

GL Sciences

# HPLC · LC/MS Columns

## General Catalog

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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 |



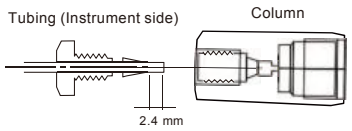
# General Precautions

## 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

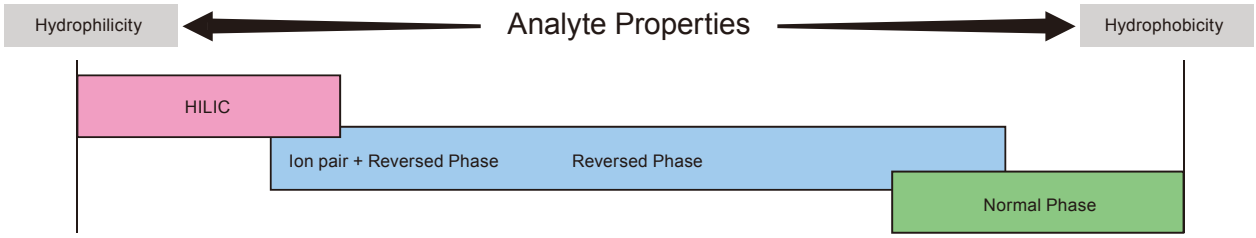
The maximum pressure of an HPLC column depends on its size and type. Please see the table below or check the appropriate instructions manual before use.

| Columns | I.D. | Particle Size | Maximum Operating Pressure |
|---|---|---|---|
| Analytical Columns<br>InertSustain Series<br>InertSustainSwift Series<br>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<br>InertSustain Series<br>InertSustainSwift Series<br>Inertsil Series | 6.0 - 50 mm | 5 , 10 µm | 20 MPa(200 bar) |
| | 100 mm | 5 , 10 µm | 10 MPa(100 bar) |
| Capillary Columns<br>InertSustain Series<br>InertSustainSwift Series<br>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) |

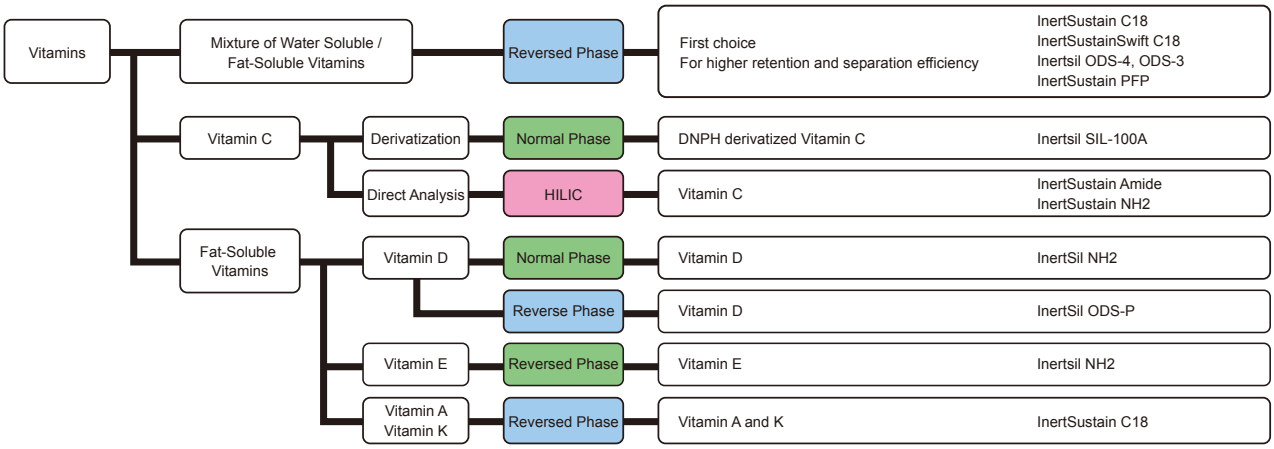
| Guard Columns | Maximum Operating Pressure |
|---|---|
| Guard Column for UHPLC | 80 MPa (800 bar) |
| Cartridge Guard Column E<br>Cartridge Guard Column Ei<br>GL Cart, Pre-clean ORG<br>PREP Guard Cartridge | 20 MPa (200 bar) |
| Packed Guard Columns<br>Packed Mini Guard Columns<br>Preparative Guard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

# Column Selection Overview

## Separation Mode Selection for Analyte Polarity



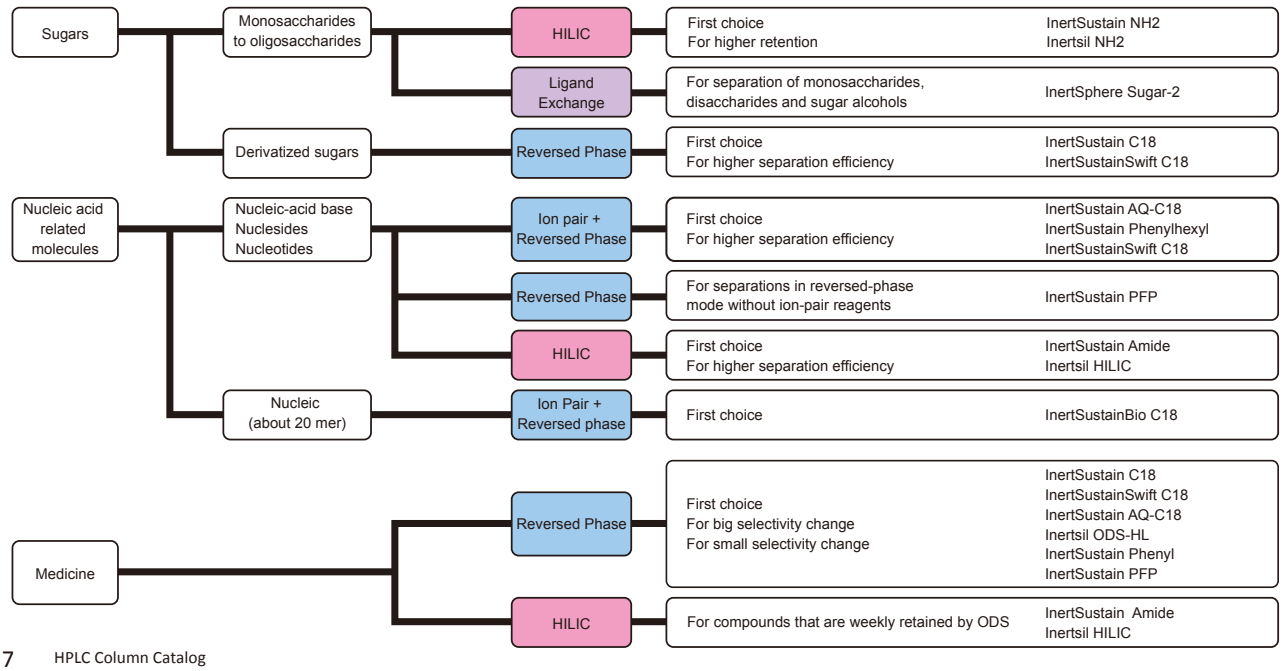

## Column Selection for Analyte Properties

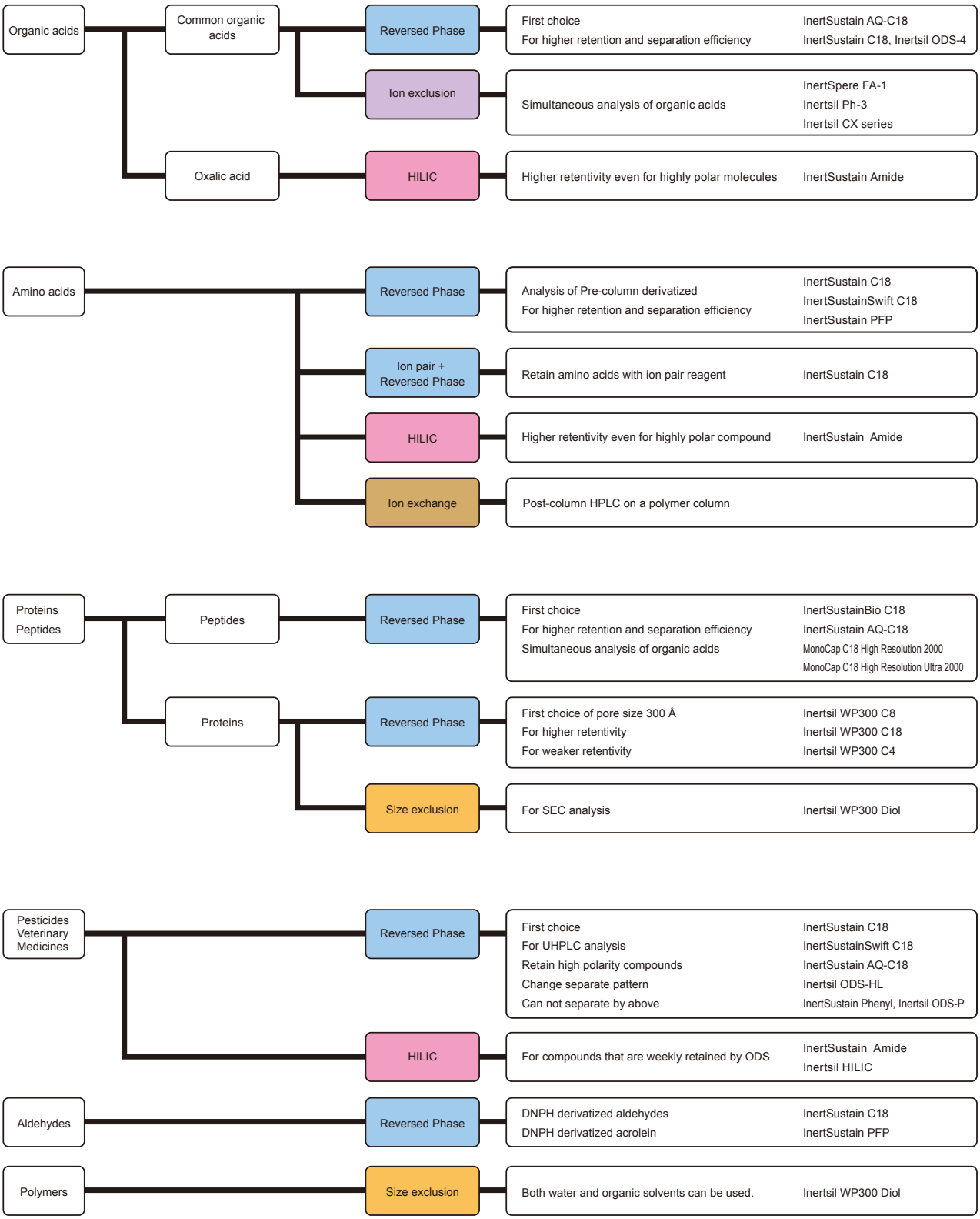



| Water Soluble Vitamins | Phase | Detector |
|---|---|---|
| Vitamin C | $NH_2$, SIL, Amide | UV |
| Vitamin $B_1$ | ODS | UV, (FL) |
| Vitamin $B_2$ | ODS | UV, FL |
| Vitamin $B_6$ | ODS | UV |
| Niacin | ODS | UV |
| Folic acid | ODS | UV |
| Pantothenic acid | ODS | UV |

| 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<br>InertSustain AQ-C18<br>InertSustainSwift C18<br>InertSustain AX-C18<br>Inertsil ODS-HL<br>Inertsil ODS-4<br>Inertsil ODS-3<br>Inertsil ODS-SP<br>Inertsil ODS-P<br>Inertsil ODS-2<br>Inertsil ODS<br>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<br>Inertsil SIL-150A<br>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<br>InertSustainSwift C8<br>Inertsil C8-4<br>Inertsil C8-3<br>Inertsil C8<br>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<br>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<br>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<br>InertSustain Phenyl<br>Inertsil Ph-3<br>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<br>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<br>Partisil SAX<br>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<br>PRP-X200, PRP-X300<br>HC-75($H^+$)<br>SUGAR SH1011, SH1821<br>RSpak KC-811<br>IC Y-521 |
| L18 | Amino and cyano groups chemically bonded to porous silica particles, 3 to 10 µm in diameter. | Partisil 5 PAC<br>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<br>HC-75($Ca^{2+}$)<br>SUGAR SC1011, SC1821<br>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<br>Inertsil WP300 Diol<br>PROTEIN KW-800 series |
| L21 | A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter. | PRP-1, PRP-3<br>GPC KF-801<br>RSpak DS-413, DS-613<br>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<br>SUGAR SH1011, SH1821<br>RSpak KC-811<br>SUGAR SP0810<br>SUGAR SC1011, SC1821<br>SUGAR SZ5532<br>SUGAR KS800 series<br>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<br>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.<br>A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable. | OHpak SB-802 HQ<br>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<br>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<br>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($Pb^{2+}$)<br>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<br>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<br>SUMICHIRAL OA7000<br>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<br>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<br>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. | |

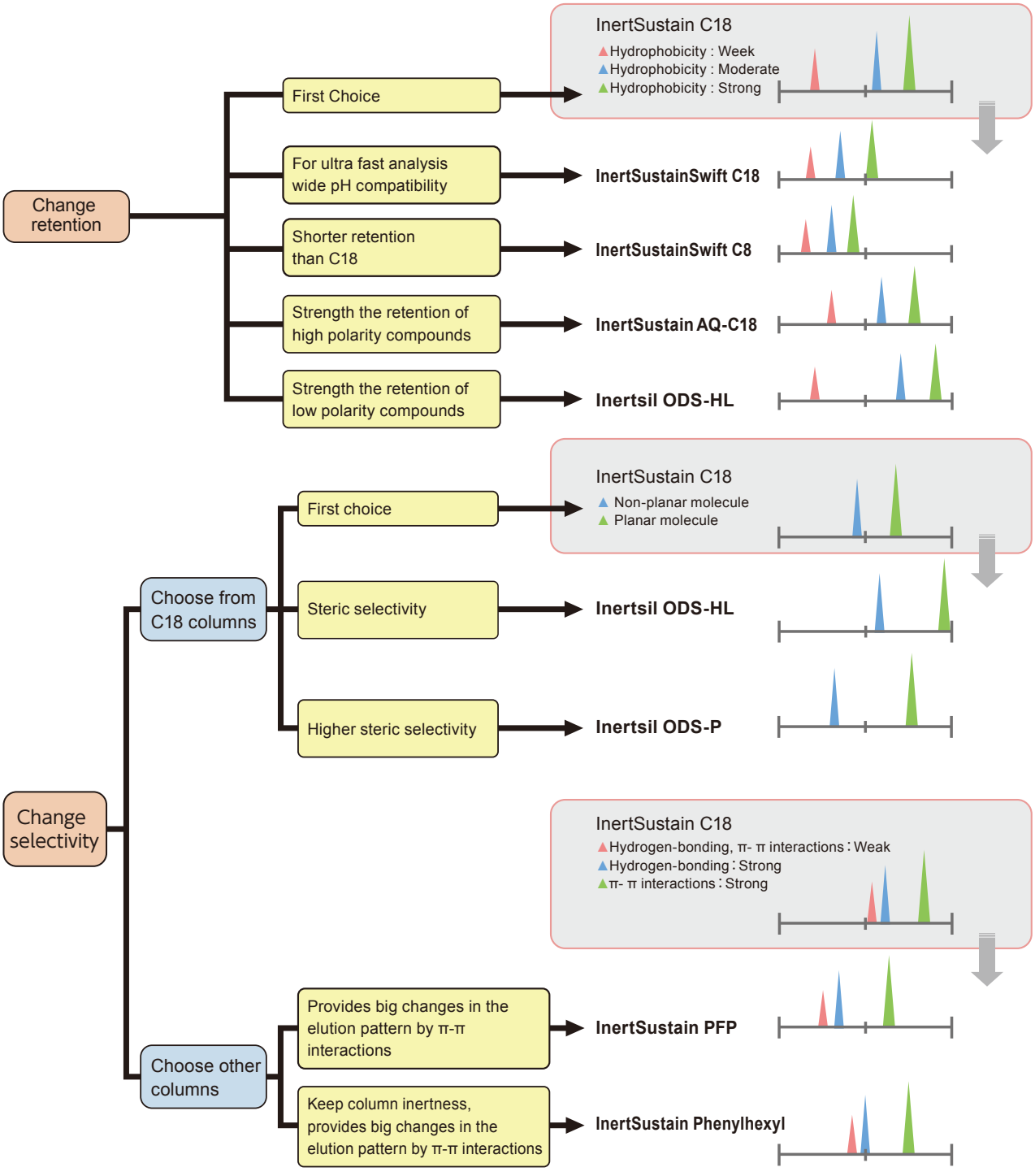
# HPLC Column Selection by USP

| 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<br>Asahipak ODP-50<br>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<br>SUMICHIRAL OA-3300 |
| L71 | A rigid, spherical polymetacrylate, 4 to 6 µm in diameter. | RSpak DE-213, DE-413<br>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<br>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<br>Asahipak NH2P-50<br>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<br>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. | |

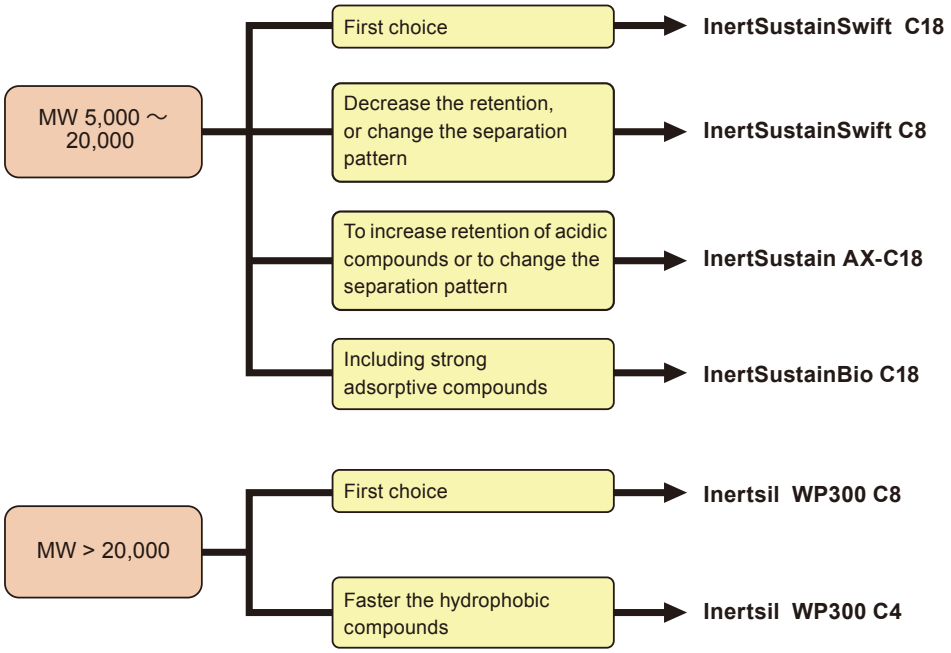
| USP Code | Description | Brand |
|---|---|---|
| L96 | Alkyl chain, reversed-phase bonded totally or superficially porous silica designed to retain hydrophilic and other polar compounds when using highly aqueous mobile phases, including 100 % aqueous, 1.5 µm to 10 µm. | InertSustain AQ-C18<br>InertSustain Swift C18<br>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<br>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<br>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<br>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

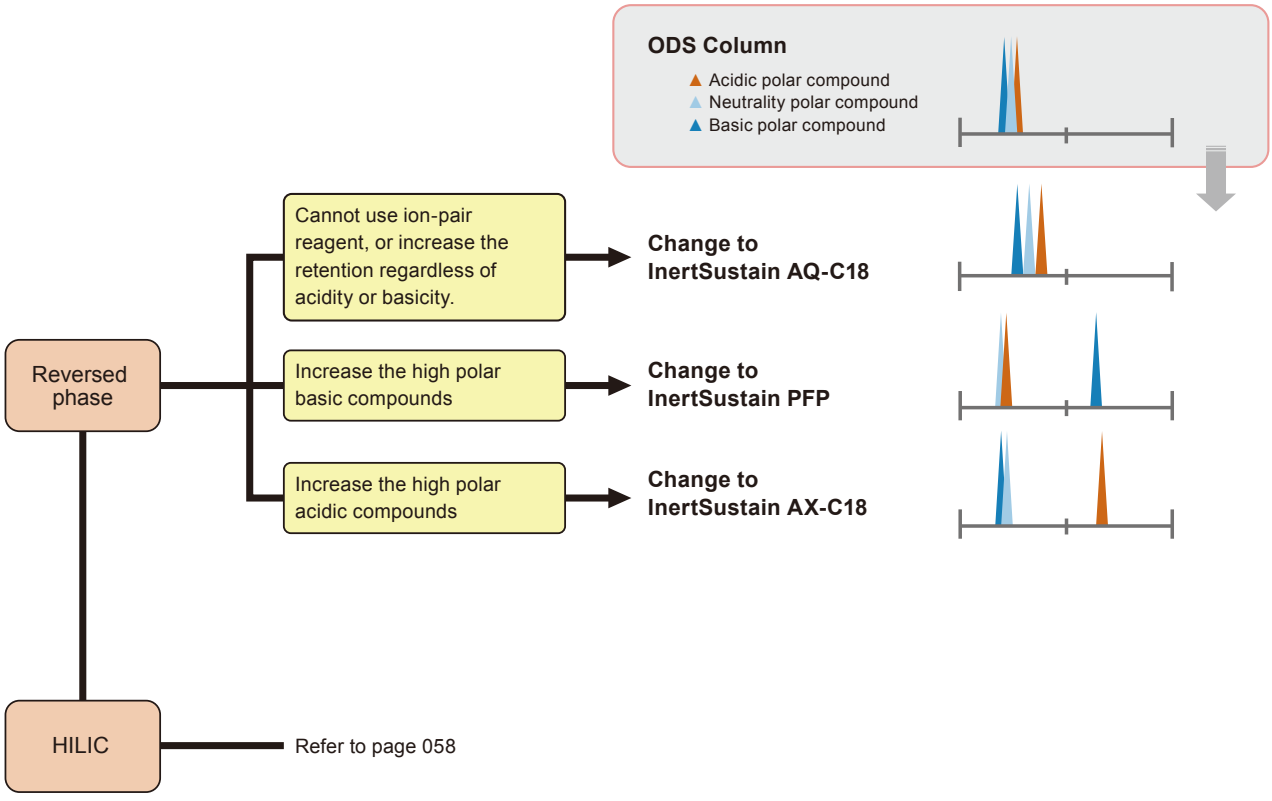
## Molecular Weight <5,000



## Molecular Weight >5,000



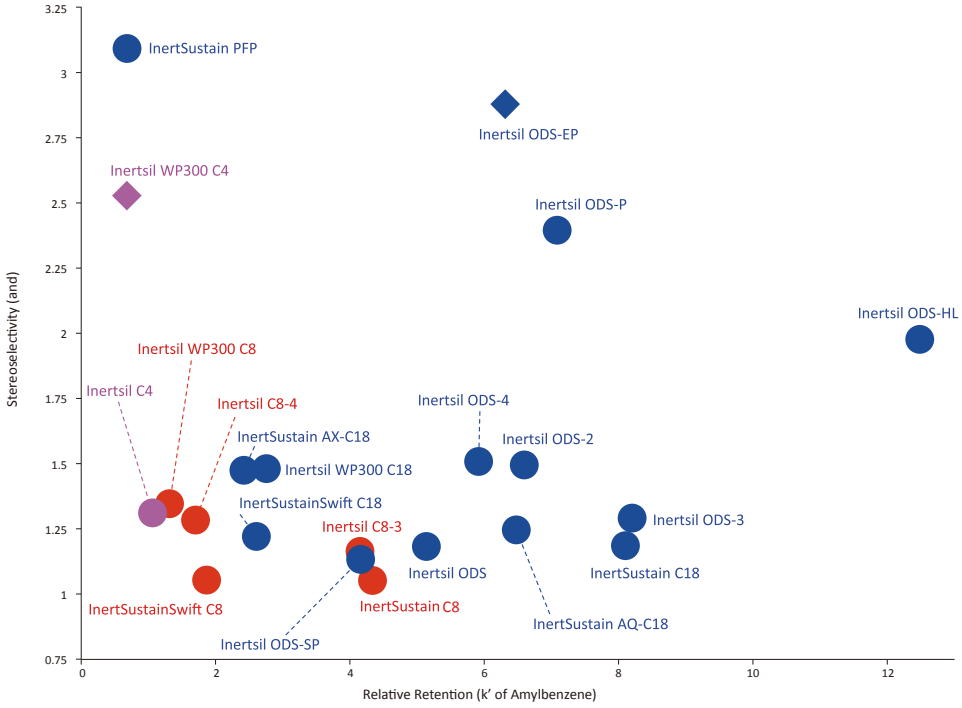

## Analyze High Polar Compounds

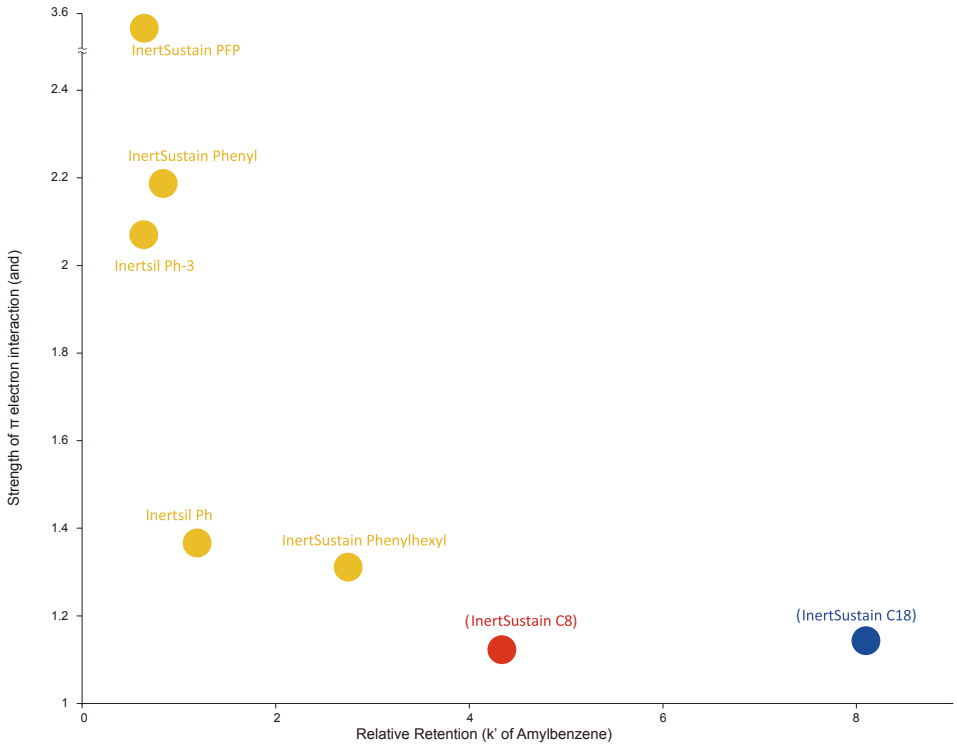


# Reversed Phase Columns

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.

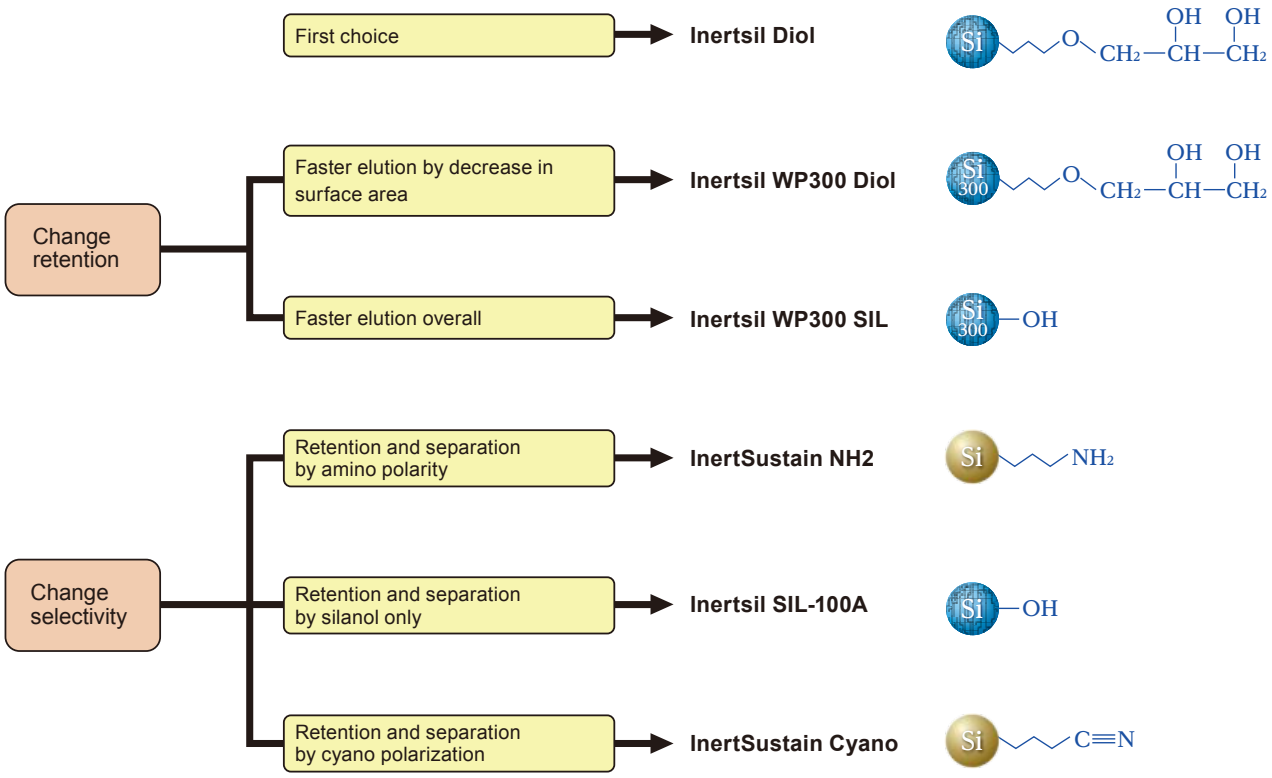
## InertSustain, Inertsil Distribution Model



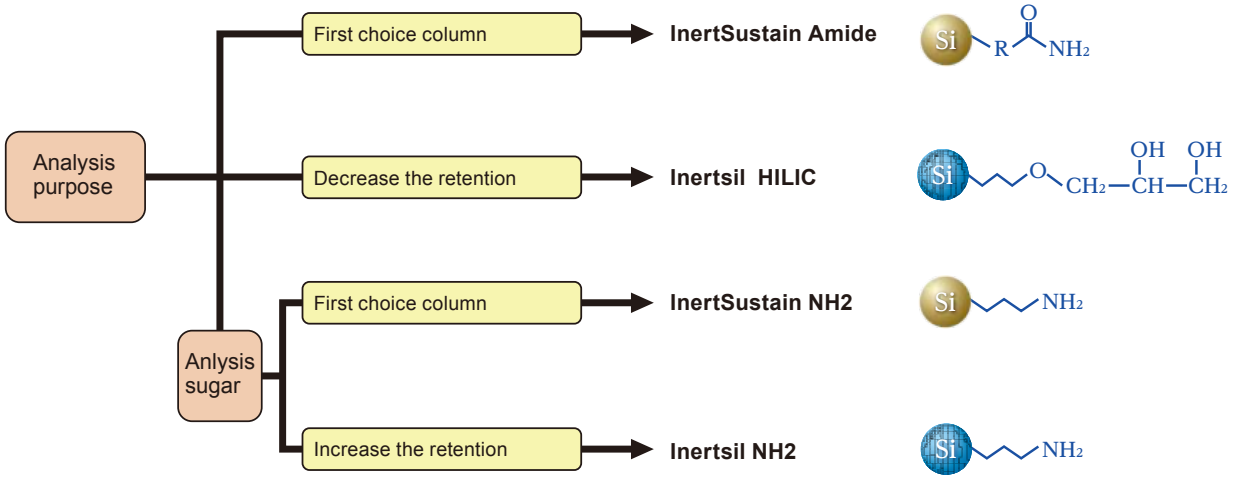



# Normal Phase Column Selection Guide

## Molecular Weight < 5,000 Samples on Normal Phase Mode




## Selecting HILIC Mode Columns

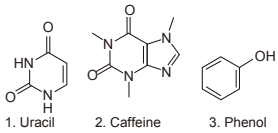


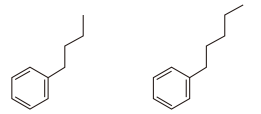
# Selectivity Comparison of Reversed Phase Columns

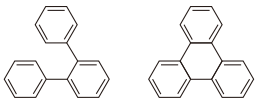
Selectivities of reversed phase columns are compared under the same conditions, packing material size, and column size.
Chemical structural formulas used for the comparison are shown at right. The separation differences between basic compounds, acidic compounds, alkyl benzenes, and polyaromatic compounds 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

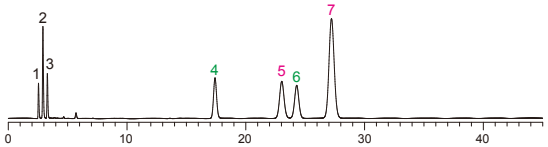
| | |
|---|---|
| Column | : Reversed Phase Column (5 µm, 250 × 4.6 mm I.D.)* |
| Eluent | : A) $CH_3OH$ B) $H_2O$ |
| | : A/B = 80/20, v/v , (InertSustain Cyano A/B = 60/40, v/v ,) |
| Flow Rate | : 1.0 mL/min* |
| Col. Temp. | : 40 °C |
| Detection | : UV 254 nm |
| Injection Vol. | : 5 µL |



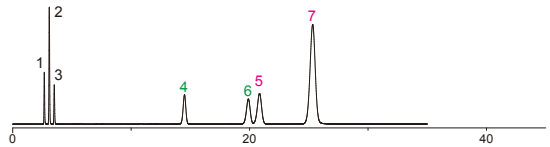




InertSustain C18




InertSustain AQ-C18



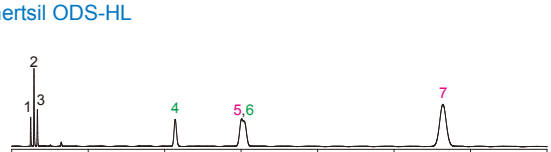

InertSustainSwift C18



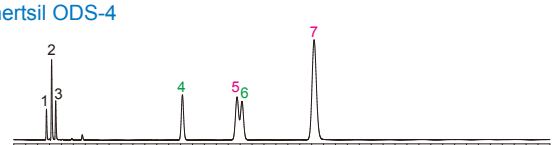

InertSustain AX-C18



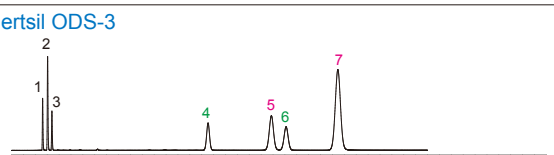

Inertsil ODS-HL



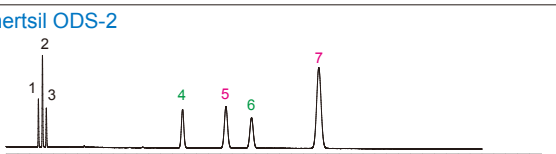

Inertsil ODS-4



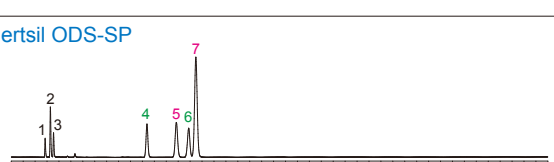

Inertsil ODS-3



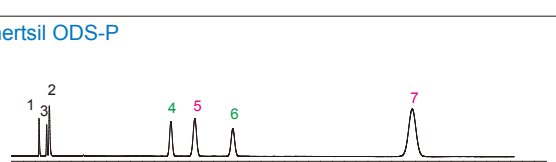

Inertsil ODS-2




Inertsil ODS-SP




Inertsil ODS-P



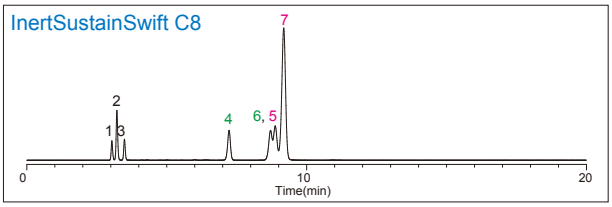

Inertsil ODS-EP



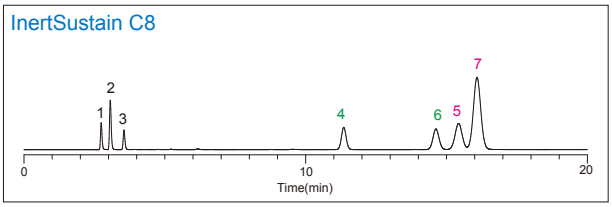

Inertsil WP300 C18



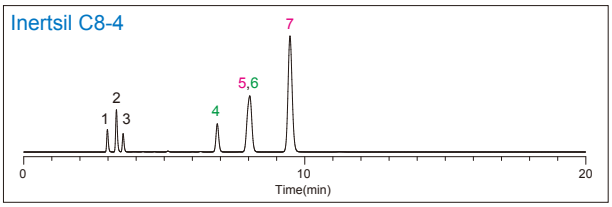
InertSustainSwift C8



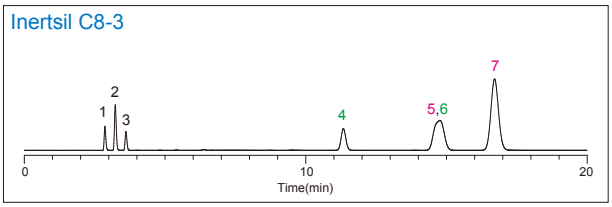

InertSustain C8



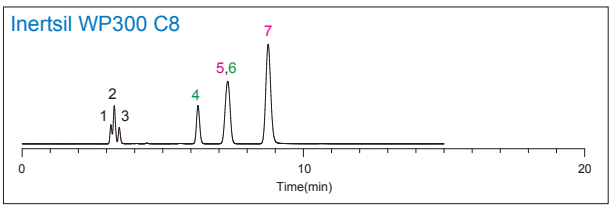

Inertsil C8-4



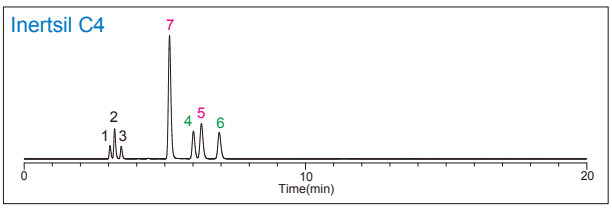

Inertsil C8-3



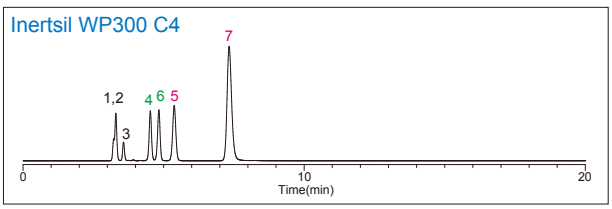

Inertsil WP300 C8



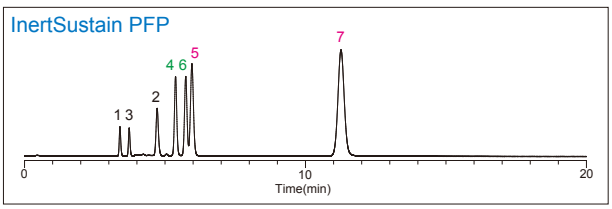

Inertsil C4



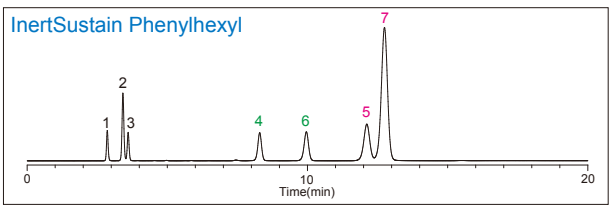

Inertsil WP300 C4



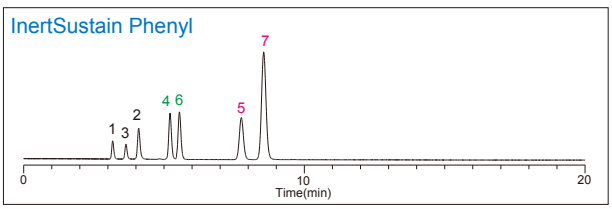

InertSustain PFP



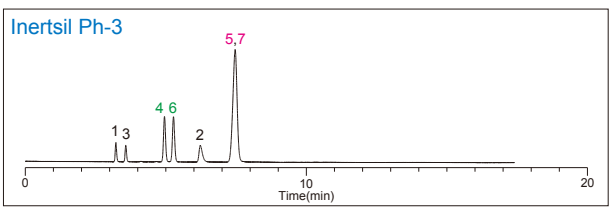

InertSustain Phenylhexyl



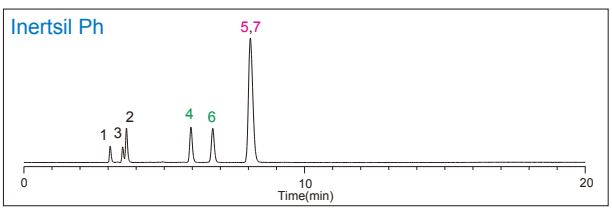

InertSustain Phenyl



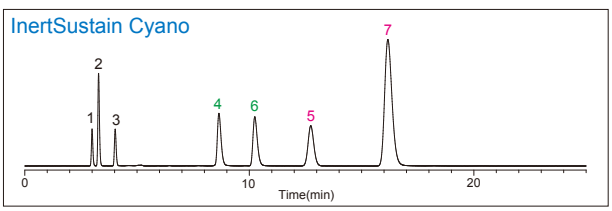

Inertsil Ph-3




Inertsil Ph




InertSustain Cyano



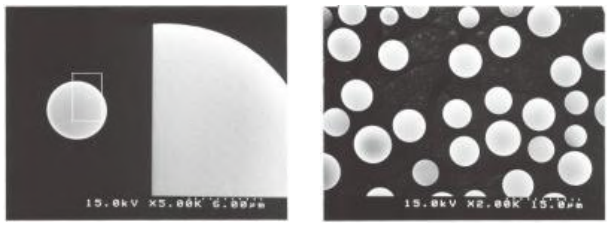
# GL Sciences State-of-the-art HPLC Technology

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

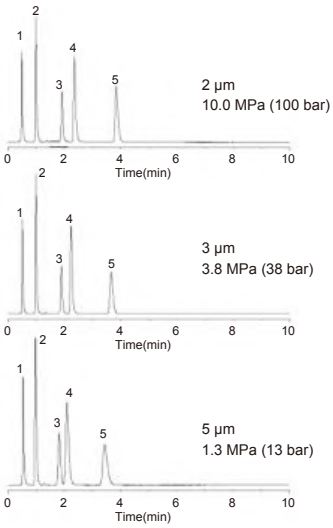
Aside from chemical modification of functional groups and end-cap processing, we also synthesize silica gel, which is a major factor in column performance.

Ultra pure base silica



## Reliable Column Performance

The same separation patterns are obtained for different particle sizes.

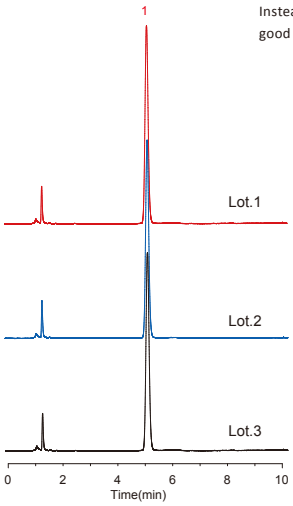



Conditions

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

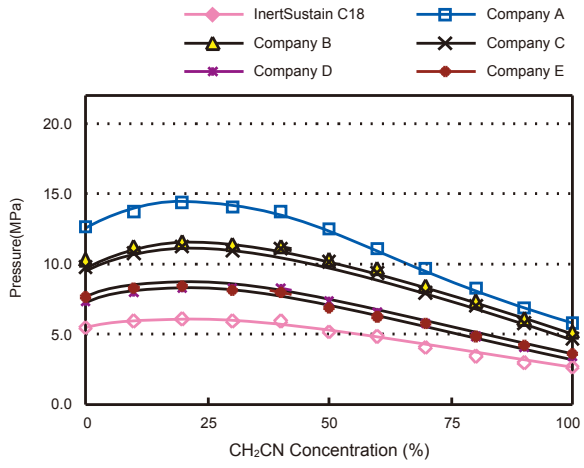



Conditions

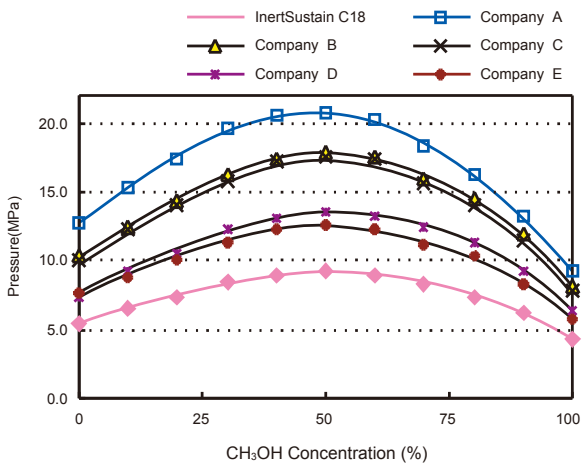
Column : InertSustain C18 (5 µm, 250 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
B) 25 mM phosphate buffer (pH 7.0)
A/B = 40/60, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 220 nm
Sample : 1. Dextromethorphan

## 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

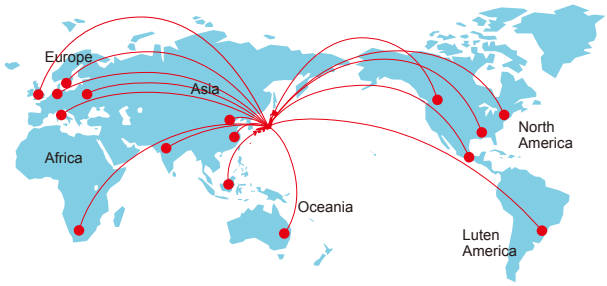


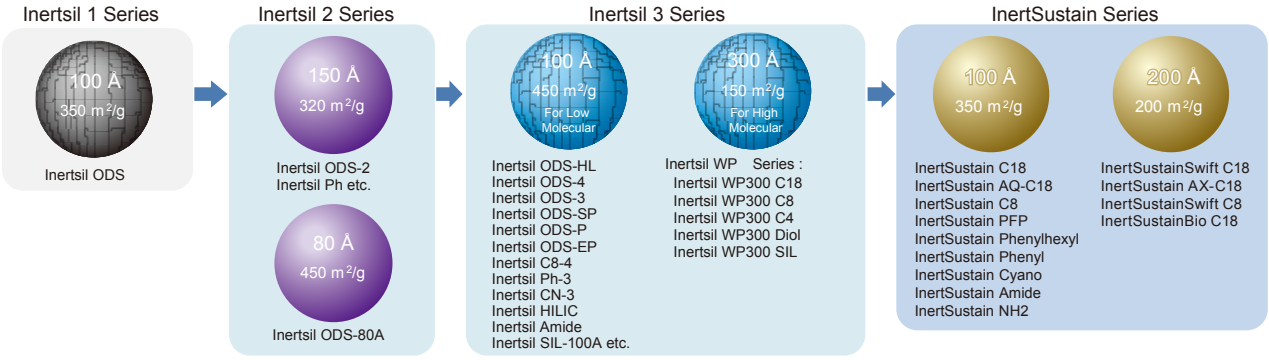

Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C



## 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.

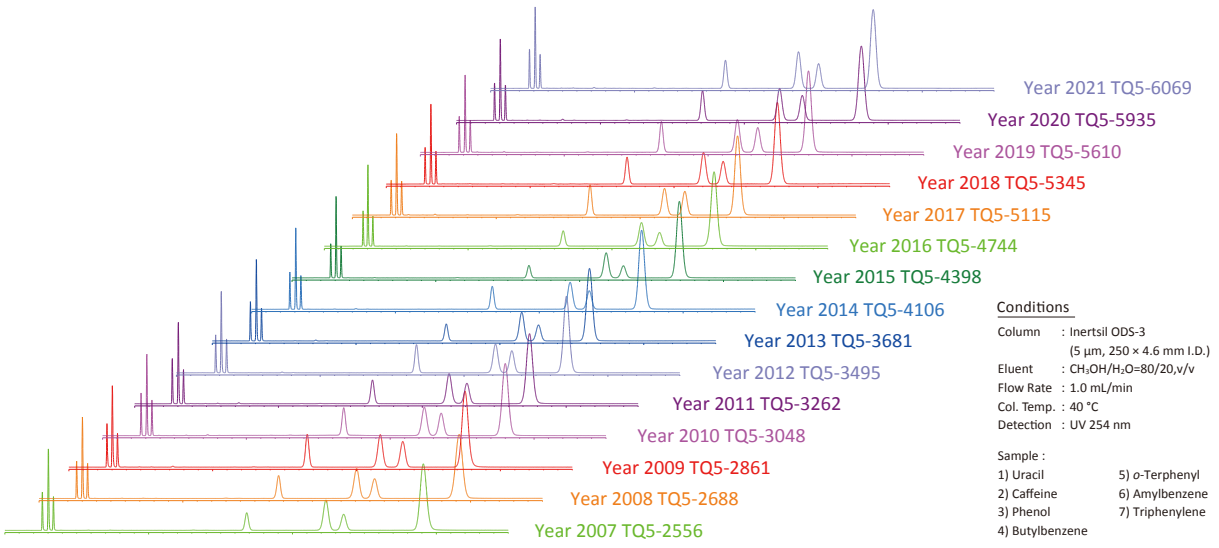
InertSustain columns employ a radically new type of silica with a uniquely modified surface that have a controllable amount of silanols. This state-of-the-art ES silica allows easy surface modification (e.g., endcapping.). The three main advantages of this technology are:

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

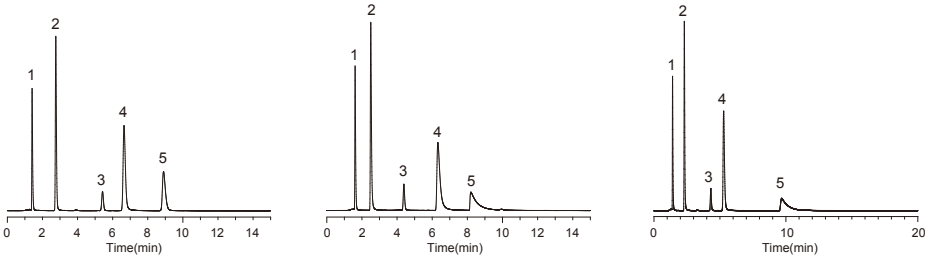
# InertSustain C18

- **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**



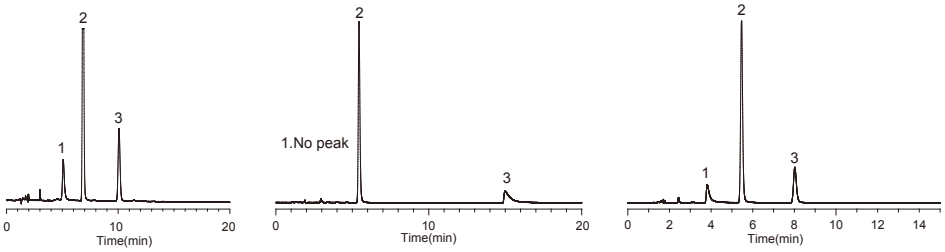

In general, silica based columns are mechanically stable and highly efficient but cannot be used under alkaline conditions as their residual silanol groups tend to adsorb organic bases. InertSustain C18 employs a radically new type of silica that is uniquely surface-modified for precise control of the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



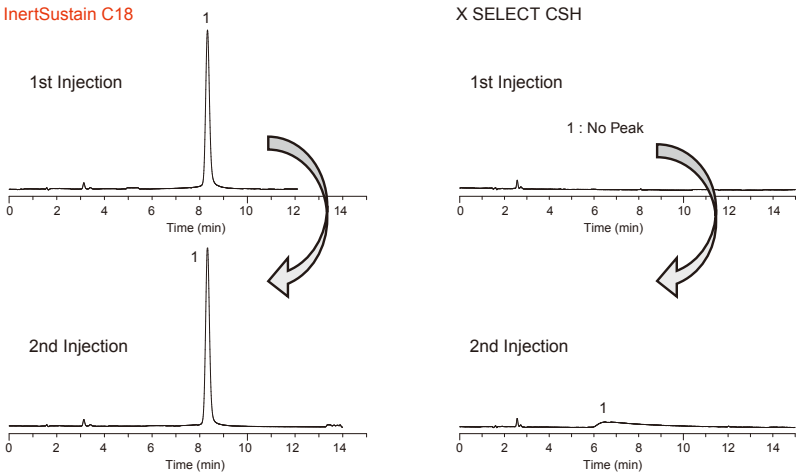

Conditions
Column Size : 3 µm, 150 × 2.1 mm I.D.
Eluent : A) $CH_3CN$
B) 25 mM $K_2HPO_4$
(pH 7.0, $KH_2PO_4$)
A/B = 30/70, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : UV 230 nm
Sample : 1. Uracil
2. Pyridine
3. Phenol
4. Berberine chloride
5. Dextromethorphan

## 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

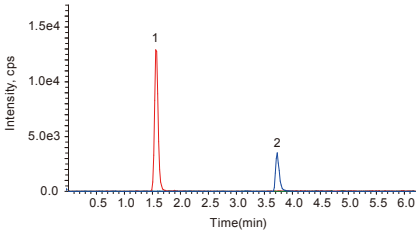



Conditions
Column Size : 5 µm, 150 × 4.6 mm I. D.
Eluent : A) $CH_3CN$
B) 0.1 % $H_3PO_4$
A / B = 40 / 60, v / v
Flow Rate : 1.0 mL / min
Col. Temp. : 40 °C
Detection : UV 254 nm
Sample : 1. Hinokitiol

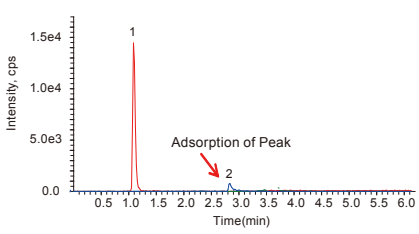
## Comparison of Performance to Core-Shell Columns

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)

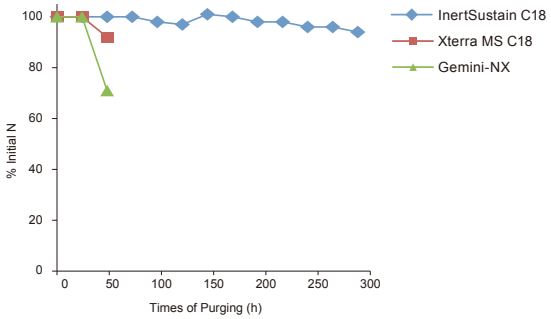



Conditions

| | | |
|---|---|---|
| Column | : | ODS Column(100 × 2.1 mm I.D.) |
| Eluent | : | A) 2 mM $CH_3COONH_4$ in 95 % $CH_3CN$<br>B) 2 mM $CH_3COONH_4$ in 10 % $CH_3CN$<br>A / B = 20 / 80 - 2 min – 100 / 0 - 2.5 min – 100 / 0 - 0.01 min - 20 / 80, v / v<br>(Mixed by a gradient mixer) |
| Flow Rate | : | 0.3 mL / min |
| Col. Temp. | : | 40 °C |
| Detection | : | LC / MS / MS<br>(4000 QTRAP® : ESI, Positive, MRM) |
| Injection Vol. | : | 10 µL |
| Sample | : | 1. Nitrofurazone (100 µg / L)<br>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) $CH_3OH$<br>B) 50 mM Triethylamine (pH 10.0)<br>A/B = 30/70, v/v |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 50 °C |

Analytical Conditions

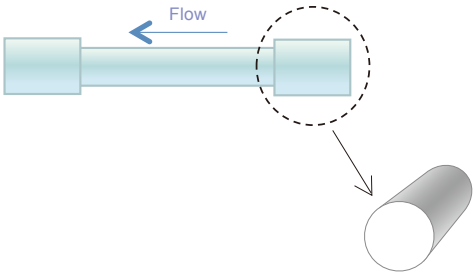
| | | |
|---|---|---|
| Eluent | : | A) $CH_3CN$<br>B) $H_2O$<br>A/B = 65/35, v/v |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | UV 254 nm |
| Sample | : | Naphthalene |

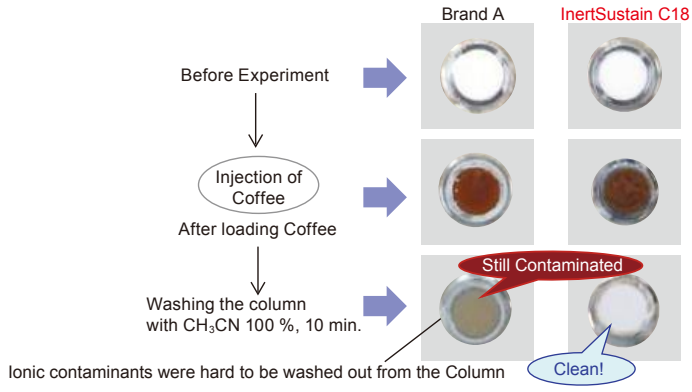
## Experience the InertSustain! (Inertness and Sustainability)

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



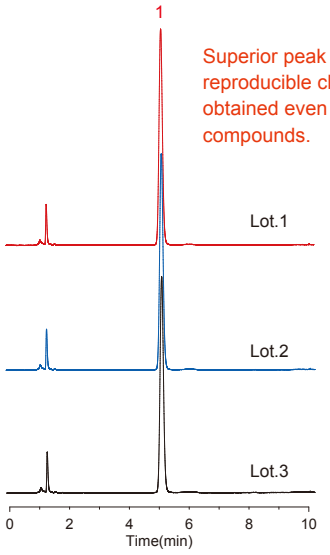



# InertSustain C18

## 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.

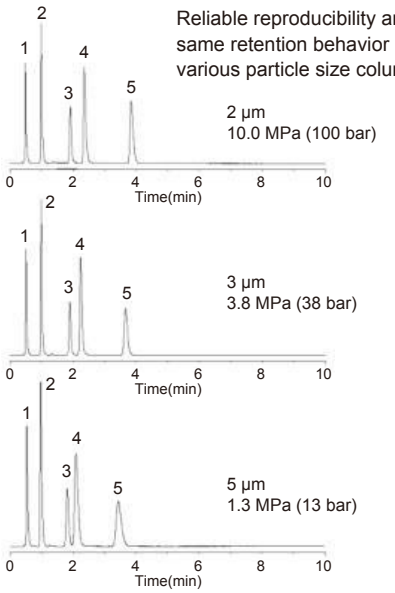
### Figure 1 : Strong Basic Compound Test




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

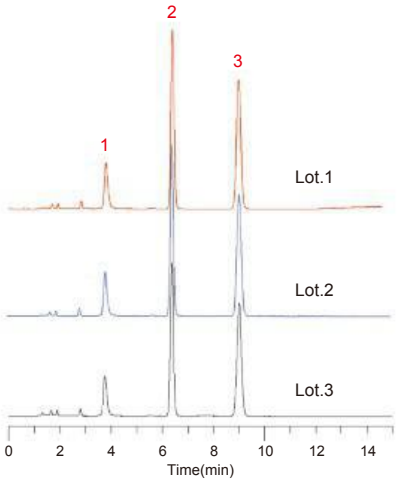



Conditions

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

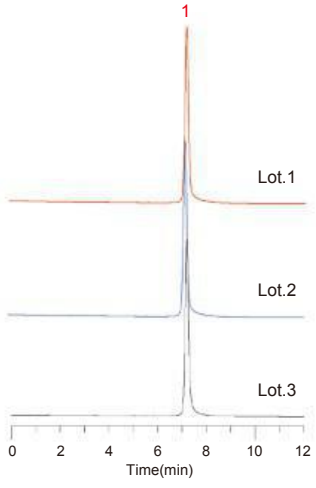
### Figure 2 : Strong Acidic Compound Test




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<br>Particle Size: 3 µm<br>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 |

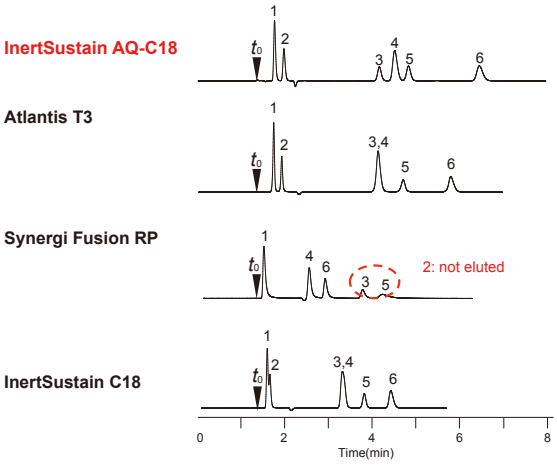
# InertSustain AQ-C18

- **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

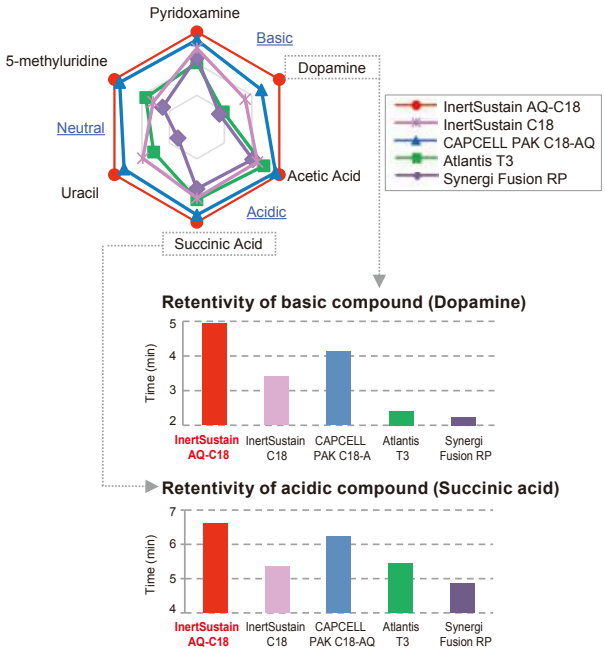



Conditions

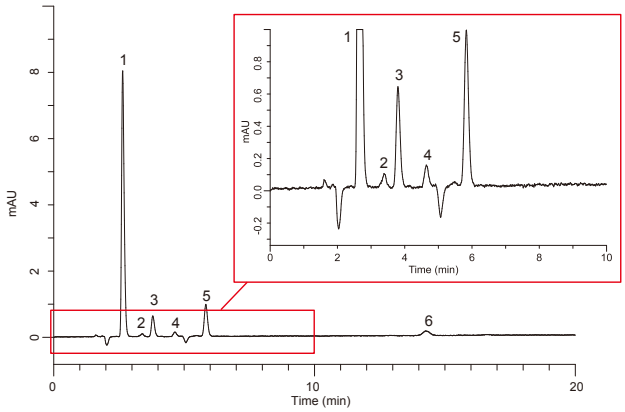
| | |
|---|---|
| Column | : 5 µm, 150 × 4.6 mm I.D. |
| Eluent | : 0.1 % HCOOH in $H_2O$ |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 210 nm |

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<br>2. ATP<br>3. ADP<br>4. AMP<br>5. Hyp<br>6. Ino<br>(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<br>Particle Size: 3 µm<br>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 | | |
|---|---|---|---|---|---|
| | 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 | | |
| Particle Size: 3 µm | 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 | | |
|---|---|---|---|---|---|
| | 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 | | |
| Particle Size: 5 µm | 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 |

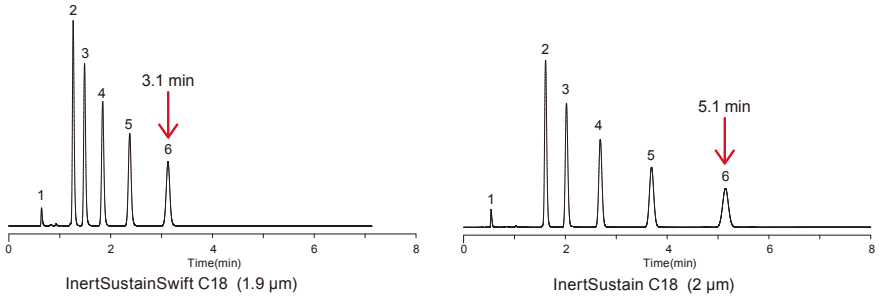
# InertSustainSwift C18

- **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

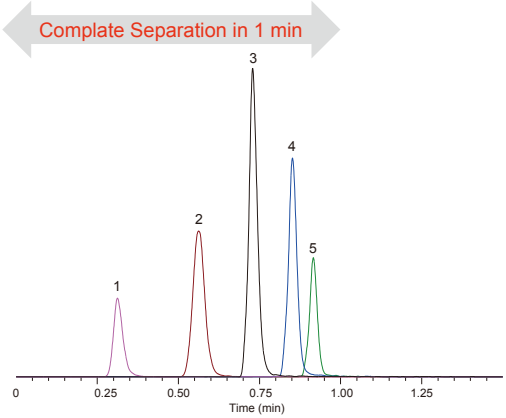



InertSustainSwift C18 (1.9 µm)　　InertSustain C18 (2 µm)

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 |

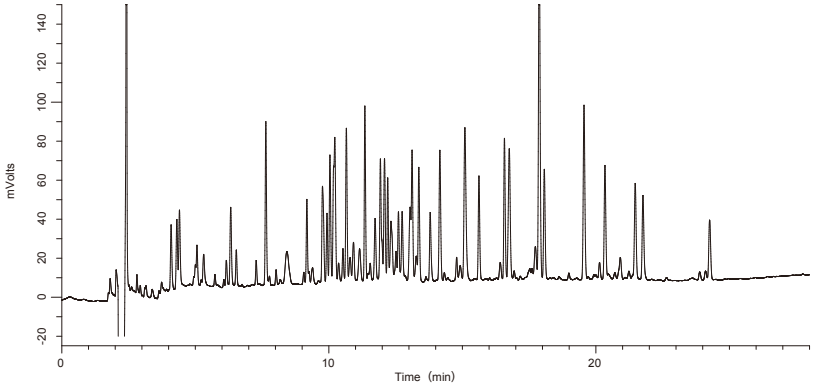
## Figure 2 : Rapid LC/MS/MS Analysis of Basic Drugs




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<br>Particle Size: 3 µm<br>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 |

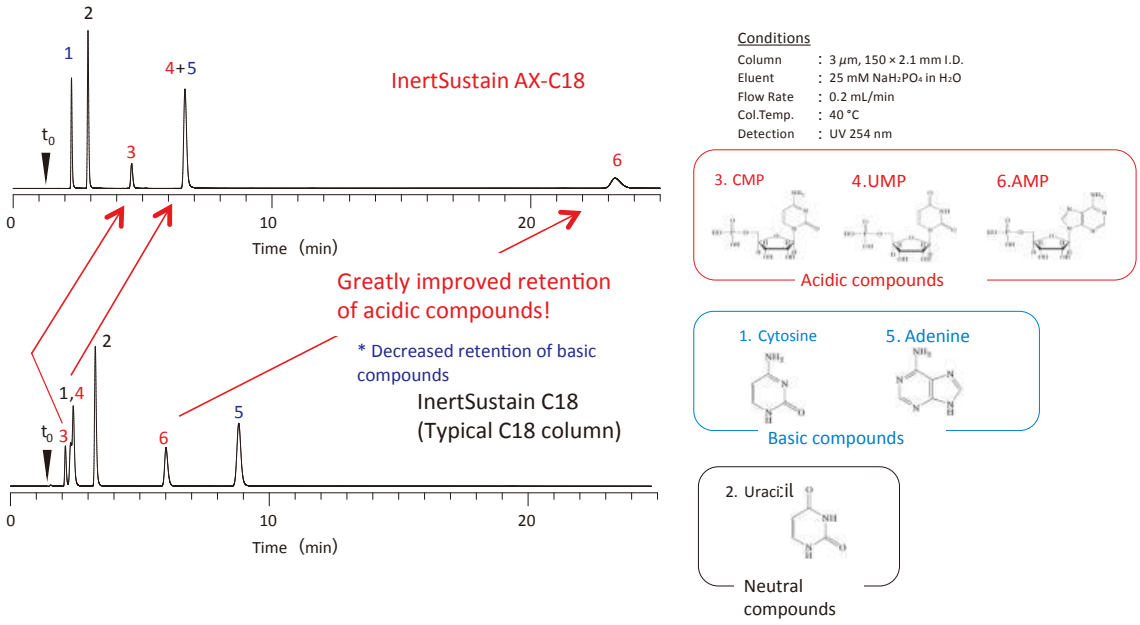
# InertSustain AX-C18

- **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**

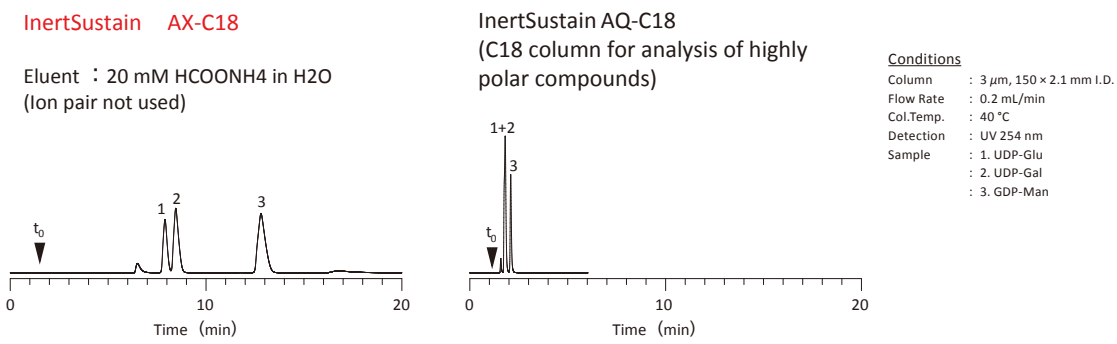



InertSustain AX-C18 is a mixed-mode column in which C18 groups and tertiary amino groups are chemically bonded to silica gel. It provides hydrophobic and electrostatic interactions via AX groups. By controlling the quantity of AX groups, acidic compounds can be eluted even over the range of buffer concentrations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

| HP Series Particle size : 3 µm | Length \ I.D. (mm) | 2.1 | 3.0 | 4.6 |
|---|---|---|---|---|
| | 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 |

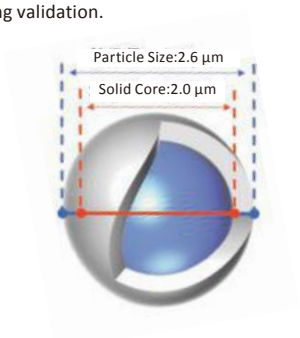
# InertCore Plus C18

- **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.

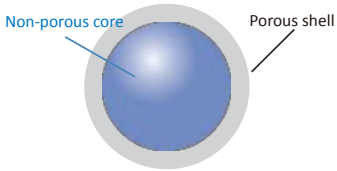
## Features

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

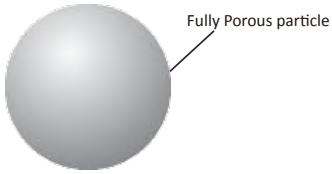



The molecules of the target analyses pass through the fine pores in the particles of the packing material. Core-shell particles form around a solid non-porous core, reducing the diffusion inside the fine-pore structure. This behavior differs from that in traditional fully porous particles. A core-shell 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.

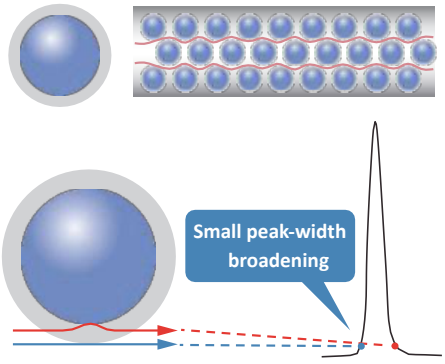
## Core-Shell Type Packing Material

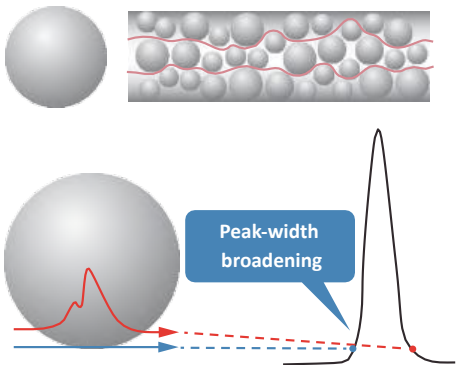



## Conventional Fully Porous Packing Material




- 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.



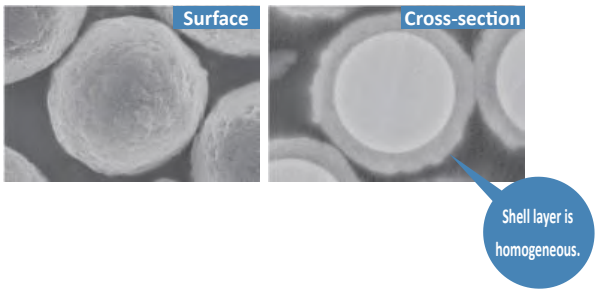



## Comparison with Products from Other Brands

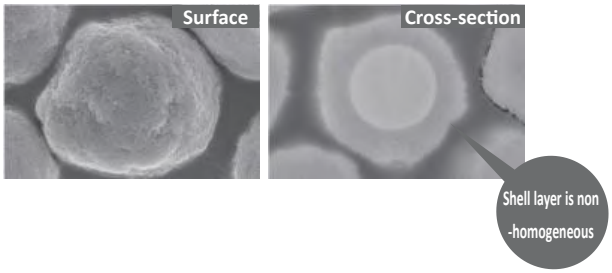
InertCore Plus C18 columns are subjected to rigorous internal quality control from bare silica manufacturing to inspection, resulting in superior reproducibility due to shell layer homogeneity

### SEM image

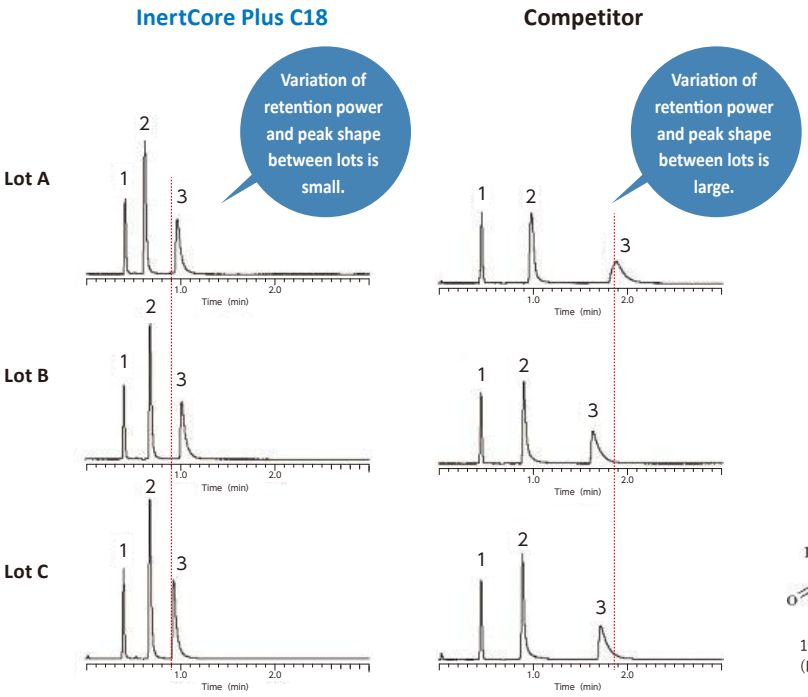
**InertCore Plus C18**




**Core-shell Columns from Other Brands**



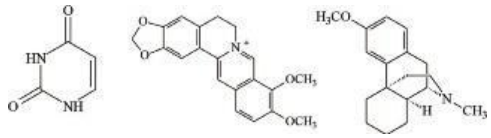

### Superior Reproducibility




### 2 Strongly Basic Compounds Adsorption Test

Conditions

| | | |
|---|---|---|
| Column Size | : | 2.6 μm,100×2.1 mm I.D. |
| Eluent | : | A) $CH_3CN$<br>B) 25 mM $K_2HPO_4$(pH7.0,$KH_2PO_4$)<br>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<br>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 |

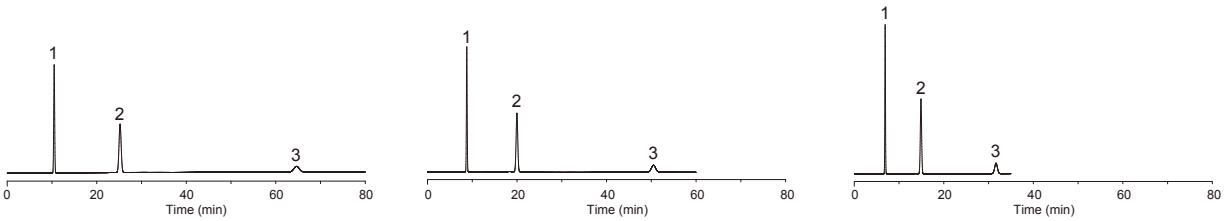
# Inertsil ODS-HL

- **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

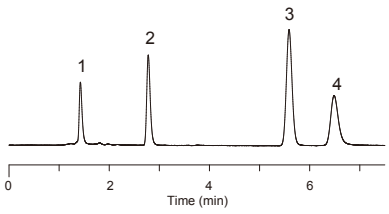



Conditions

| | | | |
|---|---|---|---|
| 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

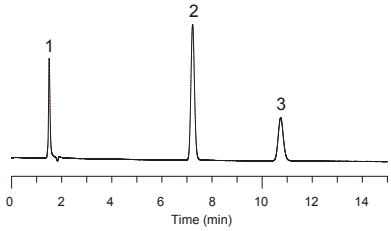
### Bisic Compound Test




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 | | |

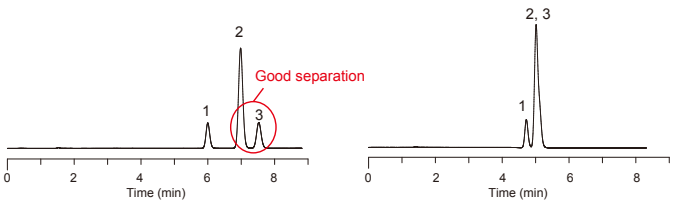
### Acidic Compound Test




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 | | |

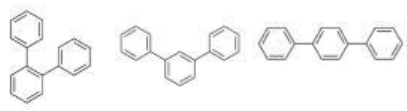
## Figure 3 : High - Density Bouding of C18 Phase Delivers Alternative Selectifity to Conventional C18 Columns




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<br>Particle Size: 3 µm<br>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 |

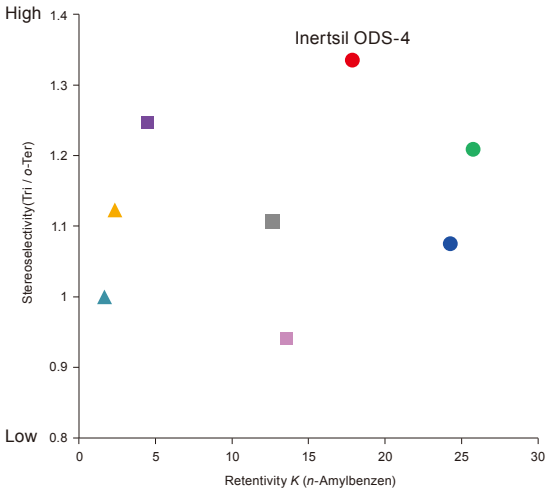
# Inertsil ODS-4

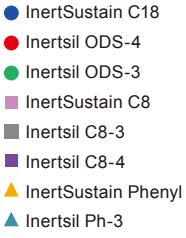
- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 2 µm, 3 µm, 5 µm
- **Surface Area** : 450 $m^2/g$
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 11 %
- **USP Code** : L1
- **pH Range** : 2 - 7.5

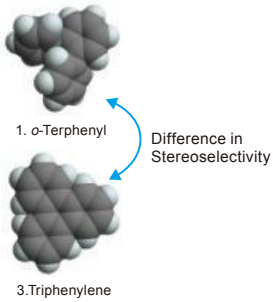



Inertsil ODS-4 delivers the same extreme inertness to any type of compounds just like InertSustain C18 along with unprecedented stability under 100 % aqueous mobile phases for qualitative and quantitative analysis.
However, as the base silica gel and carbon loading are different on Inertsil ODS-4, differences in selectivity can be observed for certain analytes.

## Figure 1 : Comparison of Selectivity Between Various GL Sciences' Columns



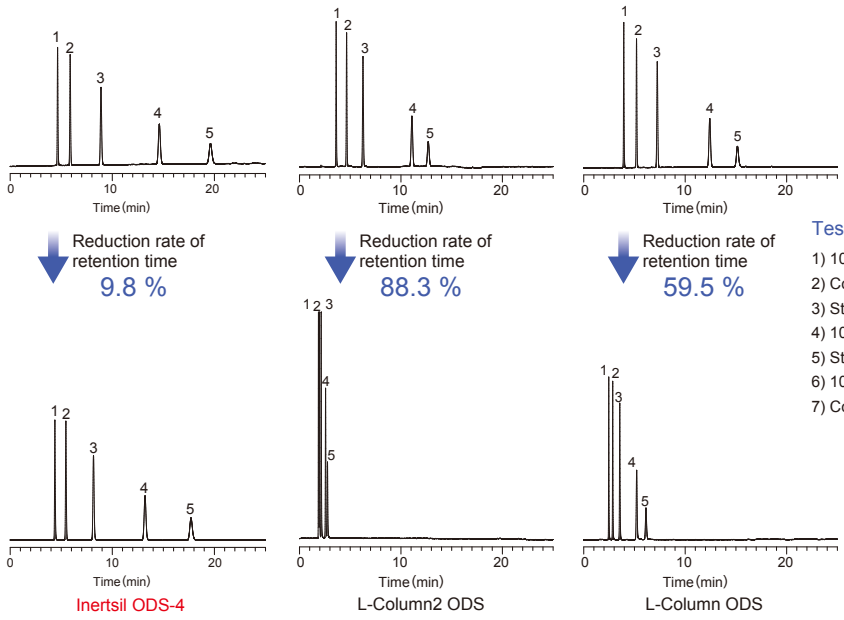




Conditions

| | | |
|---|---|---|
| Column Size | : 5 µm, 150 × 4.6 mm I.D. | Sample : |
| Eluent | : A) $CH_3OH$ | 1. *o*-Terphenyl |
| | B) $H_2O$ | 2. *n*-Amylbenzene |
| | A/B = 70/30, v/v | 3. Triphenylene |
| Flow Rate | : 0.8 mL/min | |
| Col. Temp. | : 40 °C | |
| Detection | : UV 254 nm | |

## 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<br>Particle Size: 3 µm<br>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 |

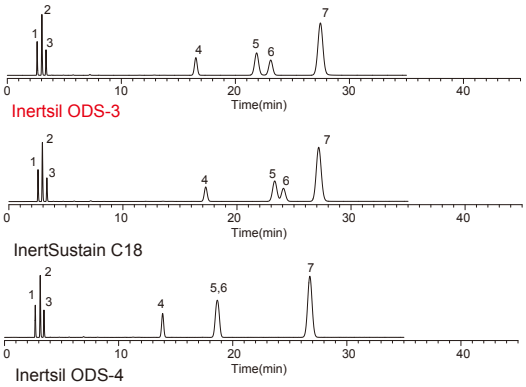
# Inertsil ODS-3

- **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.

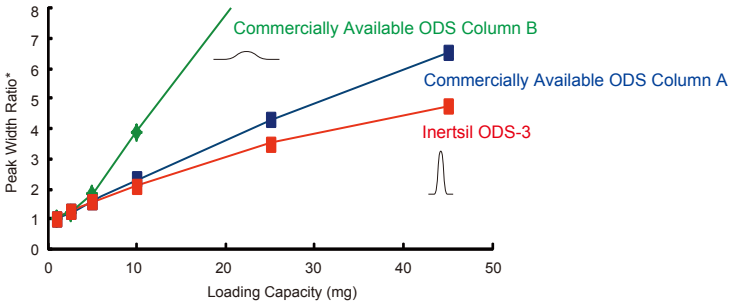
## Figure 1 : Comparison of Retentivity




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 |

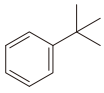
## Figure 2 : Comparison of Loading Capacity




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

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) |



## 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<br>Particle Size: 3 µm<br>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

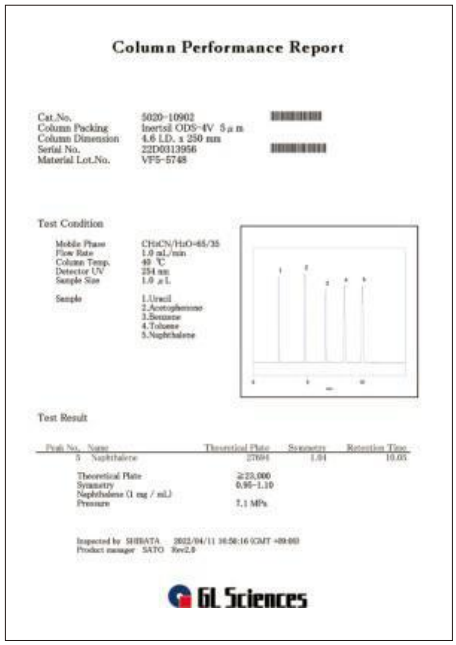
## (Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- **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

Cat.No. 5020-10902
Column Packing Inertsil ODS-4V 5 µ m
Column Dimension 4.6 I.D. x 250 mm
Serial No. 22D0313956
Material Lot.No. VP5-5748

Test Condition

Mobile Phase CH3CN/H2O=65/35
Flow Rate 1.0 mL/min
Column Temp. 40 ℃
Detector UV 254 nm
Sample Size 1.0 µ L
Sample
1.Uracil
2.Acetophenone
3.Benzene
4.Toluene
5.Naphthalene

Test Result

| Peak No. | Name | Theoretical Plate | Symmetry | Retention Time |
|---|---|---|---|---|
| 5 | Naphthalene | 27604 | 1.04 | 10.05 |

Theoretical Plate ≥22,000
Symmetry 0.95–1.10
Naphthalene (1 mg / mL)
Pressure 7.1 MPa

Inspected by SHIBATA 2022/04/11 16:58:16 GMT +09:00
Product manager SATO Rev2.0

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 | |

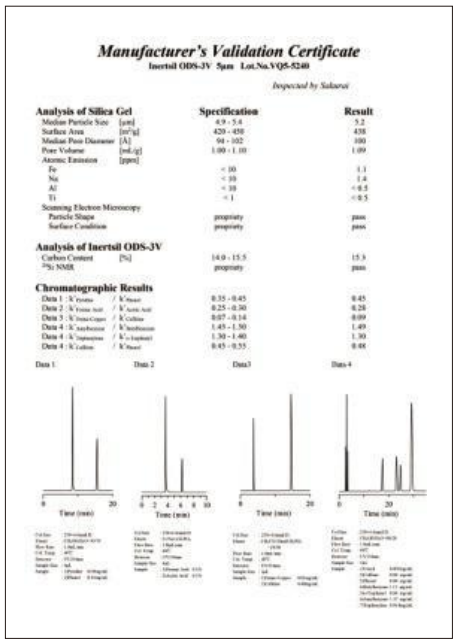
# Inertsil ODS-3V
## (Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

- **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 |
|---|---|---|---|
| Median Particle Size | [µm] | 4.9 - 5.4 | 5.2 |
| Surface Area | [$m^2/g$] | 420 - 450 | 438 |
| Median Pore Diameter | [Å] | 94 - 102 | 100 |
| Pore Volume | [mL/g] | 1.00 - 1.10 | 1.09 |
| Atomic Emission | [ppm] | | |
| Fe | | < 10 | 1.1 |
| Na | | < 10 | 1.4 |
| Al | | < 10 | < 0.5 |
| Ti | | < 1 | < 0.5 |
| Scanning Electron Microscopy | | | |
| Particle Shape | | propriety | pass |
| Surface Condition | | propriety | pass |

| Analysis of Inertsil ODS-3V | | | |
|---|---|---|---|
| Carbon Content | [%] | 14.0 - 15.5 | 15.3 |
| $^{29}$Si NMR | | propriety | pass |

**Chromatographic Results**

| | | | |
|---|---|---|---|
| Data 1 : $k'_{Pyrene}$ / $k'_{Phenol}$ | | 0.35 - 0.45 | 0.45 |
| Data 2 : $k'_{Pyrene\ Acid}$ / $k'_{Acetic\ Acid}$ | | 0.25 - 0.30 | 0.28 |
| Data 3 : $k'_{Pyrene\ Copper}$ / $k'_{Caffeine}$ | | 0.07 - 0.14 | 0.09 |
| Data 4 : $k'_{Anthracene}$ / $k'_{Acridine\ Orange}$ | | 1.45 - 1.50 | 1.49 |
| Data 4 : $k'_{Triphenylene}$ / $k'_{o-Terphenyl}$ | | 1.30 - 1.40 | 1.39 |
| Data 4 : $k'_{Caffeine}$ / $k'_{Phenol}$ | | 0.45 - 0.55 | 0.48 |

Data 1 Data 2 Data3 Data 4




### 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

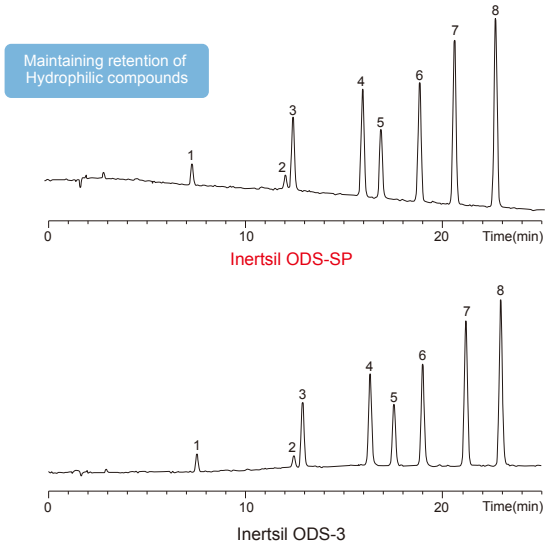
- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 $m^2/g$
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 8.5 %
- **USP Code** : L1
- **pH Range** : 2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



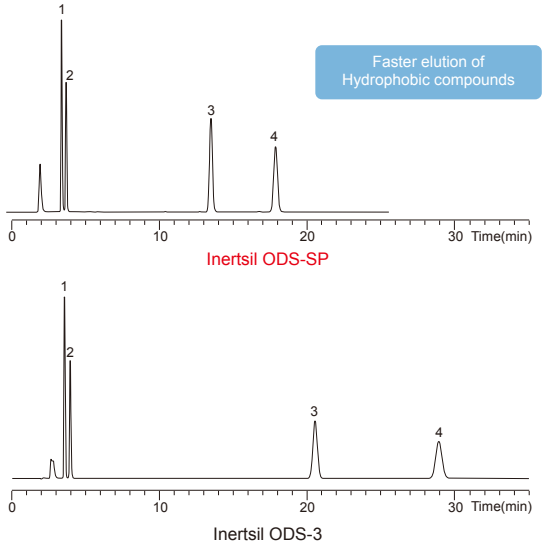

As shown in Figure 1, Inertsil ODS-SP is super-base deactivated and optimally bonded to retain hydrophilic compounds without excessively retaining hydrophobic compounds. Therefore, it achieves better and faster separations than its predecessors.
With its relatively low carbon load, Inertsil ODS-SP is 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

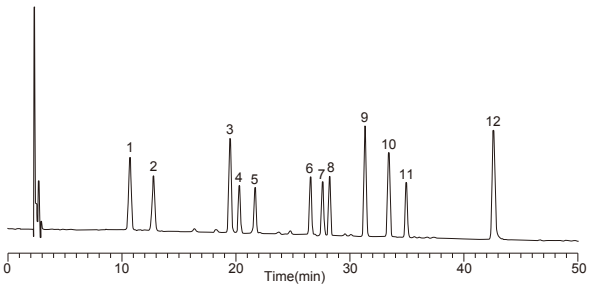
Conditions
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) $CH_3OH$
B) 10 mM $NaH_2PO_4$
A/B = 10/90 – 30 min – 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Sample : 1. Gallocatechin (GC)
2. Epigallocatechin (EGC)
3. Catechin (C)
4. Epigallocatechin gallate (EGCg)
5. Epicatechin (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<br>Particle Size: 3 µm<br>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 |
| Particle Size: 5 µm | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 20 | 5020-02711 | 5020-02721 | 5020-02731 | 5020-02741 |
| | 50 | 5020-02712 | 5020-02722 | 5020-02732 | 5020-02742 |
| | 75 | 5020-02713 | 5020-02723 | 5020-02733 | 5020-02743 |
| | 100 | 5020-02714 | 5020-02724 | 5020-02734 | 5020-02744 |
| | 150 | 5020-02715 | 5020-02725 | 5020-02735 | 5020-02745 |
| | 250 | 5020-02716 | 5020-02726 | 5020-02736 | 5020-02746 |

## 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 |

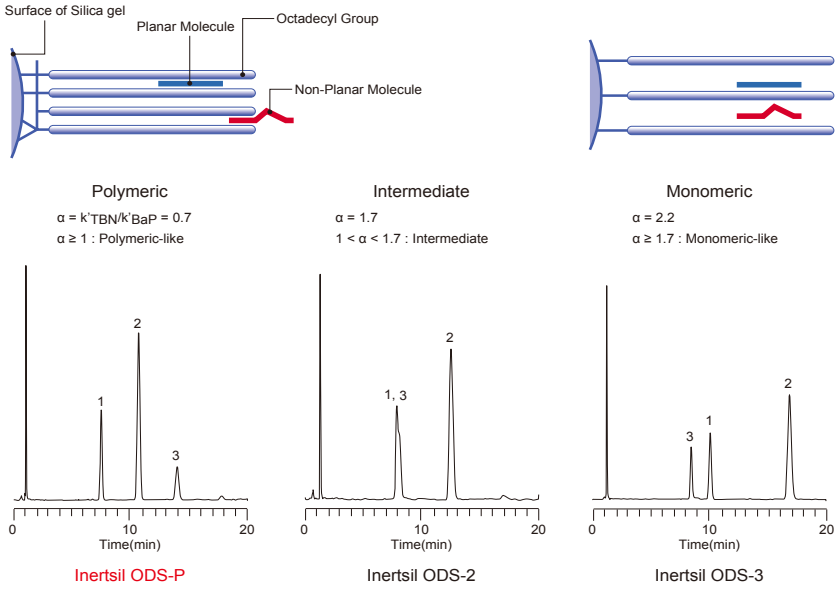
# Inertsil ODS-P

- **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

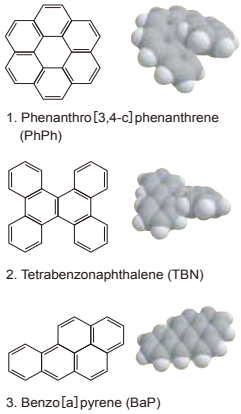



GL Sciences offers a polymerically bonded ODS-P phase with high steric selectivity for separating planar and non-planar compounds (see Figure 1). This polymeric type C18 column delivers complete baseline separation of structurally similar compounds, such as vitamins D2 and D3 (see Figure 2). Inertsil 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

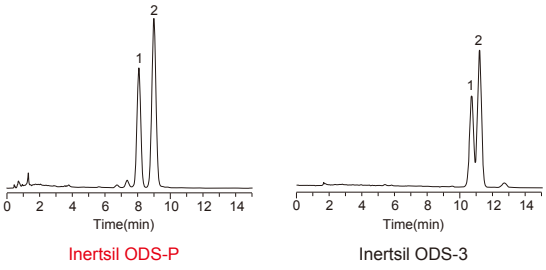



Conditions
Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 85/15, v/v
Flow Rate : 2.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm

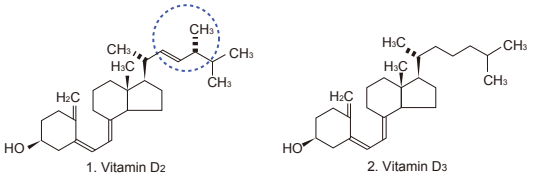


1. Phenanthro[3,4-c]phenanthrene (PhPh)
2. Tetrabenzonaphthalene (TBN)
3. Benzo[a]pyrene (BaP)

## 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

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

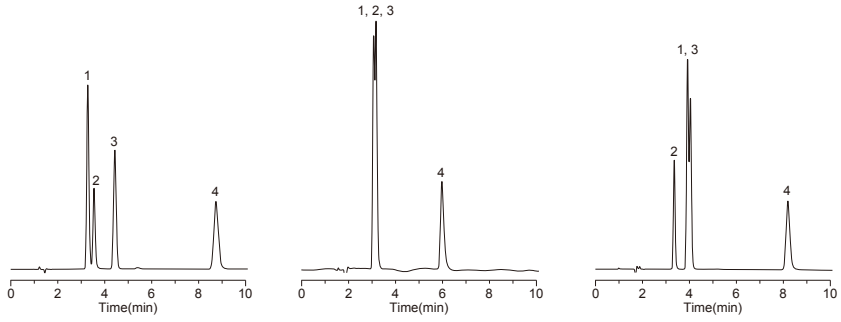
- **Silica** : **3 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **450 $m^2/g$**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Octadecyl**
- **End-capping** : **None**
- **Carbon Loading** : **9 %**
- **USP Code**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




PG : Polar Group

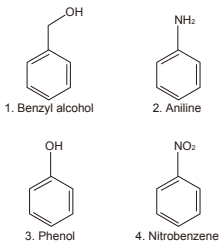
Inertsil ODS-EP contains a polar functional group embedded between the silica surface and the C18 group. The embedded polar group makes the C18 phase stable in 100 % aqueous eluents without "phase collapse." This phase is also extremely "base deactivated" and provides superior peak shape for acids and bases in organic eluents as well as acidified eluents typically used in LC/MS.

## Figure 1 : Comparison of Selectivity

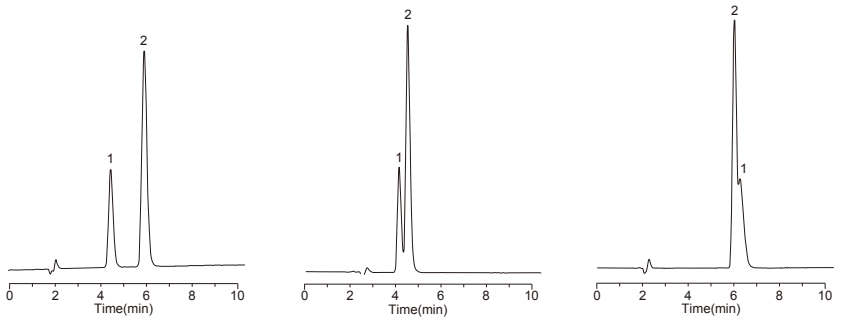



Conditions

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

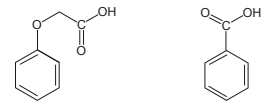



## Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase




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

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

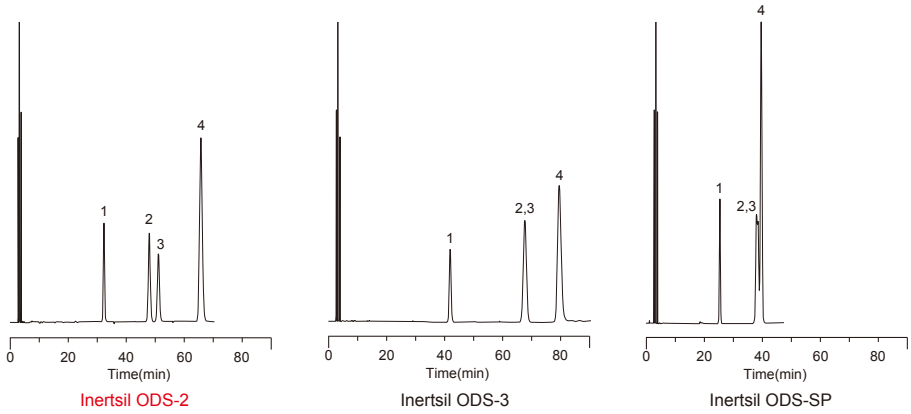
# Inertsil ODS-2

- **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**



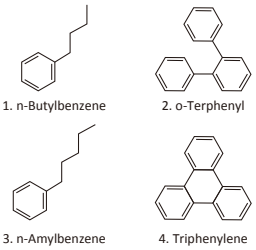

Inertsil ODS-2 has a highly inert filler in which a spherical silica gel with a pore diameter of 150 Å was chemically modified and end-capped with an octadecyl group and silanol group, respectively.

## 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

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

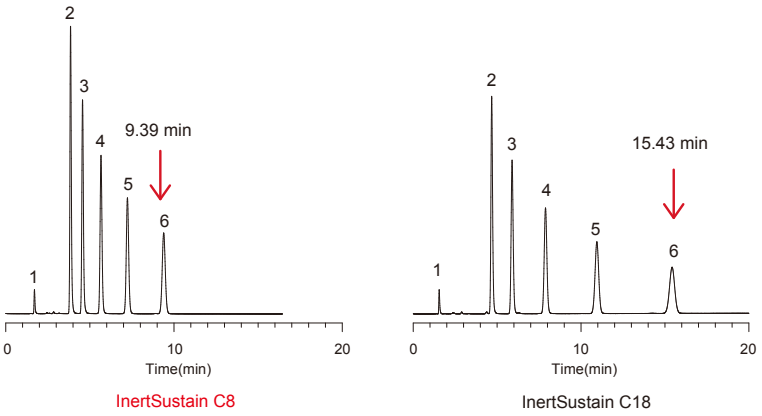
# InertSustain C8

- **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

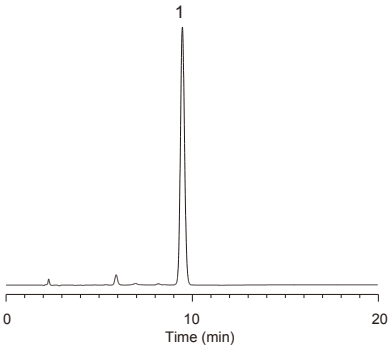



Conditions

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<br>Particle Size: 3 µm<br>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 |

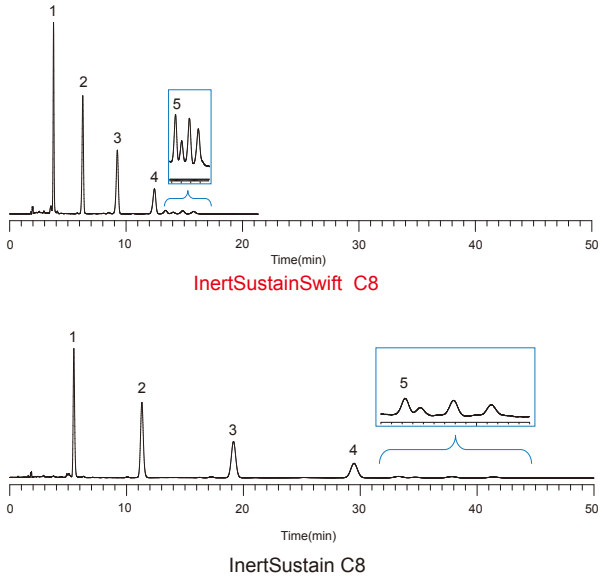
# InertSustainSwift C8

- **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.

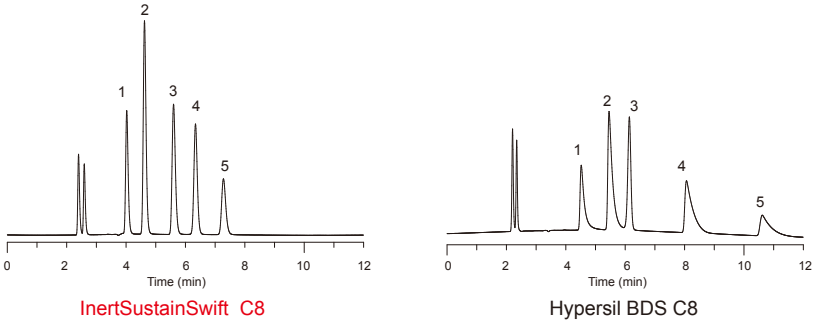
## Figure 1 : Comparison of Retentivity




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




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<br>Particle Size: 3 µm<br>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 |

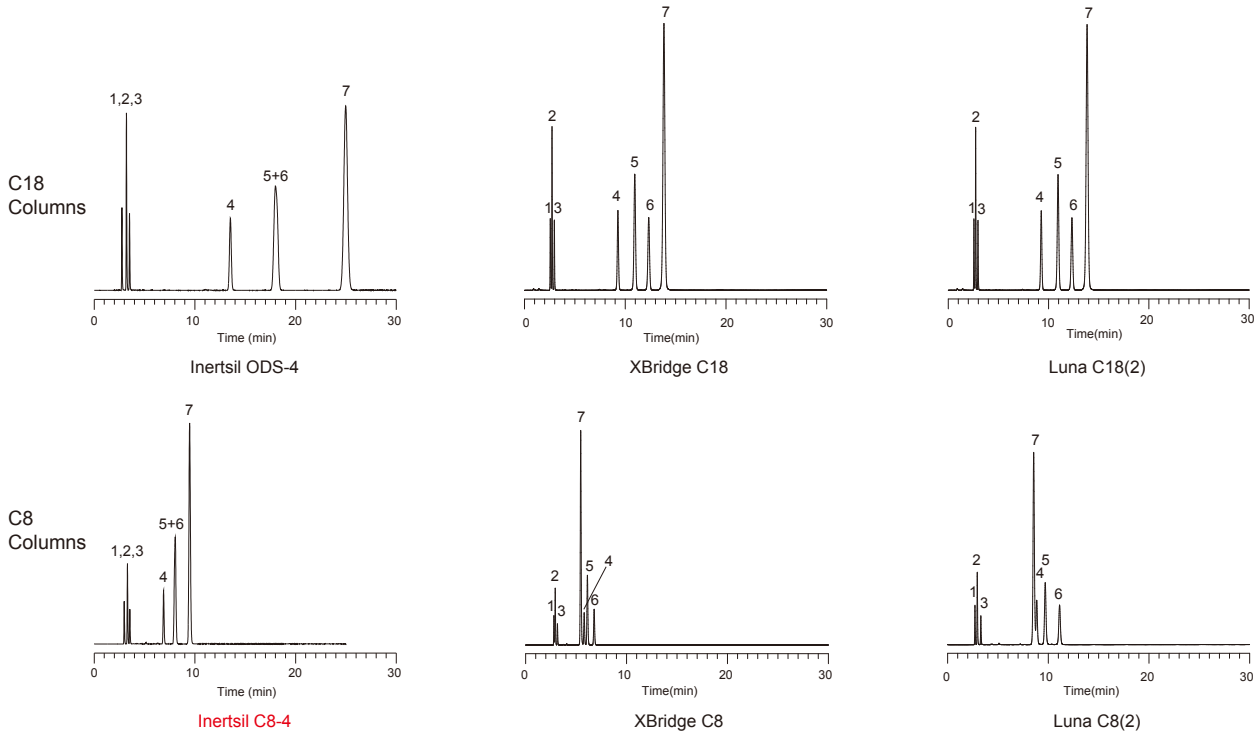
# Inertsil C8-4

- **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<br>Particle Size: 3 µm<br>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 |

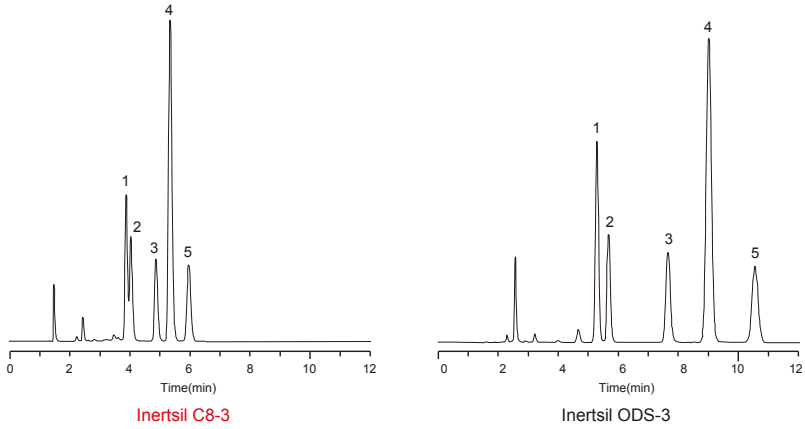
# Inertsil C8-3

- **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.

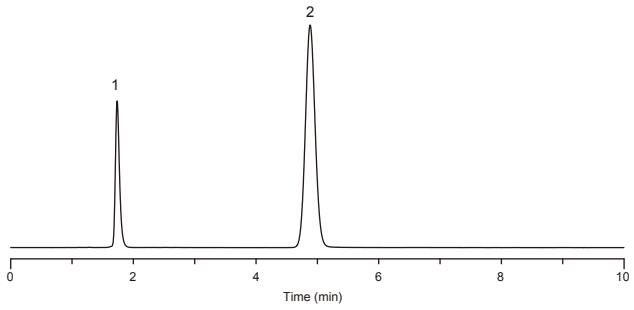
## Figure 1 : Comparison of Retentivity




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 | | |
| HP Series<br>Particle Size: 3 µm<br>50 MPa (500 bar) | Length \ I.D. (mm) | 2.1 | 3.0 | 4.6 | |
| | 30 | 5020-14101 | 5020-14104 | 5020-14107 | |
| | 50 | 5020-14102 | 5020-14105 | 5020-14108 | |
| | 75 | 5020-14103 | 5020-14106 | 5020-14109 | |
| | 100 | 5020-14031 | 5020-14034 | 5020-14037 | |
| | 150 | 5020-14032 | 5020-14035 | 5020-14038 | |
| | 250 | 5020-14033 | 5020-14036 | 5020-14039 | |

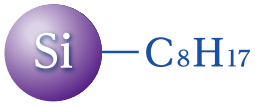
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 33 | 5020-84811 | 5020-84821 | | |
| | 50 | 5020-84812 | 5020-84822 | | |
| | 75 | 5020-84813 | 5020-84823 | | |
| | 100 | 5020-84814 | 5020-84824 | | |
| | 150 | 5020-13522 | 5020-13520 | | |
| | 250 | 5020- | 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 |

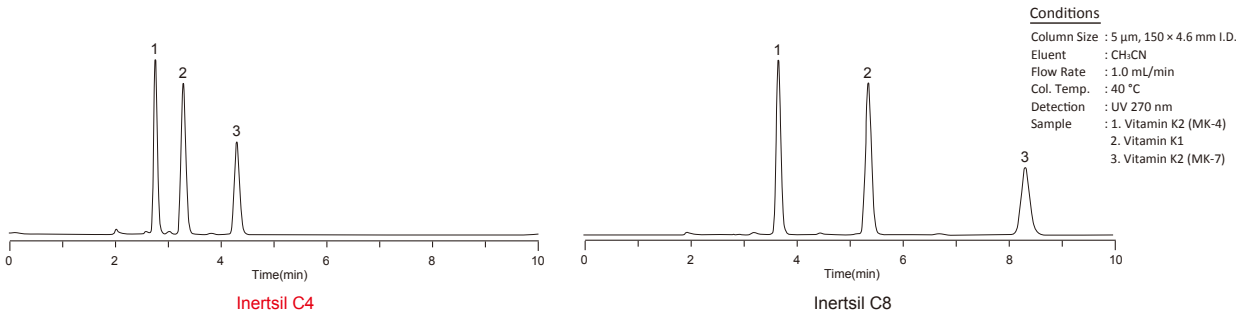
# Inertsil C4

- **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

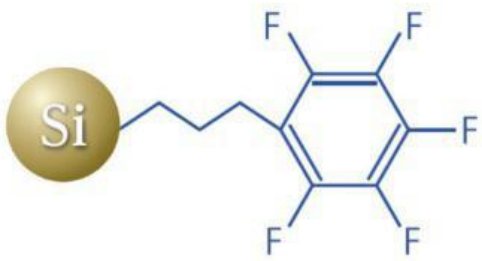
| Particle Size: 5 µm | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
|---|---|---|---|---|---|
| | 150 | 5020-01421 | 5020-01422 | 5020-01423 | 5020-01424 |
| | 250 | 5020-01425 | 5020-01426 | 5020-01427 | 5020-01428 |

## 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 |

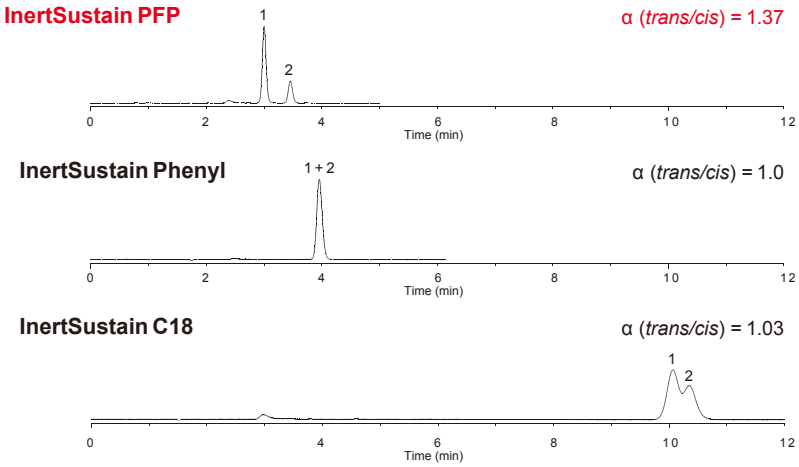
# InertSustain PFP

- **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

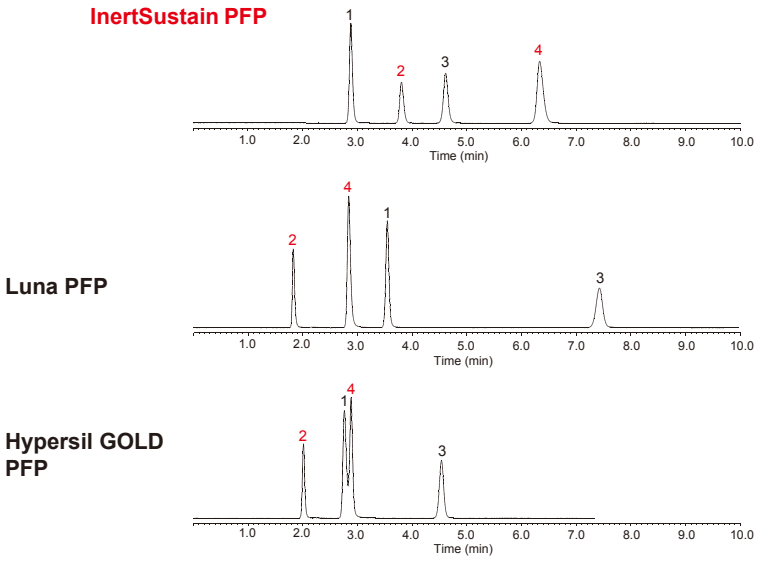
| | |
|---|---|
| Eluent | : A) $CH_3OH$ |
| | B) $H_2O$ |
| | A/B = 80/20, v/v |
| Column Size | : 5 µm,150 × 4.6 mm I.D. |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 210 nm |
| Sample | : 1. *cis*-Stilbene |
| | 2. *trans*-Stilbene |

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

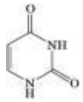


1. *cis*-Stilbene (*cis*)
2. *trans*-Stilbene (*trans*)

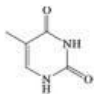
## Figure 2: Comparison of High Polarity Compounds Analysis




Middle Compound Compound

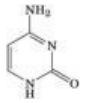


1 : Uracil

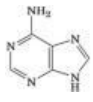


3 : Thymine

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<br>Particle Size: 3 µm<br>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 | | |
| Particle Size: 5 µm | 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 | | |
| | 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 |

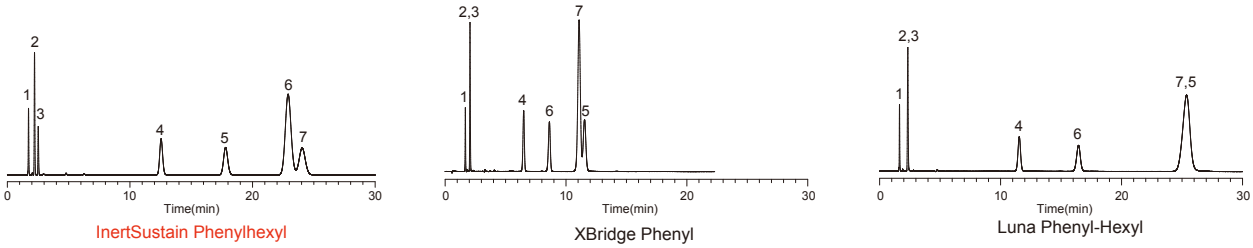
# InertSustain Phenylhexyl

- **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

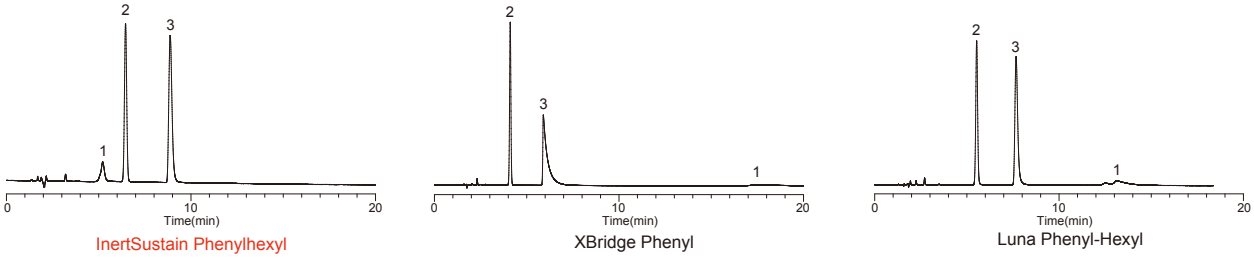



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
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

Sample : 1. Uracil
2. Caffeine
3. Phenol
4. Butylbenzene
5. *o*-Terphenyl
6. Amylbenzene
7. Triphenylene

## Figure 2 : Analysis of Acidic Compounds




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

## Analytical Columns

| | Length \ I.D.(mm) | 2.1 | 3.0 | 4.6 |
|---|---|---|---|---|
| HP Series<br>Particle Size: 3 µm<br>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 |

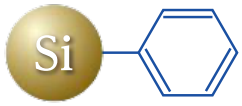
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-89160 | 5020-89166 | | |
| | 50 | 5020-89161 | 5020-89167 | | |
| | 75 | 5020-89162 | 5020-89168 | | |
| | 100 | 5020-89163 | 5020-89169 | | |
| | 150 | 5020-89164 | 5020-89170 | | |
| | 250 | 5020-89165 | 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 |
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| Particle Size: 5 µm | 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 |

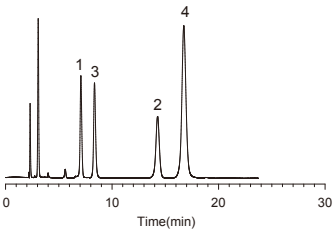
# InertSustain Phenyl

- **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**

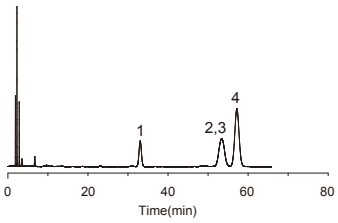



InertSustain Phenyl is a direct phenyl group bond type with a phenyl group that is bonded directly to silica gel. It provides significantly different separation compared with ODS columns and better separation performance. it recognizes the differences among the electronic states of aromatic compounds 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



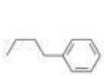

InertSustain Phenyl




InertSustain C18

Conditions

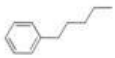
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) $CH_3OH$
B) $H_2O$
A/B = 70/30, v/v
Flow Rate : 0.8 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm



1. Butylbenzene



2.*o* -Terphenyl
Non - Planar Structure

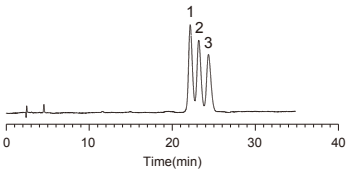


3. Amylbenzene

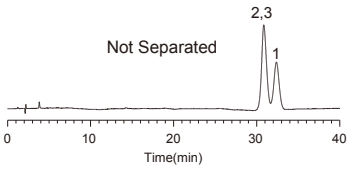


4. Triphenylene
Planar Structure

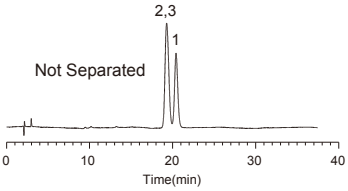
## Figure 2 : Analysis of Structural Isomers (Positional Isomers of Cresol)




InertSustain Phenyl




Ascentis Phenyl




XBridge Phenyl

Conditions

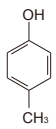
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) $CH_3OH$
B) $H_2O$
A/B = 20/80, v/v
Col. Temp. : 40 °C
Flow Rate : 0.8 mL/min
Detection : UV 254 nm




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<br>Particle Size: 3 µm<br>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 |

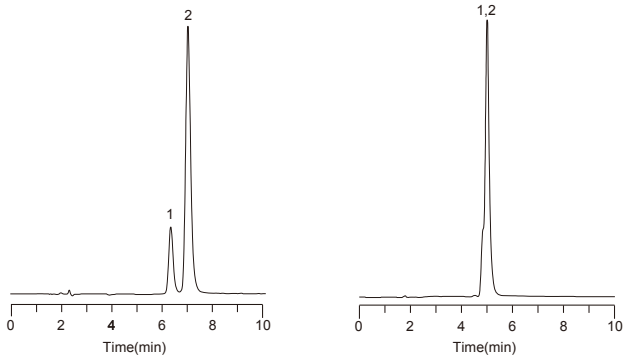
# Inertsil Ph-3

- **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**



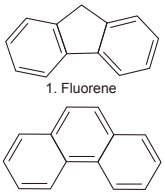

Like InertSustain Phenyl, Inertsil Ph-3 contains phenyl groups that directly bond to the silica gel, providing pure reverse-phase characteristics that are critical for resolving highly polar compounds such as acidic and basic pharmaceuticals. The near-perfect phenyl phase coverage on this material results 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

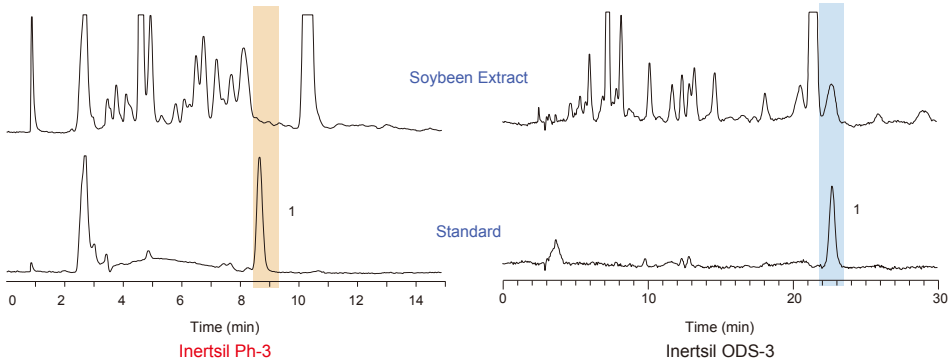


1. Fluorene



2. Phenanthrene

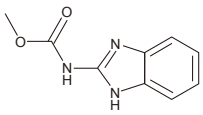
## Figure 2 : Application on Pesticide Detection Test




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 | | |
| HP Series<br>Particle Size: 3 µm<br>50 MPa (500 bar) | Length \ I.D. (mm) | 2.1 | 3.0 | 4.6 | |
| | 30 | 5020-14111 | 5020-14114 | 5020-14117 | |
| | 50 | 5020-14112 | 5020-14115 | 5020-14118 | |
| | 75 | 5020-14113 | 5020-14116 | 5020-14119 | |
| | 100 | 5020-14041 | 5020-14044 | 5020-14047 | |
| | 150 | 5020-14042 | 5020-14045 | 5020-14048 | |
| | 250 | 5020-14043 | 5020-14046 | 5020-14049 | |

| | 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 |
| Particle Size: 5 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 33 | 5020-85111 | 5020-85121 | | |
| | 50 | 5020-85112 | 5020-85122 | | |
| | 75 | 5020-85113 | 5020-85123 | | |
| | 100 | 5020-85114 | 5020-85124 | | |
| | 150 | 5020-13612 | 5020-13610 | | |
| | 250 | 5020-85116 | 5020-85126 | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 33 | 5020-05111 | 5020-05121 | 5020-05131 | 5020-05141 |
| | 50 | 5020-05112 | 5020-05122 | 5020-05132 | 5020-05142 |
| | 75 | 5020-05113 | 5020-05123 | 5020-05133 | 5020-05143 |
| | 100 | 5020-05114 | 5020-05124 | 5020-05134 | 5020-05144 |
| | 150 | 5020-05115 | 5020-05125 | 5020-01922 | 5020-01920 |
| | 250 | 5020-05116 | 5020-05126 | 5020-01923 | 5020-01921 |

## 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 |

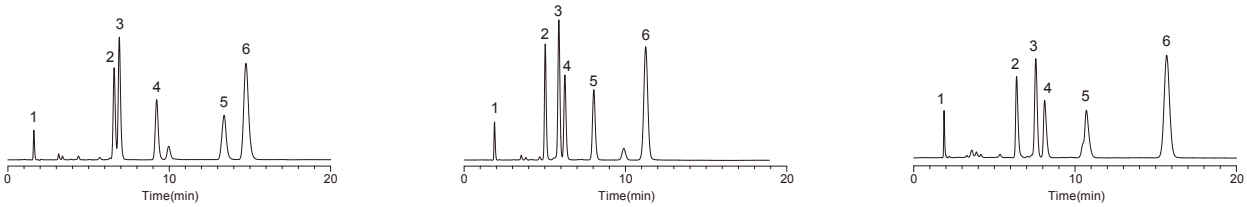
# Inertsil Ph

- **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



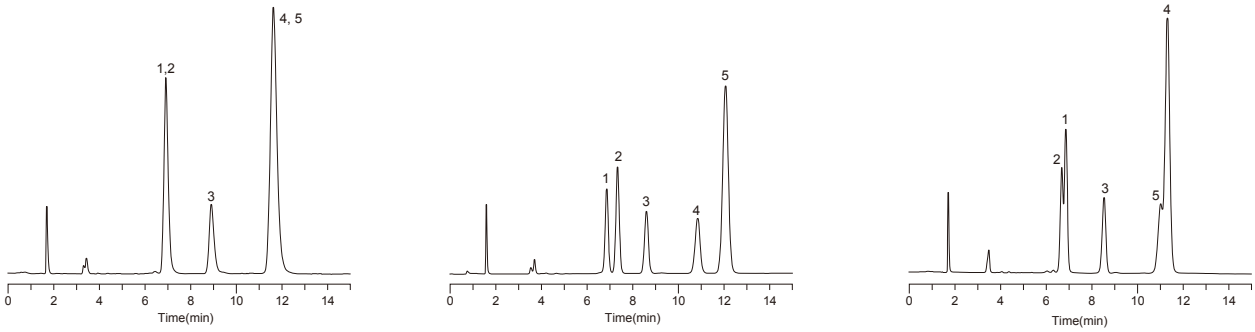

Inertsil Ph | Inertsil Ph-3 | InertSustain Phenyl

Conditions

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

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

## Figure 2 : Comparison of Selectivity




Inertsil Ph | Inertsil Ph-3 | other brand's Phenyl Column

Conditions

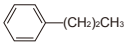
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm



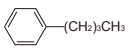

1. Ethylbenzene



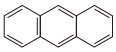
2. Naphthalene




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 |

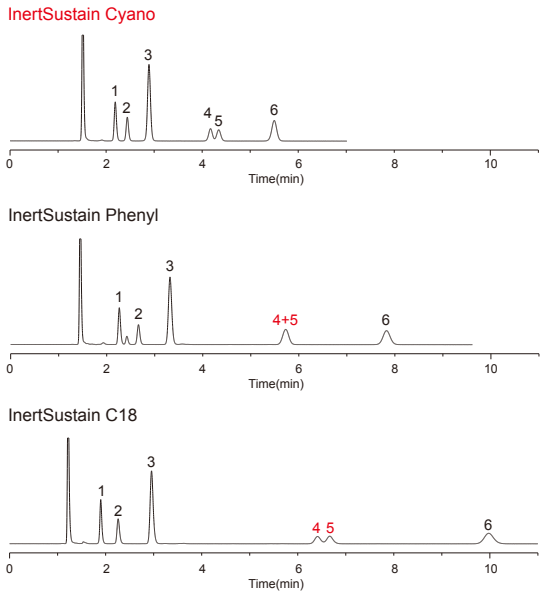
# InertSustain Cyano

- **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)

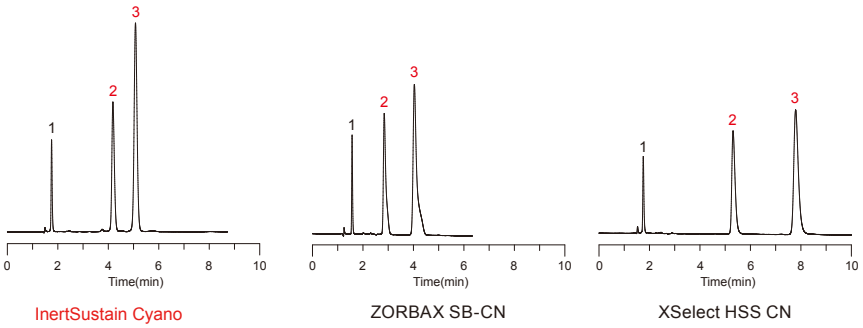
## Figure 1 : Comparison of Selectivity




Conditions

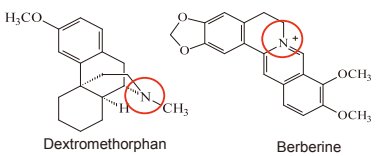
| | | |
|---|---|---|
| Column Size | : | 5 µm,150 × 4.6 mm I.D. |
| Eluent | : | A) $CH_3CN$ |
| | | B) 0.1 % $H_3PO_4$ |
| | | A/B = 25/75, v/v |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | UV 280 nm |
| Sample | : | 1. 4-Hydroxybenzamide |
| | | 2. Hydroquinone |
| | | 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<br>Particle Size: 3 µm<br>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 |
| Particle Size: 5 µm | 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 |
| | 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 |

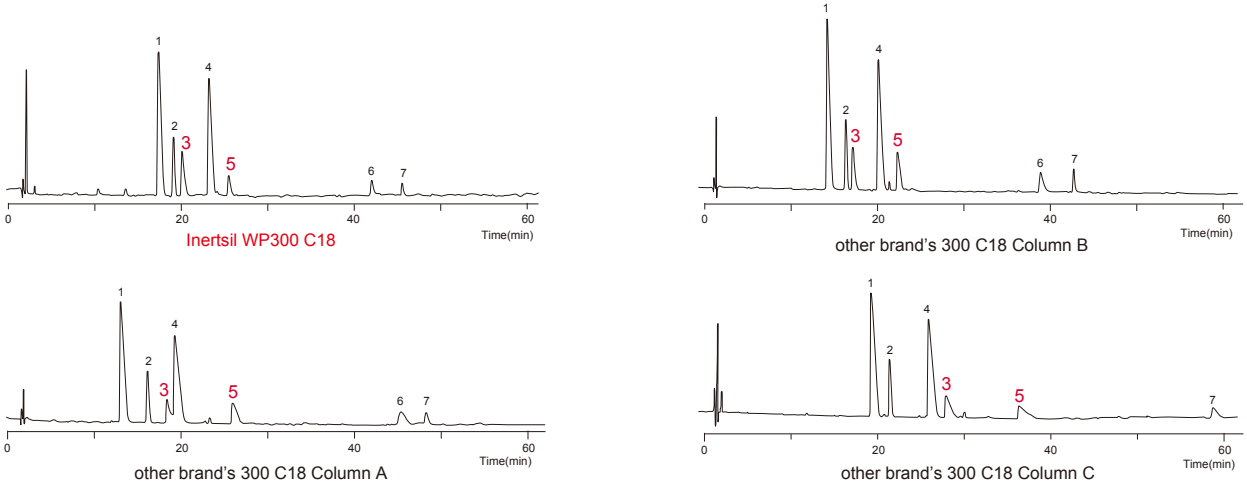
# Inertsil WP300 C18

- **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

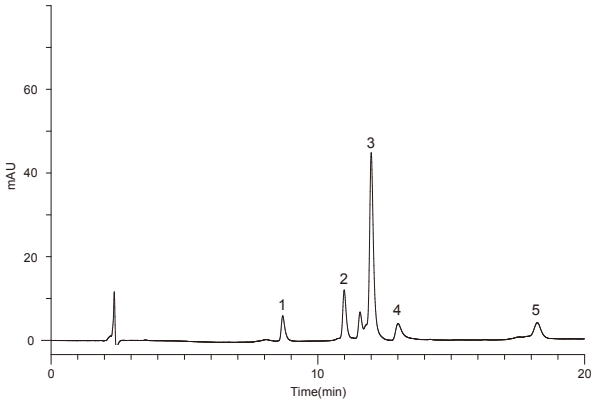



Conditions

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

| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.6 | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 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 |

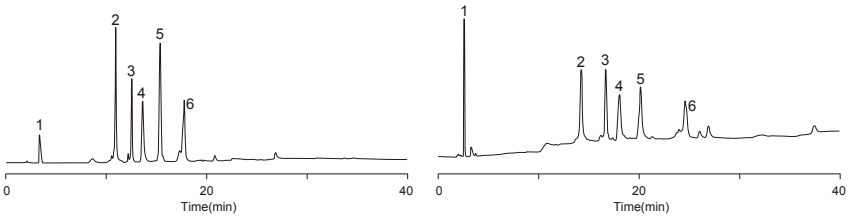
# Inertsil WP300 C8

- **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

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

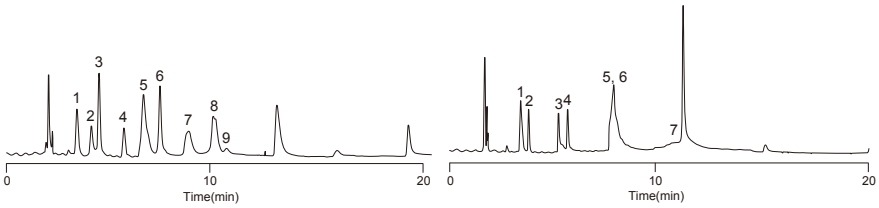
- **Silica** : **WP300 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **150 $m^2/g$**
- **Pore Size** : **300 Å (30 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Functional Group** : **Butyl**
- **End-capping** : **None**
- **Carbon Loading** : **3 %**
- **USP Code**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

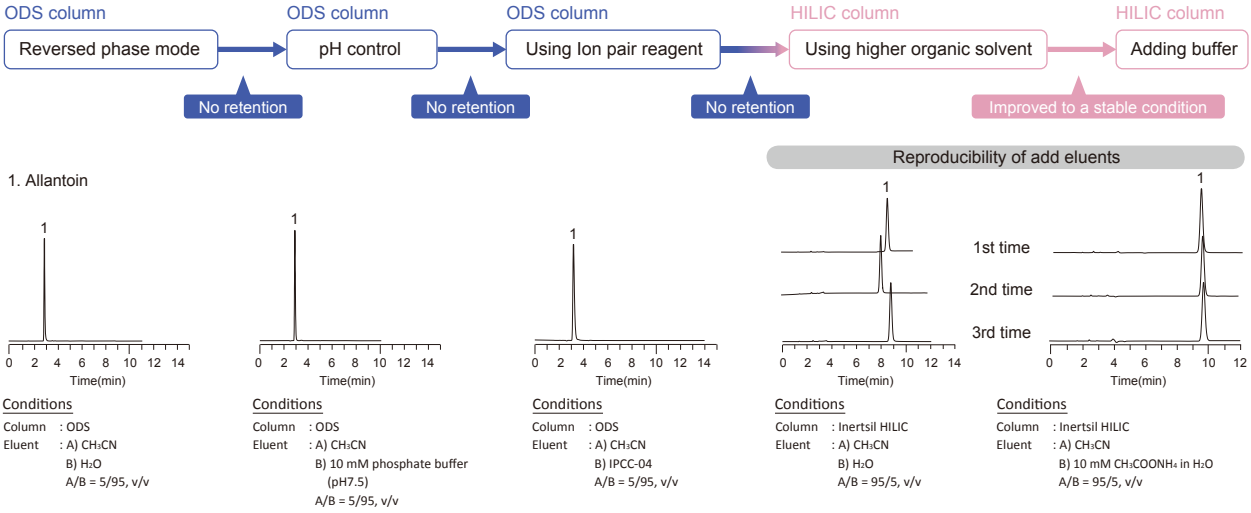
# HILIC Columns


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

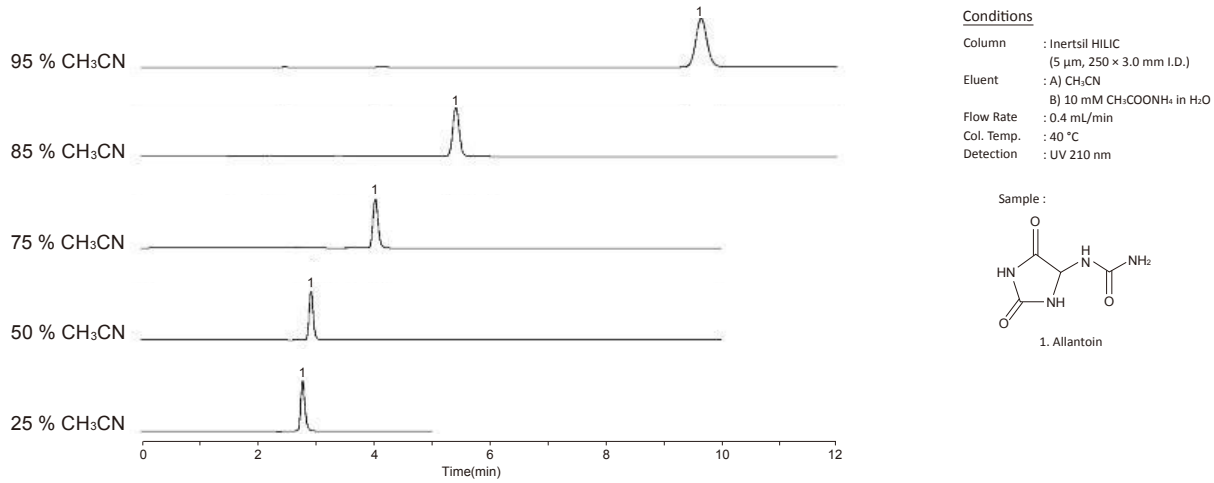
# About HILIC Columns

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



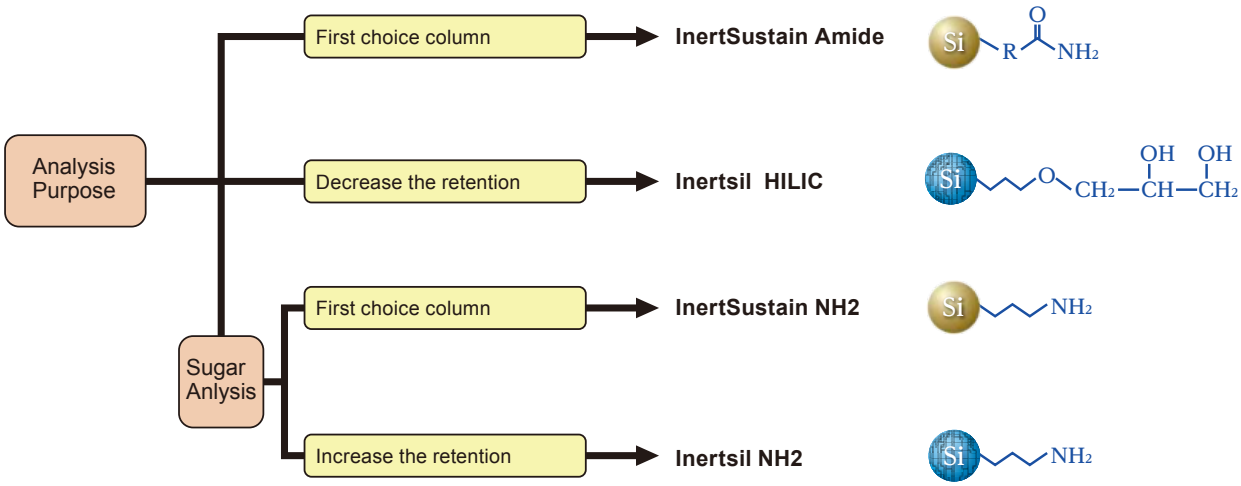

## Figure 2 : Correlation between Retention Time and the Concentration of $CH_3CN$ in Mobile Phase



## HILIC Column Specification

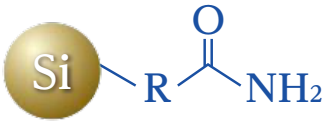
| Columns | Features | Particle Size (µm) | Pore Size (nm) | Surface Area ($m^2/g$) | Carbon Loading (%) | Recommended pH range |
|---|---|---|---|---|---|---|
| InertSustain Amide | Frist choice column for HILIC mode. | 1.9, 3, 5 | 10 | 350 | 15 | 2 - 8.5 |
| Inertsil HILIC | Effective when the overall 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

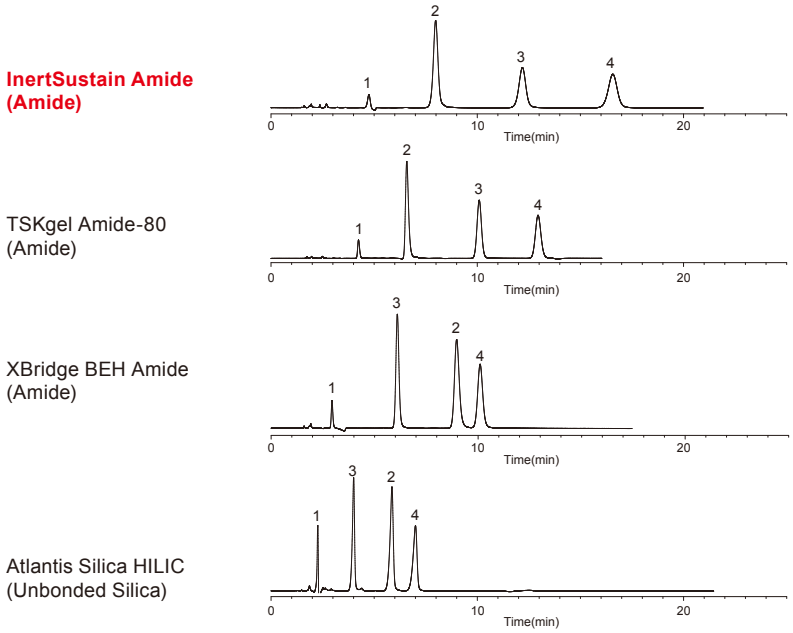


# InertSustain Amide

- **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**



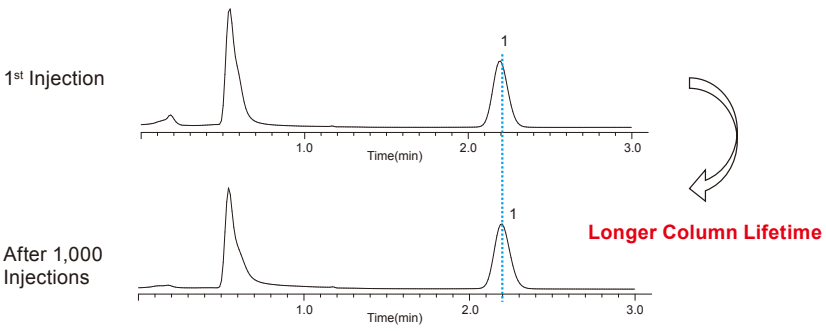

InertSustain Amide is a HILIC column that enhances the retention of extremely polar compounds.
This column offers the strongest retentivity among the marketed amide columns through bonding of carbamoyl groups. It achieves superior stability and durability even for water-rich mobile phases.
HILIC phases 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

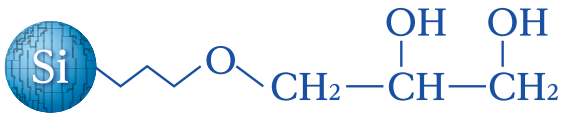
| | Length \ I.D. (mm) | 2.1 | 3.0 | | |
|---|---|---|---|---|---|
| Particle Size: 1.9 µm | 30 | 5020-88815 | 5020-88820 | | |
| | 50 | 5020-88816 | 5020-88821 | | |
| | 75 | 5020-88817 | 5020-88822 | | |
| | 100 | 5020-88818 | 5020-88823 | | |
| | 150 | 5020-88819 | 5020-88824 | | |
| | Length \ I.D. (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 | | |
| Particle Size: 3 µm | 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 |
| | 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 | | |
| Particle Size: 5 µm | 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 |

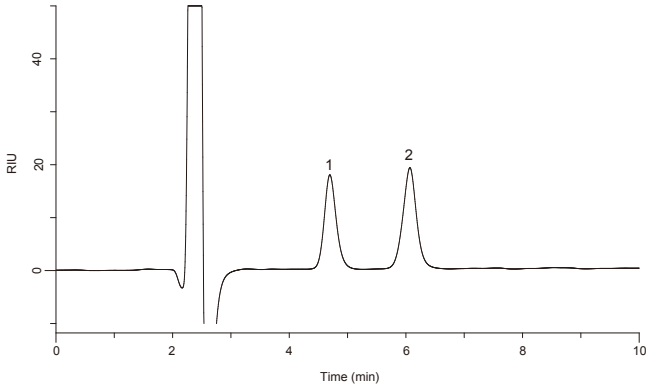
# Inertsil HILIC

- **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.

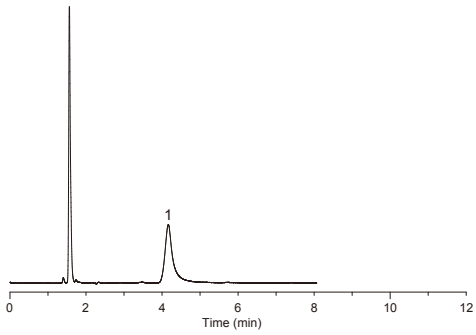
## Figure 1 : Analysis of Taurine and Inositol




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) |

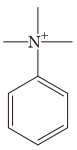
## Figure 2 : Analysis of Basic Compound




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 |

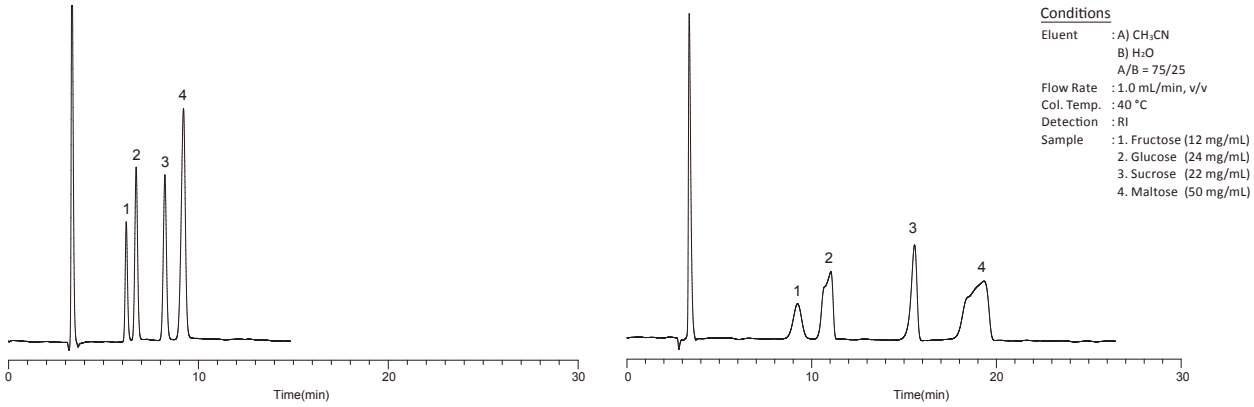
# InertSustain NH2

- **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



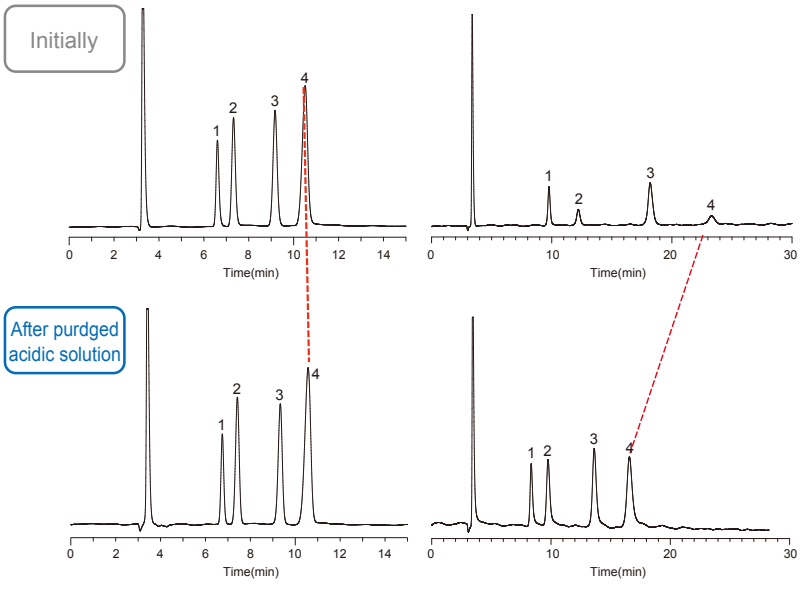

InertSustain NH2 shows far superior stability compared to other brand available aminopropyl columns, as our newly developed “Evolved Surface Silica” is chemically bonded with aminopropyl group. Generally, aminopropyl columns are used for applications that are hard to be separated in a reversed phase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



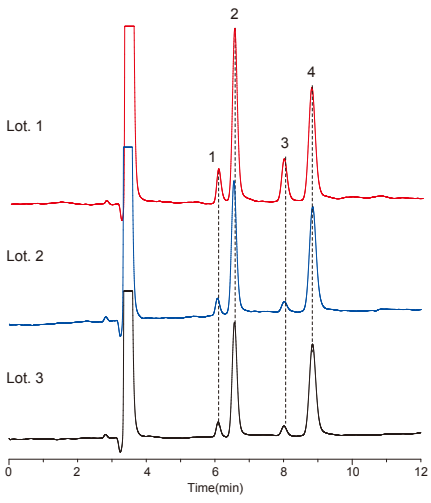

InertSustain NH2 | other brand Amide Column

## 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.) | Sample : 1. Fructose 2. Glucose 3. Sucrose 4. Maltose |
| 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 | |

## Analytical Columns

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

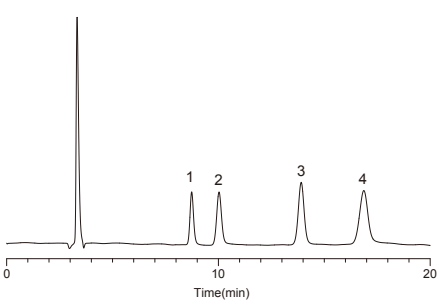
# Inertsil NH2

- **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**

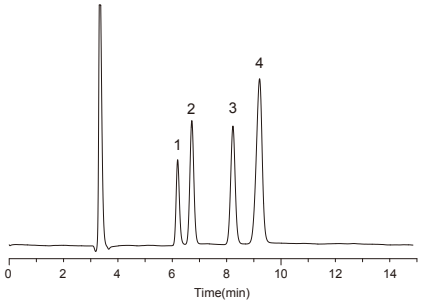



Inertsil NH2 has an aminopropyl group that is chemically bonded to silica gel. It is widely used for analysing suger in reverced phase mode.

## Figure 1 : Comparison of Aminopropyl Columns



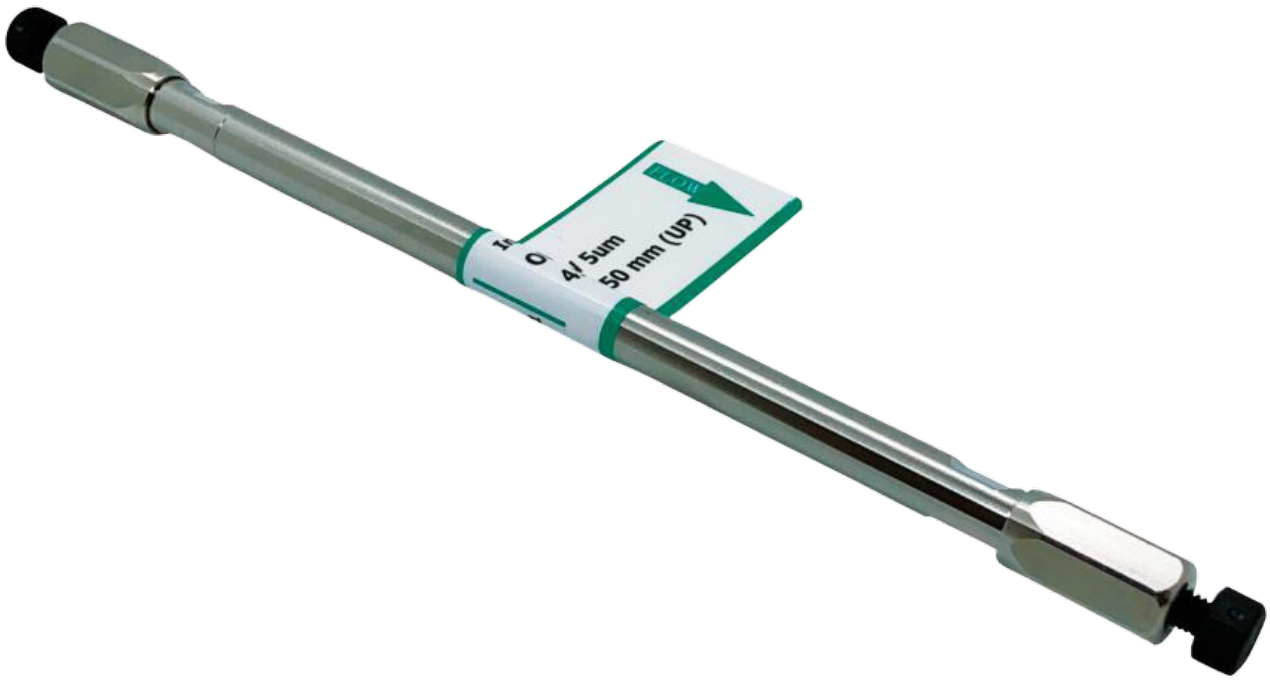

Inertsil NH2




InertSustain NH2

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

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

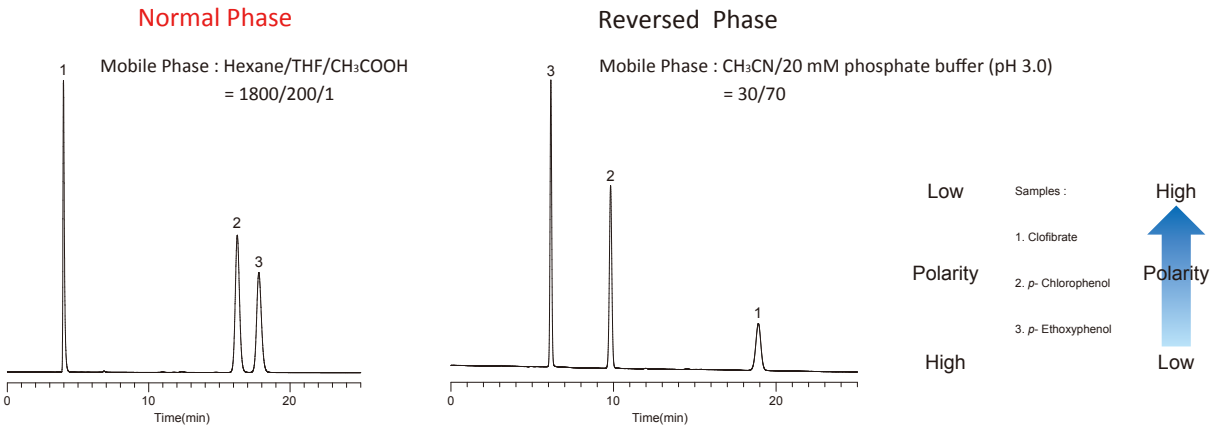
| Particle Size | Length \ I.D. (mm) | 4.0 |
|---|---|---|
| 3 µm | 150 | 5020-89958 |
| | 250 | 5020-89959 |
| 5 µm | 150 | 5020-89952 |
| | 250 | 5020-89953 |

# 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

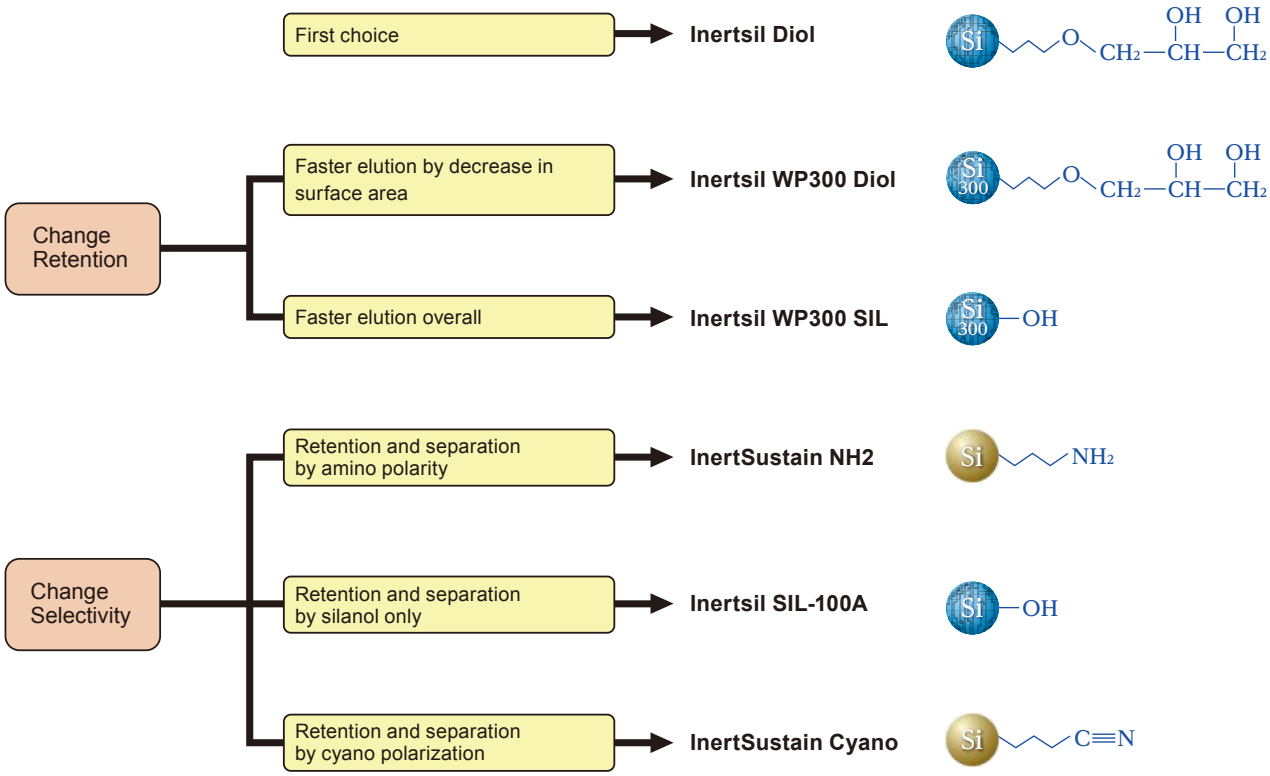
Column : Inertsil CN-3 (5 µm, 250 × 4.6 mm I.D.)
Flow Rate : 1.0 mL/min
Detection : UV 275 nm

## 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

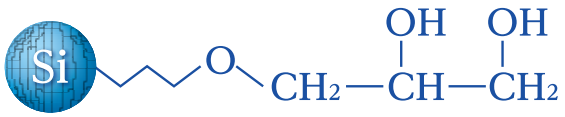
Normal-phase mode typically uses a solvent of combined hexane and ethanol, although a less polar solvent such as propanol or ethyl acetate is used in some cases. The solvent must be properly selected according to the retention strength of the target components.

### 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 |

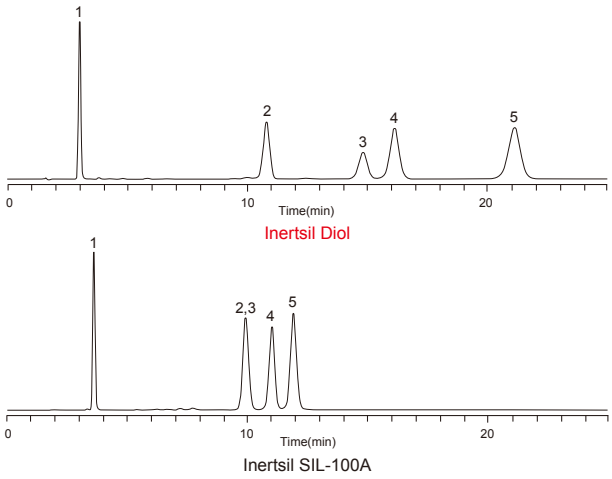
# Inertsil Diol

- **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.

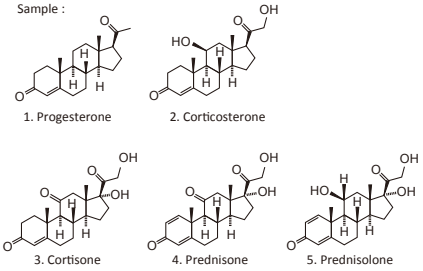
## Figure 1 : Comparison of Selectivity between Diol Column and Silica Column




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 |

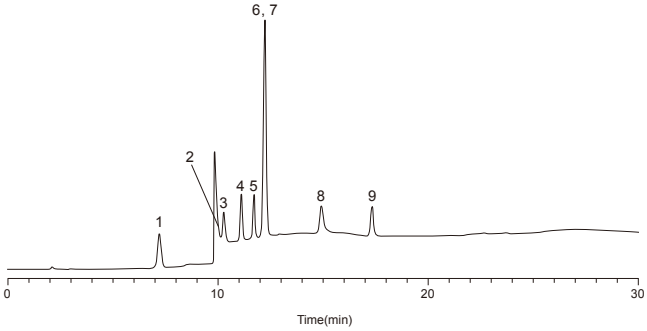
Sample :

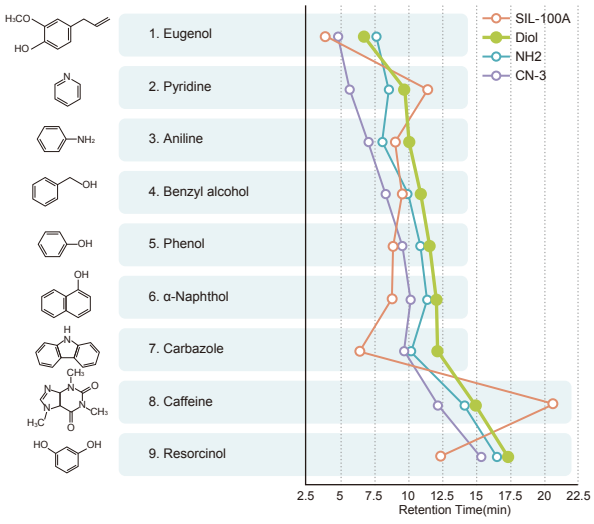



## Figure 2 : Selectivity of Inertsil Diol

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

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

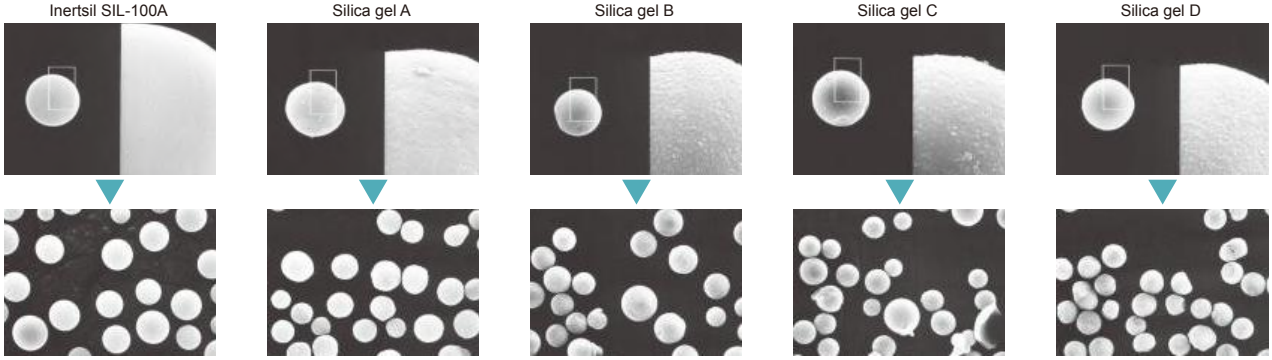
# Inertsil SIL-100A

- **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.

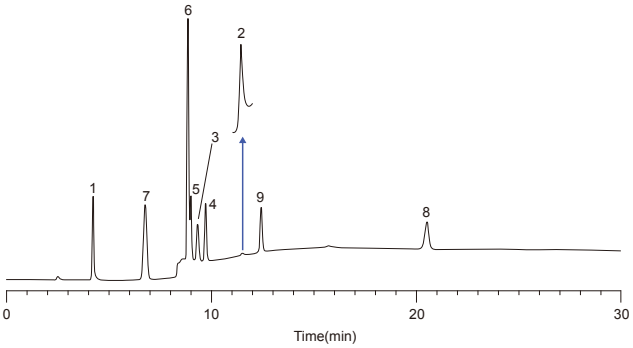
## Figure 1 : SEM Photos of Inertsil SIL-100A and Other Brand Available Silica Gels

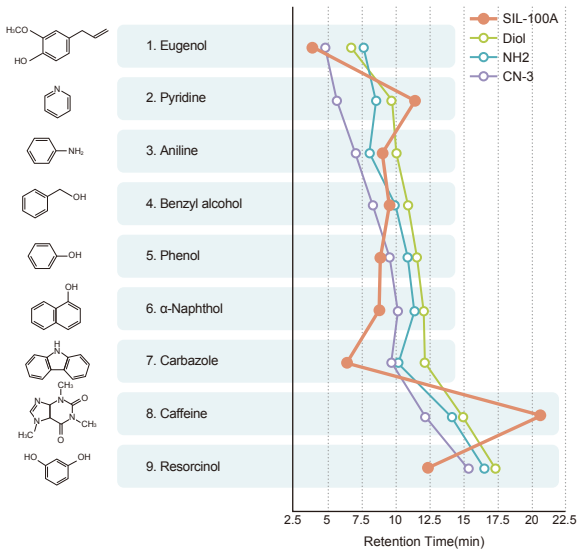



## Figure 2 : Selectivity of Inertsil SIL-100A

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 |

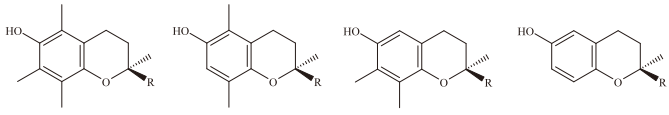
# InertSustain NH2

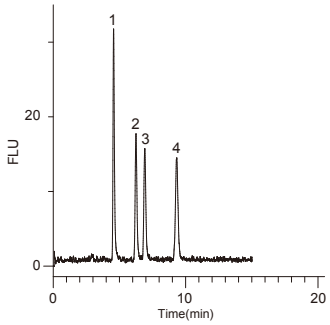
- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **3 µm, 5 µm**
- **Surface Area** : **350 $m^2$/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Aminopropyl**
- **End-capping** : **None**
- **Carbon Loading** : **7 %**
- **USP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

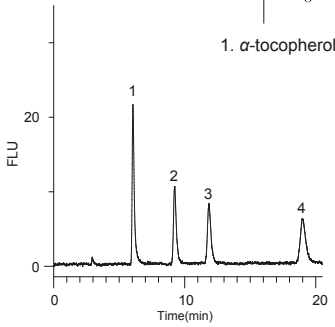



InertSustain NH2 is a normal-phase column that is expected to change separation patterns due to a difference in selectivity compared with silica gel columns.
Compared with Inertsil NH2 (described below), it has a smaller surface area and elutes analytes faster to produce sharper peaks.
An InertSustain 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



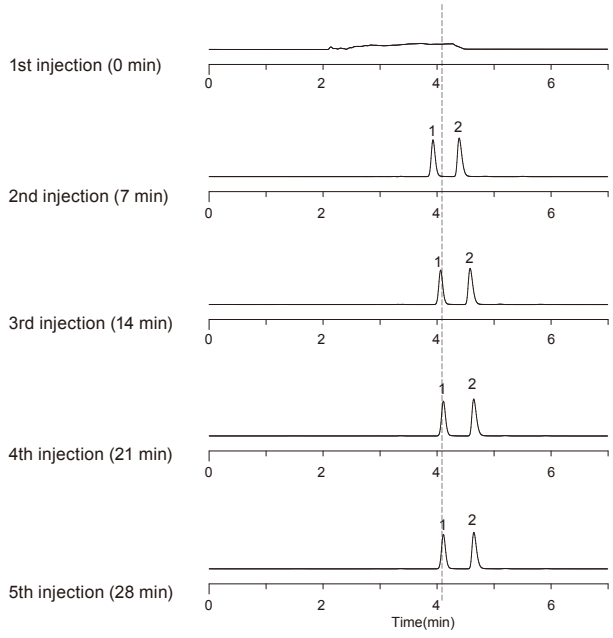



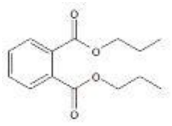




Conditions

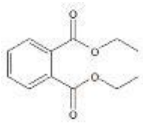
| | | |
|---|---|---|
| Column | : | 5 µm, 250 × 4.6 mm I.D. |
| Eluent | : | A) *n*-Hexane<br>B) Ethyl acetate<br>A/B = 85/15, v/v |
| Flow Rate | : | 1.2 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | FL Ex. 298 nm Em. 325 nm |
| Injection Vol. | : | 20 µL |
| Sample | : | α-tocopherol (1 µg/mL in Hexane)<br>β-tocopherol (1 µg/mL in Hexane)<br>γ-tocopherol (1 µg/mL in Hexane)<br>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<br>B) Isopropanol<br>A/B = 95/5, v/v (gradient mixer) |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | UV 300 nm |

## Analytical Columns

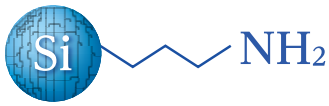
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-16768 | 5020-16774 | | |
| | 50 | 5020-16769 | 5020-16775 | | |
| | 75 | 5020-16770 | 5020-16776 | | |
| | 100 | 5020-16771 | 5020-16777 | | |
| | 150 | 5020-16772 | 5020-16778 | | |
| | 250 | 5020-16773 | 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 |

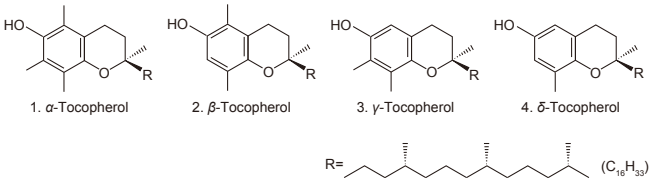
# Inertsil NH2

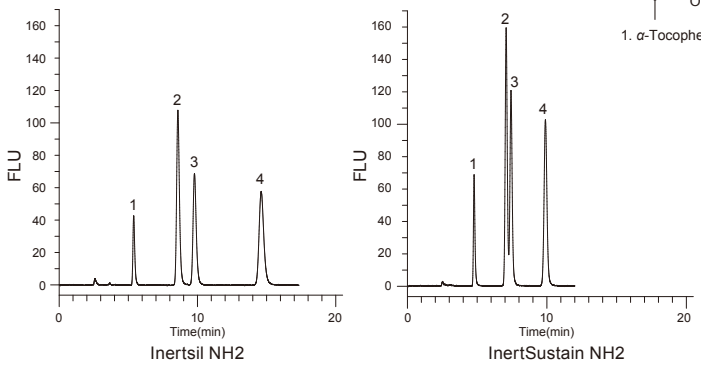
- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 $m^2/g$
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Aminopropyl
- **End-capping** : None
- **Carbon Loading** : 8 %
- **USP Code** : L8
- **pH Range**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



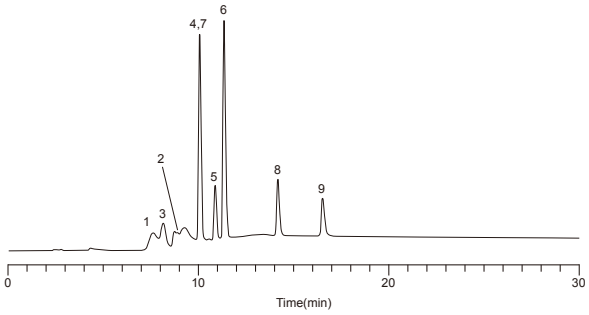

Conditions

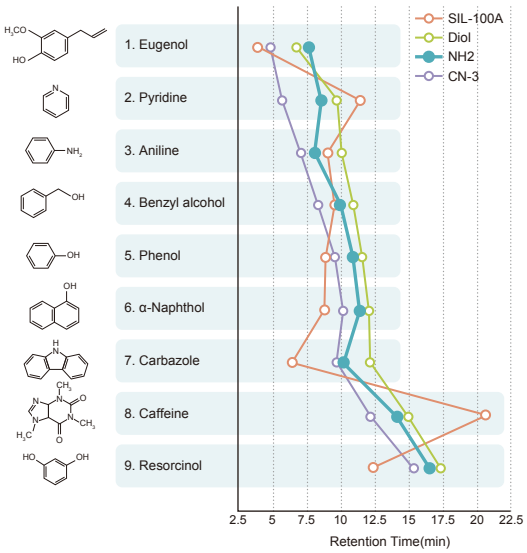
| | |
|---|---|
| Column | : 5 µm, 250 × 4.6 mm I.D. |
| Eluent | : A) *n*-Hexane<br>B) Isopropanol<br>A/B = 98/2, v/v |
| Flow Rate | : 1.2 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : FL Ex. 298 nm Em. 325 nm |
| Injection. Vol. | : 20 µL |
| Sample | : α-tocopherol (1 µg/mL in Hexane)<br>β-tocopherol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

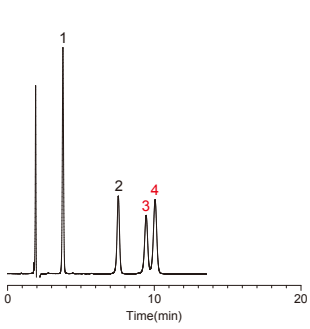
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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**

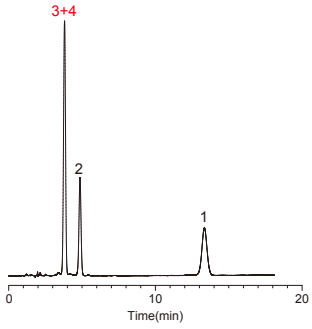
InertSustain Cyano has chemically bonded cyanopropyl groups to silica gel, which are end-capped for use in both normal- and reversed-phase modes. Components that were difficult to separate in reversed-phase mode may be separated in normal-phase mode.
In addition, the end-caping process enables the cleaning 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



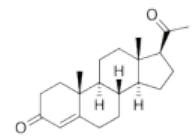

Conditions

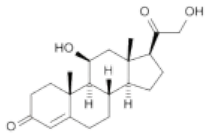
| | | |
|---|---|---|
| Eluent | : | A) Hexane |
| | | B) Ethanol |
| | | A/B = 90/10, v/v |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | UV 220 nm |

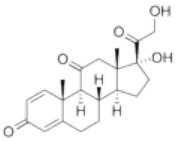


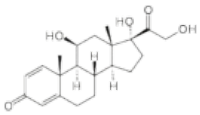

Conditions

| | | |
|---|---|---|
| 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 |

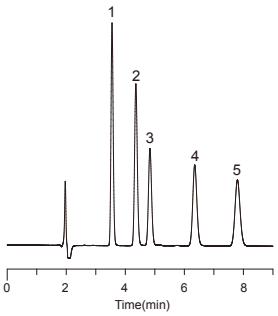

1. Progesterone


2. Corticosterone

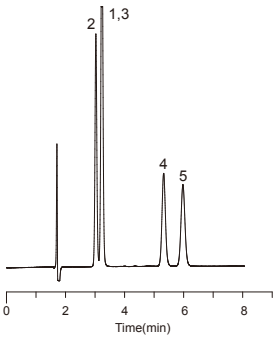

3. Prednisone


4. Prednisolone

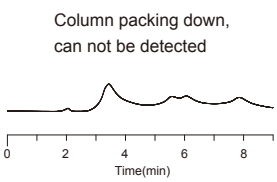
## Figure 2: Comparison with Other Brands Column



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<br>Particle Size : 3 µm<br>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 | | |
| Particle Size: 3 µm | 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 | | |
| | 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 | | |
| Particle Size: 5 µm | 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 |

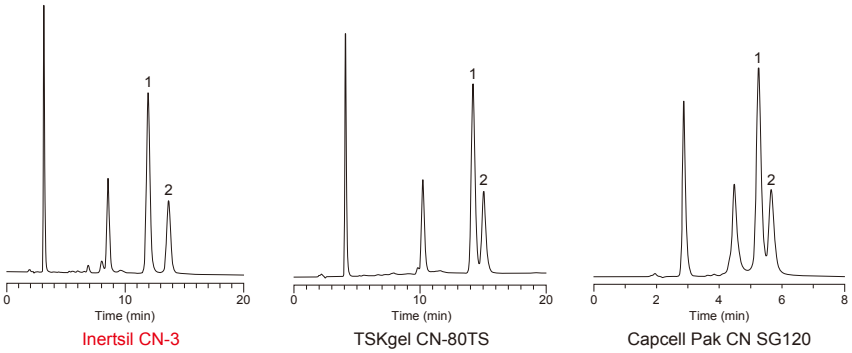
# Inertsil CN-3

- **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



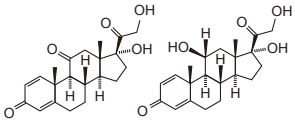

Inertsil CN-3 has a silica gel aminopropyl group that is chemically bonded.
Results of the analysis of nine compounds on an Inertsil CN-3 column are shown. Differences in selectivity compared with other Inertsil series normal-phase columns are also provided.

## Figure1 : Comparison of Selectivity




Conditions

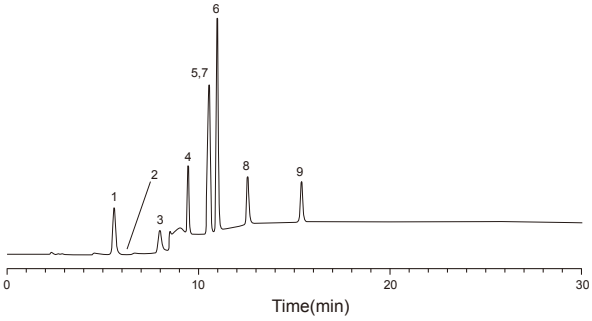
| | |
|---|---|
| Column | : Cyano Column (5 µm, 150 × 4.6 mm I.D.) |
| Eluent | : A) Hexane B) Ethanol A/B = 90/10, v/v |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 254 nm |

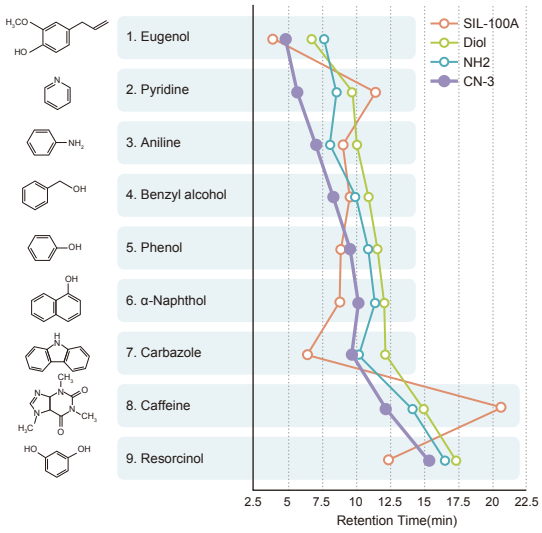



## Figure2 : Selectivity of Inertsil® CN-3

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

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

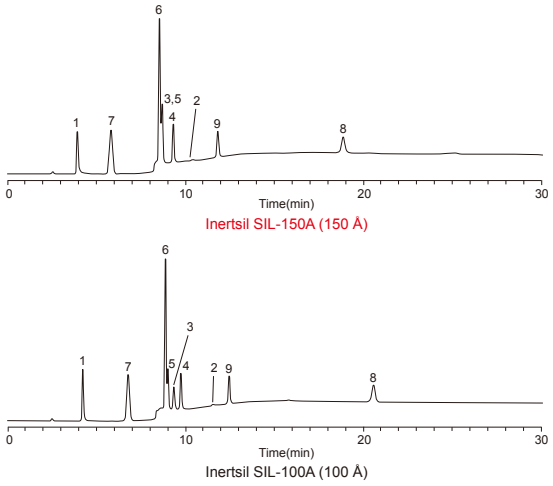
# Inertsil SIL-150A

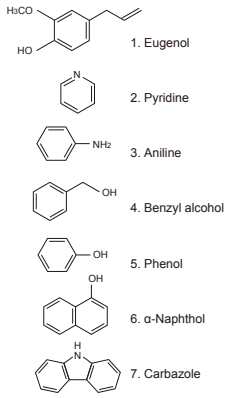
- **Base Material** : **2 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **320 $m^2/g$**
- **Pore Size** : **150 Å (15 nm)**
- **Pore Volume** : **1.20 mL/g**
- **Functional Group** : **None**
- **End-capping** : **None**
- **Carbon Loading** : **- %**
- **USP Code**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

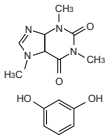
## Figure 1 : Comparison of Retentivity and Selectivity with Different Pore Size




Conditions

| | |
|---|---|
| Column Size | : 5 µm, 150 × 3.0 mm I.D. |
| Eluent | : A) *n*-Hexane/Ethanol = 100/1, v/v<br>B) Ethanol<br>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 |

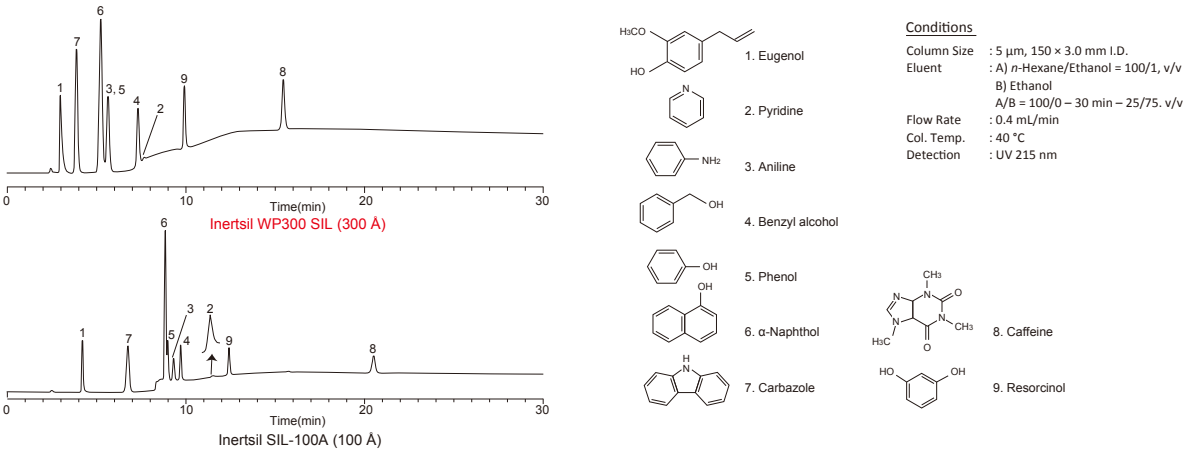
# Inertsil WP300 SIL

- **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




## 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

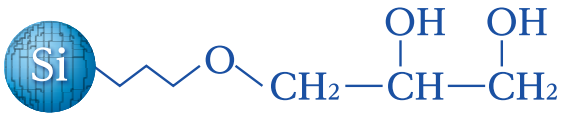
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 1.0 | 10 | 1.0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

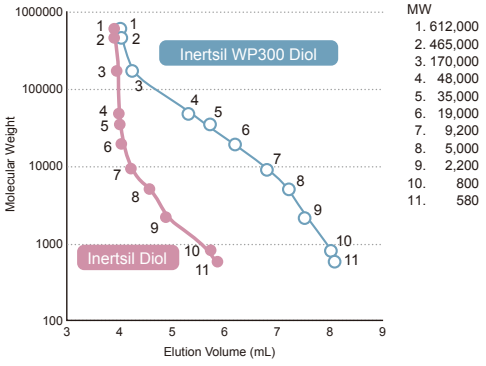



Inertsil Diol is chemically bonded dihydroxypropyl groups to silica gel, can be used for aqueous size-exclusion chromatography (SEC) (GFC) or organic SEC (GPC). The maximum operating pressure is 20 MPa (200 bar), higher than in most polymer base columns and enabling analysis with several columns in series.

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.

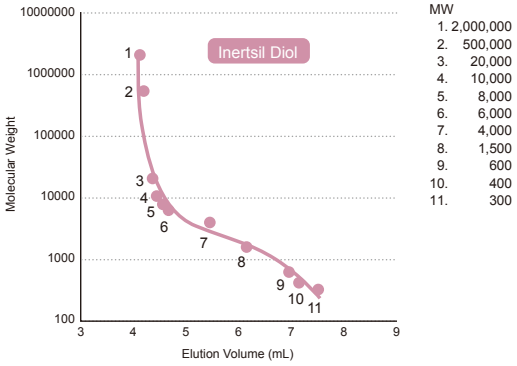
## Figure1 : Calibration Curve for Aqueous and Organic SEC Analysis




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

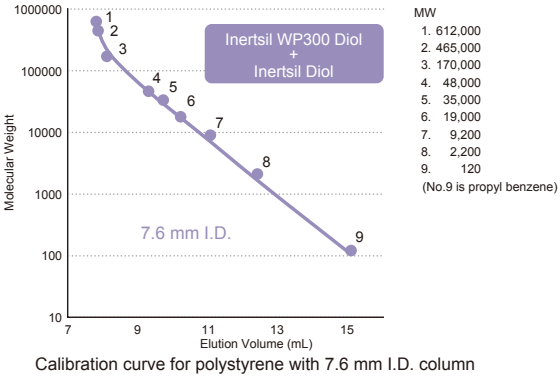



Calibration curve for polystyrene glycol

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)

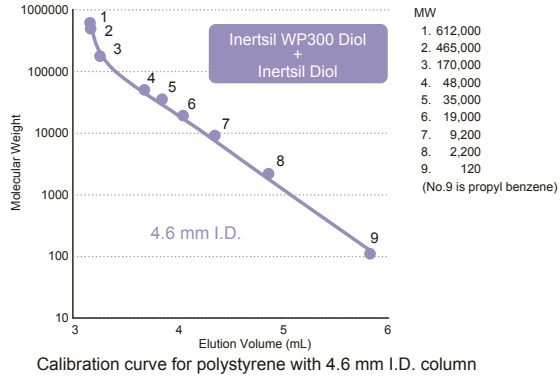
## Figure2 : Calibration Curve for Small I.D. SEC Columns




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

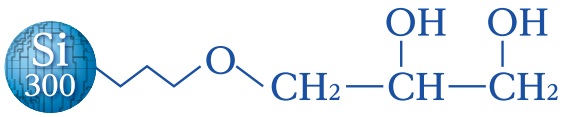
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 33 | 5020-86531 | 5020-86541 | | |
| | 50 | 5020-86532 | 5020-86542 | | |
| | 75 | 5020-86533 | 5020-86543 | | |
| | 100 | 5020-86534 | 5020-86544 | | |
| | 150 | 5020-86535 | 5020-86545 | | |
| | 250 | 5020-86536 | 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 |

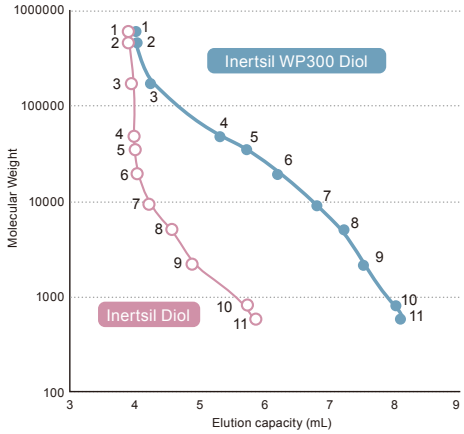
# Inertsil WP300 Diol

- **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



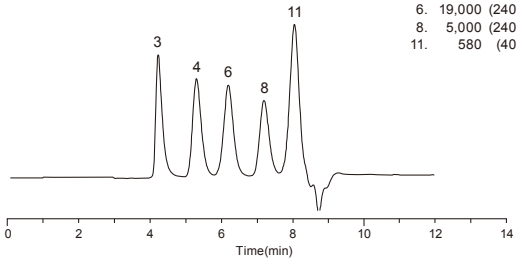

MW
1. 612,000
2. 465,000
3. 170,000
4. 48,000
5. 35,000
6. 19,000
7. 9,200
8. 5,000
9. 2,200
10. 800
11. 580

Calibration curve for polystyrenes by organic SEC

Conditions

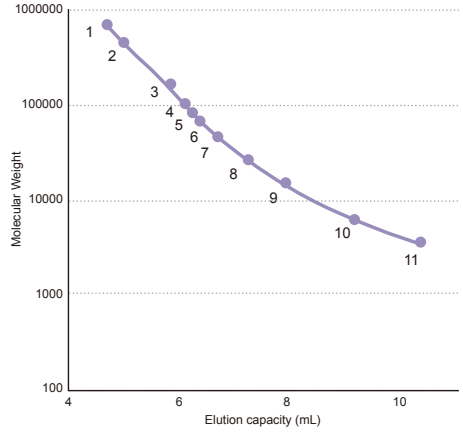
| | |
|---|---|
| Column Size | : 5 µm, 250 × 7.6 mm I.D. |
| Eluent | : THF |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 254 nm |

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




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 |

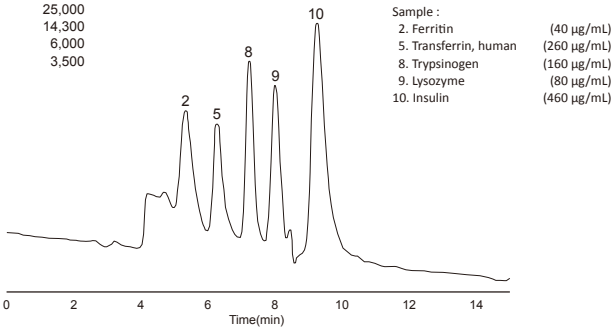
Calibration curve for proteins

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

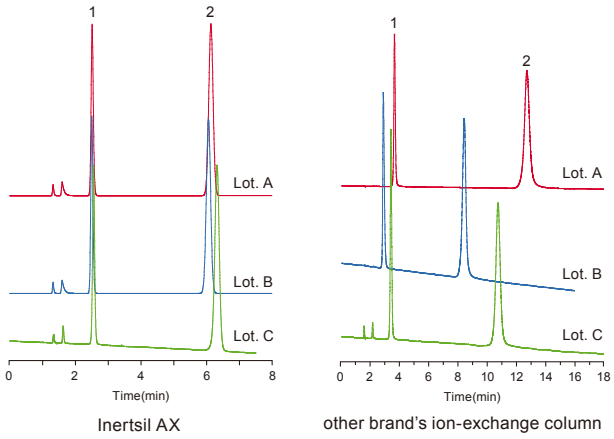
# Inertsil AX

- **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**



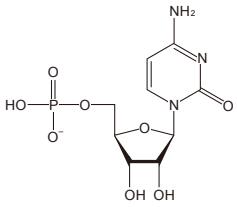

Inertsil AX has diethylamino groups bonded to silica gel by an alkyl chain. The diethylamino groups provide the anionic functions required for anion exchange chromatography. This column is mainly used for analyses of acidic compounds. Conventional ion-exchange columns obtain inconsistent lot-to-lot results, 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

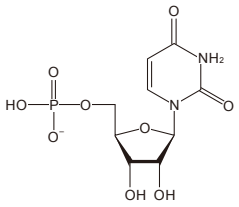



Conditions

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)

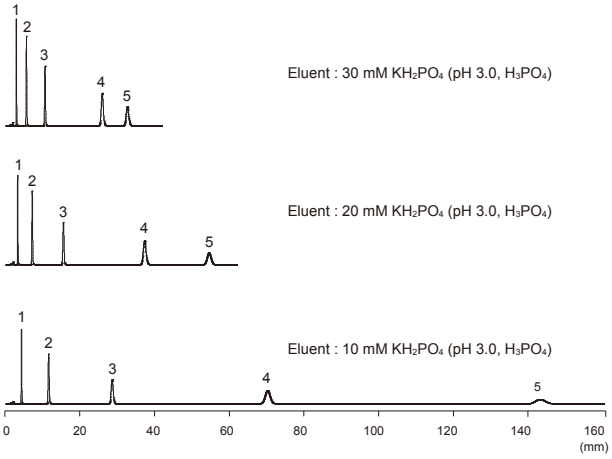


Cytidine 5'-monophosphate (CMP)



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

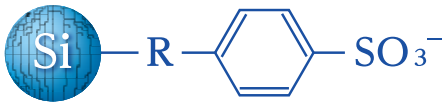
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 5 µm | 33 | 5020-80111 | 5020-80121 | | |
| | 50 | 5020-80112 | 5020-80122 | | |
| | 75 | 5020-80113 | 5020-80123 | | |
| | 100 | 5020-80114 | 5020-80124 | | |
| | 150 | 5020-80115 | 5020-80125 | | |
| | 250 | 5020-80116 | 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 |

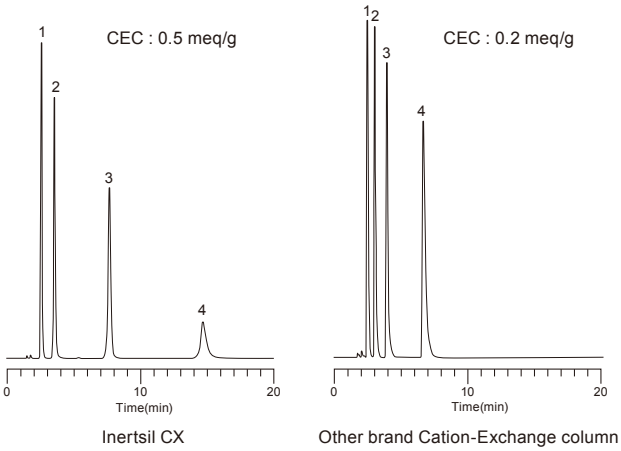
# Inertsil CX

- **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).

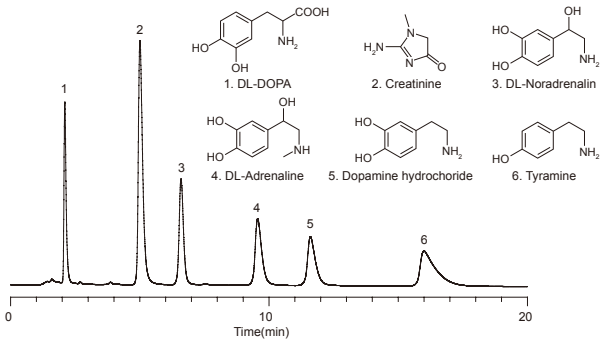
## Figure 1 : Comparison of Ion Exchange Capacity with Other Brands




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) |

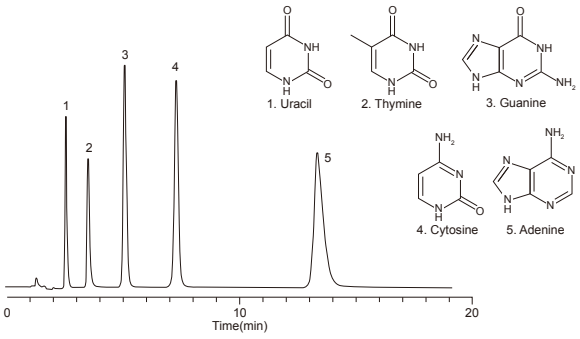
## Figure 2 : Biogenic Amine Analysis




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

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

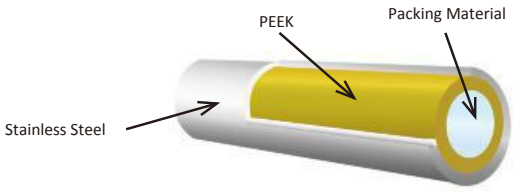
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 1.0 | 10 | 1.0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


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# Metal-Free PEEK Columns

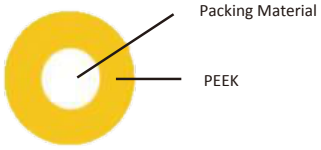
## UHPLC-PEEK columns






- 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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 |

| Particle Size | Length (mm) | I.D. (mm) | |
|---|---|---|---|
| | | 2.1 | 4.6 |
| 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

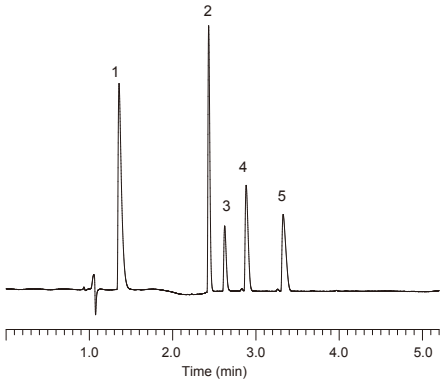
| Particle Size | Length (mm) | I.D. (mm) |
|---|---|---|
| | | 4.6 |
| 5 µm | 150 | 5020-87460 |
| | 250 | 5020-87461 |

# 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

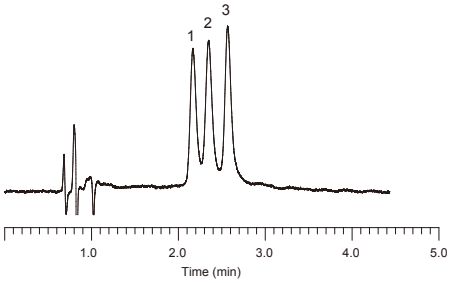



Conditions

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 ˚C
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 ˚C
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 |

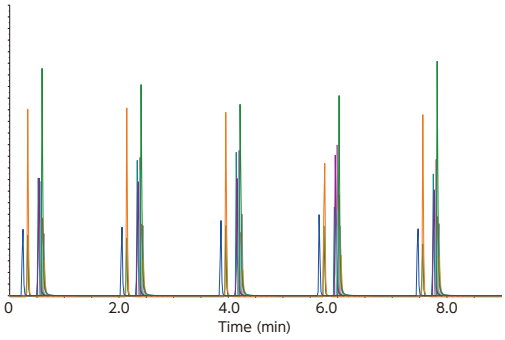
# MonoSelect C18 for HTS

- **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

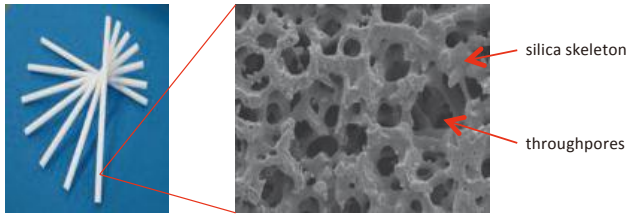
- **Base Material** : High Purity Monolithic Silica Gel
- **Through Pore Size** : 1 µm
- **Surface Area** : 340 m²/g
- **Pore Size** : 110 Å
- **Functional Group** : Octadecyl
- **End-capping** : Yes
- **Carbon Loading** : 18 %
- **Max. Operating Temperature** : 70 ℃
- **Max. Operating Pressure** : 40 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.

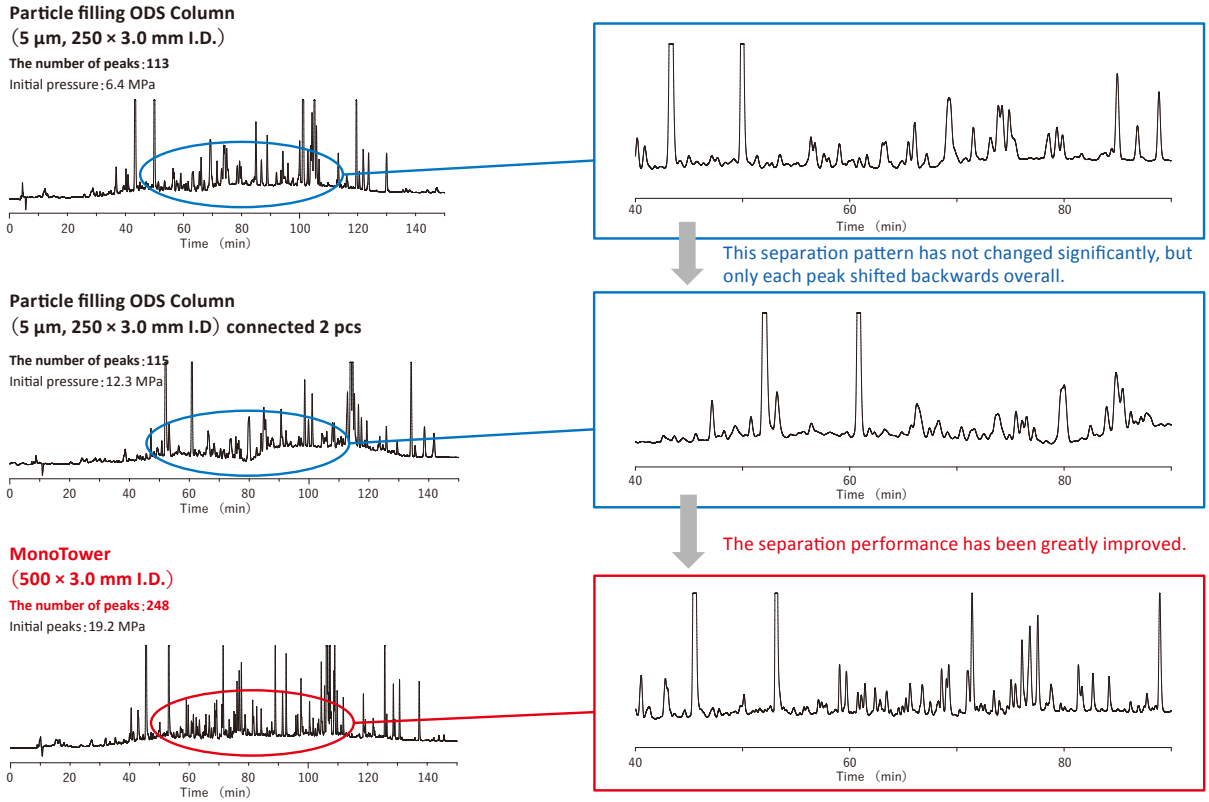
## Silica Monoliths

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.




## 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.



| 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 |

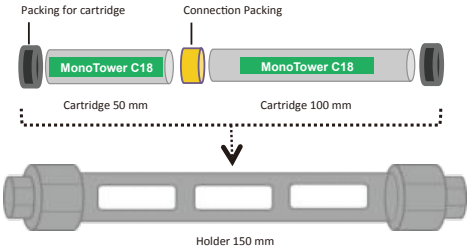
* The standard joint type is a Parker type (UP type).

## 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

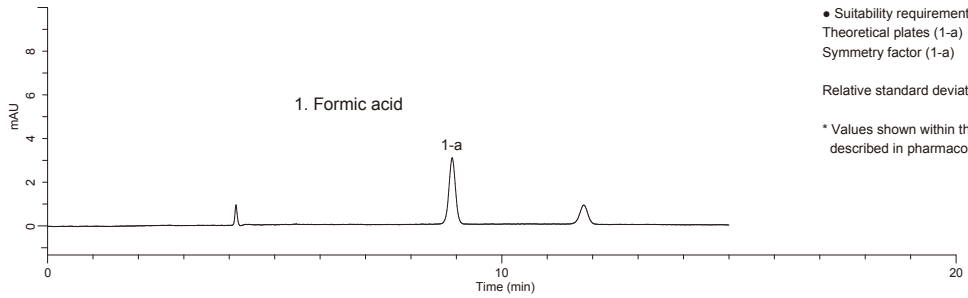
| Holder | Cartridge | |
|---|---|---|
| 150 mm → | 50 mm × 3 pcs | Impossible to connect |
| 500 mm → | 50 mm × 10 pcs | |

# 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

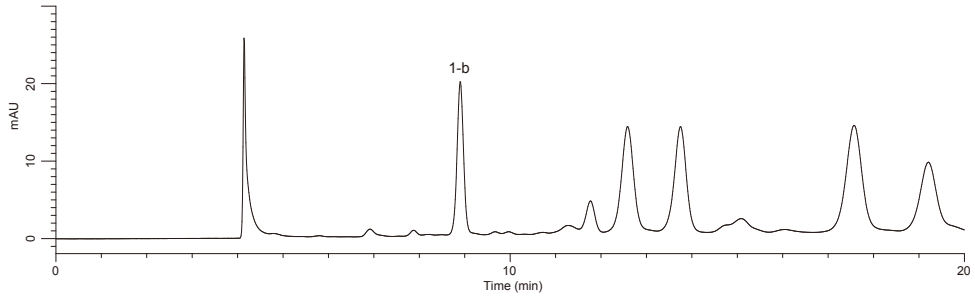



● Suitability requirements
Theoretical plates (1-a) : 17,902 (≧ 1,000)*
Symmetry factor (1-a) : (0.5 ≦)* 0.99(≦ 1.5)*

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

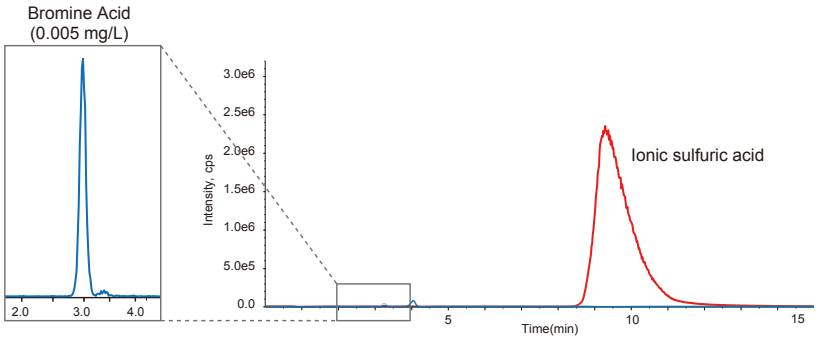


# SYPRON AX-1

- **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 |

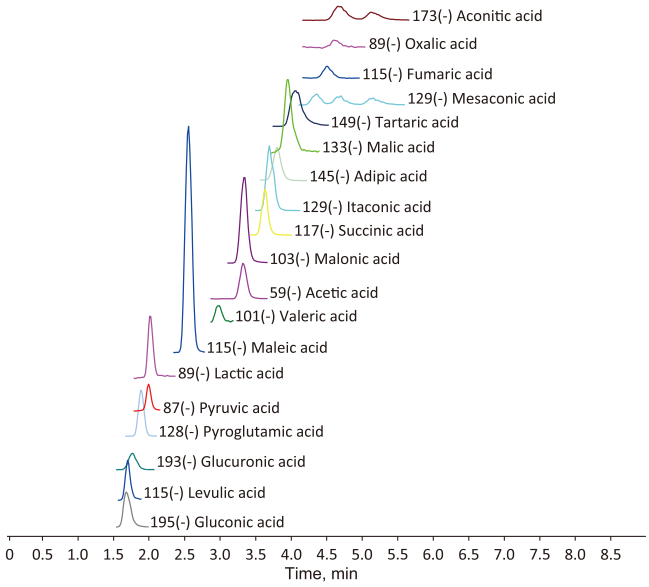
## Cartridge Guard Column E

| 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

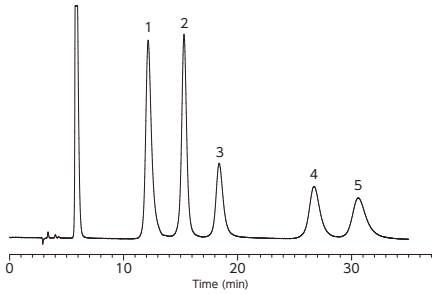
| Particle size | I.D. (mm) | Length (mm) | Material (Watted Part) | Cat. No. |
|---|---|---|---|---|
| 5 µm | 2.1 | 100 | PEEK | 5020-11006 |
| | | 150 | PEEK | 5020-11007 |

# 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

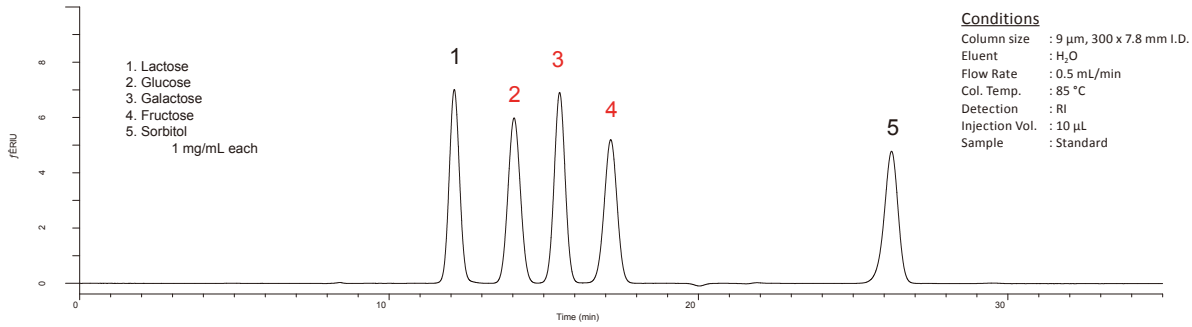
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Cat.No. | Cat.No. |
| 4.6 | 10 | 4.0 | 5020-19048 | 5020-19098 |

# 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**

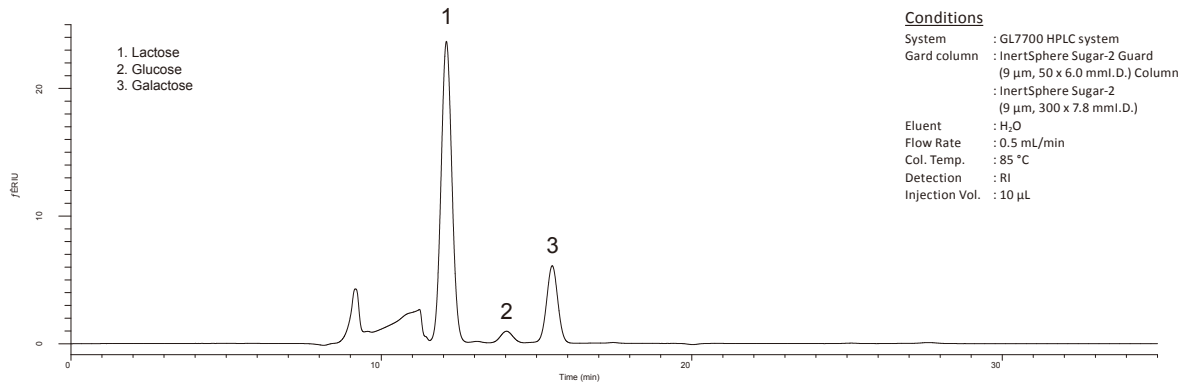
InertSpherer Sugar-2 is packed with $Ca^{2+}$-loaded resin for sugar analyses. This column is mainly used in SEC mode. The molecules are eluted in order of their molecular weights (large to small). In ligand-exchange mode, ion interactions between the metal ions and hydroxyl groups form a complex with 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 |

# Application Specific Columns

## 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).

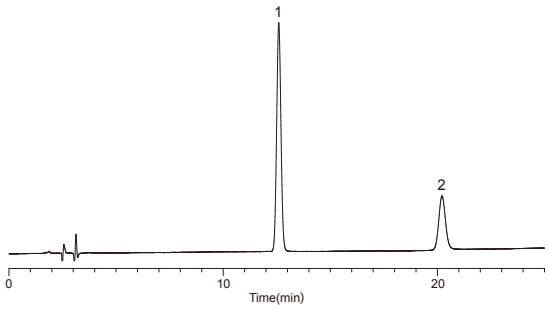
## 3 µm Particle Size HPLC Columns

| 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) $CH_3CN$ |
| | | B) $H_2O$ |
| | | 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 |

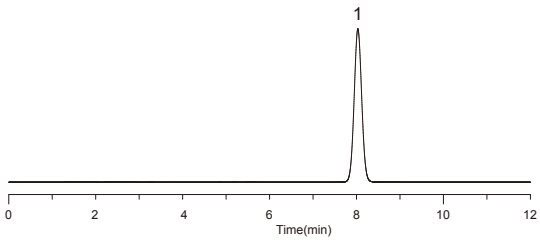
## 10 µm Particle Size HPLC Columns

| 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

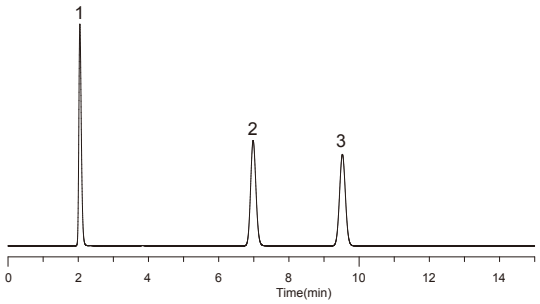



Conditions

| | | |
|---|---|---|
| Column | : | Inertsil WP300 C18 (4 µm, 150 × 3.9 mm I.D.) |
| Eluent | : | A) $CH_3CN$ |
| | | B) $CH_3OH$ |
| | | 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) $CH_3CN$ |
| | | 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

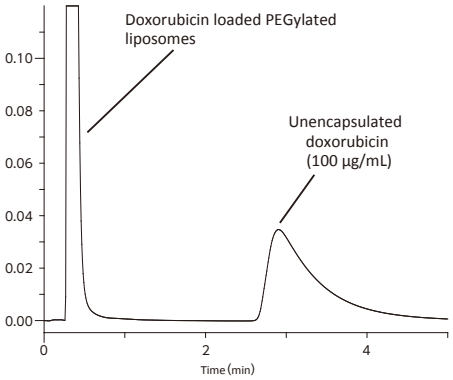
- **Base Material** : **Highly pure monolithic silica**
- **Through-pore size** : **1 µm**
- **Meso-pore size** : **110 Å (11 nm)**
- **Surface Area** : **340 m²/g**
- **Functional Group** : **Octadecyl**
- **Max. Operating Temperatur** : **50 ℃**
- **Max. Operating Pressure** : **40 MPa (400 bar)**
- **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)<br>B) $CH_3OH$<br>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**

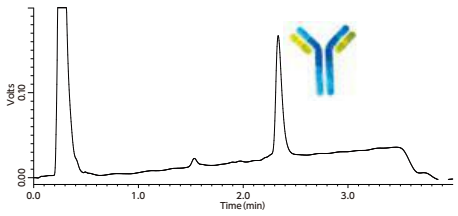
MonoSlect RP-mAb is a HPLC column Specialized for Monoclonal Antibody Analysis. Monolithic silica consists of co-continuous through- pores and skeletons which have mesopores. The large surface area and high permeability of this structure enables “strong retentivity and low pressure”. Broad peaks are 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

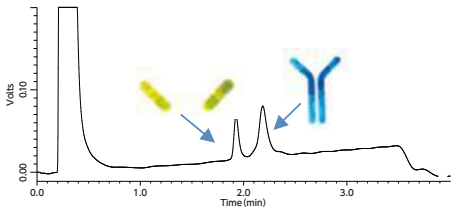



Reduction process

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)

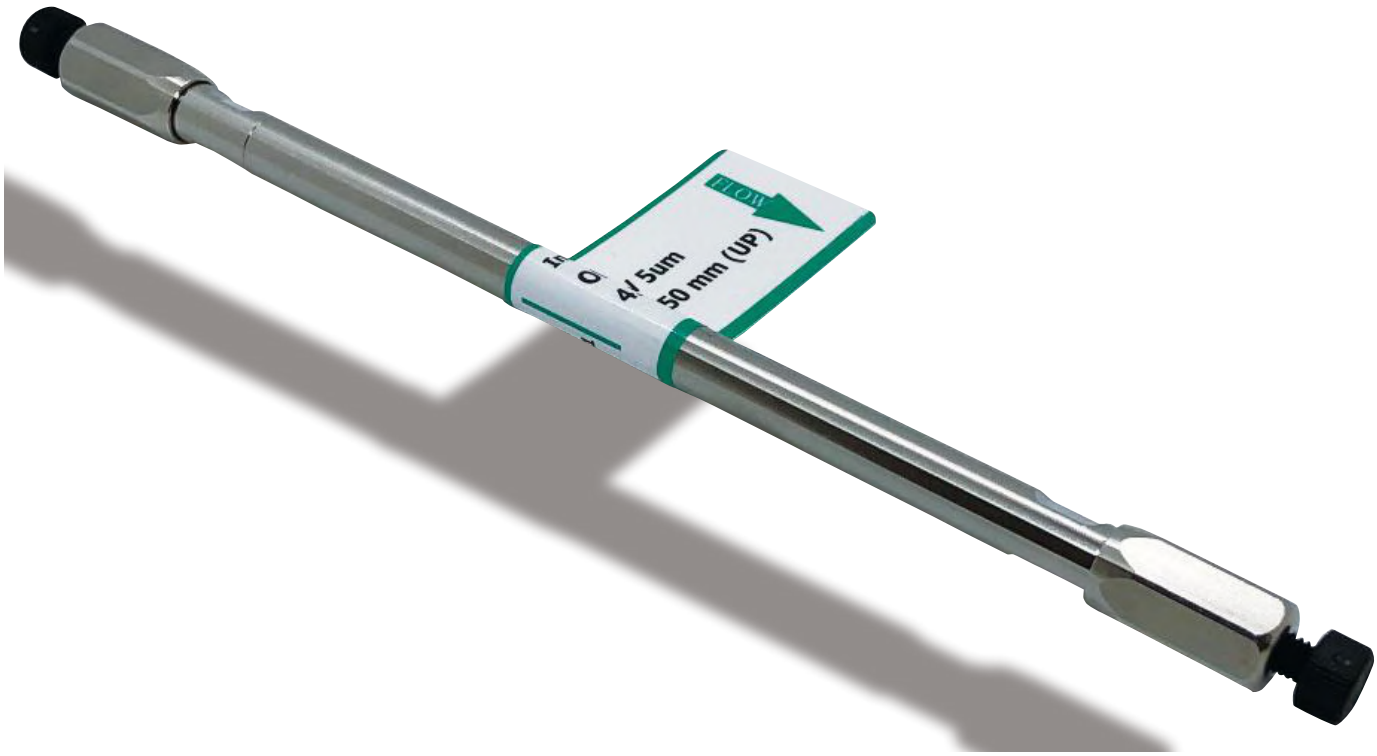
| Item | I.D. (mm) | Length(mm) | Cat.No. |
|---|---|---|---|
| MonoSelect RP-mAb Holder Set | 2.1 | 20 | 5020-10818 |

## 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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# 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**<br>First choice for Guard Column | 1.0 - 1.5 mm | 10 mm |
| | | 2.1 - 4.6 mm | 10, 20 mm |
| | **Cartridge Guard Column Ei**<br>Guard column with PEEK inlet and outlet | 1.0 - 3.0 mm | 10 mm |
| | **UHPLC Guard Column**<br>For high speed, high efficiency separations | 1.0 - 3.0 mm | 10 mm |
| | **SILFILTER STD C18**<br>Almightily for various ODS columns | 3.0 - 4.6 mm | 10 mm |
| | **GL-Cart Guard Column**<br>Direct-Connection and Indirect-Connection designs with economic cost | 4.0, 4.6 mm | 5 mm |
| Unchangeable packed design | **Packed Guard Column**<br>Packed as same as analytical column | 1.0 - 4.6 mm | 33, 50 mm |
| | **Packed Mini Guard Column**<br>Short length type of packed guard column | 4.0, 4.6 mm | 10 mm |
| | **Preparative Guard Column**<br>Guard columns for preparative columns | 6.0 - 100 mm | 50 mm<br>75 mm (for 50 mm I.D.)<br>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

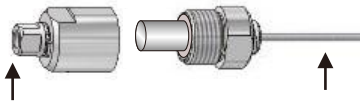
| Length (mm) | I.D. (mm) | Replacement Cartridge Guard Column (2 pcs) | Cartridge Guard Column (2 pcs) + Holder (1 pcs) set |
|---|---|---|---|
| | | Particle Size 1.9 µm | Particle Size 1.9 µm |
| 10 | 1.5 | 5020-88825 | 5020-88828 |
| | 2.1 | 5020-88826 | 5020-88829 |
| | 3.0 | 5020-88827 | 5020-88830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

## 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 | 5020-87919 | 5020-87918 |
| 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

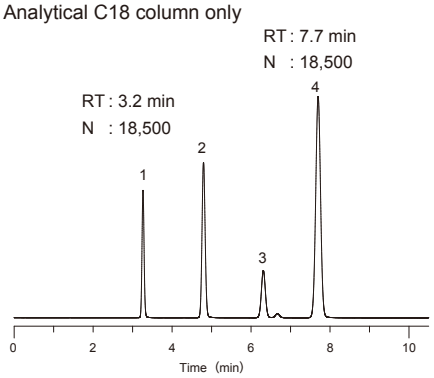
- **Specifications**

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

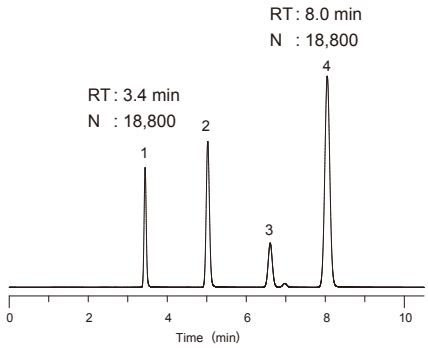
## There is no sacrifice in separation efficiency.

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

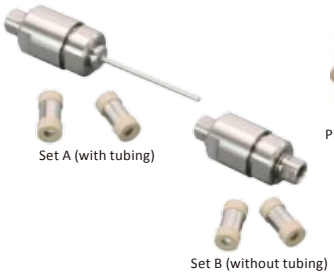



With SILFILTER STD C18




Conditions

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





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 |

# Filters, Impurity Remove Columns

## 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

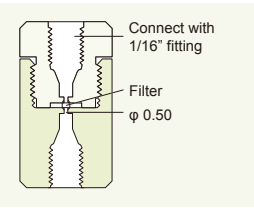
| Item | I.D. | Length | Material | Conection | Cat.No. |
|---|---|---|---|---|---|
| Pre-column Coupler UP | 0.18 mm | 29.2 mm | PCTFE | Paker type (UP type) | 6010-49200 |
| | 0.25 mm | | | | 6010-49201 |
| | 0.50 mm | | | | 6010-49202 |
| Pre-column Coupler W | 0.25 mm | 32 mm | PCTFE | Waters type | 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



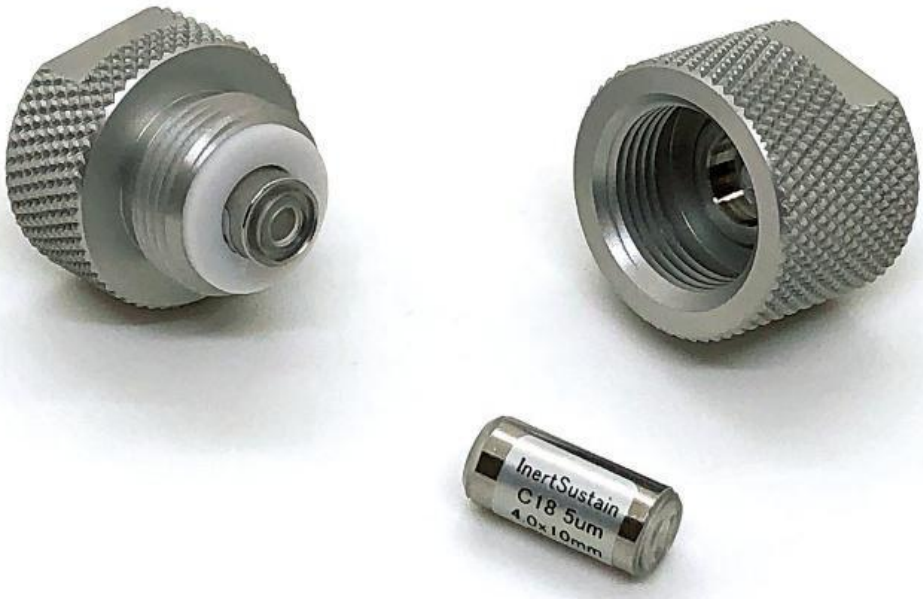
Pre-column filter




- **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

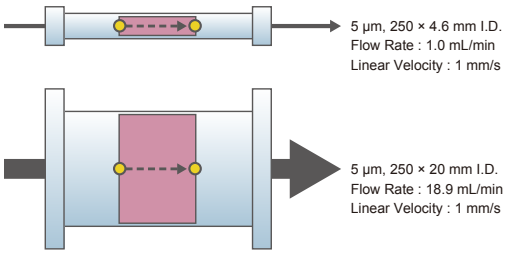
# Preparative Columns


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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.

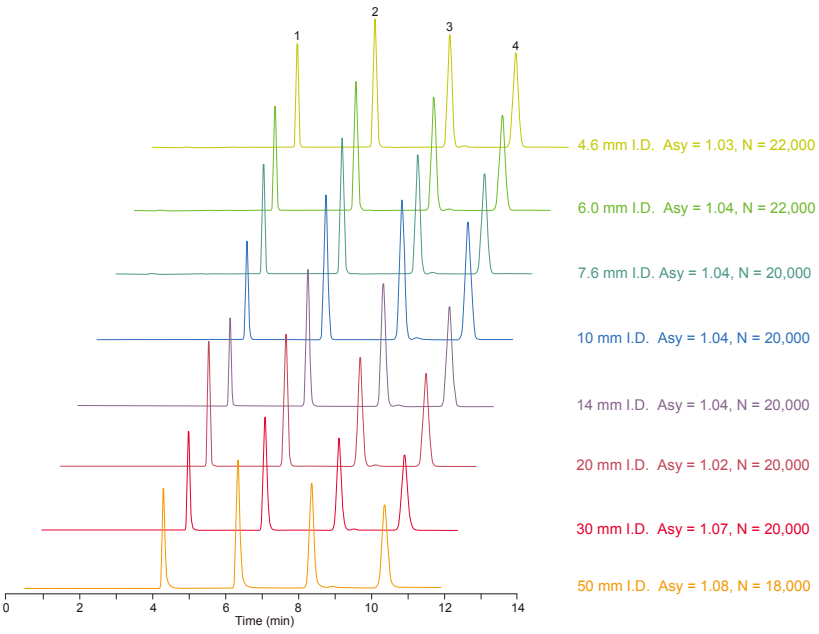



| Column I.D. (mm) | Scale-Up Factor | Appropriate Flow Rate (mL/min)*1 | | | | Remarks |
|---|---|---|---|---|---|---|
| | | Reversed/Normal Phases | SEC | HILIC | Chiral | |
| 4.6 | 1 | 1 | 0.2 - 0.3 | 0.5 | 1 | Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns. |
| 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.

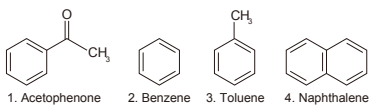
## Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

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



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<br>Particle Size | Length (mm) | 50 | 100 | 150 | 250 |
|---|---|---|---|---|---|
| | I.D. (mm) | Cat.No. | Cat.No. | Cat.No. | Cat.No. |
| InertSustain C18<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>Particle Size | Length (mm)<br>I.D. (mm) | 50<br>Cat.No. | 100<br>Cat.No. | 150<br>Cat.No. | 250<br>Cat.No. |
|---|---|---|---|---|---|
| Inertsil ODS-SP<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>Particle Size | Length (mm)<br>I.D. (mm) | 50<br>Cat.No. | 100<br>Cat.No. | 150<br>Cat.No. | 250<br>Cat.No. |
|---|---|---|---|---|---|
| Inertsil C8-3<br>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<br>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<br>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<br>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<br>Phenylhexyl<br>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<br>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<br>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<br>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<br>Particle Size | Length (mm)<br>I.D. (mm) | 50<br>Cat.No. | 100<br>Cat.No. | 150<br>Cat.No. | 250<br>Cat.No. |
|---|---|---|---|---|---|
| Inertsil CN-3<br>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<br>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<br>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<br>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<br>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<br>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<br>Particle Size | Length (mm)<br>I.D. (mm) | 50<br>Cat.No. | 100<br>Cat.No. | 150<br>Cat.No. | 250<br>Cat.No. |
|---|---|---|---|---|---|
| InertSustain NH2<br>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<br>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<br>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<br>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<br>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<br>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<br>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
20x250mm

# Capillary Columns


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# 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.

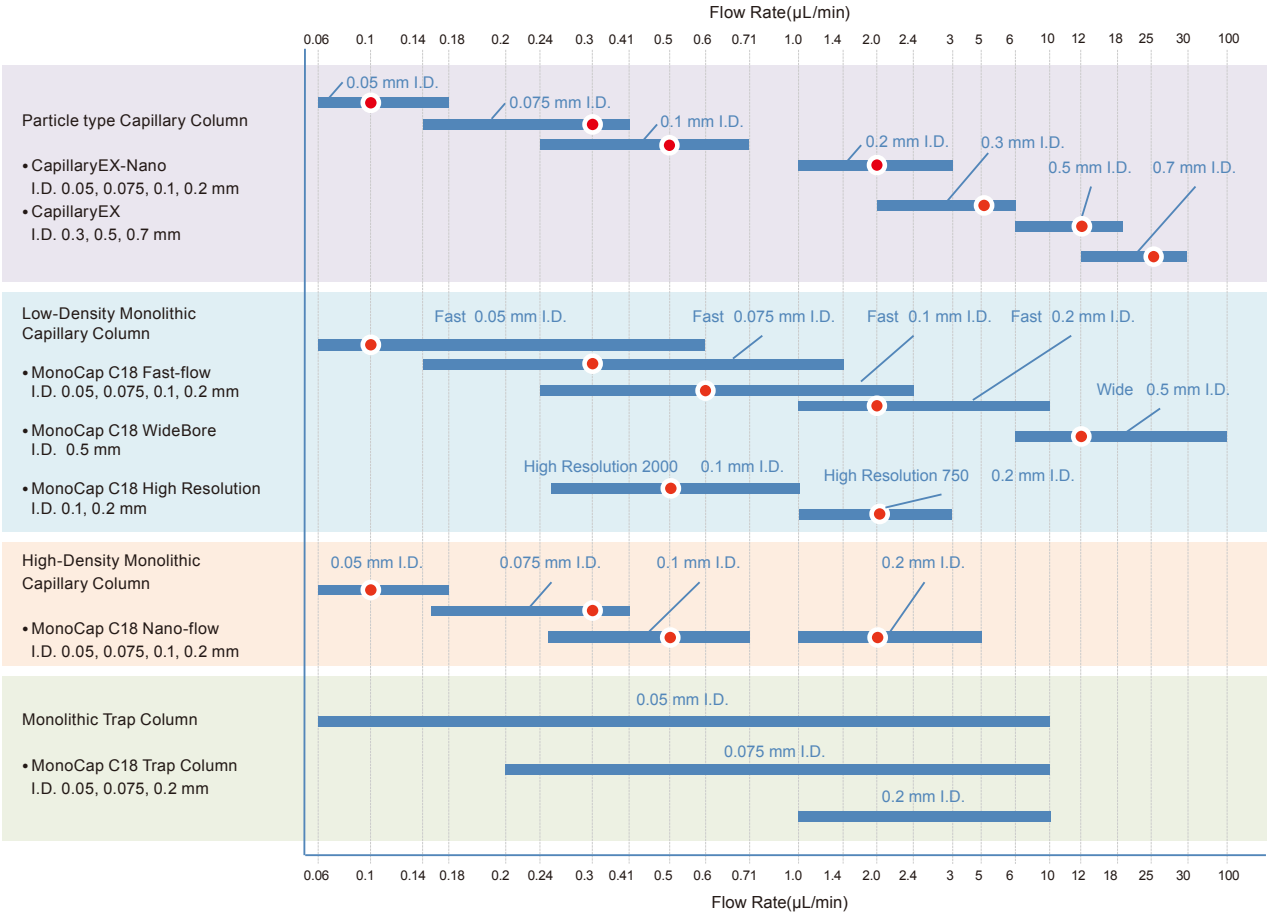
MonoCap Trap columns are also available for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

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).



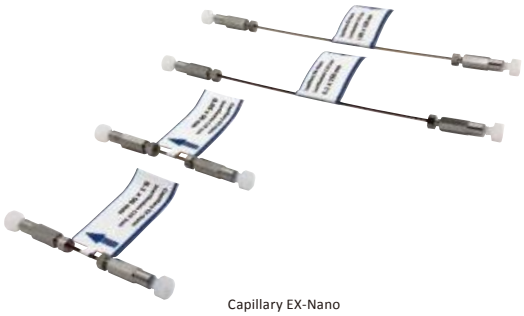
MonoCap High Resolution 2000

## 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 Cat.No. | Length 150 mm 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 Cat.No. | Length 150 mm 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 |

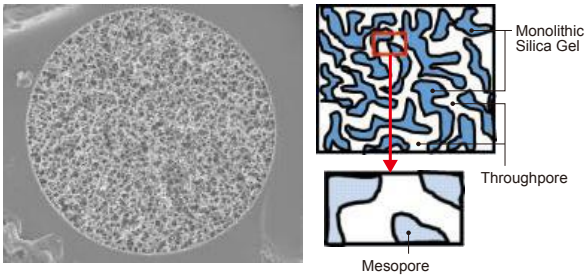
# Particle Type Capillary HPLC Columns

| Phase | I.D. (mm) | Particle Size (μm) | Length 50 mm Cat.No. | Length 150 mm 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

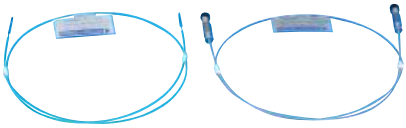
→

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



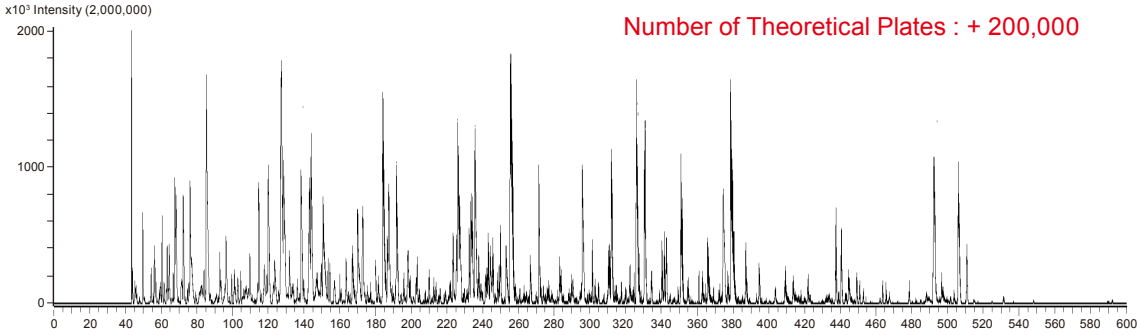
MonoCap High Resolution 2000




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 |

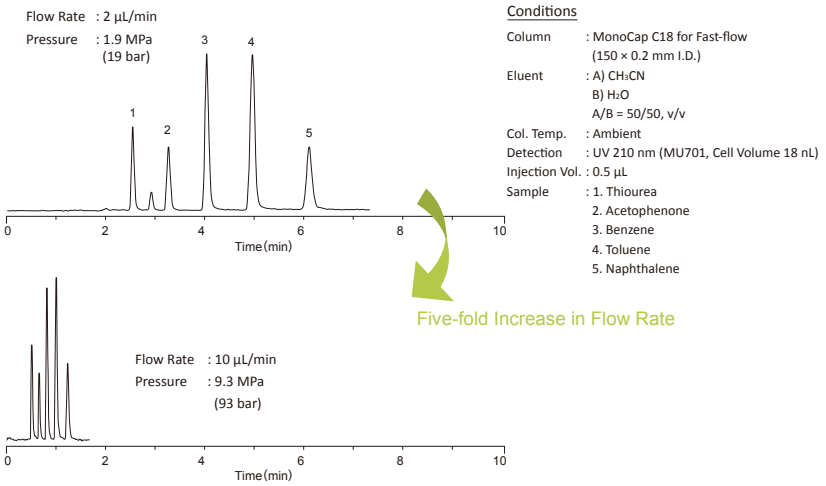
### MonoCap C18 High Resolution 750

| 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

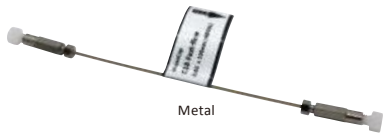
## MonoCap C18 Fast-flow

### Figure 1 : Workable at High Flow Rates without Sacrificing Efficiency



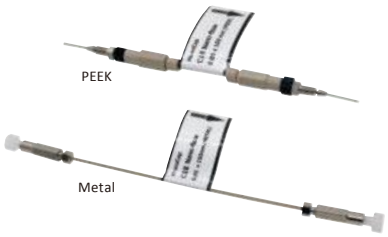

Workable over a broad range of linear velocities (0.5 to 5 mm/s) with no efficiency and separation losses at high speeds. The number of theoretical plates in MonoCap C18 Fastflow nearly equals that in a porous particle-type capillary column packed with a 5-µm-sized packing material. Columns are protected 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 |

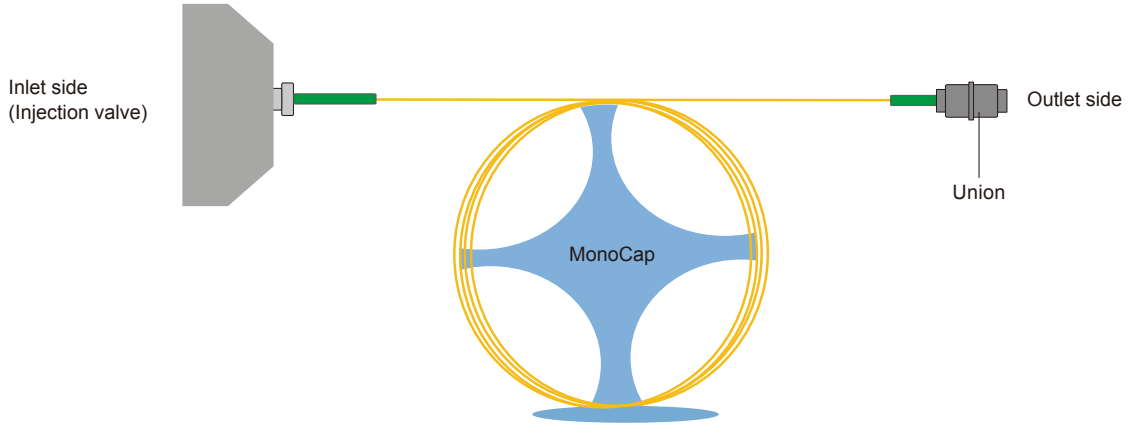
# How to Connect MonoCap Columns

## 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).

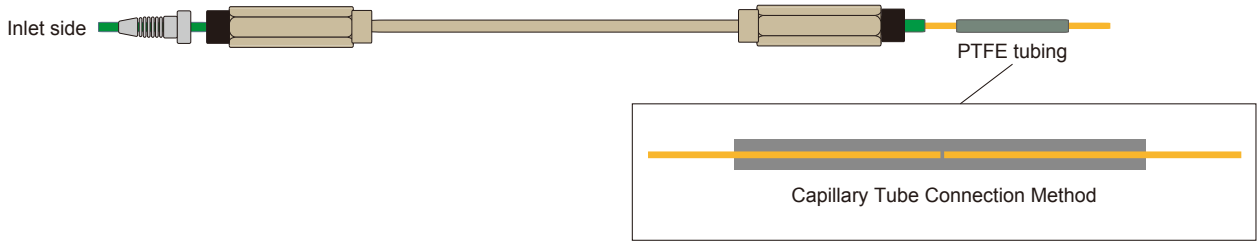
**<Example 1>**

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<br>MonoCap (Metal columns)<br>Capillary EX-Nano, Capillary -EX | Nut ZN1-10 : 6 pcs<br>Ferrule ZF1PK-10 : 6 pcs<br>Sleeve F-230 (color : grey 40 mm) 6 pcs | 5020-10380 |

### For 1/32 inch

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

| Description | Content | Cat.No. |
|---|---|---|
| Connection Kit for<br>MonoCap C18 High<br>Resolution 2000 | 1/16 inch PEEK Ferrule, SUS Nut, Sleeve 2 pcs each<br>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.<br>(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<br>(Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each) | 5020-10044 |
| MonoCap C18 Trap Column Connection Kit 1/32 inch<br>(Union·Sleeve·Capillary Tubing 2 pcs each Nut·Ferrule 4 pcs each) | 5020-10045 |
| MonoCap C18 Trap Column Assembly Parts 1/16 inch<br>(Nut·Ferrule 4 pcs each) | 5020-10046 |
| MonoCap C18 Trap Column Assembly Parts 1/32 inch<br>(Nut·Ferrule 4 pcs each) | 5020-10047 |

## Union



U-411



P-779

- **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



UH-432

- **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



UH-436

- **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<br>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<br>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<br>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 |

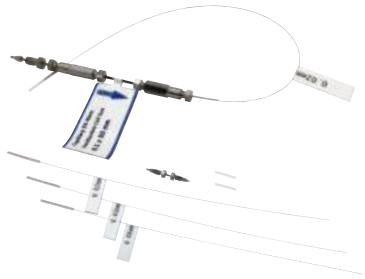
## Connection Kits for Capillary EX • EX-Nano Columns



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<br>·40 × 0.1 mm I.D. 1/16 inch O.D.Tubing<br>(Both ends with male nuts including PEEK ferrules) | 5020-01880 |
| ·Capillary Tubing Connector<br>·500 × 0.075 mm I.D. 0.375 mm O.D. Tubing<br>(Male nut, PEEK ferrule, 1/16 inch O.D. PTFE with sleeve) | |
| ·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D.<br>(O.D. 0.375 mm Connection for Capillary Tubing) | |

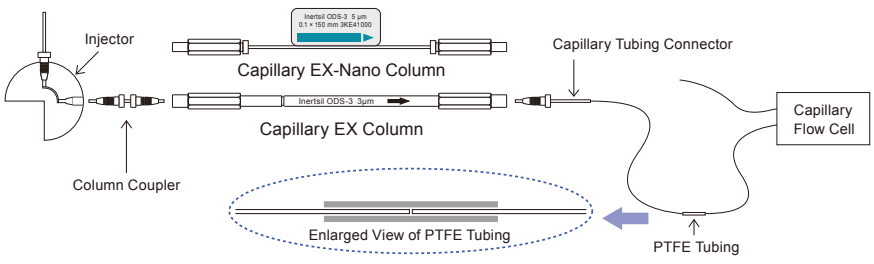


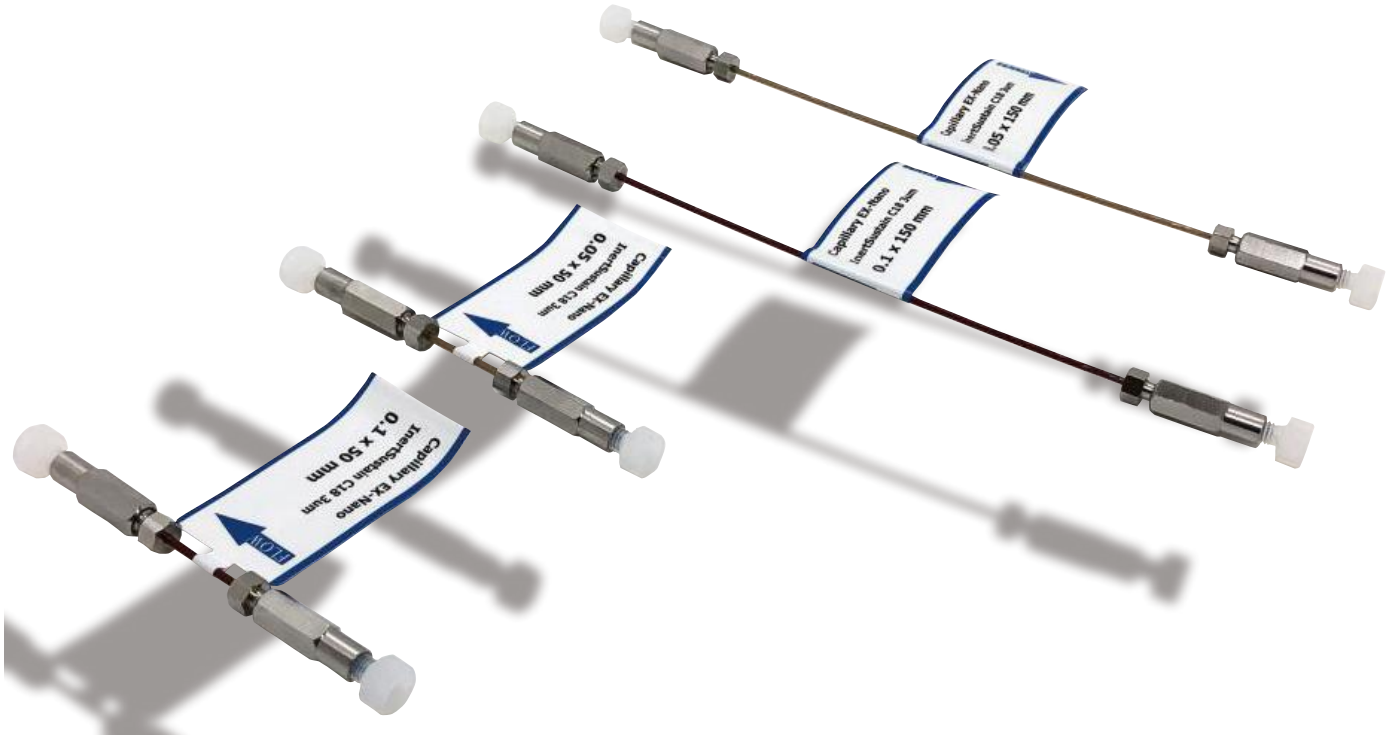
Connection Kit for Capillary EX-Nano Columns
(Top Image: Installed view, Bottom Image: Contents of Kit)

### 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<br>·40 × 0.05 mm I.D. 1/16 inch O.D. Tubing<br>(Both ends with male nuts including PEEK ferrules) | 5020-01881 |
| ·Capillary Tubing Connector<br>·300 × 0.05 mm I.D. 0.375 mm O.D. Tubing<br>·300 × 0.03 mm I.D. 0.375 mm O.D. Tubing<br>·300 × 0.02 mm I.D. 0.375 mm O.D. Tubing<br>(Male nut, PEEK ferrule, 1/16 inch O.D. PTFE with sleeve) | |
| ·PTFE Tubing 20 mm 2 pcs 1/16 inch O.D.<br>(O.D. 0.375 mm Connection for Capillary Tubing) | |

### How To Connect




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

# Applications

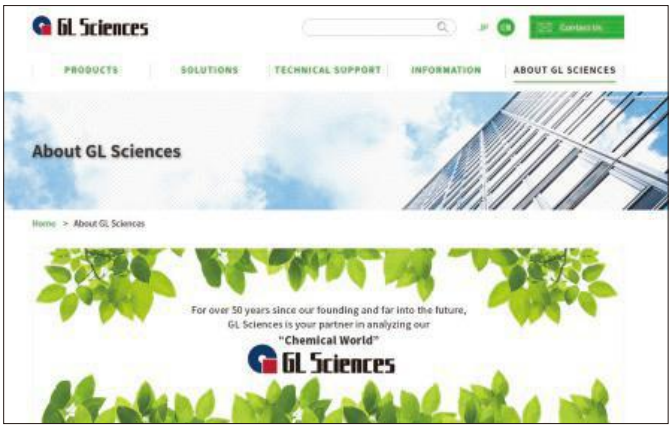

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# Applications

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## InertSearch

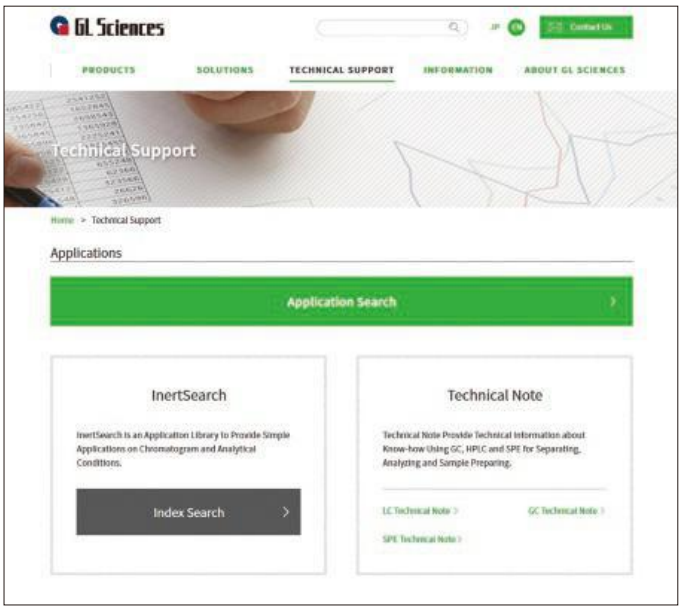
https://www.glsciences.com/technique/app/inert_search.html

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

## Technical Note

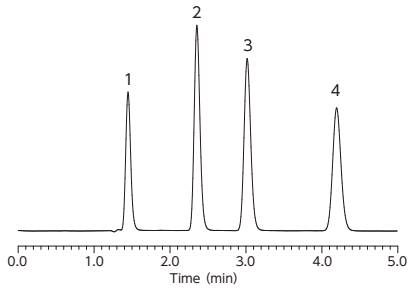
https://www.glsciences.com/technique/app/lc_technical_note.html

"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)

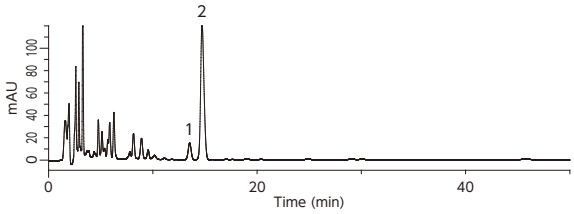



Conditions

| | |
|---|---|
| Column | : Inertsil ODS-4(5μm, 150 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) 50 mM $KH_2PO_4$ im $H_2O$<br>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)



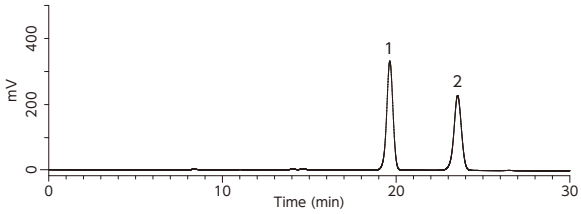

Conditions

| | |
|---|---|
| Column | : Inertsil ODS-4<br>(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)

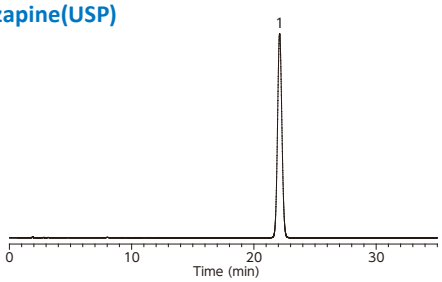



Conditions

| | |
|---|---|
| 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)



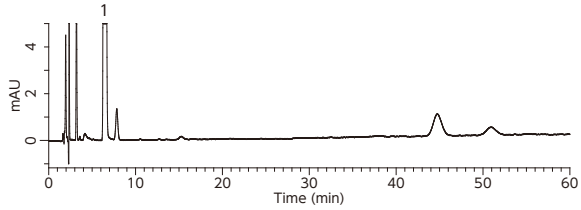

Conditions

| | |
|---|---|
| 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

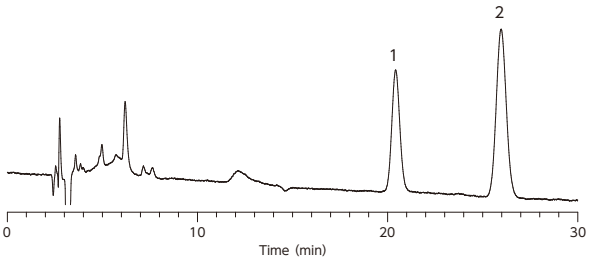



Conditions

| | |
|---|---|
| Column | : InertSustain Cyano<br>(5 μm, 150 x 4.6 mm I.D.) |
| Eluent | : A) Buffer* B) $CH_3CN$<br>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

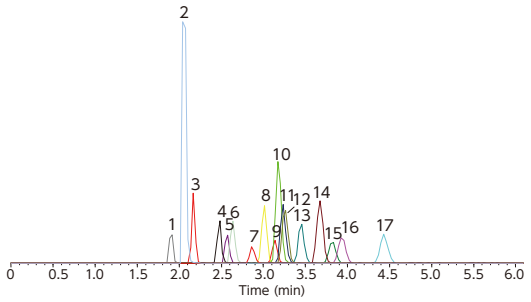
| | |
|---|---|
| Column | : InertSustain AQ-C18 (5 μm, 250 × 6.0 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) Phosphate Buffer (pH = 2.5)<br>A/B = 40/60, v/v |
| Flow Rate | : 1.4 mL/min |
| Col.Temp. | : 25 ˚C |
| Detection | : UV 220 nm |
| Injection Vol. | : 20 μL |
| Data Source | : LC Technical Note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

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

# Applications

## Pharmaceuticals

### Analysis of 17 Anti-depressant Drugs



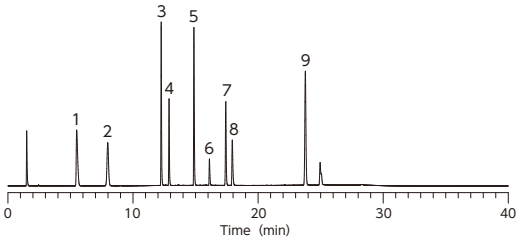

**Conditions**

| | |
|---|---|
| Column | : InertSustain C18 HP (3 μm,150 × 2.1 mm I.D.) |
| Eluent | : A) 0.1 % HCOOH in $CH_3CN$<br>B) 0.1 % HCOOH in $H_2O$<br>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
2. Milnacipran
3. Trazodone
4. Mianserin
5. Amoxapine
6. Doxepin
7. Paroxetine
8. Desipramine
9. Fluvoxamine
10. Imipramine
11. Nortriptyline
12. Maprotiline
13. Amitriptyline
14. Trimipramine
15. Fluoxetine
16. Sertraline
17. Clomipramine

(100 ng/mL each)

### Analysis of 9 Drugs

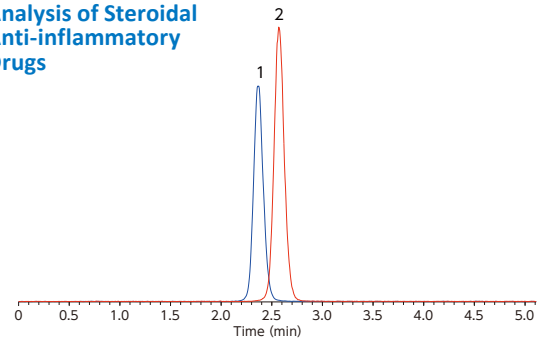



**Conditions**

| | |
|---|---|
| Column | : InertSustain C18 (3 μm, 150 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN$<br>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

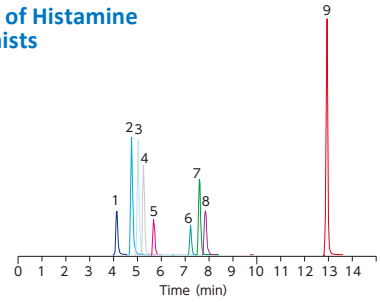



**Conditions**

| | |
|---|---|
| Column | : InertSustain Phenyl (2 μm, 50 × 2.1 mm I.D.) |
| Eluent | : A) $CH_3OH$/HCOOH = 100/0.05, v/v<br>B) $H_2O$/HCOOH = 100/0.05, v/v<br>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

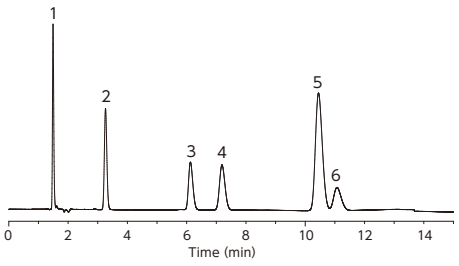



**Conditions**

| | |
|---|---|
| Column | : Inertsil ODS-4 (3 μm, 150 × 2.1 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) 2 mM $CH_3COONH_4$<br>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
2. Cinnarizin
3. Clemastine
4. Difenidol
5. Diphenhydramine
6. Diphenylpyraline
7. Hydroxyzine
8. Promethazine
9. Triprolidine (0.1 mg/L each)

### Analysis of β-blocker

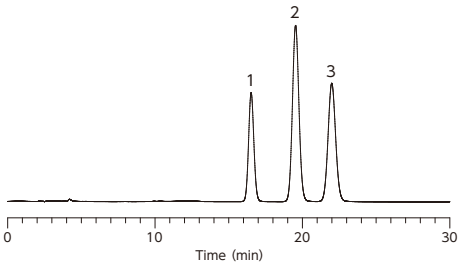



**Conditions**

| | |
|---|---|
| Column | : InertSustain AQ-C18 (5 μm, 150 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN$ B) 0.1 % $H_3PO_4$ in $H_2O$<br>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



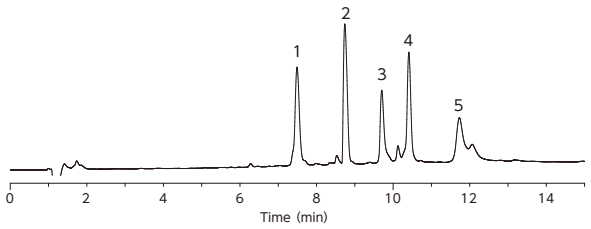

**Conditions**

| | |
|---|---|
| Column | : InertSustain Phenylhexyl(5 μm, 150 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) 25 mM $KH_2PO_4$ in $H_2O$(pH = 3.0, $H_3PO_4$)<br>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

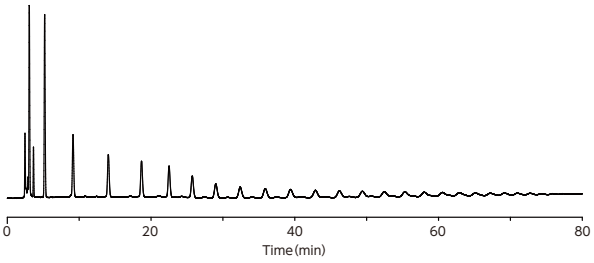



Conditions

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

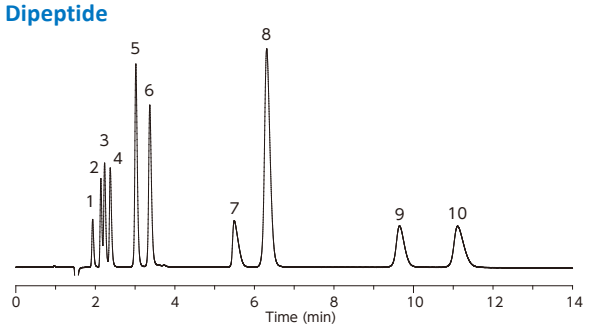



Conditions

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

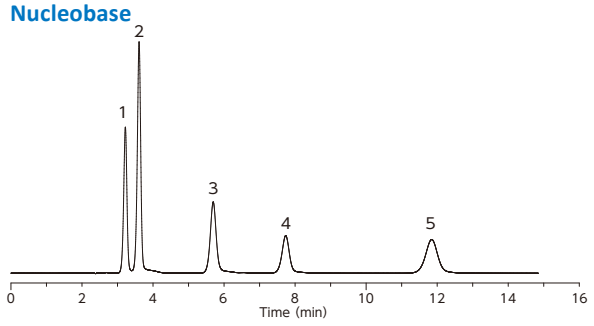



Conditions

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

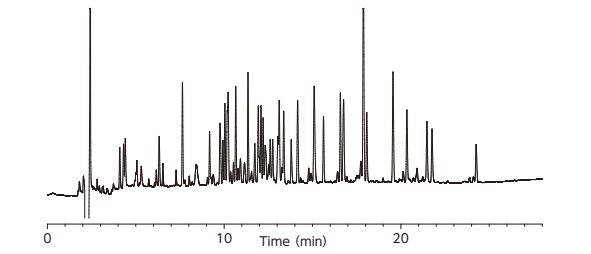



Conditions

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

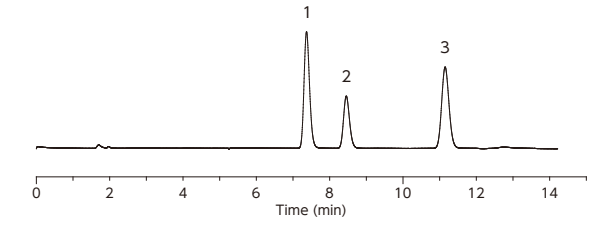



Conditions

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

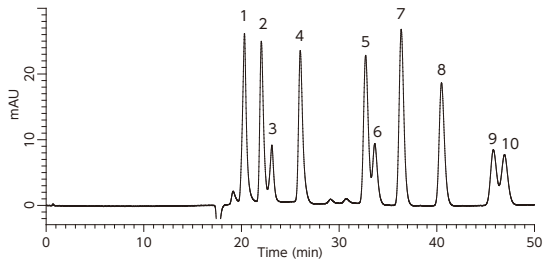
Column : Inertsil ODS-4
(5 μm, 250 × 3.0 mm I.D.)
Eluent : A) Acetate-citrate buffer B) $CH_3CN$
A/B = 100/16, v/v
Flow Rate : 0.5 mL/min
Col.Temp. : 35 °C
Detection : ECD (ED743, Diamond)
Injection Vol. : 20 μL

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

# Applications

## Foods

### Organic Acid



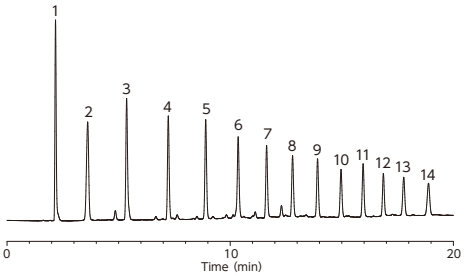

Conditions

| | |
|---|---|
| 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



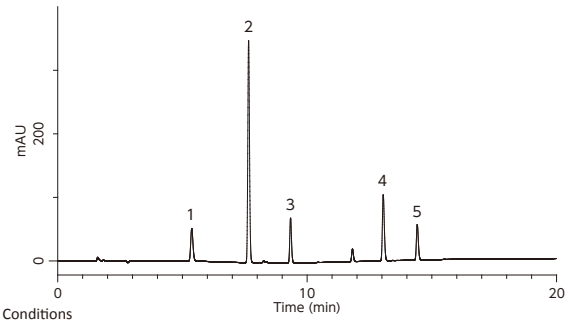

Conditions

| | |
|---|---|
| Column | : InertSustain C18 (5 μm, 150 × 4.6 mm I.D) |
| Eluent | : A) 0.1 % $H_3PO_4$ in $CH_3CN$<br>B) 0.1 % $H_3PO_4$ in $H_2O$<br>A/B = 10/90 -15 min<br>- 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



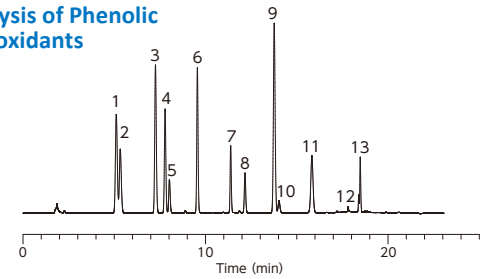

Conditions

| | |
|---|---|
| Column | : InertSustain AQ-C18(5 μm, 150 x 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN$<br>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

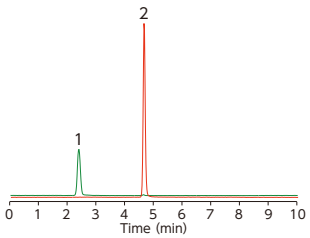



Conditions

| | |
|---|---|
| Column | : InertSustainSwift C18 HP (3 μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN/CH_3OH$ = 1/1, v/v<br>B) 5 % $CH_3COOH$ in $H_2O$<br>A/B = 30/70 - 2 min - 30/70 - 8 min<br>- 58/42 - 13 min - 58/42 - 15 min<br>- 100/0 - 18 min - 100/0 - 18.1 min<br>- 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

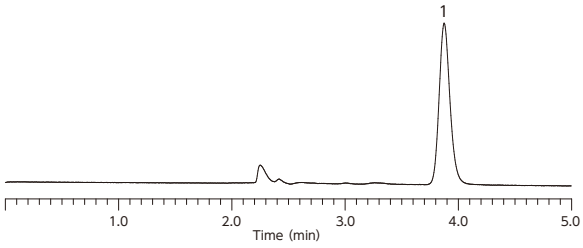



Conditions

| | |
|---|---|
| Column | : Inertsil HILIC (5 μm, 150 × 3.0 mm I.D.) |
| Eluent | : A) $CH_3CN$<br>B) 10 mM $CH_3COONH_4$ in $H_2O$<br>A/B = 90/10 - 0.5 min - 90/10<br>- 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



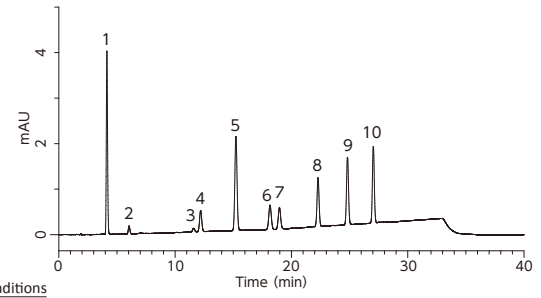

Conditions

| | |
|---|---|
| Column | : InertSustain Amide (5μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN$<br>B) 30 mM $Na_2HPO_4$ in $H_2O$ (pH 6.8)<br>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

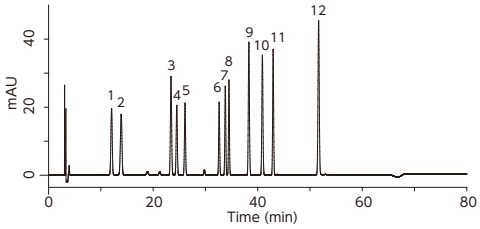
## Catechin in Tea




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 | 2. Gallocatechin(GC) |
| | B) 0.1 % $H_3PO_4$ in $H_2O$ (pH 2.1) | 3. Epigallocatechin(EGC) |
| | A/B = 10/90 - 15 min - 20/80 - 30 min | 4. Catechin(C) |
| | - 40/60 - 30.1 min - 10/90 - 40 min | 5. Caffeine |
| | - 10/90, v/v | 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 Soybean

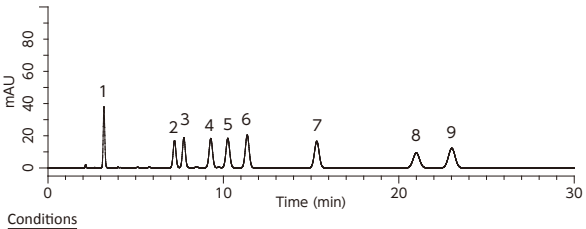



Conditions

| | |
|---|---|
| Column | : InertSustainSwift C18 (5 μm, 250 x 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN/H_2O/CH_3COOH$ = 150/850/1, v/v/v<br>B) $CH_3CN/H_2O/CH_3COOH$ = 350/650/1, v/v/v |
| Flow Rate | : 1.0 mL/min |
| Col.Temp. | : 35 °C |
| Detection | : PDA 254 nm (PD7752 PDA Detector) |
| Injection Vol. | : 10 μL |

Sample :
1. Daidzin (D)
2. Glycitin (GI)
3. Genistin (G)
4. 6''-O-Malonyldaidzin (MD)
5. 6''-O- Malonylglycitin (MGl)
6. 6''-O- Acetyldaidzin (AD)
7. 6''-O- Malonylgenistin (MG)
8. 6''-O- Acetylglycitin (AGl)
9. Daizein (De)
10. Glycitein (Gle)
11. 6''-O- Acetylgenistin (AG)
12. Genistein (Ge)
(10 mg/L each)

## Steviol glycoside

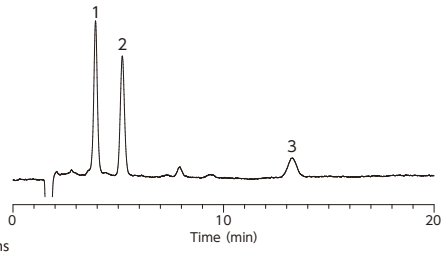



Conditions

| | | |
|---|---|---|
| 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



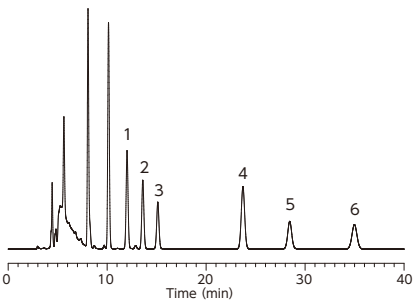

Conditions

| | |
|---|---|
| Column | : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.) |
| 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 |

Sample :
1. Oxytetracycline
2. Tetracycline
3. Chlortetracycline
(1 mg/L each)

* 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

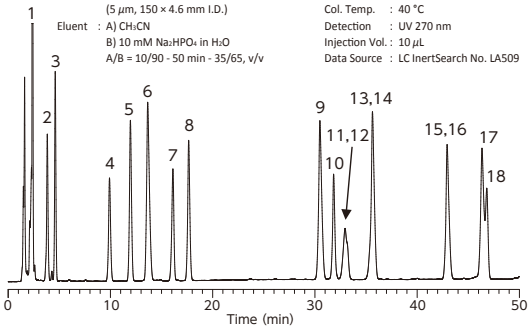
| | |
|---|---|
| Column | : Inertsil ODS-SP (5 μm, 250 × 4.6 mm I.D.) |
| Guard Column | : Inertsil ODS-SP (5 μm, 10 × 4.0 mm I.D.) |
| Eluent | : A) $CH_3CN$ B) $H_2O$ A/B= 65/35, v/v |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : FL Ex 325 nm Em 525 nm |
| Injection | : 10 μL |
| Data Source | : LC Technical Note No. 48 |

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)

## Analysis of Food Dyes

Conditions

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

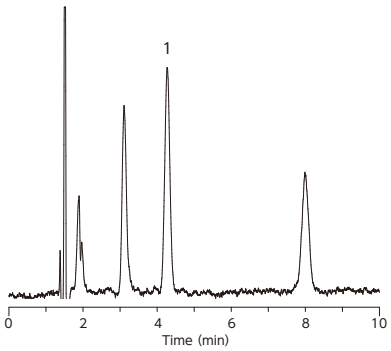



Sample :
1. Tartrazine (Food Yellow No. 4, 7.6 mg/L)
2. Amaranth (Food Red No. 2, 3.8 mg/L)
3. Ingigocarmine (Food Blue No. 2, 7.6 mg/L)
4. New coccine (Food Red No. 102, 3.8 mg/L)
5. Sunset Yellow FCF (Food Yellow No. 5, 5.3 mg/L)
6. Naphthol Yellow S (7.6 mg/L)
7. Uranine (3.8 mg/L)
8. Allura red AC (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)

# Applications

## Environment

### Analysis of Non-ionic Surfactant

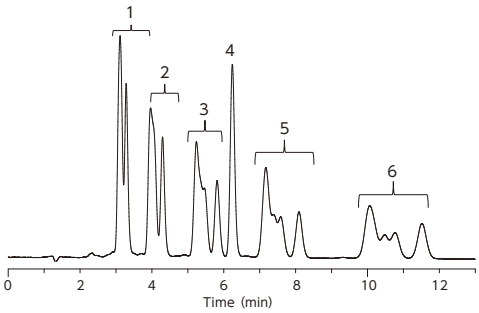



Conditions

| | |
|---|---|
| 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

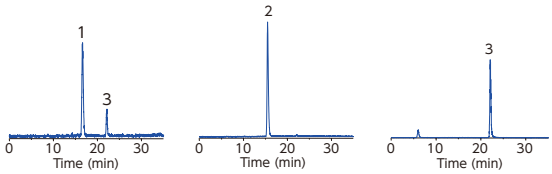



Conditions

| | |
|---|---|
| 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

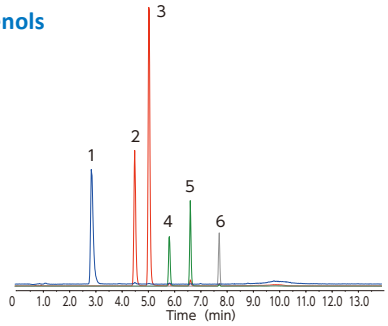



Conditions

| | |
|---|---|
| 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

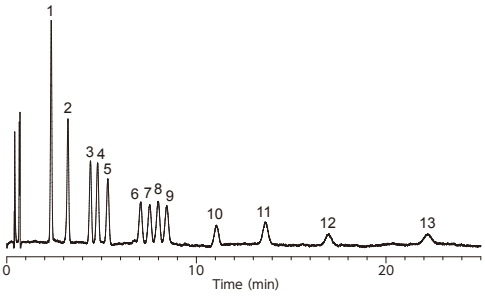



Conditions

| | |
|---|---|
| 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

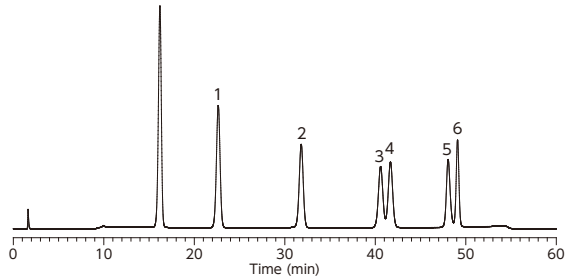



Conditions

| | |
|---|---|
| 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

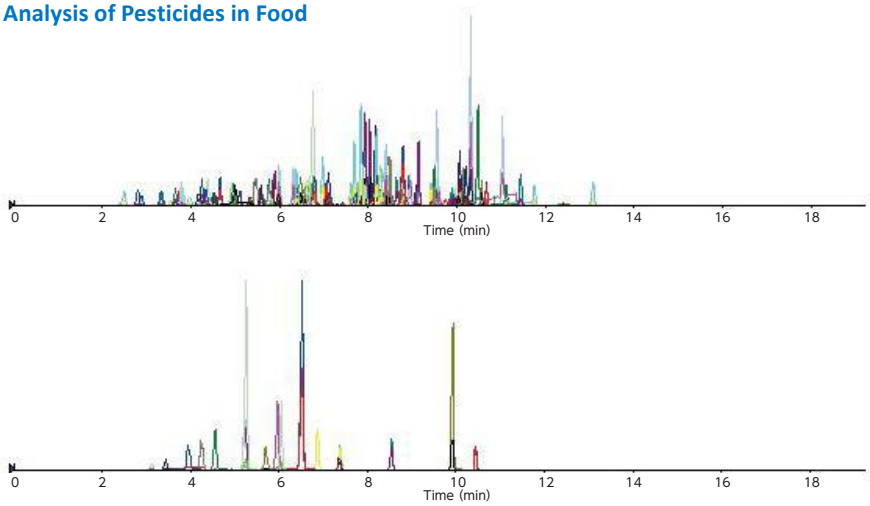
| | |
|---|---|
| Column | : InertSustain PFP (5 μm, 250 x 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH/CH_3CN$=9/1, v/v B) $H_2O$ A/B = 40/60 – 40 min – 53/47 – 10 min – 70/30 – 0.1 min – 40/60, v/v |
| Flow Rate | : 1.0 mL/min |
| Col.Temp. | : 40 °C |
| Detection | : UV 360 nm (UV7750 UV Detector) |
| Injection 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

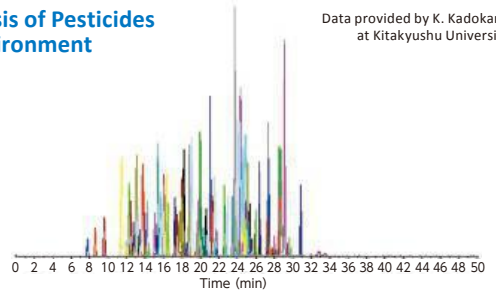



Conditions

| | |
|---|---|
| Column | : InertSustain C18 (2 μm, 100 × 2.1 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) 2 mM $CH_3COONH_4$ in $H_2O$<br>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

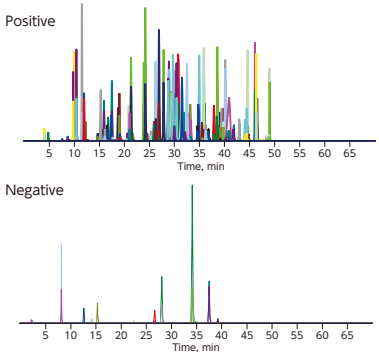
Data provided by K. Kadokami at Kitakyushu University




Conditions

| | |
|---|---|
| Column | : Inertsil ODS-4 HP (3 μm, 150 × 2.1 mm I.D.) |
| Eluent | : A) 5 mM $CH_3COONH_4$ in $CH_3OH$<br>B) 5 mM $CH_3COONH_4$ in $H_2O$<br>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 |

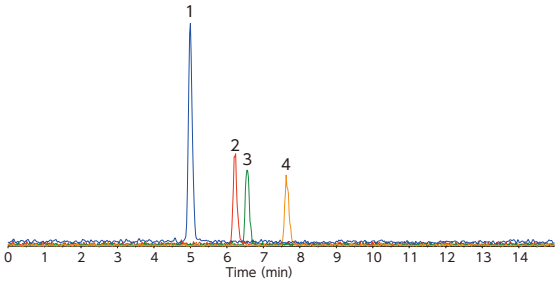
## Analysis of Pesticides in Water




Conditions

| | |
|---|---|
| Column | : InertSustain C18 HP (3 μm, 150 × 2.1mm I.D) |
| Eluent | : A)5mmol/L $CH_3COONH_4$ in $H_2O$<br>B)5mmol/L $CH_3COONH_4$ in $CH_3OH$<br>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

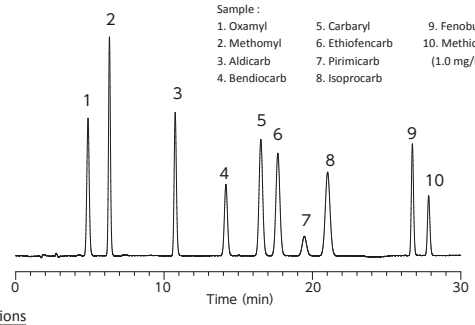



Conditions

| | |
|---|---|
| Column | : InertSustain Phenyl (3 μm, 150 × 2.1 mm I.D) |
| Eluent | : A) 0.1 % HCOOH in $CH_3CN$<br>B) 0.1 % HCOOH in $H_2O$<br>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)

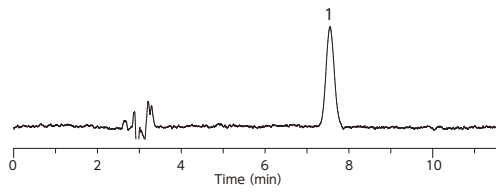
Conditions

| | |
|---|---|
| Column | : InertSustain C18 (5 μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$ B) $H_2O$<br>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 |

# Applications

## Vitamins

### Vitamin A

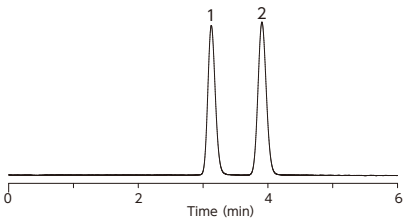



Conditions

| | |
|---|---|
| Column | : Inertsil ODS-3 (5 μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) $H_2O$<br>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

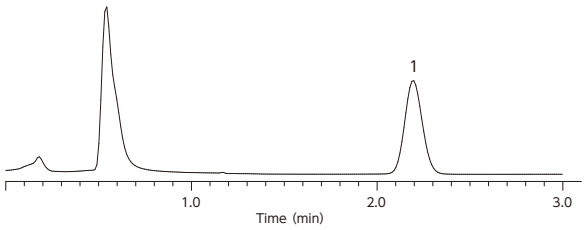



Conditions

| | |
|---|---|
| Column | : Inertsil ODS-3 (5 mm, 150 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$<br>B) 0.01 M $NaH_2PO_4$,<br>0.15 M $NaClO_4$ in $H_2O$ (pH 2.2)<br>A/B = 1/9, v/v |
| Reaction Reagent | : 0.05 w/v % potassium ferricyanide<br>+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

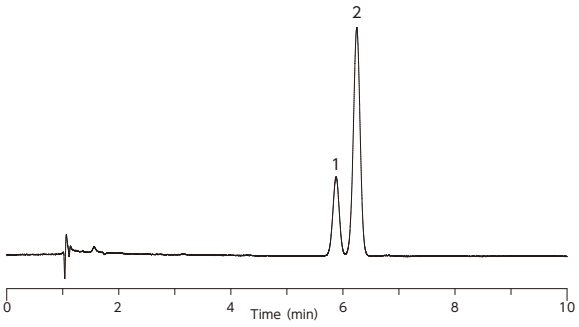



Conditions

| | |
|---|---|
| Column | : InertSustain Amide (5 μm, 150 × 3.0 mm I.D) |
| Eluent | : A) $CH_3CN$<br>B) 0.1 % $H_3PO_4$ in $H_2O$<br>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

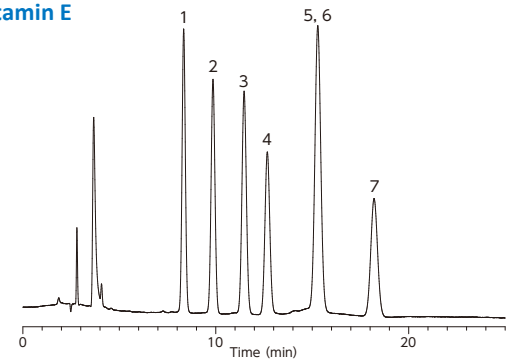



Conditions

| | |
|---|---|
| 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

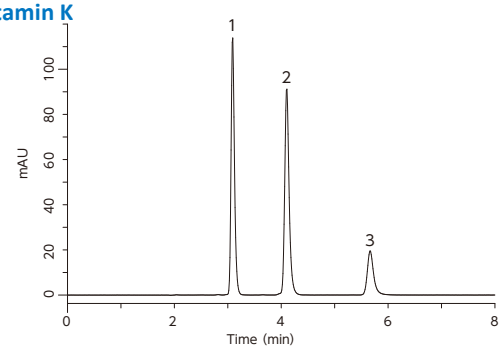



Conditions

| | |
|---|---|
| Column | : Inertsil ODS-HL<br>(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



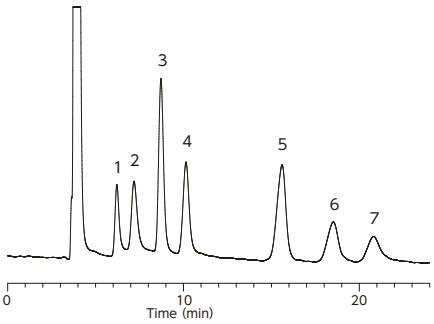

Conditions

| | |
|---|---|
| Column | : InertSustainSwift C8<br>(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

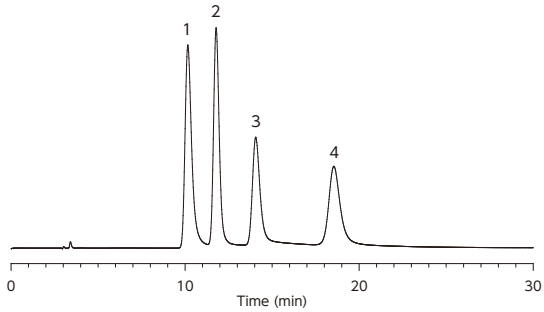
## Sugars




Conditions

| | | |
|---|---|---|
| Column | : InertSustain NH2 (5 μm, 250 × 4.6 mm I.D.) | Sample : |
| Eluent | : A) $CH_3CN$ | 1. Rhamnose |
| | B) $H_2O$ | 2. Fucose |
| | A/B = 85/15, v/v | 3. Fructose |
| Flow Rate | : 1.0 mL/min | 4. Glucose |
| Col. Temp. | : 40 °C | 5. Sucrose |
| Detection | : RI | 6. Maltose |
| Injection Vol. | : 10 μL | 7. Lactose |
| Data Source | : LC InertSearch No. LB180 | (10 mg/mL each) |

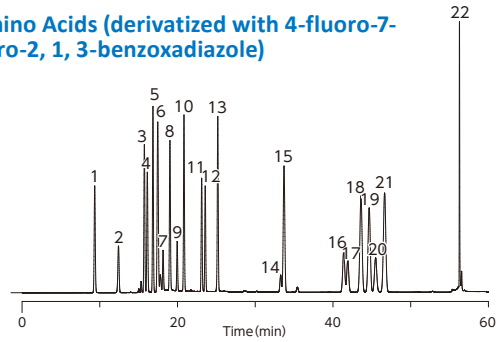
## Sugar analysis with ECD




Conditions

| | | |
|---|---|---|
| Column | : InertSphere Sugar-1 (5 μm, 150 × 4.6 mm I.D.) | Sample : |
| Eluent | : 100 mM NaOH in $H_2O$ | 1. Fucose |
| Flow Rate | : 0.5 mL/min | 2. Glucose |
| Col.Temp. | : 30 °C | 3. Fructose |
| Detection | : ECD (ED743, Gold) | 4. Lactose |
| Injection Vol. | : 10 μL | |

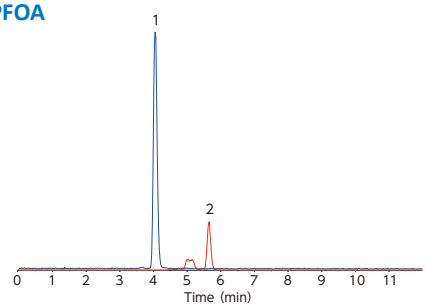
## Amino Acids (derivatized with 4-fluoro-7-nitro-2, 1, 3-benzoxadiazole)




Conditions

| | | |
|---|---|---|
| Column | : InertSustainSwift C18 | Sample : |
| | (5μm, 250 × 4.6 mm I.D.) | 1. NBD-Taurin |
| Eluent | : A) 0.1 % TFA in $CH_3CN$ | 2. NBD-Histidine |
| | B) 0.1 % TFA in $H_2O$ | 3. NBD-Glutamine |
| | A/B = 10/90 - 5 min - 10/90 - 20 min | 4. NBD-Serine |
| | - 30/70 - 50 min - 35/65 - 50.1 min | 5. NBD-Arginine |
| | - 80/20 - 55 min - 80/20 - 55.1 min | 6. NBD-OH |
| | - 10/90 - 70 min - 10/90, v/v | 7. NBD-Aspartic acid |
| Flow Rate | : 1.0 mL/min | 8. NBD-Glycine |
| Col. Temp. | : 40 °C | 9. NBD-Glutamic acid |
| Detection | : FL Ex 470 nm Em 530 nm | 10. NBD-Threonine |
| Injection Vol. | : 5 μL | 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 | |

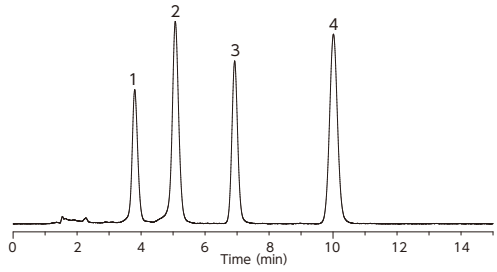
## PFOS · PFOA




Conditions

| | | |
|---|---|---|
| Column | : Inertsil ODS-4 | Sample : |
| | (3 μm, 100 × 2.1 mm I.D.) | 1. PFOA (Perfluorooctanoic acid) |
| Eluent | : A) 5 mM $CH_3COONH_4$ in $CH_3OH$ | 2. PFOS (Perfluorooctanesulfonic acid) |
| | B) 5 mM $CH_3COONH_4$ in $H_2O$ | (1 mg/L each) |
| | 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 | |

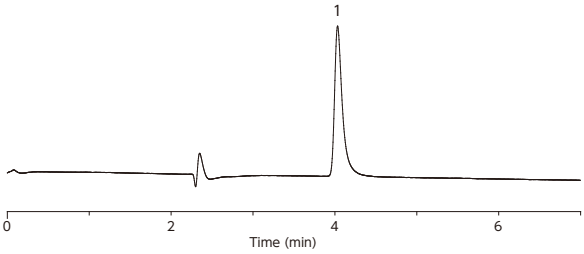
## Analysis of Pre-column Derivatized Aflatoxin




Conditions

| | | |
|---|---|---|
| Column | : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.) | Sample : |
| Eluent | : A) $CH_3OH$ B) $CH_3CN$ C) $H_2O$ | 1. Aflatoxin G1 |
| | A/B/C = 30/10/60, v/v/v (Premix) | 2. Aflatoxin B1 |
| Flow Rate | : 1.0 mL/min | 3. Aflatoxin G2 |
| Col. Temp. | : 40 °C | 4. Aflatoxin B2 |
| Detection | : FL Ex 365 nm Em 450 nm | (5 ng/mL each) |
| Injection Vol. | : 20 μL | |
| Data Source | : LC InertSearch No. LB107 | |

## Hydrogen Peroxide




Conditions

| | | |
|---|---|---|
| Column | : Inertsil CX (5 μm, 250 × 4.6 mmI.D.) | Sample : |
| Eluent | : 10 mM $Na_2SO_4$ | 1. Hydrogen peroxide |
| Flow Rate | : 0.8 mL/min | ($H_2O_2$, 100 ng/mL) |
| Col.Temp. | : 30 °C | |
| Detection | : ECD (ED743, Platinum) | |
| Injection Vol. | : 10 μL | |

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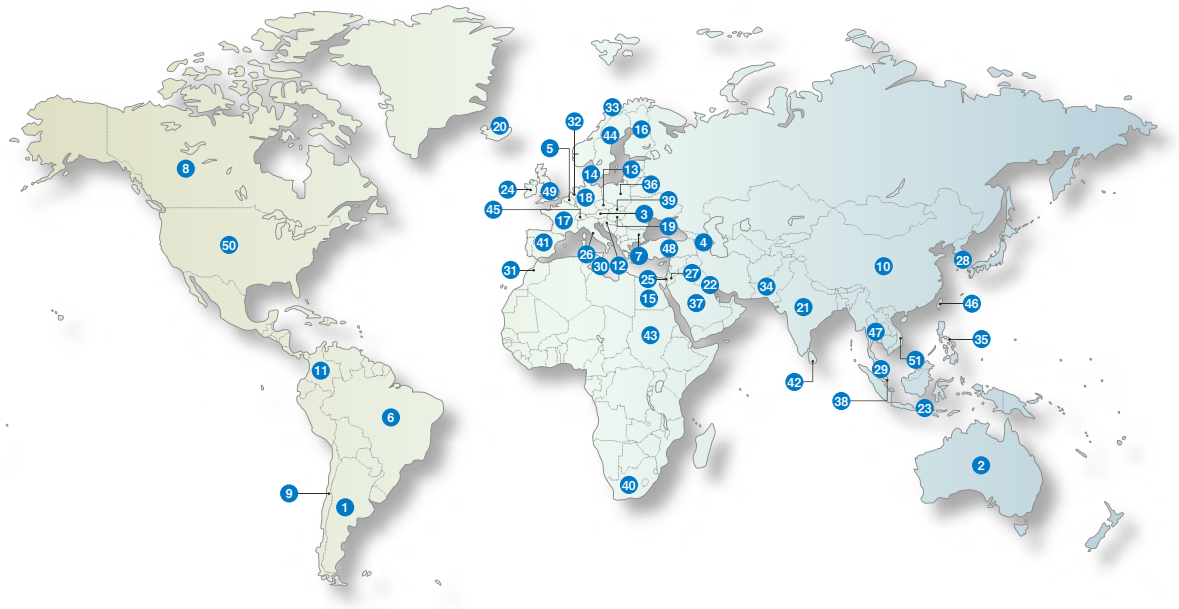
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**GL Sciences Inc. Japan**
22-1 Nishishinjuku 6-chome
Shinjuku-ku, Tokyo
163-1130, Japan

Phone : +81-3-5323-6620
Fax : +81-3-5323-6621
Email : world@gls.co.jp
Web : www.glsciences.com

**GL Sciences Inc. USA**
4733 Torrance Blvd. Suite 255
Torrance, CA 90503
USA

Phone : +1-310-265-4424
Fax : +1-310-265-4425
Email : info@glsciencesinc.com
Web : www.glsciencesinc.com

**GL Sciences B.V.**
Dillenburgstraat 7C
5652AM, Eindhoven
The Netherlands

Phone : +31-40-254-9531
Email : info@glsciences.eu
Web : www.glsciences.eu

**GL Sciences (Shanghai) Limited**
Tower B, Room 2003
Far East International Plaza
No.317 Xianxia Road, Changning District
Shanghai, China 200051

Phone : +86-21-62782272
Email : contact@glsciences.com.cn
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