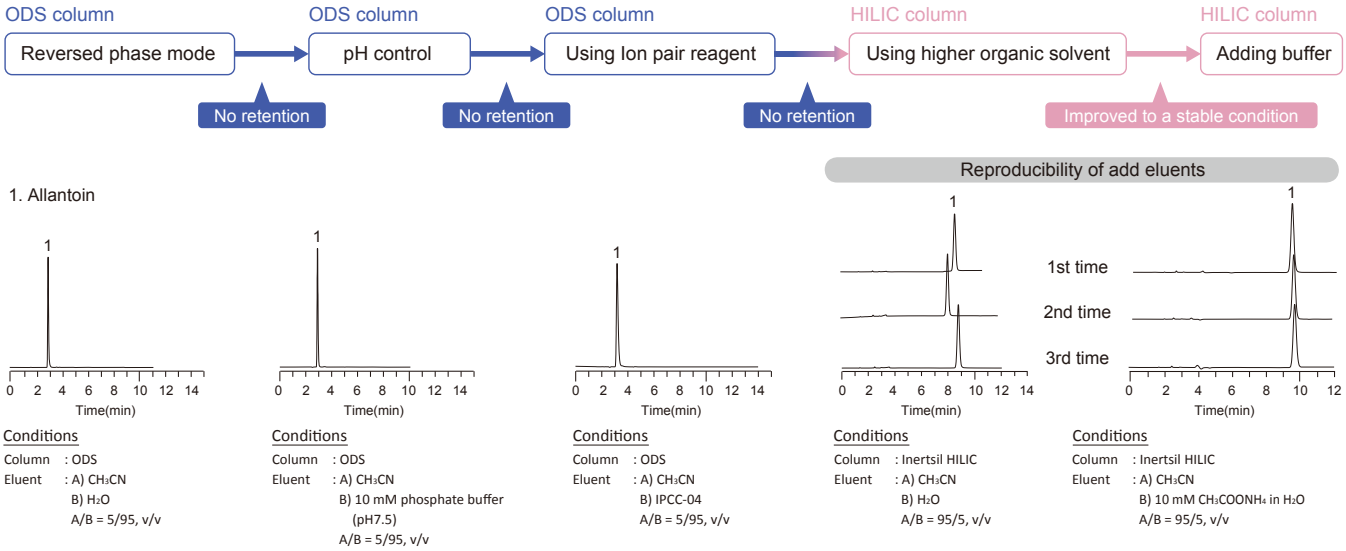
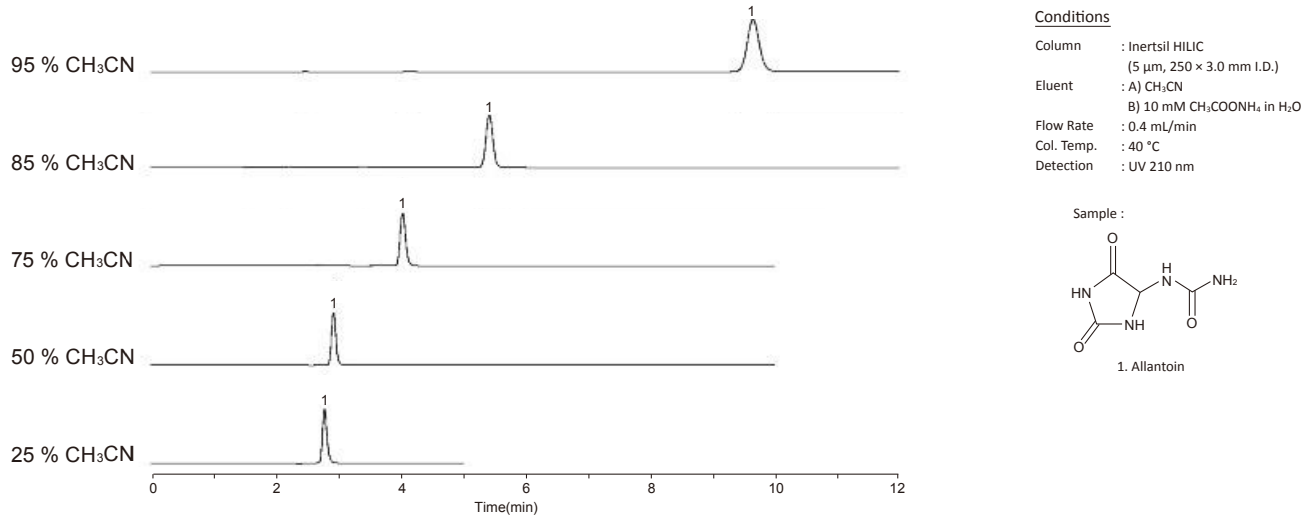


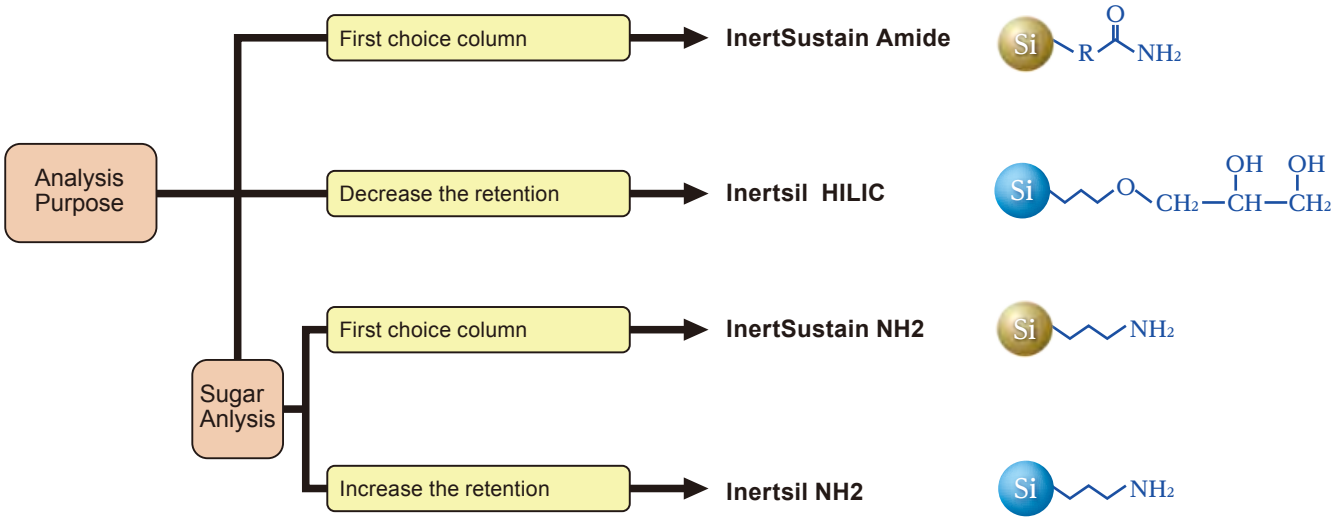
Figure 2 : Correlation between Retention Time and the Concentration of CH_3CN in Mobile Phase



HILIC Column Specification

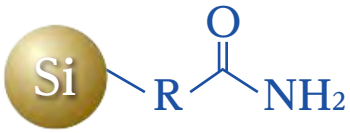
Columns	Features	Particle Size (μm)	Pore Size (nm)	Surface Area (m^2/g)	Carbon Loading (%)	Recommended pH range
InertSustain Amide	Frist choice column for HILIC mode.	1.9, 3, 5	10	350	15	2 - 8.5
Inertsil HILIC	Effective when the overall retention is to be reduced or when the separation pattern is to be changed.	3, 5	10	450	20	2 - 7.5
InertSustain NH2	First choice column for sugar analysis.	3, 5	10	350	7	2 - 7.5
Inertsil NH2	Effective for intensifying retention in sugar analysis.	3, 5	10	450	8	2 - 7.5

HILIC Column Selection

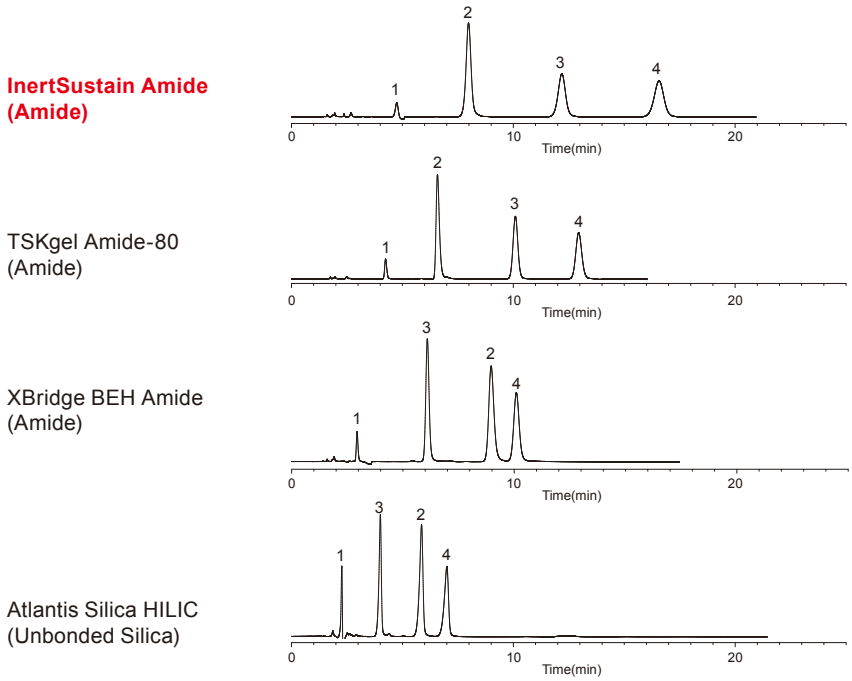


InertSustain Amide

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Carbamoyl**
- **End-capping** : **None**
- **Carbon Loading** : **15 %**
- **USP Code** : **L68**
- **pH Range** : **2 - 8.5**



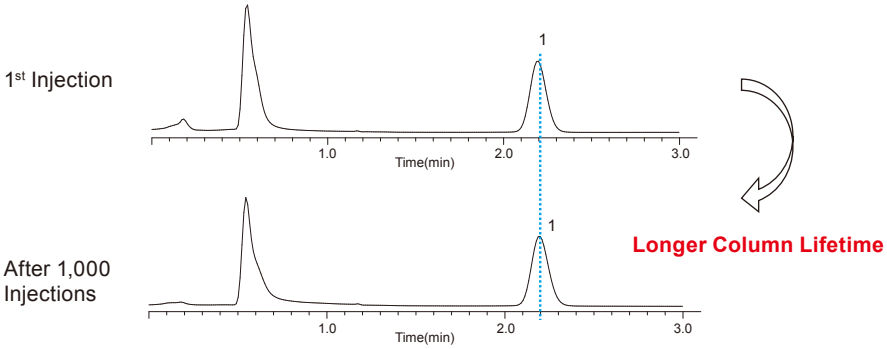
InertSustain Amide is a HILIC column that enhances the retention of extremely polar compounds.
This column offers the strongest retentivity among the marketed amide columns through bonding of carbamoyl groups. It achieves superior stability and durability even for water-rich mobile phases.
HILIC phases are particularly useful for compounds that are weakly retained by reversed phase columns such as Melamine and Cyanuric Acid.
As shown below, InertSustain Amide provides stronger retention for such analytes compared to other HILIC brand columns.



Conditions

Column	: 5 µm, 150 × 2.1 mm I.D
Eluent	: A) CH_3CN
	B) 10 mM $HCOONH_4$ in H_2O
	A/B = 90/10, v/v
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 °C
Detection	: UV 215 nm
Sample	: 1. Cyanuric Acid
	2. Melamine
	3. Ammelide
	4. Ammeline

The use of metaphosphoric acid aqueous solution as a diluent solvent is a common technique to prevent the decomposition of sample in Vitamin C (ascorbic acid) analysis. A silica-base amide type columns often show short column lifetime due to the usage of strongly acidic diluent solvent in the analysis. As proven below, InertSustain Amide offer longer column lifetime even under such harsh analytical condition.



Conditions

Column	: InertSustain Amide
	(5 µm, 150 × 3.0 mm I.D)
Eluent	: A) CH_3CN
	B) 0.1% H_3PO_4 in H_2O
	A/B = 87/13, v/v
Flow Rate	: 0.8 mL / min
Col. Temp.	: 40 °C
Detection	: UV 243 nm
Injection Vol.	: 2 µL
Sample	: 1. Ascorbic aciid
Diluent	: 2 % metaphosphoric acid aqueous solution

Analytical Columns

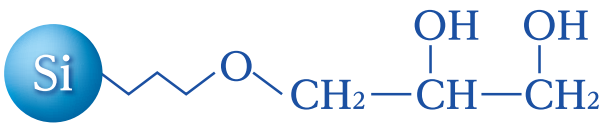
Particle Size: 1.9 µm	Length \ I.D. (mm)	2.1	3.0		
	30	5020-88815	5020-88820		
	50	5020-88816	5020-88821		
	75	5020-88817	5020-88822		
	100	5020-88818	5020-88823		
	150	5020-88819	5020-88824		
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88766	5020-88772		
	50	5020-88767	5020-88773		
	75	5020-88768	5020-88774		
	100	5020-88769	5020-88775		
	150	5020-88770	5020-88776		
	250	5020-88771	5020-88777		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88726	5020-88734	5020-88742	5020-88750
	50	5020-88727	5020-88735	5020-88743	5020-88751
	75	5020-88728	5020-88736	5020-88744	5020-88752
	100	5020-88729	5020-88737	5020-88745	5020-88753
	125	5020-88730	5020-88738	5020-88746	5020-88754
	150	5020-88731	5020-88739	5020-88747	5020-88755
	250	5020-88732	5020-88740	5020-88748	5020-88756
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-88642	5020-88648		
	50	5020-88643	5020-88649		
	75	5020-88644	5020-88650		
	100	5020-88645	5020-88651		
	150	5020-88646	5020-88652		
	250	5020-88647	5020-88653		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-88602	5020-88610	5020-88618	5020-88626
	50	5020-88603	5020-88611	5020-88619	5020-88627
	75	5020-88604	5020-88612	5020-88620	5020-88628
	100	5020-88605	5020-88613	5020-88621	5020-88629
	125	5020-88606	5020-88614	5020-88622	5020-88630
	150	5020-88607	5020-88615	5020-88623	5020-88631
	250	5020-88608	5020-88616	5020-88624	5020-88632

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-88805	5020-88709	5020-88806	5020-88710
1.5, 2.1		1.5	5020-88807	5020-88711	5020-88808	5020-88712
2.1, 3.0		3.0	5020-88803	5020-88707	5020-88804	5020-88708
4.0, 4.6		4.0	5020-88801	5020-88705	5020-88802	5020-88706
2.1, 3.0	20	3.0	5020-88811	5020-88715	5020-88812	5020-88716
4.0, 4.6		4.0	5020-88809	5020-88713	5020-88810	5020-88714
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

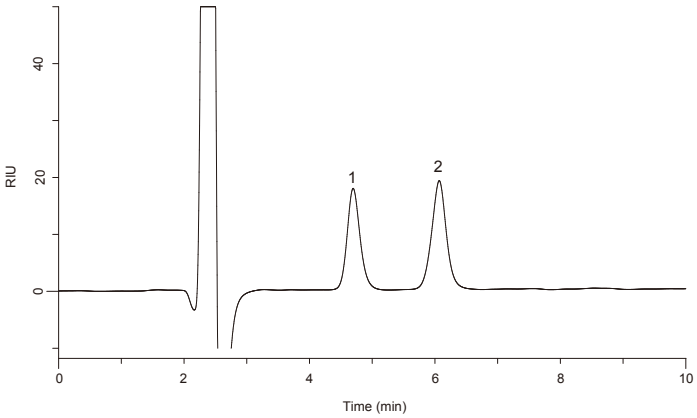
Inertsil HILIC

- **Base Material** : **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**
- **Functional Group** : **Diol (Dihydroxypropyl Groups)**
- **End-capping** : **None**
- **Carbon Loading** : **20 %**
- **USP Code** : **L20**
- **pH Range** : **2 - 7.5**



HILIC was developed as an alternative to reversed-phase chromatography for analyzing highly polar compounds (Figure 1). An Inertsil HILIC column is chemically bonded with diol groups, providing excellent peak shapes for neutral and basic compounds. In HILIC mode, the retention ability generally increases with increasing organic solvent concentration (Figure 2). Moreover, the stability of the analysis can be improved by adding a basic solvent such as ammonium acetate to the eluent.

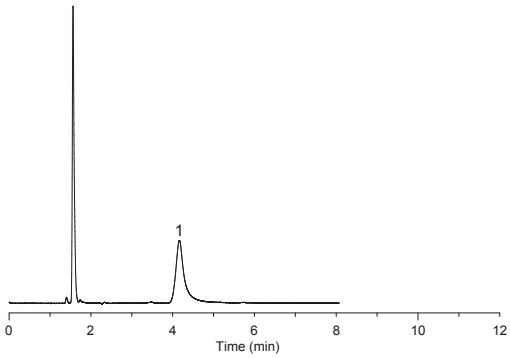
Figure 1 : Analysis of Taurine and Inositol



Conditions

Column	: 5µm, 150 × 3.0 mm I.D.
Eluent	: A) CH_3CN
	B) H_2O
	A/B = 80/20 ,v/v
Flow Rate	: 0.4 mL/min
Col. Temp.	: 40 °C
Detection	: RI (35 °C, positive)
Injection Vol.	: 20 µL
Sample	: 1.Taurine
	2.Inositol
	(500 mg/L each)

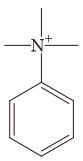
Figure 2 : Analysis of Basic Compound



Conditions

Column	: 5 µm, 150 × 2.1 mm I.D.
Eluent	: A) CH_3CN
	B) 10 mM $HCOONH_4$ im H_2O
	A/B = 90/10, v/v
Flow Rate	: 0.2 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

Sample :



1. Trimethylphenylammonium

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

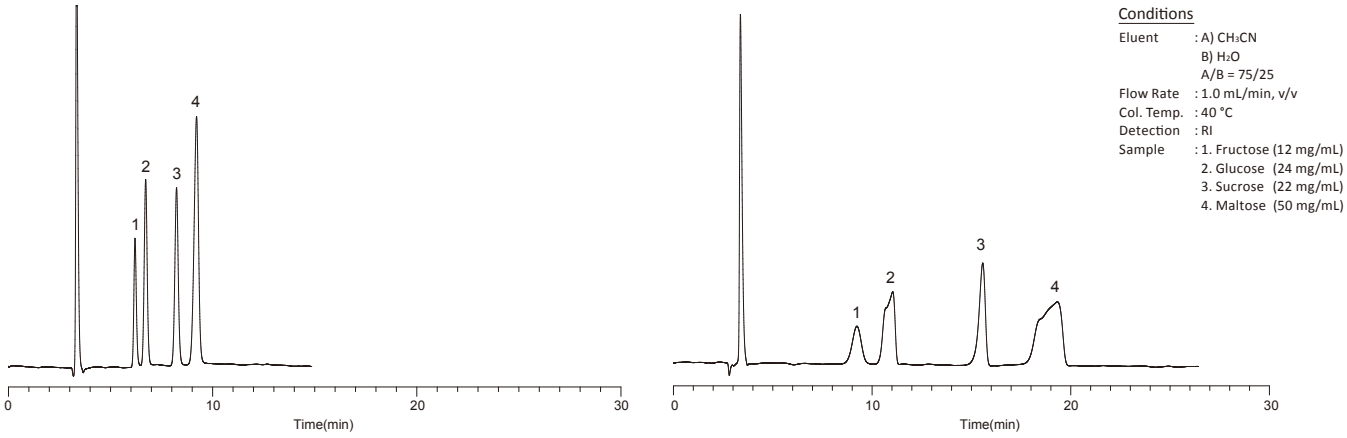
InertSustain NH2

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Aminopropyl**
- **End-capping** : **None**
- **Carbon Loading** : **7 %**
- **USP Code** : **L8**
- **pH Range** : **2 - 7.5**



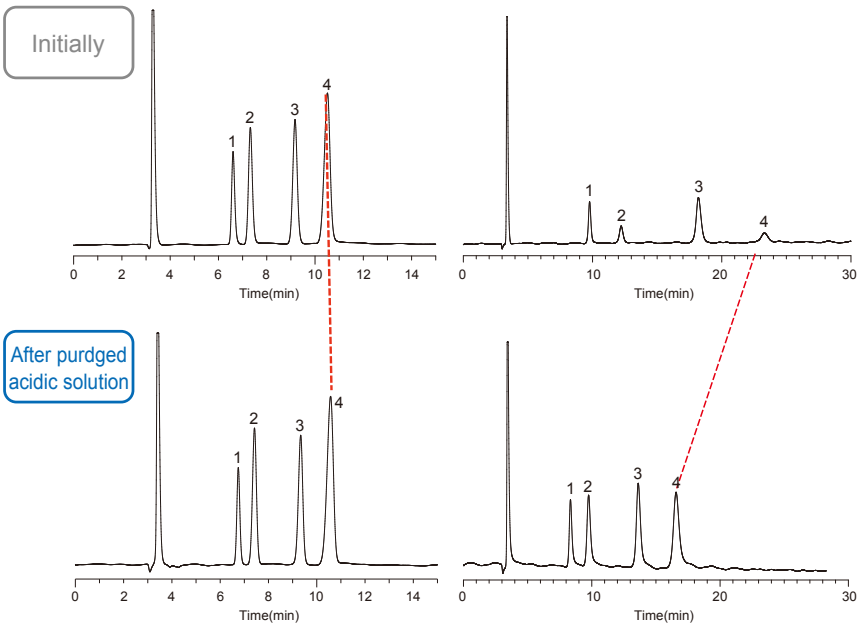
InertSustain NH2 shows far superior stability compared to other brand available aminopropyl columns, as our newly developed “Evolved Surface Silica” is chemically bonded with aminopropyl group. Generally, aminopropyl columns are used for applications that are hard to be separated in a reversed phase 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



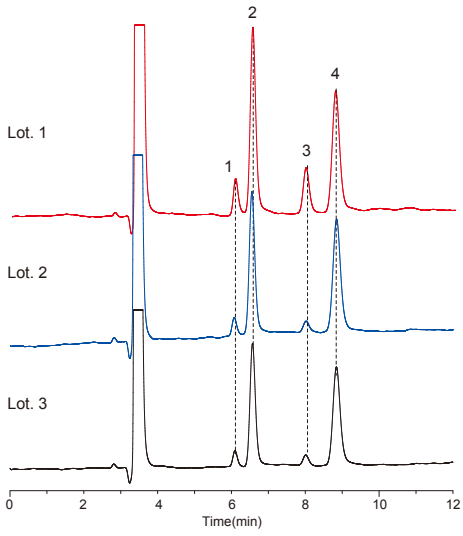
InertSustain NH2 | other brand Amide Column

Figure 2 : Retention Change after Purdged Acidic Solution



InertSustain NH2 | Other brand NH_2 columns

Figure 3 : Reliable Reproducibility



Conditions

Column : InertSustain NH2 (5 µm, 250 × 4.6 mm I.D.)
Eluent : A) CH_3CN B) H_2O A/B = 75/25, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : RI

Sample :
1. Fructose
2. Glucose
3. Sucrose
4. Maltose

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

InertSustain NH2 with 100% CH_3CN

Recommended using in HILIC mode. (Normal shipping containment solvents are hexane/ethanol based.)

Particle Size	Length \ I.D. (mm)	4.0	4.6
5 µm	150	5020-89954	5020-89950
	250	5020-89955	5020-89951
3 µm	150	–	5020-89956
	250	–	5020-89957

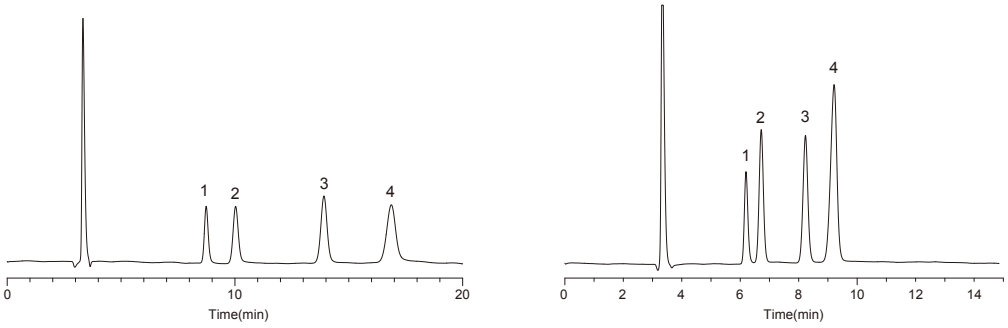
Inertsil NH2

- **Base Material** : 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
- **Functional Group** : Aminopropyl
- **End-capping** : None
- **Carbon Loading** : 8 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5



Inertsil NH2 has an aminopropyl group that is chemically bonded to silica gel. It is widely used for analysing suger in reverced phase mode.

Figure 1 : Comparison of Aminopropyl Columns



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3CN B) H_2O A/B = 75/25, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: RI
Sample	: 1. Fructose 2. Glucose 3. Sucrose 4. Maltose



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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

InertSil NH2 with 100% CH_3CN

Recommended using in HILIC mode.(Normal shipping containment solvents are hexane/ethanol based.)

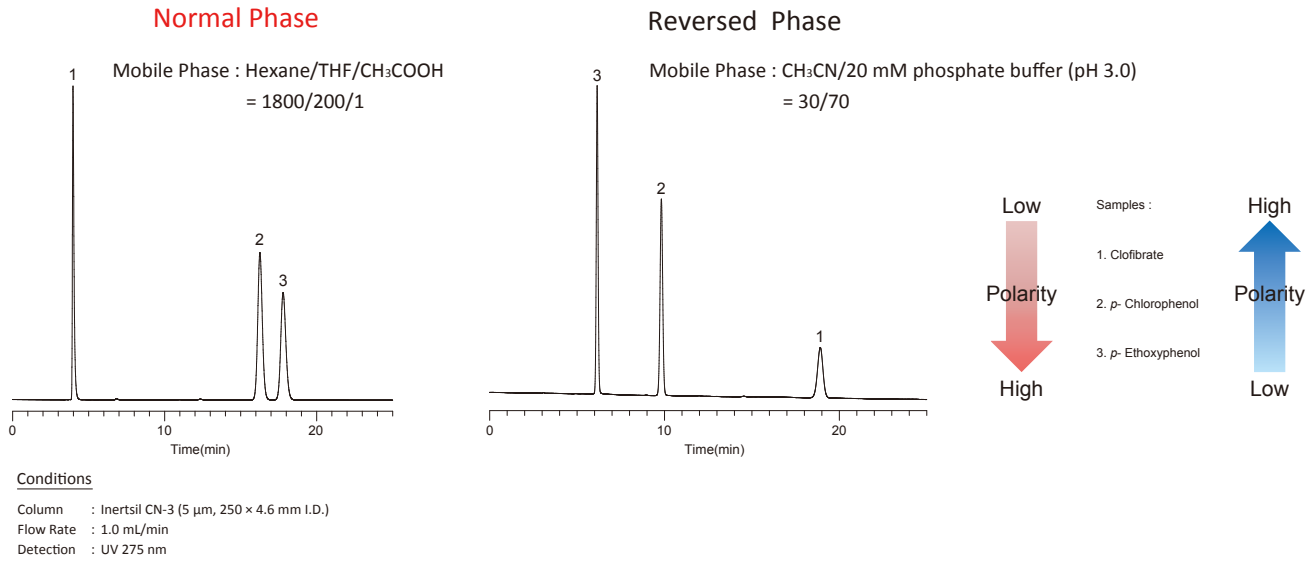
Particle Size	Length \ I.D. (mm)	4.0
3 µm	150	5020-89958
	250	5020-89959
5 µm	150	5020-89952
	250	5020-89953

Normal Phase Columns

- About Normal Phase Columns 070
- Inertsil Diol 072
- Inertsil SIL-100A 074
- InertSustain NH2 076
- Inertsil NH2 078
- InertSustain Cyano 080
- Inertsil CN-3 082
- Inertsil SIL-150A 084
- Inertsil WP300 SIL 085

About Normal Phase Columns

Comparison of Reversed Phase and Normal Phase



Conditions

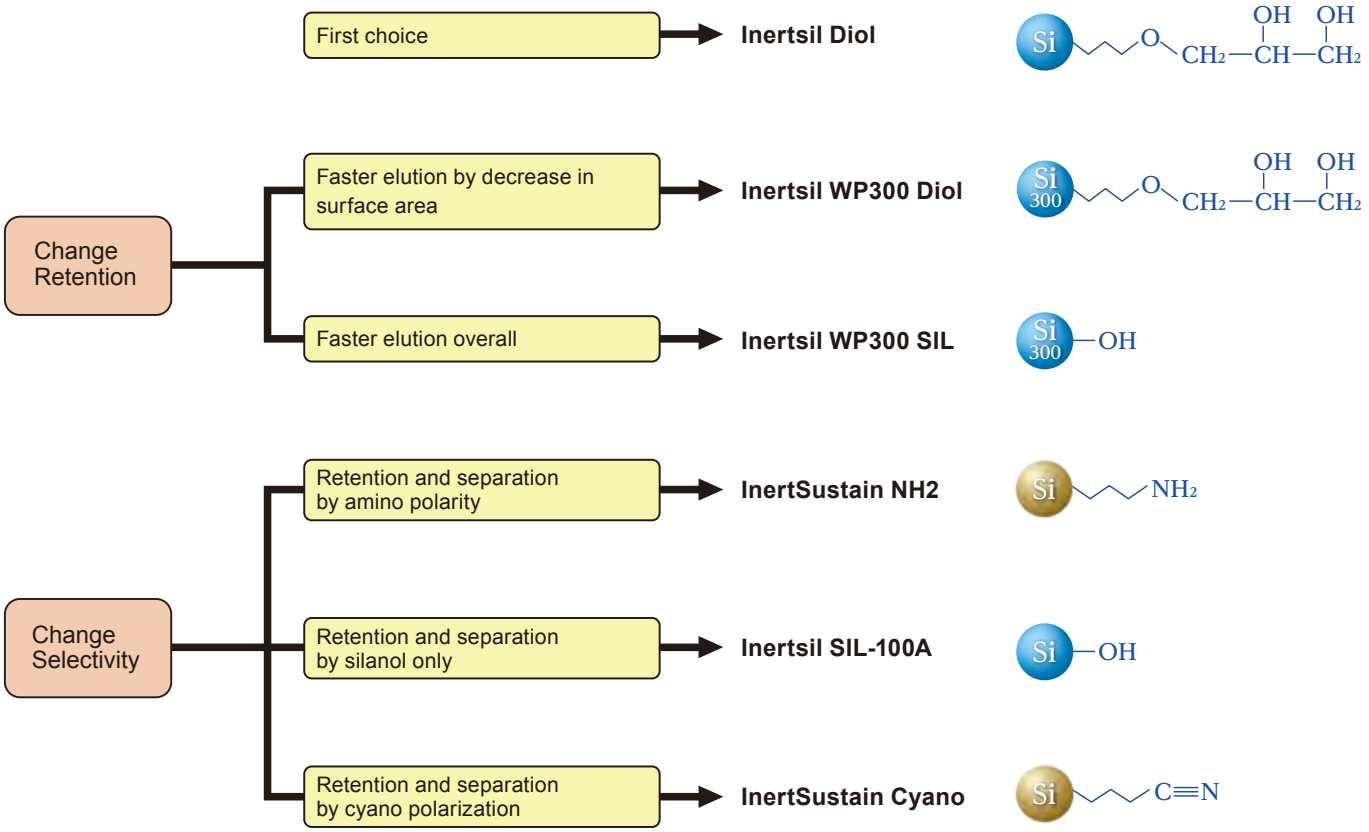
Column : Inertsil CN-3 (5 µm, 250 × 4.6 mm I.D.)
Flow Rate : 1.0 mL/min
Detection : UV 275 nm

GL Sciences has Variety Normal Phase Columns, Choose a Proper One for Your Applications

Column	Feature	Particle size (µm)	Pore Size (nm)	Surface area (m^2/g)	Carbon Loading (%)	Recommended operating pH range
Inertsil Diol	First choice of normal phase column (also can use as SEC)	3, 5	10	450	20	2 - 7.5
Inertsil SIL-100A	High purity silica gel column with pore size 100 Å	3, 5	10	450	—	2 - 7.5
InertSustain NH2	Weak retentivity amino column	3, 5	10	350	7	2 - 7.5
Inertsil NH2	Strong retentivity amino column	3, 5	10	450	8	2 - 7.5
InertSustain Cyano	Super inertness and also can use as a reversed phase column	3, 5	10	350	8	2 - 7.5
Inertsil CN-3	Strong retentivity cyano column	3, 5	10	450	14	2 - 7.5
Inertsil SIL-150A	High purity silica gel column with pore size 150 Å	5	15	320	—	2 - 7.5
Inertsil WP300 SIL	High purity silica gel column with pore size 300 Å	5	30	150	—	2 - 7.5

Normal Phase Column Selection Guide

Molecular Weight < 5,000 Samples on Normal Phase Mode



Solvents used in Normal Phase Mode

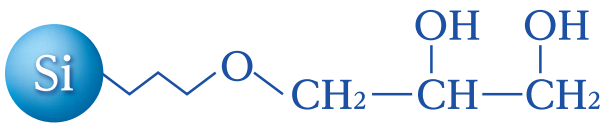
Normal-phase mode typically uses a solvent of combined hexane and ethanol, although a less polar solvent such as propanol or ethyl acetate is used in some cases. The solvent must be properly selected according to the retention strength of the target components.

Shipping Solvents of Normal Phase Columns

Columns	Shipping Solvents
Inertsil Diol	*n* - Hexane/Ethanol = 95/5, v/v
Inertsil SIL-100A	
Inertsil SIL-150A	
Inertsil WP300 SIL	
InertSustain NH2	*n* - Hexane/Ethanol = 98/2, v/v
Inertsil NH2	
Inertsil CN-3	
InertSustain Cyano	Acetonitrile/Water = 50/50, v/v

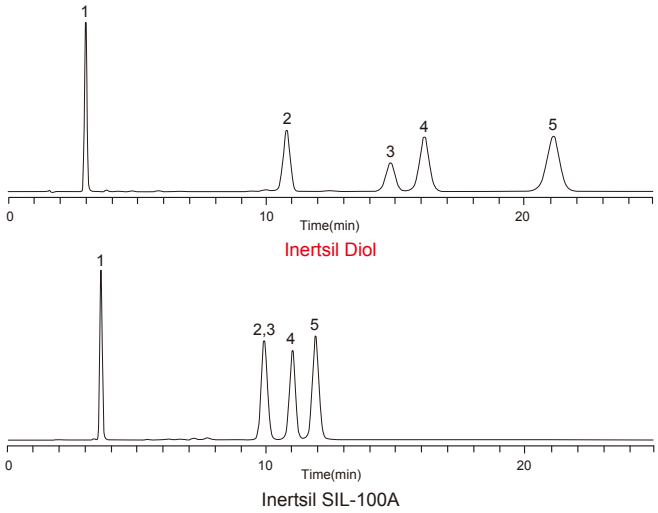
Inertsil Diol

- **Base Material** : 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
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : None
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5



Inertsil Diol has a dihydroxypropyl group-bonded phase with unique selectivity in normal mode. The separation mechanism of the diol column is dominated by hydrogen bonding interactions between the diol groups and polar compounds. Diol columns provide an alternative selectivity to silica columns, often with increased retentivity.
As shown in Figure 1, Inertsil Diol is more selective for diol groups than Inertsil SIL-100A (a pure silica gel column).
Nine compounds were eluted by Inertsil Diol and other normal-phase columns in the Inertsil series (Figure 2). Comparing the retention times of these compounds, one observes that Inertsil Diol stably retained both basic and acidic compounds. Moreover, as Intersill Diol has low nonspecific adsorption of water, it can be washed with 100 % water eluent.

Figure 1 : Comparison of Selectivity between Diol Column and Silica Column



Conditions

Column Size	: 5 µm, 150 × 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 :

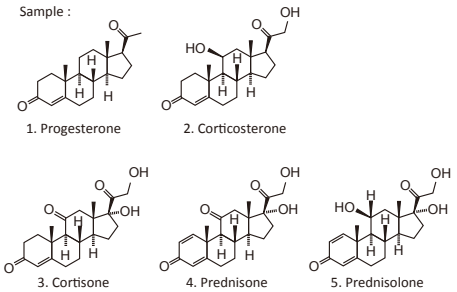
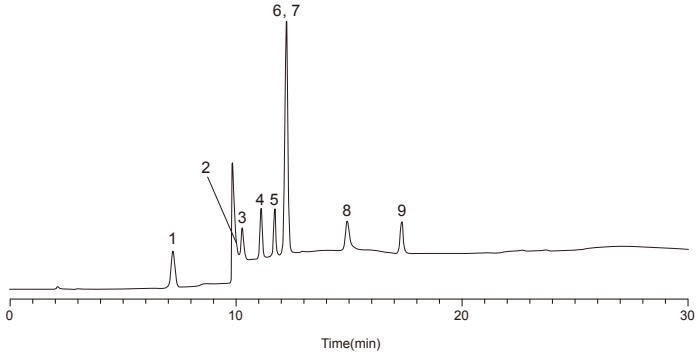
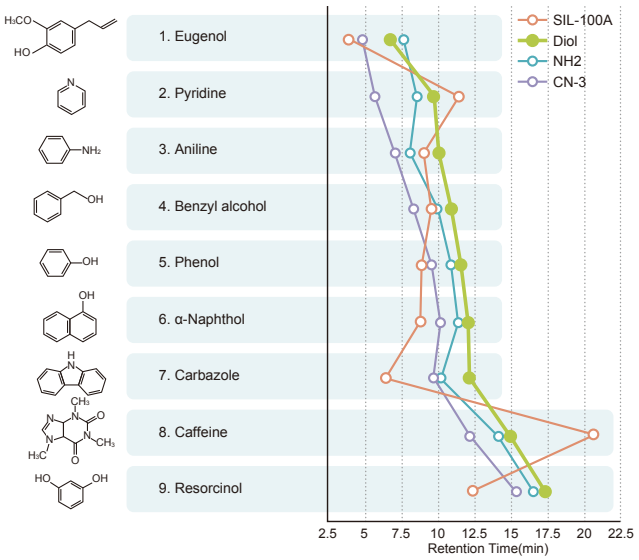


Figure 2 : Selectivity of Inertsil Diol

Conditions

Column	: Inertsil Diol (5 µm, 150 × 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
	150	5020-05415	5020-05425	5020-05435	5020-05445
	250	5020-05416	5020-05426	5020-05436	5020-05446
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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

Inertsil SIL-100A

- **Base Material** : 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
- **Functional Group** : None
- **End-capping** : None
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 - 7.5



Inertsil SIL-100A is packed with 100Å pore size. The metal content is extremely low and the surface area and pore size are ideally controlled.
The absence of shape distortion, particle size variation, and surface irregularities that are found in commercially available silica gel allows sharp peaks and stable normal-phase analyses with high column-to-column reproducibility.
Nine compounds were analyzed on an Inertsil SIL-100A to show the difference in selectivity compared with Inertsil normal-phase columns.
Inertsil SIL-100A retained weakly the acidic compounds. Meanwhile, circular compounds were strongly retained due to the silanol groups.

Figure 1 : SEM Photos of Inertsil SIL-100A and Other Brand Available Silica Gels

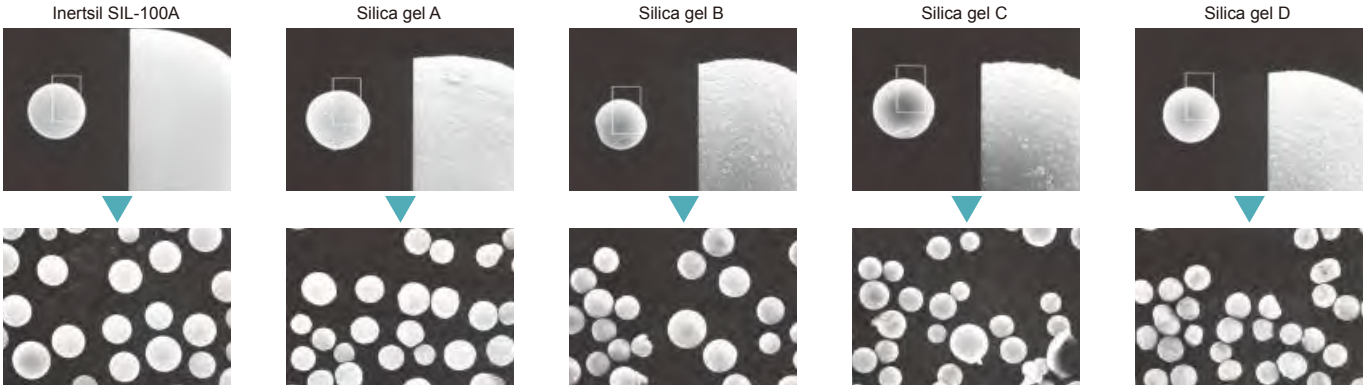
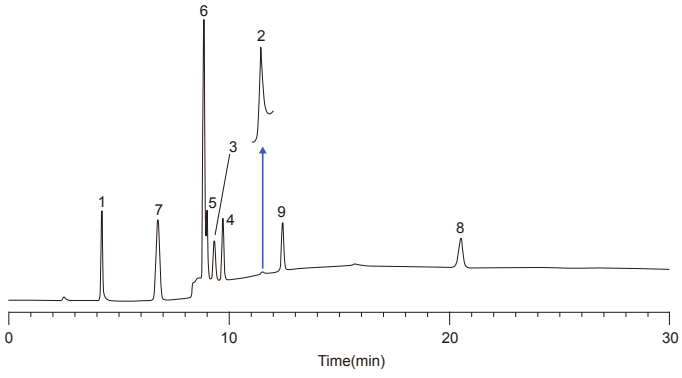
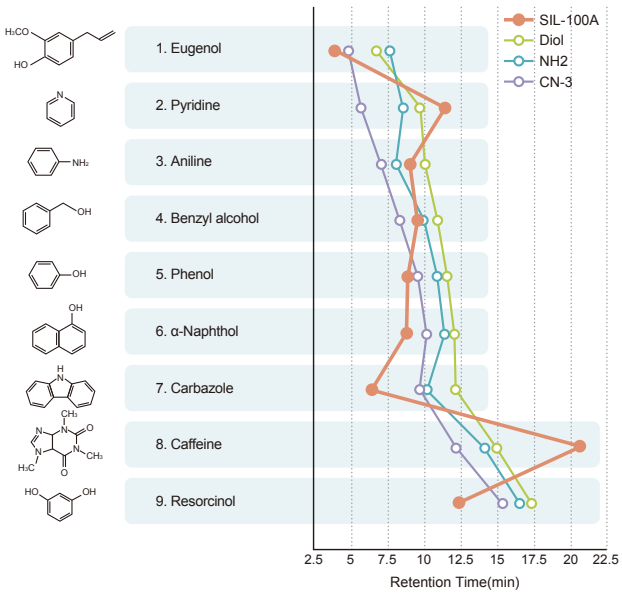


Figure 2 : Selectivity of Inertsil SIL-100A

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
	150	5020-04215	5020-04225	5020-04235	5020-01701
	250	5020-04216	5020-04226	5020-04236	5020-01702
Particle Size: 5 µm	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

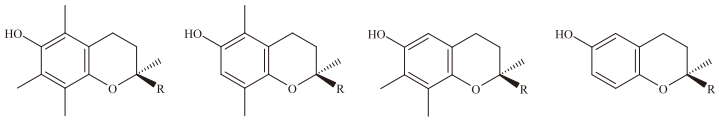
InertSustain NH2

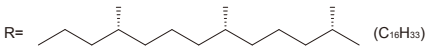
- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Aminopropyl**
- **End-capping** : **None**
- **Carbon Loading** : **7 %**
- **USP Code** : **L8**
- **pH Range** : **2 - 7.5**

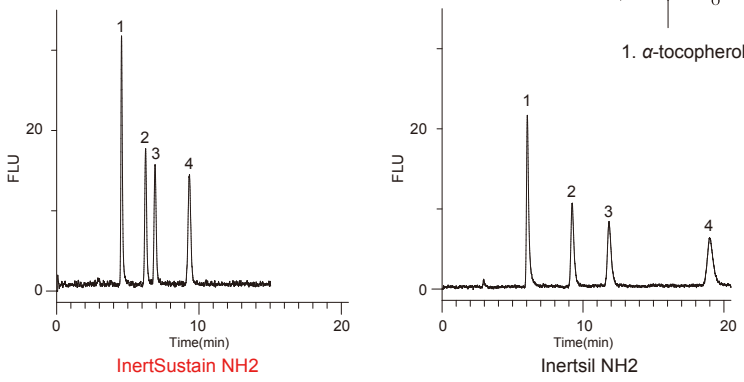


InertSustain NH2 is a normal-phase column that is expected to change separation patterns due to a difference in selectivity compared with silica gel columns.
Compared with Inertsil NH2 (described below), it has a smaller surface area and elutes analytes faster to produce sharper peaks.
An InertSustain NH2 column uses n-hexane and ethyl acetate as eluents for fast elution while maintaining the separation of the tested components.
Using a column washed with isopropanol, a sample of phthalate diester was used and the time to stabilize to the analytical conditions was measured.
It is a normal-phase column that stabilized after 21 minutes during the fourth injection. It equilibrated quickly after column washing.

Figure 1 : Analysis of Vitamin E with InertSustain NH2 & Inertsil NH2 Column



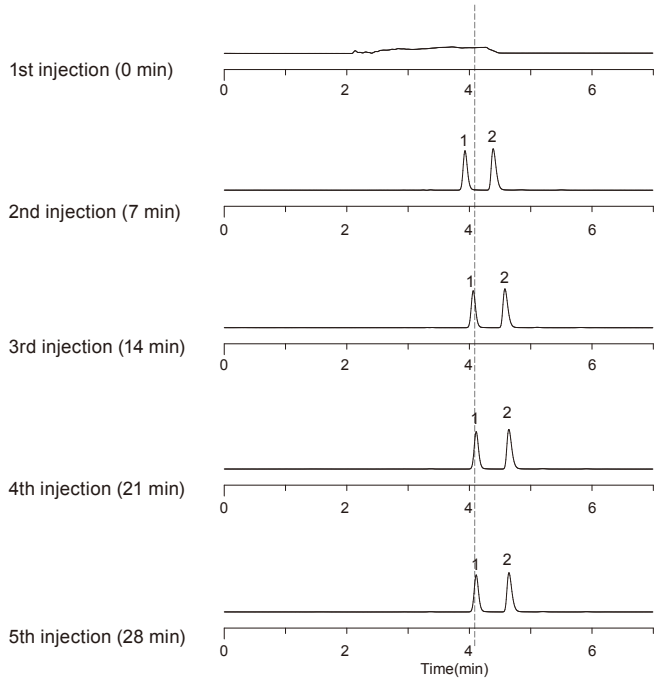


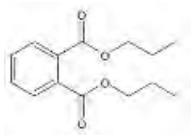


Conditions

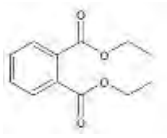
Column	:	5 µm, 250 × 4.6 mm I.D.
Eluent	:	A) *n*-Hexane B) Ethyl acetate A/B = 85/15, v/v
Flow Rate	:	1.2 mL/min
Col. Temp.	:	40 °C
Detection	:	FL Ex. 298 nm Em. 325 nm
Injection Vol.	:	20 µL
Sample	:	α-tocopherol (1 µg/mL in Hexane) β-tocopherol (1 µg/mL in Hexane) γ-tocopherol (1 µg/mL in Hexane) δ-tocopherol (1 µg/mL in Hexane)

Figure 2 : Evaluation of Equilibration Time





Di-*n*-propylphthlate



Diethy phthalate

Conditions

Column	:	InertSustain NH2 (5 µm, 250 × 4.6 mm I.D.)
Eluent	:	A) *n*-Hexane/Isopropanol = 100/1, v/v B) Isopropanol A/B = 95/5, v/v (gradient mixer)
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 300 nm

Analytical Columns

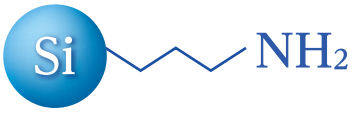
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	30	5020-16768	5020-16774		
	50	5020-16769	5020-16775		
	75	5020-16770	5020-16776		
	100	5020-16771	5020-16777		
	150	5020-16772	5020-16778		
	250	5020-16773	5020-16779		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-16732	5020-16739	5020-16746	5020-16753
	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

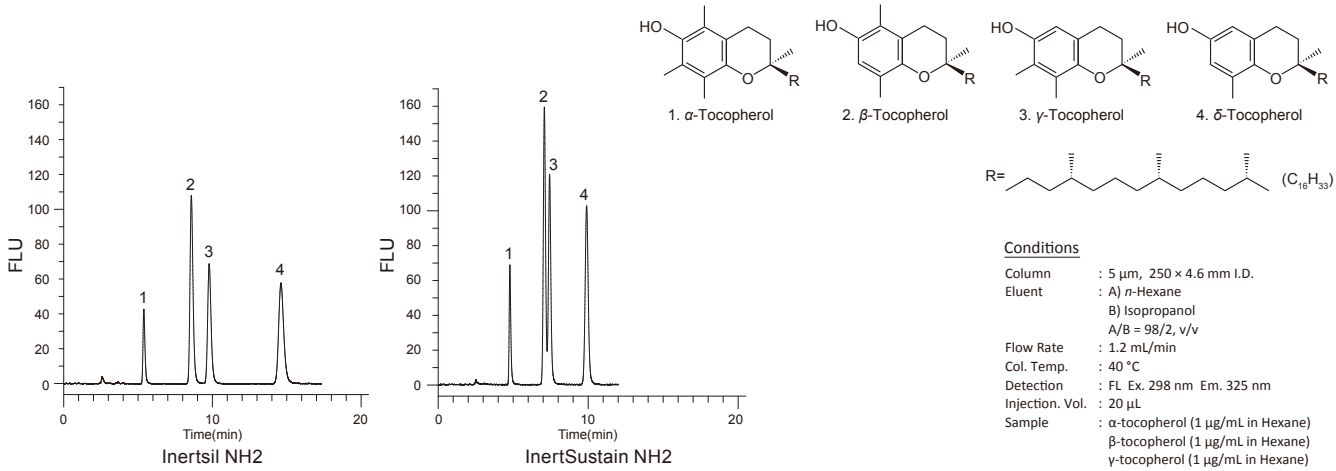
Inertsil NH2

- **Base Material** : 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
- **Functional Group** : Aminopropyl
- **End-capping** : None
- **Carbon Loading** : 8 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5



Inertsil NH2 has a wide surface area and bonds with aminopropyl groups. Modification with primary amines achieves a high retention time and better separation than other commercially available amino columns. Inertsil NH2 separated tocopherol isomers with good peak shapes within a shorter time than other commercially amino columns.
Primary amines on the surface provide Inertsil NH2 with unique selectivity as a normal phase column. Inertsil NH2 strongly retains acidic compounds and weakly retains basic compound.

Figure 1 : Analysis of Vitamin E



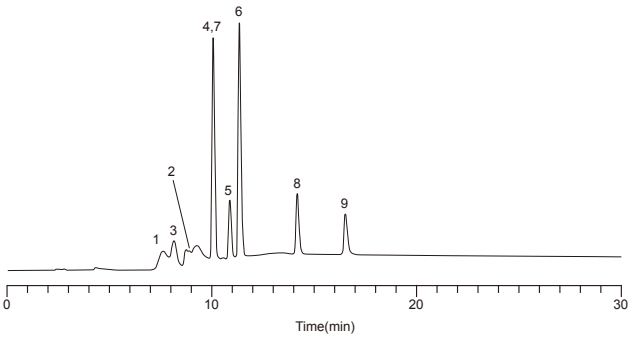
Conditions

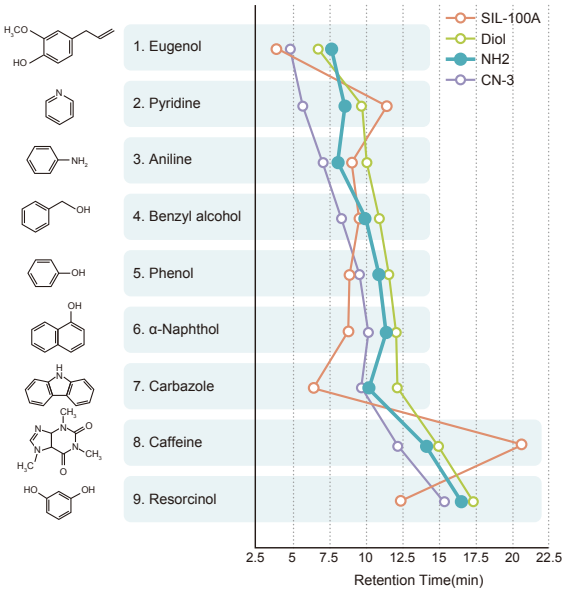
Column	:	5 µm, 250 × 4.6 mm I.D.
Eluent	:	A) *n*-Hexane B) Isopropanol A/B = 98/2, v/v
Flow Rate	:	1.2 mL/min
Col. Temp.	:	40 °C
Detection	:	FL Ex. 298 nm Em. 325 nm
Injection. Vol.	:	20 µL
Sample	:	α-tocopherol (1 µg/mL in Hexane) β-tocopherol (1 µg/mL in Hexane) γ-tocopherol (1 µg/mL in Hexane) δ-tocopherol (1 µg/mL in Hexane)

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
	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

Cartridge Guard Column E

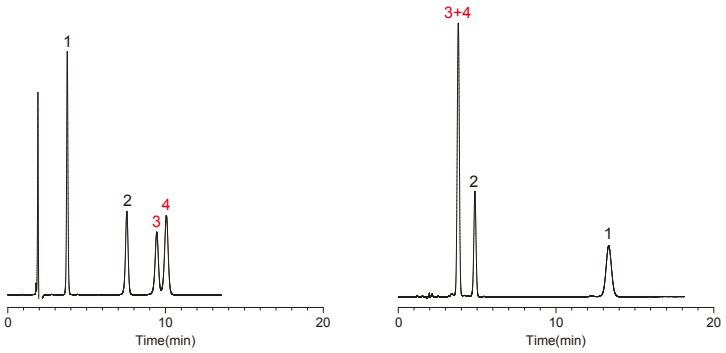
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19221	5020-19220	5020-19271	5020-19270
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

InertSustain Cyano

- **Base Material : High Purity ES Silica Gel**
- **Particle Size : 3 µm, 5 µm**
- **Surface Area : 350 m^2/g**
- **Pore Size : 100 Å (10 nm)**
- **Pore Volume : 0.85mL/g**
- **Functional Group : Cyanopropyl**
- **End-capping : Yes**
- **Carbon Loading : 8 %**
- **USP Code : L10**
- **pH Range : 2 - 7.5**

InertSustain Cyano has chemically bonded cyanopropyl groups to silica gel, which are end-capped for use in both normal- and reversed-phase modes. Components that were difficult to separate in reversed-phase mode may be separated in normal-phase mode.
In addition, the end-caping process enables the cleaning with highly polar solvents such as water.
InertSustain Cyano columns can be used as reversed-phase columns, and they are shipped with a water/acetonitrile mixture as the shipping solvent. However, they can be used as normal-phase columns by replacing the solvent with an intermediate polar solvent before an analysis.

Figure 1 : Comparison of Normal Phase Mode and Reversed Phase Mode Analysis

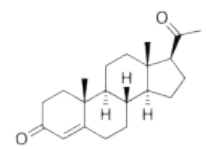


Conditions

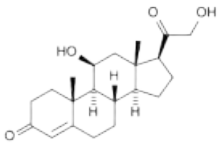
Eluent	:	A) Hexane
		B) Ethanol
		A/B = 90/10, v/v
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 220 nm

Conditions

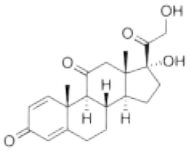
Eluent	:	A) CH_3OH
		B) H_2O
		A/B = 40/60, v/v
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 220 nm



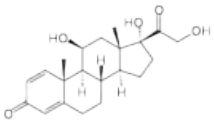
1. Progesterone



2. Corticosterone

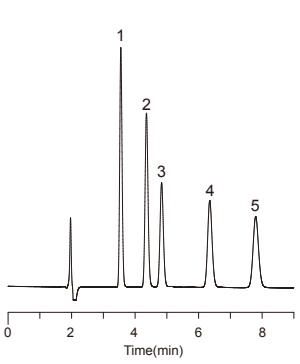


3. Prednisone

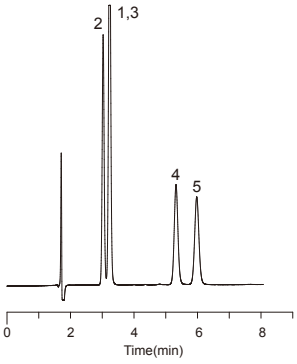


4. Prednisolone

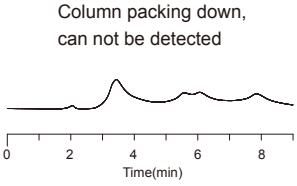
Figure 2: Comparison with Other Brands Column



InertSustain Cyano



ZORBAX SB-CN



XSelect HSS CN

Conditions

Column Size	:	5 µm,150 × 4.6 mm I.D.
Eluent	:	A) *n*-Hexane
		B) Ethanol
		A/B = 90/10, v/v
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 220 nm
Sample	:	1. Progesterone
		2. Estrone
		3. β-Estradiol
		4. Corticosterone
		5. Hydrocortisone

Analytical Columns

	Length\I.D. (mm)	2.1	3.0	4.6
HP Series Particle Size : 3 µm 50 MPa (500 bar)	30	5020-89459	5020-89465	5020-89471
	50	5020-89460	5020-89466	5020-89472
	75	5020-89461	5020-89467	5020-89473
	100	5020-89462	5020-89468	5020-89474
	150	5020-89463	5020-89469	5020-89475
	250	5020-89464	5020-89470	5020-89476

	Length\I.D. (mm)	1.0	1.5
	30	5020-89410	5020-89416
	50	5020-89411	5020-89417
	75	5020-89412	5020-89418
	100	5020-89413	5020-89419
	150	5020-89414	5020-89420
	250	5020-89415	5020-89421

	Length\I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	30	5020-89374	5020-89381	5020-89388	5020-89395
	50	5020-89375	5020-89382	5020-89389	5020-89396
	75	5020-89376	5020-89383	5020-89390	5020-89397
	100	5020-89377	5020-89384	5020-89391	5020-89398
	150	5020-89378	5020-89385	5020-89392	5020-89399
	250	5020-89379	5020-89386	5020-89393	5020-89400

	Length\I.D. (mm)	1.0	1.5
	30	5020-89288	5020-89294
	50	5020-89289	5020-89295
	75	5020-89290	5020-89296
	100	5020-89291	5020-89297
	150	5020-89292	5020-89298
	250	5020-89293	5020-89299

	Length\I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	30	5020-89251	5020-89258	5020-89265	5020-89272
	50	5020-89252	5020-89259	5020-89266	5020-89273
	75	5020-89253	5020-89260	5020-89267	5020-89274
	100	5020-89254	5020-89261	5020-89268	5020-89275
	150	5020-89255	5020-89262	5020-89269	5020-89276
	250	5020-89256	5020-89263	5020-89270	5020-89277

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-89449	5020-89355	5020-89450	5020-89356
1.5, 2.1		1.5	5020-89451	5020-89357	5020-89452	5020-89358
2.1, 3.0		3.0	5020-89447	5020-89353	5020-89448	5020-89354
4.0, 4.6		4.0	5020-89445	5020-89351	5020-89446	5020-89352
2.1, 3.0	20	3.0	5020-89455	5020-89361	5020-89456	5020-89362
4.0, 4.6		4.0	5020-89453	5020-89359	5020-89454	5020-89360
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

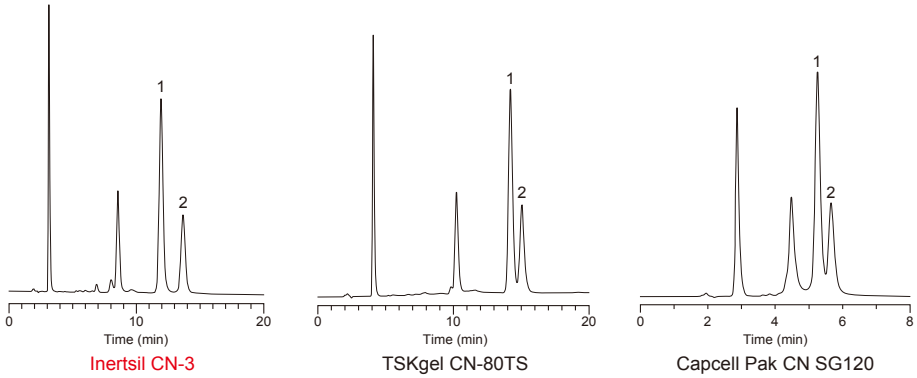
Inertsil CN-3

- **Base Material** : 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
- **Functional Group** : Cyanopropryl
- **End-capping** : None
- **Carbon Loading** : 14 %
- **USP Code** : L10
- **pH Range** : 2 - 7.5



Inertsil CN-3 has a silica gel aminopropyl group that is chemically bonded.
Results of the analysis of nine compounds on an Inertsil CN-3 column are shown. Differences in selectivity compared with other Inertsil series normal-phase columns are also provided.

Figure1 : Comparison of Selectivity



Conditions

Column	: Cyano Column (5 µm, 150 × 4.6 mm I.D.)
Eluent	: A) Hexane B) Ethanol A/B = 90/10, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

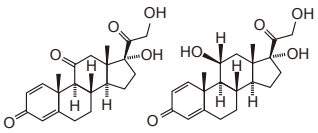
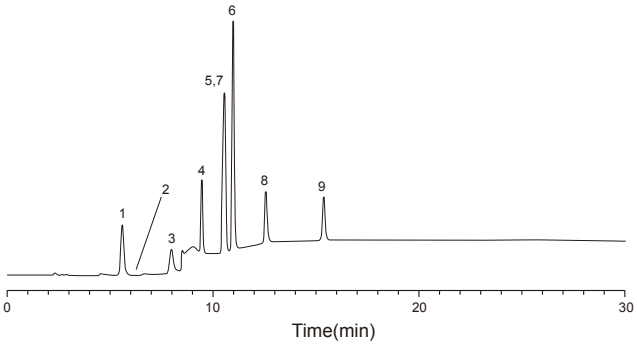
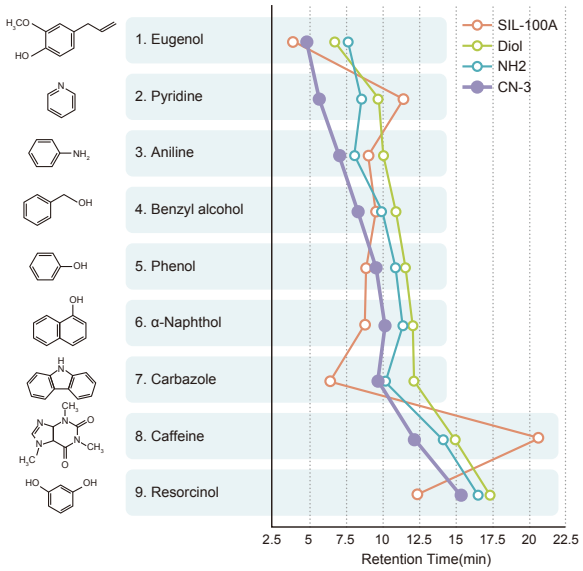


Figure2 : Selectivity of Inertsil® CN-3

Conditions

Column	: Inertsil CN-3 (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	5020-85331	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
	150	5020-05265	5020-05275	5020-05285	5020-05295
	250	5020-05266	5020-05276	5020-05286	5020-05296
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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

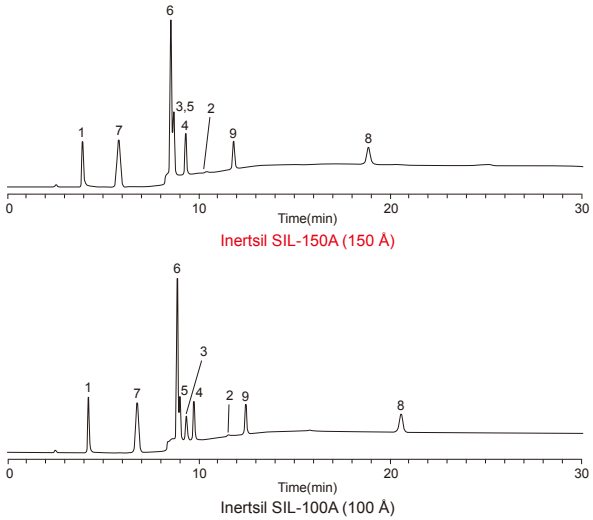
Inertsil SIL-150A

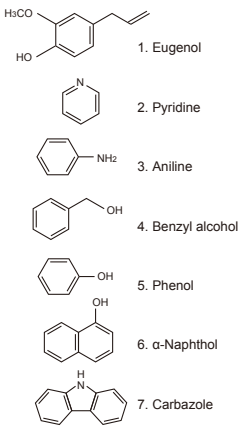
- **Base Material** : 2 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 320 m^2/g
- **Pore Size** : 150 Å (15 nm)
- **Pore Volume** : 1.20 mL/g
- **Functional Group** : None
- **End-capping** : None
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 - 7.5



Inertsil Sil-150A has a larger pore size of 150 Å (15 nm) and a smaller surface area than Inertsil Sil-100A column, making it a relatively weak retention column.

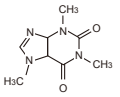
Figure 1 : Comparison of Retentivity and Selectivity with Different Pore Size

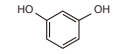




Conditions

Column Size	: 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

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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

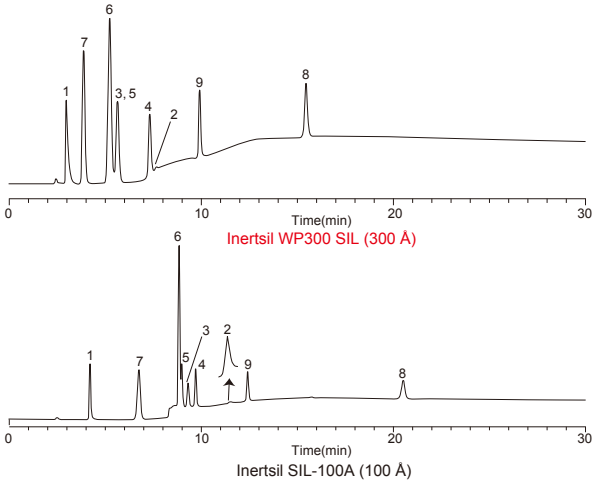
Inertsil WP300 SIL

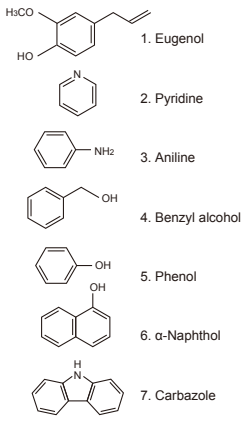
- **Base Material** : **High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **150 m^2/g**
- **Pore Size** : **300 Å (30 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **None**
- **End-capping** : **None**
- **Carbon Loading** : **- %**
- **USP Code** : **L3**
- **pH Range** : **2 - 7.5**



Inertsil WP300 SIL is a pure silica gel phase with wide pores (300 Å) for analyzing large-molecule compounds. Widening the pores reduces the surface area of silica gel and consequently the number of interactions between the analyte and silica gel, allowing faster elution. The following figure compares the separation and elution speeds of Inertsil WP300 SIL and Inertsil SIL-100A (with a pore size of 100 Å and a surface area is 450 m^2/g). The Inertsil WP300 SIL column elutes faster than Inertsil SIL-100A but yields similar separation patterns.

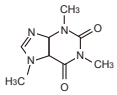
Figure 1 : Comparison of Selectivity and Retentivity with Different Pore Size



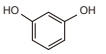


Conditions

Column Size	: 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



8. Caffeine



9. Resorcinol

Analytical Columns

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	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	4.0	4.6
	33	5020-06011	5020-06021	5020-06031	5020-06041
	50	5020-06012	5020-06022	5020-06032	5020-06042
	75	5020-06013	5020-06023	5020-06033	5020-06043
	100	5020-06014	5020-06024	5020-06034	5020-06044
	150	5020-06015	5020-06025	5020-06035	5020-06045
	250	5020-06016	5020-06026	5020-06036	5020-06046

Cartridge Guard Column E

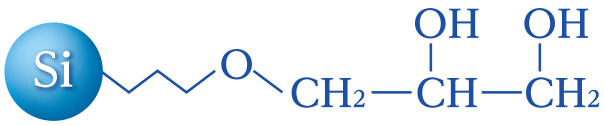
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19232	5020-19282
1.5, 2.1		1.5	5020-19332	5020-19382
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

SEC Columns (GPC/GFC)

- Inertsil Diol 088
- Inertsil WP300 Diol 090

Inertsil Diol

- **Base Material** : 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
- **Functional Group** : Diol (Dihydroxypropyl Groups)
- **End-capping** : None
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5

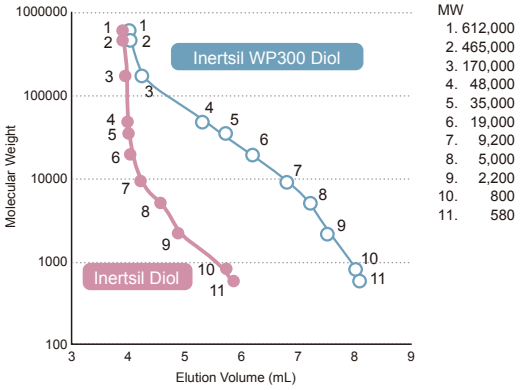


Inertsil Diol is chemically bonded dihydroxypropyl groups to silica gel, can be used for aqueous size-exclusion chromatography (SEC) (GFC) or organic SEC (GPC). The maximum operating pressure is 20 MPa (200 bar), higher than in most polymer base columns and enabling analysis with several columns in series.

Figure 2 shows an example of polystyrene analysis with Inertsil Diol and Inertsil WP300 Diol in series. Serial coupling of two columns with different pore sizes covers a broader range of molecular weight than single columns (see calibration curve in Figure 1).

The typical internal diameter of a SEC column is 7–8 mm. A column of smaller inner diameter (4.6 mm) obtains a calibration curve with smaller elution volume than the larger-diameter column. Therefore, the Intersil Diol column enables a solvent-saving, environmentally conservative, low-cost analysis.

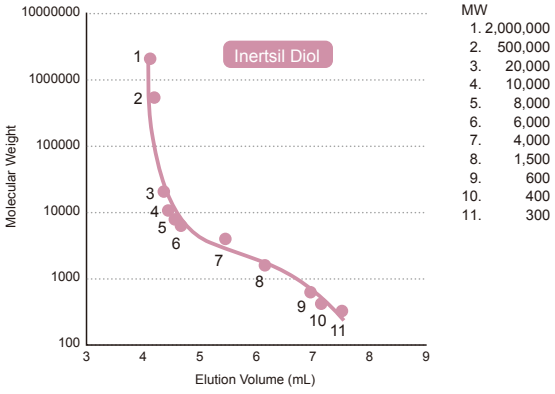
Figure1 : Calibration Curve for Aqueous and Organic SEC Analysis



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

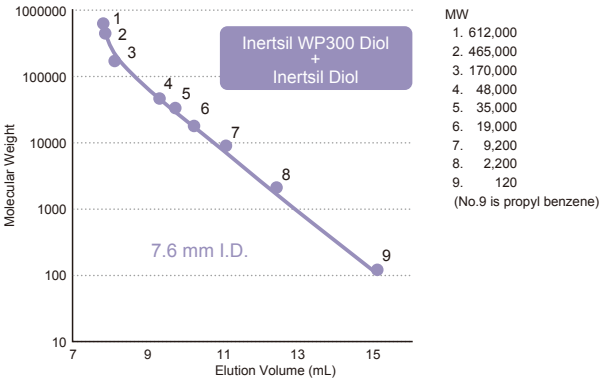


Calibration curve for polystyrene glycol

Conditions

Column : Inertsil Diol (5 µm, 250 × 7.6 mm I.D.)
Eluent : H_2O
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : RI (Cell Temp. 35 °C)

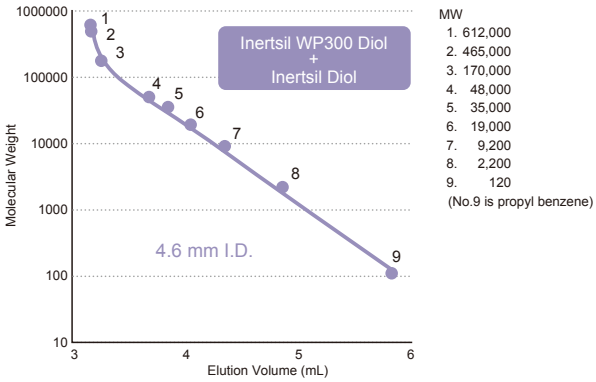
Figure2 : Calibration Curve for Small I.D. SEC Columns



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

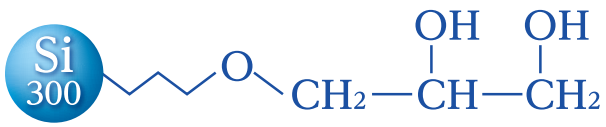
Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-86531	5020-86541		
	50	5020-86532	5020-86542		
	75	5020-86533	5020-86543		
	100	5020-86534	5020-86544		
	150	5020-86535	5020-86545		
	250	5020-86536	5020-86546		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-05411	5020-05421	5020-05431	5020-05441
	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
	150	5020-05415	5020-05425	5020-05435	5020-05445
	250	5020-05416	5020-05426	5020-05436	5020-05446
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	

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

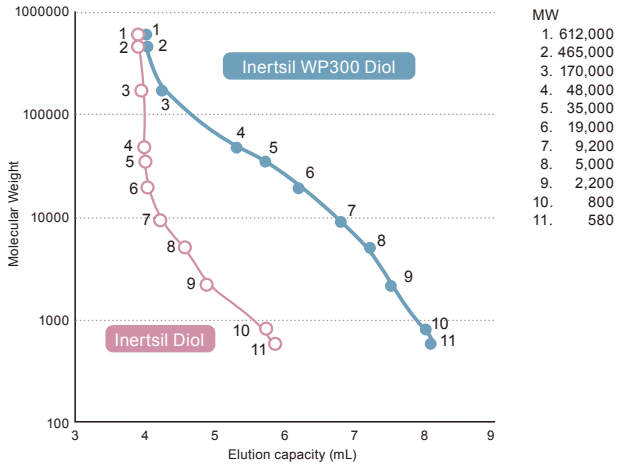
Inertsil WP300 Diol

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



Inertsil WP300 Diol has dihydroxypropyl groups bonded to silica gel. The large pore size (300 Å) enables the analysis of large molecules. Like Inertsil Diol, Is can be used for both aqueous, organic SEC, and as a diol column,
Inertsil WP300 Diol can be used in both normal phase and reversed-phase modes.

Figure 1 : Calibration Curve and Analysis of Polystyrenes



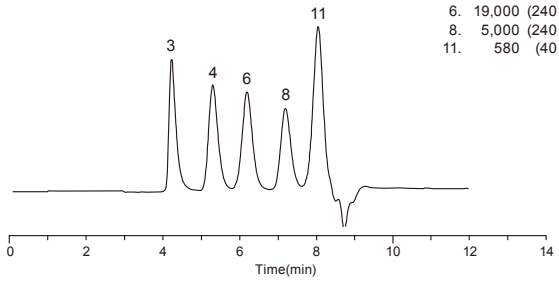
Calibration curve for polystyrenes by organic SEC

MW
1. 612,000
2. 465,000
3. 170,000
4. 48,000
5. 35,000
6. 19,000
7. 9,200
8. 5,000
9. 2,200
10. 800
11. 580

Conditions

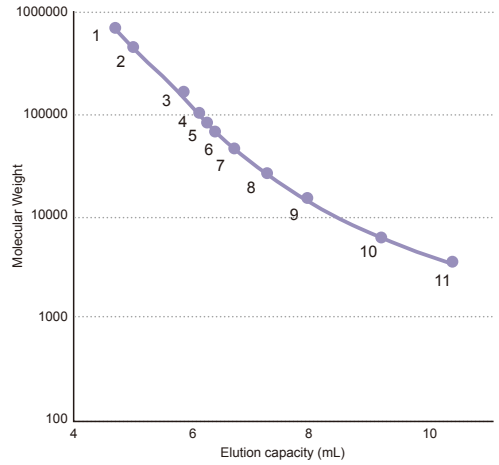
Column Size	: 5 µm, 250 × 7.6 mm I.D.
Eluent	: THF
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

MW
3. 170,000 (240 µg/mL)
4. 48,000 (240 µg/mL)
6. 19,000 (240 µg/mL)
8. 5,000 (240 µg/mL)
11. 580 (40 µg/mL)



Analysis of polystyrenes by Inertsil WP300 Diol

Figure 2 : Calibration Curve and Analysis of Proteins



Calibration curve for proteins

MW

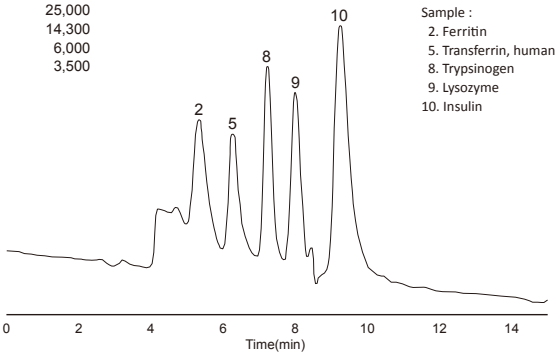
1. Thyroglobulin	660,000
2. Ferritin	444,000
3. γ-Globulins	160,000
4. Phosphorylase	97,400
5. Transferrin, human	80,000
6. BSA	66,000
7. Ovalbumin	45,000
8. Trypsinogen	25,000
9. Lysozyme	14,300
10. Insulin	6,000
11. Insulin chain B	3,500

Conditions

Column	: Inertsil WP300 Diol (5 µm, 250 × 7.6 mm I.D.)
Eluent	: 0.2 M NaCl, 0.1 M NaH_2PO_4 (pH 6.7, Na_2HPO_4)
Flow Rate	: 1.0 mL/min
Col. Temp.	: 35 °C
Detection	: UV 280 nm
Injection. Vol.	: 10 µL

Sample :

2. Ferritin	(40 µg/mL)
5. Transferrin, human	(260 µg/mL)
8. Trypsinogen	(160 µg/mL)
9. Lysozyme	(80 µg/mL)
10. Insulin	(460 µg/mL)



Analysis of proteins by Inertsil WP300 Diol

Analytical Columns

	Length \ I.D. (mm)	1.0	1.5	2.1	3.0	4.0	4.6
Particle Size: 5 µm	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			

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

Ion Exchange Columns

- Inertsil AX 094
- Inertsil CX 096

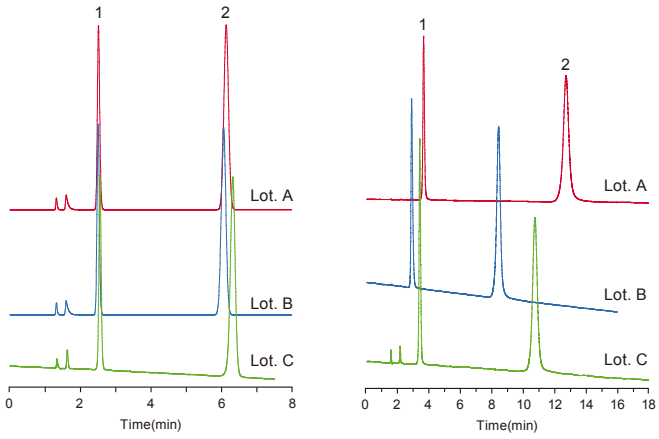
Inertsil AX

- **Base Material** : **3 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **450 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Diethylaminopropyl**
- **End-capping** : **None**
- **Carbon Loading** : **17 %**
- **Anion Exchange Capacity** : **0.4 meq/g**
- **USP Code** : **-**
- **pH Range** : **2 - 7.5**



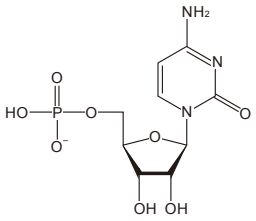
Inertsil AX has diethylamino groups bonded to silica gel by an alkyl chain. The diethylamino groups provide the anionic functions required for anion exchange chromatography. This column is mainly used for analyses of acidic compounds. Conventional ion-exchange columns obtain inconsistent lot-to-lot results, and Inertsil AX is manufactured under strict quality control to offer excellent lot-to-lot reproducibility.
The retentivity of Inertsil AX is influenced by the buffer concentration in the eluent. The retention time can be adjusted by altering the buffer concentration (Figure 2).

Figure 1 : Comparison of Lot-to-lot Reproducibility with Other Brands

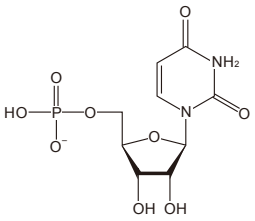


Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.
Eluent	: 60 mM KH_2PO_4 (pH 3.0, H_3PO_4)
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)

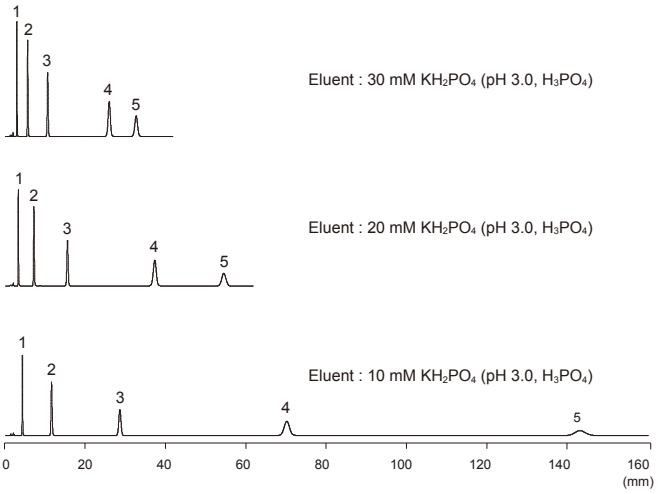


Cytidine 5'-monophosphate (CMP)



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

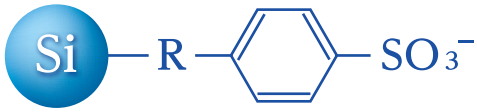
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-80111	5020-80121		
	50	5020-80112	5020-80122		
	75	5020-80113	5020-80123		
	100	5020-80114	5020-80124		
	150	5020-80115	5020-80125		
	250	5020-80116	5020-80126		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-07211	5020-07221	5020-07231	5020-07241
	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

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	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

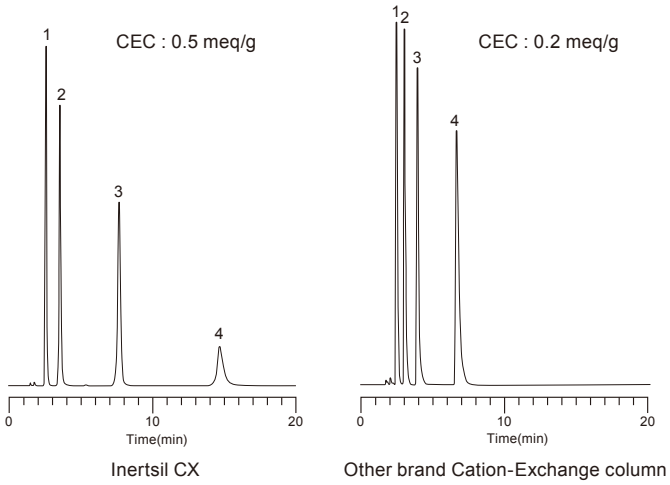
Inertsil CX

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Benzensulfonyl
- **End-capping** : None
- **Carbon Loading** : 14 %
- **Cation Exchange Capacity** : 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 provide the cationic functions required for cation exchange chromatography. This column is mainly used for analyzing basic compounds. Being manufactured under strict quality control, Inertsil CX offers the same excellent batch-to-batch reproducibility as Inertsil AX. Inertsil CX also provides a high ion exchange capacity and high retentivity and selectivity. Therefore, it is also suitable for analyzing amino acids and nucleobases (see Figures 2 and 3).

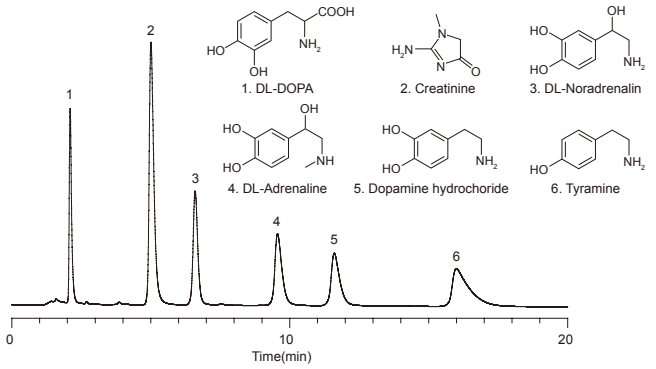
Figure 1 : Comparison of Ion Exchange Capacity with Other Brands



Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.	
Eluent	: 0.2 M CH_3COONH_4 (pH 5.0, HCOOH)	
Flow Rate	: 1.0 mL/min	
Col. Temp.	: 40 °C	
Detection	: UV 260 nm	
Injection vol.	: 10 µL	
Sample	: 1. Uracil	(0.02 mg/mL)
	2. Thymine	(0.02 mg/mL)
	3. Cytosine	(0.02 mg/mL)
	4. Adenine	(0.02 mg/mL)

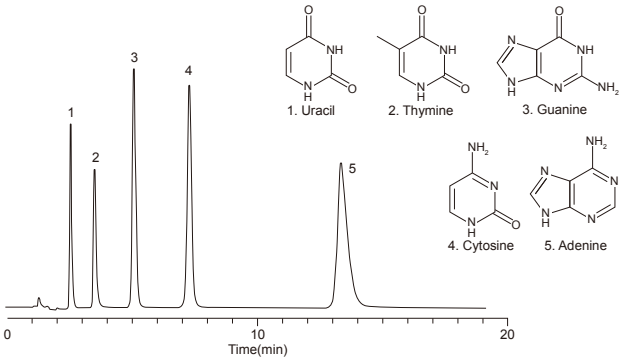
Figure 2 : Biogenic Amine Analysis



Conditions

Column	: Inertsil CX (5 µm, 150 × 4.6 mm I.D.)	Sample	: 1. *dl*-DOPA	(0.98 mg/mL)
Eluent	: 0.2 M K_2HPO_4 (pH 6.0, KH_2PO_4)		2. Creatinine	(0.31 mg/mL)
Flow Rate	: 1.0 mL/min		3. *dl*-Noradrenalin	(1.02 mg/mL)
Col. Temp.	: 40 °C		4. *dl*-Adrenaline	(1.05 mg/mL)
Detection	: UV 254 nm		5. Dopamine hydrochloride	(0.99 mg/mL)
Injection Vol.	: 10 µL		6. Tyramine	(1.10 mg/mL)

Figure 3 : Nucleoside Analysis



Conditions

Column	: Inertsil CX (5 µm, 150 × 4.6 mm I.D.)	Sample	: 1. Uracil	(0.05 mg/mL)
Eluent	: 0.2 M $HCOONH_4$ (pH 5.0, HCOOH)		2. Thymine	(0.05 mg/mL)
Flow Rate	: 1.0 mL/min		3. Guanine	(0.15 mg/mL)
Col. Temp.	: 40 °C		4. Cytosine	(0.15 mg/mL)
Detection	: UV 260 nm		5. Adenine	(0.15 mg/mL)
Injection Vol.	: 10 µL			

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

Cartridge Guard Column E

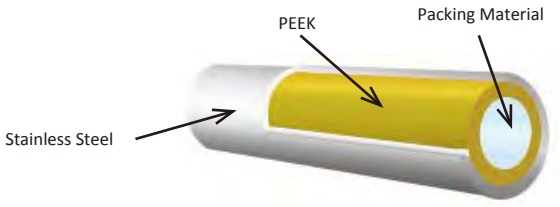
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19234	5020-19284
1.5, 2.1		1.5	5020-19334	5020-19384
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

Application Specific Columns

- Metal-Free PEEK Columns 100
- InertSastainBio C18 102
- MonoSelect C18 for HTS 103
- MonoTower C18 104
- InterSphere FA-1 106
- SYPRON AX-1 108
- SYPRON AX-2 109
- InterSphere Sugar-1 110
- InterSphere Sugar-2 111
- Inertsil Sulfa C18 112
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- Delay column for PFAS 113
- Corresponding Pharmacopeia (JP, USP, EP) 114
- Inertsil TMS 115
- MonoSelect nPEC 116
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Metal-Free PEEK Columns

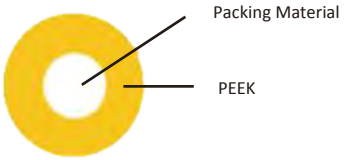
UHPLC-PEEK columns





- Material : Wetted Part ... PEEK
  Outer Part ... Stainless Steel
- Particle Sizes : 1.9 µm, 2 µm, 3 µm
- Packing Materials : InertSustain & Inertsil series
- Max. Operating Pressure : 80 MPa (800 bar): 1.9 µm, 2 µm
  50 MPa (500 bar): 3 µm

PEEK columns





- Material : PEEK
- Particle Sizes : 5 µm
- Packing Materials : InertSustain & Inertsil series
- Max. Operating Pressure : 20 MPa (200 bar)

Analytical Columns

Other packing materials and column dimensions are available on request.

InertSustain C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
2 µm	50	5020-87400	5020-87403
	100	5020-87401	5020-87404
	150	5020-87402	5020-87405
3 µm	50	5020-87412	5020-87416
	100	5020-87413	5020-87417
	150	5020-87414	5020-87418
	250	5020-87415	5020-87419

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87468	5020-87472
	100	5020-87469	5020-87473
	150	5020-87470	5020-87474
	250	5020-87471	5020-87475

InertSustain AQ-C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 µm	50	5020-87068	5020-87065
	100	5020-87069	5020-87066
	150	5020-87070	5020-87067
3 µm	50	5020-87061	5020-87057
	100	5020-87062	5020-87058
	150	5020-87063	5020-87059
	250	5020-87064	5020-87060

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87053	5020-87049
	100	5020-87054	5020-87050
	150	5020-87055	5020-87051
	250	5020-87056	5020-87052

InertSustainSwift C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 µm	50	5020-87548	5020-87551
	100	5020-87549	5020-87552
	150	–	5020-87553
3 µm	50	5020-87554	5020-87558
	100	5020-87555	5020-87559
	150	5020-87556	5020-87560
	250	5020-87557	5020-87561

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87562	5020-87566
	100	5020-87563	5020-87567
	150	5020-87564	5020-87568
	250	5020-87565	5020-87569

Inertsil ODS-HL

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 µm	50	5020-88834	–
	100	5020-88835	–
	150	5020-88836	–
3 µm	50	5020-87532	5020-87536
	100	5020-87533	5020-87537
	150	5020-87534	5020-87538
	250	5020-87535	5020-87539

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
5 µm	50	5020-87540	5020-87544
	100	5020-87541	5020-87545
	150	5020-87542	5020-87546

Inertsil ODS-4

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87452	5020-87456
	100	5020-87453	5020-87457
	150	5020-87454	5020-87458
	250	5020-87455	5020-87459
5 µm	50	5020-87508	5020-87512
	100	5020-87509	5020-87513
	150	5020-87510	5020-87514
	250	5020-87511	5020-87515

Inertsil ODS-3

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87444	5020-87448
	100	5020-87445	5020-87449
	150	5020-87446	5020-87450
	250	5020-87447	5020-87451
5 µm	50	5020-87500	5020-87504
	100	5020-87501	5020-87505
	150	5020-87502	5020-87506
	250	5020-87503	5020-87507

InertSustainSwift C8

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 µm	50	5020-87570	5020-87573
	100	5020-87571	5020-87574
	150	-	5020-87575
3 µm	50	5020-87576	5020-87580
	100	5020-87577	5020-87581
	150	5020-87578	5020-87582
	200	5020-87579	5020-87583
5 µm	50	5020-87584	5020-87588
	100	5020-87585	5020-87589
	150	5020-87586	5020-87590
	250	5020-87587	5020-87591

InertSustain PFP

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87592	5020-87596
	100	5020-87593	5020-87597
	150	5020-87594	5020-87598
	250	5020-87595	5020-87599
5 µm	50	5020-87600	5020-87604
	100	5020-87601	5020-87605
	150	5020-87602	5020-87606
	250	5020-87603	5020-87607

InertSustain Phenylhexyl

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	50	5020-87436	5020-87440
	100	5020-87437	5020-87441
	150	5020-87438	5020-87442
	250	5020-87439	5020-87443
5 µm	50	5020-87492	5020-87496
	100	5020-87493	5020-87497
	150	5020-87494	5020-87498
	250	5020-87495	5020-87499

InertSustain Amide

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
1.9 µm	50	5020-88831	–
	100	5020-88832	–
	150	5020-88833	–
3 µm	50	5020-87420	5020-87424
	100	5020-87421	5020-87425
	150	5020-87422	5020-87426
	250	5020-87423	5020-87427
5 µm	50	5020-87476	5020-87480
	100	5020-87477	5020-87481
	150	5020-87478	5020-87482
	250	5020-87479	5020-87483

InertSustain AX-C18

Particle Size	Length (mm)	I.D. (mm)	
		2.1	4.6
3 µm	150	5020-91059	5020-91061
	250	5020-91060	5020-91062

Inertsil WP300 Diol

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87466
	250	5020-87467

Inertsil C8

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87462
	250	5020-87463

Inertsil C4

Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87464
	250	5020-87465

Inertsil ODS-2

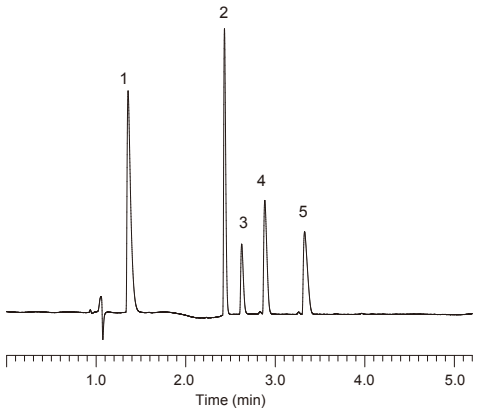
Particle Size	Length (mm)	I.D. (mm)
		4.6
5 µm	150	5020-87460
	250	5020-87461

InertSustainBio C18

- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm**
- **Surface Area** : **200 m^2/g**
- **Pore Size** : **200 Å (20 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **9 %**
- **USP Code** : **L1**
- **pH Range** : **1 - 10**
- **Max. Operating Pressure** : **80MPa, 800 bar for 1.9 µm columns**
  50MPa, 500 bar for 3 µm columns

InertSustain Bio C18 is a recommended HPLC column for peptide and protein analysis.
It uses a packing material with a pore size of 200Å, making it ideal in the determination of low to high molecular weight compounds (up to several tens of thousands Da).The use of extremely low-adsorption packing materials and metal-free column hardware enables analyte sharp peaks even for adsorbable analytes.

Analysis of Peptides

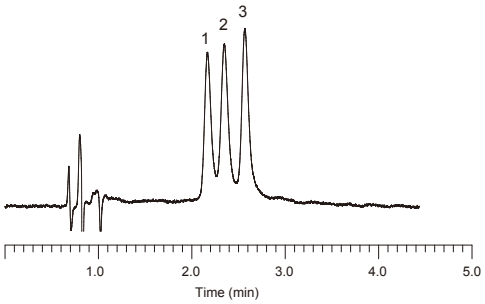


Conditions

Column : InertSustainBio C18
(1.9 µm, 100 × 2.1 mm I.D)
Eluent : A) 0.1% HCOOH in H_2O
B) 0.1% HCOOH in CH_3CN
A/B = 95/5 - 0.5 min - 70/30 - 2.5 min - 60/40
- 0.5 min - 60/40 - 0.01/min - 95/5 - 6.49 min - 95/5, v/v
Flow Rate : 0.3 mL/min
Col. Temp. : 40 ℃
Detection : UV 280 nm
Injection Vol. : 5 µL

Sample :
1. Gly-Tyr
2. Val-Tyr-Val
3. Angiotensin II
4. Methionine encephalin
5. Leucine encephalin
(50 mg/mL each)

Analysis of Oligonucleotides



Conditions

Column : InertSustainBio C18 (1.9 µm, 100 × 2.1 mm I.D)
Eluent : A) 0.1 % Triethylamine in H_2O (pH 6.3, CH_3COOH)
B) Eluent A/CH_3CN = 50/50, v/v
A/B = 83/17 - 4 min - 80/20 - 0.1 min - 83/17 - 5.9 min - 83/17, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 ℃
Detection : UV 260 nm
Injection Vol. : 10 µL
Sample : 1. 5′ - GTT ACA GAA TCT GAC AAG CCT AAT ACG - 3′ (27 mer)
2. 5′ - GTT ACA GAA TCT GCC AAG CCT AAT ACG - 3′ (27 mer)
3. 5′ - GTT ACA GAA TCT GTC AAG CCT AAT ACG - 3′ (27 mer)
(300 pmol/L each)

Analytical Columns

	Length \ I.D. (mm)	2.1	4.6
Particle Size: 1.9 µm	50	5020-89500	5020-87516
	100	5020-89501	5020-87517
	150	–	5020-87518
Particle Size: 3 µm	50	5020-89503	5020-87520
	100	5020-89504	5020-87521
	150	5020-89505	5020-87522
	250	5020-87519	5020-87523

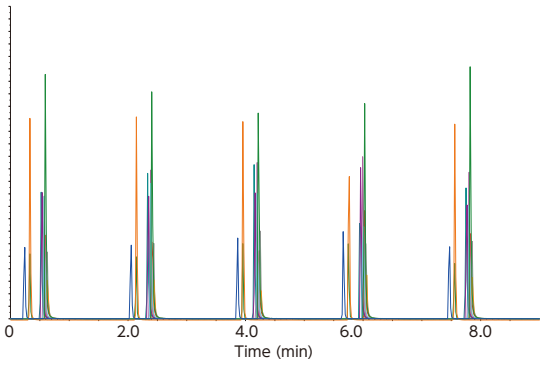
MonoSelect C18 for HTS

- **Base Material** : **High Purity Monolithic Silica Gel**
- **Functional Group** : **Octadecyl**
- **Max. Operating Pressure** : **40 MPa**
- **End-capping** : **Yes**
- **pH Range** : **2-7.5**
- **Max. Operating Temperature** : **70 ℃**
- **Carbon Loading** : **7 %**

MonoSelect C18 for HTS is based on monolithic silica technology. The very low flow resistance and excellent separation performances of this column are suitable for high-throughput screening (HTS). The metal-free hardware delivers sharp peaks when analyzing metal chelators. The particular structure of MonoSelect C18 prevents clogging and enhances the resistance for HTS.

Superior Repeatability During Continuous Injections

The following data were obtained through a continuous injection test of a sample containing 11 compounds. The superior repeatability of MonoSelect C18 for HTS, measured by comparing the peak areas obtained by each column, is attributed to fast equilibration.



Time of one analysis cycle:
1 min Analysis Time + 1 min Sample Injection Time (the stabilization is performed during this time) = 2 min

Time (min)	A (%)	B (%)
0.00	95	5
1.00	10	90

Conditions

Eluent : A) 0.1 % HCOOH in H_2O
B) 0.1 % HCOOH in CH_3CN
Flow Rate : 0.6mL/min
Col. Temp. : 40 °C
Detection : LC/MS/MS
Injection Vol. : 1 μL

① Acetaminophen
② Pindolol
③ Caffeine
④ Diphenhydramine
⑤ Doxepin
⑥ Desipramine
⑦ Trimipramine
⑧ Impramine
⑨ Amitriptyline
⑩ Chlorpromazine
⑪ Clomipramine

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	Ave.
MonoSelect C18 for HTS	2.21 %	2.76 %	8.89 %	4.64 %	6.51 %	8.39 %	3.22 %	4.97 %	3.17 %	4.00 %	4.66 %	4.86 %
Column A	16.00 %	13.10 %	13.70 %	11.00 %	7.31 %	7.25 %	5.80 %	6.81 %	6.64 %	4.88 %	7.56 %	9.10 %
Column B	6.61 %	6.45 %	9.02 %	3.36 %	6.49 %	7.86 %	7.44 %	7.62 %	6.98 %	6.80 %	8.96 %	7.05 %

Contact us for more detailed analytical conditions

MonoSelect C18 for HTS Holder Cartridge Kits

Item	Specifications	Cat.No.
10mm Holder Cartridge Kit	2.1 mm I.D. x 10 mm cartridge 1PC Holder for 10mm cartridge 1PC	5020-10810
20mm Holder Cartridge Kit	2.1 mm I.D. x 20 mm cartridge 1PC Holder for 20mm cartridge 1PC	5020-10811



10mm Holder Kit

MonoSelect C18 for HTS Cartridges

Item	I.D. (mm)	Length (mm)	Cat.No.	Qty.
MonoSelect C18 for HTS Cartridge	2.1	10	5020-10812	1 pc
		20	5020-10813	1 pc



20mm Holder Kit

MonoSelect C18 for HTS Holder

Item	Length of the Cartridge Applicable	Cat.No.	Qty.
MonoSelect C18 for HTS Holder	10 mm	5020-10814	1 pc
	20 mm	5020-10815	1 pc

MonoTower C18

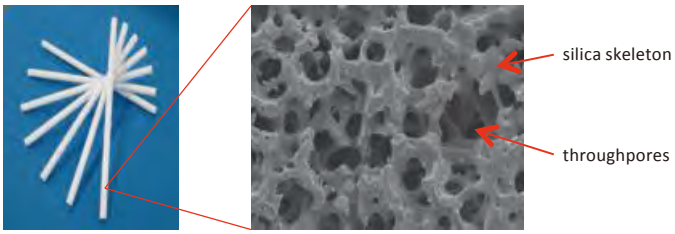
- **Base Material** : High Purity Monolithic Silica Gel
- **Through Pore Size** : 1 µm
- **Surface Area** : 340 m²/g
- **Pore Size** : 110 Å
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 18 %
- **Max. Operating Temperature** : 70 ℃
- **Max. Operating Pressure** : 40 MP
- **Column I. D.** : 3.0 mm
- **Cartridge Length** : 50, 100, 150 mm (Max 500 mm)
- **Holder Length** : 50, 100, 150, 250, 500 mm
- **pH Range** : 2-7.5



MonoTower C18 columns are a cartridge-type ODS column suitable for general-purpose HPLC. The cartridge of this column uses a silica monolith for HPLC. This columnar silica continuum (silica rod) has a double-throughpore structure with mesopores as the separation carriers. Therefore, it provides high resolution while maintaining a low column back pressure. Dedicated holders and cartridges are available in many sizes and can be freely combined.

Silica Monoliths

Silica monoliths consist of a co-continuous structure of silica skeleton throughpores. The pore size is controlled within the order of micrometers. Owing to the higher porosity than particle-filled silica gel, the pressure is not easily increased during pumping.
As micron-sized mesopores (pores) also exist within the silica framework, the surface area is equivalent to that of particle-filled types.

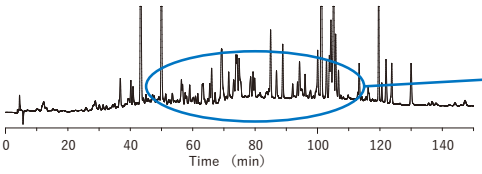


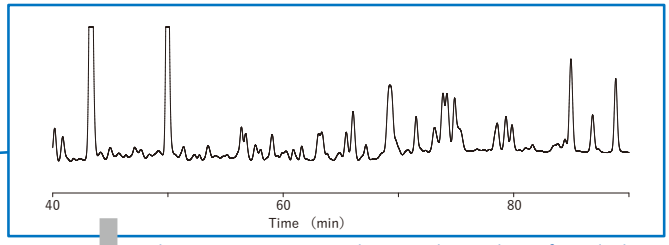
silica rod

Comparison of Separation Performance Wit Particle-packed Columns

MonoTower C18 and particle-packed columns were compared under identical conditions in a gradient-elution analysis of crude drug extracts.
A 500-mm-long MonoTower C18 achieved much higher separation performance than a 250-mm-long particle-packed column and a 500-mm-long column formed by connecting two such columns; specifically, the MonoTower C18 separated and detected many more peaks than the packed columns.

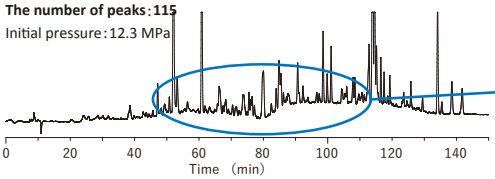
Particle filling ODS Column
(5 µm, 250 × 3.0 mm I.D.)
The number of peaks:113
Initial pressure:6.4 MPa

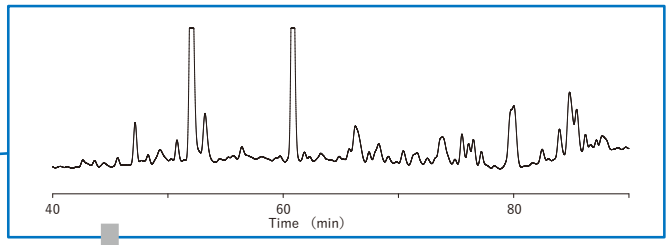




This separation pattern has not changed significantly, but only each peak shifted backwards overall.

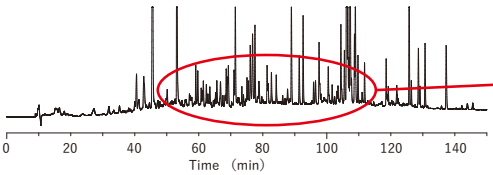
Particle filling ODS Column
(5 µm, 250 × 3.0 mm I.D) connected 2 pcs
The number of peaks:115
Initial pressure:12.3 MPa

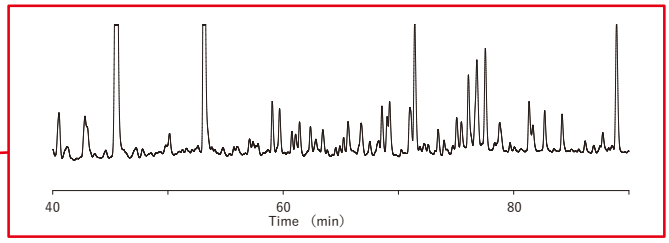




The separation performance has been greatly improved.

MonoTower
(500 × 3.0 mm I.D.)
The number of peaks:248
Initial peaks:19.2 MPa





Item	I.D. (mm)	Length(mm)	Cat.No.
MonoTower C18 Cartridge	3.0	50	5020-10860
		100	5020-10861
		150	5020-10862

* Two cartridge packings are included in each cartridge.
* Cartridges are shipped dry. They must be flushed with methanol or acetonitrile before use.



Holder

Item	I.D.(mm)	Length (mm)	Cat.No.
MonoTower holder	3.0	50	5020-10870
		100	5020-10871
		150	5020-10872
		250	5020-10873
		500	5020-10874

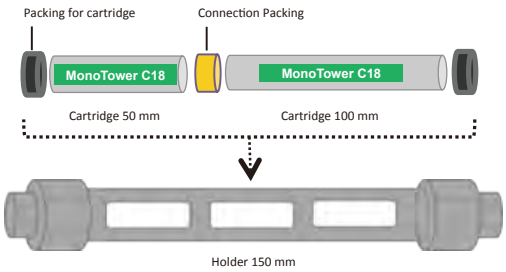
* The standard joint type is a Parker type (UP type).

Replacement Part

Item	Qty.	Cat.No.
Packing for cartridge	6	5020-10880
Connection Packing	3	5020-10881

How to use

To use MonoTower C18, place the cartridge in a special holder. Connect the cartridges with the packing and set them in the corresponding length holder.



Recommended Combinations

Holder	Cartridge
150 mm	50 + 100 mm
	150 mm
250 mm	100 + 150 mm
500 mm	50 + 150 + 150 + 150 mm

Some combinations of cartridges might not fit in the holder

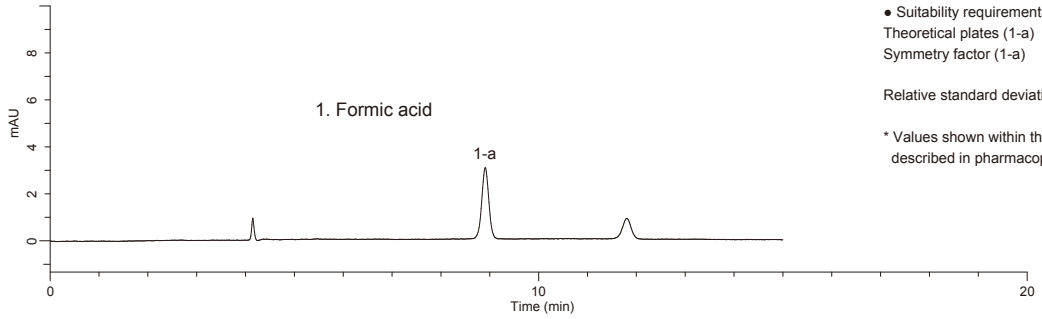
Holder	Cartridge	
150 mm →	50 mm × 3 pcs	} Impossible to connect
500 mm →	50 mm × 10 pcs	

InertSphere FA-1

- **Base Material** : **Styrene-Divinylbenzene Copolymer**
- **Particle Size** : **9 µm**
- **Functional Group** : **Sulfonate**
- **Counter Ion** : **H^+**
- **USP Code** : **L17**

InertSphere FA-1 is designed for organic acid analysis by bonding of sulfonic acid groups to a styrene divinylbenzene polymer base material.
Separations are performed mainly by ion -exclusion mode where the sulfonic acid groups ionically repel organic acids to provide an elution order relative to the pKa values of the analytes.
Combined with a post-column method using BTB, the effect of foreign components is greatly reduced and the organic acids were analyzed with good reproducibility.It can also be used in formic acid analysis in the purity test (7) for poppidone in the Japanese Pharmacopoeia.

Formic Acid

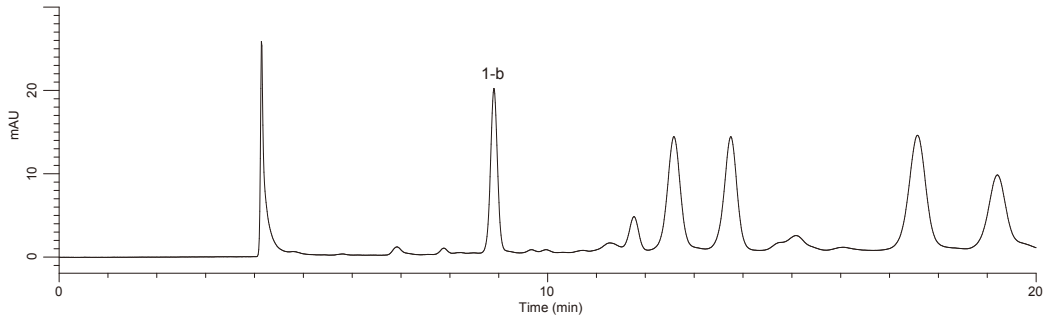


● Suitability requirements
Theoretical plates (1-a) : 17,902 (≧ 1,000)*
Symmetry factor (1-a) : (0.5 ≦)* 0.99(≦ 1.5)*

Relative standard deviation of peak area (1-a) (%)(n=6) : 0.61 (≦ 2.0)*

* Values shown within the brackets are the criteria described in pharmacopeia methods.

Povidone K15



Ordering Information

Particle Size (µm)	I.D. (mm)	Length (mm)	Cat.No.
9	7.8	300	5020-11003

Other Related Products

Glass Chromatography Column with Fritted Disc and PTFE Stopcock Plug

● Glass Chromatography Column with PTFE and Filter
8 mm I.D. x 200 mm Length
Cat.No. : 6010-23200

For Povidone, Purity Test, Sample Preparation, Packing Material

● Packing Material for Glass Chromatography Column
Strong acid ion-exchange resin
MCI GEL CK08P 100 mL
Particle Size : 75 - 150 µm
Counter ion : H^+
Cat.No. : 5055-79540

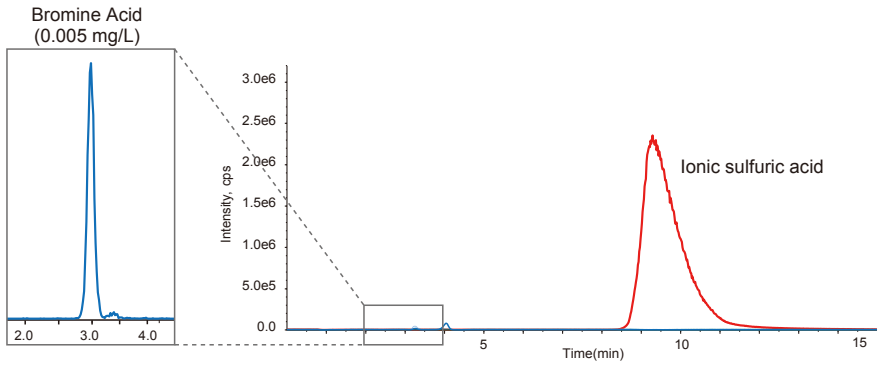

ODS-3V 5µm
4.6 x 150 mm (UP)
ODS-3V 5µm
4.6 x 250 mm (UP)

SYPRON AX-1

- **Base Material** : **Methacrylate Polymer**
- **Particle Size** : **5 µm**
- **Functional Group** : **Quaternary Ammonium**
- **pH Range** : **2 - 12**
- **Recommended operating pH range** : **3 - 7**

SYPRON AX-1 is a cation exchange column, in which quaternary ammonium bonds to hydrophilic polymer. Being designed to maximize the performance of LC/MS, it improves the separation efficiency of compounds, especially of bromate in tap-water analysis.

Analysis of Bromine in Tap Water



Conditions

Column Size	:	SYPRON AX-1(5 µm, 100 × 2.1 mm I.D.)
Eluent	:	A) 25 mM CH_3COONH_4 in H_2O
		B) CH_3CN
		A/B=70/30, v/v
Flow Rate	:	0.2 mL/min
Injection Vol.	:	10 µL
Col. Temp.	:	40 °C
Detection	:	LC/MS/MS (ESI, Negative, SRM)

Analytical Columns

Particle size	I.D. (mm)	Length (mm)	Material (Watted Part)	Cat.No.
5 µm	2.1	100	SUS	5020-11002
	2.1	150		5020-11008
	3.0	100		5020-11011
	2.1	100	PEEK	5020-11009
	2.1	150		5020-11010

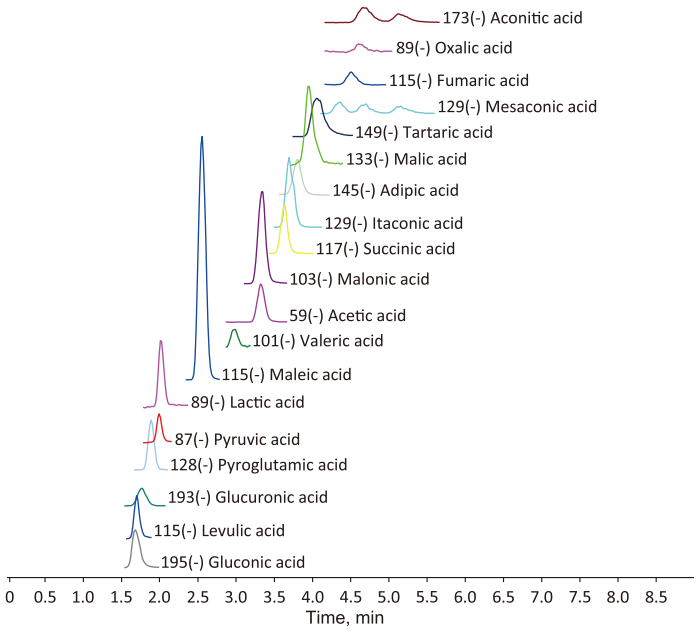
Cartridge Guard Column E

Item	I.D. (mm)	Length (mm)	Cat.No.
SYPRON AX-1 Replacement Cartridge (2 pcs)	2.1	10	5020-08641
	3.0	10	5020-08643
SYPRON Guard Holder			5020-08640

SYPRON AX-2

- **Base Material** : **Methacrylate Polymer**
- **Particle Size** : **5 µm**
- **Functional Group** : **Quaternary Ammonium**
- **pH Range** : **2 - 12**
- **Recommended Operation pH Range** : **3 - 7**

SYPRON AX-2 columns perform well on salt gradient analysis using anion-exchange mode with mass chromatography. It can achieve a rapid column equilibration time in the salt-gradient method, which is beneficial for organic acid analysis. As SYPRON AX-2 is an ion-exchange column, it enhances the retention of dicarboxylic acid, which is usually weakly retained in reversed-phase mode or ion-exclusion chromatography.



Conditions

Column : SYPRON AX-2 (5 µm, 150 x 2.1 mm I.D.)
Eluent : A) H_2O/CH_3CN=50/50, v/v
B) 100 mM $HCOONH_4$ in H_2O/CH_3CN=50/50,v/v
A/B = 90/10 – 5 min – 50/50 – 0.1 min – 90/10, v/v (total 9 min)
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : LC/MS (ESI, Negative, SRM)
Injection : 10 µL

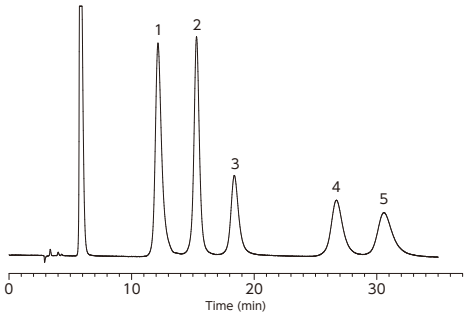
Particle size	I.D. (mm)	Length (mm)	Material (Watted Part)	Cat. No.
5 µm	2.1	100	PEEK	5020-11006
		150	PEEK	5020-11007

InertSphere Sugar-1

- **Base Material** : **Styrene Divinylbenzene Copolymer**
- **Particle size** : **5 µm**
- **Exchange capacity** : **0.7 meq/g**
- **Organic solvent resist** : **0 - 100 % (Methanol only)**
- **Functional Group** : **Quaternary Alkylamine**
- **pH Range** : **2 - 14**
- **Max Pressure** : **15 MPa**

InertSphere Sugar-1 is a suitable anion-exchange column for sugar analysis. It is packed with a quaternary ammonium group binding polymer and allows sensitive sugar analysis with an electrochemical detector (ED743). InertSphere Sugar-1 is especially suitable for monosaccharide and disaccharide analysis. Note: This analysis requires a solvent bottle with a CO_2 trap cartridge to avoid dissolution of carbonate ions in the solvent. The CO_2 trap cartridge contains hazardous materials requiring special freight handling at additional cost.

Figure 1 : Examples of Analysis of Monosaccharides and Disaccharides



Conditions

Column	: InertSphere Sugar-1 (5 µm, 150 × 4.6 mm I.D.)
Eluent	: 100 mM NaOH
Flow Rate	: 0.5 mL/min
Col. Temp.	: 25 °C
Detection	: ECD (Gold with Ag/AgCl ref.)
Injection Vol.	: 10 µL
Sample	: 1. Fucose
	2. Glucose
	3. Fructose
	4. Lactose
	5. Sucrose
	(10 mg/L each)

Analytical Column

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

Cartridge Guard Column E

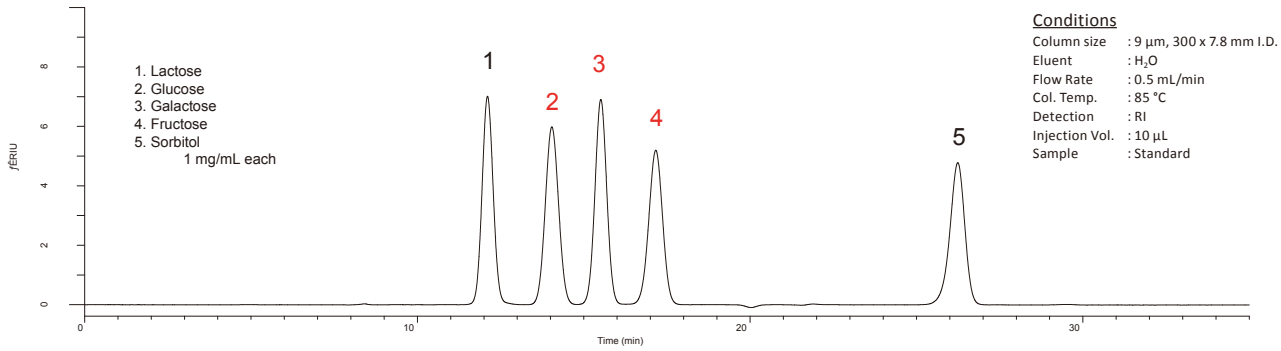
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Cat.No.	Cat.No.
4.6	10	4.0	5020-19048	5020-19098

InertSphere Sugar-2

- **Base Material** : **Styrene-divinyl Polymer**
- **Particle Size** : **9 µm**
- **Functional Group** : **Sulfo**
- **Counter Ion** : **Ca^{2+}**
- **Carbon Load** : **8 %**
- **USP Code** : **L19**

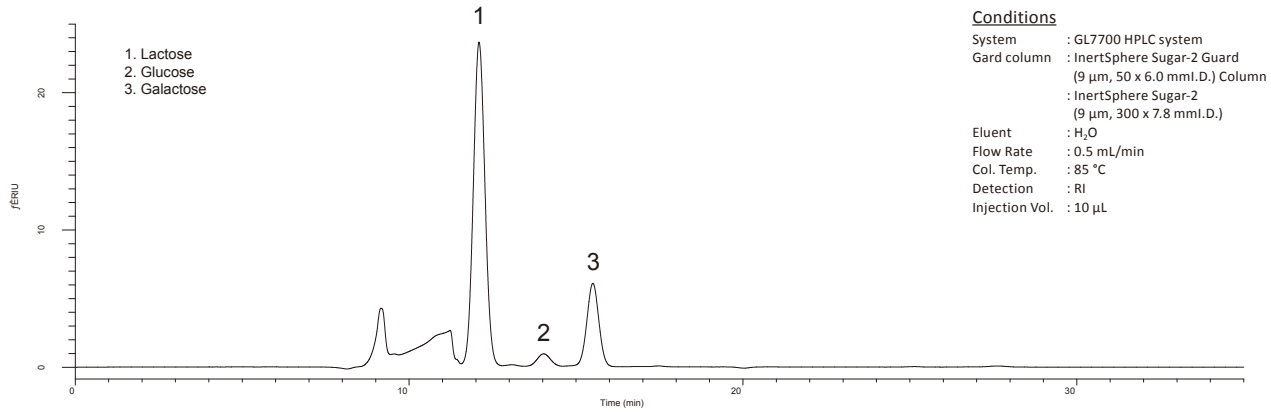
InertSpherer Sugar-2 is packed with Ca^{2+}-loaded resin for sugar analyses. This column is mainly used in SEC mode. The molecules are eluted in order of their molecular weights (large to small). In ligand-exchange mode, ion interactions between the metal ions and hydroxyl groups form a complex with the counter ion. This mode is especially effective for analyses of sugars and alcohols. Preparation of a mixed solvent is not required because 100% water can be used as the eluent.

Figure 1 : Sugar (Standard Solution)



InertSphere Sugar-2 separate Glucose, Galactose and Sorbitol which are difficult to be separated by NH_2 columns.

Figure 2 : Analysis of Plain Yogurt



Analytical Column

Particle Size (µm)	Column I.D. (mm)	Column Length (mm)	Cat. No.
9	7.8	300	5020-11000

Guard Column

Particle Size (µm)	Column I.D. (mm)	Column Length (mm)	Cat. No.
9	6	50	5020-10999

Application Specific Columns

Inertsil Sulfa C18

- **Base Material** : 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
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1

Inertsil Sulfa C18 is suitable for simultaneous determination of sulfa drugs and synthetic antimicrobial agents listed in the Food Sanitation Inspection Guidelines. With the problem of veterinary drug residues in livestock and marine products, the development of analytical methods that can reliably quantify synthetic antimicrobial agents (e.g., sulfa drugs) is important. The data obtained from the determination of synthetic antimicrobial agent using different filler lots is attached.

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
	150	5020-07505	5020-07515	5020-07525	5020-07535
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-07545	5020-07555	5020-07565	5020-07575
	250	5020-07546	5020-07556	5020-07566	5020-07576

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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

Inertsil Acrolein C18

- **Base Material** : 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
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 9 %
- **USP Code** : L1
- **pH Range** : 2~7.5

Inertsil Acrolein C18 is an HPLC column that is capable of separating acetone and acrolein converted to DNPH in a short time and under simple mobile phase conditions (acetonitrile, and water mixtures).

Analytical Column

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

Delay column for PFAS

- **Maximum Operating Pressure : 80 MPa**
- **Packing : High-Purity Activated Carbon**
- **Dimensions : 30 mm × 3.0 mm I.D.**



Delay Column for PFAS is packed with high-purity activated carbon, which retain contaminants originating from the mobile phase or the LC system. The elution of the retained contaminants is delayed and thus the effects of the contaminants on the analysis are reduced. The columns are quite useful for PFAS (Per- and Polyfluoroalkyl Substances) analysis on LC/MS.

Item	I.D. (mm)	Length (mm)	Qty.	Cat.No.
Delay Column for PFAS	3.0	30	1pc	5020-90005

Corresponding to Pharmacopeia (JP, USP, EP) Columns

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

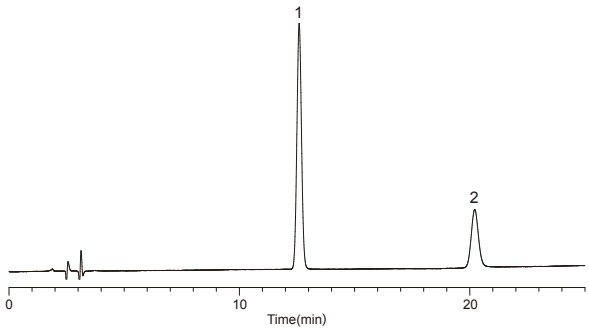
3 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	2.1	50	Inertsil WP300 C18	5020-41100
		150	Inertsil WP300 C18	5020-41101
	3.0	150	Inertsil WP300 C18	5020-41102
	3.9	100	Inertsil ODS-3	5020-89604
		100	Inertsil ODS-4	5020-89605
	4.6	33	Inertsil ODS-SP	5020-87035
		50	Inertsil WP300 C18	5020-41103
		150	Inertsil WP300 C18	5020-41104
		250	Inertsil WP300 C18	5020-41105
SIL	2.1	100	Inertsil WP300 SIL	5020-87047

5 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	3.9	150	InertSustain C18	5020-87030
			Inertsil ODS-4	5020-87023
			Inertsil ODS-3	5020-87008
			Inertsil WP300 C18	5020-87045
		300	InertSustain C18	5020-87031
			Inertsil ODS-4	5020-87024
			Inertsil ODS-3	5020-87009
	4.0	100	Inertsil ODS-2	5020-01120
		125	Inertsil ODS-SP	5020-87043
			Inertsil WP300 C18	5020-87037
		300	InertSustain C18	5020-87032
			Inertsil ODS-4	5020-87025
			Inertsil ODS-3	5020-87010
	4.6	300	InertSustain C18	5020-87033
			Inertsil ODS-4	5020-87026
			Inertsil ODS-3	5020-87011
	6.0	300	InertSustain C18	5020-89603
			Inertsil ODS-4	5020-89609
C8	3.0	60	Inertsil C8	5020-87000
	3.9	150	InertSustain C8	5020-87028
			Inertsil C8-4	5020-87021
			Inertsil C8-3	5020-87005
	4.0	80	Inertsil C8-4	5020-87022
Phenyl	3.0	100	Inertsil Ph	5020-89601
NH_2	4.6	125	Inertsil NH2	5020-89602
Pre-column	4.0	25	InertSustain C18	5020-03399
			InertSustain C8	5020-87040

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) CH.CN B) H.O A/B = 1/9, v/v
Flow Rate	:	1.0 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 235 nm
Injection Vol.	:	50 µL

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

Corresponding to Pharmacopeia (JP, USP, EP) Columns

7 µm Particle Size HPLC Columns

Packing Material	I.D. (mm)	Length (mm)	Description	Cat. No.
C18 (ODS)	4.0	250	Inertsil ODS-3	5020-87012
		300	Inertsil ODS-3	5020-87013
	4.6	120	Inertsil ODS-3	5020-87041
		125	Inertsil ODS-3	5020-87038
		250	Inertsil ODS-3	5020-87014
		300	Inertsil ODS-3	5020-87015
NH_2	4.6	125	Inertsil NH2	5020-87044

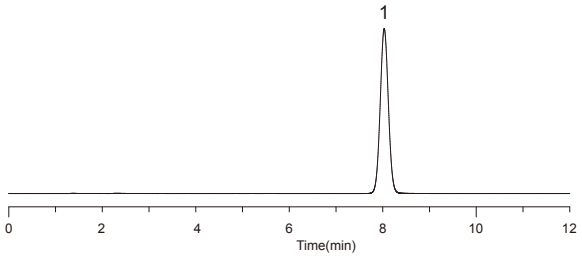
10 µm Particle Size HPLC Columns

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

Other Particle Size HPLC Columns

Particle Size	I.D. (mm)	Length (mm)	Description	Cat. No.
3.5 µm	3.0	150	Inertsil WP300 C18	5020-87034
	4.6	100	Inertsil C8-3	5020-87042
4 µm	3.9	150	Inertsil WP300 C18	5020-89606
	4.0	150	Inertsil WP300 C18	5020-89607
	4.6	150	Inertsil ODS-4	5020-89608

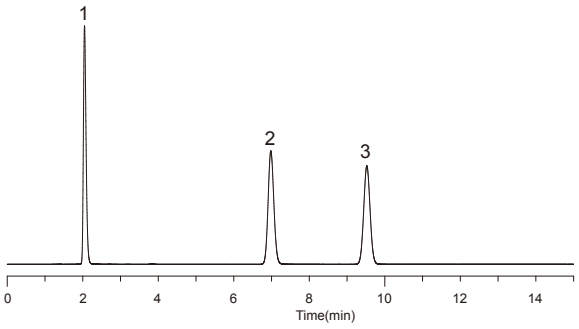
Figure 2: Voriconazole



Conditions

Column : Inertsil WP300 C18 (4 µm, 150 × 3.9 mm I.D.)
Eluent : A) CH.CN
B) CH.OH
C) Buffer*
A/B/C = 15/30/55, v/v/v
Flow Rate : 1.06 mL/min
Col. Temp. : 35 °C
Detection : UV 256 nm
Injection Vol. : 20 µL
Sample : 1. Voriconazole (25 mg/L)
*Dissolve 1.9 g of ammonium formate in 1000 mL of water.
Adjust pH 4.0 by formic acid.

Figure 3: Candesartan • Hydrochlorothiazide



Conditions

Column : Inertsil ODS-4 (4 µm, 150 × 4.6 mm I.D.)
Eluent : A) CH.CN
B) Buffer*
A/B = 11/9, v/v
Flow Rate : 0.98 mL/min
Col. Temp. : 25 °C
Detection : UV 254 nm
Injection Vol. : 10 µL

Sample:
1. Hydrochlorothiazide (62 mg/L)
2. Candesartan cilexetil (40 mg/L)
3. Benzophenone (10 mg/L)

*Dissolve 7.80 g of sodium dihydrogenphosphate dihydrate in 900 mL of water.
Adjust pH 5.5 by sodium hydroxide.
Add water to make 1,000 mL.

Inertsil TMS

- **Particle Size : 5 µm**
- **Surface Area : 450 m² /g**
- **Surface Area : 100 Å(10 nm)**
- **Functional Group : Trimethylsilyl**
- **End-capping : None**
- **Carbon Loading : 4 %**
- **pH Range : 2 - 7.5**
- **USP Code : L13**

Particle Size: 5 µm	Length(mm)	I.D. ((mm)	Cat.No.
	250	4.6	5020-18161

MonoSelect nPEC

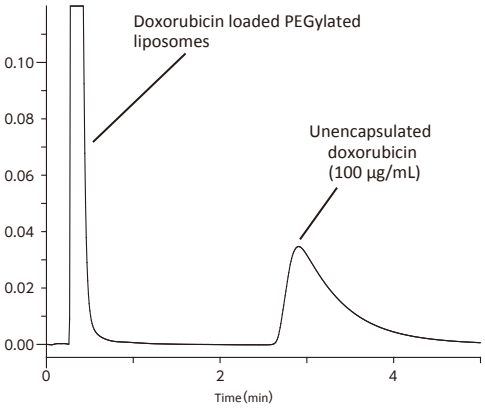
- **Base Material** : **Highly pure monolithic silica**
- **Through-pore size** : **1 µm**
- **Meso-pore size** : **110 Å (11 nm)**
- **Surface Area** : **340 m²/g**
- **Functional Group** : **Octadecyl**
- **Max. Operating Temperatur** : **50 ℃**
- **Max. Operating Pressure** : **40 MPa (400 bar)**
- **pH range** : **2 -7.5**

MonoSelect nPEC is a HPLC column capable of separating nanoparticles and free small-molecule compounds in a short time by Nanoparticle Exclusion Chromatography (nPEC) method.

Feature

- Compared with the method using ultracentrifugation, EE can be measured in a shorter time, so it is also suitable for IPC in the investigation stage of the manufacturing method of the drug product.
- The process of dilution and preparing the supernatant can be omitted, thus reducing human errors.

▪ A Representative Chromatogram



Conditions

Column	: MonoSelect nPEC (50 × 3.0 mm I.D.)
Eluent	: A) 50 mM Na_2SO_4 in 20 mM Acetate Buffer (pH4.6)
	B) CH_3OH
	A/B = 95/5, v/v
Flow Rate	: 1.0 mL/min
Column Temp.	: 30 ℃
Detection	: 254 nm
Injection Vol	: 5 µL

*This product is developed in collaboration with Dr. Kato, School of Pharmacy, Showa University, and Eisai Co., Ltd.

MonoSelect nPEC set (Holder+Cartridge)

Item	I.D. (mm)	Length(mm)	Cat.No.
MonoSelect nPEC sets	3.0	50	5020-10816

*Two packing for cartridges are attached to the cartridge.



MonoSelect nPEC Cartridge

Item	I.D. (mm)	Length	Cat.No.
MonoSelect nPEC Cartridge	3.0	50	5020-10817

*Two packing for cartridges are attached to the cartridge.



Cartridge

Item	Qty.	Cat.No.
MonoSelect nPEC Packing	6 pcs	5020-10880



MonoSelect RP-mAb

- **Base Material** : **Highly pure monolithic silica**
- **Through-pore size** : **1 µm**
- **Meso-pore size** : **60 nm**
- **Surface Area** : **50 m²/g**
- **Functional Group** : **Phenyl Group**
- **Max. Operating Temperature** : **80 ℃**
- **Max. Operating Pressure** : **40 MPa (400 bar)**
- **pH range** : **2 -7.5**

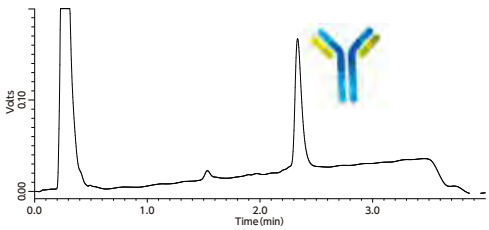
MonoSlect RP-mAb is a HPLC column Specialized for Monoclonal Antibody Analysis. Monolithic silica consists of co-continuous through- pores and skeletons which have mesopores. The large surface area and high permeability of this structure enables “strong retentivity and low pressure”. Broad peaks are obtained with conventional HPLC columns when the analytes are huge proteins larger than 10 nm such as antibodies. ”Sharp peaks of mAb” can be obtained with MonoSelect RP-mAb because the mesopores are designed to be 60 nm, which is suitable for mAb analysis.

Feature

- Applicability to Rapid Analysis Needed for Multisample Analysis
- Highly Sensitive Analysis Even with Low Concentration amples
- Available for Subunit Analysis

▪ Representative Chromatogram

Before Reduction

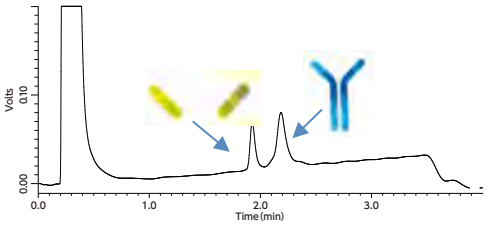


Reduction process

Conditions

Eluent	: A) 0.075 % HCOOH + 0.025 % TFA in H_2O
	B) 0.075 % HCOOH + 0.025 % TFA in CH_3CN
	A/B = 80/20-(5min)-40/60,v/v
Flow Rate	: 0.3 mL/min
Column Temp.	: 80 °C
Detection	: 214 nm
Injection Vol	: 10 µL

After Reduction



Papain digestion process

Conditions

Eluent	: A) 0.075 % HCOOH + 0.025 % TFA in H_2O
	B) 0.075 % HCOOH + 0.025 % TFA in CH_3CN
	A/B =85/15-(5min)-60/40,v/v
Flow Rate	: 0.3 mL/min
Column Temp.	: 80 °C
Detection	: 214 nm
Injection Vol	: 10 µL

MonoSelect RP-mAb set (Holder+Cartridge)

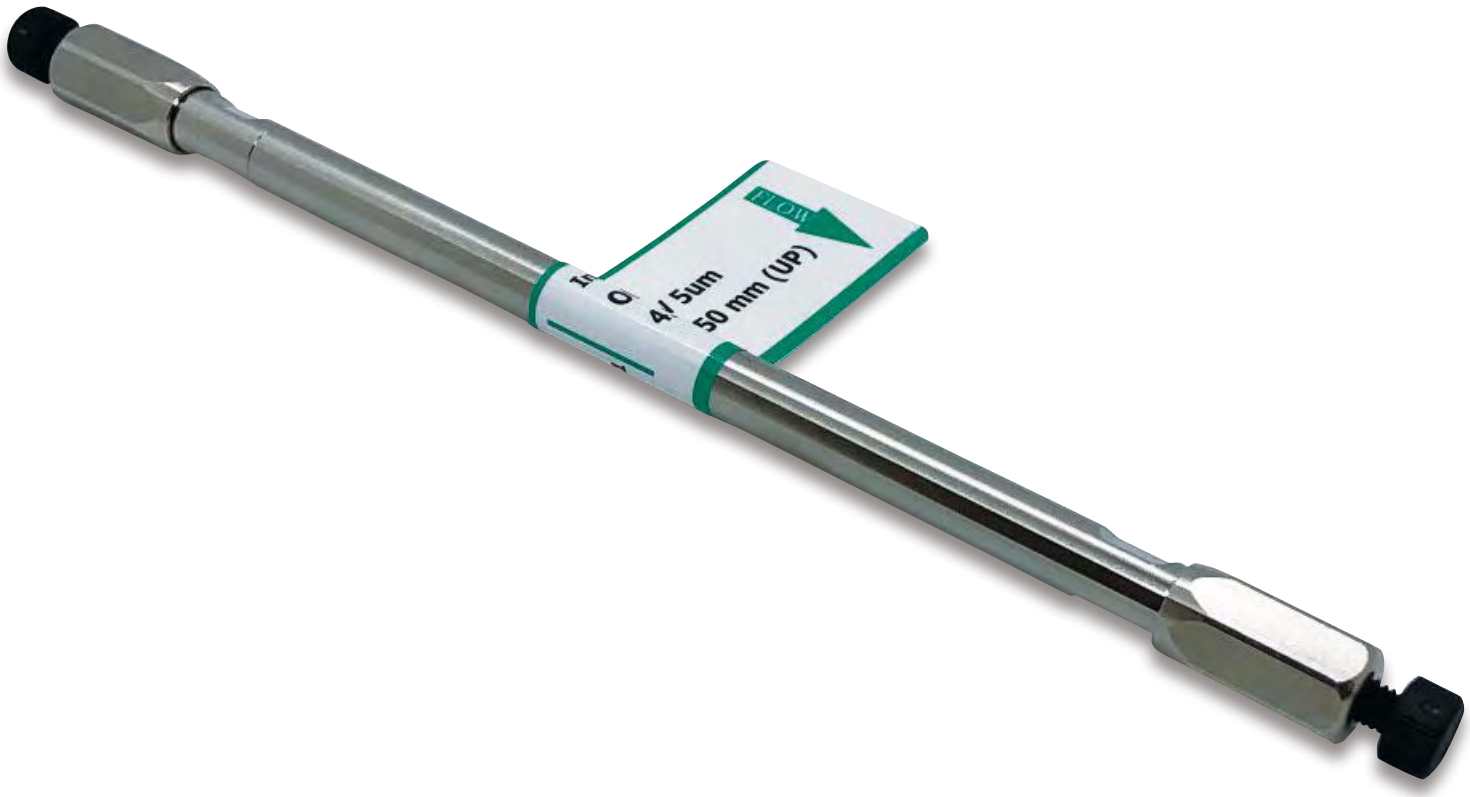
Item	I.D. (mm)	Length(mm)	Cat.No.
MonoSelect RP-mAb Holder Set	2.1	20	5020-10818

MonoSelect RP-mAb Cartridge

Item	I.D. (mm)	Length(mm)	Cat.No.
MonoSelect RP-mAb Cartridge	2.1	20	5020-10819

Cartridge

Item	Length of the Cartridge Applicable	Cat.No.
MonoSelect Cartridge Holder	20mm	5020-10815


FLOW
4/ 5um
50 mm (UP)

Guard Columns

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- Cartridge Guard Column E 121
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- Guard Columns for UHPLC 124
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How to Select a Guard Column

Guard columns are installed between the injector and the analytical column. They are primarily used to protect the analytical column.
There are two types of guard column shapes including cartridge replacement and filling types.The cartridge replacement type can be used by setting the cartridge guard column inside a dedicated holder.
This is recommended for those who want to replace guard columns frequently. Only the cartridge guard column inside can be replaced.
(Note: Dedicated holders vary depending on the type of guard column. The respective holders are not interchangeable.)
The packed type is packed in a stainless steel tube that is similar to an analytical column.

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

How to Select a Packing Material

We recommend that the type of packing material used in the guard column is the same as the analytical column.
However, SILFILTER STD C18 can be used if an ODS packing material is used in the analytical column.



Pre-column Coupler W (PCTFE)

How to Select Dimensions

Particle size: We recommended to select the same particle size as the packing material in the analytical column. I.D.: Select the I.D. of the guard column that corresponds to the I.D. of the analytical column.
Length: A short guard column is typically recommended. A longer size is recommended if there are many contaminants and the guard column is replaced frequently.



Pre-column Coupler SUS

How to Connect to an Analytical Column

When connecting a guard column to an analytical column, it is required to connect separately the other components (e.g., piping and connectors).
Pre-column couplers and other connecting parts are available.



Column Coupler for UHPLC

Cartridge Guard Column E



Cartridge Guard Column E

Cartridge guard column E is a type of guard column that is used by setting a cartridge guard column inside a dedicated holder. Since only the cartridge guard column inside can be replaced, it is recommended for those who need to replace the guard column frequently.
Cartridge Guard Column E is available for each of the analytical column fillers.

Line-up list

InertSustain C18

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			Cartridge E Holder/Cartridge Set (2 Cartridge E Guard Column & Holder)		
			Particle Size			Particle Size		
			3 µm	5 µm	10 µm	3 µm	5 µm	10 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	5020-90626	5020-19100	5020-19099	5020-90627
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	5020-90628	5020-19500	5020-19499	5020-90629

InertSustain AQ-C18

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-89910	5020-89808	5020-89911	5020-89809
1.5, 2.1		1.5	5020-89912	5020-89810	5020-89913	5020-89811
2.1, 3.0		3.0	5020-89908	5020-89806	5020-89909	5020-89807
4.0, 4.6		4.0	5020-89906	5020-89804	5020-89907	5020-89805
2.1, 3.0	20	3.0	5020-89916	5020-89814	5020-89917	5020-89815
4.0, 4.6		4.0	5020-89914	5020-89812	5020-89915	5020-89813

Inertsil ODS-3

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)			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-HL

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 pcs)		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	5020-87305	5020-87209	5020-87306	5020-87210
1.5, 2.1		1.5	5020-87307	5020-87211	5020-87308	5020-87212
2.1, 3.0		3.0	5020-87303	5020-87207	5020-87304	5020-87208
4.0, 4.6		4.0	5020-87301	5020-87205	5020-87302	5020-87206
2.1, 3.0	20	3.0	5020-87311	5020-87215	5020-87312	5020-87216
4.0, 4.6		4.0	5020-87309	5020-87213	5020-87310	5020-87214

Cartridge Guard Column Ei (Non-metal type)



Cartridge Guard Column Ei (Non-metal type)

Cartridge Guard Column Ei is a guard column that uses PEEK material for the wetted parts of the dedicated holder, allowing metal-free analysis.
Recommended for use where contact with a metal needs to be avoided.
* "Cartridge Guard Column Ei Set" is a combination of 2 cartridges Ei and 1 holder.

InertSustain C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19849	5020-19899
3.0	3.0	5020-19749	5020-19799

InertSustainSwift C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88117	5020-88118
3.0	3.0	5020-88115	5020-88116

Inertsil ODS-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19801	5020-19851
3.0	3.0	5020-19701	5020-19751

Inertsil ODS-2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	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

Inertsil ODS-P

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	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

InertSustain C8

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16118	5020-16119
3.0	3.0	5020-16116	5020-16117

Holder for Cartridge Guard Column Ei

Length	Qty	Cat. No.
10 mm	1 pcs	5020-08650

InertSustain AQ-C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-89818	5020-89819
3.0	3.0	5020-89816	5020-89817

Inertsil ODS-HL

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-87219	5020-87220
3.0	3.0	5020-87217	5020-87218

Inertsil ODS-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19803	5020-19853
3.0	3.0	5020-19703	5020-19753

Inertsil ODS-SP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	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

Inertsil ODS-EP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	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

InertSustainSwift C8

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88419	5020-88420
3.0	3.0	5020-88417	5020-88418

Inertsil C8-4

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19846	5020-19896
3.0	3.0	5020-19746	5020-19796

InertSustain Phenylhexyl

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-89117	5020-89118
3.0	3.0	5020-89115	5020-89116

Inertsil Ph-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19816	5020-19866
3.0	3.0	5020-19716	5020-19766

Inertsil CN-3

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19818	5020-19868
3.0	3.0	5020-19718	5020-19768

InertSustain Amide

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-88719	5020-88720
3.0	3.0	5020-88717	5020-88718

Inertsil HILIC

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19824	5020-19874
3.0	3.0	5020-19724	5020-19774

Inertsil NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19820	5020-19870
3.0	3.0	5020-19720	5020-19770

Inertsil SIL-100A

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19826	5020-19876
3.0	3.0	5020-19726	5020-19776

InertSustain PFP

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-87817	5020-87818
3.0	3.0	5020-87815	5020-87816

InertSustain Phenyl

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16418	5020-16419
3.0	3.0	5020-16416	5020-16417

InertSustain Cyano

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	1.5	5020-89367	5020-89368
3.0	3.0	5020-89365	5020-89366

Inertsil WP300 C18

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19828	5020-19878
3.0	3.0	5020-19728	5020-19778

InertSustain NH2

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-16718	5020-16719
3.0	3.0	5020-16716	5020-16717

Inertsil Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19822	5020-19872
3.0	3.0	5020-19722	5020-19772

Inertsil WP300 Diol

I.D. of the Analytical Column Applicable (mm)	I.D. (mm)	Replacement Cartridge Ei Guard Column (2 pcs)	Cartridge Ei Holder/ Cartridge Set (2 Cartridge Ei Guard Column & Holder)
		Particle Size	Particle Size
		5 µm	5 µm
2.1	2.1	5020-19831	5020-19881
3.0	3.0	5020-19731	5020-19781

Guard Columns for UHPLC



Holder for UHPLC Guard Column

Replacement Cartridge Guard Column

Guard Columns for UHPLC are high pressure (80 MPa) guard columns that can be used to protect particulate-packed columns during high-speed analysis.
Cartridge-type guard columns with replaceable contents. are available. Tubing is pre-fixed on the column connection side of the holder in order to minimize dead volume.
If you want to minimize the volume of the guard column in high-throughput analysis, a guard column for UHPLC with an inner diameter of 1.5 mm is also effective.

InertSustain C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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

InertSustain AQ-C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 µm	Particle Size 3 µm	Particle Size 1.9 µm	Particle Size 3 µm
10	1.5	5020-89944	5020-89824	5020-89947	5020-89827
	2.1	5020-89945	5020-89825	5020-89948	5020-89828
	3.0	5020-89946	5020-89826	5020-89949	5020-89829

InertSustainSwift C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 µm	Particle Size 3 µm	Particle Size 1.9 µm	Particle Size 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

InertSustain AX-C18

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-91084	5020-91087
	2.1	5020-91085	5020-91088
	3.0	5020-91086	5020-91089

Inertsil ODS-HL

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-87333	5020-87336
	2.1	5020-87334	5020-87337
	3.0	5020-87335	5020-87338

Inertsil ODS-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) 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 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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

InertSustainSwift C8

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 1.9 µm	Particle Size 3 µm	Particle Size 1.9 µm	Particle Size 3 µm
10	1.5	5020-88539	5020-88527	5020-88542	5020-88530
	2.1	5020-88540	5020-88528	5020-88543	5020-88531
	3.0	5020-88541	5020-88529	5020-88544	5020-88532

Inertsil C8-4

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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 PFP

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-87821	5020-87824
	2.1	5020-87822	5020-87825
	3.0	5020-87823	5020-87826

InertSustain Phenylhexyl

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 3 µm	Particle Size 3 µm
10	1.5	5020-89227	5020-89230
	2.1	5020-89228	5020-89231
	3.0	5020-89229	5020-89232

InertSustain Phenyl

Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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 pcs)		Cartridge Guard Column (2 pcs) + Holder (1 pcs) set	
		Particle Size 2 µm	Particle Size 3 µm	Particle Size 2 µm	Particle Size 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

InertSustain Amide

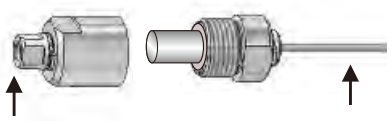
Length (mm)	I.D. (mm)	Replacement Cartridge Guard Column (2 pcs)	Cartridge Guard Column (2 pcs) + Holder (1 pcs) set
		Particle Size 1.9 µm	Particle Size 1.9 µm
10	1.5	5020-88825	5020-88828
	2.1	5020-88826	5020-88829
	3.0	5020-88827	5020-88830

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 mmI.D. × 30 mm length.

Installation



Outlet side of the injector
1/16 inch Female (No.10-32UNF)
Tubing tip length is 2.4 mm.

Column side
Purchase a proper joint.

GL Cart



GL Cart

GL cart guard columns are designed as low-cost columns to protect your expensive analytical column. The dimensions of GL Cart are 5 mm (length) × 4.6 mm (I.D.), compatible with I.D. 4.0 and 4.6 mm analytical columns.

Packing Material	Particle size (µm)	Cartridge guard column GL Cart 10 pcs (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
InertSustain AQ-C18	3	5020-89918	5020-89919
	5	5020-89822	5020-89823
InertSustainSwift C18	3	5020-88207	5020-88208
	5	5020-88121	5020-88122
InertSustain AX-C18	3	5020-91082	5020-91083
	5	5020-91035	5020-91036
Inertsil ODS-HL	3	5020-87313	5020-87314
	5	5020-87223	5020-87224
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
InertSustainSwift C8	3	5020-88513	5020-88514
	5	5020-88423	5020-88424
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 PFP	3	5020-87915	5020-87916
	5	5020-87819	5020-87820
InertSustain Phenylhexyl	3	5020-89207	5020-89208
	5	5020-89121	5020-89122
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
InertSustain Cyano	3	5020-89457	5020-89458
	5	5020-89371	5020-89372
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
InertSustain Amide	3	5020-88813	5020-88814
	5	5020-88723	5020-88724
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

Packed Guard Columns, Packed Mini Guard Columns



Packed Guard Column



Packed Mini Guard Column

The packed and mini guard columns differ in their cartridge type. They are packed under high pressure and can sustain the analytical
column's performance.
The packed guard column is 33 or 50 mm long and the mini guard column is 10 mm long.

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	10 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	5020-90631
	4.6	5020-04196	5020-04195	5020-03296	5020-03295	5020-90630
InertSustain AQ-C18	1.0	5020-89886	5020-89756	5020-89884	5020-89754	–
	1.5	5020-89885	5020-89755	5020-89883	5020-89753	–
	2.1	5020-89870	5020-89740	5020-89865	5020-89735	–
	3.0	5020-89869	5020-89739	5020-89864	5020-89734	–
	4.0	5020-89868	5020-89738	5020-89863	5020-89733	–
	4.6	5020-89867	5020-89737	5020-89862	5020-89732	–
InertSustainSwift C18	1.0	5020-88175	5020-88053	5020-88173	5020-88051	–
	1.5	5020-88174	5020-88052	5020-88172	5020-88050	–
	2.1	5020-88159	5020-88037	5020-88154	5020-88032	–
	3.0	5020-88158	5020-88036	5020-88153	5020-88031	–
	4.0	5020-88157	5020-88035	5020-88152	5020-88030	–
	4.6	5020-88156	5020-88034	5020-88151	5020-88029	–
InertSustain AX-C18	2.1	5020-91071	5020-91024	5020-91066	5020-91019	–
	3.0	5020-91070	5020-91023	5020-91065	5020-91018	–
	4.0	5020-91069	5020-91022	5020-91064	5020-91017	–
	4.6	5020-91068	5020-91021	5020-91063	5020-91016	–
Inertsil ODS-HL	1.0	5020-87281	5020-87157	5020-87279	5020-87155	–
	1.5	5020-87280	5020-87156	5020-87278	5020-87154	–
	2.1	5020-87265	5020-87141	5020-87260	5020-87136	–
	3.0	5020-87264	5020-87140	5020-87259	5020-87135	–
	4.0	5020-87263	5020-87139	5020-87258	5020-87134	–
	4.6	5020-87262	5020-87138	5020-87257	5020-87133	–
Inertsil ODS-4	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	–
	4.0	5020-04252	5020-04251	5020-03352	5020-03351	–
	4.6	5020-04152	5020-04151	5020-03252	5020-03251	–
Inertsil ODS-3	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	–
	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	–
Inertsil ODS-2	1.0	–	5020-15985	–	5020-15885	–
	1.5	–	5020-15935	–	5020-15835	–
	2.1	–	5020-04885	–	5020-03585	–
	3.0	–	5020-04485	–	5020-03485	–
	4.0	–	5020-04285	–	5020-03385	–
	4.6	–	5020-04185	–	5020-03285	–
Inertsil ODS-SP	1.0	5020-15957	5020-15956	5020-15857	5020-15856	–
	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	–

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 ODS-P	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
Inertsil ODS-EP	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
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
InertSustainSwift C8	1.0	5020-88481	5020-88357	5020-88479	5020-88355
	1.5	5020-88480	5020-88356	5020-88478	5020-88354
	2.1	5020-88465	5020-88341	5020-88460	5020-88336
	3.0	5020-88464	5020-88340	5020-88459	5020-88335
	4.0	5020-88463	5020-88339	5020-88458	5020-88334
	4.6	5020-88462	5020-88338	5020-88457	5020-88333
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 PFP	1.0	5020-87883	5020-87756	5020-87881	5020-87754
	1.5	5020-87882	5020-87755	5020-87880	5020-87753
	2.1	5020-87867	5020-87740	5020-87862	5020-87735
	3.0	5020-87866	5020-87739	5020-87861	5020-87734
	4.0	5020-87865	5020-87738	5020-87860	5020-87733
	4.6	5020-87864	5020-87737	5020-87859	5020-87732
InertSustain Phenylhexyl	1.0	5020-89175	5020-89053	5020-89173	5020-89051
	1.5	5020-89174	5020-89052	5020-89172	5020-89050
	2.1	5020-89159	5020-89037	5020-89154	5020-89032
	3.0	5020-89158	5020-89036	5020-89153	5020-89031
	4.0	5020-89157	5020-89035	5020-89152	5020-89030
	4.6	5020-89156	5020-89034	5020-89151	5020-89029

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 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
InertSustain Cyano	1.0	5020-89425	5020-89303	5020-89423	5020-89301
	1.5	5020-89424	5020-89302	5020-89422	5020-89300
	3.0	5020-89408	5020-89287	5020-89403	5020-89282
	4.0	5020-89407	5020-89285	5020-89402	5020-89280
	4.6	5020-89406	5020-89284	5020-89401	5020-89279
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
InertSustain Amide	1.0	5020-88781	5020-88657	5020-88779	5020-88655
	1.5	5020-88780	5020-88656	5020-88778	5020-88654
	2.1	5020-88765	5020-88641	5020-88760	5020-88636
	3.0	5020-88764	5020-88640	5020-88759	5020-88635
	4.0	5020-88763	5020-88639	5020-88758	5020-88634
	4.6	5020-88762	5020-88638	5020-88757	5020-88633
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

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 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
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

* Other packing materials are on request.

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
InertSustain AQ-C18	3	4.0	10	5020-89866
	5	4.0	10	5020-89736
InertSustainSwift C18	3	4.0	10	5020-88155
	5	4.0	10	5020-88033
InertSustain AX-C18	3	4.0	10	5020-91067
	5	4.0	10	5020-91020
Inertsil ODS-HL	3	4.0	10	5020-87261
	5	4.0	10	5020-87137
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
InertSustain C8	3	4.0	10	5020-16163
	5	4.0	10	5020-16034
InertSustainSwift C8	3	4.0	10	5020-88461
	5	4.0	10	5020-88337
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 PFP	3	4.0	10	5020-87863
	5	4.0	10	5020-87736
InertSustain Phenylhexyl	3	4.0	10	5020-89155
	5	4.0	10	5020-89033
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
InertSustain Cyano	3	4.0	10	5020-89405
	5	4.0	10	5020-89283
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
InertSustain Amide	3	4.0	10	5020-88761
	5	4.0	10	5020-88637
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

* Other packing materials are on request.

SILFILTER STD C18

SIL FILTER STD C18 columns are a cartridge-replaceable guard column using monolithic silica gel. The porous silica gel is molded in one piece, eliminating the need for a column filter, unlike particle-packed columns. This feature eliminates clogging of the filter and allows visual confirmation of dirt accumulation in the cartridge guard column.

- **Features**

can be attached to ODS columns of various manufacturers as guard columns·
visual confirmation of silica gel matrix contamination is possible
cartridge type for easy replacement
protects analytical columns from contamination without compromising separation performance
also available with tubes to minimize dead volume

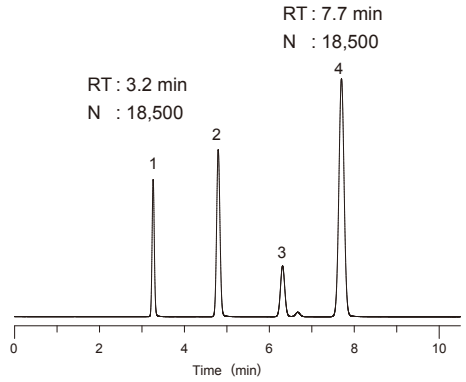
- **Specifications**

base material: high-purity monolithic silica with end-capping
max. operating pressure: 35 MPa (350 bar) and pH range: 1– 7.5
bonded phase: octadecyl groups and max. temperature: 50°C
size: 10 × 3.0 mm I.D. and I.D.s of compatible analytical columns: 3.0–4.6 mm

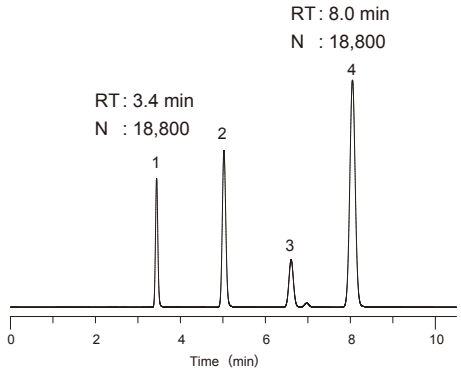
There is no sacrifice in separation efficiency.

The efficiency of SILFILTER STD C18 was confirmed by the following test.
As shown below, the efficiency of SILFILTER STD C18 remained high even for fast-eluting analytes.

Analytical C18 column only



With SILFILTER STD C18



Conditions

Column	:	C18 Column (3 µm, 150 × 3.0 mm I.D.)
Eluent	:	A) CH_3CN B) H_2O A/B = 65/35, v/v
Flow Rate	:	0.4 mL/min
Col. Temp.	:	40 °C
Detection	:	UV 254 nm
Sample		1. Acetaminophen 2. Benzene 3. Toluene 4. Naphthalene


Set A (with tubing)


Set B (without tubing)


PEEK Tough Connector

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

* 1: Tubing size is, 1/16 inch O.D. × 0.18 mm I.D. × 30 mm
* 2: Tubing tip length is 2.4 mm

Pre-Clean ORG


Pre-clean ORG


Pre-clean ORG semi

- Preclean ORG columns are designed to remove unordered organics from aqueous eluents when using high-pressure gradient systems.
- They are installed between the pump and injector.
- They extend the life of reversed-phase columns.
- The cartridge system makes column replacement easy.
- They can be used as a line filter. They are particularly suitable in preventing column clogging during analyses that are sensitive to insoluble matter in the eluent (e.g., semi-microcolumns.).
- Two types are available: Preclean ORG and Preclean ORG Semi for flow rates of > 1 and < 1 ml/min, respectively.

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

Pre-Column Coupler



Pre-column Coupler (PCTFE)



Pre-column Coupler SUS



Column Coupler for UHPLC

Pre-column couplers are joints that are used to connect various guard columns to analytical columns. PCTFE can be used with acids, alkalis, and general organic solvents. In addition, stainless steel can be used under high pressures.
The UHPLC-compatible pre-column coupler is hand-tightened to 50 MPa pressure resistance by means of a special ferrule that is composed of two different materials (i.e., PEEK and metal). The ferrals are removable and can be used repeatedly, reducing the effect of dead volume when connecting to LC columns with different joint formats.

- **Specification**

Max. operating pressure : 14.7 Mpa (Pre-column Coupler UP, Pre-column Coupler W)
50 Mpa (Column Coupler for UHPLC)
80 Mpa (Pre-column Coupler SUS)
Tube O.D. : 1/16 inch

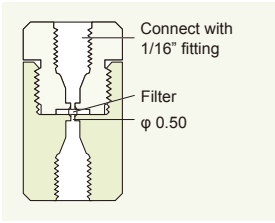
Item	I.D.	Length	Material	Conection	Cat.No.
Pre-column Coupler UP	0.18 mm	29.2 mm	PCTFE	Paker type (UP type)	6010-49200
	0.25 mm				6010-49201
	0.50 mm				6010-49202
Pre-column Coupler W	0.25 mm	32 mm	PCTFE	Waters type	6010-49251
	0.50 mm				6010-49211
Pre-column Coupler SUS	0.10 mm	40 mm	SUS	–	6010-49210
	0.25 mm				6010-49250
Column Coupler for UHPLC	0.25 mm	75 mm	PEEK, SUS	–	6010-49255
		150 mm		–	6010-49256
	0.1 mm	75 mm		–	6010-49257
		150 mm		–	6010-49258

* Product Pre-column Coupler SUS doe 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 inch
Screw specification : 10-32UNF
Filter pore size : 2 µm
Max. operating pressure : SUS : 41.4 MPa (414 bar), PEEK : 34.5 MPa (345 bar)

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


InertSustain
C18 5um
4.0x10mm

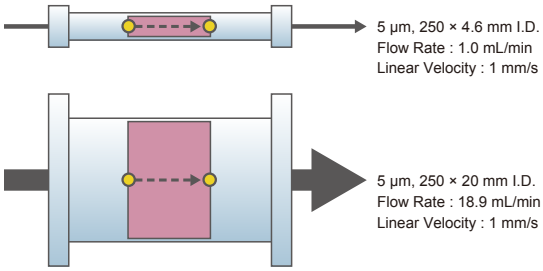
Preparative Columns

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How to select a Preparative Column

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

Columns with internal diameters ranging from 6.0 to 100 mm are widely used in preparative operations. When the analytical conditions, column packing materials, and column lengths of the analytical and preparative run are identical, nearly identical chromatograms can be achieved by simply adjusting the flow rate and sample loading volume in proportion to the column cross-sectional area.
The following table provides the appropriate flow rate for a column with a given internal diameter.

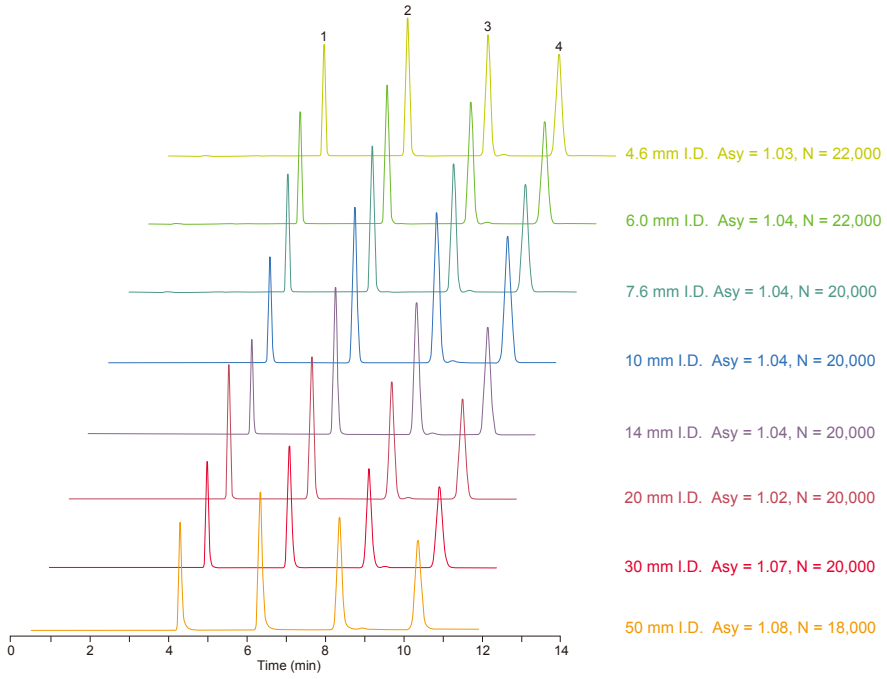


Column I.D. (mm)	Scale-Up Factor	Appropriate Flow Rate (mL/min)*1				Remarks
		Reversed/Normal Phases	SEC	HILIC	Chiral	
4.6	1	1	0.2 - 0.3	0.5	1	Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns.
6.0	1.7	1.7	0.3 - 0.5	0.8	1.7	Semi-preparative HPLC columns can be used 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.

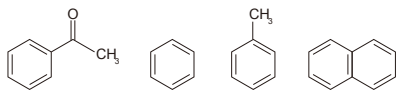
Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

Investigation of purification conditions using preparative HPLC columns is costly due to the large amount of sample required and solvent used. Therefore, it is common to initially study the purification conditions using an analytical column before scale -up to a preparative HPLC column. However, sufficient separation may not be obtained unless the preparative column with a performance that is equivalent the analytical HPLC column is used.
As shown below, Inertsil ODS-3 provides good peak symmetry with a symmetry coefficient (Asy) that is close to 1 even in large-diameter columns. The theoretical number of plates (N) remained at ~ 20,000 for a 250 mm length column. This allows smooth scale-up from an inner diameter of 4.6 to 50 mm.



Conditions

System : PLC 761 System
Column : Inertsil ODS-3 (5 µm, 250 mm)
Eluent : A) CH_3CN
B) H_2O
A/B = 65/35, v/v
Flow Rate : Linear Velocity at 1 mm/s
Col. Temp. : 40 °C
Col. Pres. : Approx. 5.0 MPa (50 bar)
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 all demands of preparative chromatography.

Phase Particle Size	Length (mm) I.D. (mm)	50 Cat.No.	100 Cat.No.	150 Cat.No.	250 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-
	100	–	5020-	5020-	5020-
InertSustain C18 10 µm	10	5020-14500	5020-14501	5020-14502	5020-14503
	14	5020-14505	5020-14506	5020-14507	5020-14508
	20	5020-14510	5020-14511	5020-14512	5020-14513
	30	5020-14515	5020-14516	5020-14517	5020-14518
	50	–	–	–	5020-14520
InertSustain AQ-C18 5 µm	6.0	5020-89757	5020-89758	5020-89759	5020-89760
	7.6	5020-89761	5020-89762	5020-89763	5020-89764
	10	5020-89765	5020-89766	5020-89767	5020-89768
	14	5020-89769	5020-89770	5020-89771	5020-89772
	20	5020-89773	5020-89774	5020-89775	5020-89776
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
InertSustainSwift C18 5 µm	6.0	5020-88054	5020-88055	5020-88056	5020-88057
	7.6	5020-88058	5020-88059	5020-88060	5020-88061
	10	5020-88062	5020-88063	5020-88064	5020-88065
	14	5020-88066	5020-88067	5020-88068	5020-88069
	20	5020-88070	5020-88071	5020-88072	5020-88073
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
Inertsil ODS-HL 5 µm	6.0	5020-87158	5020-87159	5020-87160	5020-87161
	7.6	5020-87162	5020-87163	5020-87164	5020-87165
	10	5020-87166	5020-87167	5020-87168	5020-87169
	14	5020-87170	5020-87171	5020-87172	5020-87173
	20	5020-87174	5020-87175	5020-87176	5020-87177
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
Inertsil ODS-HL 10 µm	10	5020-89552	5020-89553	5020-89554	5020-89555
	14	5020-89557	5020-89558	5020-89559	5020-89560
	20	5020-89562	5020-89563	5020-89564	5020-89565
	30	5020-89567	5020-89568	5020-89569	5020-89570
	50	–	–	–	5020-89572
	100	–	–	–	–
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-
	100	–	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-	5020-06852
	100	–	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-	5020-79120
	100	–	5020-	5020-	5020-

Preparative Columns

Phase Particle Size	Length (mm) I.D. (mm)	50 Cat.No.	100 Cat.No.	150 Cat.No.	250 Cat.No.
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
	50	–	5020-	5020-	5020-84786
Inertsil ODS-EP 5 µm	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-	5020-18286
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	5020-31501	5020-	5020-	5020-31503
	10	5020-31511	5020-	5020-	5020-31513
	20	5020-31521	5020-	5020-	5020-31523
Inertsil ODS 10 µm	6.0	5020-	5020-	5020-02203	5020-02204
	7.6	5020-31601	5020-	5020-	5020-31603
	10	5020-31611	5020-	5020-	5020-31613
	20	5020-31621	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-
	100	–	5020-	5020-	5020-
InertSustainSwift C8 5 µm	6.0	5020-88358	5020-88359	5020-88360	5020-88361
	7.6	5020-88362	5020-88363	5020-88364	5020-88365
	10	5020-88366	5020-88367	5020-88368	5020-88369
	14	5020-88370	5020-88371	5020-88372	5020-88373
	20	5020-88374	5020-88375	5020-88376	5020-88377
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	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-
	100	–	5020-	5020-	5020-

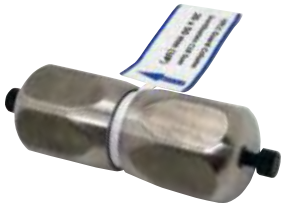
Phase Particle Size	Length (mm) I.D. (mm)	50 Cat.No.	100 Cat.No.	150 Cat.No.	250 Cat.No.
Inertsil C8-3 5 µm	6.0	5020-04952	5020-04954	5020-04955	5020-04956
	7.6	5020-04962	5020-04964	5020-04965	5020-04966
	10	5020-84952	5020-84954	5020-84955	5020-84956
	14	5020-79031	5020-79032	5020-79033	5020-79034
	20	5020-84962	5020-84964	5020-84965	5020-84966
	30	5020-84972	5020-	5020-	5020-84976
	50	–	5020-	5020-	5020-84986
	100	–	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-	5020-79320
	100	–	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
InertSustain PFP 5 µm	6.0	5020-87757	5020-87758	5020-87759	5020-87760
	7.6	5020-87761	5020-87762	5020-87763	5020-87764
	10	5020-87765	5020-87766	5020-87767	5020-87768
	14	5020-87769	5020-87770	5020-87771	5020-87772
	20	5020-87773	5020-87774	5020-87775	5020-87776
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
InertSustain Phenylhexyl 5 µm	6.0	5020-89054	5020-89055	5020-89056	5020-89057
	7.6	5020-89058	5020-89059	5020-89060	5020-89061
	10	5020-89062	5020-89063	5020-89064	5020-89065
	14	5020-89066	5020-89067	5020-89068	5020-89069
	20	5020-89070	5020-89071	5020-89072	5020-89073
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-
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-
	100	–	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-	5020-85186
	100	–	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
InertSustain Cyano	6.0	5020-89304	5020-89305	5020-89306	5020-89307
	7.6	5020-89308	5020-89309	5020-89310	5020-89311
	10	5020-89312	5020-89313	5020-89314	5020-89315
	14	5020-89316	5020-89317	5020-89318	5020-89319
	20	5020-89320	5020-89321	5020-89322	5020-89323
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	5020-	5020-	5020-

Preparative Columns

Phase Particle Size	Length (mm) I.D. (mm)	50 Cat.No.	100 Cat.No.	150 Cat.No.	250 Cat.No.
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-	5020-85386
	100	–	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-	5020-85866
	100	–	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-	5020-85766
	100	–	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-	5020-86166
	100	–	5020-	5020-	5020-
InertSustain Amide 5 µm	6.0	5020-88658	5020-88659	5020-88660	5020-88661
	7.6	5020-88662	5020-88663	5020-88664	5020-88665
	10	5020-88666	5020-88667	5020-88668	5020-88669
	14	5020-88670	5020-88671	5020-88672	5020-88673
	20	5020-88674	5020-88675	5020-88676	5020-88677
	30	5020-	5020-	5020-	5020-
	50	–	5020-	5020-	5020-
	100	–	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-	5020-86786
	100	–	5020-	5020-	5020-

Phase Particle Size	Length (mm) I.D. (mm)	50 Cat.No.	100 Cat.No.	150 Cat.No.	250 Cat.No.
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-
	100	–	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-	5020-85586
	100	–	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-	5020-86586
	100	–	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-	5020-84386
	100	–	5020-	5020-	5020-
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-	5020-86066
	100	–	5020-	5020-	5020-
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-	5020-85966
	100	–	5020-	5020-	5020-

Guard Columns for Preparative Columns



Guard Columns for Preparative Columns

Packed guard columns are for use in preparative HPLC columns. Guard columns are available for each packing material.

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-
	10 µm	10 × 50	5020-14504
		14 × 50	5020-14509
		20 × 50	5020-14514
		30 × 50	5020-14519
		50 × 75	5020-14521
InertSustain AQ-C18	5 µm	6.0 × 50	5020-89777
		7.6 × 50	5020-89778
		10 × 50	5020-89779
		14 × 50	5020-89780
		20 × 50	5020-89781
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
InertSustainSwift C18	5 µm	6.0 × 50	5020-88074
		7.6 × 50	5020-88075
		10 × 50	5020-88076
		14 × 50	5020-88077
		20 × 50	5020-88078
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
Inertsil ODS-HL	5 µm	6.0 × 50	5020-87178
		7.6 × 50	5020-87179
		10 × 50	5020-87180
		14 × 50	5020-87181
		20 × 50	5020-87182
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	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
		50 × 75	5020-79121

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
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
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
		100 × 100	5020-
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-2	5 µm	7.6 × 50	5020-06132
		10 × 50	5020-15602
		20 × 50	5020-15632
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-
		50 × 75	5020-
		100 × 100	5020-
InertSustainSwift C8	5 µm	6.0 × 50	5020-88378
		7.6 × 50	5020-88379
		10 × 50	5020-88380
		14 × 50	5020-88381
		20 × 50	5020-88382
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil C8-4	5 µm	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-
		50 × 75	5020-
		100 × 100	5020-
Inertsil C8-3	5 µm	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
		100 × 100	5020-
	10 µm	10 × 50	5020-79304
		14 × 50	5020-79309
		20 × 50	5020-79314
		30 × 50	5020-79319
		50 × 75	5020-79321
Inertsil C8	5 µm	7.6× 50	5020-06133
		10× 50	5020-15603
		20× 50	5020-15633
InertSustain PFP	5 µm	6.0 × 50	5020-87777
		7.6 × 50	5020-87778
		10 × 50	5020-87779
		14 × 50	5020-87780
		20 × 50	5020-87781
		30 × 50	5020-
InertSustain Phenylhexyl	5 µm	6.0 × 50	5020-89074
		7.6 × 50	5020-89075
		10 × 50	5020-89076
		14 × 50	5020-89077
		20 × 50	5020-89078
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	5020-
InertSustain Phenyl	5 µm	6.0 × 50	5020-16375
		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-
Inertsil Ph-3	5 µm	6.0 × 50	5020-05157
		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
		100 × 100	5020-
Inertsil Ph	5 µm	7.6 × 50	5020-06134
		10 × 50	5020-15604
		20 × 50	5020-15634
Inertsil CN-3	5 µm	6.0 × 50	5020-05357
		7.6 × 50	5020-05367
		10 × 50	5020-85357
		14 × 50	5020-79045
		20 × 50	5020-85367
		30 × 50	5020-85377
		50 × 75	5020-85387
		100 × 100	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
InertSustain Cyano	5 µm	6.0×50	5020-89324
		7.6×50	5020-89325
		10×50	5020-89326
		14×50	5020-89327
		20×50	5020-89328
		30×50	5020-
		50×75	5020-
		100×100	5020-
Inertsil WP300 C18	5 µm	6.0 × 50	5020-05954
		7.6 × 50	5020-05959
		10 × 50	5020-85837
		14 × 50	5020-79075
		20 × 50	5020-85847
		30 × 50	5020-85857
		50 × 75	5020-85867
		100 × 100	5020-
Inertsil WP300 C8	5 µm	6.0 × 50	5020-05964
		7.6 × 50	5020-05969
		10 × 50	5020-85737
		14 × 50	5020-79080
		20 × 50	5020-85747
		30 × 50	5020-85757
		50 × 75	5020-85767
		100 × 100	5020-
Inertsil WP300 C4	5 µm	6.0 × 50	5020-05974
		7.6 × 50	5020-05979
		10 × 50	5020-86137
		14 × 50	5020-79085
		20 × 50	5020-86147
		30 × 50	5020-86157
		50 × 75	5020-86167
		100 × 100	5020-
InertSustain Amide	5 µm	6.0 × 50	5020-88678
		7.6 × 50	5020-88679
		10 × 50	5020-88680
		14 × 50	5020-88681
		20 × 50	5020-88682
		30 × 50	5020-
		50 × 50	5020-
		100 × 50	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-

Guard Columns for Preparative Columns

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
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-
Inertsil Diol	5 µm	6.0 × 50	5020-05657
		7.6 × 50	5020-05667
		10 × 50	5020-86557
		14 × 50	5020-79055
		20 × 50	5020-86567
		30 × 50	5020-86577
		50 × 75	5020-86587
		100 × 100	5020-
Inertsil SIL-100A	5 µm	6.0 × 50	5020-04357
		7.6 × 50	5020-04367
		10 × 50	5020-84357
		14 × 50	5020-79060
		20 × 50	5020-84367
		30 × 50	5020-84377
		50 × 75	5020-84387
		100 × 100	5020-

Phase	Particle Size	I.D.×Length (mm)	Cat.No.
Inertsil SIL-150A	5 µm	7.6 × 50	5020-06131
		10 × 50	5020-15601
		20 × 50	5020-15631
Inertsil WP300 SIL	5 µm	6.0 × 50	5020-05994
		7.6 × 50	5020-05999
		10 × 50	5020-86037
		14 × 50	5020-79095
		20 × 50	5020-86047
		30 × 50	5020-86057
		50 × 75	5020-86067
		100 × 100	5020-
Inertsil WP300 Diol	5 µm	6.0 × 50	5020-05984
		7.6 × 50	5020-05989
		10 × 50	5020-85937
		14 × 50	5020-79090
		20 × 50	5020-85947
		30 × 50	5020-85957
		50 × 75	5020-85967
		100 × 100	5020-

PREP Guard Cartridges



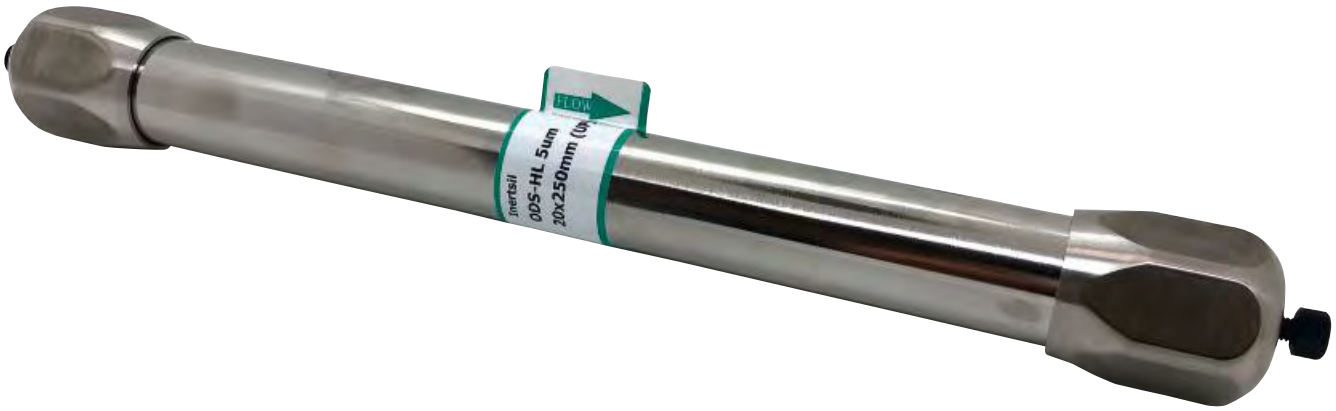
PREP Guard Cartridges

PREP Guard Cartridge Columns are cartridge-type preparative guard columns.

Phase	Length (mm)	I.D. (mm)	Replacement Cartridge (2 pcs)	Holder/Replacement Cartridge Set (2 Cartridges & 1 Holder)
			Cat. No.	Cat. No.
InertSustain C18	30	7.6	5020-15744	5020-15794
InertSustain AQ-C18	30	7.6	5020-89782	5020-89783
InertSustainSwift C18	30	7.6	5020-88079	5020-88080
Inertsil ODS-HL	30	7.6	5020-87183	5020-87184
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-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
InertSustainSwift C8	30	7.6	5020-88383	5020-88384
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 PFP	30	7.6	5020-87782	5020-87783
InertSustain Phenylhexyl	30	7.6	5020-89079	5020-89080
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
InertSustain Cyano	30	7.6	5020-89329	5020-89330
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
InertSustain Amide	30	7.6	5020-88683	5020-88684
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

Holder

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


FLOW
inertsil
ODS-HL 5um
10x250mm

Capillary Columns

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- How to Connect MonoCap Columns 160
- Connection Kits 162
- Connection Kits for Capillary EX • EX-Nano Columns 163

Capillary HPLC Columns

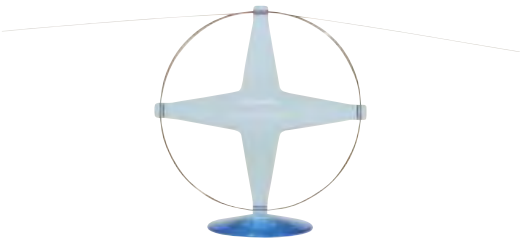
Capillary EX and Capillary EX-Nano HPLC columns analyze trace amounts of samples in proteomic and bioanalytical analyses with high sensitivity and high resolution. Capillary EX and Capillary EX-Nano columns are totally porous particle-type columns with flow rates generally below 100 µL/min.

Another capillary column called MonoCap uses monolithic silica technology to provide high throughput, high sensitivity, and high resolution separation of peptides and protein digests.

MonoCap Fast-Flow provides a high throughput analysis at half the operating pressures of totally porous particle-type columns. In MonoCap Nano-flow, the sizes of the mesopores and throughpores are optimized for extremely high LC/MS sensitivity.

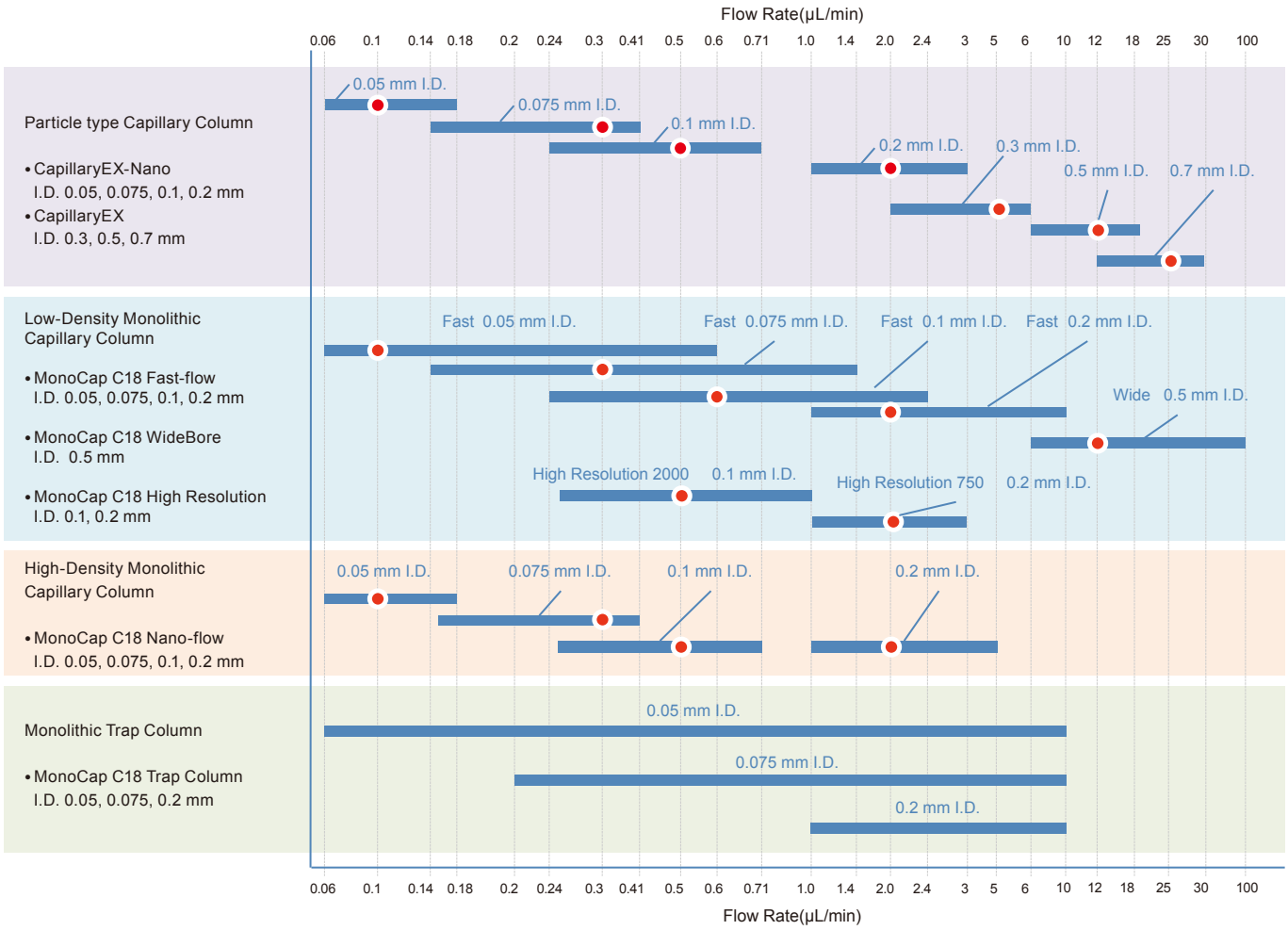
MonoCap Trap columns are also available for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

The chart below provides the recommended ranges of uses and flow rates for a 1 50-mm-long column. The red circle indicates the linear velocity at 1 mm/s (Figure 1).



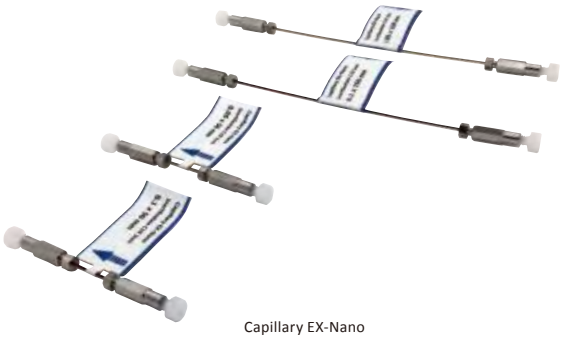
MonoCap High Resolution 2000

Figure 1 : Recommended Operating Flow Rate Range



Particle Type Capillary HPLC Columns

Columns with I.D.s of 0.05, 0.075, 0.1 and 0.2 mm are Capillary EX-Nano columns. Those with I.D.s of 0.3, 0.5 and 0.7 mm are Capillary EX columns. Capillary EX-Nano columns intrcduce a fused silica capillary tube with a very smooth and clean inner surface providing a high number of theoretical plates. Capillary EX columns employ the column hardware used in analytical columns, which is very easy to use.



Capillary EX-Nano



Capillary EX

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm	Length 150 mm
			Cat.No.	Cat.No.
InertSustain C18	0.05	3	5020-15038	5020-15088
		5	5020-15037	5020-15087
	0.075	3	5020-15188	5020-15238
		5	5020-15187	5020-15237
	0.1	3	5020-15338	5020-15388
		5	5020-15337	5020-15387
	0.2	3	5020-15488	5020-15538
		5	5020-15487	5020-15537
	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
InertSustain AQ-C18	0.05	3	5020-89894	5020-89895
		5	5020-89792	5020-89793
	0.075	3	5020-89897	5020-89898
		5	5020-89795	5020-89796
	0.1	3	5020-89900	5020-89901
		5	5020-89798	5020-89799
	0.2	3	5020-89903	5020-89904
		5	5020-89801	5020-89802
	0.3	3	5020-89887	5020-89888
		5	5020-89784	5020-89785
	0.5	3	5020-89889	5020-89890
		5	5020-89786	5020-89787
	0.7	3	5020-89891	5020-89892
		5	5020-89788	5020-89789

Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm	Length 150 mm
			Cat.No.	Cat.No.
InertSustainSwift C18	0.05	3	5020-88183	5020-88184
		5	5020-88089	5020-88090
	0.075	3	5020-88186	5020-88187
		5	5020-88092	5020-88093
	0.1	3	5020-88189	5020-88190
		5	5020-88095	5020-88096
	0.2	3	5020-88192	5020-88193
		5	5020-88098	5020-88099
	0.3	3	5020-88176	5020-88177
		5	5020-88081	5020-88082
	0.5	3	5020-88178	5020-88179
		5	5020-88083	5020-88084
	0.7	3	5020-88180	5020-88181
		5	5020-88085	5020-88086
Inertsil ODS-HL	0.05	3	5020-87289	5020-87290
		5	5020-87193	5020-87194
	0.075	3	5020-87292	5020-87293
		5	5020-87196	5020-87197
	0.1	3	5020-87295	5020-87296
		5	5020-87199	5020-87200
	0.2	3	5020-87298	5020-87299
		5	5020-87202	5020-87203
	0.3	3	5020-87282	5020-87283
		5	5020-87185	5020-87186
	0.5	3	5020-87284	5020-87285
		5	5020-87187	5020-87188
	0.7	3	5020-87286	5020-87287
		5	5020-87189	5020-87190
Inertsil ODS-4	0.05	3	5020-15002	5020-15052
		5	5020-15001	5020-15051
	0.075	3	5020-15152	5020-15202
		5	5020-15151	5020-15201
	0.1	3	5020-15302	5020-15352
		5	5020-15301	5020-15351
	0.2	3	5020-15452	5020-15502
		5	5020-15451	5020-15501
	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

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm Cat.No.	Length 150 mm Cat.No.
Inertsil ODS-3	0.05	3	5020-15005	5020-15055
		4	5020-15004	5020-15054
		5	5020-15003	5020-15053
	0.075	3	5020-15155	5020-15205
		4	5020-15154	5020-15204
		5	5020-15153	5020-15203
	0.1	3	5020-15305	5020-15355
		4	5020-15304	5020-15354
		5	5020-15303	5020-15353
	0.2	3	5020-15455	5020-15505
		4	5020-15454	5020-15504
		5	5020-15453	5020-15503
	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
Inertsil ODS-SP	0.05	3	5020-15007	5020-15057
		5	5020-15006	5020-15056
	0.075	3	5020-15157	5020-15207
		5	5020-15156	5020-15206
	0.1	3	5020-15307	5020-15357
		5	5020-15306	5020-15356
	0.2	3	5020-15457	5020-15507
		5	5020-15456	5020-15506
	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
		5	5020-15008	5020-15058
	0.075	3	5020-15159	5020-15209
		5	5020-15158	5020-15208
	0.1	3	5020-15309	5020-15359
		5	5020-15308	5020-15358
	0.2	3	5020-15459	5020-15509
		5	5020-15458	5020-15508
	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
InertSustain C8	0.05	3	5020-16191	5020-16192
		5	5020-16090	5020-16091
	0.075	3	5020-16194	5020-16195
		5	5020-16093	5020-16094
	0.1	3	5020-16197	5020-16198
		5	5020-16096	5020-16097
	0.2	3	5020-16200	5020-16201
		5	5020-16099	5020-16100
	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

Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm	Length 150 mm
			Cat.No.	Cat.No.
InertSustainSwift C8	0.05	3	5020-88489	5020-88490
		5	5020-88393	5020-88394
	0.075	3	5020-88492	5020-88493
		5	5020-88396	5020-88397
	0.1	3	5020-88495	5020-88496
		5	5020-88399	5020-88400
	0.2	3	5020-88498	5020-88499
		5	5020-88402	5020-88403
	0.3	3	5020-88482	5020-88483
		5	5020-88385	5020-88386
	0.5	3	5020-88484	5020-88485
		5	5020-88387	5020-88388
	0.7	3	5020-88486	5020-88487
		5	5020-88389	5020-88390
Inertsil C8-4	0.05	3	5020-15036	5020-15086
		5	5020-15035	5020-15085
	0.075	3	5020-15186	5020-15236
		5	5020-15185	5020-15235
	0.1	3	5020-15336	5020-15386
		5	5020-15335	5020-15385
	0.2	3	5020-15486	5020-15536
		5	5020-15485	5020-15535
	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
Inertsil C8-3	0.05	3	5020-15015	5020-15065
		5	5020-15014	5020-15064
	0.075	3	5020-15165	5020-15215
		5	5020-15164	5020-15214
	0.1	3	5020-15315	5020-15365
		5	5020-15314	5020-15364
	0.2	3	5020-15465	5020-15515
		5	5020-15464	5020-15514
	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
	0.075	5	5020-15178	5020-15228
	0.1	5	5020-15328	5020-15378
	0.2	5	5020-15478	5020-15528
	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
	0.075	5	5020-15179	5020-15229
	0.1	5	5020-15329	5020-15379
	0.2	5	5020-15479	5020-15529
	0.3	5	5020-11529	5020-11579
	0.5	5	5020-11629	5020-11679
	0.7	5	5020-11729	5020-11779

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm Cat.No.	Length 150 mm Cat.No.
InertSustain PFP	0.05	3	5020-87891	5020-87892
		5	5020-87791	5020-87792
	0.075	3	5020-87894	5020-87895
		5	5020-87794	5020-87795
	0.1	3	5020-87897	5020-87898
		5	5020-87797	5020-87798
	0.2	3	5020-87900	5020-87901
		5	5020-87800	5020-87801
	0.3	3	5020-87884	5020-87885
		5	5020-87784	5020-87785
	0.5	3	5020-87886	5020-87887
		5	5020-87786	5020-87787
	0.7	3	5020-87888	5020-87889
		5	5020-87788	5020-87789
InertSustain Phenylhexyl	0.05	3	5020-89183	5020-89184
		5	5020-89089	5020-89090
	0.075	3	5020-89186	5020-89187
		5	5020-89092	5020-89093
	0.1	3	5020-89189	5020-89190
		5	5020-89095	5020-89096
	0.2	3	5020-89192	5020-89193
		5	5020-89098	5020-89099
	0.3	3	5020-89176	5020-89177
		5	5020-89081	5020-89082
	0.5	3	5020-89178	5020-89179
		5	5020-89083	5020-89084
	0.7	3	5020-89180	5020-89181
		5	5020-89085	5020-89086
InertSustain Phenyl	0.05	3	5020-16491	5020-16492
		5	5020-16390	5020-16391
	0.075	3	5020-16494	5020-16495
		5	5020-16393	5020-16394
	0.1	3	5020-16497	5020-16498
		5	5020-16396	5020-16397
	0.2	3	5020-16500	5020-16501
		5	5020-16399	5020-16400
	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
		5	5020-15016	5020-15066
	0.075	3	5020-15167	5020-15217
		5	5020-15166	5020-15216
	0.1	3	5020-15317	5020-15367
		5	5020-15316	5020-15366
	0.2	3	5020-15467	5020-15517
		5	5020-15466	5020-15516
	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
InertSustain Amide	0.05	3	5020-88789	5020-88790
		5	5020-88693	5020-88694
	0.075	3	5020-88792	5020-88793
		5	5020-88696	5020-88697
	0.1	3	5020-88795	5020-88796
		5	5020-88699	5020-88700
	0.2	3	5020-88798	5020-88799
		5	5020-88702	5020-88703
	0.3	3	5020-88782	5020-88783
		5	5020-88685	5020-88686
	0.5	3	5020-88784	5020-88785
		5	5020-88687	5020-88688
	0.7	3	5020-88786	5020-88787
		5	5020-88689	5020-88690

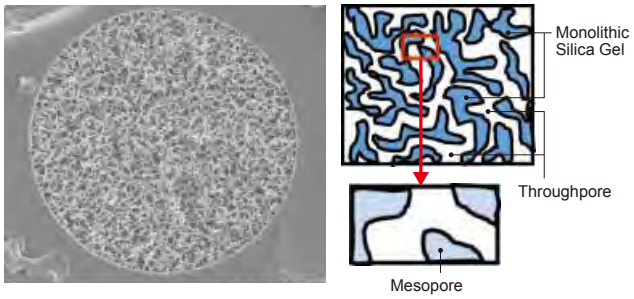
Particle Type Capillary HPLC Columns

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm	Length 150 mm
			Cat.No.	Cat.No.
Inertsil HILIC	0.05	3	5020-15025	5020-15075
		5	5020-15024	5020-15074
	0.075	3	5020-15175	5020-15225
		5	5020-15174	5020-15224
	0.1	3	5020-15325	5020-15375
		5	5020-15324	5020-15374
	0.2	3	5020-15475	5020-15525
		5	5020-15474	5020-15524
	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
		5	5020-16690	5020-16691
	0.075	3	5020-16794	5020-16795
		5	5020-16693	5020-16694
	0.1	3	5020-16797	5020-16798
		5	5020-16696	5020-16697
	0.2	3	5020-16800	5020-16801
		5	5020-16699	5020-16700
	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
		5	5020-15020	5020-15070
	0.075	3	5020-15171	5020-15221
		5	5020-15170	5020-15220
	0.1	3	5020-15321	5020-15371
		5	5020-15320	5020-15370
	0.2	3	5020-15471	5020-15521
		5	5020-15470	5020-15520
	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
InertSustain Cyano	0.05	3	5020-89433	5020-89434
		5	5020-89339	5020-89340
	0.075	3	5020-89436	5020-89437
		5	5020-89342	5020-89343
	0.1	3	5020-89439	5020-89440
		5	5020-89345	5020-89346
	0.2	3	5020-89442	5020-89443
		5	5020-89348	5020-89349
	0.3	3	5020-89426	5020-89427
		5	5020-89331	5020-89332
	0.5	3	5020-89428	5020-89429
		5	5020-89333	5020-89334
	0.7	3	5020-89430	5020-89431
		5	5020-89335	5020-89335

Phase	I.D. (mm)	Particle Size (μm)	Length 50 mm Cat.No.	Length 150 mm Cat.No.
Inertsil CN-3	0.05	3	5020-15019	5020-15069
		5	5020-15018	5020-15068
	0.075	3	5020-15169	5020-15219
		5	5020-15168	5020-15218
	0.1	3	5020-15319	5020-15369
		5	5020-15318	5020-15368
	0.2	3	5020-15469	5020-15519
		5	5020-15468	5020-15518
	0.3	3	5020-11519	5020-11569
		5	5020-11518	5020-11568
	0.5	3	5020-11619	5020-11669
		5	5020-11618	5020-11668
	0.7	3	5020-11719	5020-11769
		5	5020-11718	5020-11768
Inertsil Diol	0.05	3	5020-15023	5020-15073
		5	5020-15022	5020-15072
	0.075	3	5020-15173	5020-15223
		5	5020-15172	5020-15222
	0.1	3	5020-15323	5020-15373
		5	5020-15322	5020-15372
	0.2	3	5020-15473	5020-15523
		5	5020-15472	5020-15522
	0.3	3	5020-11523	5020-11573
		5	5020-11522	5020-11572
	0.5	3	5020-11623	5020-11673
		5	5020-11622	5020-11672
	0.7	3	5020-11723	5020-11773
		5	5020-11722	5020-11772
Inertsil SIL-100A	0.05	3	5020-15027	5020-15077
		5	5020-15026	5020-15076
	0.075	3	5020-15177	5020-15227
		5	5020-15176	5020-15226
	0.1	3	5020-15327	5020-15377
		5	5020-15326	5020-15376
	0.2	3	5020-15477	5020-15527
		5	5020-15476	5020-15526
	0.3	3	5020-11527	5020-11577
		5	5020-11526	5020-11576
	0.5	3	5020-11627	5020-11677
		5	5020-11626	5020-11676
	0.7	3	5020-11727	5020-11777
		5	5020-11726	5020-11776
Inertsil AX	0.05	5	5020-15033	5020-15083
	0.075	5	5020-15183	5020-15233
	0.1	5	5020-15333	5020-15383
	0.2	5	5020-15483	5020-15533
	0.3	5	5020-11533	5020-11583
	0.5	5	5020-11633	5020-11683
	0.7	5	5020-11733	5020-11783
Inertsil CX	0.05	5	5020-15034	5020-15084
	0.075	5	5020-15184	5020-15234
	0.1	5	5020-15334	5020-15384
	0.2	5	5020-15484	5020-15534
	0.3	5	5020-11534	5020-11584
	0.5	5	5020-11634	5020-11684
	0.7	5	5020-11734	5020-11784

Monolithic Capillary HPLC Columns

MonoCap Series



Structure of Monolithic Silica

MonoCap series provide a capillary column with uniform three-dimensional network-structured silica gel that is formed in a phased silica gel by a sol-gel reaction where the octadecyl groups are chemically bonded. Since it is composed of high-purity silica gel, it is also suitable for microanalysis of compounds that are prone to adsorption. In the MonoCap series, High Resolution, Fast-flow, Nano-flow, and Trap types are available.High Resolution type provides high resolution. The column with a length of 2,000 mm can achieve a high resolution of > 200,000 theoretical plates. The High Resolution Ultra type can achieve a high resolution of > 300,000.

Fast-flow type provides low liquid resistance and can be used with an alternating current amount. High-speed liquid feeding can save time during measurement and column equilibration.

Nano-flow type provides a high-density monolith structure, which enables a high number of theoretical plates. In addition, high peak intensity can be expected in LC/MS.

The Trap type with a large through pore can be used at low pressures and is suitable for sample concentration and pretreatment.

Physical Properties of MonoCap Series

Description	Monolithic Silica	Skeleton	Throughpore	Mesopore	Porosity	Functional Group	End-Capping	Max. Operating Pressure
MonoCap C18 High Resolution 750	High Purity Silica Gel	1 µm	2 µm	15 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 High Resolution 2000		1 µm	2 µm	15 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap C18 High Resolution Ultra 2000		1 µm	2 µm	11 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap C18 High Resolution Ultra 1000		1 µm	2 µm	11 nm	85 %	Octadecyl	Yes	35 MPa (350 bar)
MonoCap HILIC-UP High Resolution 2000		1 µm	2 µm	12 nm	85 %	Octadecyl	No	35 MPa (350 bar)
MonoCap C18 Fast-flow		1 µm	2 µm	15 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 Nano-flow		1 µm	1 µm	11 nm	85 %	Octadecyl	Yes	22 MPa (220 bar)
MonoCap C18 Trap Column		2 µm	5 µm	11 nm	85 %	Octadecyl	Yes	20 MPa (200 bar)

* 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

→

1. Metal Hardwares
   End-fittings are Parker Style (UP type).
   Valco 1/32 inch (6-40 UNF) end-fittings can also be arranged upon request, indicate 1/32 inch when ordering.

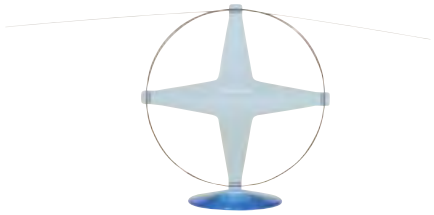
2. PEEK Hardwares
   1/16 inch male nut, ferrule and PTFE sleeve are included.

MonoCap C18 High Resolution 2000
MonoCap C18 High Resolution Ultra 2000
MonoCap C18 High Resolution Ultra 1000
MonoCap HILIC-UP High Resolution

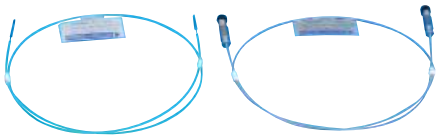
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End-fittings are not included.
The connection kits shown at page 156 must be purchased separately once.

MonoCap C18 High Resolution/MonoCap C18 High Resolution Ultra



MonoCap High Resolution 2000

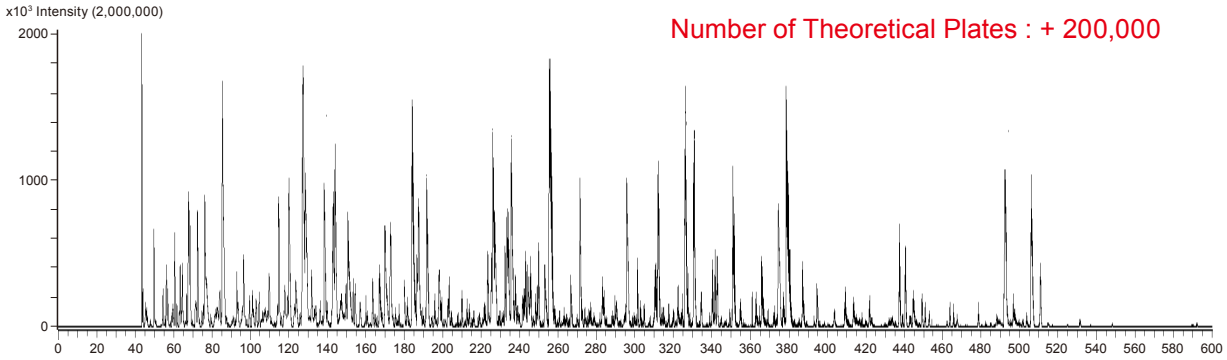


PEEK Metal

MonoCap High Resolution 750

MonoCap C18 High Resolution columns take advantage of the low-pressure analysis capabilities of silica monoliths that provide > 60,000 and > 200,000 theoretical plates in 750 and 2,000 mm lengths, respectively. In addition, MonoCap C18 High Resolution Ultra columns are high theoretical plate columns (i.e., > 300,000 counts) with a length of 2,000 mm.
Difficult separations can be achieved in 150 or 250 mm long columns using gentle gradient or isocratic conditions.

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 CH_3CN
B) 0.1 % HCOOH in H_2O
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

Ordering Information

MonoCap C18 High Resolution Ultra 2000

I.D. (mm)	Length (mm)	Cat. No.
0.075	2000	5020-10006
0.1	2000	5020-10018

MonoCap C18 High Resolution 2000

I.D. (mm)	Length (mm)	Cat. No.
0.075	2000	5020-10005
0.1	2000	5020-10015

MonoCap C18 High Resolution Ultra 1000

I.D. (mm)	Length (mm)	Cat. No.
0.1	1000	5020-10067

MonoCap HILIC-UP High Resolution 2000

I.D. (mm)	Length (mm)	Cat. No.
0.1	2000	5020-10019

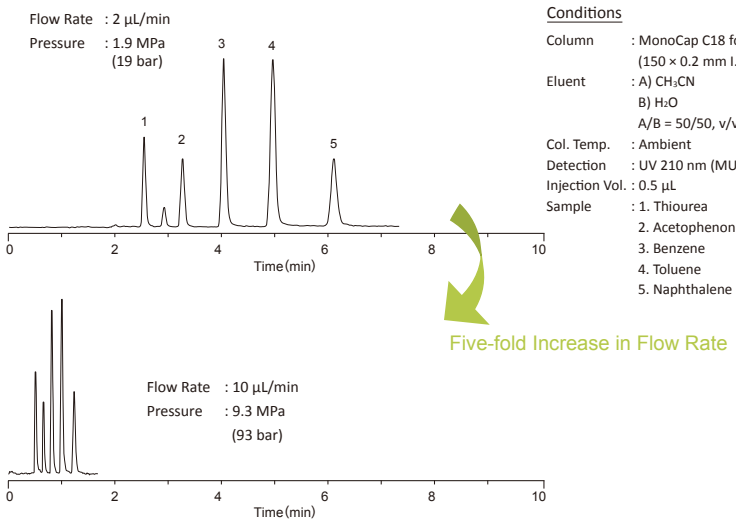
MonoCap C18 High Resolution 750

I.D. (mm)	Length (mm)	Hardware Material	Cat. No.
0.1	750	Metal	5020-10113
		PEEK	5020-10013
0.2	750	Metal	5020-10123
		PEEK	5020-10023

Monolithic Capillary HPLC Columns

MonoCap C18 Fast-flow

Figure 1 : Workable at High Flow Rates without Sacrificing Efficiency

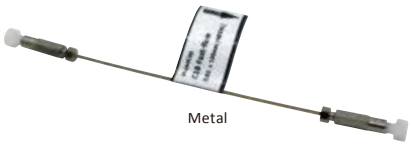


Conditions

Column : MonoCap C18 for Fast-flow (150 × 0.2 mm I.D.)
Eluent : A) CH_3CN
B) H_2O
A/B = 50/50, v/v
Col. Temp. : Ambient
Detection : UV 210 nm (MU701, Cell Volume 18 nL)
Injection Vol. : 0.5 µL
Sample : 1. Thiourea
2. Acetophenone
3. Benzene
4. Toluene
5. Naphthalene

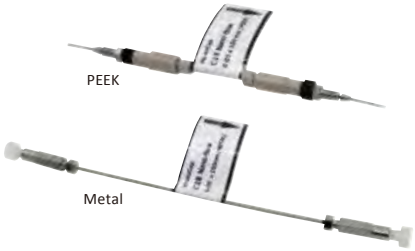
Workable over a broad range of linear velocities (0.5 to 5 mm/s) with no efficiency and separation losses at high speeds. The number of theoretical plates in MonoCap C18 Fastflow nearly equals that in a porous particle-type capillary column packed with a 5-µm-sized packing material. Columns are protected by either metal or PEEK hardware. End-fittings are 1/16-inch (10-32 UNF). 1/32-inch end-fittings are also available upon request.


PEEK


Metal

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

MonoCap C18 Nano-flow


PEEK

Metal

MonoCap C18 Nano-flow columns produce more theoretical plates than a totally porous particle-type capillary column packed with a 3-µm-sized packing material. These columns can be operated over a wide range of flow rates with low back pressure and achieves very sensitive results in Nano-LC-ESI/MS applications. They 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

* All 50 mm length PEEK columns does not come with a hardware and will be supplied with 3 pcs of columns only.

MonoCap C18 Trap Column



MonoCap C18 Trap Column with Hardware
(1/16 inch End-fittings)

MonoCap Trap columns have relatively large throughpores and operate at high flow rates (e.g., 10 µL/min). Therefore, they are 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-inch (10-32 UNF). 1/32-inch end-fittings are 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	–	
	Without Hardware	5020-10034		5020-10031

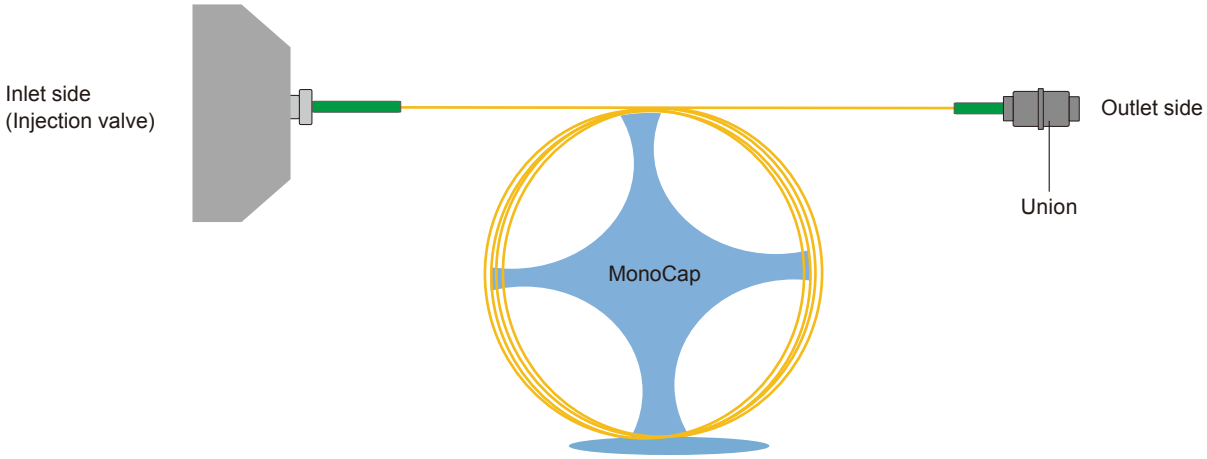
How to Connect MonoCap Columns

How to Connect MonoCap High Resolution Columns

Connect the inlet side of the column directly to the auto sampler or injection valve, or from the piping to connect a union.
Use the union to connect the outlet side of the column to the detector (UV, MS).
Please use the connection parts or connection kits for capillary LC columns.

Example of connecting a MonoCap column:

Connect the inlet side directly to the injection valve and the outlet side to the detector via the union.



How to Connect MonoCap (Metal Hardware) Columns

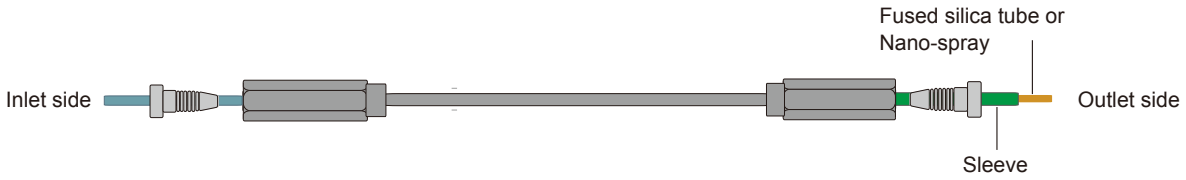
Connect the column-inlet side to the piping from the auto sampler and injection valve.
Connect the column-outlet side to the detector (UV, MS).

<Example 1>



<Example 2>

If connect to the nano-ion source or directly to nano-spray, tighten the joint with a sleeve.



How to Connect MonoCap (PEEK Hardware) Columns

Connect the column-inlet side to the piping from the auto sampler and injection valve.
Use the union to connect the column-outlet side to the detector (UV, MS).

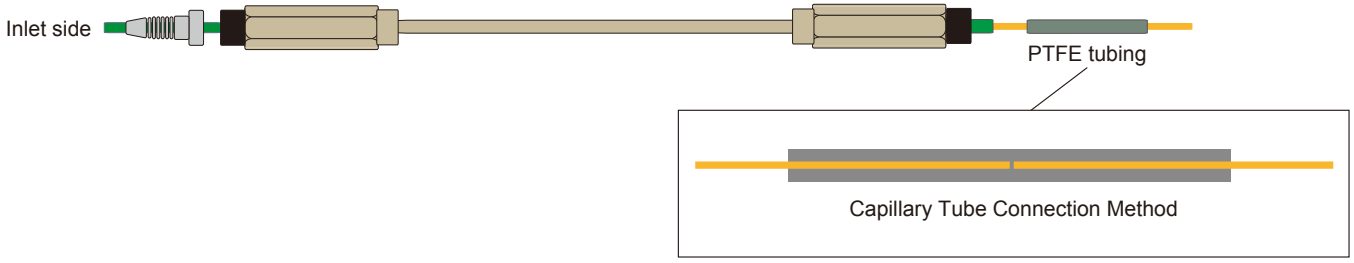
<Example 1>

Connect the column inlet side directly to auto sampler (or injection valve), and connect the outlet side by a union.



<Example 2>

Connect column inlet side to auto sampler (or injection valve) directly, and using a PTFE tubing to connect to fused silica tubing.



Connection Kits

Capillary Tubing Connector Kit



For 1/16 inch

Applicable Products	Content	Cat. No.
MonoCap High Resolution MonoCap (Metal columns) Capillary EX-Nano, Capillary -EX	Nut ZN1-10 : 6 pcs Ferrule ZF1PK-10 : 6 pcs Sleeve F-230 (color : grey 40 mm) 6 pcs	5020-10380

For 1/32 inch

Applicable Products	Content	Cat. No.
MonoCap High Resolution MonoCap (Metal columns) Capillary EX-Nano, Capillary -EX	Nut 6 pcs Ferrule : 6 pcs Sleeve (color: nature 40 mm) 6 pcs	5020-10381

Description	Content	Cat.No.
Connection Kit for MonoCap C18 High Resolution 2000	1/16 inch PEEK Ferrule, SUS Nut, Sleeve 2 pcs each 1/32 inch PEEK Ferrule, SUS Nut, Sleeve 2 pcs each	5020-10017

Description	Qty.	Cat. No.
PTFE Tubing 20 mm 2 pcs 1/16 inchO.D. (Connect to 0.375 mm capillary tubing)	10 pcs	5020-10382

Connection Kit for MonoCap C18 Trap Column



MonoCap C18 Trap Column Connection Kit 1/16 inch

Description	Cat.No.
MonoCap C18 Trap Column Connection Kit 1/16 inch (Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each)	5020-10044
MonoCap C18 Trap Column Connection Kit 1/32 inch (Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each)	5020-10045
MonoCap C18 Trap Column Assembly Parts 1/16 inch (Nut·Ferrule 4 pcs each)	5020-10046
MonoCap C18 Trap Column Assembly Parts 1/32 inch (Nut·Ferrule 4 pcs each)	5020-10047

Union



U-411



P-779



UH-432



UH-436

- **Specification**
  Applicable Tubing O.D. : 1/16 inch
  Maximum Pressure : 137.8 MPa (1378 bar) : SUS, 41.4 MPa (414 bar) : PEEK

P/N	Description	Screw Type	Orifice Diameter (µm)	Cat.No.
U-435	SUS ZDV Union	10-32UNF	250	6010-72352
U-411	SUS ZDV Union	10-32UNF	178	6010-72351
P-779	PEEK Nano Tight Union	10-32UNF	125	6010-72321

* Fittings are attached

- **Specification**
  Applicable Tubing O.D. : 1/32 inch
  Maximum Pressure : 103 MPa (1030 bar)

P/N	Description	Screw Type	Orifice Diameter (µm)	Cat.No.
UH-432	Micro Tight Union 1/32 inch	5/16-24 Coned	150	6010-77070

* Fittings are attached

- **Specification**
  Applicable Tubing O.D. : 360 µm
  Maximum Pressure : 103 MPa (1030 bar) : SUS

P/N	Description	Screw Type	Orifice Diameter (µm)	Cat.No.
UH-436	Micro Tight Union	5/16-24 Coned	150	6010-77071

* Fittings are attached

Tubing for Capillary Columns

	Applicable Columns' I.D. (mm)	Tubing Size	Length (m)	Qty. (pcs)	Cat. No.
Fused Silica Capillary Tubing	0.05 - 0.3	I.D. : 0.03 mm O.D. : 0.375 mm	0.2	10	5020-10383
			0.3	10	5020-10384
			0.5	10	5020-10385
			1	2	5020-10386
	0.5 - 0.7	I.D. : 0.05 mm O.D. : 0.375 mm	0.2	10	5020-10387
			0.3	10	5020-10388
			0.5	10	5020-10389
			1	2	5020-10390
	Applicable Columns' I.D. (mm)	PEEK Tubing	Length (m)	Qty. (pcs)	Cat. No.
PEEK Tubing	0.05 - 0.7	I.D. : 0.065 mm O.D. : 1/16 inch	0.05	10	5020-10391
			0.1	10	5020-10392
			0.3	10	5020-10393
			0.5	2	5020-10394

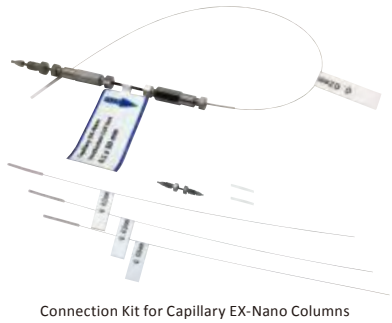
Connection Kits for Capillary EX • EX-Nano Columns



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 inch 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 inch O.D. PTFE with sleeve)	
·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

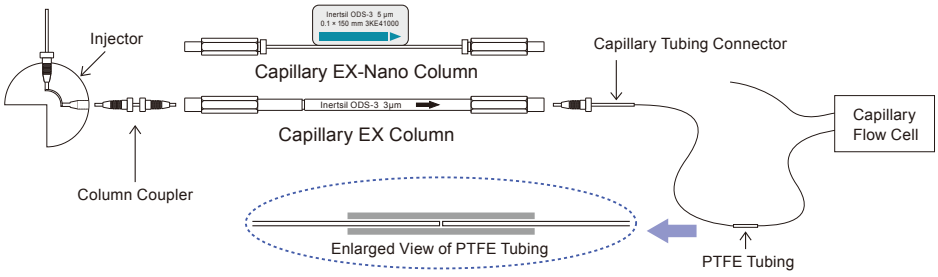


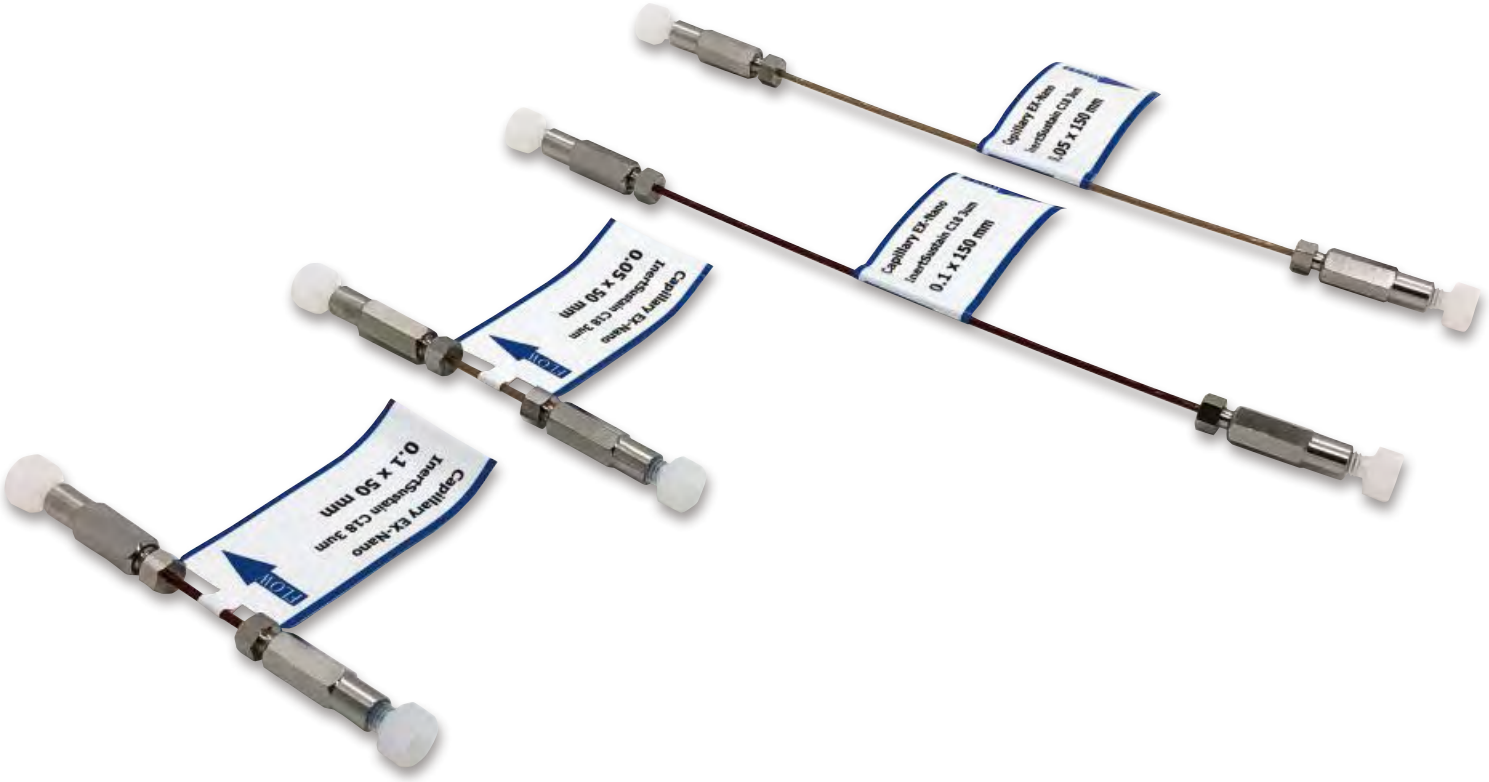
Connection Kit for Capillary EX-Nano Columns
(Top Image: Installed view, Bottom Image: Contents of Kit)

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 inch 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 inch O.D. PTFE with sleeve)	
·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D. (O.D. 0.375 mm Connection for Capillary Tubing)	

How To Connect




Capillary EX-Nano
InertSustain C18 3µm
0.1 x 50 mm
FLOW
Capillary EX-Nano
InertSustain C18 3µm
0.05 x 50 mm
FLOW
Capillary EX-Nano
InertSustain C18 3µm
0.1 x 150 mm
Capillary EX-Nano
InertSustain C18 3µm
0.05 x 150 mm

Applications

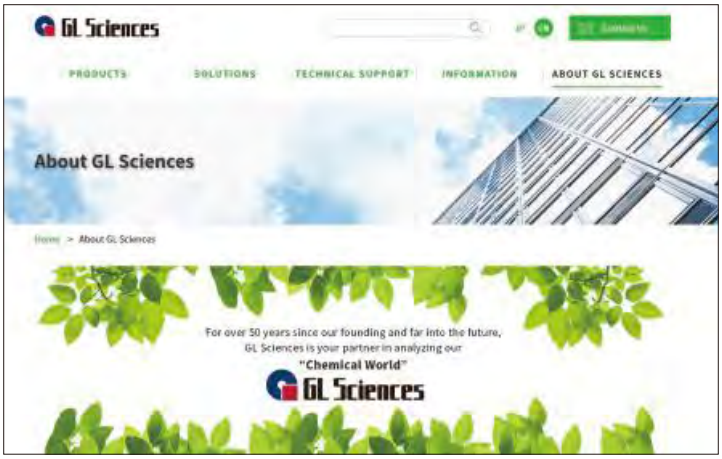
- Visit our website 166
- Pharmacopeia 167
- Pharmaceuticals 168
- Biochemicals 169
- Foods 170
- Environmental 172
- Pesticides 173
- Vitamins 174
- Others 175

Applications

Visit our website

Technical support is provided on our website. You can browse or search GL Sciences' online library of LC applications, which feature chromatograms with methods and conditions sorted by technique and compound class by InertSearch and Technical Note.

https://www.glsciences.com/



InertSearch

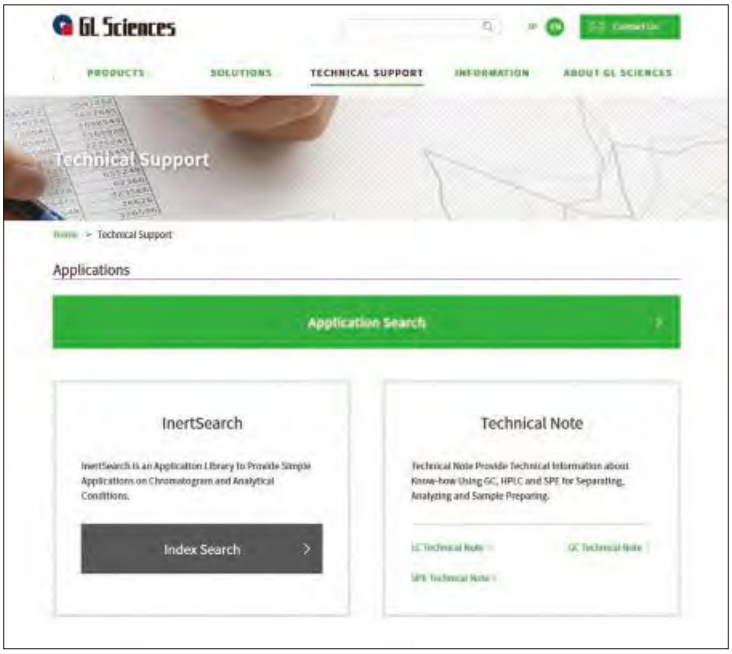
https://www.glsciences.com/technique/app/inert_search.html

"InertSearch" is GL Sciences' onsite search engine for chromatographic data. It provides a large number of chromatographic results of various analyses.

Technical Note

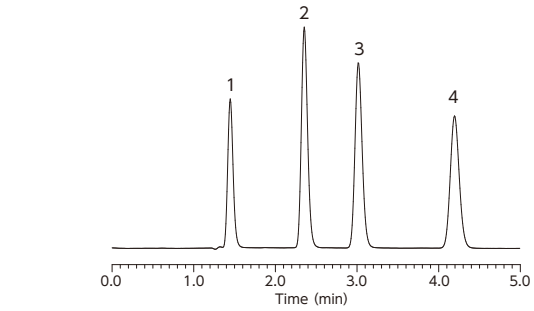
https://www.glsciences.com/technique/app/lc_technical_note.html

"Technical Note" is a database of chromatographic results providing useful information of various analyses. These files explain each analysis in detail (e.g., method and instruction, chromatogram with analytic conditions, and chemical structures of compounds).



Pharmacopeia

p-Hydroxybenzoic acid ethyl ester (JP)

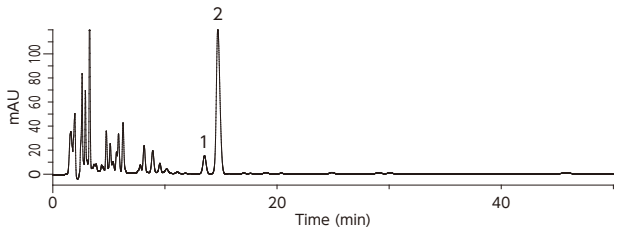


Conditions

Column : Inertsil ODS-4(5μm, 150 × 4.6 mm I.D.)
Eluent : A) CH_3OH
B) 50 mM KH_2PO_4 im H_2O
A/B = 13/7, v/v
Flow Rate : 1.3 mL/min
Col. Temp. : 35 ˚C
Detection : UV 272 nm
Injection Vol. : 10 μL
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

Glycyrrhizic Acid in Glycyrrhiza (JP)



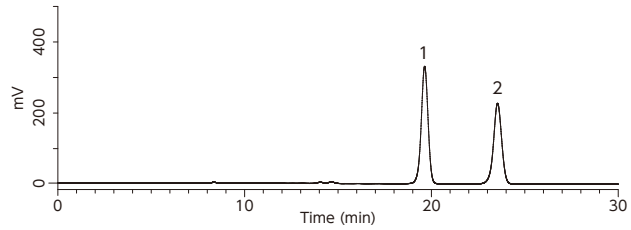
Conditions

Column : Inertsil ODS-4
(5 μm, 150 x 4.6 mm I.D.)
Eluent : Solution*
Flow Rate : 0.9 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No.LB482

Sample :
1. Impurity
2. Glycyrrhizic acid

*Dissolve 3.85 g of ammonium acetate in 720 mL of water, and add 5 mL of acetic acid and 280 mL of acetonitrile.

D-Mannitol (JP)

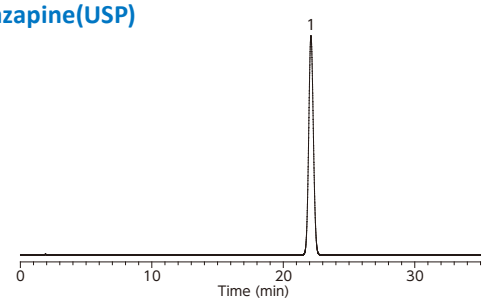


Conditions

Column : InertSphere Sugar-2(9 μm, 300 x 7.8 mm I.D.)
Eluent : H_2O
Flow Rate : 0.5 mL/min
Col.Temp. : 85 °C
Detection : RI (40 °C)
Injection Vol. : 20 μL
Data Source : LC Techinical Note No.LT147

Sample :
1. D-Mannitol
2. D-Sorbitol

Mirtazapine(USP)



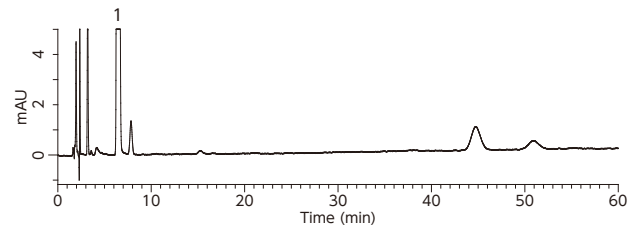
Conditions

Column : Inertsil ODS-3 (5 μm, 250 × 4.6 mm I.D.)
Eluent : Buffer*
Flow Rate : 1.5 mL/min
Col. Temp. : 60 °C
Detection : UV 295 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No.LB555

Sample :
1. Mirtazapine (500 mg/L)

*Add 23.5 mL of 25% tetramethylammonium hydroxide solution to 626.5 mL of water. Adjust with phosphoric acid to a pH of 7.4. Add 150 mL of acetonitrile, 125 mL of methanol, and 75 mL of tetrahydrofuran.

Sitagliptin

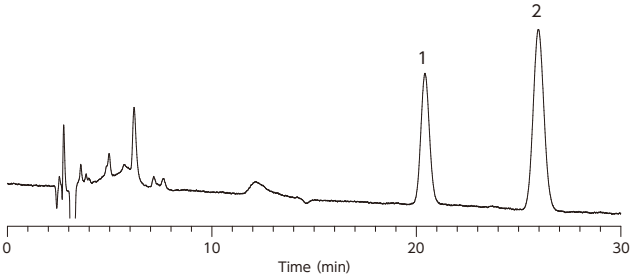


Conditions

Column : InertSustain Cyano
(5 μm, 150 x 4.6 mm I.D.)
Eluent : A) Buffer* B) CH_3CN
A/B = 85/15, v/v
Flow Rate : 1.0 mL/min
Col.Temp. : 30 °C
Detection : UV 205 nm (PD7752 PDA Detector)
Injection Vol. : 20 μL

*Dissolve 1.36 g of KH_2PO_4 in 900 mL of water.
Adjust pH 2.0 by phosphoric acid.
Add water to make 1,000 mL.

Tranexamic Acid (JP)



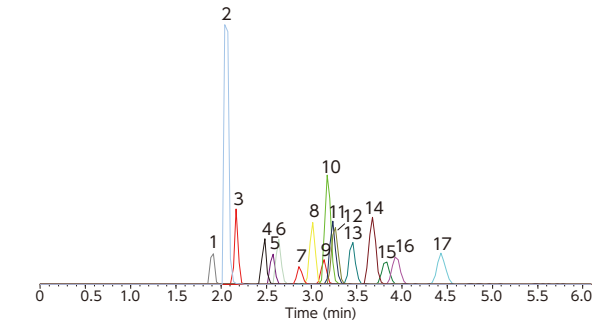
Conditions

Column : InertSustain AQ-C18 (5 μm, 250 × 6.0 mm I.D.)
Eluent : A) CH_3OH
B) Phosphate Buffer (pH = 2.5)
A/B = 40/60, v/v
Flow Rate : 1.4 mL/min
Col.Temp. : 25 ˚C
Detection : UV 220 nm
Injection Vol. : 20 μL
Data Source : LC Technical Note No.92

Sample :
1. Tranexamic acid (200 mg/L)
2. 4-Aminobenzoic acid methyl ester (2 mg/L)

Pharmaceuticals

Analysis of 17 Anti-depressant Drugs



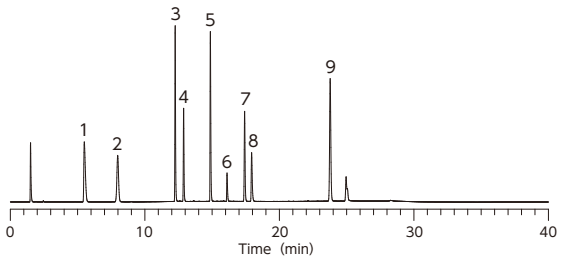
Conditions

Column	: InertSustain C18 HP (3 μm,150 × 2.1 mm I.D.)
Eluent	: A) 0.1 % HCOOH in CH_3CN B) 0.1 % HCOOH in H_2O 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 μL
Data Source	: LC InertSearch No. LA908

Sample :

1. Sulpiride	10. Imipramine
2. Milnacipran	11. Nortriptyline
3. Trazodone	12. Maprotiline
4. Mianserin	13. Amitriptyline
5. Amoxapine	14. Trimipramine
6. Doxepin	15. Fluoxetine
7. Paroxetine	16. Sertraline
8. Desipramine	17. Clomipramine
9. Fluvoxamine	(100 ng/mL each)

Analysis of 9 Drugs



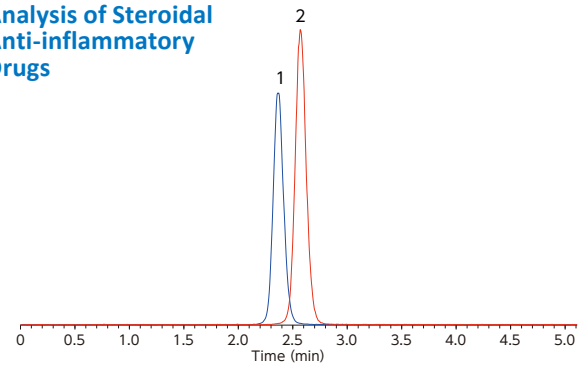
Conditions

Column	: InertSustain C18 (3 μm, 150 × 4.6 mm I.D.)
Eluent	: A) CH_3CN B) 10 mM KH_2PO_4 in H_2O (pH 7.0, 10 mM K_2HPO_4 in H_2O)
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 220 nm
Injection Vol.	: 10 μL
Data Source	: LC InertSearch No. LB400

Sample :

1. Acetylsalicylic acid
2. Acetaminophen
3. Caffeine
4. Ranitidine
5. Ketoprofen
6. Berberine hydrochloride
7. Chlorpromazine
8. Dextromethorphan
9. Amitriptyline (50 mg/L each)

Analysis of Steroidal Anti-inflammatory Drugs



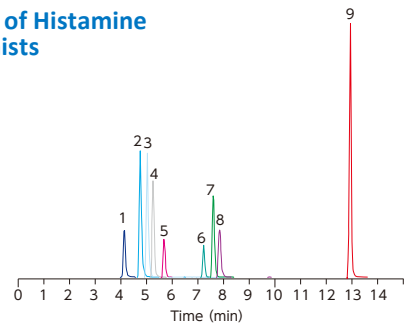
Conditions

Column	: InertSustain Phenyl (2 μm, 50 × 2.1 mm I.D.)
Eluent	: A) CH_3OH/HCOOH = 100/0.05, v/v B) H_2O/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 μL
Data Source	: LC InertSearch No. LB198

Sample :

1. Hydrocortisone
2. Prednisolone (0.1 mg/L each)

Analysis of Histamine Antagonists



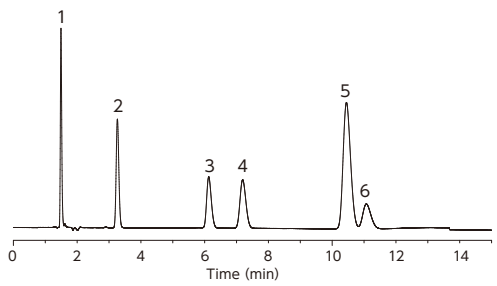
Conditions

Column	: Inertsil ODS-4 (3 μm, 150 × 2.1 mm I.D.)
Eluent	: A) CH_3OH B) 2 mM CH_3COONH_4 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 μL
Data Source	: LC InertSearch No. LA678

Sample :

1. Chlorpheniramine	6. Diphenylpyraline
2. Cinnarizin	7. Hydroxyzine
3. Clemastine	8. Promethazine
4. Difenidol	9. Triprolidine
5. Diphenhydramine	(0.1 mg/L each)

Analysis of β-blocker



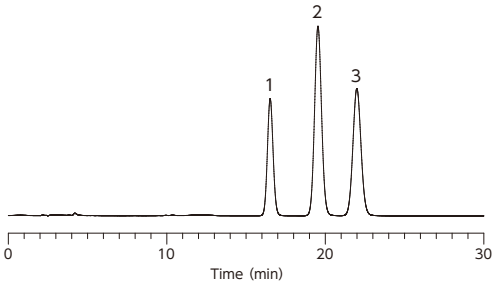
Conditions

Column	: InertSustain AQ-C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent	: A) CH_3CN B) 0.1 % H_3PO_4 in H_2O A/B = 25/75, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 220 nm
Injection Vol.	: 1 μL
Data Source	: LC InertSearch No. LB362

Sample :

1. Atenolol
2. Acebutolol
3. Oxprenolol
4. Labetalol
5. Propranolol
6. Alprenolol (100 μg/mL each)

Analysis of Nonsteroidal Anti-inflammatory Drug



Conditions

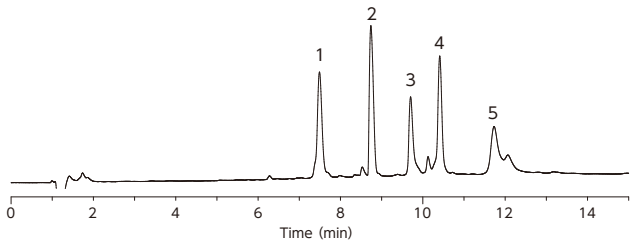
Column	: InertSustain Phenylhexyl(5 μm, 150 × 4.6 mm I.D.)
Eluent	: A) CH_3OH B) 25 mM KH_2PO_4 in H_2O(pH = 3.0, H_3PO_4) A/B = 60/40, v/v
Flow Rate	: 0.8 mL/min
Col. Temp.	: 40 °C
Detection	: UV 230 nm
Injection Vol.	: 5 μL
Data Source	: LC InertSearch No. LB421

Sample :

1. Ibuprofen
2. Diclofenac sodium
3. Indomethacin

Biochemicals

Protein

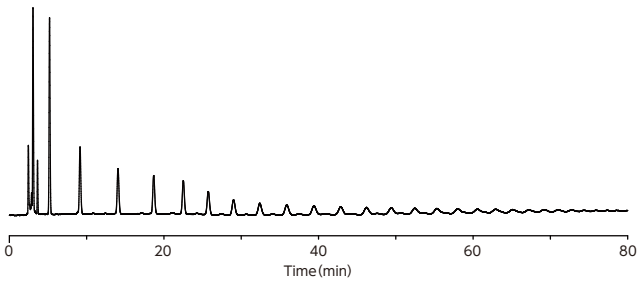


Conditions

Column : MonoCap C18 Fast-Flow (150 mm × 0.2 mm I.D)
Eluent : A) 0.1 % TFA in CH_3CN
B) 0.1 % TFA in H_2O
: A/B= 20/80 - 10 min - 60/40-15 min - 60/40
Flow Rate : 5 μL/min
injection vol. : 0.3 μL
Col. Temp. : ambient
Detection : UV 210 nm

Sample :
1. Ibonuclease A
2. Insulin
3. Cytochrome C
4. Lysozyme
5. BSA

2-AB Derivatized glycans

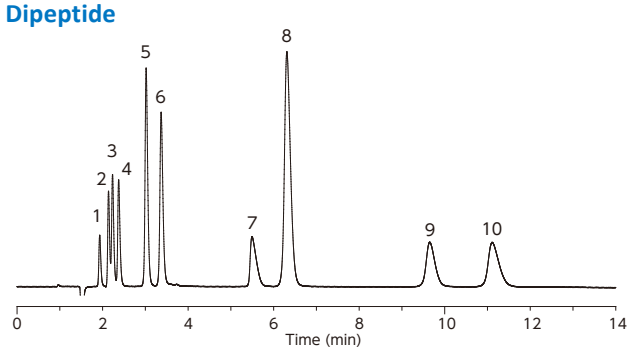


Conditions

Column : InertSustain Amide (5μm, 250 × 4.6 mm I.D.)
Eluetnt : A) CH_3CN
B) 50 mM $HCOONH_4$ in H_2O (pH 4.4, HCOOH)
Flow Rate : 1.0 mL/min
Col. Temp. : 50 ˚C
Detection : FL Ex 330 nm Em 420 nm
(FL7753 FL Detector)
Injection vol. : 25 μ L

Sample :
2-AB Labeled Glucose Homopolymer Ladder
Data Sorce :
LC Technical Note No.LT172

Dipeptide

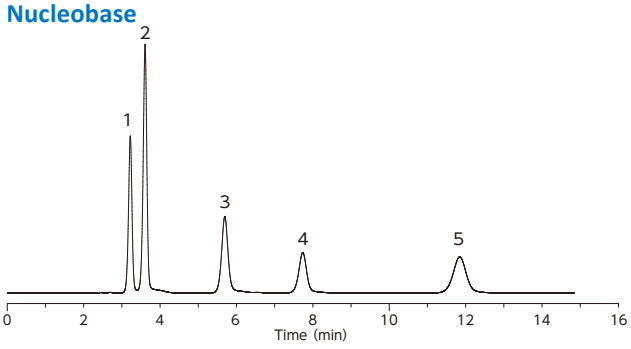


Conditions

Column : InertSustain PFP (3 μm, 150 × 2.1 mm I.D.)
Eluent : 0.1 % HCOOH in H_2O
Flow Rate : 0.3 mL / min
Col.Temp. : 40°C
Detection : UV 220 nm

Sample :
1. Glu-Lys
2. Ala-Gly
3. Ala-Gln
4. Ala-Ala
5. Gly-His
6. Ala-Val
7. Ala-His
8. Ala-Tyr
9. Gly-Phe
10. Ala-Phe

Nucleobase

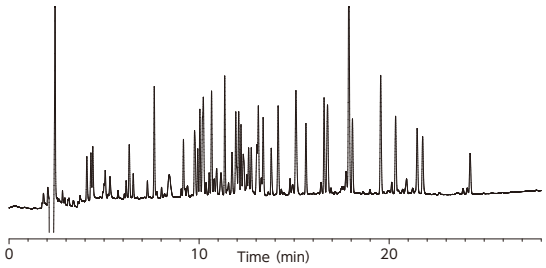


Conditions

Column : InertSustain Amide
(5μm, 150 × 2.1 mm I.D.)
Eluent : A) CH_3CN
B) 10 mM $HCOONH_4$ in H_2O
A/B = 90/10, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 ˚C
Detection : UV 254 nm

Sample :
1. Tymine
2. Uracil
3. Adenine
4. Cytosine
5. Guanine

Analysis of BSA Digests

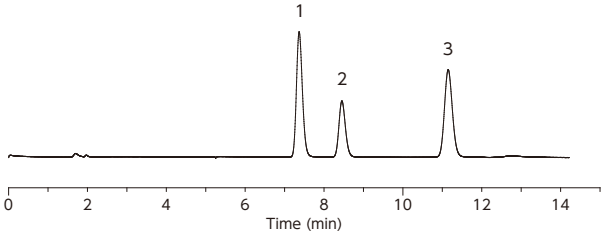


Conditions

Column : InertSustainSwift C18
(1.9 μm, 150 × 2.1 mm I.D.)
Eluent : A) 0.1% TFA in CH_3CN
B) 0.1% TFA in H_2O
A/B = 10/90 - 30 min - 50/50 - 0.1 min - 90/10
- 5 min - 90/10 - 0.1 min - 10/90 - 15 min
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LB438

Sample :
Tryptic Digest of BSA (0.5 mg/mL)

Catecholamine in Urine



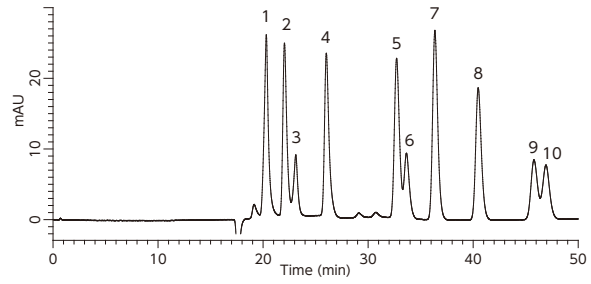
Conditions

Column : Inertsil ODS-4
(5 μm, 250 × 3.0 mm I.D.)
Eluent : A) Acetate-citrate buffer B) CH_3CN
A/B = 100/16, v/v
Flow Rate : 0.5 mL/min
Col.Temp. : 35 °C
Detection : ECD (ED743, Diamond)
Injection Vol. : 20 μL

Sample :
1. Norepinephrine (NE)
2. Epinephrine (E)
3. Dopamine (DA)

Foods

Organic Acid

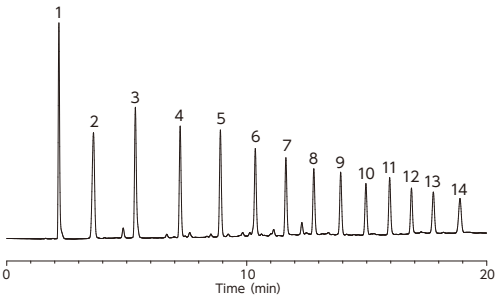


Conditions

Column	: InertSphere FA-1 Guard(9 μm, 6.0 mmI.D. × 50 mm)
Guard Column	: InertSphere FA-1(9 μm, 7.8 mmI.D. × 300 mm)× 2 pcs joint
Eluent	: 3 mM $HClO_4$
Reaction Reagent	: 0.1 mM BTB + 30 mM Na_2HPO_4
Flow Rate	: 0.5 mL/min
Col Tempe.	: 35 °C
Detection	: VIS 440 nm
Injection Vol.	: 10 μL
Data Source	: LC Technical Note No.LT173

Sample :
1. Phosphoric acid
2. Citric acid
3. Pyruvic acid
4. Malic acid
5. Succinic acid
6. Lactic acid
7. Formic acid
8. Acetic acid
9. Levulinic acid
10. Pyroglutamic acid
(1 mg/mL each)

Fatty Acid

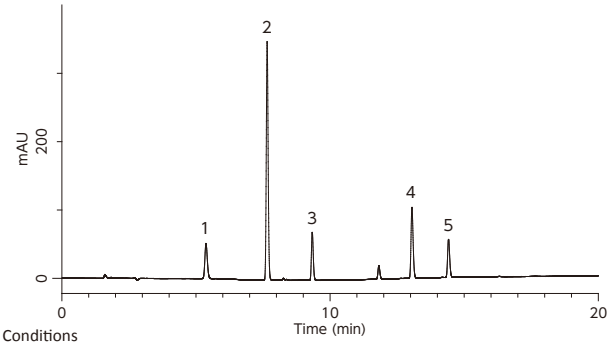


Conditions

Column	: InertSustain C18 (5 μm, 150 × 4.6 mm I.D)
Eluent	: A) 0.1 % H_3PO_4 in CH_3CN B) 0.1 % H_3PO_4 in H_2O 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 μL
Data Source	: LC InertSearch No. LA901

Sample :
1. Acetic acid (C2)
2. Propionic acid (C3)
3. Butyric acid (C4)
4. Valeric acid (C5)
5. Caproic acid (C6)
6. Enanthic acid (C7)
7. Caprylic acid (C8)
8. Pelargonic acid (C9)
9. Capric acid (C10)
10. Undecanoic acid (C11)
11. Lauric acid (C12)
12. Tridecanoic acid (C13)
13. Myristic acid (C14)
14. Pentadecanoic acid (C15)
(1 mg/mL each)

Preservative · Sweetner

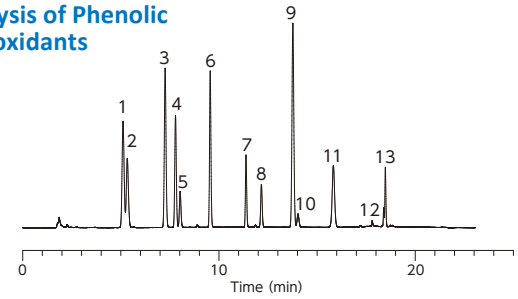


Conditions

Column	: InertSustain AQ-C18(5 μm, 150 x 4.6 mm I.D.)
Eluent	: A) CH_3CN B) 10 mM KH_2PO_4 in H_2O (pH 2.0, H_3PO_4)
Flow Rate	: 1.0 mL/min
Col.Temp.	: 40 °C
Detection	: UV 210 nm (PD7752 PDA Detector)
Injection Vol.	: 20 μL
Data Source	: LC InertSearch No.LB559

Sample :
1. Acesulfame potassium
2. Saccharin
3. Aspartame
4. Advantame
5. Neotame
(10 mg/L each)

Analysis of Phenolic Antioxidants

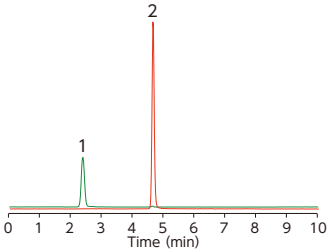


Conditions

Column	: InertSustainSwift C18 HP (3 μm, 250 × 4.6 mm I.D.)
Eluent	: A) CH_3CN/CH_3OH = 1/1, v/v B) 5 % CH_3COOH in H_2O A/B = 30/70 - 2 min - 30/70 - 8 min - 58/42 - 13 min - 58/42 - 15 min - 100/0 - 18 min - 100/0 - 18.1 min - 30/70 - 25 min - 30/70, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 280 nm
Injection Vol.	: 10 μL
Data Source	: LC InertSearch No. LB405

Sample :
1. Propyl gallate (PG)
2. 3,4-Dihydroxybenzoic acid (DHBA)
3. 2,4,5-Trihydroxybutyrophenone (THBP)
4. Butyl gallate (BG)
5. tert-Butylhydroquinone (TBHQ)
6. Isoamyl gallate (IAG)
7. Nordihydroguaiaretic acid (NDGA)
8. Butylated hydroxyanisole (BHA)
9. 4-Hexylresorcinol (HR)
10. 4-Hydroxymethyl-2,6-di-tert-butylphenol (HMBP)
11. Octyl gallate (OG)
12. Dibutylhydroxytoluene (BHT)
13. Dodecyl gallate (DG) (10 mg/L each)

Melamine

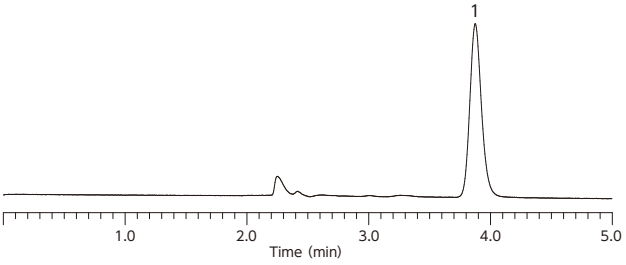


Conditions

Column	: Inertsil HILIC (5 μm, 150 × 3.0 mm I.D.)
Eluent	: A) CH_3CN B) 10 mM CH_3COONH_4 in H_2O 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 μL
Data Source	: LC Technical Note No.132

Sample :
1. Cyanoguanidine (20 μg/L)
2. Melamine (10 μg/L)

Oxalic Acid



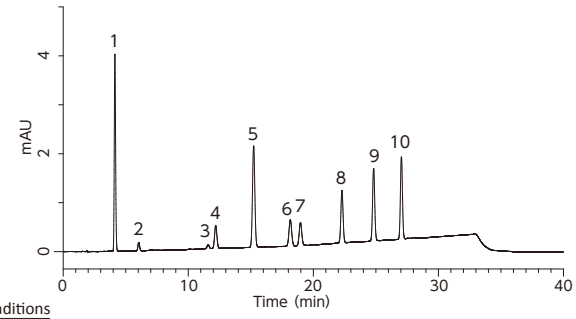
Conditions

Column	: InertSustain Amide (5μm, 250 × 4.6 mm I.D.)
Eluent	: A) CH_3CN B) 30 mM Na_2HPO_4 in H_2O (pH 6.8) A/B = 65/35, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 220 nm
Injection Vol.	: 5μL
Data Source	: LC InertSearch No.LB466

Sample :
1. Oxalic acid (100 mg/L)

Foods

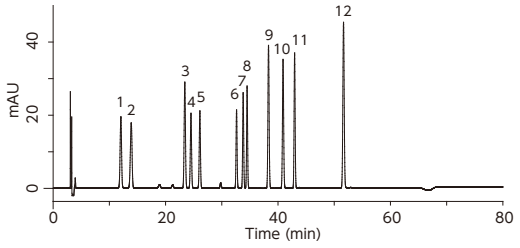
Catechin in Tea



Conditions

Column	: InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)	Sample : 1. Gallic acid(GA)
Eluent	: A) CH_3OH/CH_3CN = 9/1, v/v B) 0.1 % H_3PO_4 in H_2O (pH 2.1) A/B = 10/90 - 15 min - 20/80 - 30 min - 40/60 - 30.1 min - 10/90 - 40 min - 10/90, v/v	2. Gallocatechin(GC) 3. Epigallocatechin(EGC) 4. Catechin(C) 5. Caffeine 6. Epigallocatechin gallate(EGCG)
Flow Rate	: 1.0 mL/min	7. Epicatechin(EC)
Col:Temp	: 40 °C	8. Gallocatechin gallate(GCG)
Detection	: UV 280 nm	9. Epicatechin gallate(ECG)
Injection Vol.	: 10 μL	10. Catechin gallate(CG)
Data Source	: LC Technical Note No. 145	(1 mg/L each)

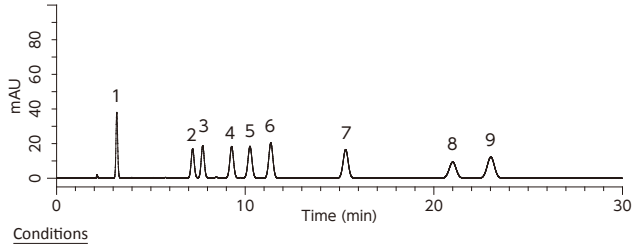
Isoflavone in Soybeen



Conditions

Column	: InertSustainSwift C18 (5 μm, 250 x 4.6 mm I.D.)	Sample : 1. Daidzin (D)
Eluent	: A) $CH_3CN/H_2O/CH_3COOH$ = 150/850/1, v/v/v B) $CH_3CN/H_2O/CH_3COOH$ = 350/650/1, v/v/v	2. Glycitin (Gl) 3. Genistin (G) 4. 6''-O-Malonyldaidzin (MD) 5. 6''-O- Malonylglycitin (MGl)
Flow Rate	: 1.0 mL/min	6. 6''-O- Acetyldaidzin (AD)
Col.Temp.	: 35 °C	7. 6''-O- Malonylgenistin (MG)
Detection	: PDA 254 nm (PD7752 PDA Detector)	8. 6''-O- Acetylglycitin (AGl)
Injection Vol.	: 10 μL	9. Daizein (De) 10. Glycitein (Gle) 11. 6''-O- Acetylgenistin (AG) 12. Genistein (Ge) (10 mg/L each)

Steviol glycoside

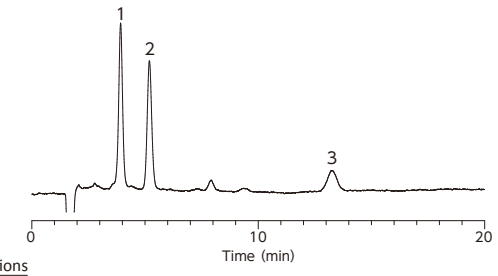


Conditions

Column	: Inertsil ODS-HL (5 μm, 250 x 4.6 mm I.D.)	Sample : 1. Rebaudioside D 2. Rebaudioside A 3. Stevioside 4. Rebaudioside F 5. Rebaudioside C 6. Dulcoside A 7. Rubusoside 8. Rebaudioside B 9. Steviolbioside (100 mg/L each)
Eluent	: A) CH_3CN B) 0.01 M Phosphate buffer in H_2O (pH 2.6)* A/B = 8/17, v/v	
Flow Rate	: 1.0 mL/min	
Col. Temp.	: 40 °C	
Detection	: UV 210 nm (UV7751 UV Detector)	
Injection Vol.	: 10 μL	
Data Source	: LC InertSearch No.LB567	

*Dissolve 1.56 g of sodium dihydrogenphosphate dihydrate in 1000 mL of water (Solution A).
Dissolve 1.15 g of phosphoric acid in 1000 mL of water (Solution B).
Mix together equal parts of SolutionA and Solution B.

Tetracycline

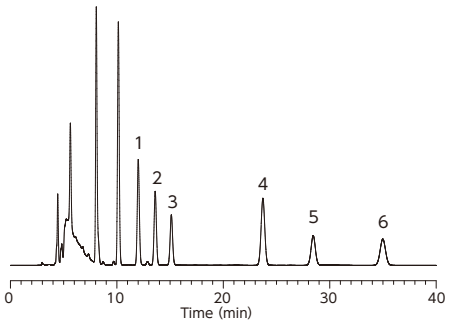


Conditions

Column	: InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)	Sample : 1. Oxytetracycline 2. Tetracycline 3. Chlortetracycline (1 mg/L each)
Eluent	: A) CH_3OH B) Imidazole buffer* A/B = 20/80, v/v (Premix)	
Flow Rate	: 1.0 mL/min	
Col. Temp.	: 40 °C	
Detection	: FL Ex 380 nm Em 520 nm	
Injection Vol.	: 20 μL	

* Imidazole buffer :
Dissolve 68.08 g of imidazole, 0.37 g of disodium ethylenediaminetetraacetate and 10.72 g of magnesium acetate in 800 mL of H_2O.
Adjust to pH 7.2 with acetic acid and dilute this solution to 1,000 mL with H_2O.

Analysis of Non-volatile Corruption Amine



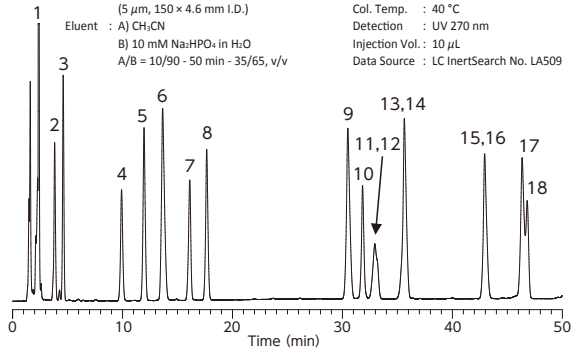
Conditions

Column	: Inertsil ODS-SP (5 μm, 250 × 4.6 mm I.D.)	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)
Guard Column	: Inertsil ODS-SP (5 μm, 10 × 4.0 mm I.D.)	
Eluent	: A) CH_3CN B) H_2O 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 μL	
Data Source	: LC Technical Note No. 48	

Analysis of Food Dyes

Conditions

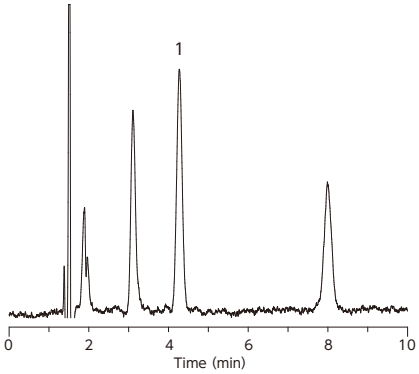
Column	: Inertsil ODS-3 (5 μm, 150 × 4.6 mm I.D.)	Flow Rate : 1.0 mL/min Col. Temp. : 40 °C Detection : UV 270 nm Injection Vol. : 10 μL Data Source : LC InertSearch No. LA509
Eluent	: A) CH_3CN B) 10 mM Na_2HPO_4 in H_2O A/B = 10/90 - 50 min - 35/65, v/v	



Sample :
1. Tartrazine (Food Yellow No. 4, 7.6 mg/L)
2. Amaranth (Food Red No. 2, 3.8 mg/L)
3. Ingigocarmine (Food Blue No. 2, 7.6 mg/L)
4. New coccine (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)

Environment

Analysis of Non-ionic Surfactant

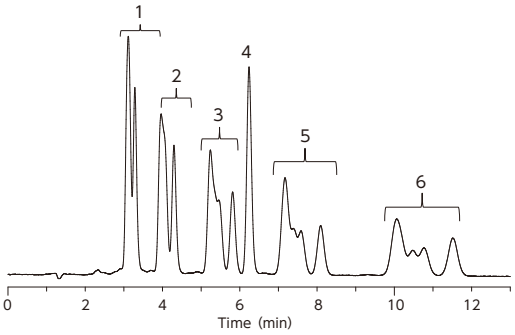


Conditions

Column : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) CH_3OH B) 10 mM $Na_2B_4O_7$ in H_2O A/B = 38/62, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 510 nm
Injection Vol. : 20 μL
Data Source : LC InertSearch No. LA974

Sample :
1. Heptaoxyethylene dodecyl ether [Deriv.](0.002 mg/L)

Analysis of Anionic Surfactant

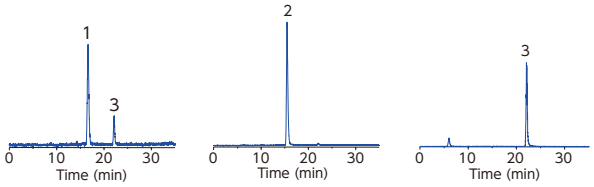


Conditions

Column : Inertsil ODS-3 (5 μm, 150 × 4.6 mm I.D.)
Eluent : 0.1 M $NaClO_4$ in CH_3CN/H_2O = 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 μL
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

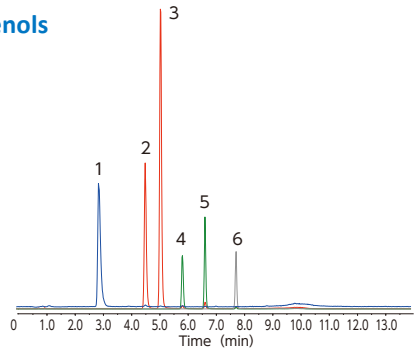


Conditions

Column : InertSustain C18 (3 μm, 150 × 4.6 mm I.D.)
Eluent : A) CH_3OH
B) 0.2 % HCOOH in H_2O
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 μL
Data Source : LC Technical Note No. 125

Sample :
1. Monochloroacetic acid (MCAA) (2 μg/L)
2. Dichloroacetic acid (DCAA) (4 μg/L)
3. Trichloroacetic acid (TCAA) (20 μg/L)

Chlorophenols

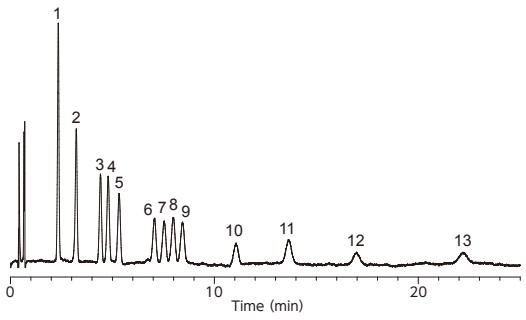


Conditions

Column : InertSustain C18 HP (3 μm, 100 × 2.1 mm I.D.)
Elient : A) CH_3OH, B) H_2O
A/B = 40/60 – 8 min – 90/10 – 0.5 min – 90/10 – 0.1 min – 40/60 – 5 min, v/v
Flo Rate : 0.3 mL/min
Col.Temp. : 40 °C
Detection : LC/MS
Injection Vol. : 25 μL
Data Source : LC Technical Note No. 149

Sample :
1. Phenol
2. 2-chlorophenol
3. 4-chlorophenol
4. 2,6-dichlorophenol
5. 2,4-dichlorophenol
6. 2,4,6-trichlorophenol (0.83 μg / L each)

DNPH Aldehydes

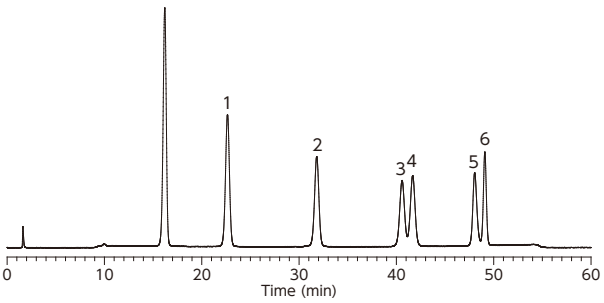


Conditions

Column : InertSustain C18 HP (3 μm, 150 × 3.0 mm I.D.)
Eluent : A) CH_3CN
B) THF
C) H_2O
A/B/C = 35/10/55, v/v/v
Flow Rate : 1.5 mL/min
Col. Temp. : 40 °C
Detection : UV 360 nm
Injection Vol. : 10 μL
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 μg/L each)

Aldehydes subject to specific malodorous substances



Conditions

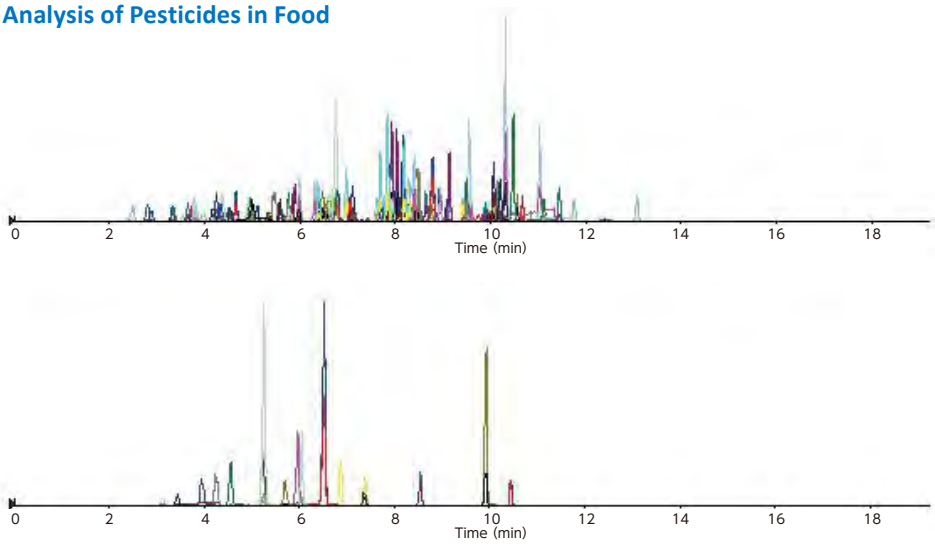
Column : InertSustain PFP (5 μm, 250 x 4.6 mm I.D.)
Eluent : A) CH_3OH/CH_3CN=9/1, v/v
B) H_2O
A/B = 40/60 – 40 min – 53/47 – 10 min – 70/30 – 0.1 min – 40/60, v/v
Flow Rate : 1.0 mL/min
Col.Temp. : 40 °C
Detection : UV 360 nm (UV7750 UV Detector)
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LB539

Sample :
1. DNPH-Acetaldehyde
2. DNPH-Propionaldehyde
3. DNPH-*n*-Butyraldehyde
4. DNPH-Isobutyraldehyde
5. DNPH-Isovaleraldehyde
6. DNPH-*n*-Valeraldehyde (1.0 μg/mL each)

Pesticides

Analysis of Pesticides in Food

Data provided by AB Sciex

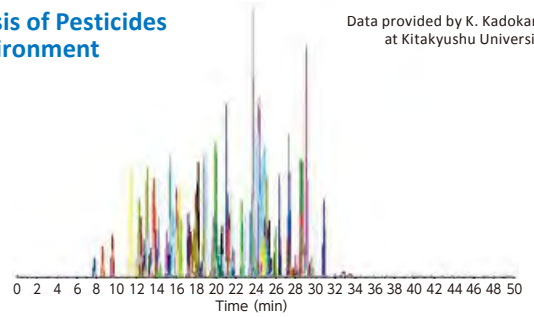


Conditions

Column	: InertSustain C18 (2 μm, 100 × 2.1 mm I.D.)
Eluent	: A) CH_3OH B) 2 mM CH_3COONH_4 in H_2O 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 °C
Detection	: LC/MS/MS (4000 QTRAP : ESI, MRM)
Injection Vol.	: 10 μL
Data Source	: LC Technical Note No. 129

Analysis of Pesticides in Environment

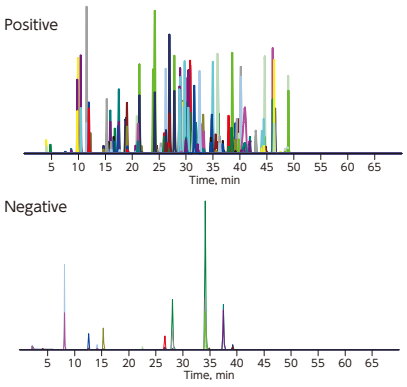
Data provided by K. Kadokami at Kitakyushu University



Conditions

Column	: Inertsil ODS-4 HP (3 μm, 150 × 2.1 mm I.D.)
Eluent	: A) 5 mM CH_3COONH_4 in CH_3OH B) 5 mM CH_3COONH_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 °C
Detection	: LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol.	: 2.5 μL
Data Source	: LC InertSearch No. LA 843

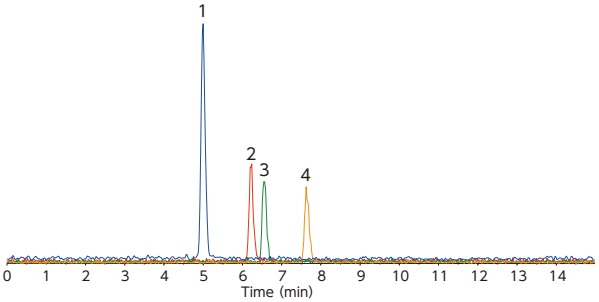
Analysis of Pesticides in Water



Conditions

Column	: InertSustain C18 HP (3 μm, 150 × 2.1mm I.D)
Eluent	: A)5mmol/L CH_3COONH_4 in H_2O B)5mmol/L CH_3COONH_4 in CH_3OH A/B = 90/10 – 7min – 55/45 – 35min – 20/80 – 4min – 0/100 (5min hold) – 4min - 90/10 (10min hold)
Flow Rate	: 0.2 mL/min
Injection Vol.	: 30 μL
Col. Temp.	: 40 °C
Data Source	: LC Technical Note No. LT168

Pesticides

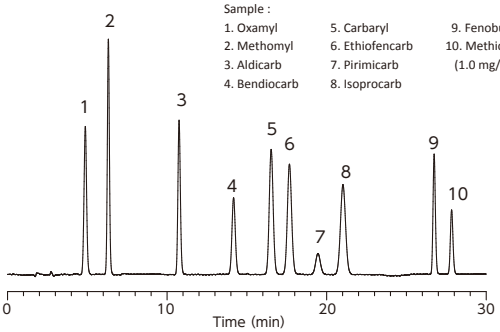


Conditions

Column	: InertSustain Phenyl (3 μm, 150 × 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 °C
Detection	: LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol.	: 5 μL
Data Source	: LC InertSearch No. LB077

Sample :
1. Paclobutrazole
2. Diniconazole
3. Propiconazole
4. Difenconazole
(1 μg/L each)

Analysis of Carbamate Insecticides



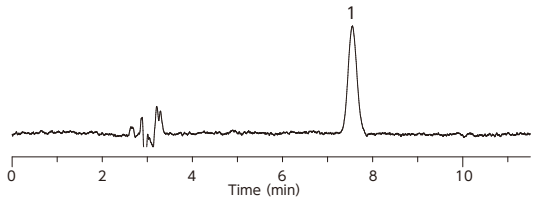
Sample :
1. Oxamyl
2. Methomyl
3. Aldicarb
4. Bendiocarb
5. Carbaryl
6. Ethiofencarb
7. Pirimicarb
8. Isoprocarb
9. Fenobucarb
10. Methiocarb
(1.0 mg/L each)

Conditions

Column	: InertSustain C18 (5 μm, 250 × 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 °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 μL
Data Source	: LC InertSearch No. LA916

Vitamins

Vitamin A

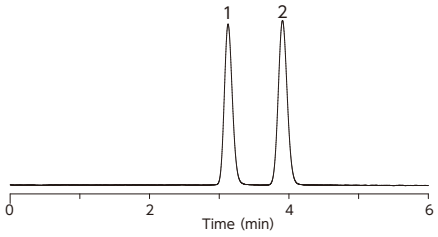


Conditions

Column	: Inertsil ODS-3 (5 μm, 250 × 4.6 mm I.D.)
Eluent	: A) CH_3OH B) H_2O A/B = 95/5, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 325 nm
Injection Vol.	: 20 μL
Data Source	: LC Technical Note No. 32

Sample :
1. Retinol (50 μg/L)

Vitamin B1

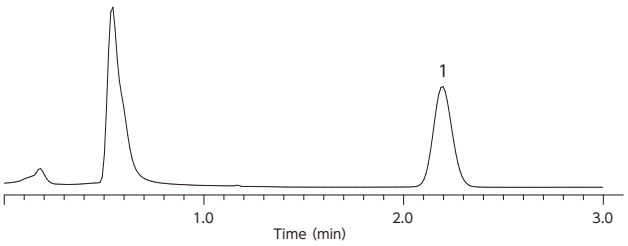


Conditions

Column	: Inertsil ODS-3 (5 mm, 150 × 4.6 mm I.D.)
Eluent	: A) CH_3OH B) 0.01 M NaH_2PO_4, 0.15 M $NaClO_4$ in H_2O (pH 2.2) A/B = 1/9, v/v
Reaction Reagent	: 0.05 w/v % potassium ferricyanide +15 w/v % NaOH, 0.4 mL/min
Flow Rate	: 1.0 mL/min
Col.Temp.	: 40 °C
Detection	: FL Ex 375 nm Em 440 nm
Injection Vol	: 20 μL
Data Source	: LC Technical Note No. 143

Sample :
1. Thiamine
2. Hydroxyethylthiamine (HET)
(50 mg/L each)

Vitamin C

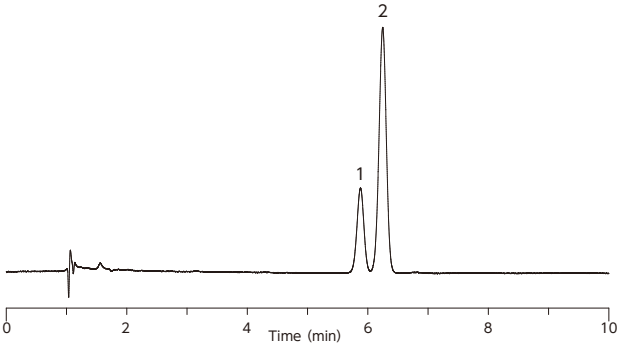


Conditions

Column	: InertSustain Amide (5 μm, 150 × 3.0 mm I.D)
Eluent	: A) CH_3CN B) 0.1 % H_3PO_4 in H_2O A/B = 87/13, v/v
Flow Rate	: 0.8 mL / min
Col. Temp.	: 40 °C
Detection	: UV 243 nm
Injection Vol.	: 2 μL

Sample :
1. Ascorbic acid

Vitamin D2, D3

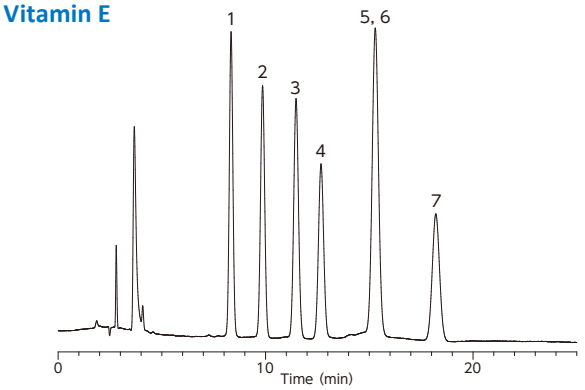


Conditions

Column	: Inertsil ODS-HL (3μm, 150 × 2.1 mm I.D.)
Eluent	: CH_3OH
Flow Rate	: 0.3 mL/min
Col. Temp.	: 25 °C
Detection	: UV 265 nm
Injection Vol.	: 5μL
Data Source	: LC InertSearch No. LB467

Sample :
1. Vitamin D2
2. Vitamin D3
(5 mg/L each)

Vitamin E

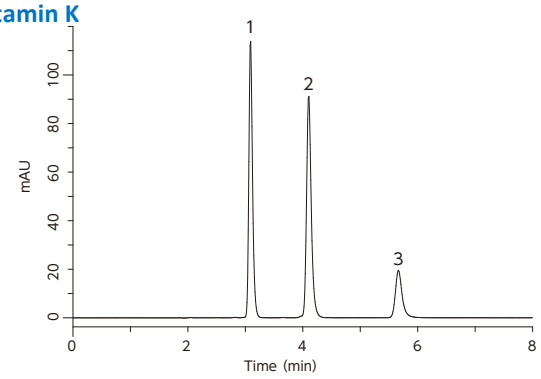


Conditions

Column	: Inertsil ODS-HL (5μm, 250 × 4.6 mm I.D.)
Eluent	: CH_3OH
Flow Rate	: 1.0 mL/min
Col. Temp.	: 30 °C
Detection	: UV 210 nm
Injection Vol.	: 5μL

Sample :
1. δ -Tocotrienol
2. γ -Tocotrienol
3. α -Tocotrienol
4. δ -Tocopherol
5. β -Tocopherol
6. γ -Tocopherol
7. α -Tocopherol
(10 mg/L each)

Vitamin K



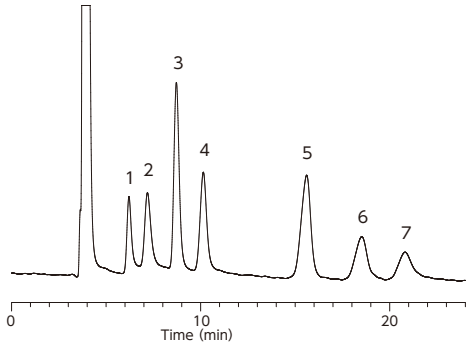
Conditions

Column	: InertSustainSwift C8 (5μm, 150 × 4.6 mm I.D.)
Eluent	: CH_3CN
Flow rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 270 nm
Injection Vol.	: 5μL
Data Source	: LC InertSearch No. LB468

Sample :
1. Vitamin K2 (MK-4)
2. Vitamin K1
3. Vitamin K2 (MK-7)
(50 mg/L each)

Others

Sugars

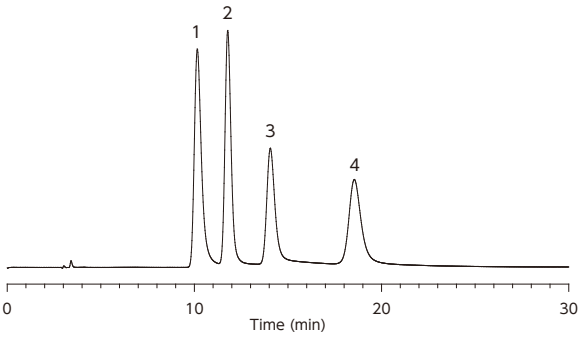


Conditions

Column	: InertSustain NH2 (5 μm, 250 × 4.6 mm I.D.)
Eluent	: A) CH_3CN B) H_2O A/B = 85/15, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: RI
Injection Vol.	: 10 μL
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 with ECD

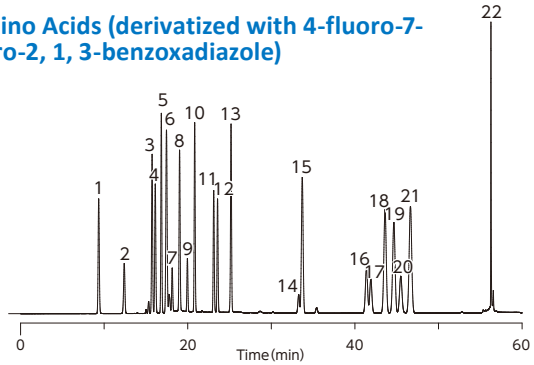


Conditions

Column	: InertSphere Sugar-1 (5 μm, 150 × 4.6 mm I.D.)
Eluent	: 100 mM NaOH in H_2O
Flow Rate	: 0.5 mL/min
Col.Temp.	: 30 °C
Detection	: ECD (ED743, Gold)
Injection Vol.	: 10 μL

Sample :
1. Fucose
2. Glucose
3. Fructose
4. Lactose

Amino Acids (derivatized with 4-fluoro-7-nitro-2, 1, 3-benzoxadiazole)



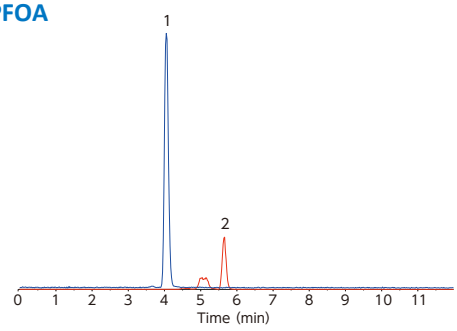
Conditions

Column	: InertSustainSwift C18 (5μm, 250 × 4.6 mm I.D.)
Eluent	: A) 0.1 % TFA in CH_3CN B) 0.1 % TFA in H_2O A/B = 10/90 - 5 min - 10/90 - 20 min - 30/70 - 50 min - 35/65 - 50.1 min - 80/20 - 55 min - 80/20 - 55.1 min - 10/90 - 70 min - 10/90, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: FL Ex 470 nm Em 530 nm
Injection Vol.	: 5 μL

Sample :
1. NBD-Taurin
2. NBD-Histidine
3. NBD-Glutamine
4. NBD-Serine
5. NBD-Arginine
6. NBD-OH
7. NBD-Aspartic acid
8. NBD-Glycine
9. NBD-Glutamic acid
10. NBD-Threonine
11. NBD-Alanine
12. NBD-GABA
13. NBD-Proline
14. NBD-Methionine
15. NBD-Valine
16. NBD-Cystine
17. NBD-Ornithine
18. NBD-Isoleucine
19. NBD-Leucine
20. NBD-Lysine
21. NBD-Phenylalanine
22. NBD-Tyrosine
(50 μmol/L each)

Data Source : LC InertSearch No. LB470

PFOS · PFOA

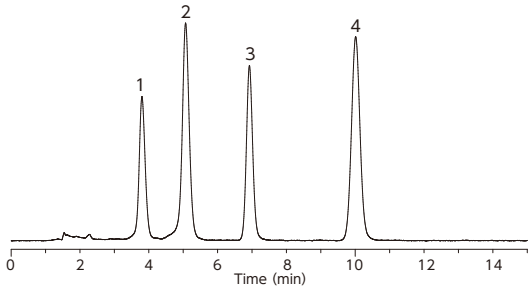


Conditions

Column	: Inertsil ODS-4 (3 μm, 100 × 2.1 mm I.D.)
Eluent	: A) 5 mM CH_3COONH_4 in CH_3OH B) 5 mM CH_3COONH_4 in H_2O A/B = 60/40 - 8 min - 75/25 - 0.1 min - 90/10 - 1.9 min - 90/10 - 0.1 min - 60/40 - 4.9 min - 90/10, v/v
Flow Rate	: 0.6 mL/min
Col. Temp.	: 40 °C
Detection	: LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
Injection Vol.	: 2 μL
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

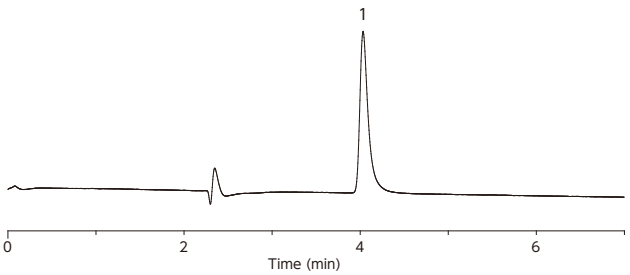


Conditions

Column	: InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent	: A) CH_3OH B) CH_3CN C) H_2O 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 μL
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



Conditions

Column	: Inertsil CX (5 μm, 250 × 4.6 mmI.D.)
Eluent	: 10 mM Na_2SO_4
Flow Rate	: 0.8 mL/min
Col.Temp.	: 30 °C
Detection	: ECD (ED743, Platinum)
Injection Vol.	: 10 μL

Sample :
1. Hydrogen peroxide
(H_2O_2, 100 ng/mL)

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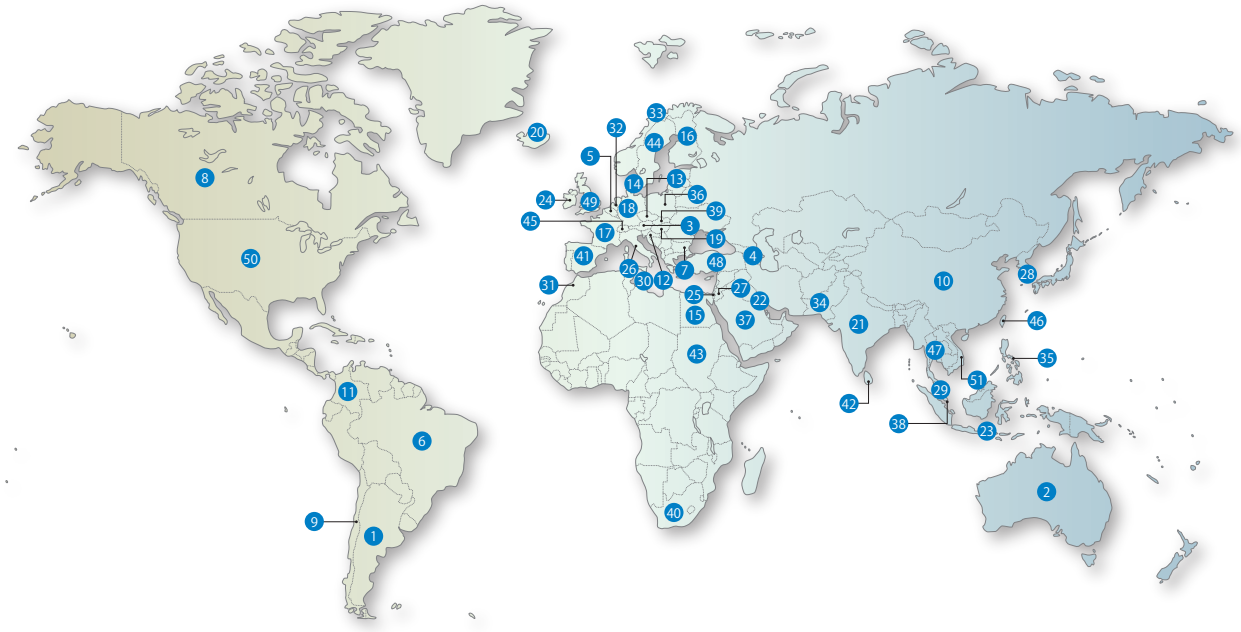
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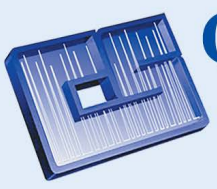
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