GL Sciences

# GL SCIENCES
# HPLC COLUMN CATALOG



GL Sciences Inc.

# Contents



## Reversed Phase Columns



## HILIC Columns



## Normal Phase Columns



## SEC Columns



## Ion Exchange Columns



## Application Specific Columns

# GL Sciences HPLC Columns' Specification

| | Column | Features | USP Code | Particle Size (μm) | Pore Size (nm) | Surface Area ($m^2$/g) |
|---|---|---|---|---|---|---|
| Reversed Phases | InertSustain C18 | First choice with ultra high inertness and high durability | L1 | 2, 3, 5 | 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 |
| | 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-80A | Elute low molecule with a sharp peak shape | L1 | 5 | 8 | 450 |
| | Inertsil ODS-2 | Ultra pure silica gel is used | L1 | 5 | 15 | 320 |
| | Inertsil ODS | Inertness 1st generation | L1 | 5, 10 | 10 | 350 |
| 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 |
| HILIC | InertSustain Amide | First choice for HILIC mode | L68 | 3, 5 | 10 | 350 |
| | Inertsil Amide | Increasing retentivity of high polar compounds | L68 | 3, 5 | 10 | 450 |
| | 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 |
| | InertSustain Cyano | Ultra inertness and can be used in reversed phase mode | L10 | 3, 5 | 10 | 350 |
| | 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 |
| | 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 | — | 5 | — | — |
| | Inertsil Peptides C18 | Peptide analysis | L1 | 4 | 10 | 450 |
| | Inertsil Acrolein C18 | Acrolein analysis | L1 | 5 | 10 | 450 |
| | Inertsil Sulfa C18 | Sulfa analysis | L1 | 3, 5 | 10 | 450 |
| | Inertsil AS | Arsenic compounds analysis | L1 | 3 | 10 | 450 |
| | InertSphere FA-1 | Povidone impurity analysis column | L17 | 9 | — | — |
| | MonoCap Series | Monolithic silica capillary column | | | | |

| | Column | Carbon Loading (%) | End-Capping | Inertness | Recommended pH range |
|---|---|---|---|---|---|
| Reversed Phases | InertSustain C18 | 14 | ○ | ★★★★★ | 1 - 10 |
| | InertSustain AQ-C18 | 13 | ○ | ★★★★★ | 1 - 10 |
| | InertSustainSwift C18 | 9 | ○ | ★★★★★ | 1 - 10 |
| | Inertsil ODS-HL | 23 | ○ | ★★★★★ | 2 - 7.5 |
| | Inertsil ODS-4 | 11 | ○ | ★★★★★ | 2 - 7.5 |
| | Inertsil ODS-4V | 11 | ○ | ★★★★★ | 2 - 7.5 |
| | Inertsil ODS-3 | 15 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS-3V | 15 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS-SP | 8.5 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS-P | 29 | – | ★★★ | 2 - 7.5 |
| | Inertsil ODS-EP | 9 | – | ★★★★ | 2 - 7.5 |
| | Inertsil WP300 C18 | 9 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS-80A | 17.5 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS-2 | 18.5 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil ODS | 14 | ○ | ★★ | 2 - 7.5 |
| Other Reversed Phases | InertSustain C8 | 8 | ○ | ★★★★★ | 1 - 10 |
| | InertSustainSwift C8 | 6 | ○ | ★★★★★ | 1 - 10 |
| | Inertsil C8-4 | 5 | ○ | ★★★★★ | 2 - 7.5 |
| | Inertsil C8-3 | 9 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil C8 | 10.5 | ○ | ★★ | 2 - 7.5 |
| | Inertsil C4 | 7.5 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil WP300 C8 | 4 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil WP300 C4 | 3 | – | ★★★★ | 2 - 7.5 |
| | InertSustain PFP | 10 | ○ | ★★★★★ | 2 - 7.5 |
| | InertSustain Phenylhexyl | 9 | ○ | ★★★★★ | 1 - 10 |
| | InertSustain Phenyl | 10 | – | ★★★★ | 2 - 7.5 |
| | Inertsil Ph-3 | 9.5 | – | ★★★ | 2 - 7.5 |
| | Inertsil Ph | 10 | ○ | ★★★ | 2 - 7.5 |
| HILIC | InertSustain Amide | 15 | – | — | 2 - 8.5 |
| | Inertsil Amide | 18 | – | — | 2 - 7.5 |
| | Inertsil HILIC | 20 | – | — | 2 - 7.5 |
| | InertSustain NH2 | 7 | – | — | 2 - 7.5 |
| | Inertsil NH2 | 8 | – | — | 2 - 7.5 |
| Normal Phase | Inertsil Diol | 20 | – | — | 2 - 7.5 |
| | Inertsil SIL-100A | — | – | — | 2 - 7.5 |
| | Inertsil SIL-150A | — | – | — | 2 - 7.5 |
| | Inertsil WP300 SIL | — | – | — | 2 - 7.5 |
| | InertSustain Cyano | 8 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil CN-3 | 14 | – | — | 2 - 7.5 |
| SEC | Inertsil WP300 Diol | 9 | – | — | 2 - 7.5 |
| Ion-Exchange | Inertsil AX | 17 | – | — | 2 - 7.5 |
| | Inertsil CX | 14 | – | — | 2 - 7.5 |
| Application Specific Columns | InertSustainBio C18 | 9 | ○ | ★★★★★ | 1 - 10 |
| | SYPRON AX-1 | — | – | — | 3 - 7 |
| | SYPRON AX-2 | — | – | — | |
| | InertSphere Sugar-1 | — | – | — | 2 - 14 |
| | InertSphere Sugar-2 | — | – | — | |
| | Inertsil Peptides C18 | 15 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil Acrolein C18 | 9 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil Sulfa C18 | 15 | ○ | ★★★★ | 2 - 7.5 |
| | Inertsil AS | 15 | ○ | ★★★ | 2 - 7.5 |
| | InertSphere FA-1 | — | – | — | — |
| | MonoCap Series | | | | |

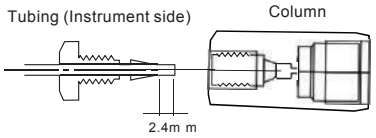
# Column End-fittings

## Column End-fittings

The specification of GL Sciences' end-fitting style is summarized below. The chromatographic separation and result can be negatively impacted if the style of the column end-fittings does not match the existing tubing ferrule settings.

| Column Type | End-fitting |
|---|---|
| InertSustain C18, InertSustain C8, InertSustain Phenyl, Inertsil ODS-4, Inertsil ODS-3, Inertsil C8-4, Inertsil C8-3, Inertsil Ph-3, InertSustainSwift C18, InertSustainSwift C8,InertSustain Series, Inertsil Series, | Parker Style (UP Type) |
| InertSphere Sugar-1, InertSphere Sugar-2, InertSphere FA-1 | |
| InertSustain AQ-C18,InertSustainSwift C18, InertSustainSwift C8 | |
| UHPLC PEEK Columns, PEEK Columns | |
| SYPRON AX-1, SYPRON AX-2 | |
| Mono Series, GL-Park Series | |
| 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 | |
| Capillary EX Micro Guard Column | |

●Parker Style (UP type)




## Recommended Operating Pressure

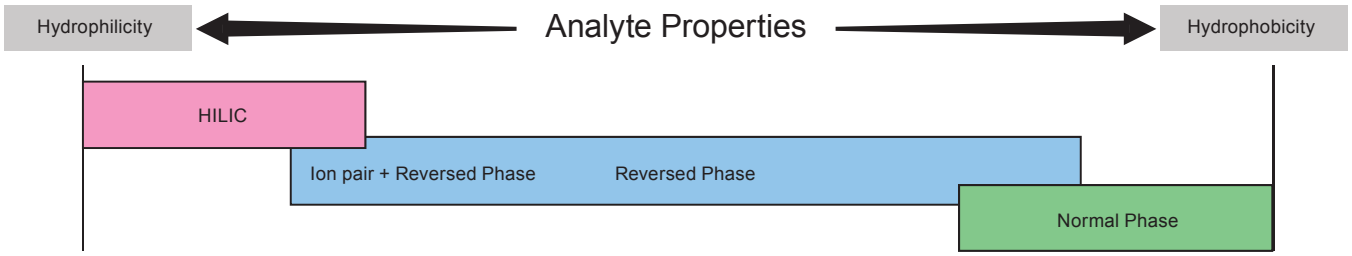
GL Sciences' HPLC columns can tolerate up to pressures shown below. Although the columns are packed by high pressure slurry method, it is recommended to keep the operating pressure under the pressure shown below to maintain peak performance and ensure long column life and stability.

| Analytical Columns | End-fittings | Maximum Operating Pressure |
|---|---|---|
| InertSustain Series<br>InertSustainSwift Series<br>Inertsil Series | 1.9 µm, 2 µm | 80 MPa (800 bar) |
| InertSustain Series<br>InertSustainSwift Series<br>Inertsil Series | 3 µm HP | 50 MPa (500 bar) |
| InertSustain Series<br>InertSustainSwift Series<br>Inertsil Series | 3~10 µm | 20 MPa (200 bar) |
| InertSphere Sugar-1 | 5 µm | 15 MPa (150 bar) |
| Capillary EX Columns | 3 µm, 5 µm | 20 MPa (200 bar) |
| Capillary EX Nano Columns | 3 µm, 5 µm | 15 MPa (150 bar) |

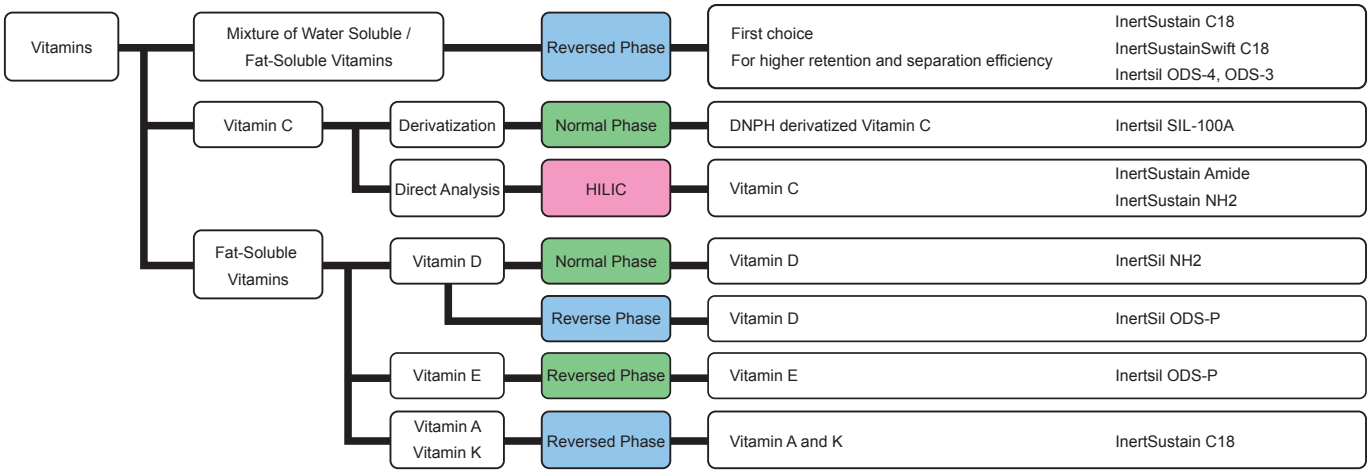
| Guard Columns | Maximum Operating Pressure |
|---|---|
| Guard Column for UHPLC | 80 MPa (800 bar) |
| Cartridge Guard Column E<br>Cartridge Guard Column Ei<br>GL Cart, Pre-clean ORG<br>PREP Guard Cartridge | 20 MPa (200 bar) |
| Packed Guard Columns<br>Packed Mini Guard Columns<br>Capillary Micro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

# Column Selection Overview

## Separation Mode Selection for Analyte Polarity



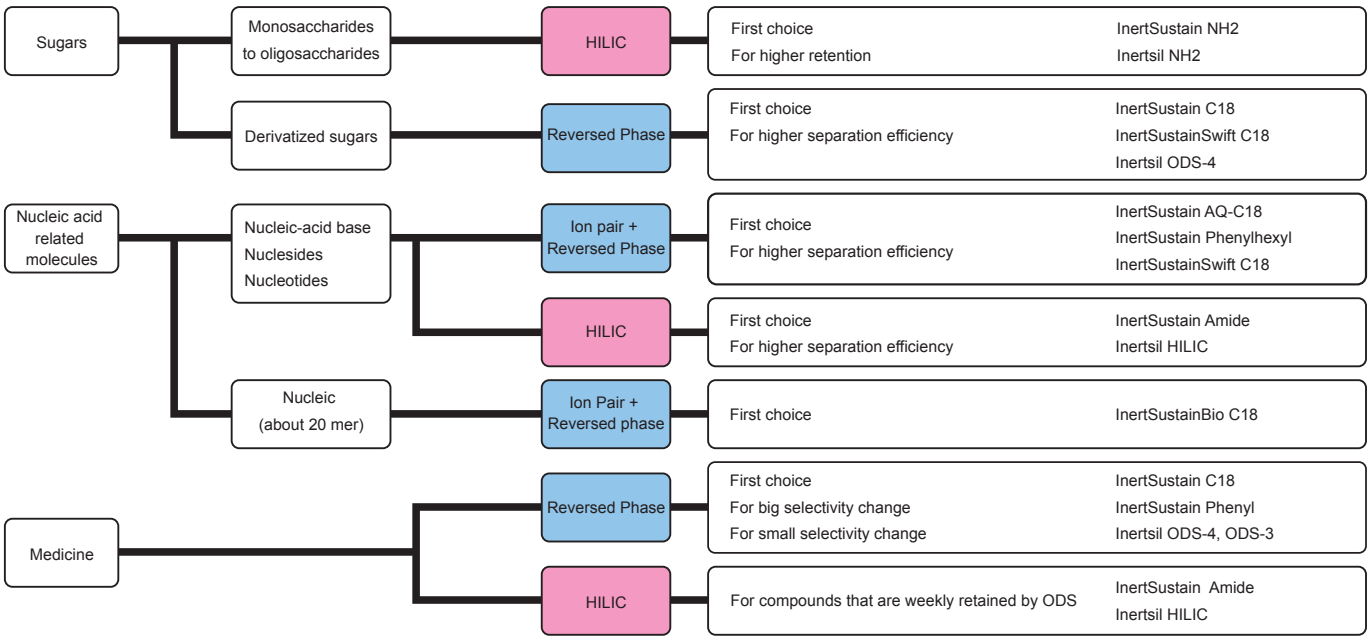

## Column Selection for Analyte Properties

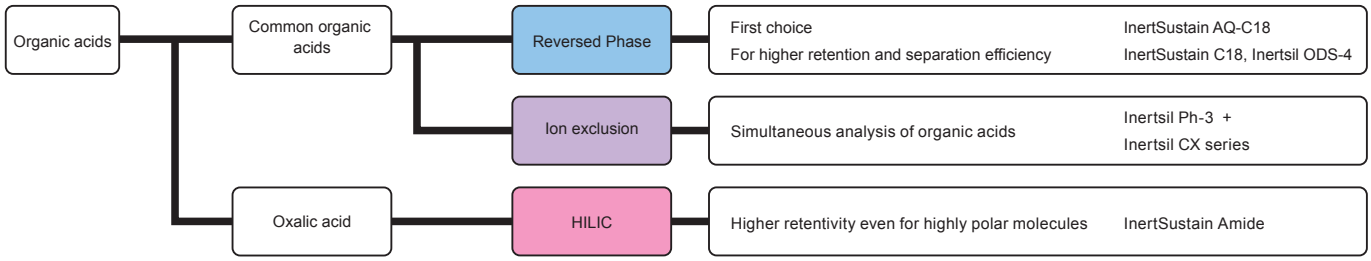


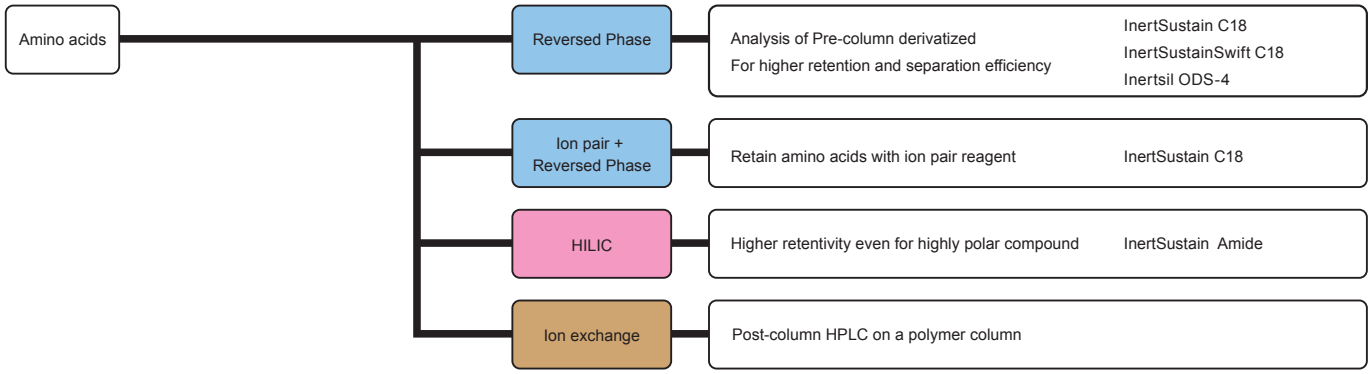

| Water Soluble Vitamins | Phase | Detector |
|---|---|---|
| Vitamin C | $NH_2$, SIL, Amide | UV |
| Vitamin $B_1$ | ODS | UV, (FL) |
| Vitamin $B_2$ | ODS | UV, FL |
| Vitamin $B_6$ | ODS | UV |
| Niacin | ODS | UV |
| Folic acid | ODS | UV |
| Pantothenic acid | ODS | UV |

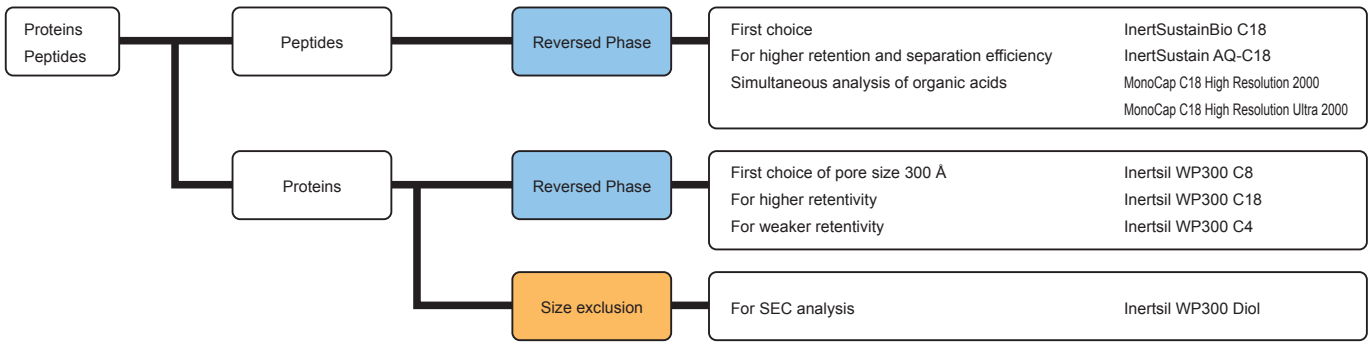
| Fat-Soluble Vitamin | Phase | Detector |
|---|---|---|
| Vitamin A | ODS | UV, FL |
| Vitamin D | ODS, $NH_2$ | UV |
| Vitamin E | ODS | UV, FL |
| Vitamin K | ODS | UV, (FL) |

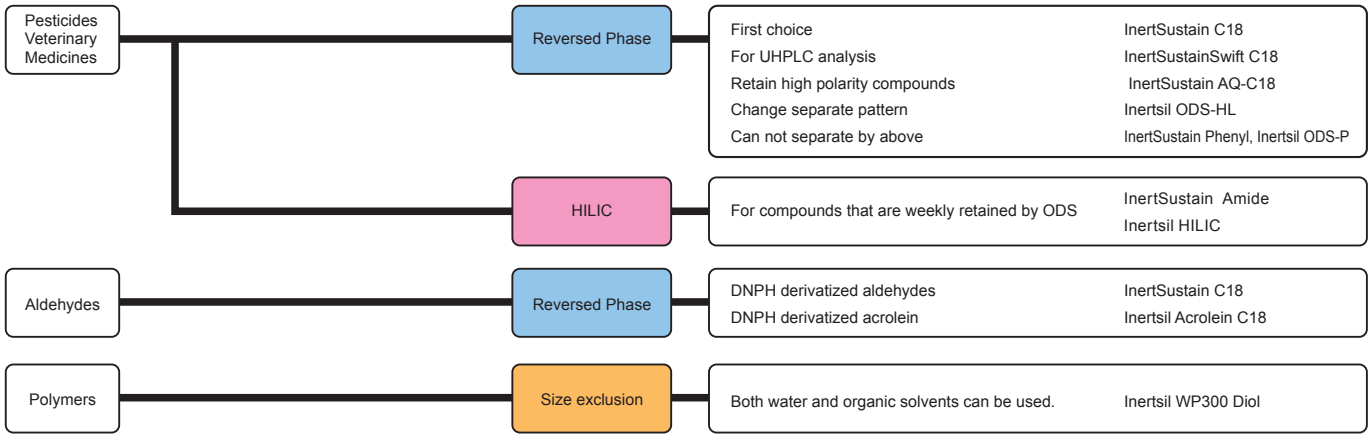
* (FL): Post-column derivatization




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
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
Inertsil ODS-4
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
Inertsil Acrolein C18
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>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. | ECONO PREP ODS |
| 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. | ECONO PREP SIL |
| L5 | Alumina of controlled surface porosity bonded to a solid spherical core, 30 to 50 µm in diameter. | |
| L6 | Strong cation exchange packing-sulfonated fluorocarbon polymer coated on a solid spherical core, 30 to 50 µm in diameter. | |
| L7 | Octylsilane chemically bonded to totally porous or superficially porous silica particles, 1.5 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 |
| 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. | 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 |

| USP Code | Description | Brand |
|---|---|---|
| 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. | |
| 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. | |
| 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. | |

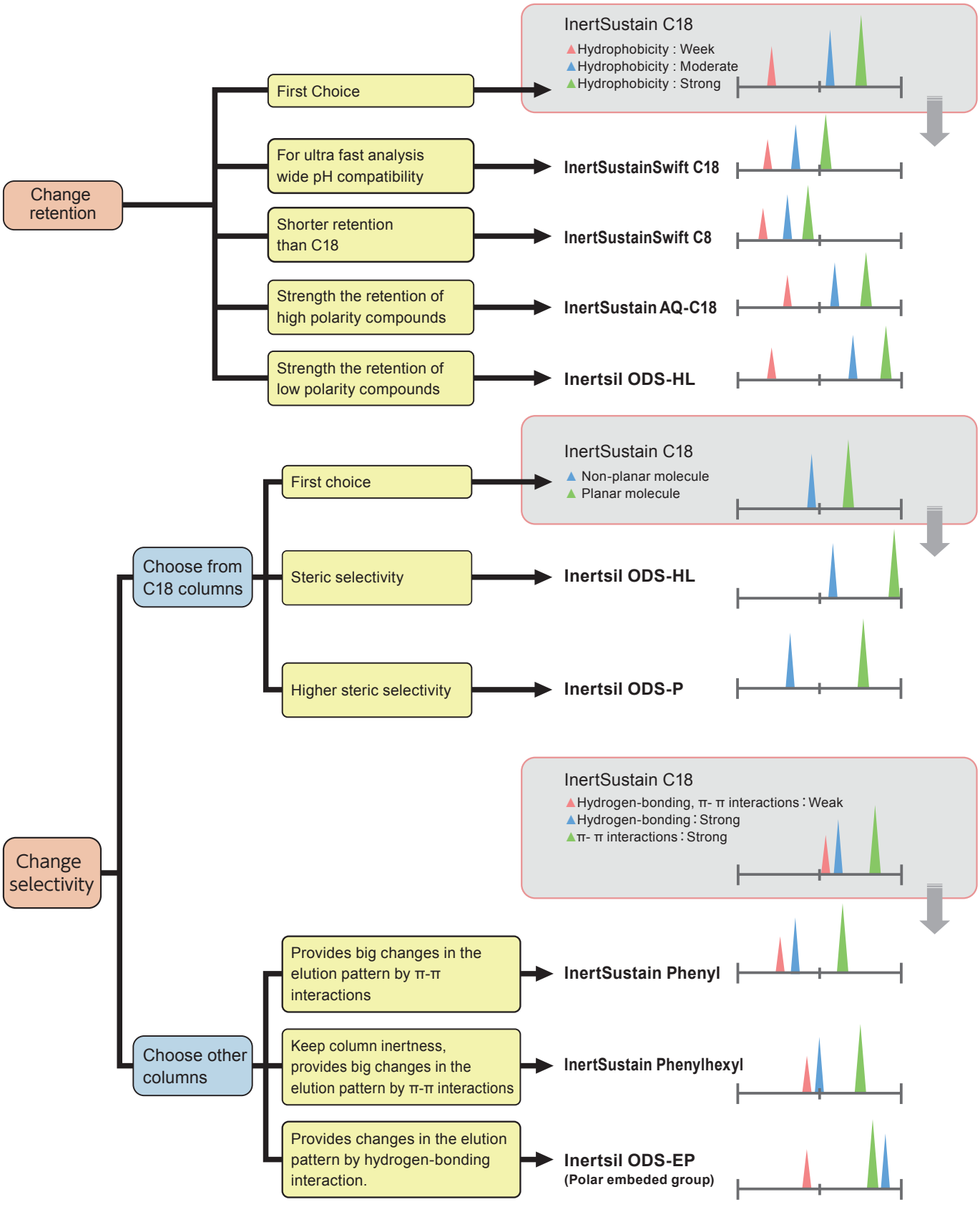
# HPLC Column Selection by USP

| USP Code | Description | Brand |
|---|---|---|
| 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. | |
| 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<br>Inertsil 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. | |
| 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. | |

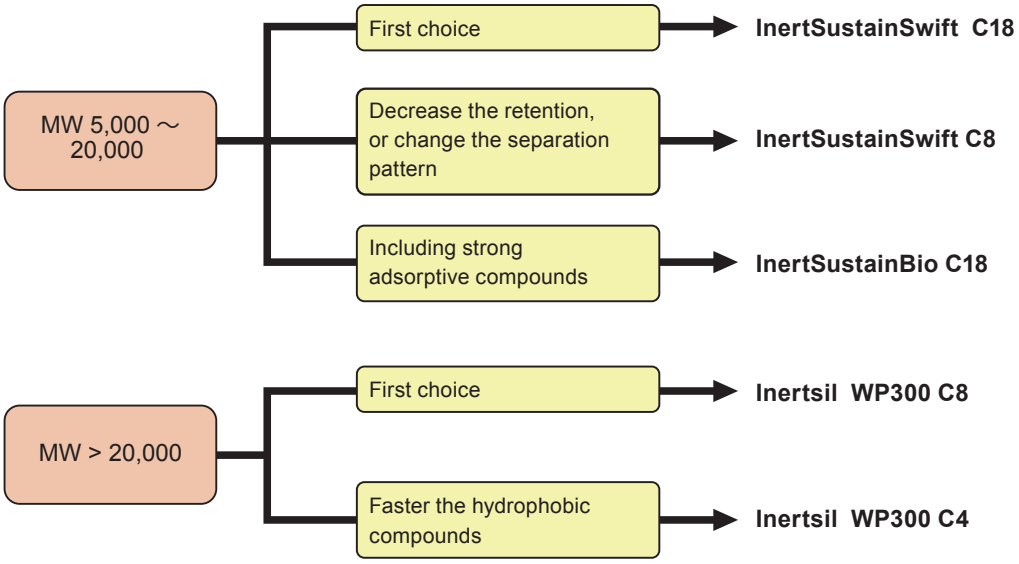
| USP Code | Description | Brand |
|---|---|---|
| L86 | A 5 µm fused core particle with a highly polar ligand possessing 5 hydroxyl groups tethered to the silica gel outer layer. | |
| L87 | Dodecyl silane chemically bonded to porous silica particles, 1.5 to 10 µm in diameter. | |
| L88 | Glycopeptide 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-exchange 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. | |
| 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 |
| 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. | |

# Reversed Phase Column Selection Guide

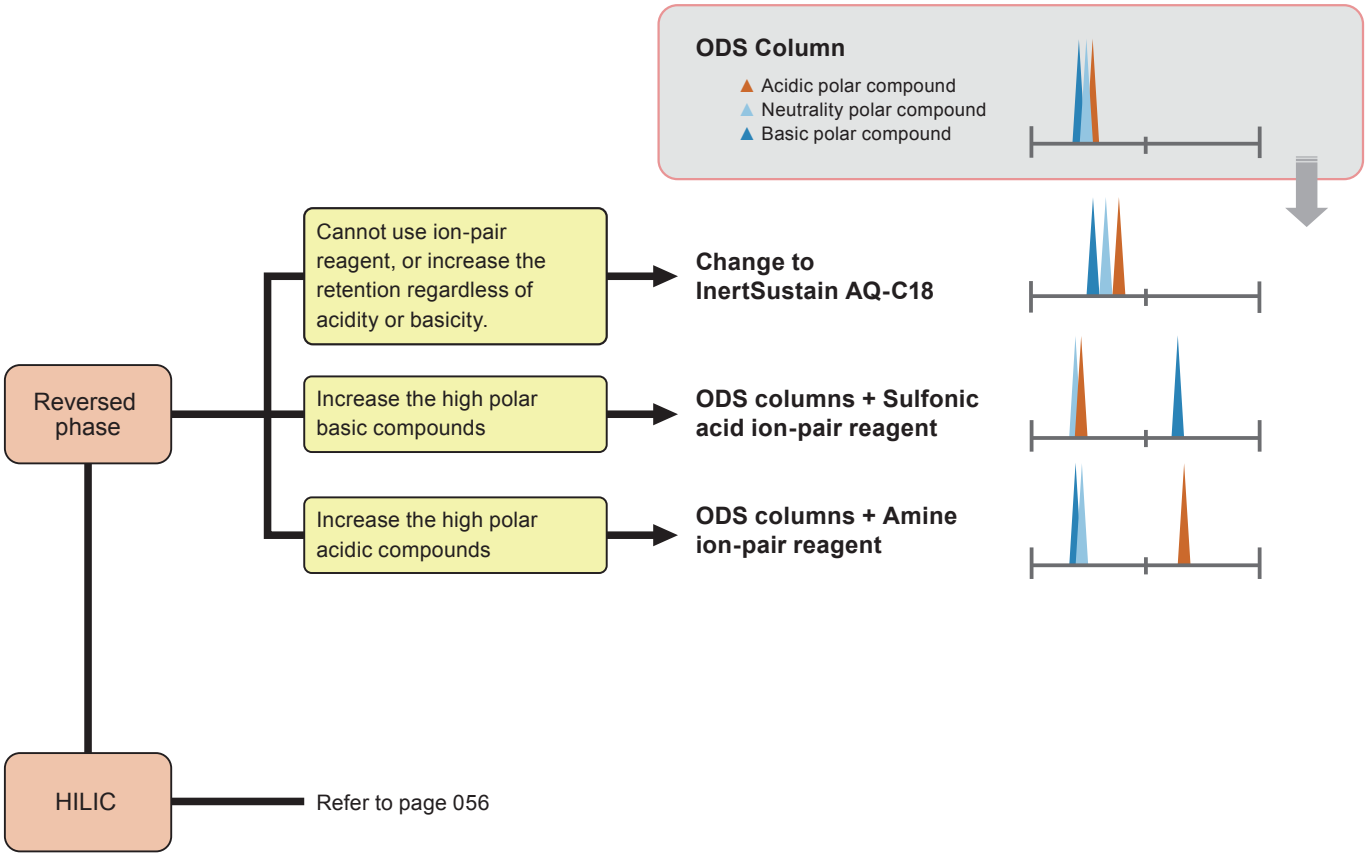
## Molecular Weight <5,000



## Molecular Weight >5,000




## Analyze High Polar Compounds

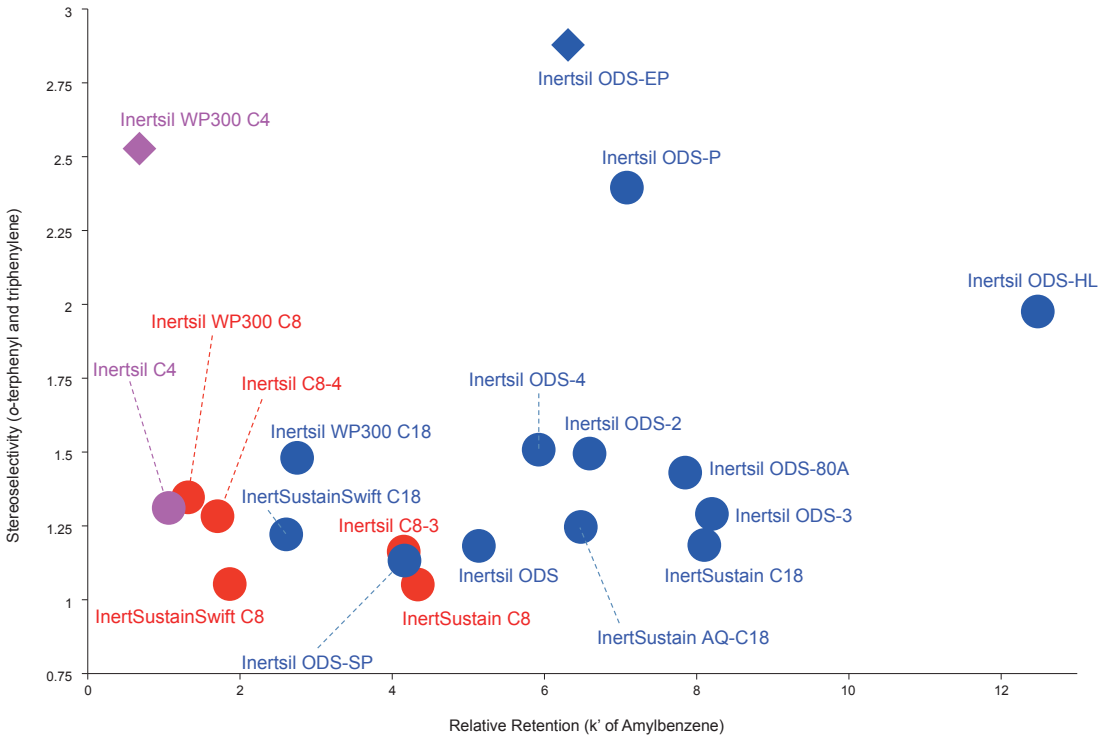


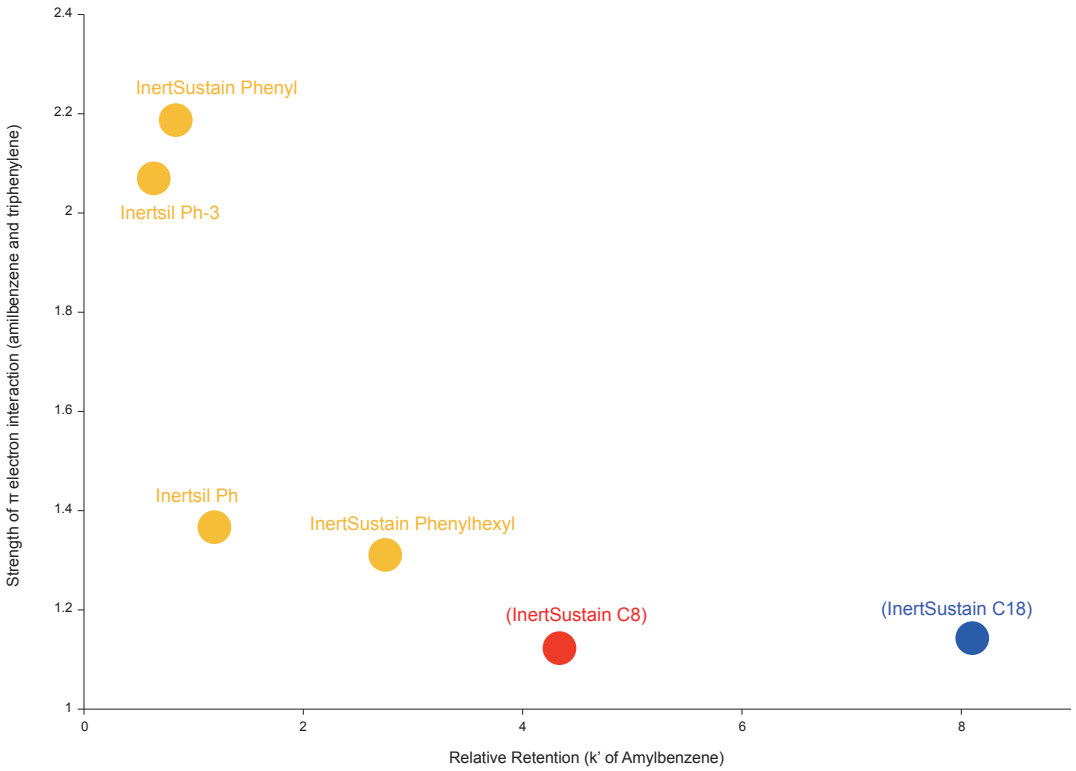
# Reversed Phase Columns

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

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

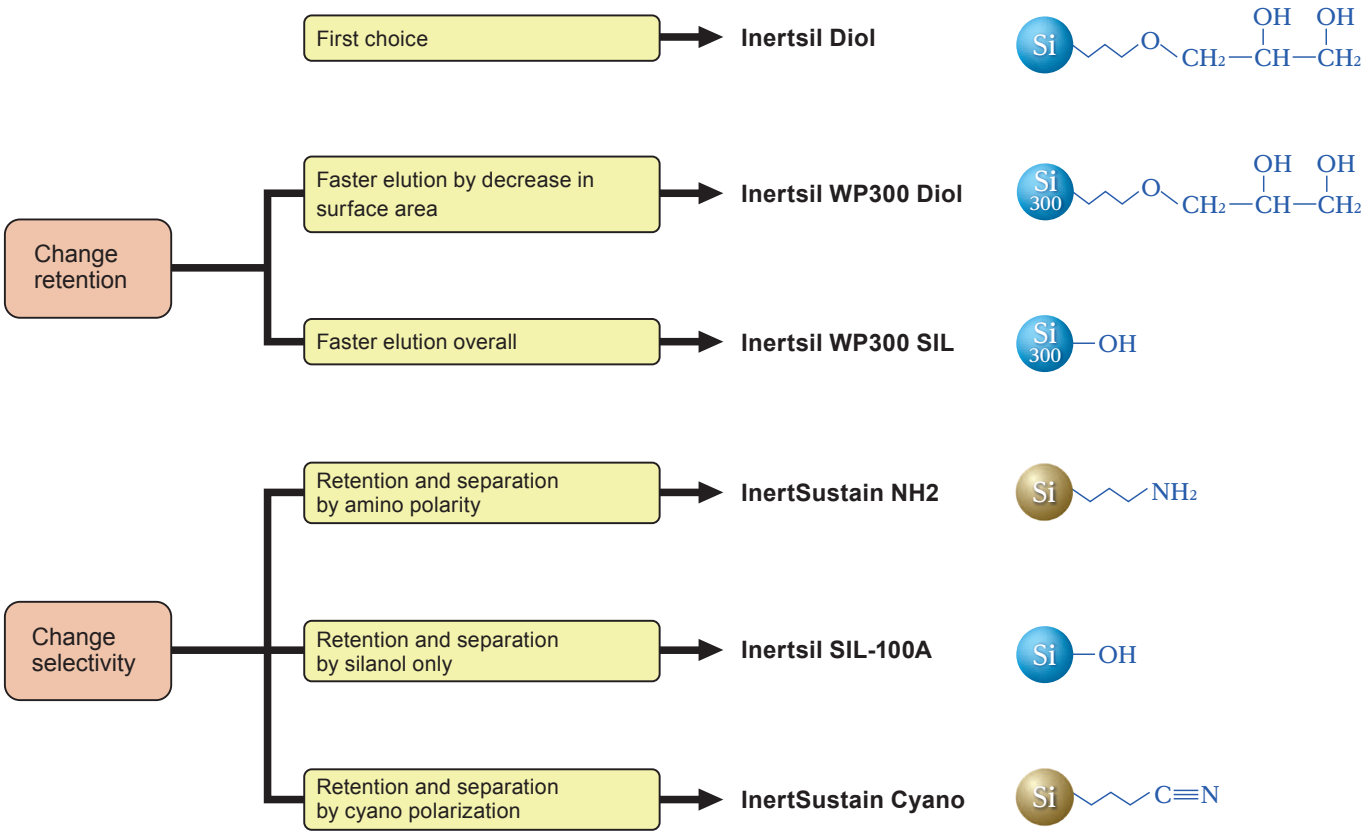
## InertSustain, Inertsil Distribution Model



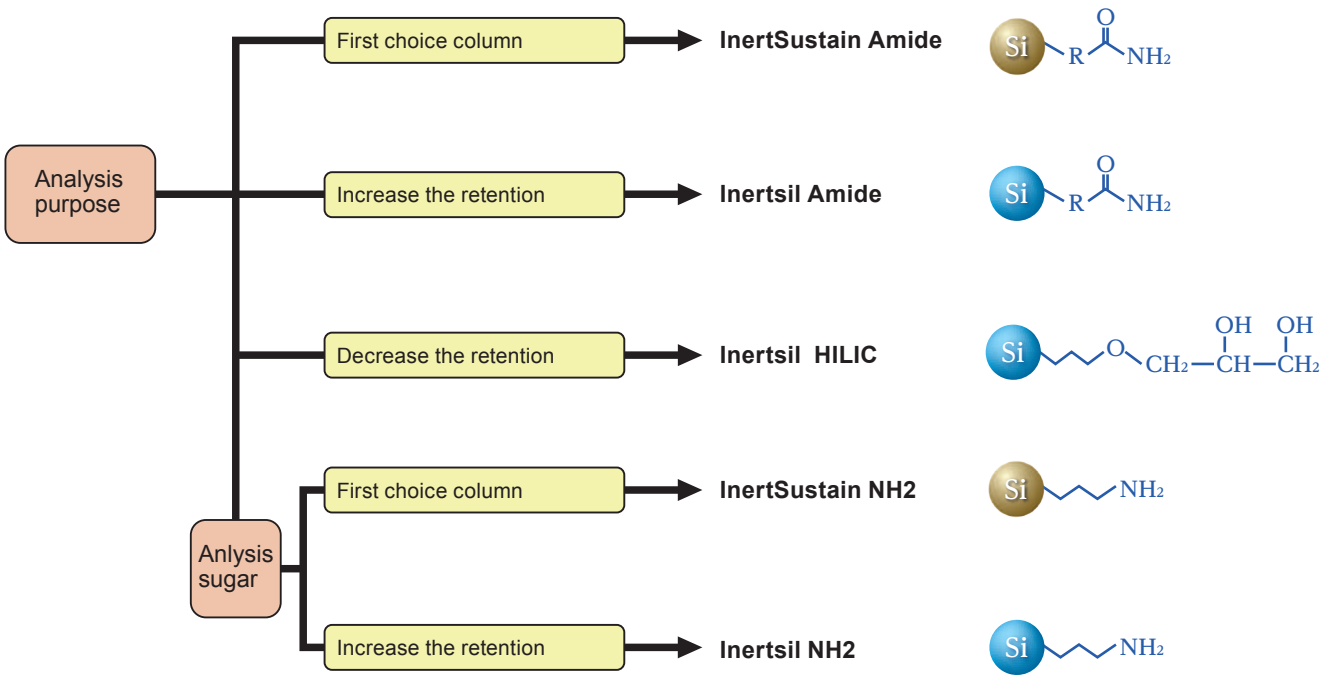



# Normal Phase Column Selection Guide

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




## Selecting HILIC Mode Columns



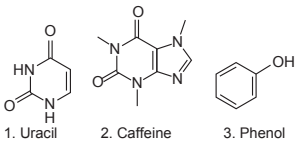
# Selectivity Comparison of Reversed Phase Columns

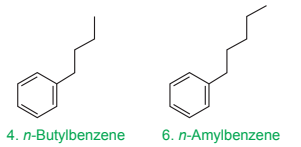
Selectivity of reversed phase columns are compared under the same conditions, packing material size and column size. Chemical structural formulas used for the comparison are shown at right. Separation differences between basic compounds, acidic compounds, alkyl benzenes and polyaromatic compounds shows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

Conditions

| | |
|---|---|
| Column | : Reversed Phase Column (5 µm, 250 × 4.6 mm I.D.)* |
| Eluent | : A) $CH_3OH$ B) $H_2O$ |
| | : A/B = 80/20, v/v , (Inertsil Diol, CN-3) A/B = 70/30, v/v , |
| Flow Rate | : 1.0 mL/min* |
| Col. Temp. | : 40 °C |
| Detection | : UV 254 nm |
| Injection Vol. | : 5 µL* |

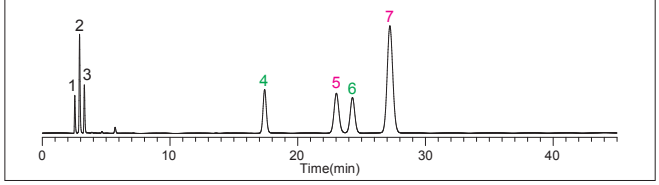
* : For Mono Clad C18-HS (3.0 mm I.D.), 0.4 mL/min of flow rate and 2 µL of injection volume are adopted according to the column internal diameter.



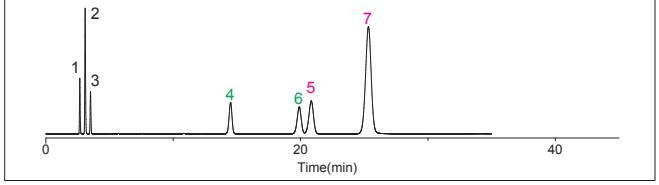





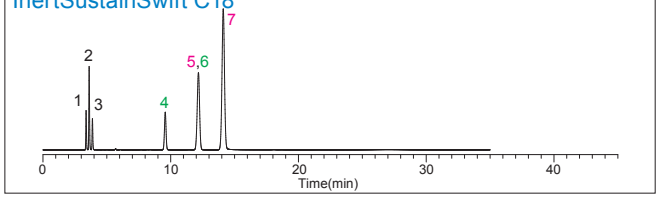
InertSustain C18



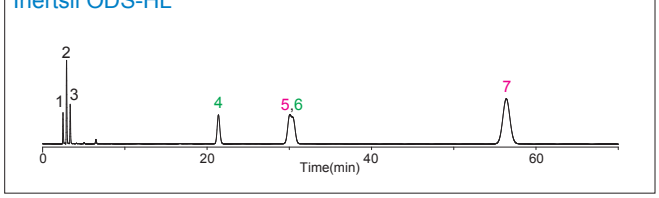

InertSustain AQ-C18



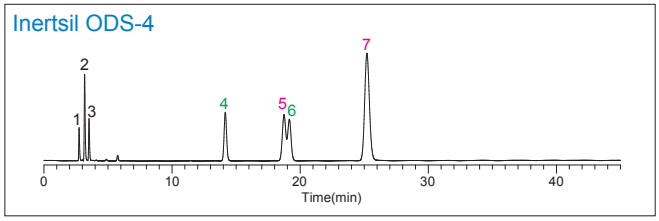

InertSustainSwift C18



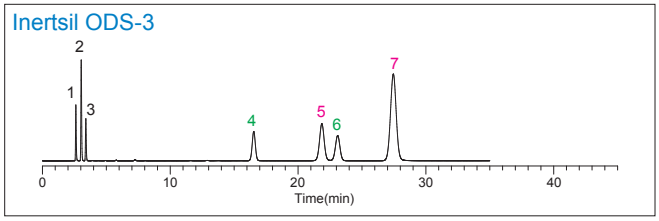

Inertsil ODS-HL



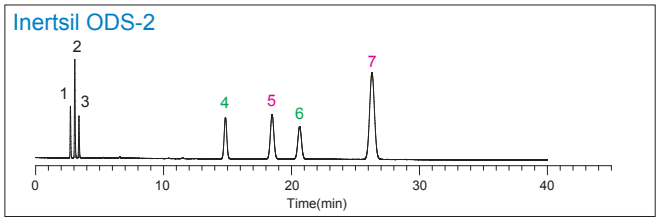

Inertsil ODS-4



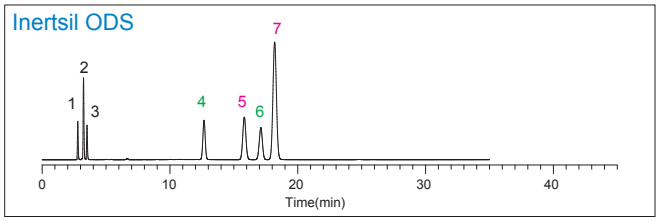

Inertsil ODS-3



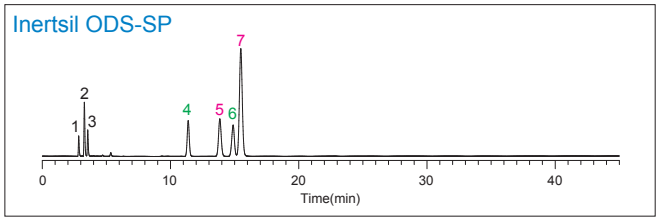

Inertsil ODS-2



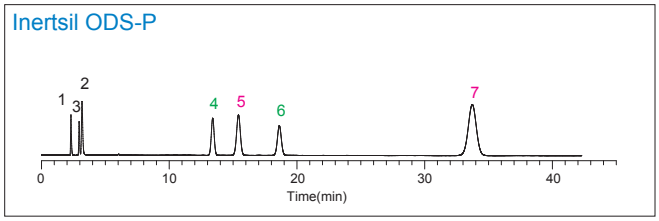

Inertsil ODS



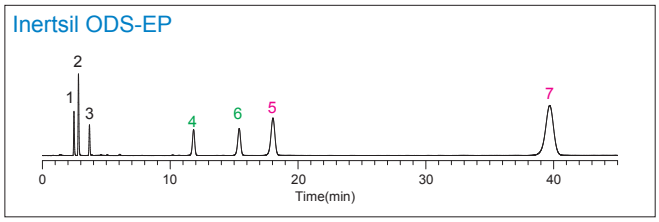

Inertsil ODS-SP



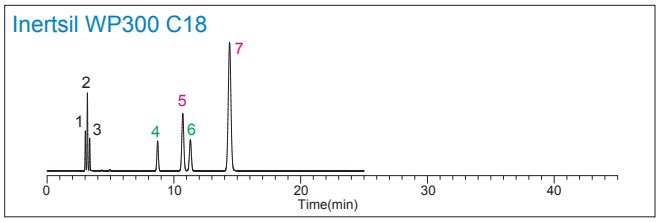

Inertsil ODS-P



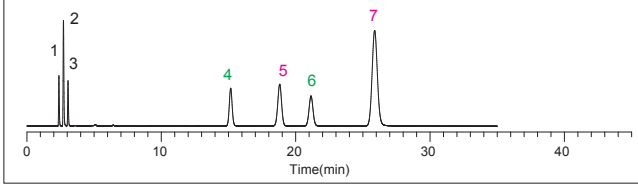

Inertsil ODS-EP



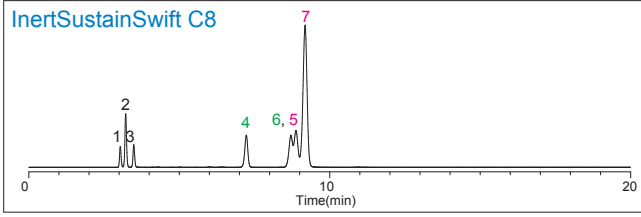

Inertsil WP300 C18



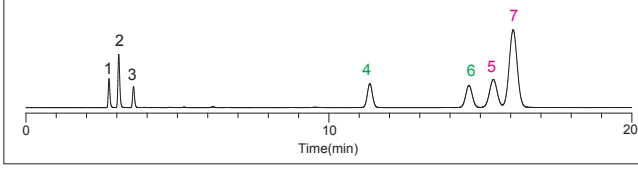
Inertsil ODS-80A



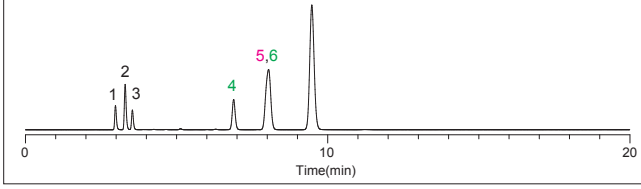

InertSustainSwift C8



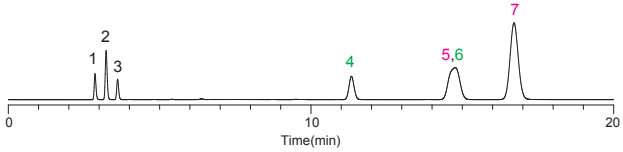

InertSustain C8



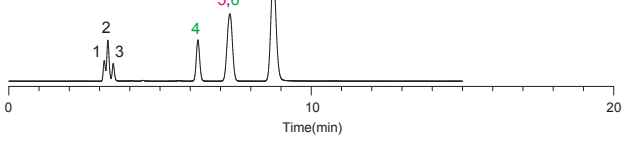

Inertsil C8-4



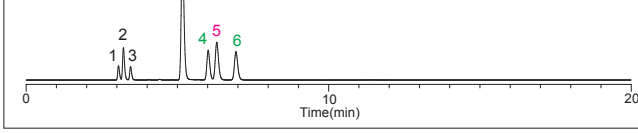

Inertsil C8-3



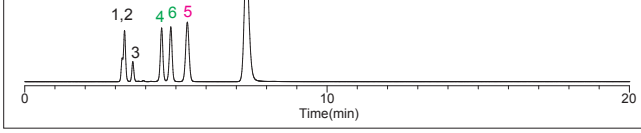

Inertsil WP300 C8



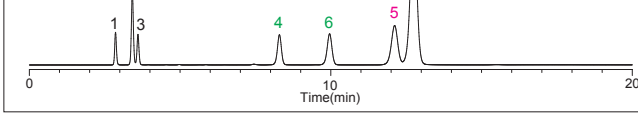

Inertsil C4



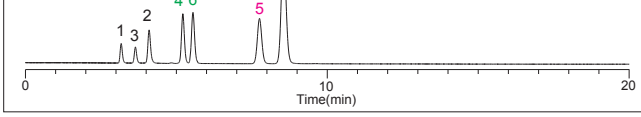

Inertsil WP300 C4



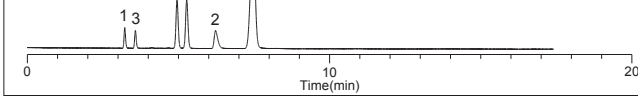

InertSustain Phenylhexyl



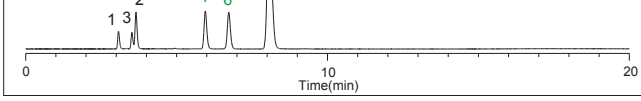

InertSustain Phenyl



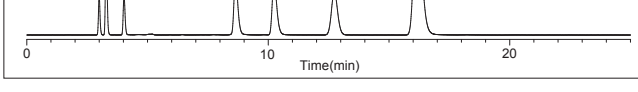

Inertsil Ph-3




Inertsil Ph




InertSustain Cyano



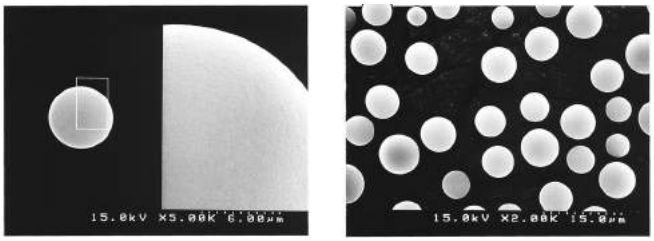
# GL Sciences' State-of-the-art HPLC Technology

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

## Sophisticated self-manufacturing technology for the base silica

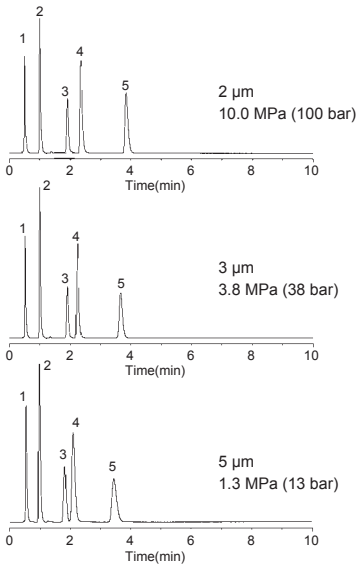
GL Sciences has been synthesizing base silica-gels, bonding phases and endcapping for column packing which enable us stable supply with exceptionally-high quality. Consequently those HPLC columns have been chosen for the method used for many years as reliable products.

Ultra pure base silica




## Reliable Column Performance

Provide the same Separation Patterns with the Changes of Particle Size

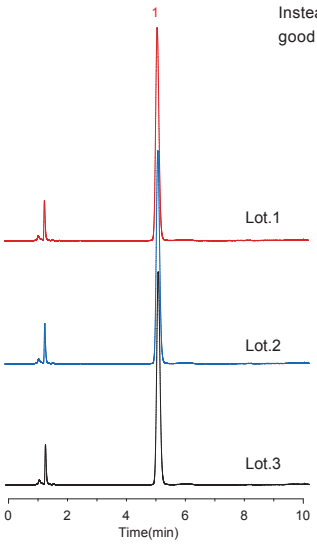



Conditions

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

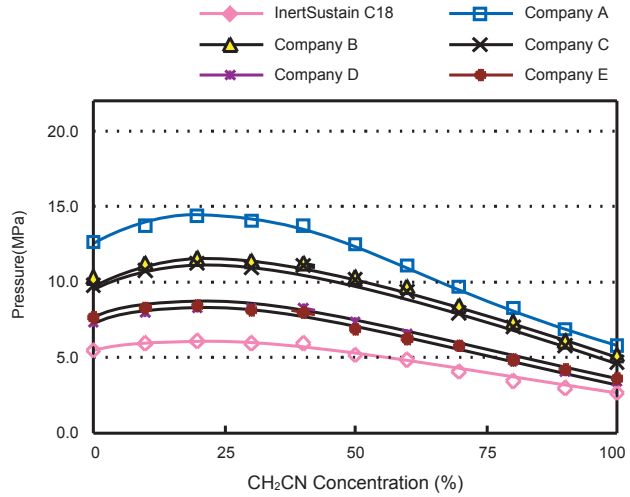



Conditions

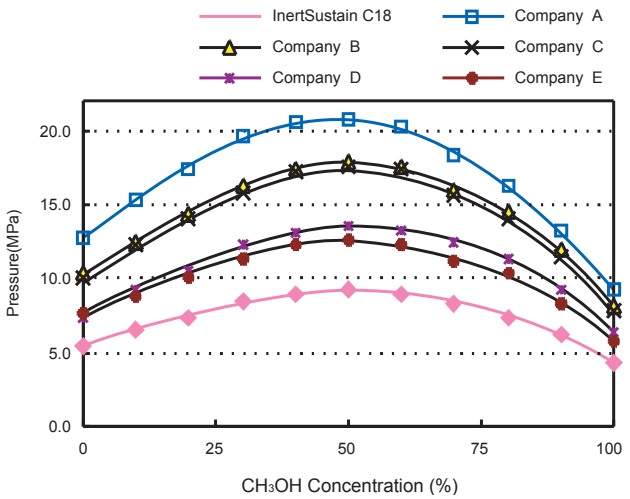
Column : InertSustain C18 (5 µm, 250 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
B) 25 mM phosphate buffer (pH 7.0)
A/B = 40/60, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 220 nm
Sample : 1. Dextromethorphan

## Base Silica is Designed for Low Column Back Pressure to Reduce the Load on the System

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

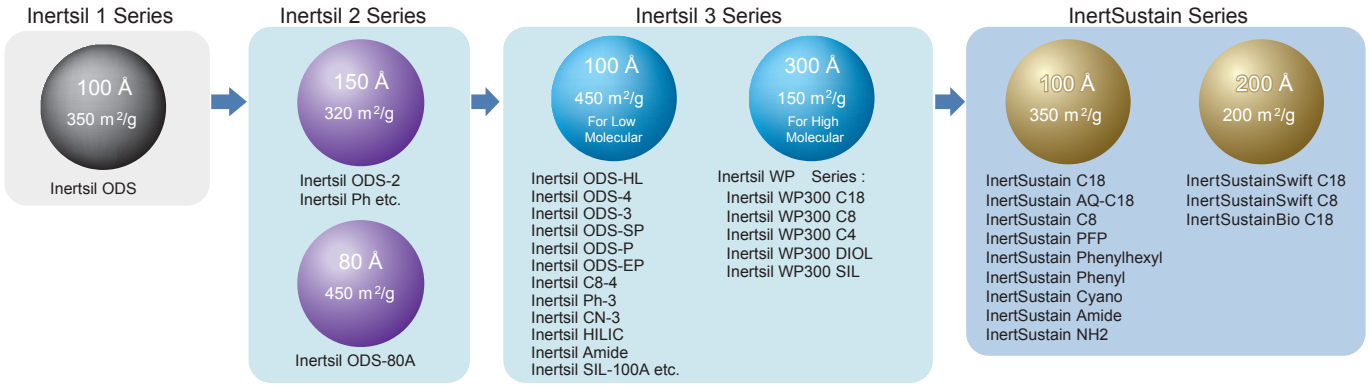



Column : 250 × 4.6 mm I.D. Flow Rate : 1 mL/min Col.Temp. : 40 °C



# The Evolving HPLC Column Packings

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


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

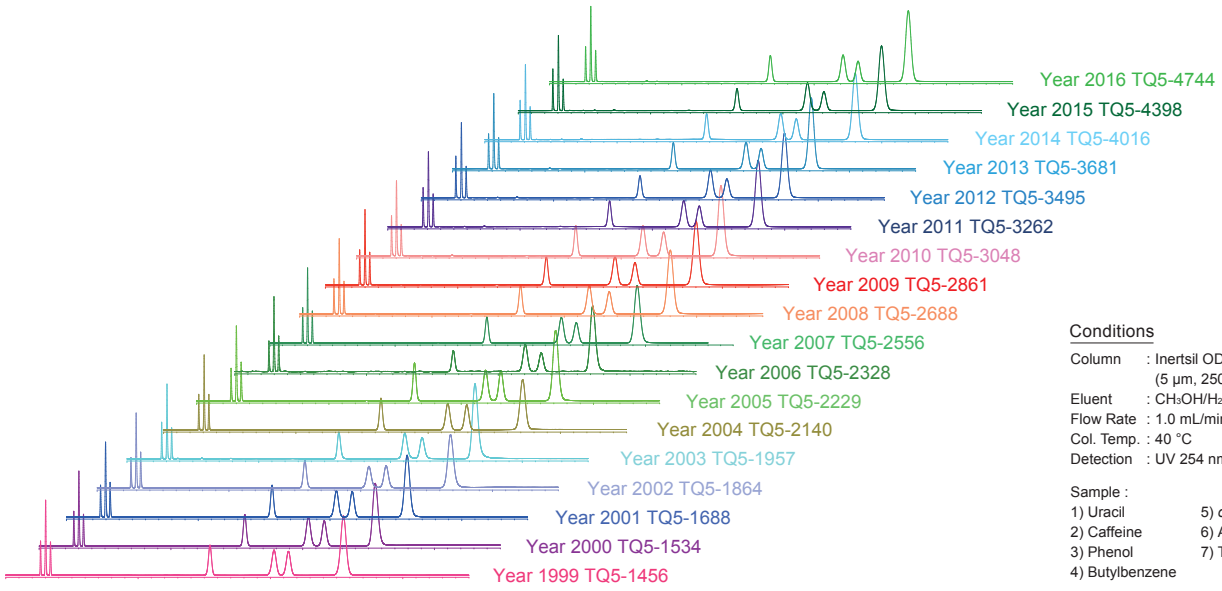
InertSustain employs a radically new type of silica , in which the surface of the silica is uniquely modified, the amount of silanols are controlled. Owing to this state-of-the-art technology ES silica allows easy surface modification including endcapping, which grants the following three favors.

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

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

## Batch to Batch Reproducibility

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




Conditions

Column : Inertsil ODS-3 (5 µm, 250 × 4.6 mm I.D.)
Eluent : $CH_3OH/H_2O$=80/20,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

# QC, ISO

## Quality Inspections

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

## ISO Certification

### GL Sciences is ISO14001 Compliant Company

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

### GL Sciences Fukushima Factory is ISO9001 Compliant Facility

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

General Technical Division

Fukushima Factory

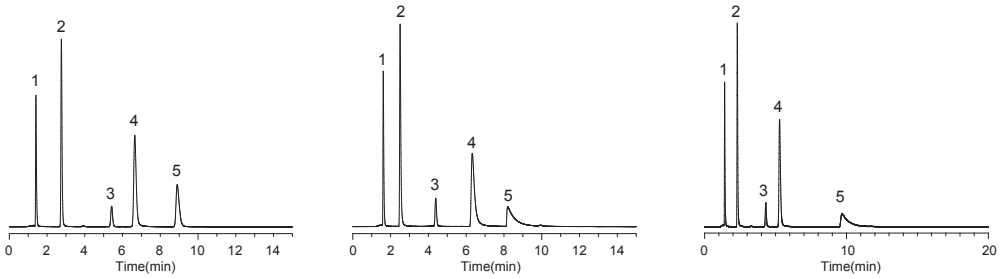
# Reversed Phase Columns

# InertSustain C18

- **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** : **Octadecyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **14 %**
- **USP Code** : **L1**
- **pH Range** : **1 - 10**


Generally, silica based columns are mechanically stable and provide high efficiencies, however, they cannot be used under alkaline conditions and their residual silanol groups tend to adsorb organic bases. InertSustain C18 employs a radically new type of silica, in which the surface of the silica is uniquely modified, enabling precise control of the silica properties.
InertSustain C18 inherits the advantages of all the current Inertsil HPLC columns (e.g., extremely low operating back pressure, superior inertness to typically any analytes, high efficiency and compatibility with a wide range of solvents), but now can be used for wide pH analysis with consistent performance from column to column and lot to lot.

## Figure 1 : Basic Compounds

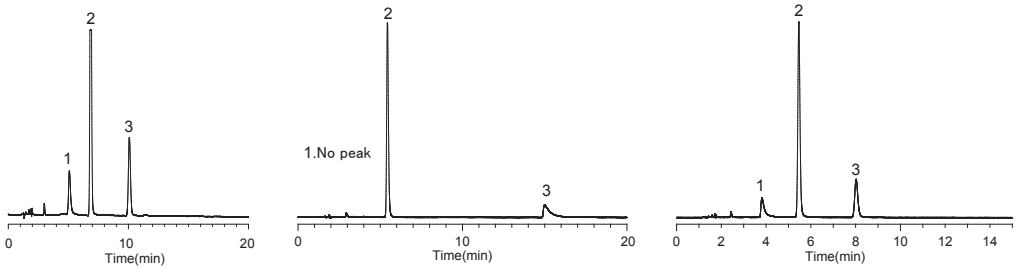



InertSustain C18 | X SELECT CSH C18 | ZORBAX Eclipse Plus C18

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

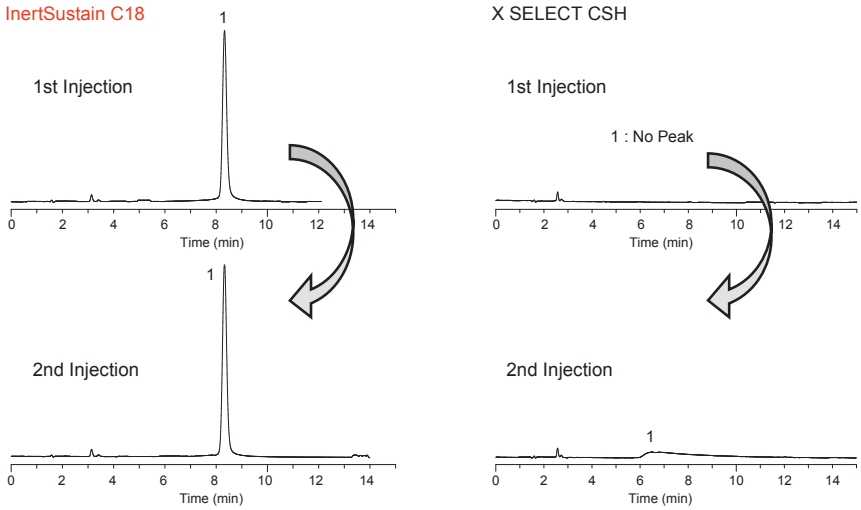



InertSustain C18 | X SELECT CSH C18 | ZORBAX Eclipse Plus C18

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



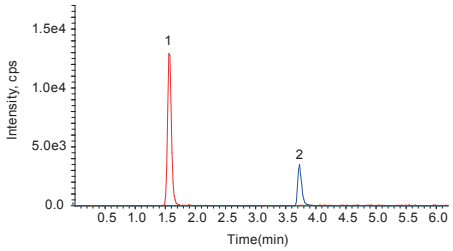

Conditions

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

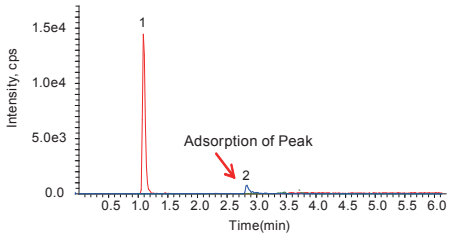
## Comparison of Performance to Core-Shell Columns

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)

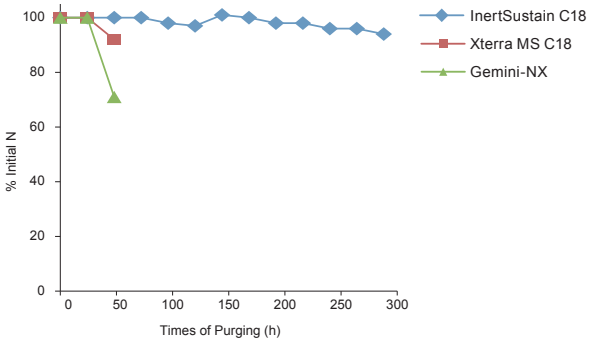



Conditions

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

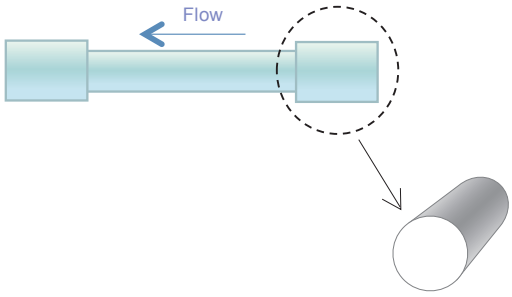
| | | |
|---|---|---|
| Eluent | : | A) $CH_3CN$<br>B) $H_2O$<br>A/B = 65/35, v/v |
| Flow Rate | : | 1.0 mL/min |
| Col. Temp. | : | 40 °C |
| Detection | : | UV 254 nm |
| Sample | : | Naphthalene |

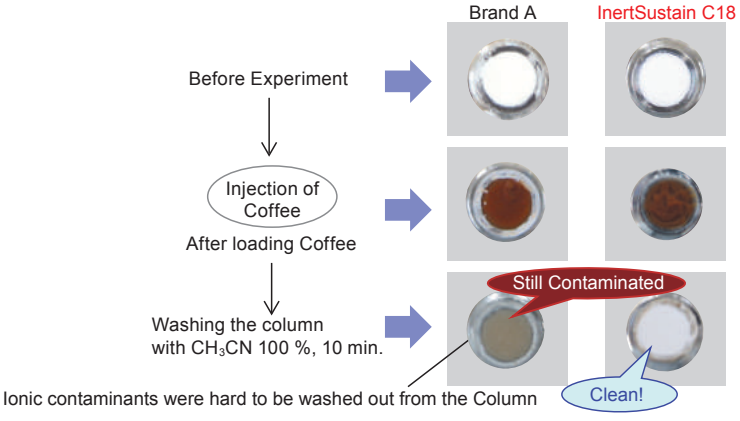
## Experience the InertSustain! (Inertness and Sustainability)

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



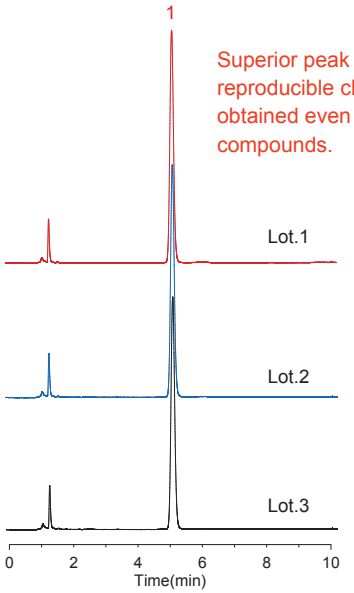



# InertSustain C18

## 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

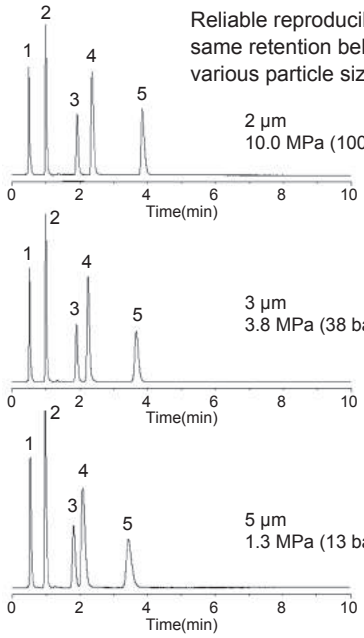



Superior peak shape with highly reproducible chromatograms can be obtained even for those strong basic compounds.

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



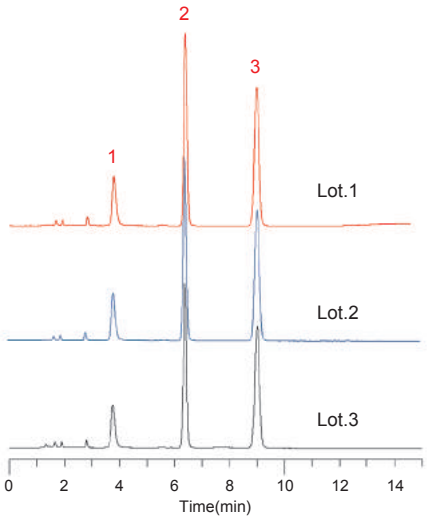

Reliable reproducibility and same retention behavior between various particle size columns

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

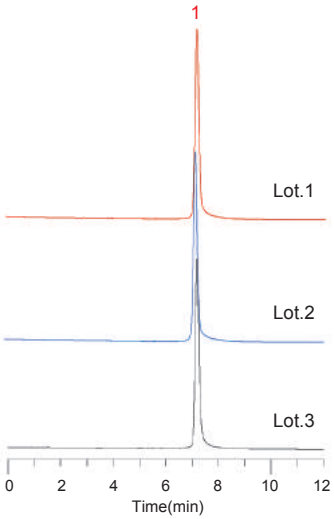
### Figure 2 : Strong Acidic Compound Test




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 |
|---|---|---|---|---|
| HPSeries<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 |

## Cartridge Guard Column E

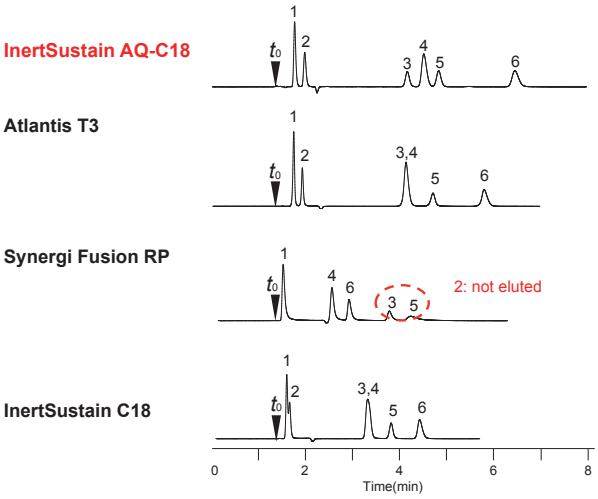
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# 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 columns are designed to achieve strong retention for highly polar compounds, which is the most challenging goals in developing reversed phase methods. The optimization of bonding of the C18 groups at equal distance to the silica gel enable InertSustain AQ-C18 to offer significant retention for highly polar compounds even under water rich mobile phases.

## Figure 1 : Superior Retention for Highly Polar Compound

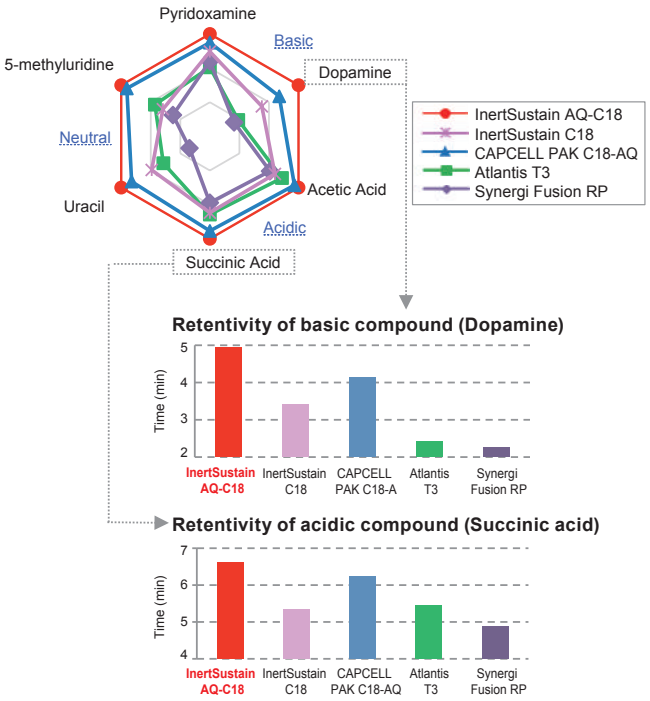



Conditions

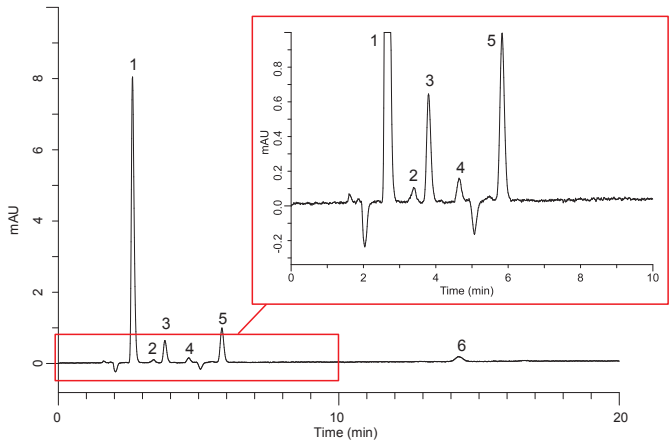
Column : 5 µm, 150 × 4.6 mm I.D.
Eluent : 0.1 % HCOOH in $H_2O$
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm

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

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




## Figure 3 : Analysis of Nucleotide in Fish Meat




Conditions

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

Sample :
1. IMP
2. ATP
3. ADP
4. AMP
5. Hyp
6. Ino
(each 5 mg/L)

* ; Equilibrate the column $CH_3CN/H_2O$=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 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-89871 | 5020-89877 | | |
| | 50 | 5020-89872 | 5020-89878 | | |
| | 75 | 5020-89873 | 5020-89879 | | |
| | 100 | 5020-89874 | 5020-89880 | | |
| | 150 | 5020-89875 | 5020-89881 | | |
| | 250 | 5020-89876 | 5020-89882 | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 30 | 5020-89831 | 5020-89839 | 5020-89847 | 5020-89855 |
| | 50 | 5020-89832 | 5020-89840 | 5020-89848 | 5020-89856 |
| | 75 | 5020-89833 | 5020-89841 | 5020-89849 | 5020-89857 |
| | 100 | 5020-89834 | 5020-89842 | 5020-89850 | 5020-89858 |
| | 125 | 5020-89835 | 5020-89843 | 5020-89851 | 5020-89859 |
| | 150 | 5020-89836 | 5020-89844 | 5020-89852 | 5020-89860 |
| | 250 | 5020-89837 | 5020-89845 | 5020-89853 | 5020-89861 |

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

## Cartridge Guard Column E

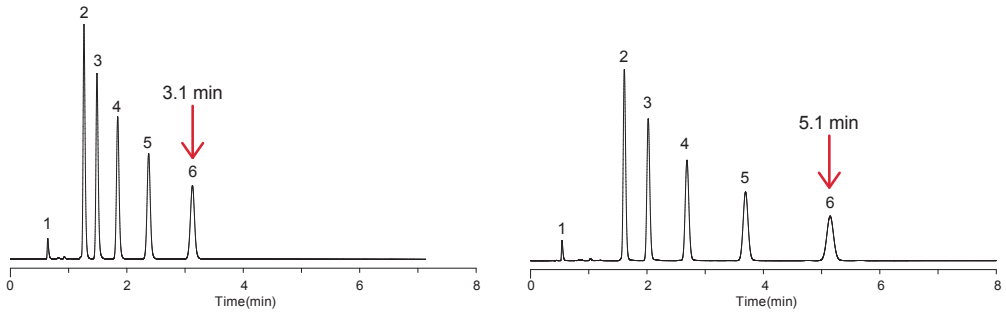
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# InertSustainSwift C18

- **Silica** : **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 - 10.0**


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

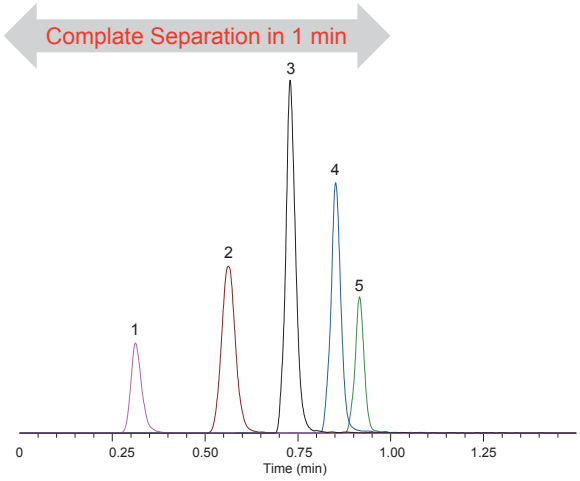
## Figure 1 : Comparison of Retentivity




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 |

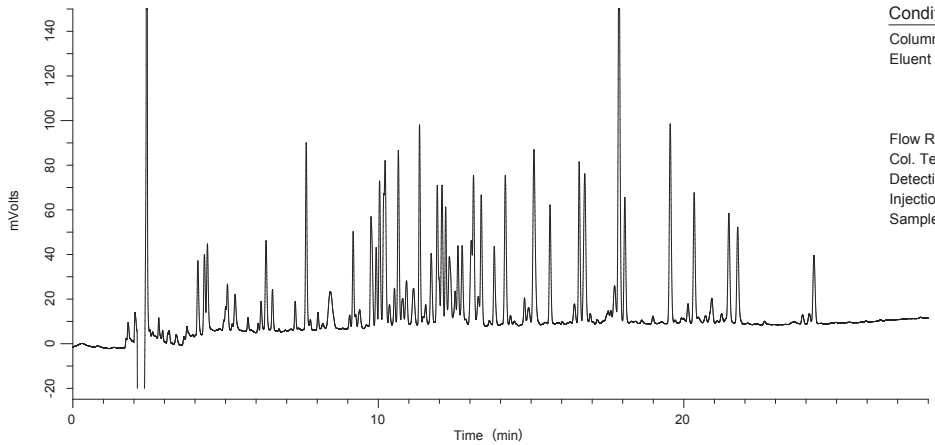
## Figure 2 : Rapid LC/MS/MS Analysis of Basic Drugs




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 ℃ |
| 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

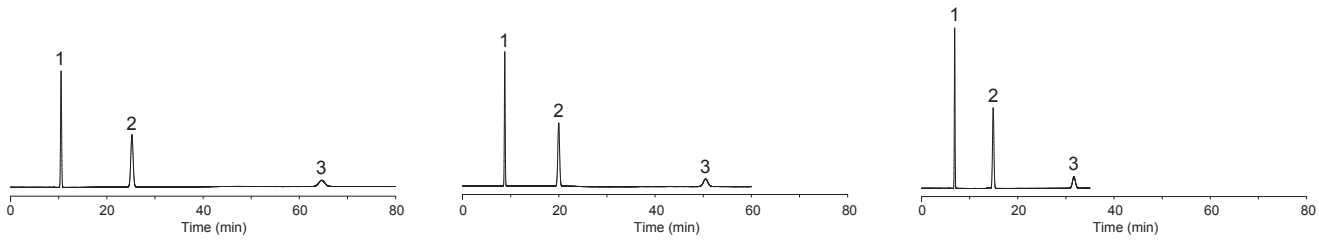
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# Inertsil ODS-HL

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


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

## Figure 1 : Comparison of Retentivety



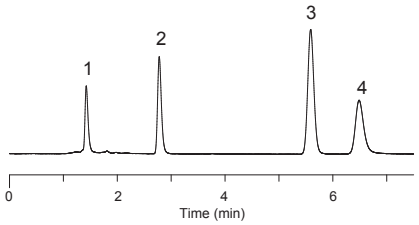

Inertsil ODS-HL | Inertsil ODS-3 | InertSustain C18

Conditions

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

## Figure 2 : Benefits of Highly Inert Packing Material

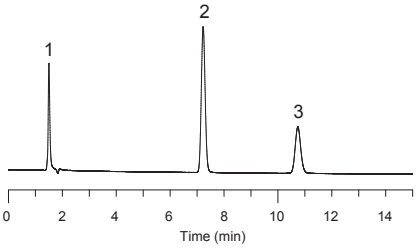
### Bisic Compound Test




Conditions

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

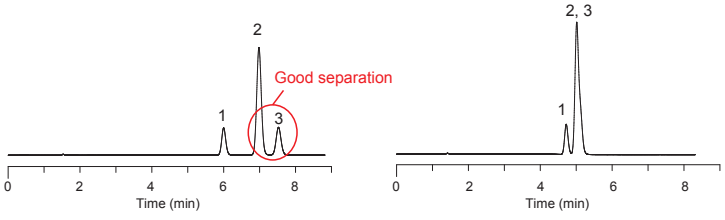
### Acidic Compound Test




Conditions

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

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

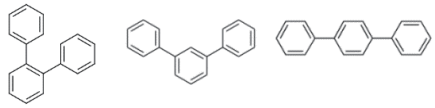



Inertsil ODS-HL (Carbon Loading 23 %) | InertSustain C18 (Carbon Loading 14 %)

Conditions

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

Sample:



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

## Analytical Columns

| | Length \ I.D. (mm) | 2.1 | 3.0 | 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 |

## Cartridge Guard Column E

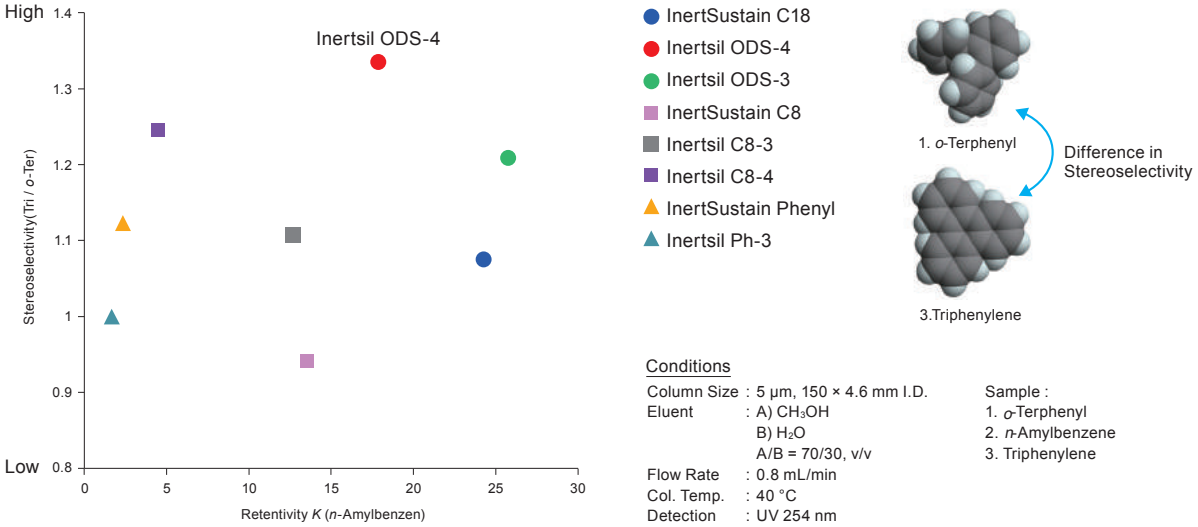
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

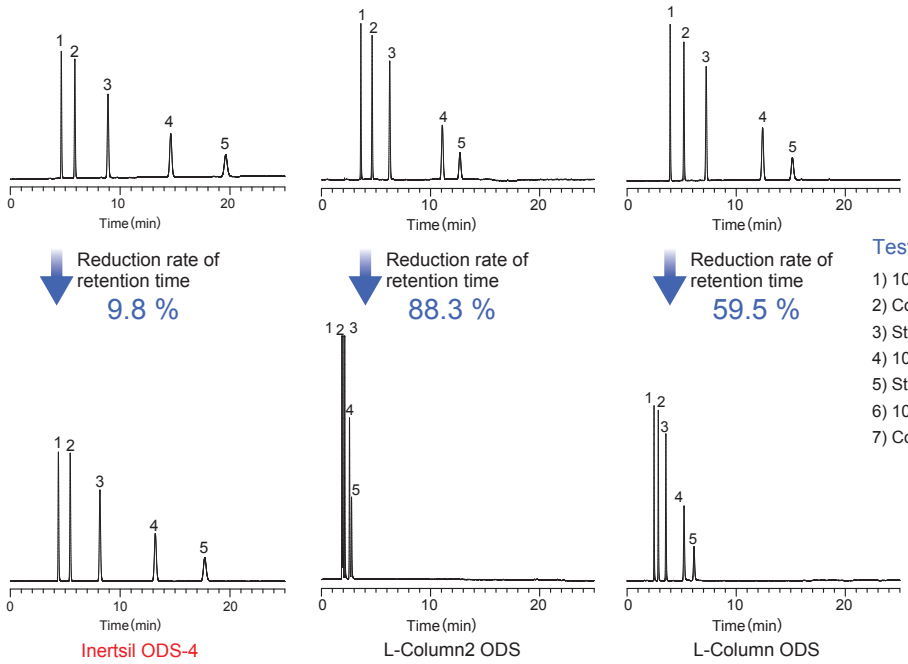
## Figure 1 : Comparison of Selectivity Between Various GL Sciences' Columns




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 | |
| HPSeries<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

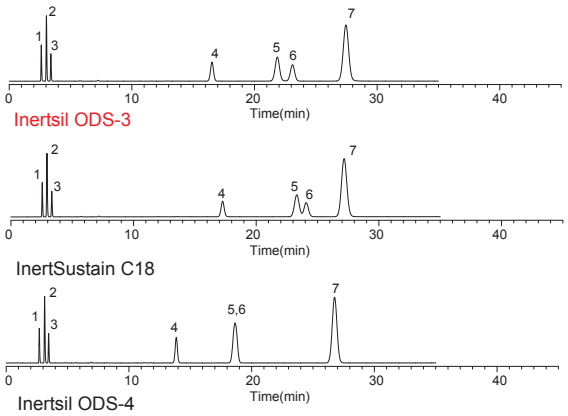
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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 still GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical, and contract research labs. As shown in Figure 1, Inertsil ODS-3 has a relatively strong retentivity compared to commercially available ODS columns. In addition, the introduction of higher surface area silica provide high preparative loading capacity without sacrificing peak shape which is illustrated in Figure 2.

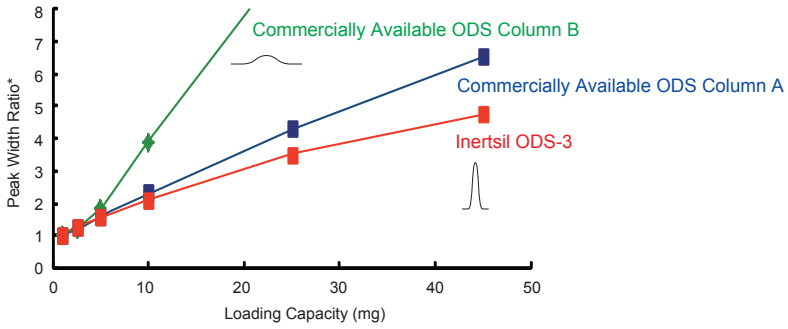
## Figure 1 : Comparison of Retentivity




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 |

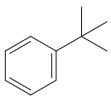
## Figure 2 : Comparison of Loading Capacity




* 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 |
| HPSeries Particle Size: 3 µm 50 MPa (500 bar) | 30 | 5020-14081 | 5020-14084 | 5020-14087 |
| | 50 | 5020-14082 | 5020-14085 | 5020-14088 |
| | 75 | 5020-14083 | 5020-14086 | 5020-14089 |
| | 100 | 5020-14011 | 5020-14014 | 5020-14017 |
| | 150 | 5020-14012 | 5020-14015 | 5020-14018 |
| | 250 | 5020-14013 | 5020-14016 | 5020-14019 |

## Analytical Columns

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

## Cartridge Guard Column E

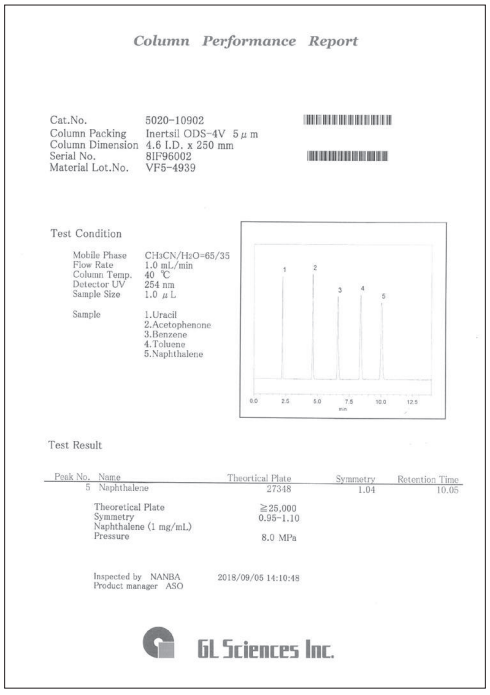
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Particle Size | | | Particle Size | | |
| | |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

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

- **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** : **11 %**
- **USP Code** : **L1**
- **pH Range** : **2 - 7.5**


Inertsil ODS-4 columns have proven superior worldwide for analysis of strong pharmaceutical bases, acids, chelating compounds, and zwitterions. The long-awaited validated Inertsil ODS-4V has now been added to our product lineup.
Each Inertsil ODS-4V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing.
By choosing Inertsil ODS-4V, you can be assured that you are using one of the most trusted and enduring HPLC columns for validation.

## Details of Column Performance Report (Front Page)



*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. 8IF96002
Material Lot.No. VF5-4939

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 | Theortical Plate | Symmetry | Retention Time |
|---|---|---|---|---|
| 5 | Naphthalene | 27348 | 1.04 | 10.05 |

| | | |
|---|---|---|
| Theoretical Plate | | ≧25,000 |
| Symmetry | | 0.95-1.10 |
| Naphthalene (1 mg/mL) | | |
| Pressure | | 8.0 MPa |

Inspected by NANBA 2018/09/05 14:10:48
Product manager ASO

GL Sciences Inc.

## Analytical Columns

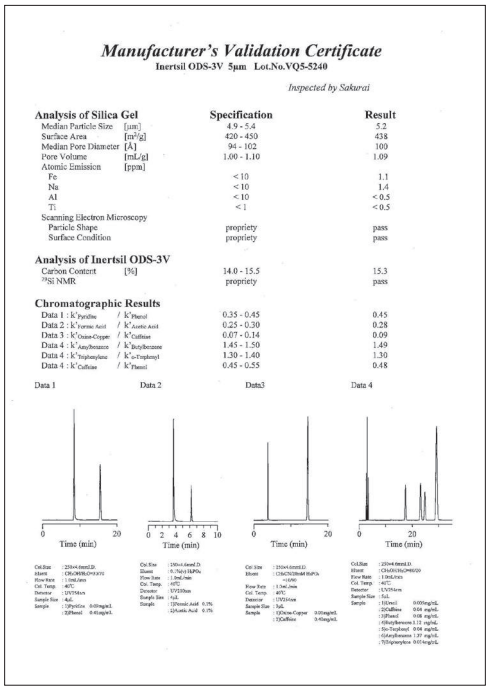
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 50 | 5020-30212 | 5020-30222 | 5020-30232 | 5020-30242 |
| | 75 | 5020-30213 | 5020-30223 | 5020-30233 | 5020-30243 |
| | 100 | 5020-30214 | 5020-30224 | 5020-30234 | 5020-30244 |
| | 150 | 5020-30215 | 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 offers all of the outstanding chromatographic benefits of Inertsil ODS-3 with the added benefit of a more thoroughly documented, validated QC procedure consistent with the demands of GLP/GMP compliance. Each Inertsil ODS-3V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing. The use of Inertsil ODS-3V columns provides an extra measure of assurance of consistent performance from column to column and batch to batch. Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies.

## Details of Manufacturer's Validation Certificate (Back Page)



*Manufacturer's Validation Certificate*

Inertsil ODS-3V 5µm Lot.No.VQ5-5240

*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' Pyridine / k' Phenol | | 0.35 - 0.45 | 0.45 |
| Data 2 : k' Formic Acid / k' Acetic Acid | | 0.25 - 0.30 | 0.28 |
| Data 3 : k' Caffeine / k' Caffeine | | 0.07 - 0.14 | 0.09 |
| Data 4 : k' Amylbenzene / k' Butylbenzene | | 1.45 - 1.50 | 1.49 |
| Data 4 : k' Triphenylene / k' o-Terphenyl | | 1.30 - 1.40 | 1.30 |
| Data 4 : k' Caffeine / k' Phenol | | 0.45 - 0.55 | 0.48 |

Data 1 Data 2 Data3 Data 4

Time (min)

## 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 | |

## Validation Packs (3-Column-Sets)

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

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

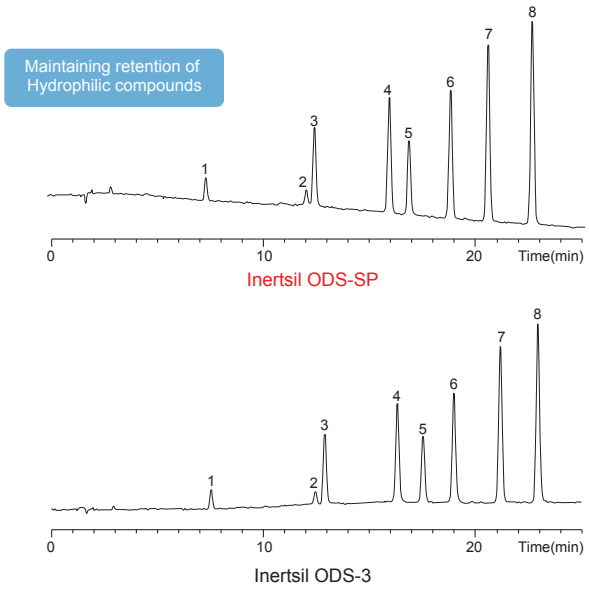
# Inertsil ODS-SP

- **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

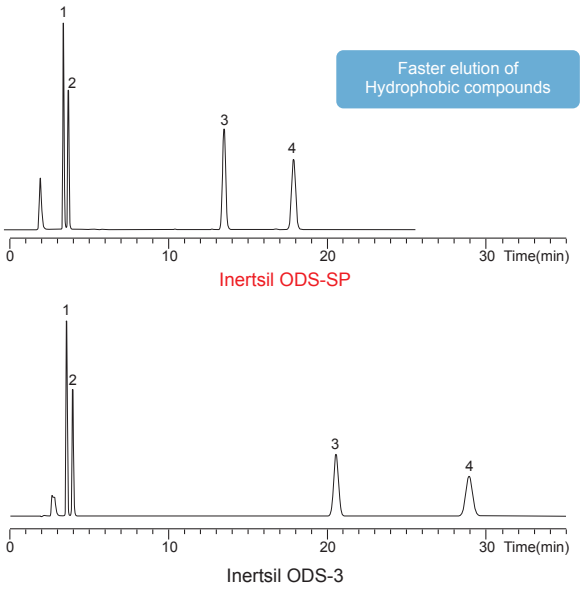

As shown in Figure 1, Inertsil ODS-SP is super base deactivated and optimally bonded to retain hydrophilic compounds without excessive retention of hydrophobic compounds achieving better separations faster than before.
As the carbon load of Inertsil ODS-SP is relatively low, it is compatible with 100 % aqueous eluents and offer faster equilibration of column for gradient analysis.

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

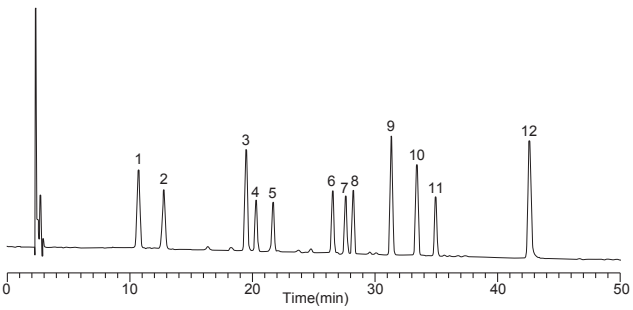
Conditions
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) $CH_3OH$
B) 10 mM $NaH_2PO_4$
A/B = 10/90 – 30 min – 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Sample : 1. Gallocatechin (GC)
2. Epigallocatechin (EGC)
3. Catechin (C)
4. Epigallocatechin gallate (EGCg)
5. Epicatechin (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 (Gl)
4. 6"-*o*-malonyldaidzin (MD)
5. 6"-*o*-malonylglycitin (MGl)
6. 6"-*o*-acetyldaidzin (AD)
7. 6"-*o*-acetylglycitin (AGl)
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 |
|---|---|---|---|---|
| HPSeries<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 |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| Particle Size: 5 µm | 20 | 5020-02711 | 5020-02721 | 5020-02731 | 5020-02741 |
| | 50 | 5020-02712 | 5020-02722 | 5020-02732 | 5020-02742 |
| | 75 | 5020-02713 | 5020-02723 | 5020-02733 | 5020-02743 |
| | 100 | 5020-02714 | 5020-02724 | 5020-02734 | 5020-02744 |
| | 150 | 5020-02715 | 5020-02725 | 5020-02735 | 5020-02745 |
| | 250 | 5020-02716 | 5020-02726 | 5020-02736 | 5020-02746 |

## Cartridge Guard Column E

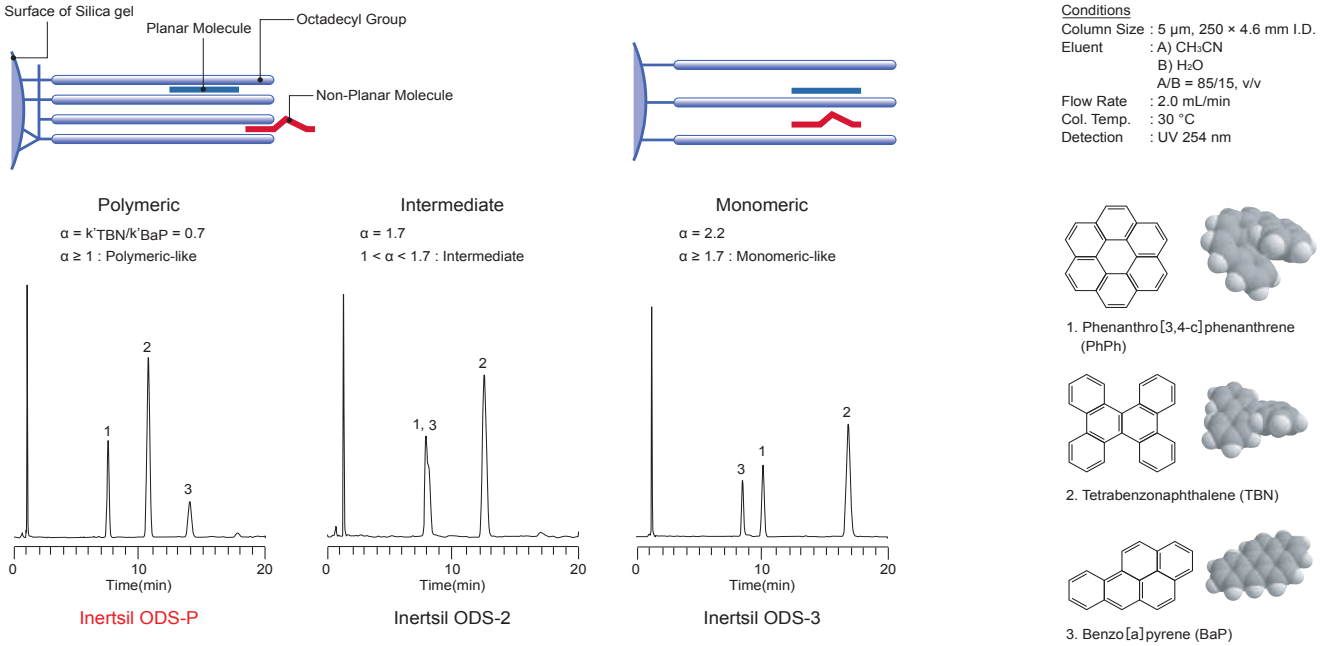
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# Inertsil ODS-P

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


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

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

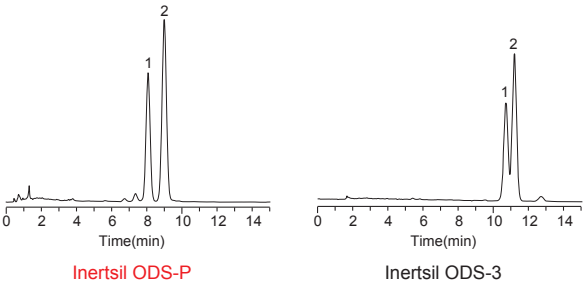



Conditions
Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 85/15, v/v
Flow Rate : 2.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm

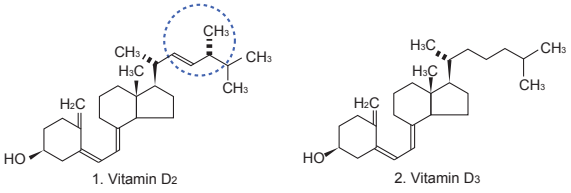


1. Phenanthro[3,4-c]phenanthrene (PhPh)
2. Tetrabenzonaphthalene (TBN)
3. Benzo[a]pyrene (BaP)

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




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



1. Vitamin $D_2$
2. Vitamin $D_3$

## Analytical Columns

| | | | | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 33 | 5020-84731 | 5020-84741 | | |
| | 50 | 5020-84732 | 5020-84742 | | |
| | 75 | 5020-84733 | 5020-84743 | | |
| | 100 | 5020-84734 | 5020-84744 | | |
| | 150 | 5020-84735 | 5020-84745 | | |
| | 250 | 5020-84736 | 5020-84746 | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 33 | 5020-04661 | 5020-04671 | 5020-04681 | 5020-04691 |
| | 50 | 5020-04662 | 5020-04672 | 5020-04682 | 5020-04692 |
| | 75 | 5020-04663 | 5020-04673 | 5020-04683 | 5020-04693 |
| | 100 | 5020-04664 | 5020-04674 | 5020-04684 | 5020-04694 |
| | 150 | 5020-04665 | 5020-04675 | 5020-04685 | 5020-04695 |
| | 250 | 5020-04666 | 5020-04676 | 5020-04686 | 5020-04696 |
| Particle Size: 5 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 33 | 5020-84711 | 5020-84721 | | |
| | 50 | 5020-84712 | 5020-84722 | | |
| | 75 | 5020-84713 | 5020-84723 | | |
| | 100 | 5020-84714 | 5020-84724 | | |
| | 150 | 5020-84715 | 5020-84725 | | |
| | 250 | 5020-84716 | 5020-84726 | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 33 | 5020-04711 | 5020-04721 | 5020-04731 | 5020-04741 |
| | 50 | 5020-04712 | 5020-04722 | 5020-04732 | 5020-04742 |
| | 75 | 5020-04713 | 5020-04723 | 5020-04733 | 5020-04743 |
| | 100 | 5020-04714 | 5020-04724 | 5020-04734 | 5020-04744 |
| | 150 | 5020-04715 | 5020-04725 | 5020-04735 | 5020-02001 |
| | 250 | 5020-04716 | 5020-04726 | 5020-04736 | 5020-02002 |

## Cartridge Guard Column E

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

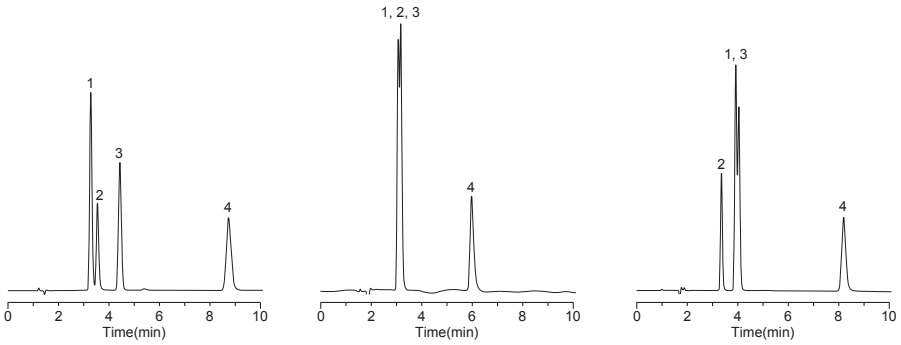
# Inertsil ODS-EP

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 5 µm
- **Surface Area** : 450 $m^2$/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Octadecyl
- **End-capping** : No
- **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.

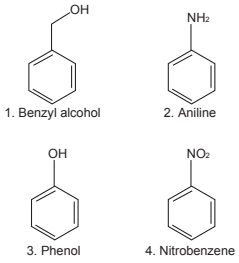
## Figure 1 : Comparison of Selectivity



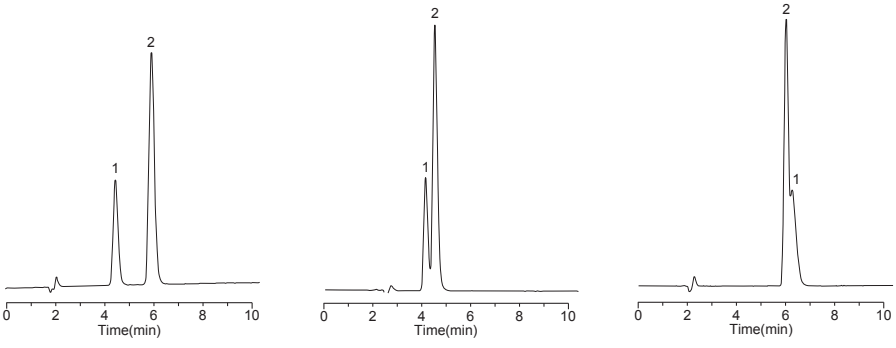

Inertsil ODS-EP | Inertsil Ph-3 | Inertsil C8-3

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



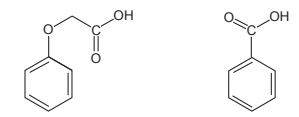

## Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase




Inertsil ODS-EP | Inertsil Ph-3 | Inertsil ODS-3

Conditions

Column Size : 5 µm, 150 × 3.0 mm I.D.
Eluent : A) $CH_3OH$
B) 0.1 % HCOOH in $H_2O$
A/B = 50/50, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm



## Analytical Columns

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

## Cartridge Guard Column E

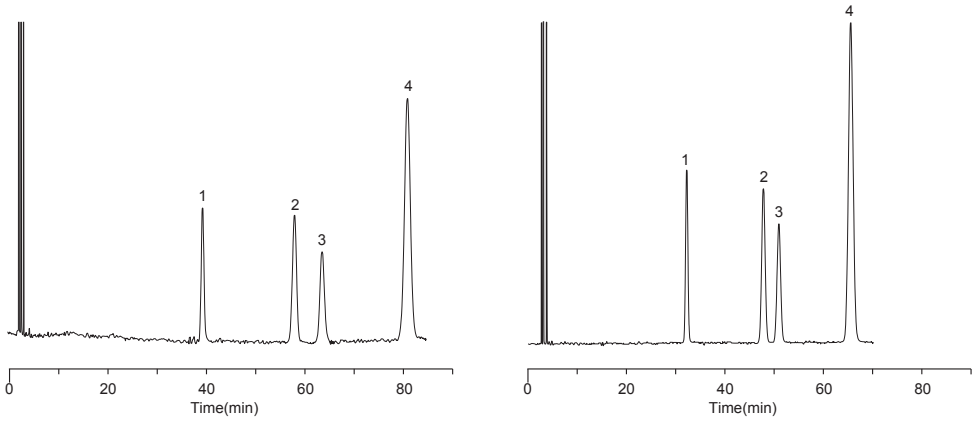
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 1.0 | 10 | 1.0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

# Inertsil ODS-80A

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


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

## Figure 1 : Comparison with Inertsil ODS-2

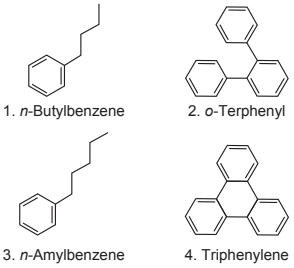



Guaranteed Number of Theoretical Plates Above 25,000
Inertsil ODS-80A[Pore Size 80 Å(8 nm)]

Guaranteed Number of Theoretical Plates Above 22,000
Inertsil ODS-2[Pore Size 150 Å(15 nm)]

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



1. *n*-Butylbenzene
2. *o*-Terphenyl
3. *n*-Amylbenzene
4. Triphenylene

## Analytical Columns

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

## 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 | 5020-19140 | 5020-19190 |
| 4.0, 4.6 | | 4.0 | 5020-19040 | 5020-19090 |
| 2.1, 3.0 | 20 | 3.0 | 5020-19540 | 5020-19590 |
| 4.0, 4.6 | | 4.0 | 5020-19440 | 5020-19490 |
| Holder for Cartridge Guard Column E | | | For 10 mm Length | 5020-08500 |
| | | | For 20 mm Length | 5020-08550 |

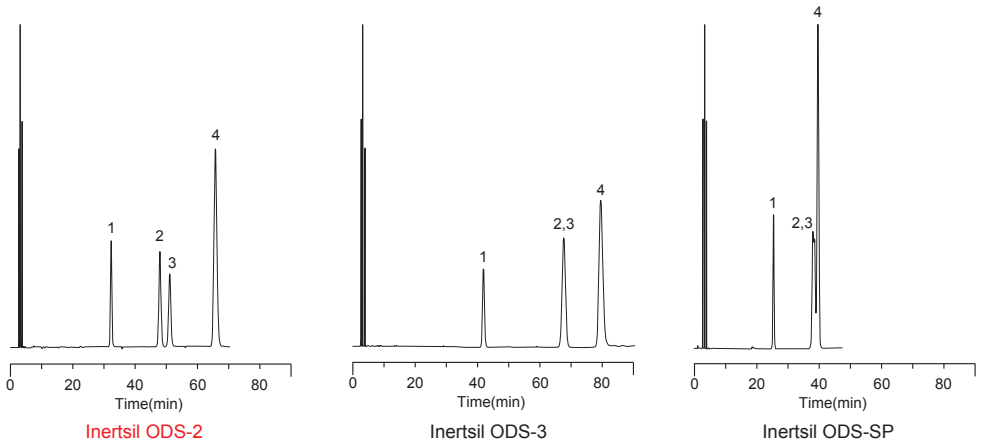

Inertsil® ODS
4.6 x 250 mm
Inertsil ODS-3V
Validation Support Column

# 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**

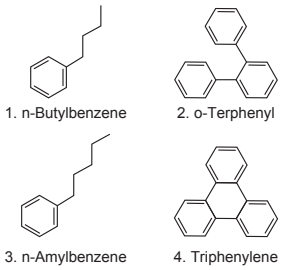

Inertsil ODS-2 columns have a pore size of 150 Å offering symmetric peaks for bases, acids with low pressure. When Inertsil ODS-2 was introduced in 1987s, this HPLC transformed the entire industry. Inertsil ODS-2 was the first HPLC phase created using ultra high purity silica, which produced superior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

## Figure 1 : Comparison of Retentivity




Conditions

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




## Analytical Columns

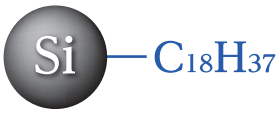
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
|---|---|---|---|---|---|
| Particle Size: 5 µm | 150 | 5020-01121 | 5020-01122 | 5020-01123 | 5020-01124 |
| | 250 | 5020-01125 | 5020-01126 | 5020-01127 | 5020-01128 |

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

## 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

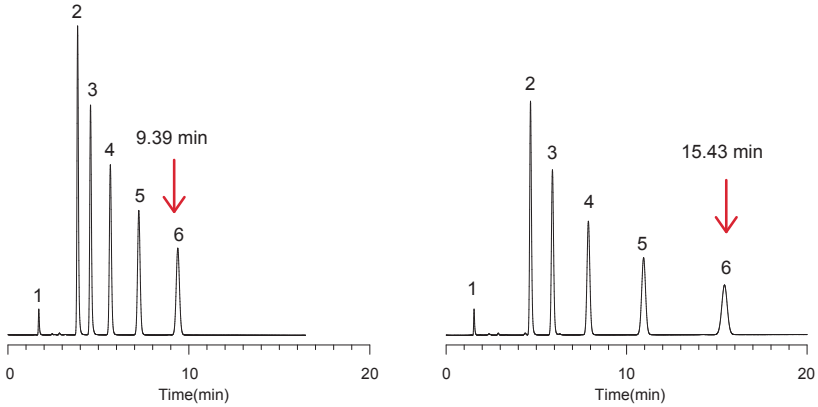
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 5 µm | 10 µm | 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** : **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 delivering the same extreme inertness to any type of compounds just like InertSustain C18, which enables rapid analysis of highly hydrophobic compounds delivering symmetric peaks at a wide range of pH.

## Figure 1 : Comparison of Retentivity

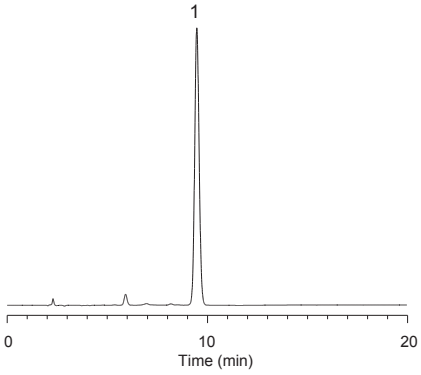



Conditions

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 |
| HPSeries<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

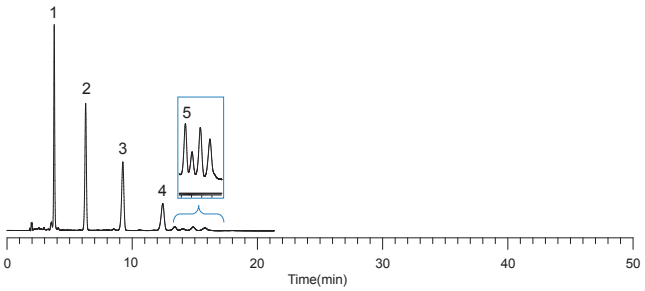
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

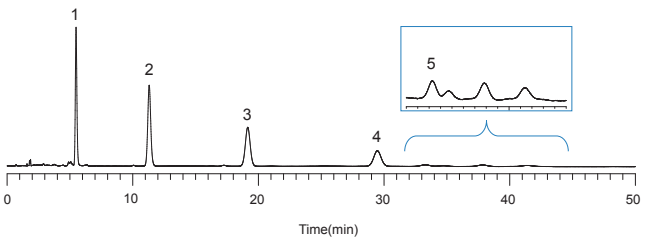
- **Base Material** : **High Purity ES Silica Gel**
- **Particle Size** : **1.9 µm, 3 µm, 5 µm**
- **Surface Area** : **200 $m^2$/g**
- **Pore Size** : **200 Å (20 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Functional Group** : **Octyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **6%**
- **USP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


InertSustainSwift C8 is an octyl group (C8) bonded column offering the same extreme inertness to any type of compounds just like InertSustainSwift C18, which is ideal for analyzing low polarity analytes. In addition, the optimized 200 Å pore size silica enables to analyze and retain peptides and oligonucleotides which have a molecular weight from several kDa to several dozen kDa.

## Figure 1 : Comparison of Retentivity




InertSustainSwift C8

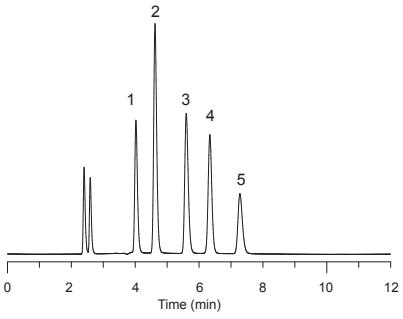



InertSustain C8

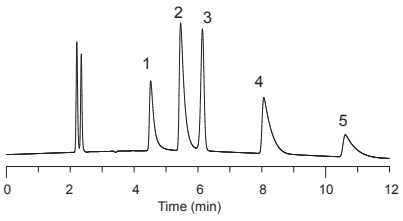
Conditions

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

## Figure 2 : Analysis of Antihistamines




InertSustainSwift C8




Hypersil BDS C8

Conditions

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

## Analytical Columns

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

| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.6 |
|---|---|---|---|---|
| HP Series<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

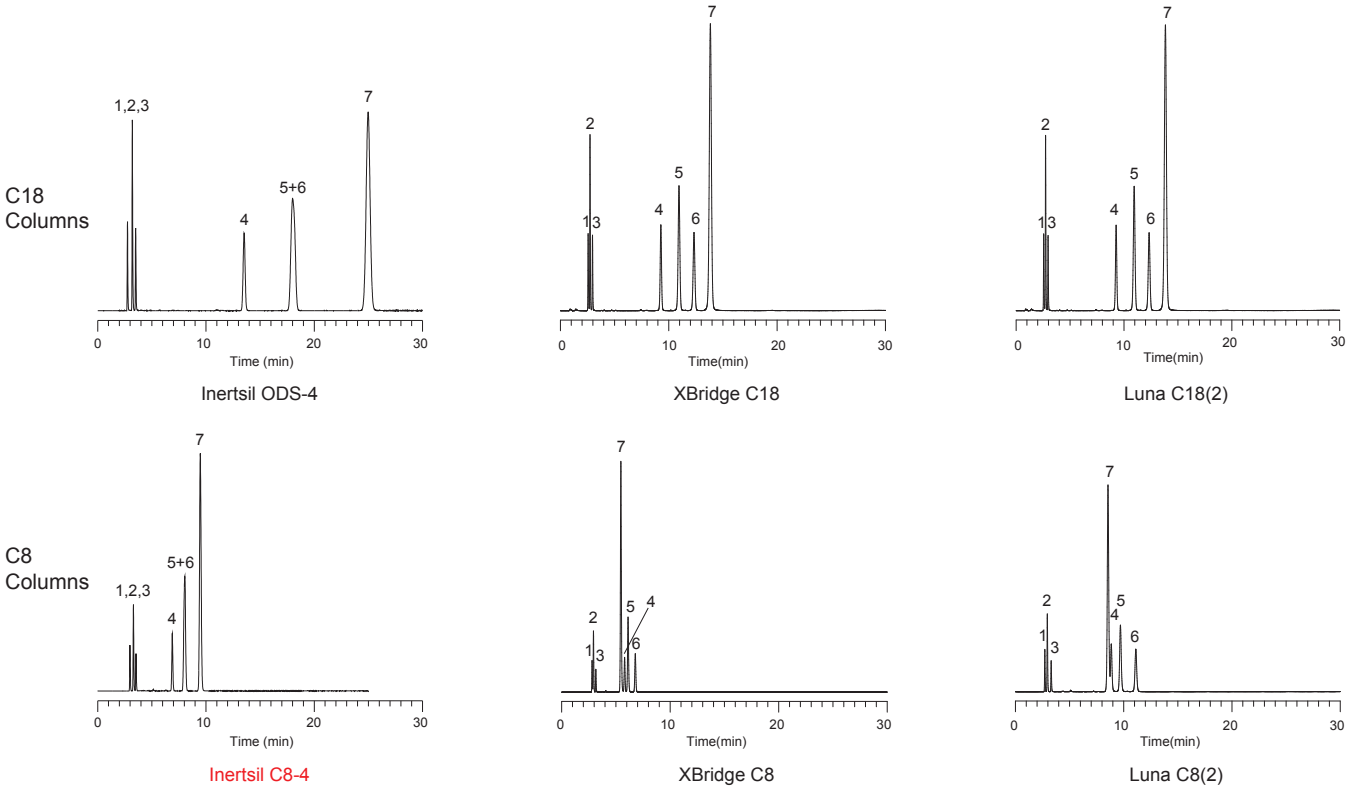
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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


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

## Figure 1 : Comparison of Separation Pattern between 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 | |
| HPSeries<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

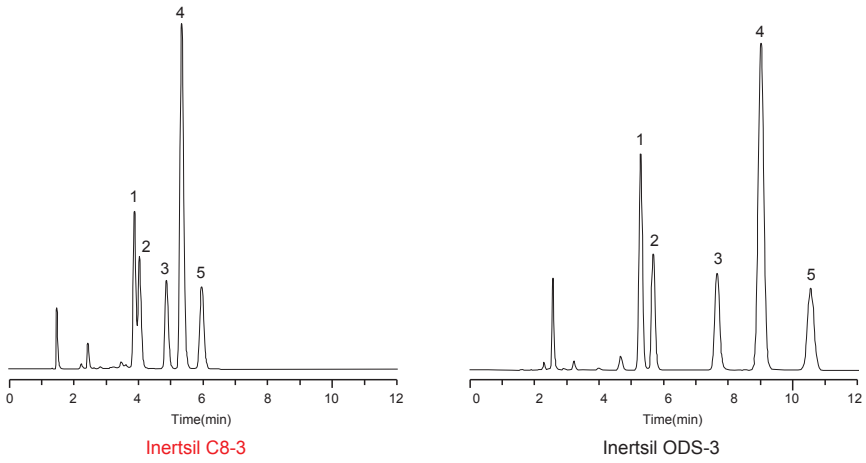
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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


The same base silica gel and bonding technology that is used for Inertsil ODS-3 is also employed for Inertsil C8-3.
The difference between the two phases is just the length of the hydrocarbon ligands. As shown in Figure 2, 10 µm particle size columns are also available to meet the requirement of various pharmacopeia methods. We recommend InertSustain C8 columns for all new method development.

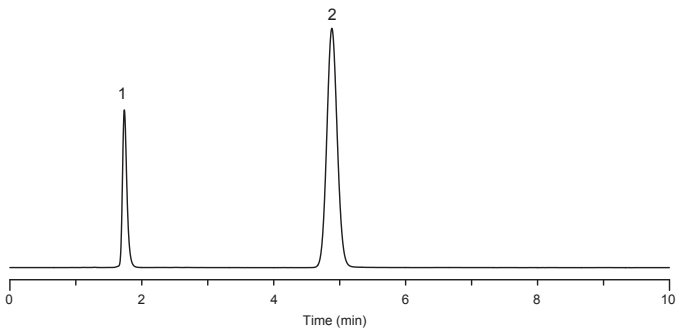
## Figure 1 : Comparison of Retentivity




Conditions

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

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




Conditions

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

## Analytical Columns

| | Length \ I.D. (mm) | 2.1 | 3.0 | |
|---|---|---|---|---|
| Particle Size: 2 µm | 30 | 5020-84930 | 5020-84935 | |
| | 50 | 5020-84931 | 5020-84936 | |
| | 75 | 5020-84932 | 5020-84937 | |
| | 100 | 5020-84933 | 5020-84938 | |
| | 150 | 5020-84934 | 5020-84939 | |

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

| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 33 | 5020-84811 | 5020-84821 | | |
| | 50 | 5020-84812 | 5020-84822 | | |
| | 75 | 5020-84813 | 5020-84823 | | |
| | 100 | 5020-84814 | 5020-84824 | | |
| | 150 | 5020-13522 | 5020-13520 | | |
| | 250 | 5020- | 5020- | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 33 | 5020-04811 | 5020-04821 | 5020-04831 | 5020-04841 |
| | 50 | 5020-04812 | 5020-04822 | 5020-04832 | 5020-04842 |
| | 75 | 5020-04813 | 5020-04823 | 5020-04833 | 5020-01910 |
| | 100 | 5020-04814 | 5020-04824 | 5020-01913 | 5020-04844 |
| | 125 | 5020-04817 | 5020-04827 | 5020-04837 | 5020-04845 |
| | 150 | 5020-04815 | 5020-04825 | 5020-04835 | 5020-01911 |
| | 250 | 5020-04816 | 5020-04826 | 5020-04836 | 5020-01912 |

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

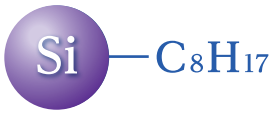
| | Length \ I.D. (mm) | 4.6 |
|---|---|---|
| Particle Size: 10 µm | 150 | 5020-01641 |
| | 250 | 5020-01642 |

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

## Analytical Columns

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

## Cartridge Guard Column E

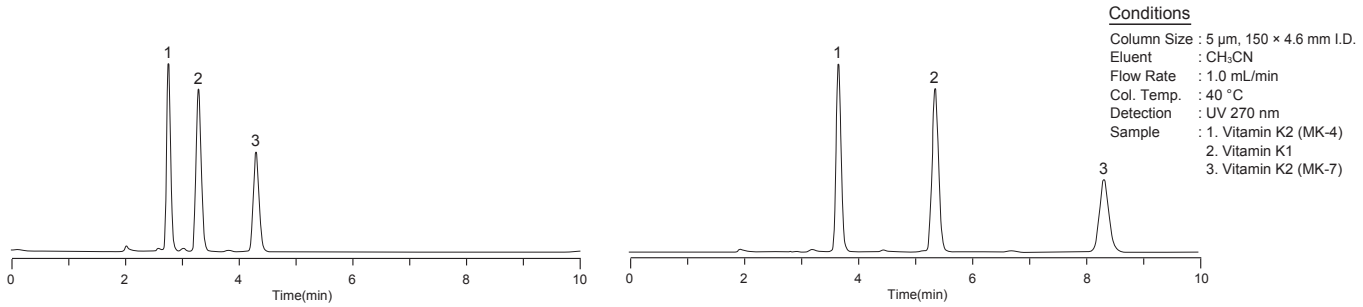
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 2.1, 3.0 | 10 | 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 columns have a pore size of 150 Å and is recommended for rapid analysis of highly hydrophobic compounds such as fat-soluble vitamins.

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




## Analytical Columns

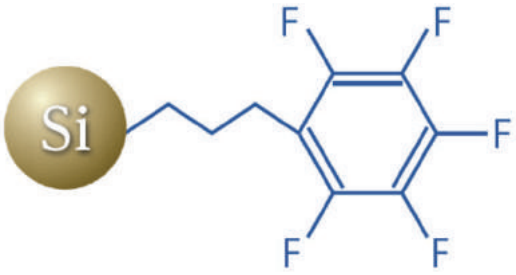
| Particle Size: 5 µm | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
|---|---|---|---|---|---|
| | 150 | 5020-01421 | 5020-01422 | 5020-01423 | 5020-01424 |
| | 250 | 5020-01425 | 5020-01426 | 5020-01427 | 5020-01428 |

## 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 |

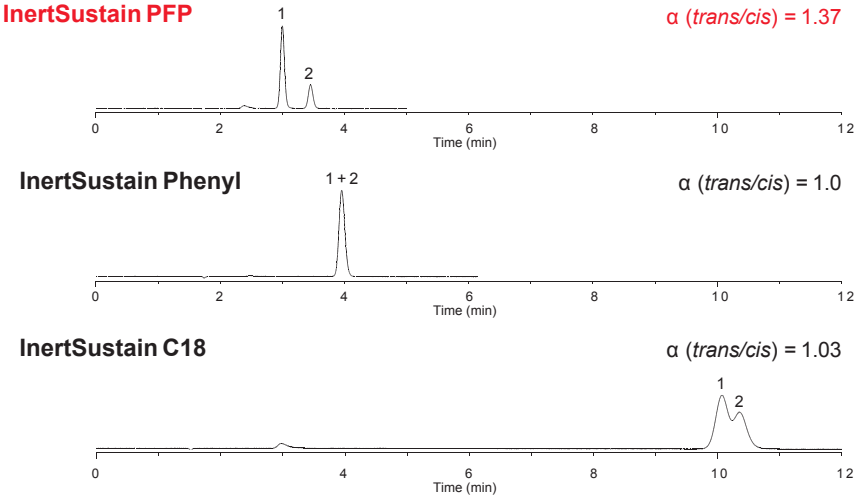
# InertSustain PFP

- **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**




InertSustain PFP columns are bonded with pentafluorophenyl groups to our newly developed ES silica gel, which delivers unique separation patterns with excellent peak shape and sensitivity. The chromatographic difference stems from the fact that the PFP phases provide interactions such as π-π, dipole, hydrogen bonding, and ionic interactions unlike conventional PFP columns.

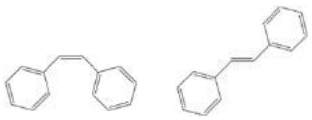
## Figure 1 : Comparison of selectivity between reversed phase columns




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

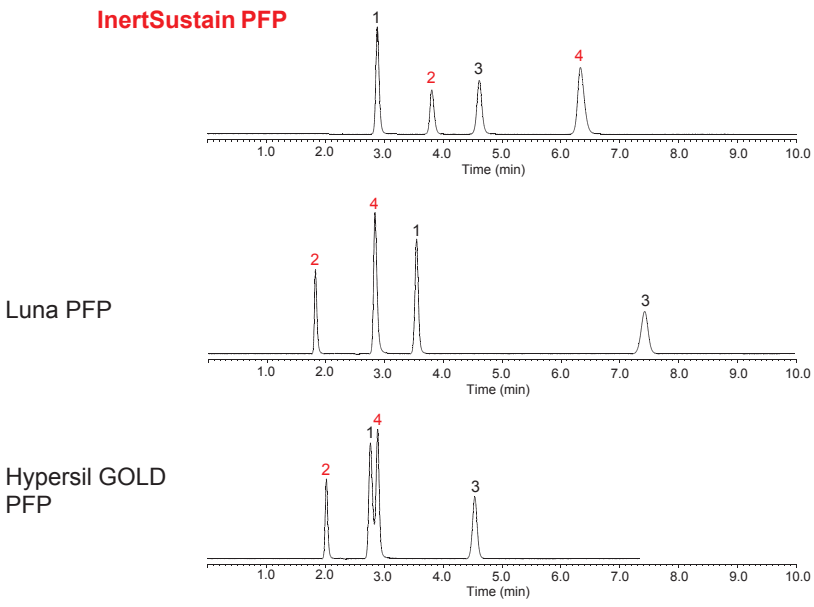


1. *cis*-Stilbene (*cis*)

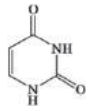


2. *trans*-Stilbene (*trans*)

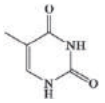
## Figure 2: Comparison of high polarity compounds analysis




Middle Compound Compound

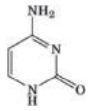


1 : Uracil

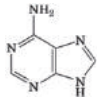


3 : Thymine

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 |
| Particle Size: 5 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 30 | 5020-87741 | 5020-87747 | | |
| | 50 | 5020-87742 | 5020-87748 | | |
| | 75 | 5020-87743 | 5020-87749 | | |
| | 100 | 5020-87744 | 5020-87750 | | |
| | 150 | 5020-87745 | 5020-87751 | | |
| | 250 | 5020-87746 | 5020-87752 | | |
| | 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

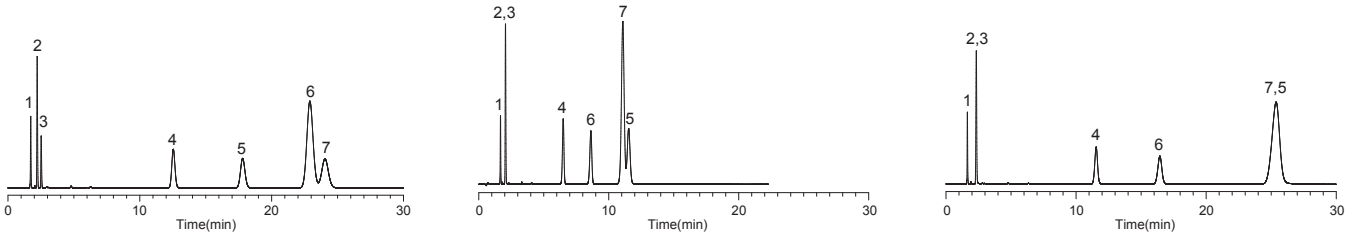
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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 columns are bonded with phenylhexyl groups, which employs a phenyl ring with a hexyl (6-carbon) linker and is densely bonded to our newly developed ES silica gel delivering complementary selectivity to straight alkyl-chain columns, but with industry leading inertness, lot-to-lot reproducibility and low back pressure.

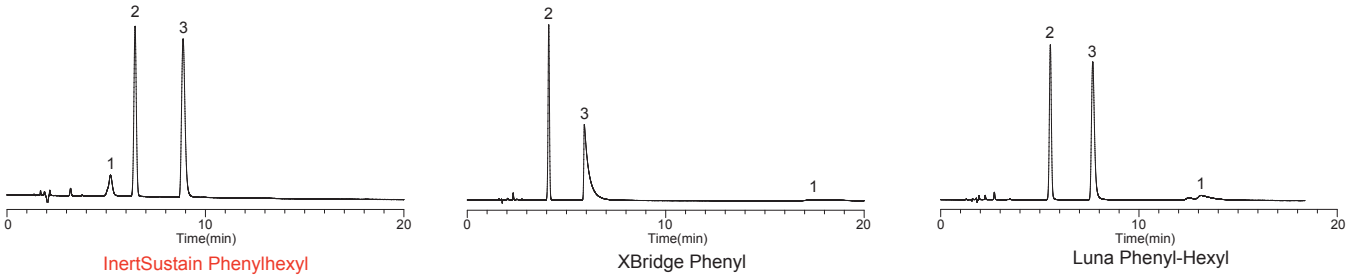
## Figure 1 : Comparison of Selectivity




Conditions

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

## Figure 2 : Analysis of Acidic Compounds




Conditions

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

## Analytical Columns

| | Length \ I.D.(mm) | 2.1 | 3.0 | 4.6 |
|---|---|---|---|---|
| HP Series<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 |

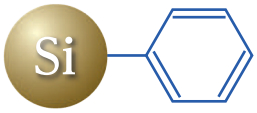
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-89160 | 5020-89166 | | |
| | 50 | 5020-89161 | 5020-89167 | | |
| | 75 | 5020-89162 | 5020-89168 | | |
| | 100 | 5020-89163 | 5020-89169 | | |
| | 150 | 5020-89164 | 5020-89170 | | |
| | 250 | 5020-89165 | 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 |
| Particle Size: 5 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 30 | 5020-89038 | 5020-89044 | | |
| | 50 | 5020-89039 | 5020-89045 | | |
| | 75 | 5020-89040 | 5020-89046 | | |
| | 100 | 5020-89041 | 5020-89047 | | |
| | 150 | 5020-89042 | 5020-89048 | | |
| | 250 | 5020-89043 | 5020-89049 | | |
| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
| | 30 | 5020-89001 | 5020-89008 | 5020-89015 | 5020-89022 |
| | 50 | 5020-89002 | 5020-89009 | 5020-89016 | 5020-89023 |
| | 75 | 5020-89003 | 5020-89010 | 5020-89017 | 5020-89024 |
| | 100 | 5020-89004 | 5020-89011 | 5020-89018 | 5020-89025 |
| | 150 | 5020-89005 | 5020-89012 | 5020-89019 | 5020-89026 |
| | 250 | 5020-89006 | 5020-89013 | 5020-89020 | 5020-89027 |

## Cartridge Guard Column E

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

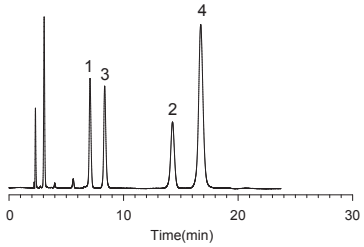
# InertSustain Phenyl

- **Silica** : **High Purity ES Silica Gel**
- **Particle Size** : **2 µm, 3 µm, 5 µm**
- **Surface Area** : **350 $m^2$/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **0.85 mL/g**
- **Functional Group** : **Phenyl**
- **End-capping** : **No**
- **Carbon Loading** : **10 %**
- **USP Code** : **L11**
- **pH Range** : **2 - 7.5**

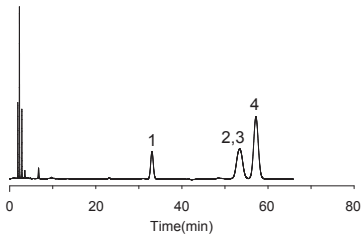



InertSustain Phenyl delivers an extremely unique reverse phase characteristics that are critical to resolving compounds that could not be separated on a C18 or C8 phase. InertSustain Phenyl provides not only pi-pi interactions, but also hydrogen bonding secondary interactions, which results in retaining polar compounds at the same time. As the phenyl groups are directly bonded to the silica gel, InertSustain Phenyl is compatible with the analysis of structural isomers due to it's high stereo-selectivity (Figure 2) while other alkyl phenyl type columns fails to separate.

## Figure 1 : Comparison of Selectivity



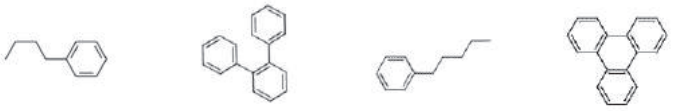

InertSustain Phenyl




InertSustain C18

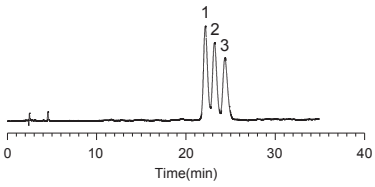
Conditions

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

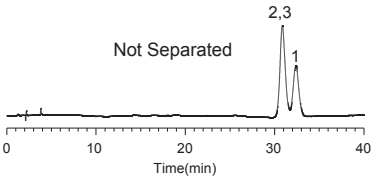


1. Butylbenzene
2. *o* -Terphenyl (Non - Planar Structure)
3. Amylbenzene
4. Triphenylene (Planar Structure)

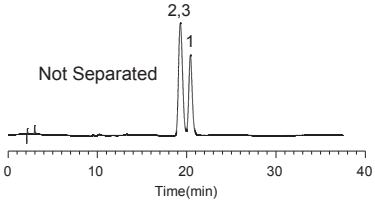
## Figure 2 : Analysis of Structural Isomers (Positional Isomers of Cresol)




InertSustain Phenyl



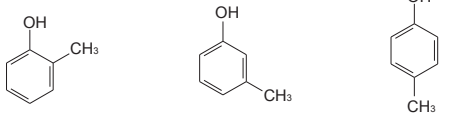

Ascentis Phenyl




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 | |
| HPSeries<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 | |

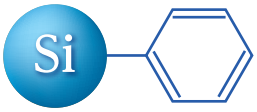
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-16468 | 5020-16474 | | |
| | 50 | 5020-16469 | 5020-16475 | | |
| | 75 | 5020-16470 | 5020-16476 | | |
| | 100 | 5020-16471 | 5020-16477 | | |
| | 150 | 5020-16472 | 5020-16478 | | |
| | 250 | 5020-16473 | 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 |

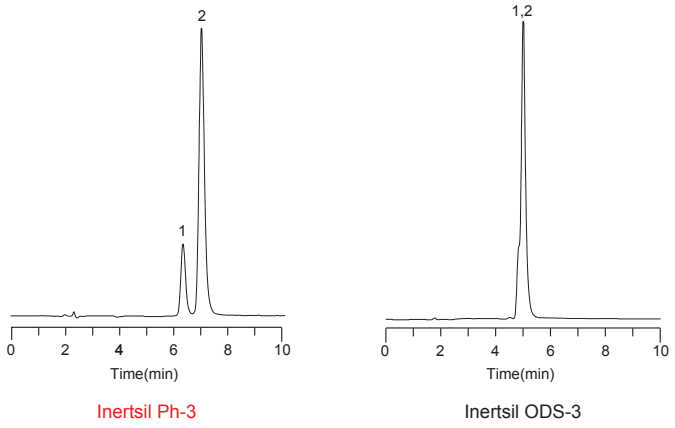
# Inertsil Ph-3

- **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** : No
- **Carbon Loading** : 9.5 %
- **USP Code** : L11
- **pH Range** : 2 - 7.5



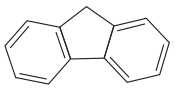

Just like InertSustain Phenyl, Inertsil Ph-3 have phenyl groups directly bonded to the silica gel which provides pure reverse phase characteristics that are critical to resolving highly polar compounds like acidic and basic pharmaceuticals. The near perfect phenyl phase coverage on this material results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

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

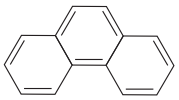



Conditions

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

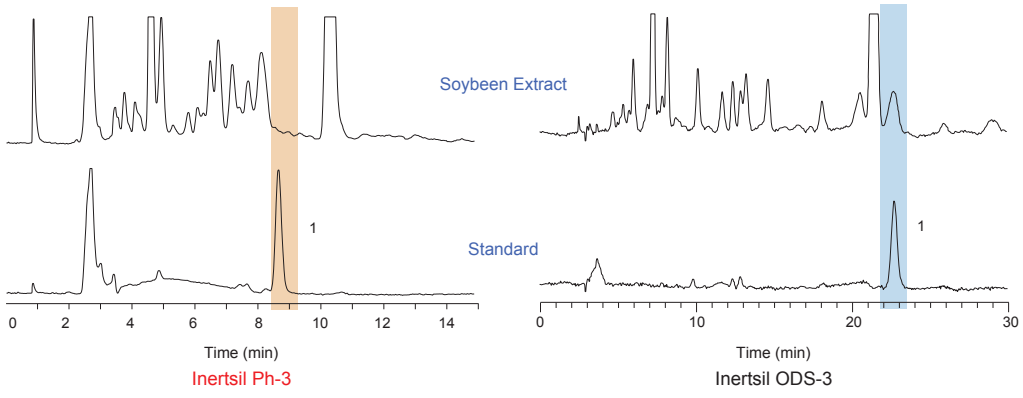


1. Fluorene



2. Phenanthrene

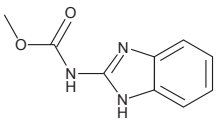
## Figure 2 : Application on Pesticide Detection Test




Conditions

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

Sample :



1. Carbendazim

## Analytical Columns

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

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

## Cartridge Guard Column E

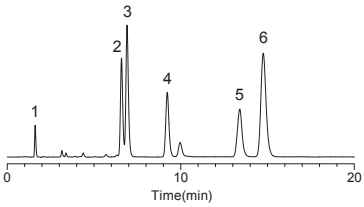
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# Inertsil Ph

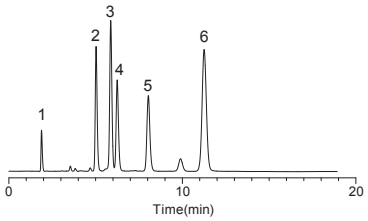
- **Silica** : **2 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **320 $m^2$/g**
- **Pore Size** : **150 Å (15 nm)**
- **Pore Volume** : **1.20 mL/g**
- **Functional Group** : **Phenethyl**
- **End-capping** : **Yes**
- **Carbon Loading** : **10 %**
- **USP Code** : **L11**
- **pH Range** : **2 - 7**


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

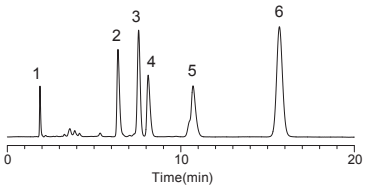
## Figure 1 : Comparison of Selectivity




Inertsil Ph




Inertsil Ph-3

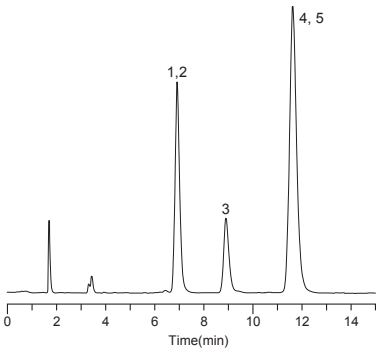



InertSustain Phenyl

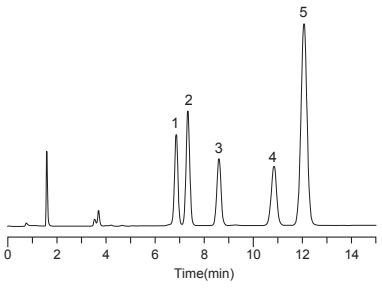
Conditions

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

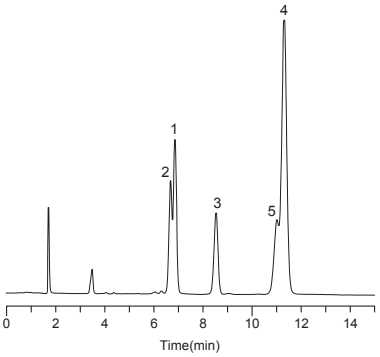
## Figure 2 : Comparison of Selectivity




Inertsil Ph



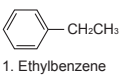

Inertsil Ph-3




other brand's Phenyl Column

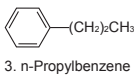
Conditions

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

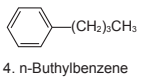



1. Ethylbenzene

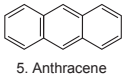
2. Naphthalene




3. n-Propylbenzene




4. n-Buthylbenzene



5. Anthracene

## Analytical Columns

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

## Cartridge Guard Column E

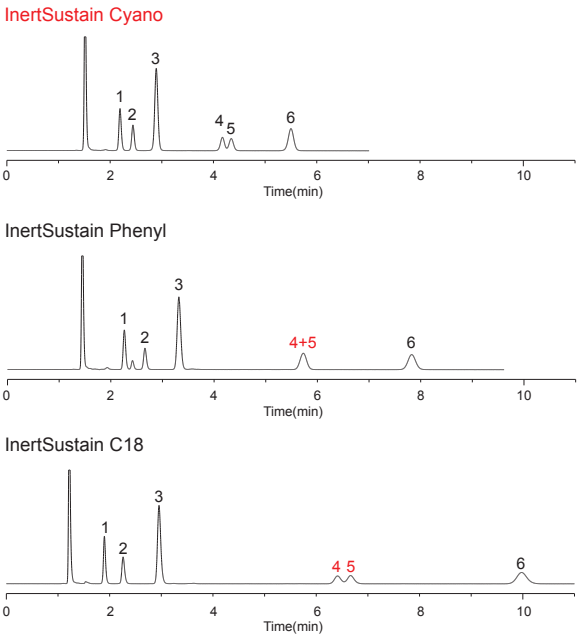
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 2.1, 3.0 | 10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

# InertSustain Cyano

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


In general, the stability and reproducibility of the Cyano phase available in the market are poor. Many batch-to-batch or lot-to-lot reproducibility issues are occurring at many laboratories.The InertSustain Cyano columns were developed to resolve these problems and are designed using the most modern LC column technology available providing them to be extremely inert, stable and reproducible.
The InertSustain Cyano columns are highly recommended for all pharmacopeia methods requiring a Cyano phase to be used. (Ex: USP L10)

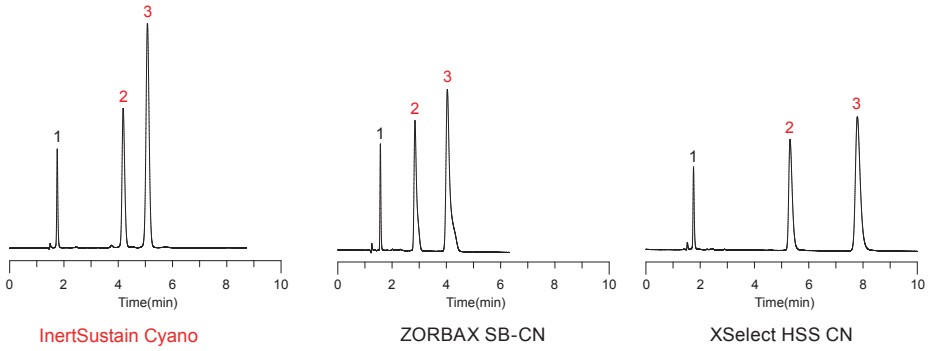
## Figure 1 : Comparison of Selectivity




Conditions

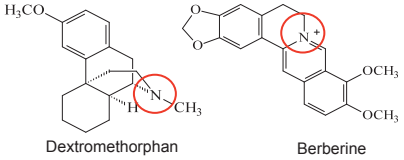
| | |
|---|---|
| Column Size | : 5 µm,150 × 4.6 mm I.D. |
| Eluent | : A) $CH_3CN$ B) 0.1 % $H_3PO_4$ A/B = 25/75, v/v |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 280 nm |
| Sample | : 1. 4-Hydroxybenzamide<br>2. Hydroquinone<br>3. 4-Hydoroxybenzoic acid<br>4. Phenol<br>5.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

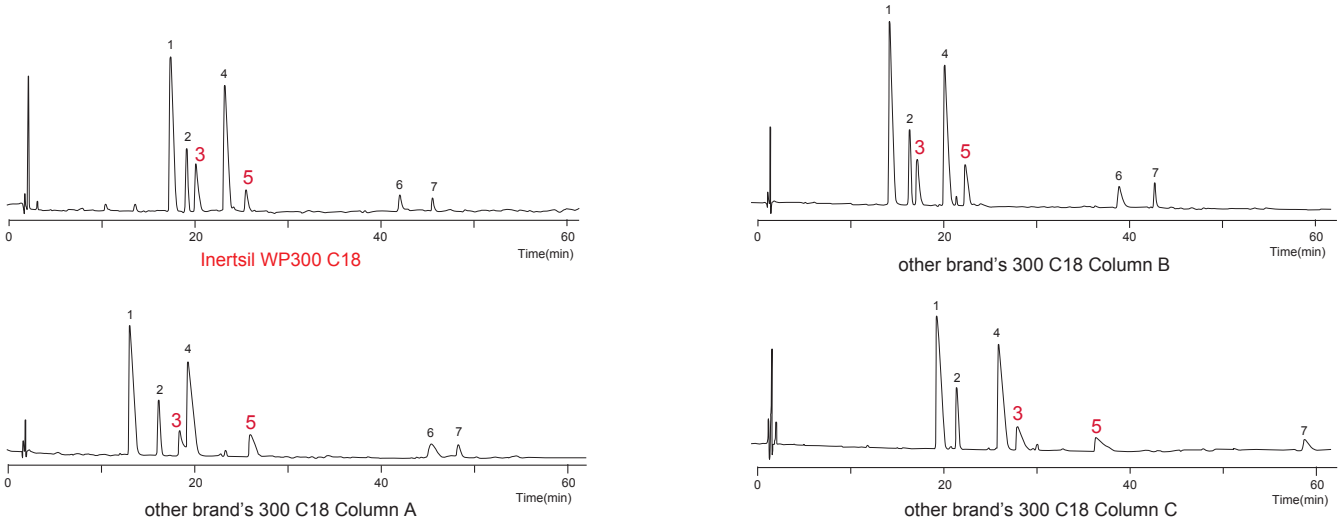
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible separations of proteins and peptides.
The results of GL Sciences' original end-capping technique are shown in Figure 1, which provide high efficiency and good peak shape for proteins and peptides.

## Figure 1 : Comparison with Other Brands



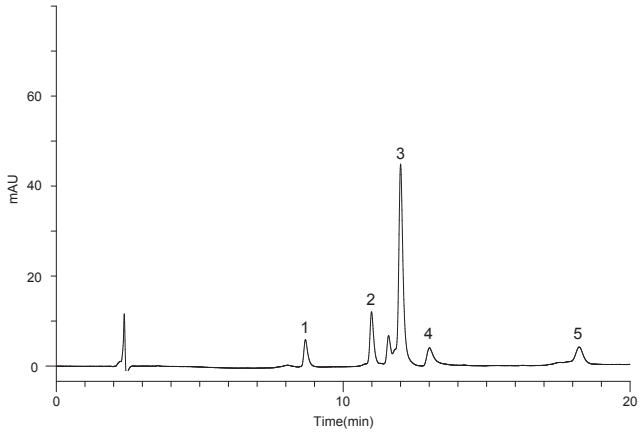

Conditions

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

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

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

## Figure 2 : Analysis of Proteins




Conditions

Column : Inertsil WP300 C18 (5 µm, 150 × 3.0 mm I.D.)
Eluent : A) 0.1 % TFA in $CH_3CN$
B) 0.1 % TFA in $H_2O$
A/B = 20/80 – 20 min – 70/30, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Injection Vol. : 10 µL
Sample : 1. Ribonuclease B
2. Cytochrome C
3. Lysozyme
4. BSA
5. Ovalbumin

## Analytical Columns

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

## Cartridge Guard Column E

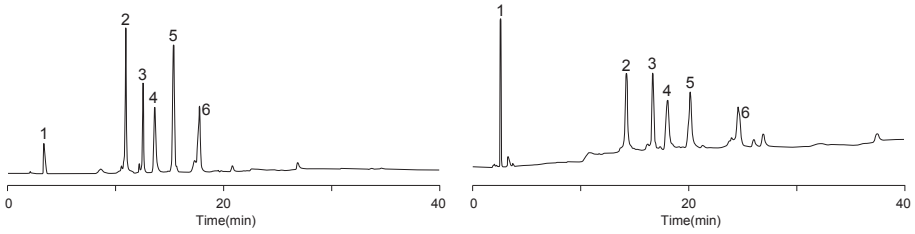
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 1.0 | 10 | 1.0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

# Inertsil WP300 C8

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


Inertsil WP300 C8 (wide pore size of 300 Å) columns bring the same legendary performance of Inertsil's narrow-pore HPLC products to columns designed specifically for the reproducible rapid separations of proteins and peptides.
As shown in Figure 1, Inertsil WP300 C8 delivers rapid analysis with sharper peaks compared to Inertsil WP300 C18.

## Figure 1 : Comparison with Inertsil WP300 C18




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 |

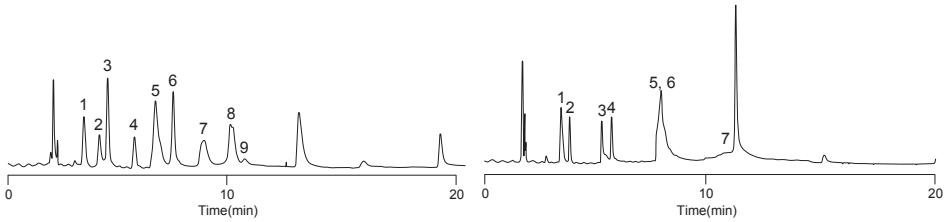
# Inertsil WP300 C4

- **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** : **No**
- **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). Also, an optimal polar group is embedded between silica surface and butyl group, which reduces adsorption of basic compounds and fat-soluble proteins. Inertsil WP300 C4 is recommended for the analysis of large, highly fat-soluble proteins and peptides as illustrated in Figure 1.

## Figure 1 : Comparison of Performance




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

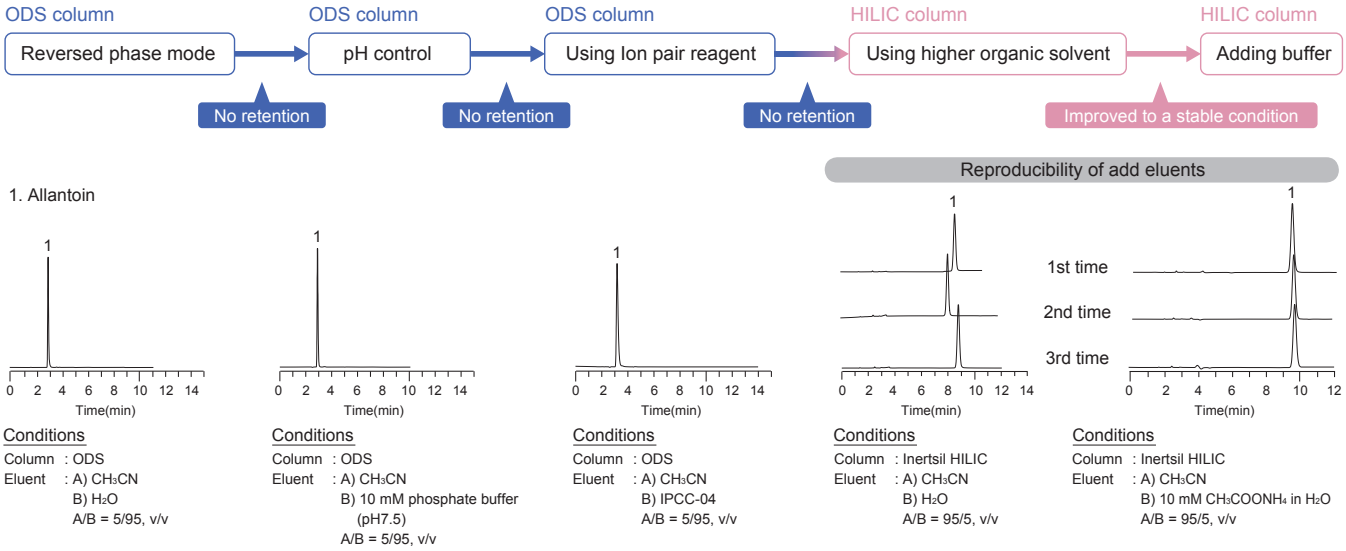
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 1.0 | 10 | 1.0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

HILIC is, abbreviated name for Hydrophilic Interaction Chromatography, and it was developed as an alternative to reversed phase chromatography for highly polar compounds (Figure1). Inertsil HILIC is the column which chemically bonded with diol group, and it provides excellent peak shape for neutral and basic compounds. In HILIC mode, generally when organic concentration is raised, it shows a strong retention (Figure 2). Moreover, it can get more stable analysis by adding basic solvent to the eluate, such as ammonium acetate.

## Figure 1 : Separation Mode from Reversed Phase to HILIC




Conditions
Column : ODS
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 5/95, v/v

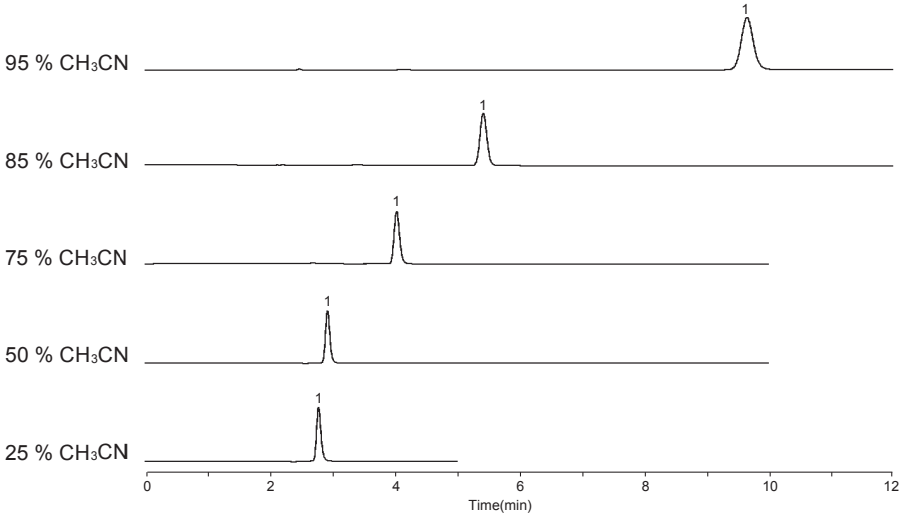
Conditions
Column : ODS
Eluent : A) $CH_3CN$
B) 10 mM phosphate buffer (pH7.5)
A/B = 5/95, v/v

Conditions
Column : ODS
Eluent : A) $CH_3CN$
B) IPCC-04
A/B = 5/95, v/v

Conditions
Column : Inertsil HILIC
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 95/5, v/v

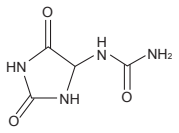
Conditions
Column : Inertsil HILIC
Eluent : A) $CH_3CN$
B) 10 mM $CH_3COONH_4$ in $H_2O$
A/B = 95/5, v/v

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




Conditions
Column : Inertsil HILIC (5 µm, 250 × 3.0 mm I.D.)
Eluent : A) $CH_3CN$
B) 10 mM $CH_3COONH_4$ in $H_2O$
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm

Sample :

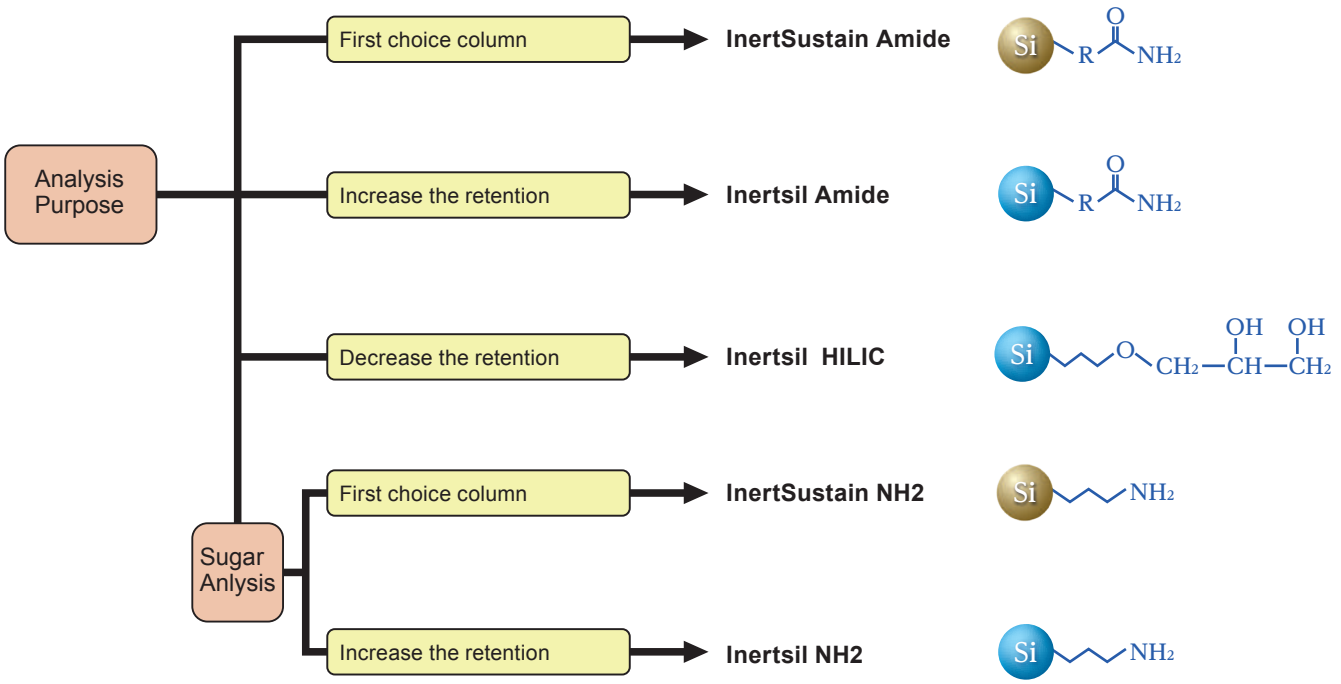


1. Allantoin

## HILIC Column Specification

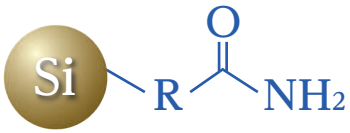
| Columns | Features | Particle Size (μm) | Pore Size (nm) | Surface Area (m²/g) | Carbon Loading (%) | Recommended pH range |
|---|---|---|---|---|---|---|
| InertSustain Amide | Frist choice column for HILIC mode. | 3, 5 | 10 | 350 | 15 | 2 - 8.5 |
| Inertsil Amide | Effective when the retention of high polar components is further strengthened. | 3, 5 | 10 | 450 | 18 | 2 - 7.5 |
| 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** : **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** : **No**
- **Carbon Loading** : **15 %**
- **USP Code** : **L68**
- **pH Range** : **2 - 8.5**




InertSustain Amide column is a HILIC (Hydrophilic Interaction Chromatography) column for enhanced retention of extremely polar compounds. It offers the strongest retentivity among the Amide columns available in the market due to the usage and bonding of carbamoyl groups. Superior stability and durability even under water rich mobile phases.

## Comparison with Other Brands

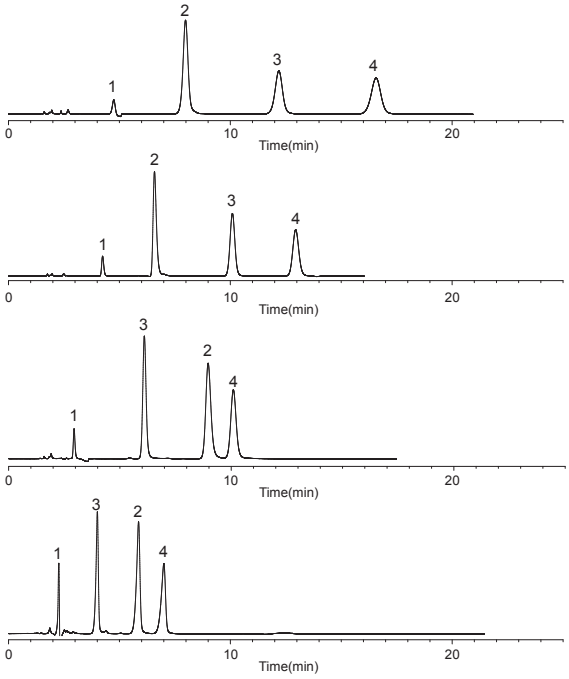
HILIC phases are particularly useful for compounds that are weakly retained by reversed phase columns such as Melamine and Cyanuric Acid. As shown below, InertSustain Amide provides stronger retention for such analytes compared to other HILIC columns available in the market.

**InertSustain Amide (Amide)**

TSKgel Amide-80 (Amide)

XBridge BEH Amide (Amide)

Atlantis Silica HILIC (Unbonded Silica)




Conditions

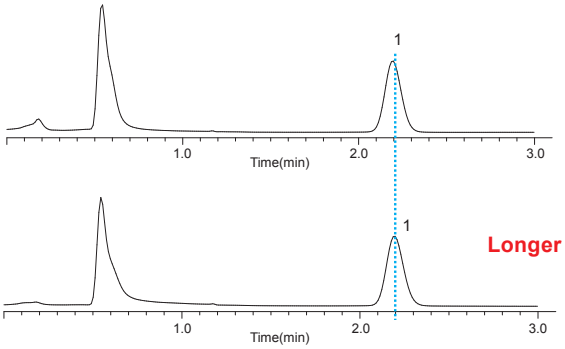
| | |
|---|---|
| Column | : 5 µm, 150 × 2.1 mm I.D |
| Eluent | : A) $CH_3CN$ |
| | B) 10 mM $HCOONH_4$ in $H_2O$ |
| | A/B = 90/10, v/v |
| Flow Rate | : 0.2 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 215 nm |
| Sample | : 1. Cyanuric Acid |
| | 2. Melamine |
| | 3. Ammelide |
| | 4. Ammeline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

## Extreme Durability

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.

1st Injection

After 1,000 Injections




**Longer Column Lifetime**

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℃ |
| Detection | : UV 243 nm |
| Injection Vol. | : 2 µL |
| Sample | : 1. Ascorbic aciid |
| Diluent | : 2 % metaphosphoric acid aqueous solution |

## Analytical Columns

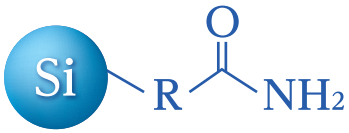
| | Length\I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| | 30 | 5020-88766 | 5020-88772 | | |
| | 50 | 5020-88767 | 5020-88773 | | |
| | 75 | 5020-88768 | 5020-88774 | | |
| | 100 | 5020-88769 | 5020-88775 | | |
| | 150 | 5020-88770 | 5020-88776 | | |
| | 250 | 5020-88771 | 5020-88777 | | |
| 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 |

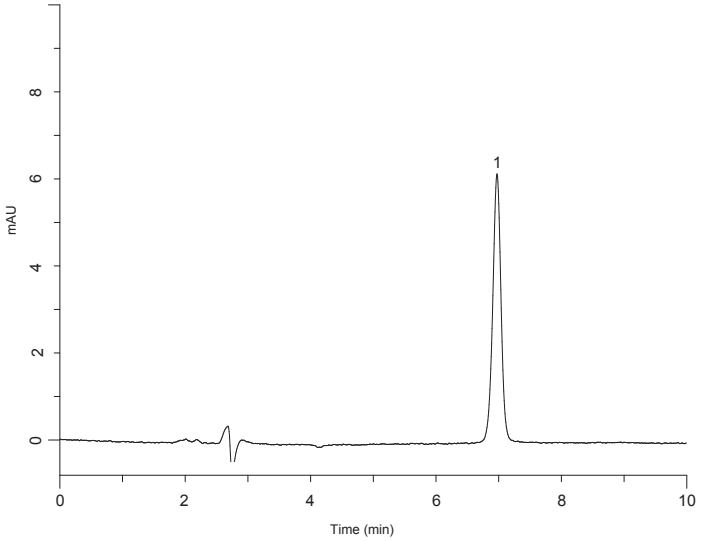
# Inertsil Amide

- **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 : Carbamoyl**
- **End-capping : No**
- **Carbon Loading : 18 %**
- **USP Code : L68**
- **pH Range : 2 - 7.5**
- **Usable organic solvents concentration: 50 % or more.**




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

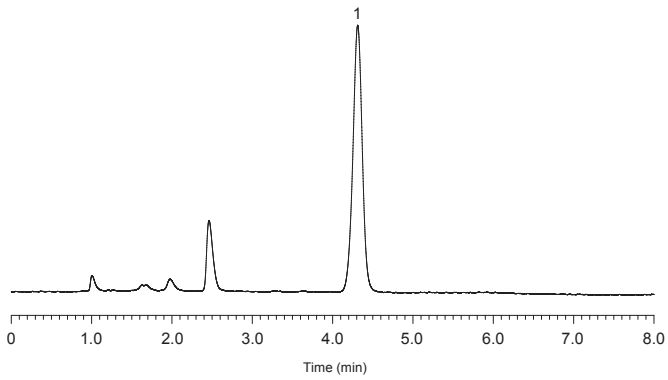
## Figure 1 : Oxalic Acid




Conditions

Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) $CH_3CN$
B) 30 mM $Na_2HPO_4$ in $H_2O$ (pH 6.8)
A/B = 65/35, v/v
Flow Rate : 1 mL/min
Col. Temp. : 50℃
Detection : UV 220 nm (GL-7450 UV Detector)
Injection Vol. : 5 µL
Sample : Oxalic acid (100 mg/L)

## Figure 2 : Urea




Conditions

Column Size : 5 µm, 150 × 3.0 mm I.D.
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 85/15 , v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 200 nm
Injection Vol. : 5.0 mL
Sample : Urea (200 mg/L)

## Analytical Columns

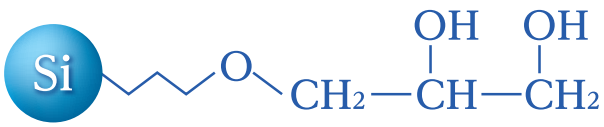
| | | | | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | Length \ I.D. (mm) | 1.0 | 1.5 | | |
| | 33 | 5020-86831 | 5020-86841 | | |
| | 50 | 5020-86832 | 5020-86842 | | |
| | 75 | 5020-86833 | 5020-86843 | | |
| | 100 | 5020-86834 | 5020-86844 | | |
| | 150 | 5020-86835 | 5020-86845 | | |
| |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

## 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 | 5020-20156 | 5020-20155 | 5020-20158 | 5020-20157 |
| 1.5, 2.1 | | 1.5 | 5020-20160 | 5020-20159 | 5020-20162 | 5020-20161 |
| 2.1, 3.0 | | 3.0 | 5020-20152 | 5020-20151 | 5020-20154 | 5020-20153 |
| 4.0, 4.6 | | 4.0 | 5020-20148 | 5020-20147 | 5020-20150 | 5020-20149 |
| 2.1, 3.0 | 20 | 3.0 | 5020-20168 | 5020-20167 | 5020-20170 | 5020-20169 |
| 4.0, 4.6 | | 4.0 | 5020-20164 | 5020-20163 | 5020-20166 | 5020-20165 |
| Holder for Cartridge Guard Column E | | | | For 10 mm Length | | 5020-08500 |
| | | | | For 20 mm Length | | 5020-08550 |

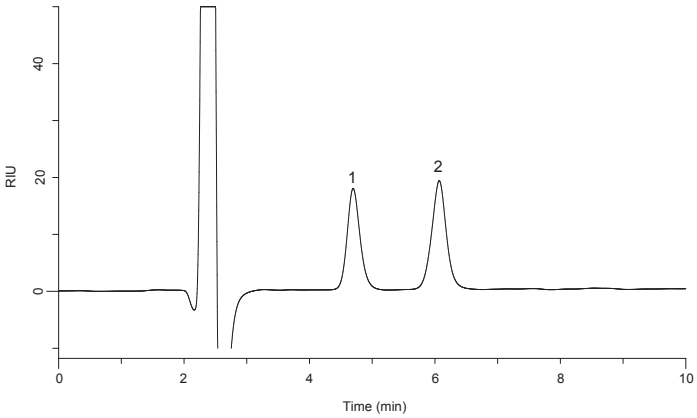
# Inertsil HILIC

- **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 : No**
- **Carbon Loading : 20 %**
- **USP Code : L20**
- **pH Range : 2 - 7.5**




HILIC is, abbreviated name for Hydrophilic Interaction Chromatography, and it was developed as an alternative to reversed phase chromatography for highly polar compounds (Figure 1). Inertsil HILIC is the column which chemically bonded with diol group, and it provides excellent peak shape for neutral and basic compounds. In HILIC mode, generally when organic solvent concentration is raised, it shows a strong retention (Figure 2). Moreover, it can get more stable analysis by adding basic solvent to the eluate, such as ammonium acetate.

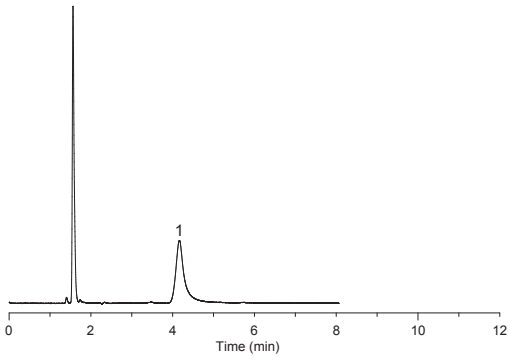
## Figure 1 : Analysis of Taurine and Inositol




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) |

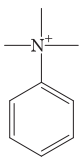
## Figure 2 : Analysis of Basic Compound




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

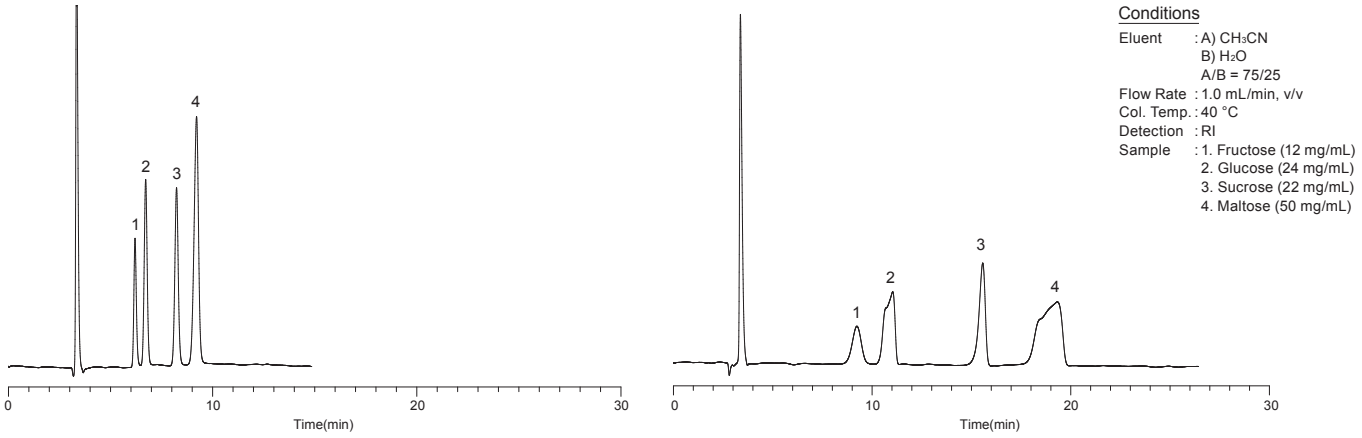
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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** : **No**
- **Carbon Loading** : **7 %**
- **USP Code** : **L8**
- **pH Range** : **2 - 7.5**

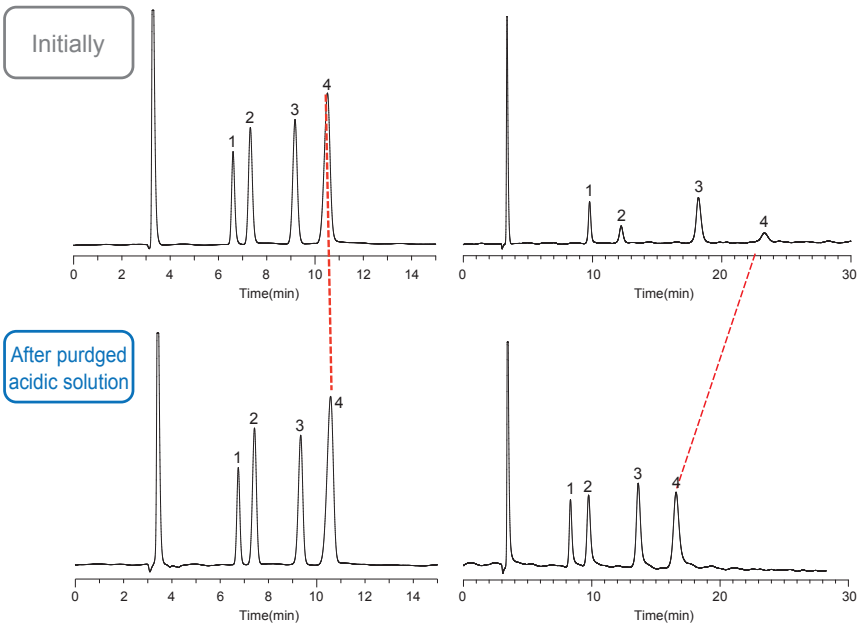

InertSustain NH2 shows far superior stability compared to other brand available aminopropyl columns, as our newly developed “Evolved Surface Silica” is chemically bonded with aminopropyl group. Generally, aminopropyl columns are used for applications that are hard to be separated in a reversed phase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

## Figure 1 : Comparison of Preventing Anomer Resolution of Sugar Analysis



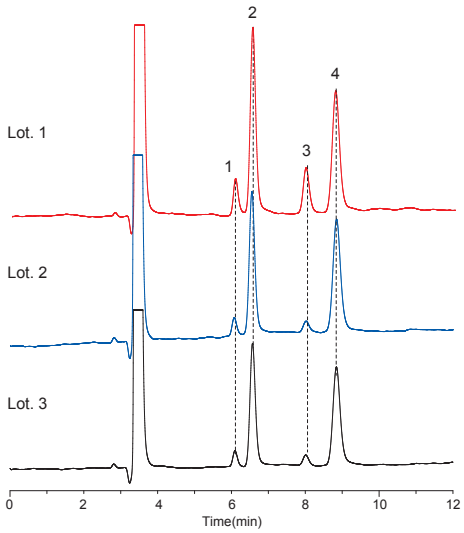

InertSustain NH2 | other brand Amide Column

## Figure 2 : Retention Change after Purdged Acidic Solution




InertSustain NH2 | Other brand $NH_2$ columns

## Figure 3 : Reliable Reproducibility




Conditions

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

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

## Analytical Columns

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

## Cartridge Guard Column E

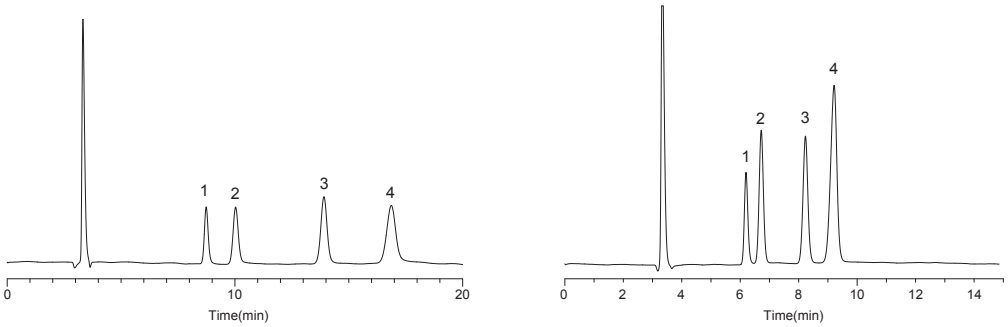
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# 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 : No**
- **Carbon Loading : 8 %**
- **USP Code : L8**
- **pH Range : 2 - 7.5**


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

## 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

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

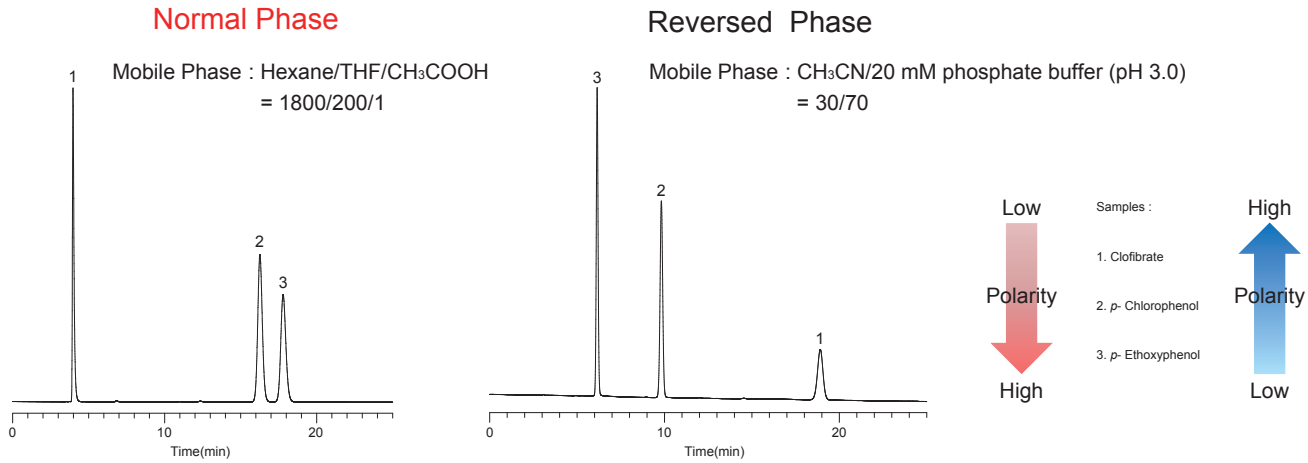
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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™ C18
Inertsil® HPLC COLUMN
Inertsil® ODS-4
FLOW
Inertsil® ODS-3
Inertsil® ODS-SP

# Normal Phase Columns

# About Normal Phase Columns

## Comparison of Reversed Phase and Normal Phase




Conditions

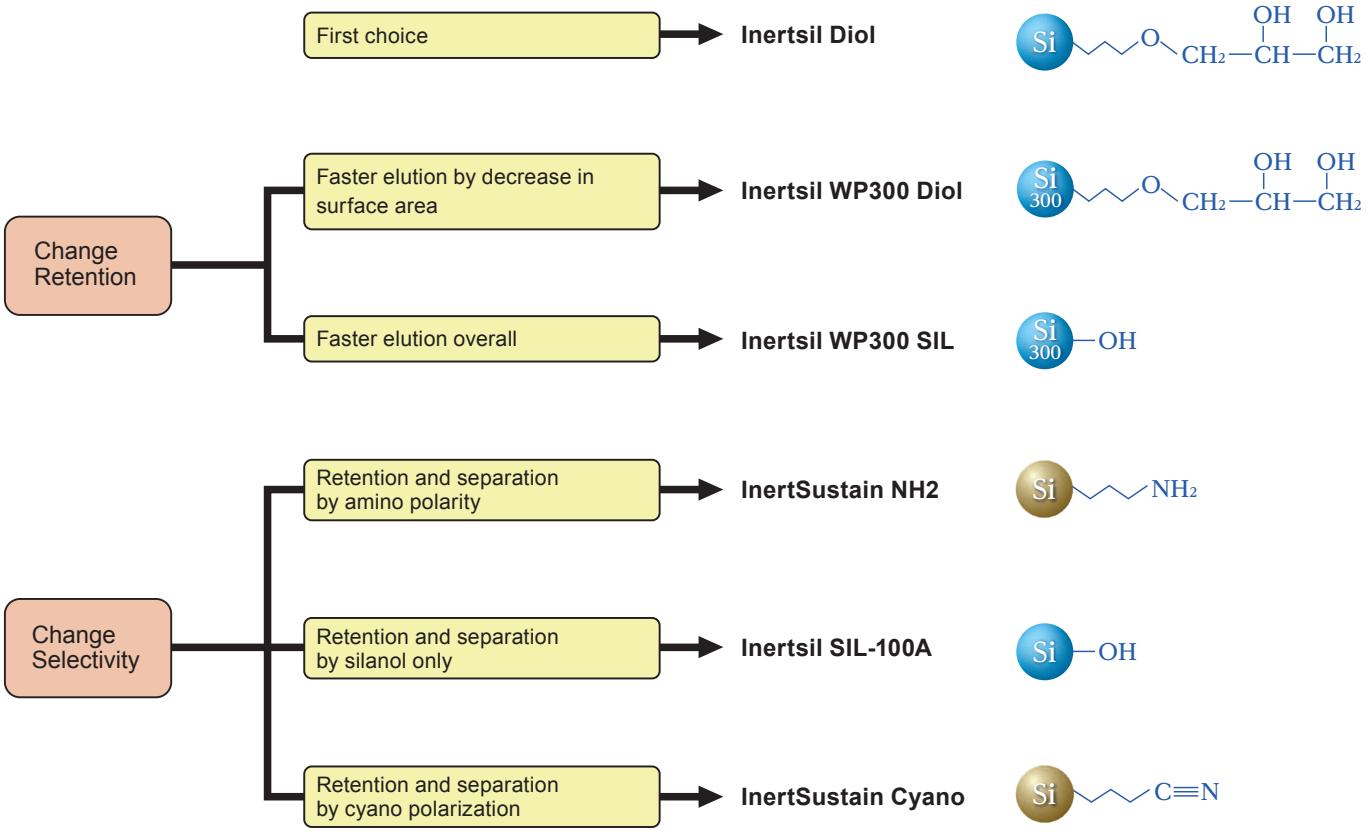
Column : Inertsil CN-3 (5 µm, 250 × 4.6 mm I.D.)
Flow Rate : 1.0 mL/min
Detection : UV 275 nm

## GL Sciences has Variety Normal Phase Columns, You Can 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

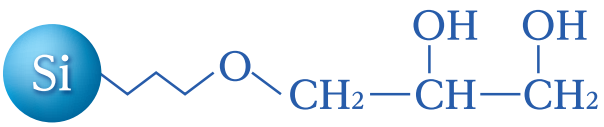
The solvents used in normal phase mode generally combine hexane and ethanol, although in some cases, less polar solvent such like propanol or ethyl acetate also used instead of ethanol. It is necessary to select the solvent according to the retention strength of the target components.

### 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 |

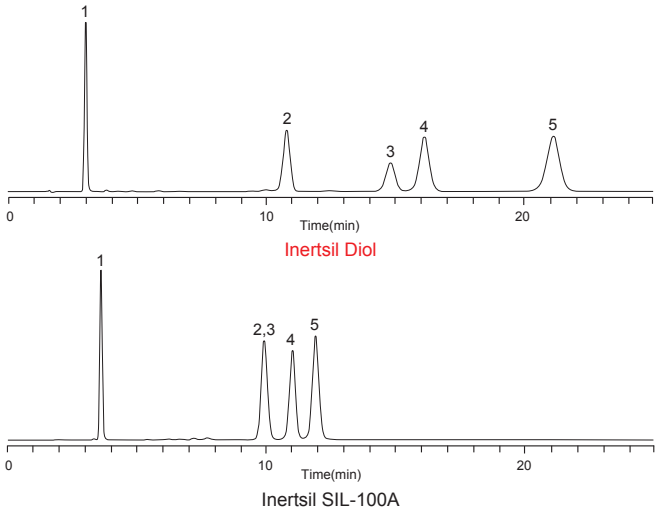
# Inertsil Diol

- **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** : No
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5




Inertsil Diol has characteristics of dihydroxypropyl group bonded phase. It shows unique selectivity normal phase mode.
The separation mechanism of diol column is featured by hydrogen bonding interactions between diol groups and polar compounds. Diol columns provide an alternative selectivity to silica columns often with increased retentivity.
Figure 1, selectivities of Inertsil Diol and Inertsil SIL-100A(a pure Silica gel column) are compared. Inertsil Diol shows higher selectivity for those compounds.
Figure 2, 9 compounds are eluted by Inertsil Diol and other normal phase columns of “Inertsil series”. By comparing their retention times of each compound, it is noticeable that Inertsil Diol provides stable retention for all of the compounds, including basic and acidic compounds. As non-specific adsorption of water is reduced, Inertsil Diol can be washed by 100 % water eluent.

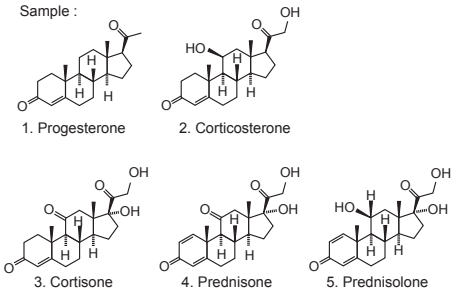
## Figure 1 : Comparison of Selectivity between Diol Column and Silica Column




Conditions

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

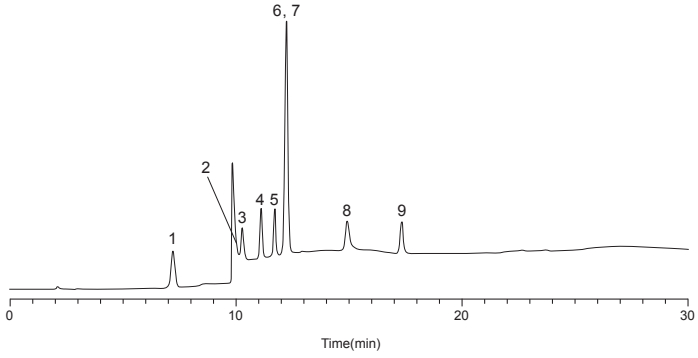
Sample :

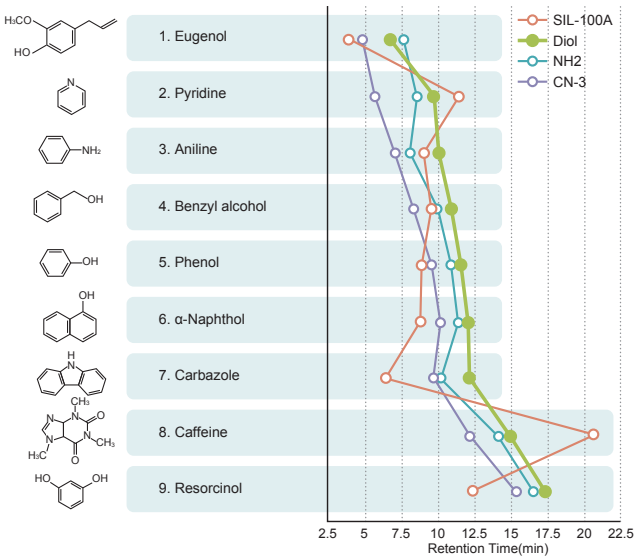



## Figure 2 : Selectivity of Inertsil Diol

Conditions

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



## Analytical Columns

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

## Cartridge Guard Column E

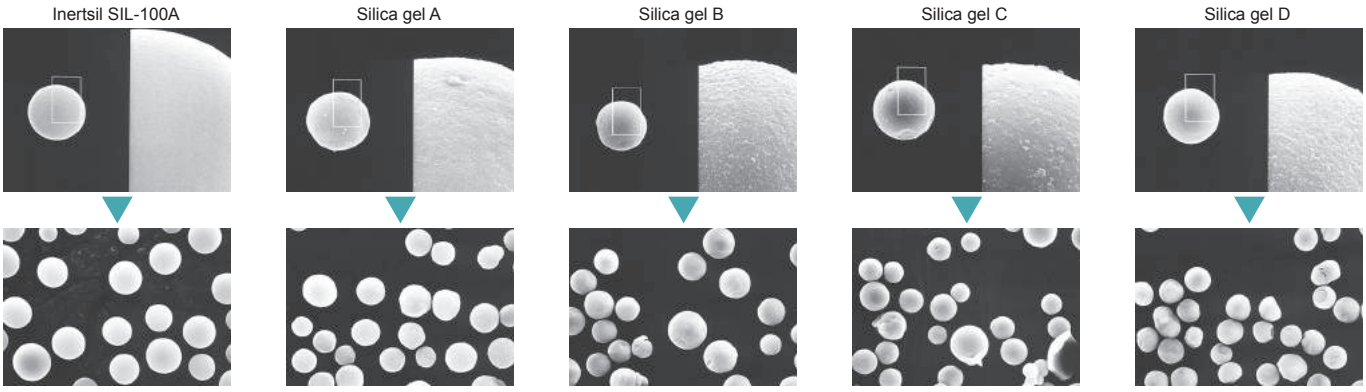
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# Inertsil SIL-100A

- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 $m^2$/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : None
- **End-capping** : No
- **Carbon Loading** : - %
- **USP Code** : L3
- **pH Range** : 2 - 7.5

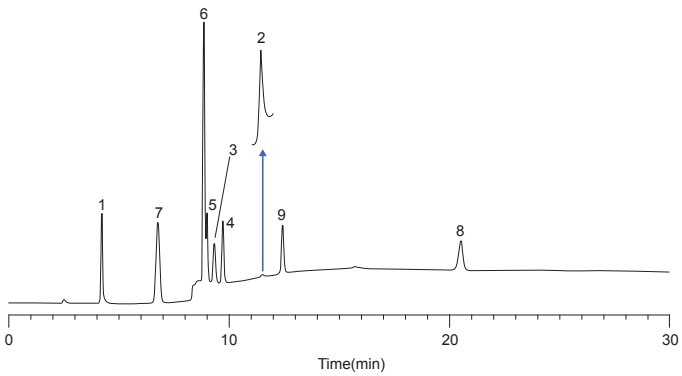

Inertsil SIL-100A is a pure silica gel column available in normal phase mode. Because of the high quality of its silica gel, Inertsil SIL-100A achievs separation with sharp peaks and provides high column-to-column reproducibility. This excellent silica gel ideally designed for HPLC is the basis for “Inertsil 3-series” of GL Scineces. GL Sciences is the first company which emphasized the importance of silica-gel purity and determined the nature of the silanol impurities in the Silica gel.
GL Sciences has established a successful manufacturing process for ultra pure silica gel with smooth and rigid surface. The SEM photos of Inertsil SIL-100A and other brands’ silica gel are shown as Figure 1. Particles of Inertsil SIL-100A stand out by the smooth surface, uniformity in size and spherical shape. From Figure 2, we can know as silanols on the sllica surface interact with basic compounds, Inertsil SIL-100A retains basic compounds strongly and acidic compounds weakly.

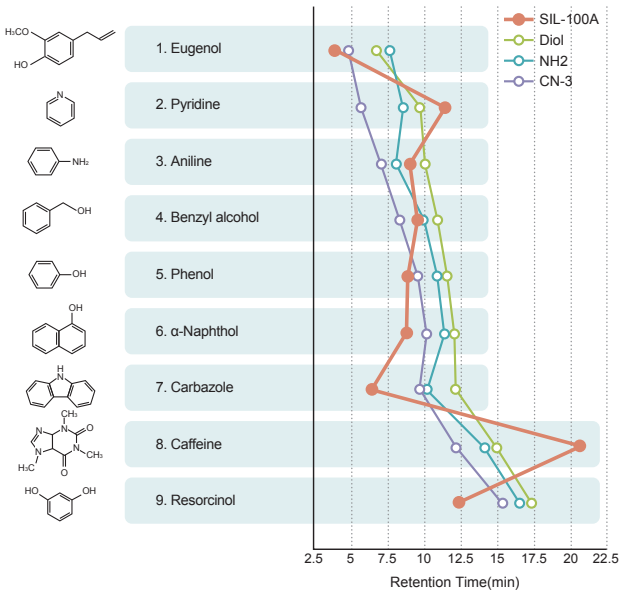
## Figure 1 : SEM Photos of Inertsil SIL-100A and Other Brand Available Silica Gels




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

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



## Analytical Columns

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

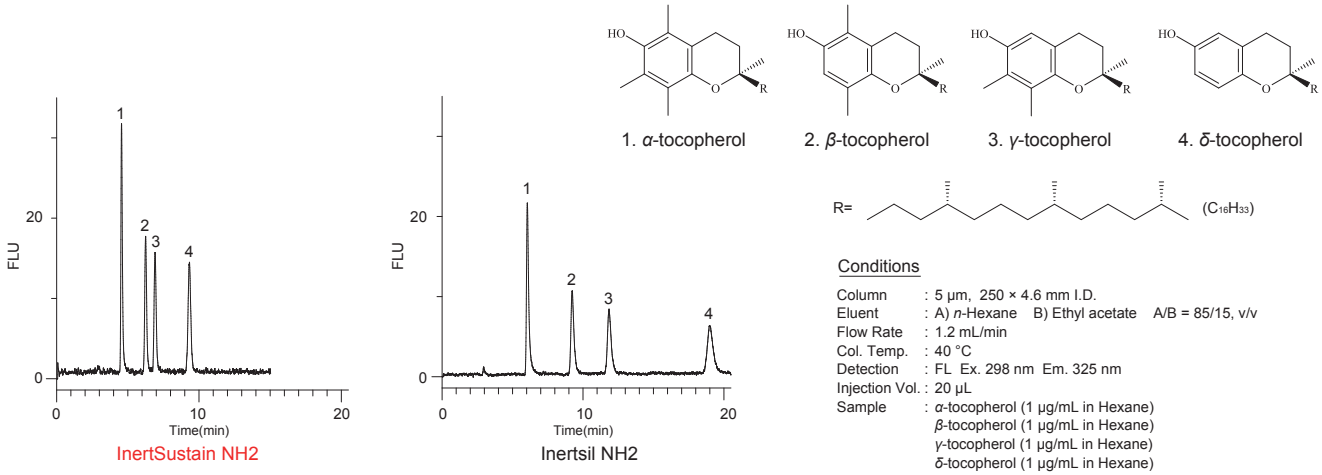
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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** : **No**
- **Carbon Loading** : **7 %**
- **USP Code** : **L8**
- **pH Range** : **2 - 7.5**


InertSustain NH2 is a newly developed ES silica column, compare to the other normal silica columns, InertSustain NH2 performs a sharp peaks, and high reproducible results with exceptional stability and durability that will maintain performance over the lifetime of the method. Also, InertSustain NH2 is an easily equilibrate column. Figure 2 is an analysis sample to show the equilibrate time of InertSustain NH2 column. Using a column was replaced with isopropanol, phthalic acid ester as the sample and measured the time until stabilized the analysis conditions. From the chromatogram we can know at the total flow time of 21 minutes of 4th injection, the column was stabled to be analyze.

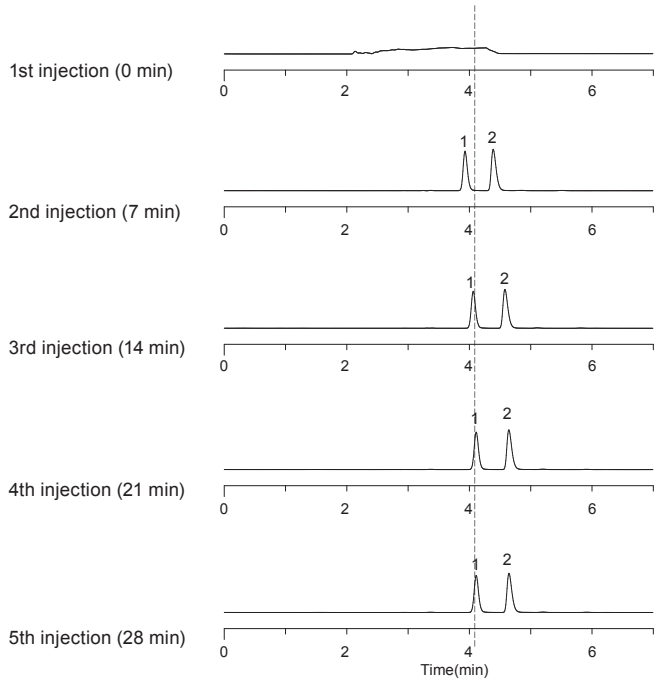
## Figure 1 : Analysis of Vitamin E with InertSustain NH2 & Inertsil NH2 Column

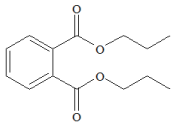



Conditions

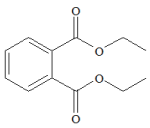
| | |
|---|---|
| Column | : 5 µm, 250 × 4.6 mm I.D. |
| Eluent | : A) *n*-Hexane B) Ethyl acetate A/B = 85/15, v/v |
| Flow Rate | : 1.2 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : FL Ex. 298 nm Em. 325 nm |
| Injection Vol. | : 20 µL |
| Sample | : α-tocopherol (1 µg/mL in Hexane)<br>β-tocopherol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

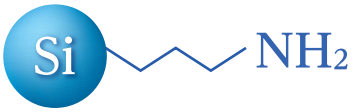
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 30 | 5020-16768 | 5020-16774 | | |
| | 50 | 5020-16769 | 5020-16775 | | |
| | 75 | 5020-16770 | 5020-16776 | | |
| | 100 | 5020-16771 | 5020-16777 | | |
| | 150 | 5020-16772 | 5020-16778 | | |
| | 250 | 5020-16773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

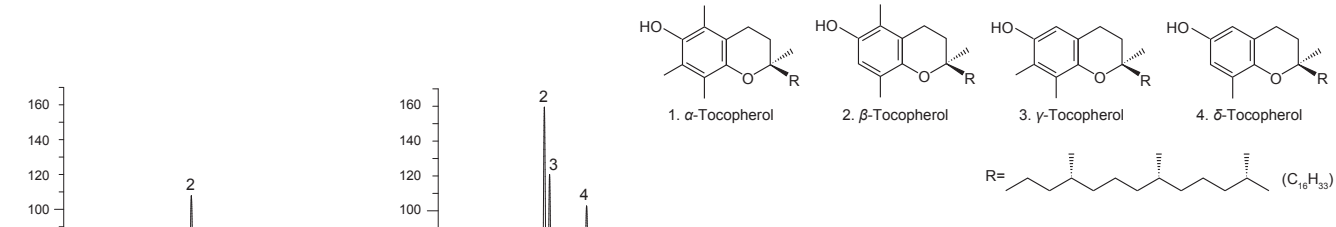
# Inertsil NH2

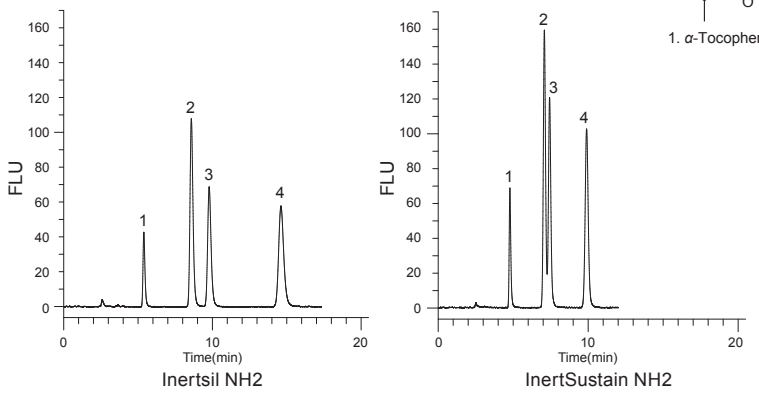
- **Base Material** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 $m^2$/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Functional Group** : Aminopropyl
- **End-capping** : No
- **Carbon Loading** : 8 %
- **USP Code** : L8
- **pH Range** : 2 - 7.5




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

## Figure 1 : Analysis of Vitamin E



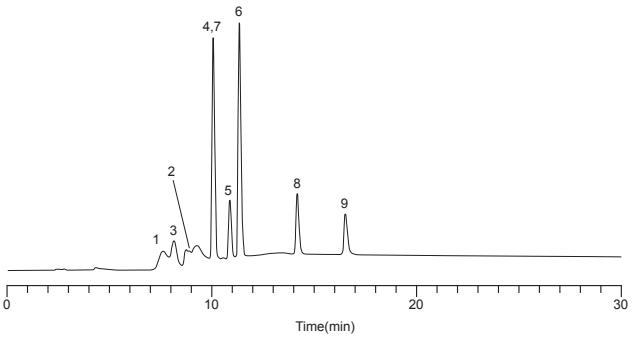

Conditions

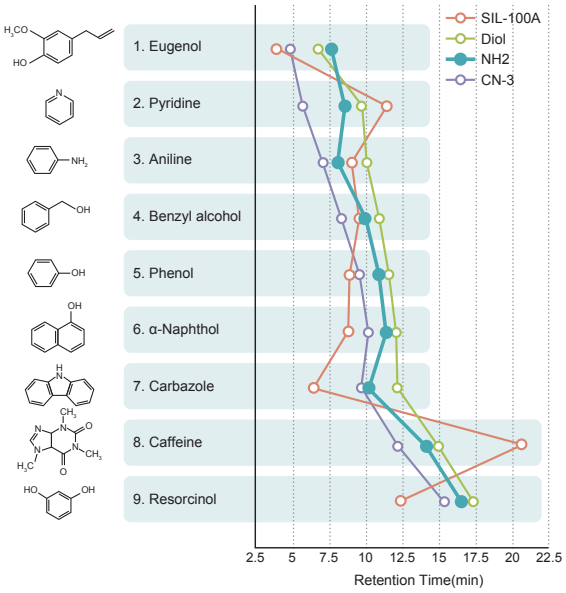
| | |
|---|---|
| Column | : 5 µm, 250 × 4.6 mm I.D. |
| Eluent | : A) *n*-Hexane<br>B) Isopropanol<br>A/B = 98/2, v/v |
| Flow Rate | : 1.2 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : FL Ex. 298 nm Em. 325 nm |
| Injection. Vol. | : 20 µL |
| Sample | : α-tocopherol (1 µg/mL in Hexane)<br>β-tocopherol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

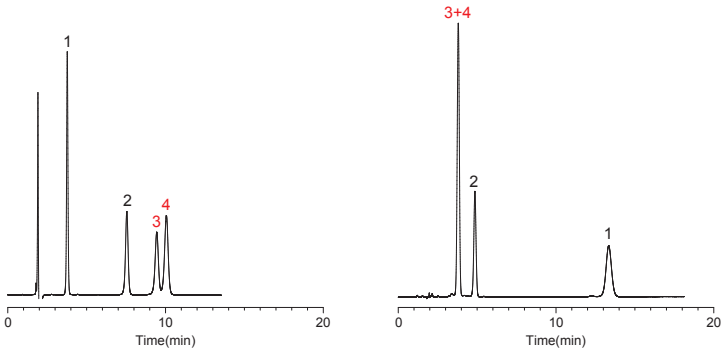
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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 column is endcapped and bonded with cyanopropyl groups, it can be used in both normal and reversed phase modes. Compounds are difficult to separate in reversed phase mode may be able to separate in normal phase mode (Figure 1). Also since it is end-capped, it can be flushed with highly polar solvents such as 100% water eluent.
InertSustain Cyano column can be also used as reversed phase mode, the delivery solvent is mixture of water and acetonitrile, by replacing the solvent it can use as normal phase column (Figure 2).

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



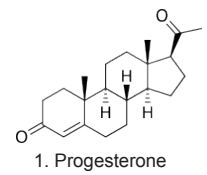

Conditions

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

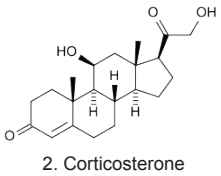



Conditions

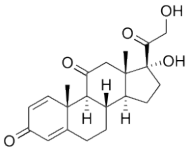
Eluent : A) $CH_3OH$ B) $H_2O$
A/B = 40/60, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 220 nm



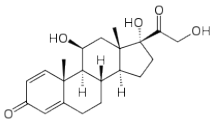
1. Progesterone



2. Corticosterone

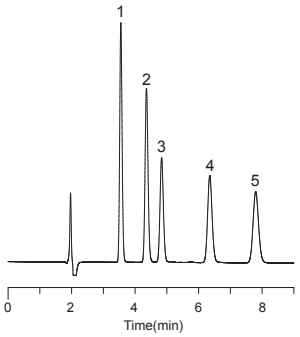


3. Prednisone

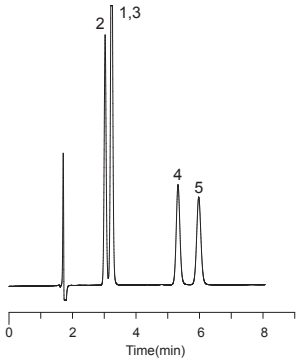


4. Prednisolone

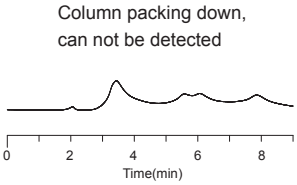
## Figure 2: Comparison with Other Brands Column




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℃
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

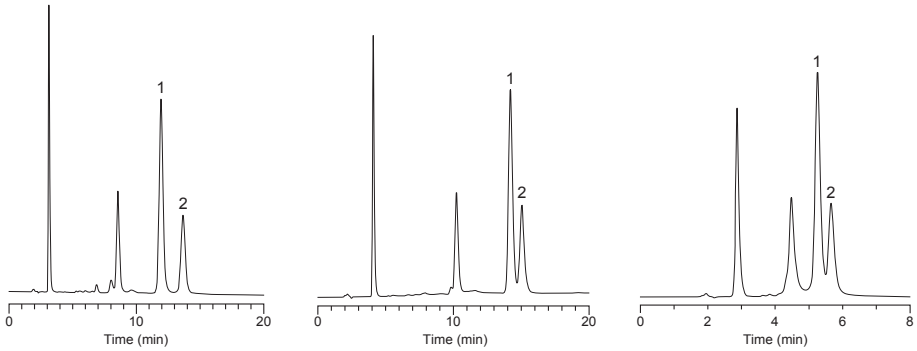
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm | 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** : No
- **Carbon Loading** : 14 %
- **USP Code** : L10
- **pH Range** : 2 - 7.5

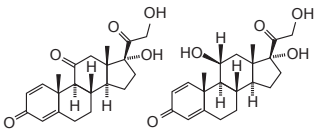

Inertsil CN-3, Cyanopropryl groups bonded to Silica gel with high density. And it is not only increase difference recognition of hydrophilicity, but also increase the durability. It is difficult to increase the both performance with other previous cyanopropryl columns. Inertsil CN-3 can be cleaned with 100 % aqueous solvent because non-specific adsorption of water effected with silanol base is prevented.
Figure 2 shows 9 compounds analysis with Inertsil CN-3. And also it shows different selectivity of the other Inertsil series columns. Each compounds are detected adequate retentivity. And then they are easy to use as same as Inertsil Diol on normal phase mode.

## Figure1 : Comparison of Selectivity




Conditions

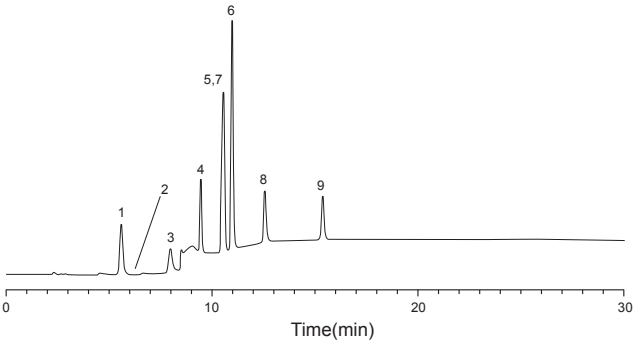
| | |
|---|---|
| Column | : Cyano Column (5 µm, 150 × 4.6 mm I.D.) |
| Eluent | : A) Hexane B) Ethanol A/B = 90/10, v/v |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 254 nm |

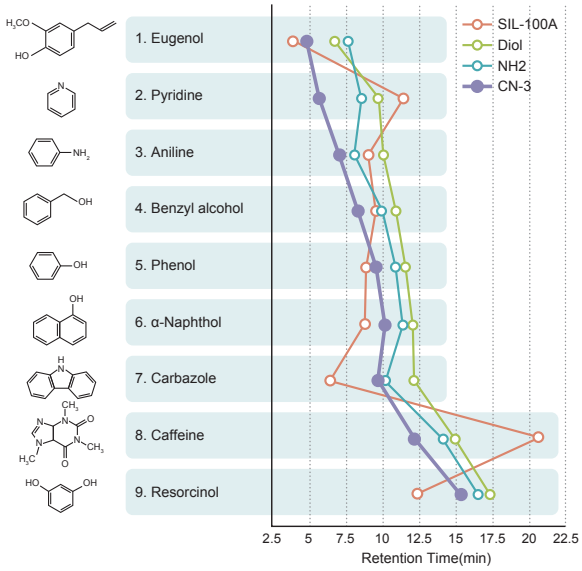



## Figure2 : Selectivity of Inertsil® CN-3

Conditions

| | |
|---|---|
| Column | : Inertsil CN-3 (5 µm, 150 × 3.0 mm I.D.) |
| Eluent | : A) Hexane/Ethanol = 100/1, v/v B) Ethanol A/B = 100/0 – 30 min – 25/75, v/v |
| Flow Rate | : 0.4 mL/min |
| Col. Temp. | : 40 °C |
| Detection | : UV 215 nm |



## Analytical Columns

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

## Cartridge Guard Column E

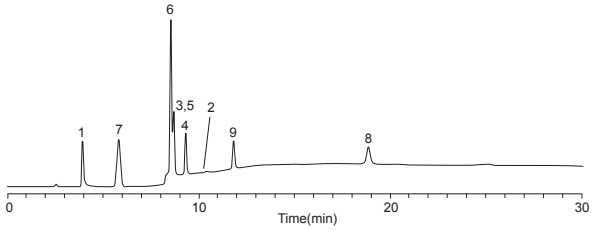
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) | |
|---|---|---|---|---|---|---|
| | | | Particle Size | | Particle Size | |
| | | | 3 µm | 5 µm |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

# Inertsil SIL-150A

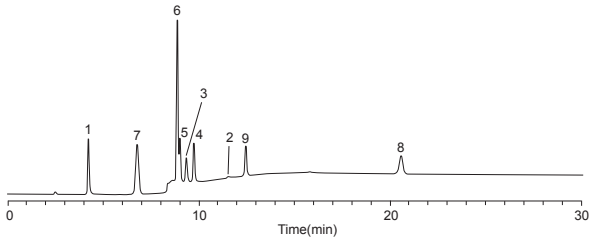
- **Base Material** : **2 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **320 $m^2$/g**
- **Pore Size** : **150 Å (15 nm)**
- **Pore Volume** : **1.20 mL/g**
- **Functional Group** : **None**
- **End-capping** : **No**
- **Carbon Loading** : **- %**
- **USP Code** : **L3**
- **pH Range** : **2 - 7.5**


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

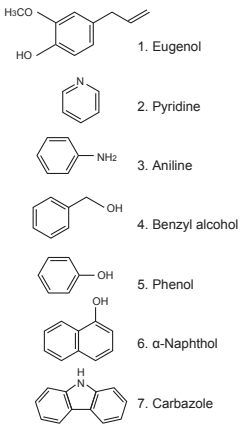
## Figure 1 : Comparison of Retentivity and Selectivity with Different Pore Size




Inertsil SIL-150A (150 Å)

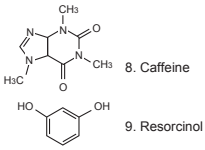



Inertsil SIL-100A (100 Å)




Conditions

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




## Analytical Columns

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

## Cartridge Guard Column E

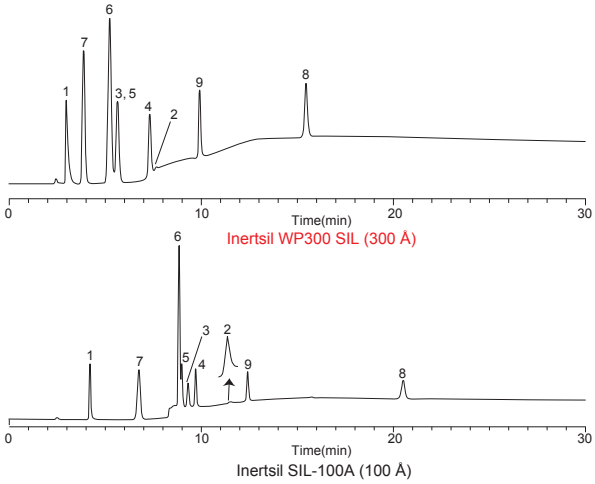
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Particle Size | Particle Size |
| | | | 5 µm | 5 µm |
| 2.1, 3.0 | 10 | 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 |

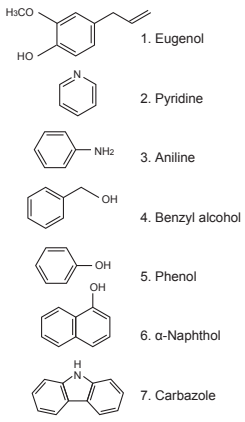
# Inertsil WP300 SIL

- **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** : **No**
- **Carbon Loading** : **- %**
- **USP Code** : **L3**
- **pH Range** : **2 - 7.5**


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

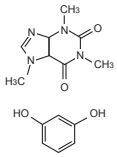
## Figure 1 : Comparison of Selectivity and Retentivity with Different Pore Size




Conditions

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




## Analytical Columns

| | Length \ I.D. (mm) | 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 |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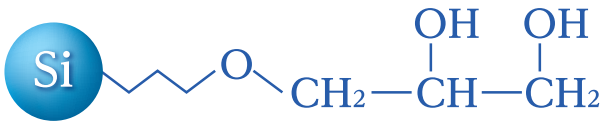
# SEC Columns (GPC/GFC)

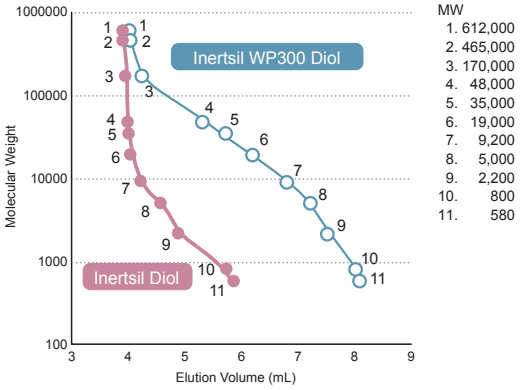
# Inertsil Diol

- **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** : No
- **Carbon Loading** : 20 %
- **USP Code** : L20
- **pH Range** : 2 - 7.5




Inertsil Diol, dihydroxypropyl groups chemical bonded onto silica gel, can be used as aqueous SEC (GFC) or organic SEC (GPC) (Figure 1). As features of the packing material, it can analyze with several columns in series since 20 MPa (200 bar) as the maximum operating pressure, and it is higher than polymer base columns.
Figure 2 shows an example of polystyrene analysis with Inertsil Diol and Inertsil WP300 Diol in series. With coupling 2 columns in different pore size in series, it can be used for broader range of molecular weight compared with Figure 1 calibration curve.
General internal diameter of SEC columns are 7-8 mm. But even if 4.6 mmI.D. column, it can obtain calibration curve with smaller elution volume rather than 7.6 mm I.D. column. Therefore it can be analyzed with saving solvent, environment conservation, and low cost.

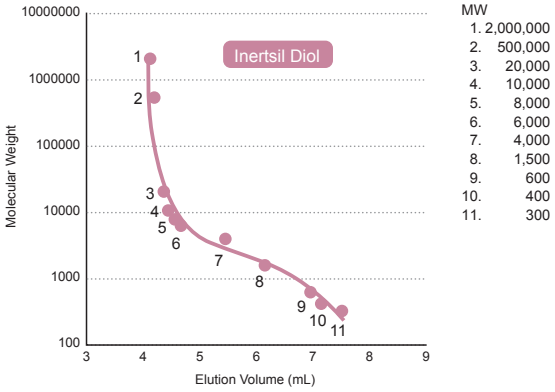
## Figure1 : Calibration Curve for Aqueous and Organic SEC Analysis




Calibration curve for polystyrenes

Conditions

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

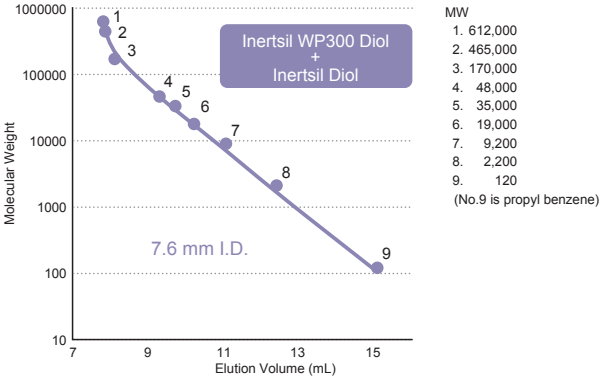



Calibration curve for polystyrene glycol

Conditions

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

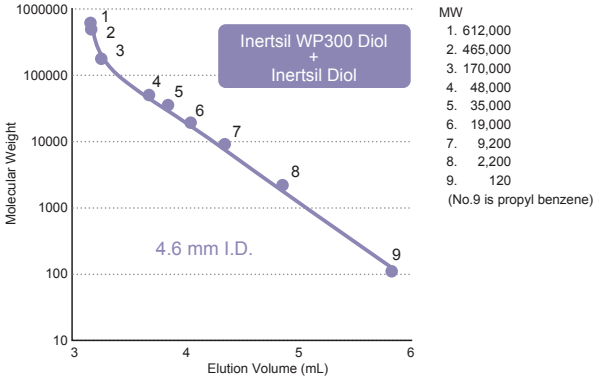
## Figure2 : Calibration Curve for Small I.D. SEC Columns




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

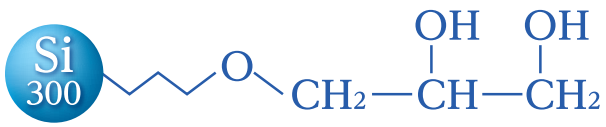
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 33 | 5020-86531 | 5020-86541 | | |
| | 50 | 5020-86532 | 5020-86542 | | |
| | 75 | 5020-86533 | 5020-86543 | | |
| | 100 | 5020-86534 | 5020-86544 | | |
| | 150 | 5020-86535 | 5020-86545 | | |
| | 250 | 5020-86536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

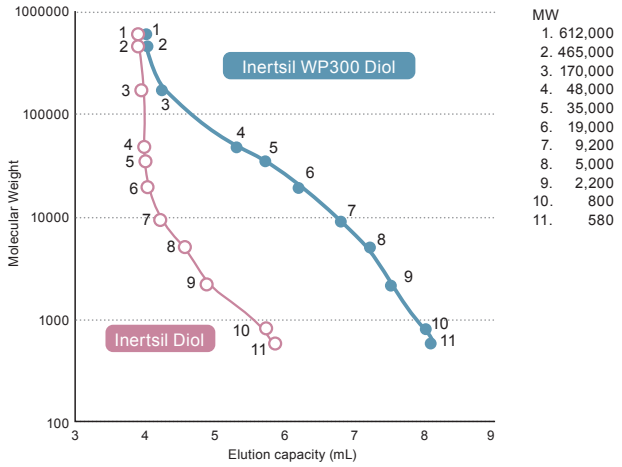
# Inertsil WP300 Diol

- **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** : **No**
- **Carbon Loading** : **9 %**
- **USP Code** : **L20, L33**
- **pH Range** : **2 - 7.5**




Inertsil WP300 Diol has dihydroxypropyl group bonded to silica gel with pore size 300 Å and is capable of analyzing large molecules. Like Inertsil Diol, Inertsil WP300 Diol can be used for both aqueous SEC (Size Exclusion Chromatography) and organic SEC. Also, as a diol column, Inertsil WP300 Diol can be used in both normal phase and reversed phase mode.
As the pore size of silica gel is wider than that of Inertsil Diol, Inertsil WP300 Diol is capable of separating compounds with a broader range of molecular weight than Inertsil Diol (Figure 1).

## Figure 1 : Calibration Curve and Analysis of Polystyrenes

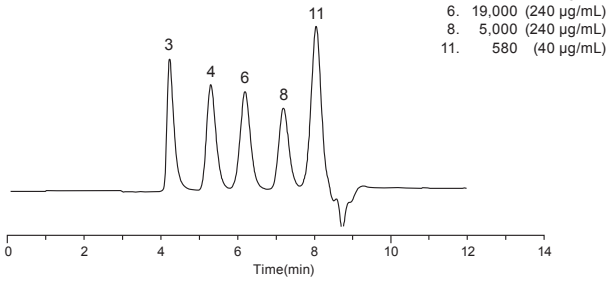



Calibration curve for polystyrenes by organic SEC

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

Conditions

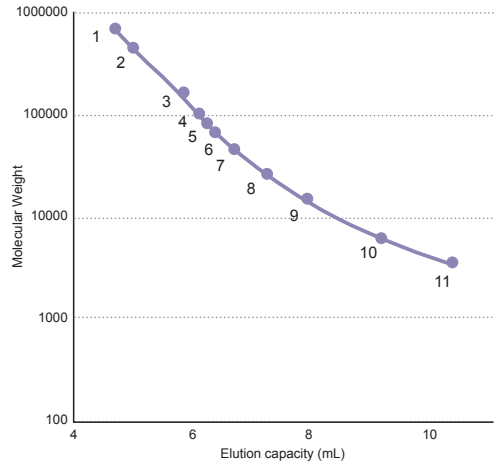
Column Size : 5 µm, 250 × 7.6 mm I.D.
Eluent : THF
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm




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

Analysis of polystyrenes by Inertsil WP300 Diol

## Figure 2 : Calibration Curve and Analysis of Proteins



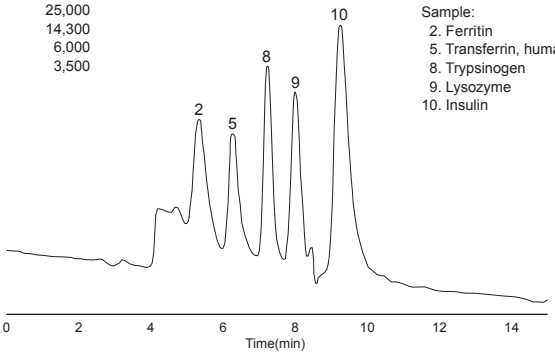

Calibration curve for proteins

MW

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

Conditions

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




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

Analysis of proteins by Inertsil WP300 Diol

## Analytical Columns

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

## Cartridge Guard Column E

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


Inertsil® ODS
Inertsil ODS-3V
Variation Support Column

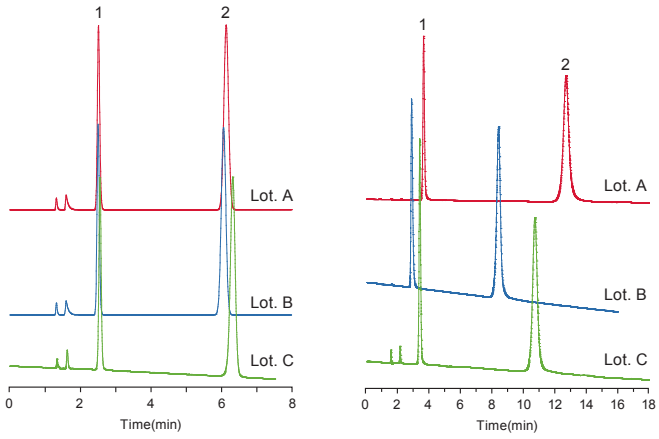
# Ion Exchange Columns

# 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** : **No**
- **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 offer anionic functions required for anion exchange chromatography. It is mainly used for analyses of acidic compounds. Conventional ion-exchange columns used to show inconsistent results from lot to lot. However, Inertsil AX is manufactured under strict quality control in order to offer excellent lot-to-lot reproducibility.
The retentivity of Inertsil AX is influenced by the buffer concentration in eluent. The retention time can be adjusted by the concentration of buffer (Figure 2).

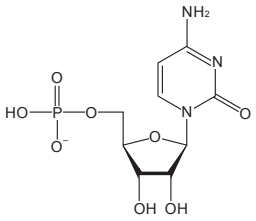
## Figure 1 : Comparison of Lot-to-lot Reproducibility with Other Brands



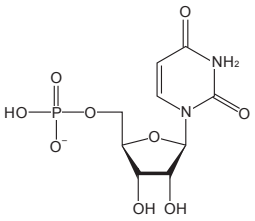

Inertsil AX　　other brand's ion-exchange column

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)

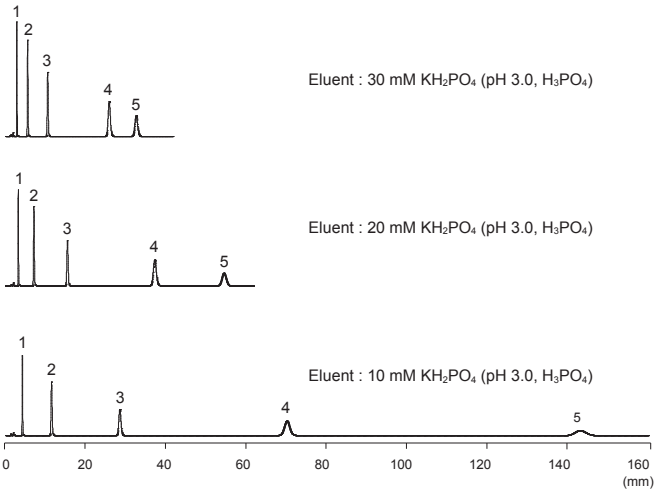



Cytidine 5'-monophosphate (CMP)




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

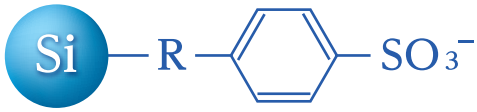
| | Length \ I.D. (mm) | 1.0 | 1.5 | | |
|---|---|---|---|---|---|
| Particle Size: 5 µm | 33 | 5020-80111 | 5020-80121 | | |
| | 50 | 5020-80112 | 5020-80122 | | |
| | 75 | 5020-80113 | 5020-80123 | | |
| | 100 | 5020-80114 | 5020-80124 | | |
| | 150 | 5020-80115 | 5020-80125 | | |
| | 250 | 5020-80116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

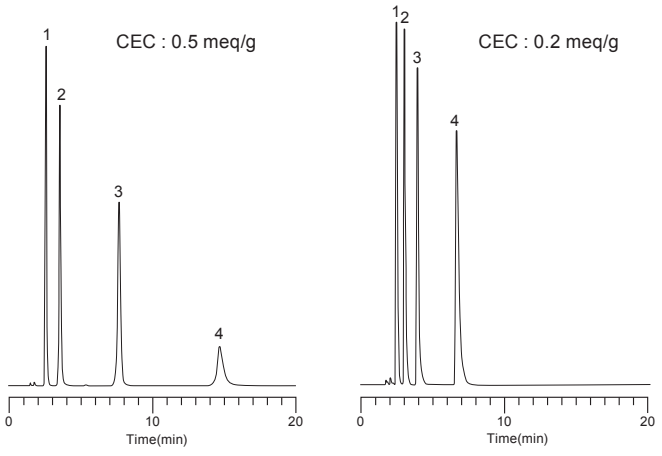
# Inertsil CX

- **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** : No
- **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 offer cationic functions required for the cation exchange chromatography. It is mainly used for analyses of basic compounds. Inertsil CX is manufactured under strict quality control in order to offer excellent batch to batch reproducibility as the same as Inertsil AX. Inertsil CX has high ion exchange capacity and provides high retentivity and selectivity. Therefore, it is also suited for analyzing amino acids and nucleobases shown in Figure 2 and Figure 3.

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

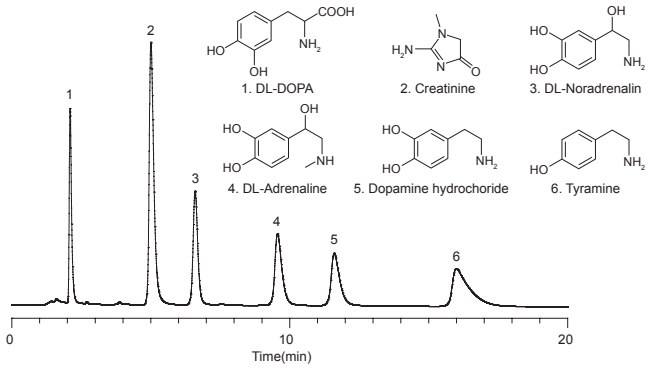



Inertsil CX　　Other brand Cation-Exchange column

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





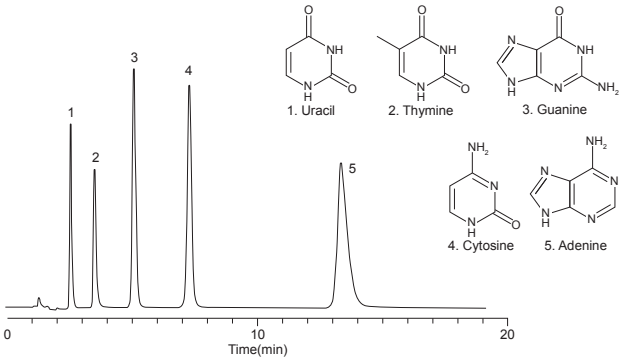


Conditions

Column : Inertsil CX (5 µm, 150 × 4.6 mm I.D.)
Eluent : 0.2 M $K_2HPO_4$ (pH 6.0, $KH_2PO_4$)
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm
Injection Vol. : 10 µL

Sample : 1. *dl*-DOPA (0.98 mg/mL)
2. Creatinine (0.31 mg/mL)
3. *dl*-Noradrenalin (1.02 mg/mL)
4. *dl*-Adrenaline (1.05 mg/mL)
5. Dopamine hydrochloride (0.99 mg/mL)
6. Tyramine (1.10 mg/mL)

## Figure 3 : Nucleoside Analysis







Conditions

Column : Inertsil CX (5 µm, 150 × 4.6 mm I.D.)
Eluent : 0.2 M $HCOONH_4$ (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 (0.05 mg/mL)
2. Thymine (0.05 mg/mL)
3. Guanine (0.15 mg/mL)
4. Cytosine (0.15 mg/mL)
5. Adenine (0.15 mg/mL)

## Analytical Columns

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

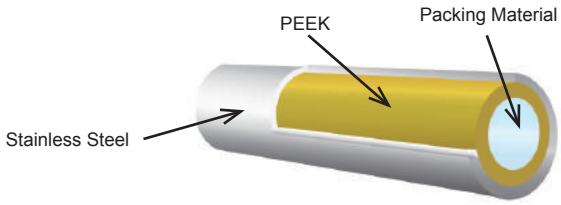
## Cartridge Guard Column E

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

# Application Specific Columns

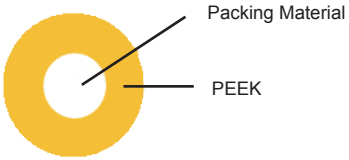
# Metal-Free PEEK Columns

## 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 : 4 µm, 5 µm, 10 µm
- Packing Materials : InertSustain & Inertsil series
- Max. Operating Pressure : 20 MPa (200 bar)

## Analytical Column List

Other packing material or dimensions are 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 | 5020-87550 | 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 |
| 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 |
| | 250 | 5020-87543 | 5020-87547 |

### 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 |

### 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 |
| 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 |

### Inertsil ODS-2

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

### 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

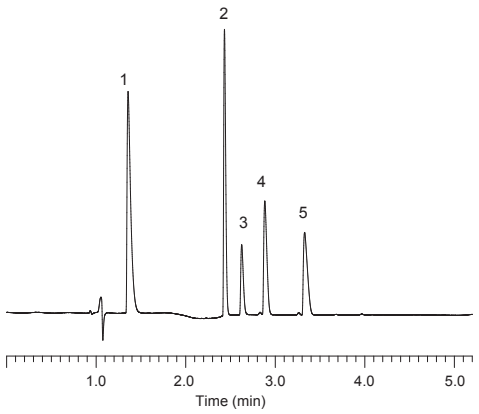
| Particle Size | Length (mm) | I.D. (mm) |
|---|---|---|
| | | 4.6 |
| 5 µm | 150 | 5020-87464 |
| | 250 | 5020-87465 |

# 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 : 9.0 %**
- **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**

The 200 Å pore size silica creates the opportunity to separate compounds having a molecular weight from small to large molecules. In addition, the usage of highly inert packing material packed into a new Steel-Coated-PEEK hardware deliver excellent peak shapes for various analytes without any adsorption.

## Analysis of Peptides

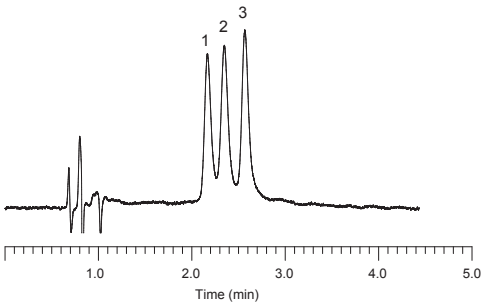



Conditions

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

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

## Analysis of Oligonucleotides




Conditions

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

## Analytical Columns

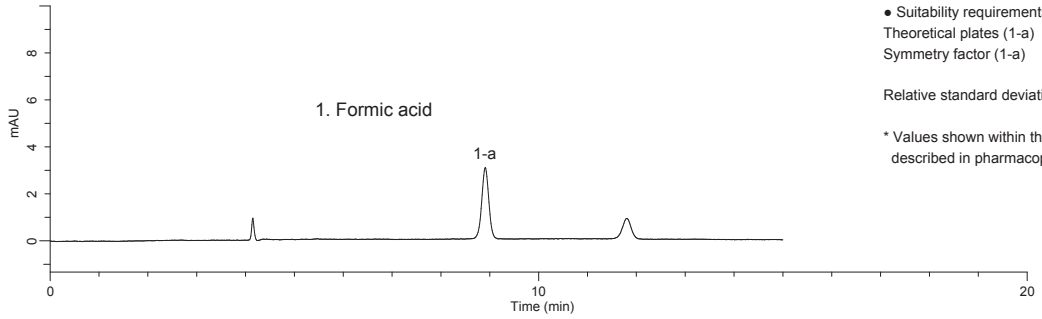
| | Length \ I.D. (mm) | 2.1 | 4.6 |
|---|---|---|---|
| Particle Size: 1.9 µm | 50 | 5020-89500 | 5020-87516 |
| | 100 | 5020-89501 | 5020-87517 |
| | 150 | 5020-89502 | 5020-87518 |
| Particle Size: 3 µm | 50 | 5020-89503 | 5020-87520 |
| | 100 | 5020-89504 | 5020-87521 |
| | 150 | 5020-89505 | 5020-87522 |
| | 250 | 5020-87519 | 5020-87523 |

# InertSphere FA-1

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

Povidone (polyvinylpyrrolidone, PVP) is used in the pharmaceutical industry as a synthetic polymer vehicle for dispersing and suspending drugs. It additionally acts as a disintegrant and tablet binder.
The revision to the harmonized standard for povidone has been approved and formic acid in povidone is now required to be measured.
The new InertSphere FA-1 columns are inspected using a standard solution of formic acid prior to shipment, which is the most appropriate column to be used in this new testing.

## Formic Acid

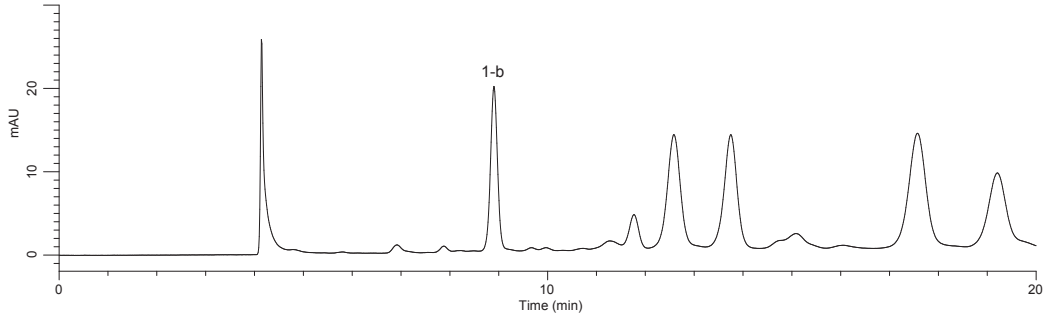



● Suitability requirements
Theoretical plates (1-a) : 17,902 (≧ 1,000)*
Symmetry factor (1-a) : (0.5 ≦)* 0.99(≦ 1.5)*

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

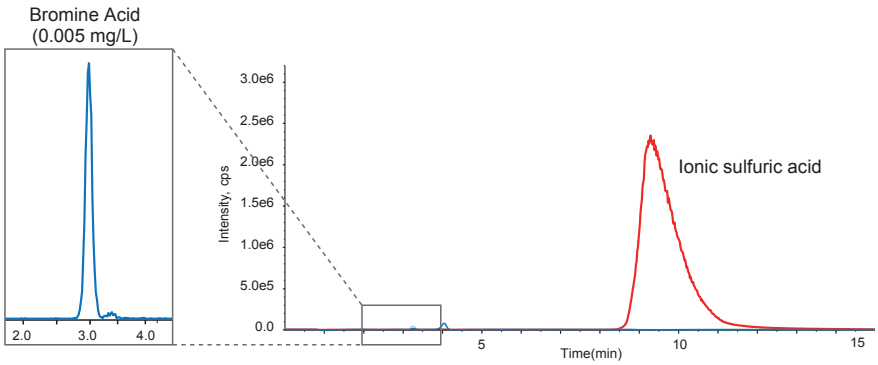
● Packing Material for Glass Chromatography Column
Strong acid ion-exchange resin
MCI GEL CK08P 100 mL
Particle Size : 75 - 150 µm
Counter ion : $H^+$
Cat.No. : 5055-79540

# 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 with quaternary ammonium bonded to hydrophilic polymer. As it's designed to maximize the performance of LC/ MS, it improves separation and efficiency 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) | Cat.No. |
|---|---|---|---|
| 5 µm | 2.1 | 100 | 5020-11002 |

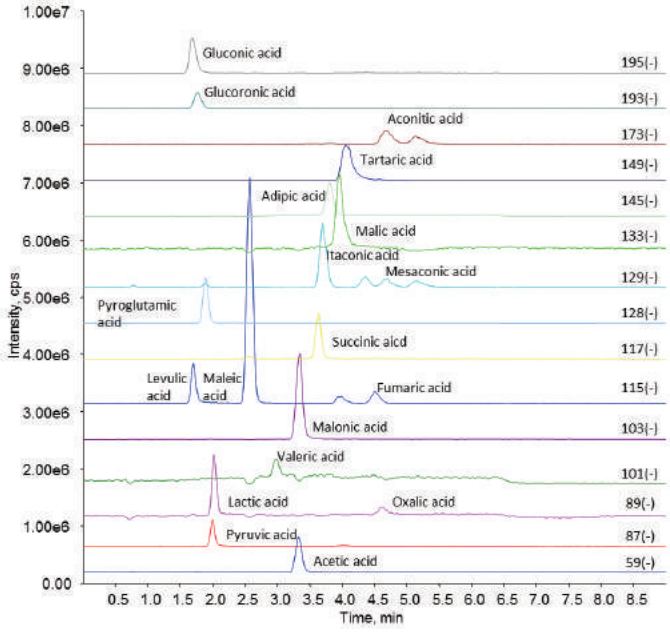
## Cartridge Guard Column E

| Item | I.D. (mm) | Length (mm) | Cat.No. |
|---|---|---|---|
| SYPRON AX-1 Replacement Cartridge (2 pcs) | 2.1 | 100 | 5020-08641 |
| 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 column provides good performance on salt gradient analysis using anion exchange mode with mass chromatography. SYPRON AX-2, is suitable column for organic acid analysis and is able to use with rapid column equilibration time in salt gradient method. As SYPRON AX-2 is an ion exchange column, dicarboxylic acid generally shows weakly retention under reversed phase mode or ion exclusion chromatography, but it can be enhanced strongly using SYPRON AX-2 column.




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**

InertSphere Sugar-1 is a suitable anion-exchange column for sugar analysis. It is packed quaternary ammonium group binding polymer. High sensitivity sugar analysis is available using an electrochemical detector ED723. Especially InertSphere Sugar-1 is suitable for Monosaccharide and Disaccharide analysis.
Note ; Solvent Bottle with $CO_2$ Trap Cartridge is necessary for analysis to avoid dissolving carbonate ion in the solvent. The Solvent Bottle $CO_2$ Trap Cartridge contains hazardous material which requires special freight handling. Additional charges apply.

## Analytical Column

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

## Cartridge Guard Column E

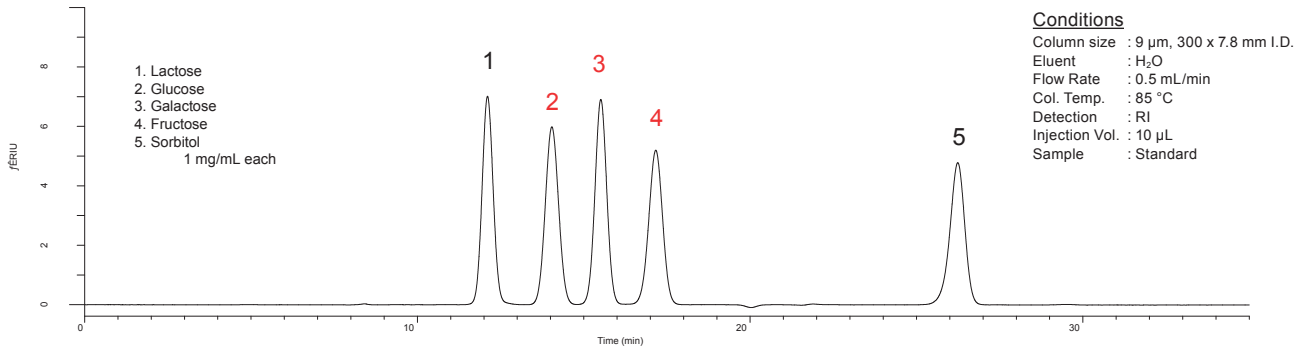
| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 pcs) | Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder) |
|---|---|---|---|---|
| | | | Cat.No. | Cat.No. |
| 4.6 | 10 | 4.0 | 5020-19048 | 5020-19098 |

# 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**

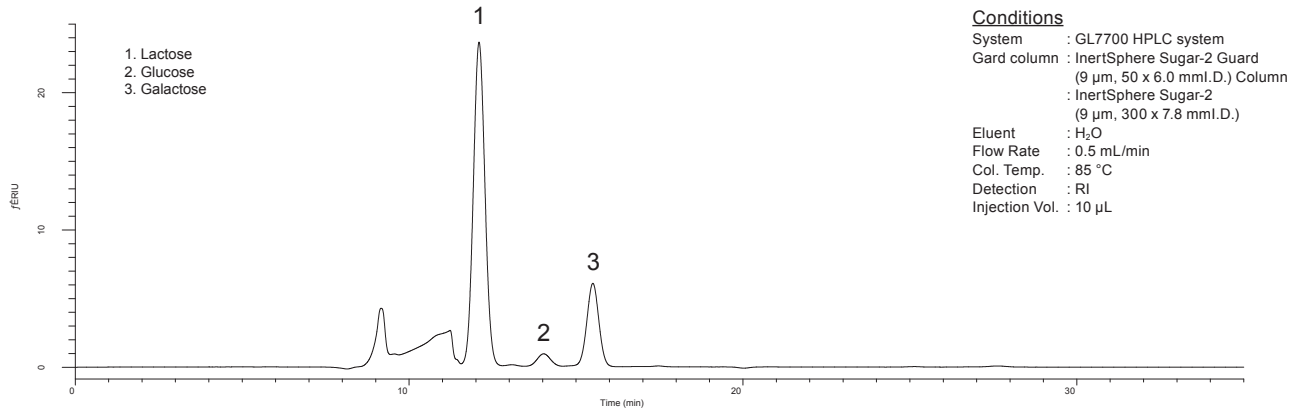
InertSpherer Sugar-2 is a column for analysis sugar, it packed with $Ca^{2+}$ loaded resin.
The column mainly is used for Size Exclusion Chromatography (SEC) mode, the elution order is from big molecular weight to small. At the same time, the ligand exchange mode employs ion interaction between metal ions and hydroxyl groups form a complex with the counter ion. Especially this mode is effective for analysis sugar-alcohol. 100% water can be used as eluent, there is no need to prepare mix solvent.

## 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 Peptides C18

- **Base Material : 3 Series High Purity Silica Gel**
- **Particle Size : 4 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**

The whole manufacturing process; synthesis of silica gel, chemical modification, packing, quality test, is under the strict quality control. The number of theoretical plates is as many as 100,000 plates/m.
For peptide mapping, analytical result of standard peptides obtained by each lot is attached to the column. For protein analysis, Inertsil WP300 or Inertsil WP300 C8 is recommended.

### Analytical Columns

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

### 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 |
| | | | 4 µm | 4 µm |
| 1.0 | 10 | 1.0 | 5020-19211 | 5020-19261 |
| 1.5, 2.1 | | 1.5 | 5020-19311 | 5020-19361 |
| 2.1, 3.0 | | 3.0 | 5020-19111 | 5020-19161 |
| 4.0, 4.6 | | 4.0 | 5020-19011 | 5020-19061 |
| 2.1, 3.0 | 20 | 3.0 | 5020-19511 | 5020-19561 |
| 4.0, 4.6 | | 4.0 | 5020-19411 | 5020-19461 |
| Holder for Cartridge Guard Column E | | | For 10 mm Length | 5020-08500 |
| | | | For 20 mm Length | 5020-08550 |

## Inertsil Acrolein C18

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

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

### Analytical Columns

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

## 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**

As drug residues in food has became a major problem today, developing analytical methods of synthetic bacterial drugs including Sulfa drugs is important. Inertsil Sulfa C18 is a superb ODS column designed for analysis of sulfa drugs.
Each lot of Inertsil Sulfa C18 is tested for the effective separation of sulfa drugs and will be delivered to you with its annalistic data.

### Analytical Columns

| | Length \ I.D. (mm) | 2.1 | 3.0 | 4.0 | 4.6 |
|---|---|---|---|---|---|
| Particle Size: 3 µm | 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 AS

- **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 : 15 %**
- **USP Code : L1**

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

### Analytical Columns

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

### 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. |
| 2.1 | 10 | 1.5 | 5020-18031 | 5020-18035 |
| 4.6 | | 4.0 | 5020-18041 | 5020-18045 |
| Holder for Cartridge Guard Column E | | | For 10 mm Length | 5020-08500 |

# Corresponding to Pharmacopeia (JP, USP, EP) Columns

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

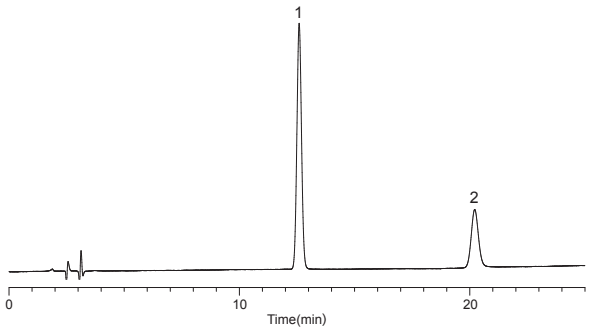
## 3 µm Particle Size HPLC Columns

| 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

## 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 |

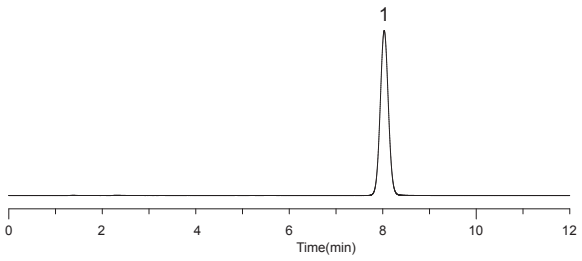
## 10 µm Particle Size HPLC Columns

| 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 |

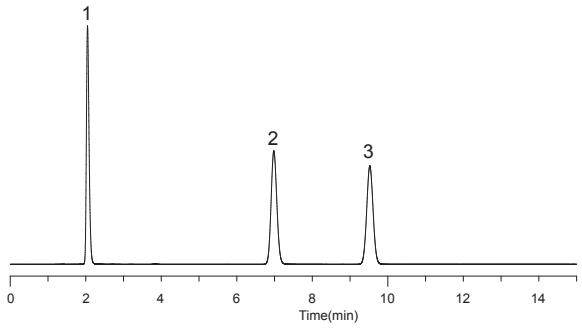
## Figure 2: Voriconazole




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)

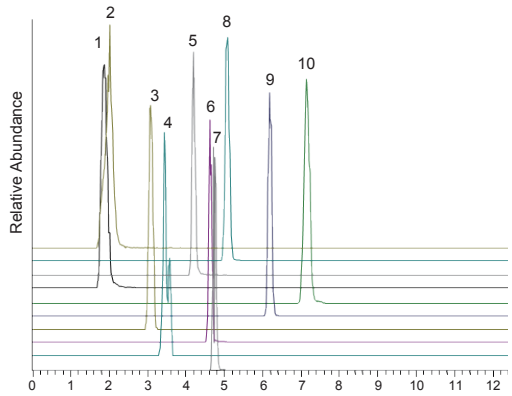
*Dissolve 7.80 g of sodium dihydrogenphosphate dihydrate in 900 mL of water.
Adjust pH 5.5 by sodium hydroxide.
Add water to make 1,000 mL.

# Corresponding SFC

Mainly supercritical $CO_2$ is used as mobile phase in SFC (Supercritical Fluid Chromatography). It is said suitable for high speed analysis because of lower viscosity than the general HPLC mobile phase and fast diffusion speed is fast in mobile phase. It is exceptional method for preparative and purification purpose because almost mobile phase is volatilized when back to normal pressure.
InertSustain and Inertsil series columns are available for SFC analysis.
The packing materials are the same as HPLC columns but they are packed in stainless tubes which correspond to SFC.
Various packing materials are available, and then utilize for expand the SFC application range.

## Example of SFC/MS Analysis

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




Conditions

| | |
|---|---|
| Column Size | : Inertsil ODS-EP (5 µm, 250 × 4.6 mm I.D.) |
| Eluent | : A) Supercritical carbon dioxide |
| | B) 0.1 % ammonium formate in methanol |
| | A/B = 95/5 - 1 min - 95/5 - 2 min - 90/10 -10 min - 80/20 |
| Flow Rate | : 3 mL/min |
| Col. Temp. | : 35 °C |
| Injection vol. | : 5 mL |
| Back Pressure | : 10 MPa (100 bar) |

Sample:

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

This data is provided by Prof. Dr. Bamba, Osaka Univercity.

## About packing materials

InertSustain and Inertsil series are available. Contact us for the details.

* Inspected with HPLC only, not with SFC.

## Sizes

The following four(4) sizes are available as standard SFC columns.
Please describe the packing materials when you order.

| Description | Cat.No. |
|---|---|
| Corresponding SFC column 5 µm, 2.1 × 150 mm | 5020-01007 |
| Corresponding SFC column 5 µm, 4.6 × 150 mm | 5020-01005 |
| Corresponding SFC column 5 µm, 4.6 × 250 mm | 5020-01006 |
| Corresponding SFC column 5 µm, 10 × 250 mm | 5020-01008 |
| Corresponding SFC column 5 µm, 20 × 250 mm | 5020-01009 |

* Maximum operating column pressures are 28 MPa (280 bar) on 2.1 × 150 mm and 25 MPa (250 bar) on 4.6 × 250 mm.

# Guard Columns

# How to Select a Guard Column

Guard columns are installed between the injector and the analytical column of a HPLC system, mainly to protect analytical columns. Guard columns are widely used as a cost effective for prolong HPLC column life. Exchangeable cartridge design and unchangeable packing design are offered.
Exchangeable cartridge design contains holder and cartridge column, and the cartridge columns are disposable, easy-to-use, and you can change the guard column in seconds.
Packed design is packed as same as analytical column, using as a guard column.

| Guard column design | Description | Compatible analytical columns' 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

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

## How to Select Dimensions

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

## Connectors

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

Pre-column Coupler W (PCTFE)

Pre-column Coupler SUS

# Cartridge Guard Column E

Cartridge Guard Column E

Cartridge guard column E designed with a special holder and cartridge, universal self-adjusting connections, reusable by changing cartridges.
Cartridges contain the same high performance packing material that are used in our GL Sciences analytical columns. Easy-to-use, convenient, and disposable guard columns protect your more expensive analytical columns.

## Line-up list

### InertSustain C18

| I.D. of the Analytical Column Applicable (mm) | Length (mm) | I.D. (mm) | Replacement Cartridge E Guard Column (2 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 | 5020-19250 | 5020-19249 | 5020-19300 | 5020-19299 |
| 1.5, 2.1 | | 1.5 | 5020-19350 | 5020-19349 | 5020-19400 | 5020-19399 |
| 2.1, 3.0 | | 3.0 | 5020-19150 | 5020-19149 | 5020-19200 | 5020-19199 |
| 4.0, 4.6 | | 4.0 | 5020-19050 | 5020-19049 | 5020-19100 | 5020-19099 |
| 2.1, 3.0 | 20 | 3.0 | 5020-19550 | 5020-19549 | 5020-19600 | 5020-19599 |
| 4.0, 4.6 | | 4.0 | 5020-19450 | 5020-19449 | 5020-19500 | 5020-19499 |

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

* Length of Cartridge Guard Column Ei is 10 mm

### 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 |

### Inertsil 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 | 5020-20179 | 5020-20181 |
| 3.0 | 3.0 | 5020-20175 | 5020-20177 |

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

### Specifications

- **Base Material : High Purity Silica Gel**
- **Particle Size : 2 µm, 3 µm**
- **Max. Operating Pressure : 80 MPa (800 bar)**
- **Analytical column I.D. : 1.0 - 3.0 mm I.D.**

## 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 |

## 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

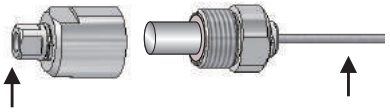
| Length (mm) | I.D. (mm) | Replacement Cartridge Guard Column (2 pcs) | | Cartridge Guard Column (2 pcs) + Holder (1 pcs) set | |
|---|---|---|---|---|---|
| | | Particle Size 2 µm | Particle Size 3 µm | Particle Size 2 µm | Particle Size 3 µm |
| 10 | 1.5 | 5020-20313 | 5020-20304 | 5020-20364 | 5020-20355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

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

| 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 |
| 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 Amide | 3 | 5020-20190 | 5020-20248 |
| | 5 | 5020-20189 | 5020-20247 |
| Inertsil HILIC | 3 | 5020-20125 | 5020-20225 |
| | 5 | 5020-20124 | 5020-20224 |
| InertSustain NH2 | 3 | 5020-16815 | 5020-16816 |
| | 5 | 5020-16722 | 5020-16723 |
| Inertsil NH2 | 3 | 5020-20121 | 5020-20221 |
| | 5 | 5020-20120 | 5020-20220 |
| Inertsil Diol | 3 | 5020-20123 | 5020-20223 |
| | 5 | 5020-20122 | 5020-20222 |
| Inertsil SIL-100A | 3 | 5020-20127 | 5020-20227 |
| | 5 | 5020-20126 | 5020-20226 |
| Inertsil SIL-150A | 5 | 5020-20139 | 5020-20239 |
| Inertsil WP300 SIL | 5 | 5020-20132 | 5020-20232 |
| Inertsil WP300 Diol | 5 | 5020-20131 | 5020-20231 |

# Packed Guard Columns, Packed Mini Guard Columns

Packed Guard Column

Packed Mini Guard Column

Packed guard column and Mini guard column are designed different with cartridges' type, using a high pressure to pack it as a guard column, and also can sustain analytical column's performance.
Packed guard column has length 33 mm and 50 mm two types, and Mini guard column has length 10 mm.

## Packed Guard Columns

| Packing Material | I.D. (mm) | Length 33 mm | | Length 50 mm | |
|---|---|---|---|---|---|
| | | Particle Size | | Particle Size | |
| | | 3 µm | 5 µm | 3 µm | 5 µm |
| InertSustain C18 | 1.0 | 5020-15996 | 5020-15995 | 5020-15896 | 5020-15895 |
| | 1.5 | 5020-15946 | 5020-15945 | 5020-15846 | 5020-15845 |
| | 2.1 | 5020-04896 | 5020-04895 | 5020-03596 | 5020-03595 |
| | 3.0 | 5020-04496 | 5020-04495 | 5020-03496 | 5020-03495 |
| | 4.0 | 5020-04296 | 5020-04295 | 5020-03396 | 5020-03395 |
| | 4.6 | 5020-04196 | 5020-04195 | 5020-03296 | 5020-03295 |
| 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 |
| 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 Amide | 1.0 | 5020-15998 | 5020-15997 | 5020-15898 | 5020-15897 |
| | 1.5 | 5020-15948 | 5020-15947 | 5020-15848 | 5020-15847 |
| | 2.1 | 5020-04898 | 5020-04897 | 5020-03598 | 5020-03597 |
| | 3.0 | 5020-04498 | 5020-04497 | 5020-03498 | 5020-03497 |
| | 4.0 | 5020-04298 | 5020-04297 | 5020-03398 | 5020-03397 |
| | 4.6 | 5020-04198 | 5020-04197 | 5020-03298 | 5020-03297 |

# 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 HILIC | 1.0 | 5020-15975 | 5020-15974 | 5020-15875 | 5020-15874 |
| | 1.5 | 5020-15925 | 5020-15924 | 5020-15825 | 5020-15824 |
| | 2.1 | 5020-04875 | 5020-04874 | 5020-03575 | 5020-03574 |
| | 3.0 | 5020-04475 | 5020-04474 | 5020-03475 | 5020-03474 |
| | 4.0 | 5020-04275 | 5020-04274 | 5020-03375 | 5020-03374 |
| | 4.6 | 5020-04175 | 5020-04174 | 5020-03275 | 5020-03274 |
| InertSustain NH2 | 1.0 | 5020-16783 | 5020-16654 | 5020-16781 | 5020-16652 |
| | 1.5 | 5020-16782 | 5020-16653 | 5020-16780 | 5020-16651 |
| | 2.1 | 5020-16767 | 5020-16638 | 5020-16762 | 5020-16633 |
| | 3.0 | 5020-16766 | 5020-16637 | 5020-16761 | 5020-16632 |
| | 4.0 | 5020-16765 | 5020-16634 | 5020-16760 | 5020-16631 |
| | 4.6 | 5020-16764 | 5020-16635 | 5020-16759 | 5020-16630 |
| Inertsil NH2 | 1.0 | 5020-15971 | 5020-15970 | 5020-15871 | 5020-15870 |
| | 1.5 | 5020-15921 | 5020-15920 | 5020-15821 | 5020-15820 |
| | 2.1 | 5020-04871 | 5020-04870 | 5020-03571 | 5020-03570 |
| | 3.0 | 5020-04471 | 5020-04470 | 5020-03471 | 5020-03470 |
| | 4.0 | 5020-04271 | 5020-04270 | 5020-03371 | 5020-03370 |
| | 4.6 | 5020-04171 | 5020-04170 | 5020-03271 | 5020-03270 |
| 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 |
| 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 |
| Inertsil ODS-80A | 5 | 4.0 | 10 | 5020-03690 |
| 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 Amide | 3 | 4.0 | 10 | 5020-03698 |
| | 5 | 4.0 | 10 | 5020-03697 |
| Inertsil HILIC | 3 | 4.0 | 10 | 5020-03675 |
| | 5 | 4.0 | 10 | 5020-03674 |
| InertSustain NH2 | 3 | 4.0 | 10 | 5020-16763 |
| | 5 | 4.0 | 10 | 5020-16634 |
| Inertsil NH2 | 3 | 4.0 | 10 | 5020-03671 |
| | 5 | 4.0 | 10 | 5020-03670 |
| Inertsil Diol | 3 | 4.0 | 10 | 5020-03673 |
| | 5 | 4.0 | 10 | 5020-03672 |
| Inertsil SIL-100A | 3 | 4.0 | 10 | 5020-03677 |
| | 5 | 4.0 | 10 | 5020-03676 |
| Inertsil SIL-150A | 5 | 4.0 | 10 | 5020-03689 |
| Inertsil WP300 SIL | 5 | 4.0 | 10 | 5020-03682 |
| Inertsil WP300 Diol | 5 | 4.0 | 10 | 5020-03681 |

* Other packing materials are on request.

# SILFILTER STD C18

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

● **Feature**

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

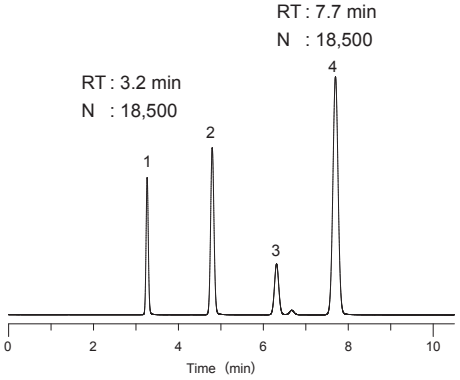
● **Specification**

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

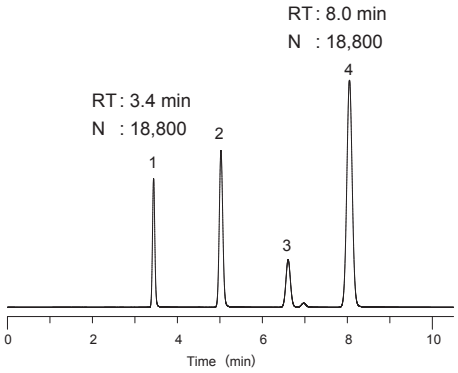
## No Sacrifice in Separation Efficiency

The following test was conducted to confirm the efficiency of SILFILTER STD C18.
As shown below, the efficiency didn't decrease even for those fast eluting samples when installing SILFILTER STD C18.

Analytical C18 column only




With SILFILTER STD C18




Conditions

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

Set A (with tubing)

Set B (without tubing)

PEEK Tough Connector

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

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

# Filters, Impurity Remove Columns

## Pre-Column Coupler

Pre-column Coupler (PCTFE)

Pre-column Coupler SUS

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

- **Specification**

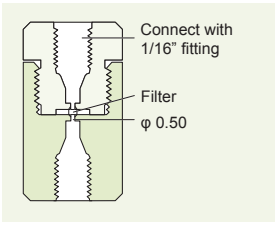
Max. operating pressure : PCTFE : 14.7 MPa (147 bar), SUS : 80 MPa (800 bar)
Tube O.D. : 1/16 inch
Length : 29.2 mm (UP type), 32 mm (W type), 40 mm (SUS type)

| Item | I.D. | Material | Conection | Cat.No. |
|---|---|---|---|---|
| Pre-column Coupler UP | 0.18 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 | PCTFE | Waters type | 6010-49251 |
| | 0.50 mm | | | 6010-49211 |
| Pre-column Coupler SUS | 0.10 mm | SUS | –* | 6010-49210 |
| | 0.25 mm | | | 6010-49250 |

* 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 |

## Pre-Clean ORG

Pre-clean ORG

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

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

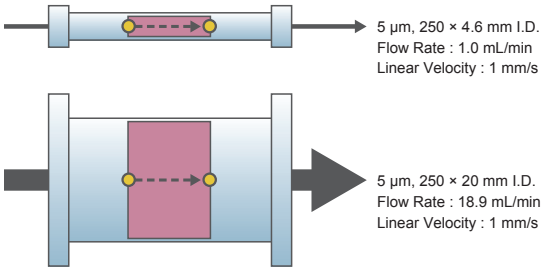

inertsil
ODS-3 5 μ

# Preparative Columns

# Choosing Preparative Columns

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

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

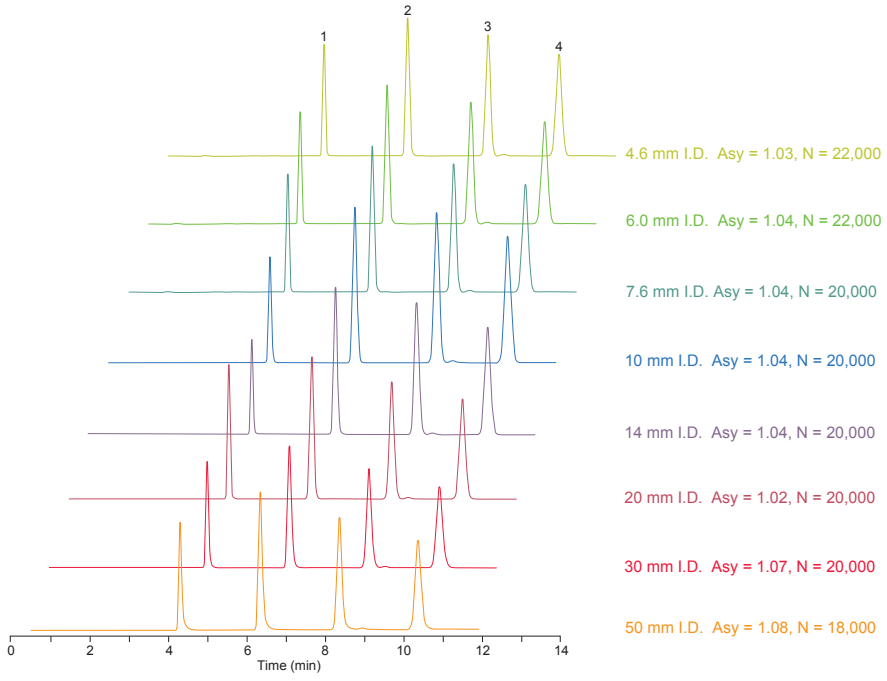



| Column I.D. (mm) | Scale-Up Factor | Appropriate Flow Rate (mL/min)*1 | | | | Remarks |
|---|---|---|---|---|---|---|
| | | Reversed/Normal Phases | SEC | HILIC | Chiral | |
| 4.6 | 1 | 1 | 0.2 - 0.3 | 0.5 | 1 | Determine and optimize the analytical separation using 4.6 mm I.D. analytical columns.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

* 1 : When the particle size of the packing material is a 5 µm.
* 2 : When the particle size of the packing material is a 10 µm.
* 3 : When the particle size of the packing material is a 20 µm.

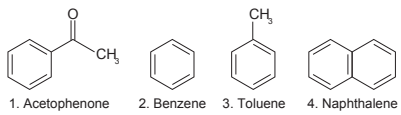
## Smooth and Easy Scale-Up from Analytical to Preparative Dimensions

Generally, analytical scale columns are used initially to determine and optimize separation conditions between the target peak and unwanted contaminants with various bonded phases. Efficient scale-up of methods from analytical to preparative dimensions requires the use of a packing material offering identical selectivity, otherwise methods would not scale as expected.
InertSustain and Inertsil preparative HPLC columns offer asymmetry factor of nearly 1.0 delivering symmetric peaks maintaining efficiency of approximately 20,000 (N) when the column length is a 250 mm. As shown below, the scalability of InertSustain and Inertsil preparative HPLC columns provides smooth, easy and highly efficient purification and isolation results.




Conditions

System : PLC 761 System
Column : Inertsil ODS-3 (5 µm, 250 mm)
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 65/35, v/v
Flow Rate : Linear Velocity at 1 mm/s
Col. Temp. : 40 °C
Col. Pres. : Approx. 5.0 MPa (50 bar)
Detection : UV 254 nm
Sample : 1. Acetophenone
2. Benzene
3. Toluene
4. Naphthalene



# Preparative Columns

Preparative Columns

InertSustain and Inertsil preparative columns are available in a broad range of column sizes to answer and meet all demands in 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 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-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-80A<br>5 µm | 6.0 | 5020- | 5020- | 5020-01603 | 5020-01604 |
| | 7.6 | 5020- | 5020- | 5020- | 5020-06146 |
| | 10 | 5020- | 5020- | 5020- | 5020-15616 |
| | 20 | 5020- | 5020- | 5020- | 5020-15646 |
| Inertsil ODS-2<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<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 PFP<br>5 µm | 6 | 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 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- |
| 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 Amide<br>5 µm | 6.0 | 5020-07842 | 5020-07844 | 5020-07845 | 5020-07846 |
| | 7.6 | 5020-07852 | 5020-07854 | 5020-07855 | 5020-07856 |
| | 10 | 5020-86852 | 5020-86854 | 5020-86855 | 5020-86856 |
| | 14 | 5020-79066 | 5020-79067 | 5020-79068 | 5020-79069 |
| | 20 | 5020-86862 | 5020-86864 | 5020-86865 | 5020-86866 |
| | 30 | 5020-86872 | 5020- | 5020- | 5020-86876 |
| | 50 | – | 5020- | 5020- | 5020-86886 |
| | 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- |
| Inertsil Peptides C18<br>4 µm | 6.0 | 5020-08062 | 5020-08064 | 5020-08065 | 5020-08066 |
| | 7.6 | 5020-08081 | 5020- | 5020- | 5020-08082 |
| | 10 | 5020-08083 | 5020- | 5020- | 5020-08084 |
| | 20 | 5020-08085 | 5020- | 5020- | 5020-08086 |
| | 30 | 5020-08087 | 5020- | 5020- | 5020-08088 |
| | 50 | – | 5020- | 5020- | 5020-08089 |

# Guard Columns for Preparative Columns

Guard Columns for Preparative Columns

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

| 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- |
| 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-80A | 5 µm | 7.6 × 50 | 5020-06136 |
| | | 10 × 50 | 5020-15606 |
| | | 20 × 50 | 5020-15636 |
| Inertsil ODS-2 | 5 µm | 7.6 × 50 | 5020-06132 |
| | | 10 × 50 | 5020-15602 |
| | | 20 × 50 | 5020-15632 |
| 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 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 Amide | 5 µm | 6.0 × 50 | 5020-07847 |
| | | 7.6 × 50 | 5020-07857 |
| | | 10 × 50 | 5020-86857 |
| | | 14 × 50 | 5020-79070 |
| | | 20 × 50 | 5020-86867 |
| | | 30 × 50 | 5020-86877 |
| | | 50 × 75 | 5020-86887 |
| | | 100 × 100 | 5020- |
| Inertsil HILIC | 5 µm | 6.0 × 50 | 5020-07747 |
| | | 7.6 × 50 | 5020-07757 |
| | | 10 × 50 | 5020-86757 |
| | | 14 × 50 | 5020-79065 |
| | | 20 × 50 | 5020-86767 |
| | | 30 × 50 | 5020-86777 |
| | | 50 × 75 | 5020-86787 |
| | | 100 × 100 | 5020- |
| InertSustain NH2 | 5 µm | 6.0 × 50 | 5020-16675 |
| | | 7.6 × 50 | 5020-16676 |
| | | 10 × 50 | 5020-16677 |
| | | 14 × 50 | 5020-16678 |
| | | 20 × 50 | 5020-16679 |
| | | 30 × 50 | 5020- |
| | | 50 × 75 | 5020- |
| | | 100 × 100 | 5020- |

# 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- |
| Inertsil Peptides C18 | 4 µm | 6.0 × 50 | 5020-08071 |
| | | 7.6 × 50 | 5020-08072 |
| | | 10 × 50 | 5020-08073 |
| | | 20 × 50 | 5020-08074 |
| | | 30 × 50 | 5020-08075 |
| | | 50 × 75 | 5020-08076 |

# PREP Guard Cartridges

PREP Guard Cartridges

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

| Phase | Length (mm) | I.D. (mm) | Replacement Cartridge (2 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-80A | 30 | 7.6 | 5020-15740 | 5020-15790 |
| Inertsil ODS-2 | 30 | 7.6 | 5020-15735 | 5020-15785 |
| Inertsil ODS | 30 | 7.6 | 5020-15741 | 5020-15791 |
| InertSustain C8 | 30 | 7.6 | 5020-16080 | 5020-16081 |
| 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 Amide | 30 | 7.6 | 5020-15745 | 5020-15795 |
| Inertsil HILIC | 30 | 7.6 | 5020-15724 | 5020-15774 |
| InertSustain NH2 | 30 | 7.6 | 5020-16680 | 5020-16681 |
| Inertsil NH2 | 30 | 7.6 | 5020-15720 | 5020-15770 |
| Inertsil Diol | 30 | 7.6 | 5020-15722 | 5020-15772 |
| Inertsil SIL-100A | 30 | 7.6 | 5020-15726 | 5020-15776 |
| Inertsil SIL-150A | 30 | 7.6 | 5020-15739 | 5020-15789 |
| Inertsil WP300 Diol | 30 | 7.6 | 5020-15731 | 5020-15781 |
| Inertsil WP300 SIL | 30 | 7.6 | 5020-15732 | 5020-15782 |
| Inertsil Peptides C18 | 30 | 7.6 | 5020-15711 | 5020-15761 |

## Holder

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

# Capillary Columns

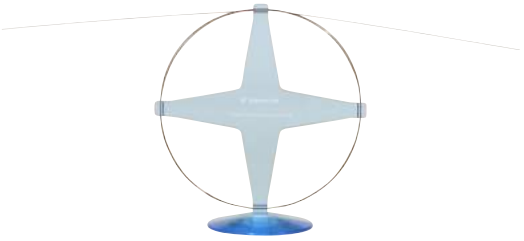
# Capillary HPLC Columns

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

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

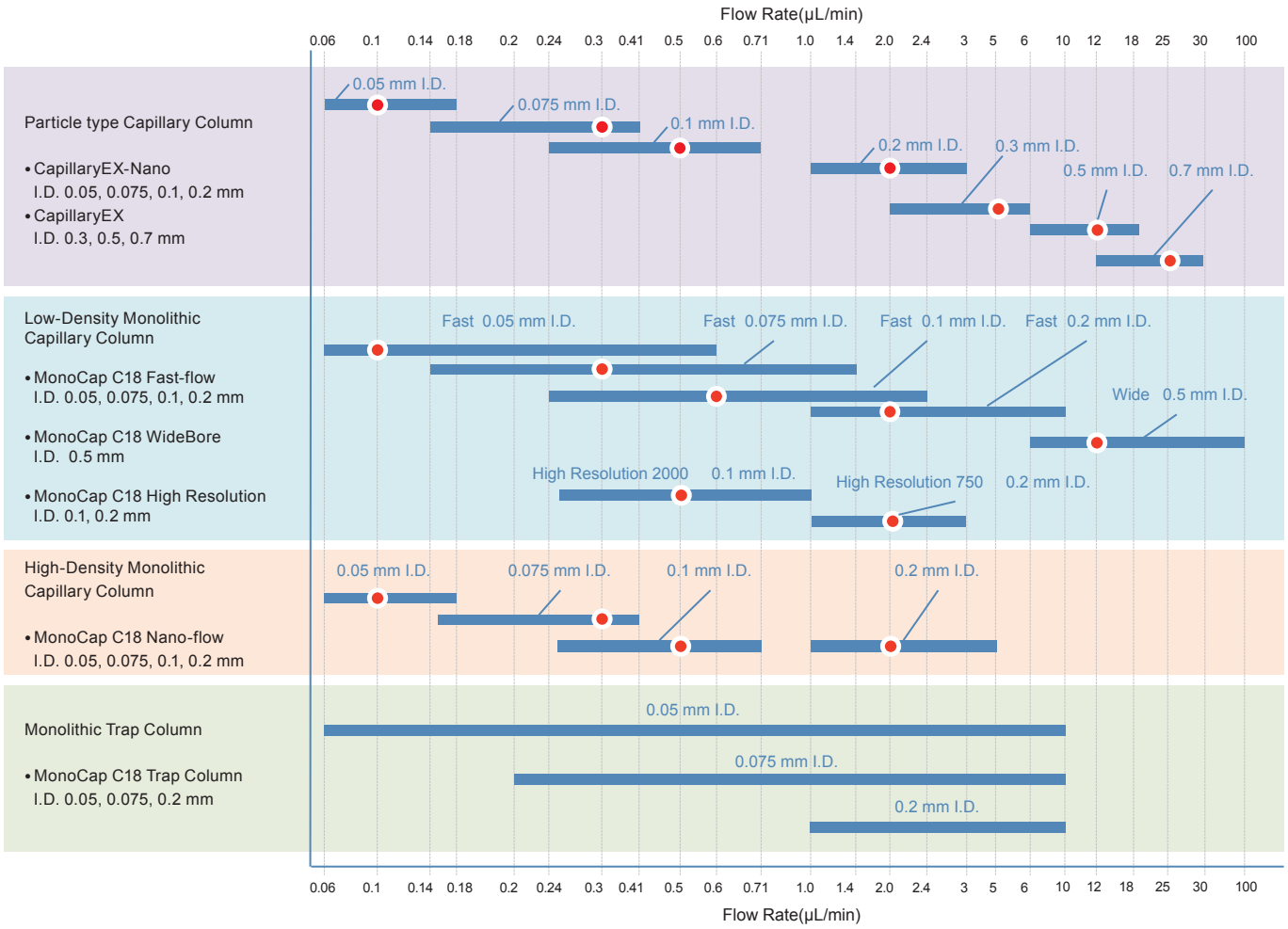
MonoCap Fast-Flow provides high throughput analysis at half of the operating pressure compared to totally porous particle type columns. MonoCap Nano-flow deliver extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes. Electrospray emitter for ESI-LC/MS, MonoSpray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

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



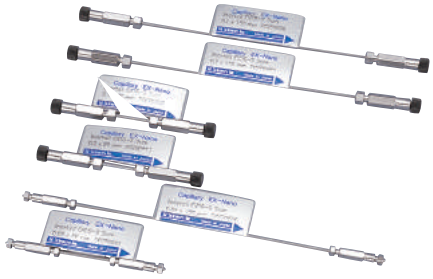
MonoCap High Resolution 2000

## Figure 1 : Recommended Operating Flow Rate Range



# Particle Type Capillary HPLC Columns

Columns with I.D. sizes of 0.05, 0.075, 0.1 and 0.2 mm are Capillary EX-Nano columns. I.D. sizes of 0.3, 0.5 and 0.7 mm are Capillary EX columns. Capillary EX-Nano columns introduces a fused silica capillary tube having a very smooth and clean inner surface resulting in high theoretical plates. Capillary EX columns employs the same column hardware used in analytical columns, which is very easy to use.



Capillary EX-Nano

Capillary EX

| Phase | I.D. (mm) | Particle Size (µm) | Length 50 mm Cat.No. | Length 150 mm Cat.No. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| InertSustain C18 | 0.05 | 3 | 5020-15038 | 5020-15088 | 5020-15138 |
| | | 5 | 5020-15037 | 5020-15087 | 5020-15137 |
| | 0.075 | 3 | 5020-15188 | 5020-15238 | 5020-15288 |
| | | 5 | 5020-15187 | 5020-15237 | 5020-15287 |
| | 0.1 | 3 | 5020-15338 | 5020-15388 | 5020-15438 |
| | | 5 | 5020-15337 | 5020-15387 | 5020-15437 |
| | 0.2 | 3 | 5020-15488 | 5020-15538 | 5020-15588 |
| | | 5 | 5020-15487 | 5020-15537 | 5020-15587 |
| | 0.3 | 3 | 5020-11539 | 5020-11589 | – |
| | | 5 | 5020-11538 | 5020-11588 | – |
| | 0.5 | 3 | 5020-11639 | 5020-11689 | – |
| | | 5 | 5020-11638 | 5020-11688 | – |
| | 0.7 | 3 | 5020-11739 | 5020-11789 | – |
| | | 5 | 5020-11738 | 5020-11788 | – |
| InertSustain AQ-C18 | 0.05 | 3 | 5020-89894 | 5020-89895 | 5020-89896 |
| | | 5 | 5020-89792 | 5020-89793 | 5020-89794 |
| | 0.075 | 3 | 5020-89897 | 5020-89898 | 5020-89899 |
| | | 5 | 5020-89795 | 5020-89796 | 5020-89797 |
| | 0.1 | 3 | 5020-89900 | 5020-89901 | 5020-89902 |
| | | 5 | 5020-89798 | 5020-89799 | 5020-89800 |
| | 0.2 | 3 | 5020-89903 | 5020-89904 | 5020-89905 |
| | | 5 | 5020-89801 | 5020-89802 | 5020-89803 |
| | 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. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| InertSustainSwift C18 | 0.05 | 3 | 5020-88183 | 5020-88184 | 5020-88185 |
| | | 5 | 5020-88089 | 5020-88090 | 5020-88091 |
| | 0.075 | 3 | 5020-88186 | 5020-88187 | 5020-88188 |
| | | 5 | 5020-88092 | 5020-88093 | 5020-88094 |
| | 0.1 | 3 | 5020-88189 | 5020-88190 | 5020-88191 |
| | | 5 | 5020-88095 | 5020-88096 | 5020-88097 |
| | 0.2 | 3 | 5020-88192 | 5020-88193 | 5020-88194 |
| | | 5 | 5020-88098 | 5020-88099 | 5020-88100 |
| | 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 | 5020-87291 |
| | | 5 | 5020-87193 | 5020-87194 | 5020-87195 |
| | 0.075 | 3 | 5020-87292 | 5020-87293 | 5020-87294 |
| | | 5 | 5020-87196 | 5020-87197 | 5020-87198 |
| | 0.1 | 3 | 5020-87295 | 5020-87296 | 5020-87297 |
| | | 5 | 5020-87199 | 5020-87200 | 5020-87201 |
| | 0.2 | 3 | 5020-87298 | 5020-87299 | 5020-87300 |
| | | 5 | 5020-87202 | 5020-87203 | 5020-87204 |
| | 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 | 5020-15102 |
| | | 5 | 5020-15001 | 5020-15051 | 5020-15101 |
| | 0.075 | 3 | 5020-15152 | 5020-15202 | 5020-15252 |
| | | 5 | 5020-15151 | 5020-15201 | 5020-15251 |
| | 0.1 | 3 | 5020-15302 | 5020-15352 | 5020-15402 |
| | | 5 | 5020-15301 | 5020-15351 | 5020-15401 |
| | 0.2 | 3 | 5020-15452 | 5020-15502 | 5020-15552 |
| | | 5 | 5020-15451 | 5020-15501 | 5020-15551 |
| | 0.3 | 3 | 5020-11502 | 5020-11552 | – |
| | | 5 | 5020-11501 | 5020-11551 | – |
| | 0.5 | 3 | 5020-11602 | 5020-11652 | – |
| | | 5 | 5020-11601 | 5020-11651 | – |
| | 0.7 | 3 | 5020-11702 | 5020-11752 | – |
| | | 5 | 5020-11701 | 5020-11751 | – |

| Phase | I.D. (mm) | Particle Size (μm) | Length 50 mm Cat.No. | Length 150 mm Cat.No. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| Inertsil ODS-3 | 0.05 | 3 | 5020-15005 | 5020-15055 | 5020-15105 |
| | | 4 | 5020-15004 | 5020-15054 | 5020-15104 |
| | | 5 | 5020-15003 | 5020-15053 | 5020-15103 |
| | 0.075 | 3 | 5020-15155 | 5020-15205 | 5020-15255 |
| | | 4 | 5020-15154 | 5020-15204 | 5020-15254 |
| | | 5 | 5020-15153 | 5020-15203 | 5020-15253 |
| | 0.1 | 3 | 5020-15305 | 5020-15355 | 5020-15405 |
| | | 4 | 5020-15304 | 5020-15354 | 5020-15404 |
| | | 5 | 5020-15303 | 5020-15353 | 5020-15403 |
| | 0.2 | 3 | 5020-15455 | 5020-15505 | 5020-15555 |
| | | 4 | 5020-15454 | 5020-15504 | 5020-15554 |
| | | 5 | 5020-15453 | 5020-15503 | 5020-15553 |
| | 0.3 | 3 | 5020-11505 | 5020-11555 | – |
| | | 4 | 5020-11504 | 5020-11554 | – |
| | | 5 | 5020-11503 | 5020-11553 | – |
| | 0.5 | 3 | 5020-11605 | 5020-11655 | – |
| | | 4 | 5020-11604 | 5020-11654 | – |
| | | 5 | 5020-11603 | 5020-11653 | – |
| | 0.7 | 3 | 5020-11705 | 5020-11755 | – |
| | | 4 | 5020-11704 | 5020-11754 | – |
| | | 5 | 5020-11703 | 5020-11753 | – |
| Inertsil ODS-SP | 0.05 | 3 | 5020-15007 | 5020-15057 | 5020-15107 |
| | | 5 | 5020-15006 | 5020-15056 | 5020-15106 |
| | 0.075 | 3 | 5020-15157 | 5020-15207 | 5020-15257 |
| | | 5 | 5020-15156 | 5020-15206 | 5020-15256 |
| | 0.1 | 3 | 5020-15307 | 5020-15357 | 5020-15407 |
| | | 5 | 5020-15306 | 5020-15356 | 5020-15406 |
| | 0.2 | 3 | 5020-15457 | 5020-15507 | 5020-15557 |
| | | 5 | 5020-15456 | 5020-15506 | 5020-15556 |
| | 0.3 | 3 | 5020-11507 | 5020-11557 | – |
| | | 5 | 5020-11506 | 5020-11556 | – |
| | 0.5 | 3 | 5020-11607 | 5020-11657 | – |
| | | 5 | 5020-11606 | 5020-11656 | – |
| | 0.7 | 3 | 5020-11707 | 5020-11757 | – |
| | | 5 | 5020-11706 | 5020-11756 | – |
| Inertsil ODS-P | 0.05 | 3 | 5020-15009 | 5020-15059 | 5020-15109 |
| | | 5 | 5020-15008 | 5020-15058 | 5020-15108 |
| | 0.075 | 3 | 5020-15159 | 5020-15209 | 5020-15259 |
| | | 5 | 5020-15158 | 5020-15208 | 5020-15258 |
| | 0.1 | 3 | 5020-15309 | 5020-15359 | 5020-15409 |
| | | 5 | 5020-15308 | 5020-15358 | 5020-15408 |
| | 0.2 | 3 | 5020-15459 | 5020-15509 | 5020-15559 |
| | | 5 | 5020-15458 | 5020-15508 | 5020-15558 |
| | 0.3 | 3 | 5020-11509 | 5020-11559 | – |
| | | 5 | 5020-11508 | 5020-11558 | – |
| | 0.5 | 3 | 5020-11609 | 5020-11659 | – |
| | | 5 | 5020-11608 | 5020-11658 | – |
| | 0.7 | 3 | 5020-11709 | 5020-11759 | – |
| | | 5 | 5020-11708 | 5020-11758 | – |
| InertSustain C8 | 0.05 | 3 | 5020-16191 | 5020-16192 | 5020-16193 |
| | | 5 | 5020-16090 | 5020-16091 | 5020-16092 |
| | 0.075 | 3 | 5020-16194 | 5020-16195 | 5020-16196 |
| | | 5 | 5020-16093 | 5020-16094 | 5020-16095 |
| | 0.1 | 3 | 5020-16197 | 5020-16198 | 5020-16199 |
| | | 5 | 5020-16096 | 5020-16097 | 5020-16098 |
| | 0.2 | 3 | 5020-16200 | 5020-16201 | 5020-16202 |
| | | 5 | 5020-16099 | 5020-16100 | 5020-16101 |
| | 0.3 | 3 | 5020-16184 | 5020-16185 | – |
| | | 5 | 5020-16082 | 5020-16083 | – |
| | 0.5 | 3 | 5020-16186 | 5020-16187 | – |
| | | 5 | 5020-16084 | 5020-16085 | – |
| | 0.7 | 3 | 5020-16188 | 5020-16189 | – |
| | | 5 | 5020-16086 | 5020-16087 | – |

# Particle Type Capillary HPLC Columns

| Phase | I.D. (mm) | Particle Size (µm) | Length 50 mm Cat.No. | Length 150 mm Cat.No. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| InertSustainSwift C8 | 0.05 | 3 | 5020-88489 | 5020-88490 | 5020-88491 |
| | | 5 | 5020-88393 | 5020-88394 | 5020-88395 |
| | 0.075 | 3 | 5020-88492 | 5020-88493 | 5020-88494 |
| | | 5 | 5020-88396 | 5020-88397 | 5020-88398 |
| | 0.1 | 3 | 5020-88495 | 5020-88496 | 5020-88497 |
| | | 5 | 5020-88399 | 5020-88400 | 5020-88401 |
| | 0.2 | 3 | 5020-88498 | 5020-88499 | 5020-88500 |
| | | 5 | 5020-88402 | 5020-88403 | 5020-88404 |
| | 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 | 5020-15136 |
| | | 5 | 5020-15035 | 5020-15085 | 5020-15135 |
| | 0.075 | 3 | 5020-15186 | 5020-15236 | 5020-15286 |
| | | 5 | 5020-15185 | 5020-15235 | 5020-15285 |
| | 0.1 | 3 | 5020-15336 | 5020-15386 | 5020-15436 |
| | | 5 | 5020-15335 | 5020-15385 | 5020-15435 |
| | 0.2 | 3 | 5020-15486 | 5020-15536 | 5020-15586 |
| | | 5 | 5020-15485 | 5020-15535 | 5020-15585 |
| | 0.3 | 3 | 5020-11536 | 5020-11586 | – |
| | | 5 | 5020-11535 | 5020-11585 | – |
| | 0.5 | 3 | 5020-11636 | 5020-11686 | – |
| | | 5 | 5020-11635 | 5020-11685 | – |
| | 0.7 | 3 | 5020-11736 | 5020-11786 | – |
| | | 5 | 5020-11735 | 5020-11785 | – |
| Inertsil C8-3 | 0.05 | 3 | 5020-15015 | 5020-15065 | 5020-15115 |
| | | 5 | 5020-15014 | 5020-15064 | 5020-15114 |
| | 0.075 | 3 | 5020-15165 | 5020-15215 | 5020-15265 |
| | | 5 | 5020-15164 | 5020-15214 | 5020-15264 |
| | 0.1 | 3 | 5020-15315 | 5020-15365 | 5020-15415 |
| | | 5 | 5020-15314 | 5020-15364 | 5020-15414 |
| | 0.2 | 3 | 5020-15465 | 5020-15515 | 5020-15565 |
| | | 5 | 5020-15464 | 5020-15514 | 5020-15564 |
| | 0.3 | 3 | 5020-11515 | 5020-11565 | – |
| | | 5 | 5020-11514 | 5020-11564 | – |
| | 0.5 | 3 | 5020-11615 | 5020-11665 | – |
| | | 5 | 5020-11614 | 5020-11664 | – |
| | 0.7 | 3 | 5020-11715 | 5020-11765 | – |
| | | 5 | 5020-11714 | 5020-11764 | – |
| Inertsil WP300 C18 | 0.05 | 5 | 5020-15028 | 5020-15078 | 5020-15128 |
| | 0.075 | 5 | 5020-15178 | 5020-15228 | 5020-15278 |
| | 0.1 | 5 | 5020-15328 | 5020-15378 | 5020-15428 |
| | 0.2 | 5 | 5020-15478 | 5020-15528 | 5020-15578 |
| | 0.3 | 5 | 5020-11528 | 5020-11578 | – |
| | 0.5 | 5 | 5020-11628 | 5020-11678 | – |
| | 0.7 | 5 | 5020-11728 | 5020-11778 | – |
| Inertsil WP300 C8 | 0.05 | 5 | 5020-15029 | 5020-15079 | 5020-15129 |
| | 0.075 | 5 | 5020-15179 | 5020-15229 | 5020-15279 |
| | 0.1 | 5 | 5020-15329 | 5020-15379 | 5020-15429 |
| | 0.2 | 5 | 5020-15479 | 5020-15529 | 5020-15579 |
| | 0.3 | 5 | 5020-11529 | 5020-11579 | – |
| | 0.5 | 5 | 5020-11629 | 5020-11679 | – |
| | 0.7 | 5 | 5020-11729 | 5020-11779 | – |

| Phase | I.D. (mm) | Particle Size (μm) | Length 50 mm Cat.No. | Length 150 mm Cat.No. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| InertSustain PFP | 0.05 | 3 | 5020-87891 | 5020-87892 | 5020-87893 |
| | | 5 | 5020-87791 | 5020-87792 | 5020-87793 |
| | 0.075 | 3 | 5020-87894 | 5020-87895 | 5020-87896 |
| | | 5 | 5020-87794 | 5020-87795 | 5020-87796 |
| | 0.1 | 3 | 5020-87897 | 5020-87898 | 5020-87899 |
| | | 5 | 5020-87797 | 5020-87798 | 5020-87799 |
| | 0.2 | 3 | 5020-87900 | 5020-87901 | 5020-87902 |
| | | 5 | 5020-87800 | 5020-87801 | 5020-87802 |
| | 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 | 5020-89185 |
| | | 5 | 5020-89089 | 5020-89090 | 5020-89091 |
| | 0.075 | 3 | 5020-89186 | 5020-89187 | 5020-89188 |
| | | 5 | 5020-89092 | 5020-89093 | 5020-89094 |
| | 0.1 | 3 | 5020-89189 | 5020-89190 | 5020-89191 |
| | | 5 | 5020-89095 | 5020-89096 | 5020-89097 |
| | 0.2 | 3 | 5020-89192 | 5020-89193 | 5020-89194 |
| | | 5 | 5020-89098 | 5020-89099 | 5020-89100 |
| | 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 | 5020-16493 |
| | | 5 | 5020-16390 | 5020-16391 | 5020-16392 |
| | 0.075 | 3 | 5020-16494 | 5020-16495 | 5020-16496 |
| | | 5 | 5020-16393 | 5020-16394 | 5020-16395 |
| | 0.1 | 3 | 5020-16497 | 5020-16498 | 5020-16499 |
| | | 5 | 5020-16396 | 5020-16397 | 5020-16398 |
| | 0.2 | 3 | 5020-16500 | 5020-16501 | 5020-16502 |
| | | 5 | 5020-16399 | 5020-16400 | 5020-16401 |
| | 0.3 | 3 | 5020-16484 | 5020-16485 | – |
| | | 5 | 5020-16382 | 5020-16383 | – |
| | 0.5 | 3 | 5020-16486 | 5020-16487 | – |
| | | 5 | 5020-16384 | 5020-16385 | – |
| | 0.7 | 3 | 5020-16488 | 5020-16489 | – |
| | | 5 | 5020-16386 | 5020-16387 | – |
| Inertsil Ph-3 | 0.05 | 3 | 5020-15017 | 5020-15067 | 5020-15117 |
| | | 5 | 5020-15016 | 5020-15066 | 5020-15116 |
| | 0.075 | 3 | 5020-15167 | 5020-15217 | 5020-15267 |
| | | 5 | 5020-15166 | 5020-15216 | 5020-15266 |
| | 0.1 | 3 | 5020-15317 | 5020-15367 | 5020-15417 |
| | | 5 | 5020-15316 | 5020-15366 | 5020-15416 |
| | 0.2 | 3 | 5020-15467 | 5020-15517 | 5020-15567 |
| | | 5 | 5020-15466 | 5020-15516 | 5020-15566 |
| | 0.3 | 3 | 5020-11517 | 5020-11567 | – |
| | | 5 | 5020-11516 | 5020-11566 | – |
| | 0.5 | 3 | 5020-11617 | 5020-11667 | – |
| | | 5 | 5020-11616 | 5020-11666 | – |
| | 0.7 | 3 | 5020-11717 | 5020-11767 | – |
| | | 5 | 5020-11716 | 5020-11766 | – |
| InertSustain Amide | 0.05 | 3 | 5020-88789 | 5020-88790 | 5020-88791 |
| | | 5 | 5020-88693 | 5020-88694 | 5020-88695 |
| | 0.075 | 3 | 5020-88792 | 5020-88793 | 5020-88794 |
| | | 5 | 5020-88696 | 5020-88697 | 5020-88698 |
| | 0.1 | 3 | 5020-88795 | 5020-88796 | 5020-88797 |
| | | 5 | 5020-88699 | 5020-88700 | 5020-88701 |
| | 0.2 | 3 | 5020-88798 | 5020-88799 | 5020-88800 |
| | | 5 | 5020-88702 | 5020-88703 | 5020-88704 |
| | 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. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| Inertsil Amide | 0.05 | 3 | 5020-15040 | 5020-15090 | 5020-15140 |
| | | 5 | 5020-15039 | 5020-15089 | 5020-15139 |
| | 0.075 | 3 | 5020-15190 | 5020-15240 | 5020-15290 |
| | | 5 | 5020-15189 | 5020-15239 | 5020-15289 |
| | 0.1 | 3 | 5020-15340 | 5020-15390 | 5020-15440 |
| | | 5 | 5020-15339 | 5020-15389 | 5020-15439 |
| | 0.2 | 3 | 5020-15490 | 5020-15540 | 5020-15590 |
| | | 5 | 5020-15489 | 5020-15539 | 5020-15589 |
| | 0.3 | 3 | 5020-11541 | 5020-11591 | – |
| | | 5 | 5020-11540 | 5020-11590 | – |
| | 0.5 | 3 | 5020-11641 | 5020-11691 | – |
| | | 5 | 5020-11640 | 5020-11690 | – |
| | 0.7 | 3 | 5020-11741 | 5020-11791 | – |
| | | 5 | 5020-11740 | 5020-11790 | – |
| Inertsil HILIC | 0.05 | 3 | 5020-15025 | 5020-15075 | 5020-15125 |
| | | 5 | 5020-15024 | 5020-15074 | 5020-15124 |
| | 0.075 | 3 | 5020-15175 | 5020-15225 | 5020-15275 |
| | | 5 | 5020-15174 | 5020-15224 | 5020-15274 |
| | 0.1 | 3 | 5020-15325 | 5020-15375 | 5020-15425 |
| | | 5 | 5020-15324 | 5020-15374 | 5020-15424 |
| | 0.2 | 3 | 5020-15475 | 5020-15525 | 5020-15575 |
| | | 5 | 5020-15474 | 5020-15524 | 5020-15574 |
| | 0.3 | 3 | 5020-11525 | 5020-11575 | – |
| | | 5 | 5020-11524 | 5020-11574 | – |
| | 0.5 | 3 | 5020-11625 | 5020-11675 | – |
| | | 5 | 5020-11624 | 5020-11674 | – |
| | 0.7 | 3 | 5020-11725 | 5020-11775 | – |
| | | 5 | 5020-11724 | 5020-11774 | – |
| InertSustain NH2 | 0.05 | 3 | 5020-16791 | 5020-16792 | 5020-16793 |
| | | 5 | 5020-16690 | 5020-16691 | 5020-16692 |
| | 0.075 | 3 | 5020-16794 | 5020-16795 | 5020-16796 |
| | | 5 | 5020-16693 | 5020-16694 | 5020-16695 |
| | 0.1 | 3 | 5020-16797 | 5020-16798 | 5020-16799 |
| | | 5 | 5020-16696 | 5020-16697 | 5020-16698 |
| | 0.2 | 3 | 5020-16800 | 5020-16801 | 5020-16802 |
| | | 5 | 5020-16699 | 5020-16700 | 5020-16701 |
| | 0.3 | 3 | 5020-16784 | 5020-16785 | – |
| | | 5 | 5020-16682 | 5020-16683 | – |
| | 0.5 | 3 | 5020-16786 | 5020-16787 | – |
| | | 5 | 5020-16684 | 5020-16685 | – |
| | 0.7 | 3 | 5020-16788 | 5020-16789 | – |
| | | 5 | 5020-16686 | 5020-16687 | – |
| Inertsil NH2 | 0.05 | 3 | 5020-15021 | 5020-15071 | 5020-15121 |
| | | 5 | 5020-15020 | 5020-15070 | 5020-15120 |
| | 0.075 | 3 | 5020-15171 | 5020-15221 | 5020-15271 |
| | | 5 | 5020-15170 | 5020-15220 | 5020-15270 |
| | 0.1 | 3 | 5020-15321 | 5020-15371 | 5020-15421 |
| | | 5 | 5020-15320 | 5020-15370 | 5020-15420 |
| | 0.2 | 3 | 5020-15471 | 5020-15521 | 5020-15571 |
| | | 5 | 5020-15470 | 5020-15520 | 5020-15570 |
| | 0.3 | 3 | 5020-11521 | 5020-11571 | – |
| | | 5 | 5020-11520 | 5020-11570 | – |
| | 0.5 | 3 | 5020-11621 | 5020-11671 | – |
| | | 5 | 5020-11620 | 5020-11670 | – |
| | 0.7 | 3 | 5020-11721 | 5020-11771 | – |
| | | 5 | 5020-11720 | 5020-11770 | – |
| InertSustain Cyano | 0.05 | 3 | 5020-89433 | 5020-89434 | 5020-89435 |
| | | 5 | 5020-89339 | 5020-89340 | 5020-89341 |
| | 0.075 | 3 | 5020-89436 | 5020-89437 | 5020-89438 |
| | | 5 | 5020-89342 | 5020-89343 | 5020-89344 |
| | 0.1 | 3 | 5020-89439 | 5020-89440 | 5020-89441 |
| | | 5 | 5020-89345 | 5020-89346 | 5020-89347 |
| | 0.2 | 3 | 5020-89442 | 5020-89443 | 5020-89444 |
| | | 5 | 5020-89348 | 5020-89349 | 5020-89350 |
| | 0.3 | 3 | 5020-89426 | 5020-89427 | 5020-89428 |
| | | 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. | Length 250 mm Cat.No. |
|---|---|---|---|---|---|
| Inertsil CN-3 | 0.05 | 3 | 5020-15019 | 5020-15069 | 5020-15119 |
| | | 5 | 5020-15018 | 5020-15068 | 5020-15118 |
| | 0.075 | 3 | 5020-15169 | 5020-15219 | 5020-15269 |
| | | 5 | 5020-15168 | 5020-15218 | 5020-15268 |
| | 0.1 | 3 | 5020-15319 | 5020-15369 | 5020-15419 |
| | | 5 | 5020-15318 | 5020-15368 | 5020-15418 |
| | 0.2 | 3 | 5020-15469 | 5020-15519 | 5020-15569 |
| | | 5 | 5020-15468 | 5020-15518 | 5020-15568 |
| | 0.3 | 3 | 5020-11519 | 5020-11569 | – |
| | | 5 | 5020-11518 | 5020-11568 | – |
| | 0.5 | 3 | 5020-11619 | 5020-11669 | – |
| | | 5 | 5020-11618 | 5020-11668 | – |
| | 0.7 | 3 | 5020-11719 | 5020-11769 | – |
| | | 5 | 5020-11718 | 5020-11768 | – |
| Inertsil Diol | 0.05 | 3 | 5020-15023 | 5020-15073 | 5020-15123 |
| | | 5 | 5020-15022 | 5020-15072 | 5020-15122 |
| | 0.075 | 3 | 5020-15173 | 5020-15223 | 5020-15273 |
| | | 5 | 5020-15172 | 5020-15222 | 5020-15272 |
| | 0.1 | 3 | 5020-15323 | 5020-15373 | 5020-15423 |
| | | 5 | 5020-15322 | 5020-15372 | 5020-15422 |
| | 0.2 | 3 | 5020-15473 | 5020-15523 | 5020-15573 |
| | | 5 | 5020-15472 | 5020-15522 | 5020-15572 |
| | 0.3 | 3 | 5020-11523 | 5020-11573 | – |
| | | 5 | 5020-11522 | 5020-11572 | – |
| | 0.5 | 3 | 5020-11623 | 5020-11673 | – |
| | | 5 | 5020-11622 | 5020-11672 | – |
| | 0.7 | 3 | 5020-11723 | 5020-11773 | – |
| | | 5 | 5020-11722 | 5020-11772 | – |
| Inertsil SIL-100A | 0.05 | 3 | 5020-15027 | 5020-15077 | 5020-15127 |
| | | 5 | 5020-15026 | 5020-15076 | 5020-15126 |
| | 0.075 | 3 | 5020-15177 | 5020-15227 | 5020-15277 |
| | | 5 | 5020-15176 | 5020-15226 | 5020-15276 |
| | 0.1 | 3 | 5020-15327 | 5020-15377 | 5020-15427 |
| | | 5 | 5020-15326 | 5020-15376 | 5020-15426 |
| | 0.2 | 3 | 5020-15477 | 5020-15527 | 5020-15577 |
| | | 5 | 5020-15476 | 5020-15526 | 5020-15576 |
| | 0.3 | 3 | 5020-11527 | 5020-11577 | – |
| | | 5 | 5020-11526 | 5020-11576 | – |
| | 0.5 | 3 | 5020-11627 | 5020-11677 | – |
| | | 5 | 5020-11626 | 5020-11676 | – |
| | 0.7 | 3 | 5020-11727 | 5020-11777 | – |
| | | 5 | 5020-11726 | 5020-11776 | – |
| Inertsil AX | 0.05 | 5 | 5020-15033 | 5020-15083 | 5020-15133 |
| | 0.075 | 5 | 5020-15183 | 5020-15233 | 5020-15283 |
| | 0.1 | 5 | 5020-15333 | 5020-15383 | 5020-15433 |
| | 0.2 | 5 | 5020-15483 | 5020-15533 | 5020-15583 |
| | 0.3 | 5 | 5020-11533 | 5020-11583 | – |
| | 0.5 | 5 | 5020-11633 | 5020-11683 | – |
| | 0.7 | 5 | 5020-11733 | 5020-11783 | – |
| Inertsil CX | 0.05 | 5 | 5020-15034 | 5020-15084 | 5020-15134 |
| | 0.075 | 5 | 5020-15184 | 5020-15234 | 5020-15284 |
| | 0.1 | 5 | 5020-15334 | 5020-15384 | 5020-15434 |
| | 0.2 | 5 | 5020-15484 | 5020-15534 | 5020-15584 |
| | 0.3 | 5 | 5020-11534 | 5020-11584 | – |
| | 0.5 | 5 | 5020-11634 | 5020-11684 | – |
| | 0.7 | 5 | 5020-11734 | 5020-11784 | – |

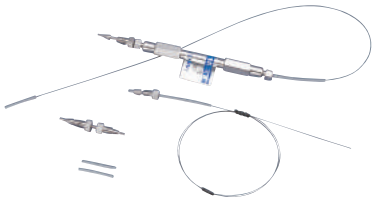
# Particle Type Capillary Micro Guard Columns

Capillary EX Micro Guard Columns

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

| Phase | I.D. (mm) | Particle Size (µm) | Length (mm) | Wetted Part Metal Cat.No. |
|---|---|---|---|---|
| InertSustain C18 | 0.3 | 3 | 2 | 5020-11847 |
| | | 5 | 2 | 5020-11846 |
| InertSustain AQ-C18 | 0.3 | 3 | 2 | 5020-89893 |
| | | 5 | 2 | 5020-89790 |
| InertSustainSwift C18 | 0.3 | 3 | 2 | 5020-88182 |
| | | 5 | 2 | 5020-88087 |
| Inertsil ODS-HL | 0.3 | 3 | 2 | 5020-87288 |
| | | 5 | 2 | 5020-87191 |
| Inertsil ODS-4 | 0.3 | 3 | 2 | 5020-11802 |
| | | 5 | 2 | 5020-11801 |
| Inertsil ODS-3 | 0.3 | 3 | 2 | 5020-11805 |
| | | 5 | 2 | 5020-11803 |
| Inertsil ODS-SP | 0.3 | 3 | 2 | 5020-11807 |
| | | 5 | 2 | 5020-11806 |
| Inertsil ODS-P | 0.3 | 3 | 2 | 5020-11809 |
| | | 5 | 2 | 5020-11808 |
| InertSustain C8 | 0.3 | 3 | 2 | 5020-16190 |
| | | 5 | 2 | 5020-16088 |
| InertSustainSwift C8 | 0.3 | 3 | 2 | 5020-88488 |
| | | 5 | 2 | 5020-88391 |
| Inertsil C8-4 | 0.3 | 3 | 2 | 5020-11836 |
| | | 5 | 2 | 5020-11835 |
| Inertsil C8-3 | 0.3 | 3 | 2 | 5020-11815 |
| | | 5 | 2 | 5020-11814 |
| Inertsil WP300 C18 | 0.3 | 5 | 2 | 5020-11828 |
| Inertsil WP300 C8 | 0.3 | 5 | 2 | 5020-11829 |
| InertSustain Phenylhexyl | 0.3 | 3 | 2 | 5020-89182 |
| | | 5 | 2 | 5020-89087 |
| InertSustain Phenyl | 0.3 | 3 | 2 | 5020-16490 |
| | | 5 | 2 | 5020-16388 |
| Inertsil Ph-3 | 0.3 | 3 | 2 | 5020-11817 |
| | | 5 | 2 | 5020-11816 |
| InertSustain Amide | 0.3 | 3 | 2 | 5020-88788 |
| | | 5 | 2 | 5020-88691 |
| Inertsil Amide | 0.3 | 3 | 2 | 5020-11849 |
| | | 5 | 2 | 5020-11848 |
| Inertsil HILIC | 0.3 | 3 | 2 | 5020-11825 |
| | | 5 | 2 | 5020-11824 |
| InertSustain NH2 | 0.3 | 3 | 2 | 5020-16790 |
| | | 5 | 2 | 5020-16688 |
| Inertsil NH2 | 0.3 | 3 | 2 | 5020-11821 |
| | | 5 | 2 | 5020-11820 |
| InertSustain Cyano | 0.3 | 3 | 2 | 5020-89432 |
| | | 5 | 2 | 5020-89337 |
| Inertsil CN-3 | 0.3 | 3 | 2 | 5020-11819 |
| | | 5 | 2 | 5020-11818 |
| Inertsil Diol | 0.3 | 3 | 2 | 5020-11823 |
| | | 5 | 2 | 5020-11822 |
| Inertsil SIL-100A | 0.3 | 3 | 2 | 5020-11827 |
| | | 5 | 2 | 5020-11826 |
| Inertsil AX | 0.3 | 5 | 2 | 5020-11833 |
| Inertsil CX | 0.3 | 5 | 2 | 5020-11834 |

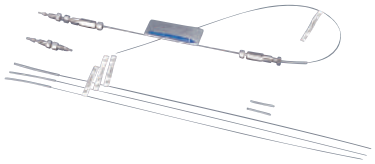
# Connection Kits for Capillary EX • EX-Nano Columns



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) | |

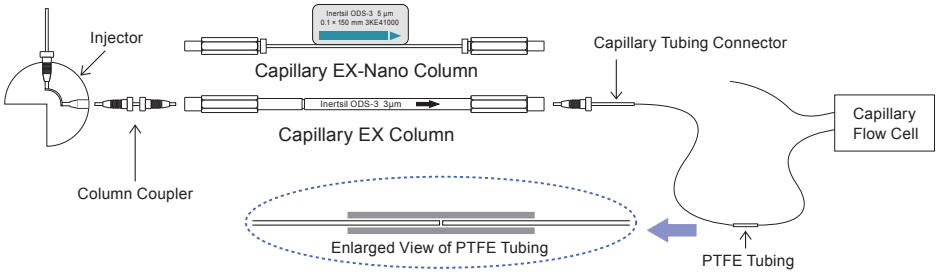


Connection Kit for Capillary EX-Nano Columns
(Top Image: Installed view, Bottom Image: Contents of Kit)

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

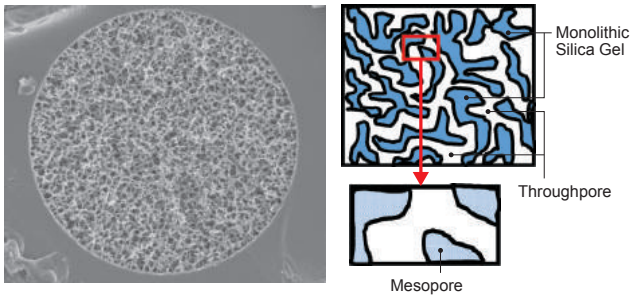
| Contents of Kit | Cat.No. |
|---|---|
| ·Column Coupler<br>·40 × 0.05 mm I.D. 1/16 inch O.D. Tubing<br>(Both ends with male nuts including PEEK ferrules) | 5020-01881 |
| ·Capillary Tubing Connector<br>·300 × 0.05 mm I.D. 0.375 mm O.D. Tubing<br>·300 × 0.03 mm I.D. 0.375 mm O.D. Tubing<br>·300 × 0.02 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



# Monolithic Capillary HPLC Columns

## MonoCap Series




Structure of Monolithic Silica

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

MonoCap High Resolution provide extremely high efficiency, delivering over 200,000 plates for a 2,000 mm length column. The High Resolution Ultra type deliver over 300,000 plates.
The Fast-flow type is compatible with high flow rate analysis due to its' low flow resistance. In addition, the equilibration time can be minimized further by setting the flow rate high.
MonoCap Nano-flow is a high-density monolithic capillary column offering extremely high sensitivity in LC/MS due to the optimization of mesopore and throughpore sizes.
MonoCap Trap columns have a relatively big throughpore, which are available for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.

### Physical Properties of MonoCap Series

| Description | Monolithic Silica | Skeleton | Throughpore | Mesopore | Porosity | 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 1000 | | 1 µm | 2 µm | 15 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 WideBore | | 1 µm | 2 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) |
| MonoCap Amide | | 1 µm | 2 µm | 15 nm | 85 % | Octadecyl | No | 22 MPa (220 bar) |
| MonoCap SCX | | 2 µm | 5 µm | 11 nm | 85 % | Octadecyl | No | 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
MonoCap C18 WideBore
MonoCap Amide
MonoCap SCX

→

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.

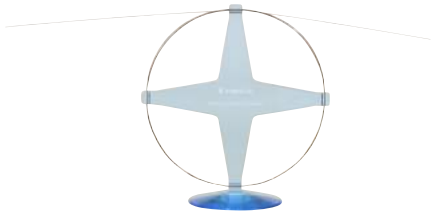
2. PEEK Hardwares
   1/16 inch male nut, ferrule and PTFE sleeve are included.

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

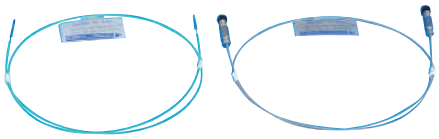
→

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

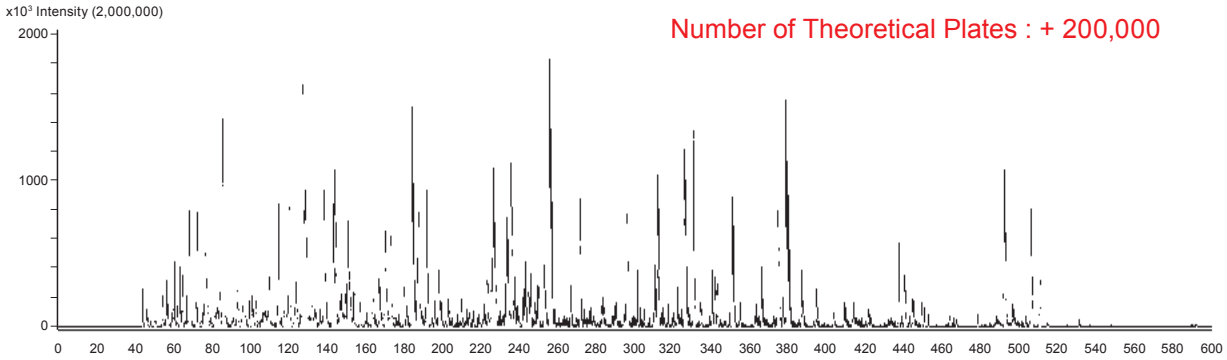


PEEK Metal

MonoCap High Resolution 750

Maximizing all the benefits and advantages of monolithic technology, MonoCap High Resolution and High Resolution Ultra are appropriate for the efficient separation of peptides and protein digests.
MonoCap High Resolution 750 deliver over 60,000 plates, while 2000 deliver over 300,000 plates.
The newly-introduced High Resolution Ultra type deliver over 300,000 plate number.

## 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. |
|---|---|---|
| 0.075 | 1000 | 5020-10066 |
| 0.1 | 1000 | 5020-10067 |

### MonoCap C18 High Resolution 1000

| I.D. (mm) | Length (mm) | Cat. No. |
|---|---|---|
| 0.3 (1/16 inch) | 1000 | 5020-10007 |
| 0.3 (1/32 inch) | 1000 | 5020-10008 |

### 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 |

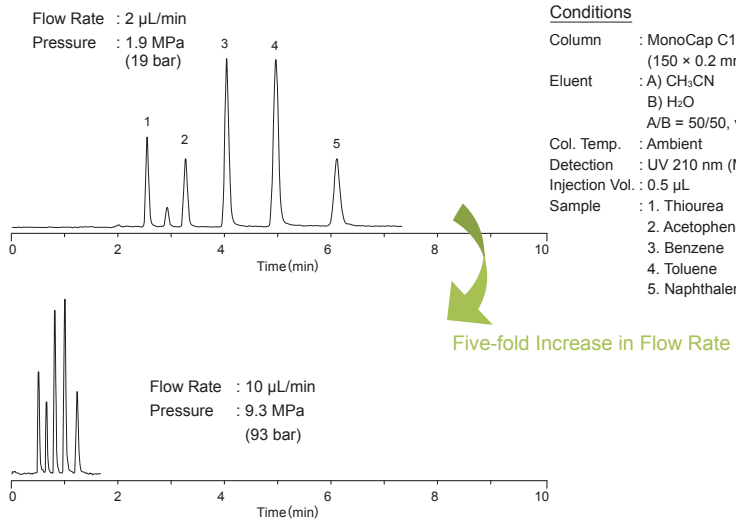
### MonoCap HILIC-UP High Resolution 2000

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

# Monolithic Capillary HPLC Columns

## MonoCap C18 Fast-flow

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




Conditions

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

Workable at a broad range of linear velocity from 0.5 to 5 mm/s without sacrificing efficiency and separation at high speed. The number of theoretical plates produced by MonoCap C18 Fast-flow is nearly equivalent to a totally porous particle type capillary column packed with a 5 µm packing material. Columns are protected by either metal or PEEK hardwares.
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

MonoCap C18 Nano-flow produces higher number of theoretical plates compared to a totally porous particle type capillary column packed with a 3 µm packing material. It can be operated at a wide range of flow rate with low back pressure and achieve very high sensitive results in Nano-LC-ESI/MS applications. Columns are protected by either metal or PEEK hardwares.

| 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 WideBore

The MonoCap C18 Fast-flow is also available in 0.5 mm I.D. size, which can be used at a wide range of flow rate from 6 to 100 µL/min without sacrificing efficiency. The number of theoretical plates produced by MonoCap C18 WideBore is nearly equivalent to a totally porous particle type capillary column packed with a 5 µm packing material. Columns are protected by metal hardwares.

| I.D. (mm) | Length (mm) | 50 | 150 | 250 |
|---|---|---|---|---|
| | Material of Hardware | Cat.No. | Cat.No. | Cat.No. |
| 0.5 | Metal | 5020-10202 | 5020-10201 | 5020-10200 |

## MonoCap C18 Trap Column

MonoCap C18 Trap Column with Hardware
(Top Image: 1/16 inch End-fittings, Bottom Image: 1/32 inch End-fittings)

MonoCap Trap columns have a relatively big throughpore and workable at a high flow rate such as 10 µL/min. This benefit makes MonoCap Trap columns to be appropriate for on-line preconcentration or desalting of protein and peptide samples prior to HPLC separation with mass spectrometry detection.
End-fittings are 1/16 inch (10-32 UNF). 1/32 inch end-fittings are also available upon request.

| I.D. (mm) | Length (mm) | 50 | 100 | 150 |
|---|---|---|---|---|
| | Hardware | Cat.No. | Cat.No. | Cat.No. |
| 0.05 | With Hardware | 5020-10026 | 5020-10038 | – |
| | Without Hardware | 5020-10027 | 5020-10039 | |
| 0.075 | With Hardware | 5020-10028 | 5020-10036 | |
| | Without Hardware | 5020-10029 | 5020-10037 | |
| 0.2 | With Hardware | 5020-10033 | – | |
| | Without Hardware | 5020-10034 | | 5020-10031 |

## MonoCap Amide

Amide groups are chemically bonded to the monolithic silica and makes it suitable for the analysis of sugars via HILIC mode. As the back pressure is significantly low, a 500 mm length MonoCap Amide column deliver over 40,000 plates offering high efficiency. Generally, HILIC mode uses acetonitrile at a concentration between 65-95 % in an aqueous buffer such as ammonium acetate or ammonium formate, which have high solubility in organic solvents. Columns are protected by either metal or PEEK hardwares.

| I.D. (mm) | Length (mm) | 150 | 250 | 500 |
|---|---|---|---|---|
| | Material of Hardware | Cat.No. | Cat.No. | Cat.No. |
| 0.075 | Metal | 5020-10191 | 5020-10192 | 5020-10193 |
| | PEEK | 5020-10091 | 5020-10092 | 5020-10093 |
| 0.1 | Metal | 5020-10181 | 5020-10182 | 5020-10183 |
| | PEEK | 5020-10081 | 5020-10082 | 5020-10083 |
| 0.2 | Metal | 5020-10171 | 5020-10172 | 5020-10173 |
| | PEEK | 5020-10071 | 5020-10072 | 5020-10073 |

## MonoCap SCX

MonoCap SCX is bonded with benzene sulfonic acid groups (strong cation exchange) and appropriate for 2D LC applications for the separation of biomolecules such as peptides and proteins.

| I.D. (mm) | Length (mm) | 50 | 150 | 250 | 500 |
|---|---|---|---|---|---|
| | Material of Hardware | Cat.No. | Cat.No. | Cat.No. | Cat.No. |
| 0.2 | Metal | 5020-10174 | 5020-10175 | 5020-10176 | 5020-10177 |
| | PEEK | 5020-10074 | 5020-10075 | 5020-10076 | 5020-10077 |

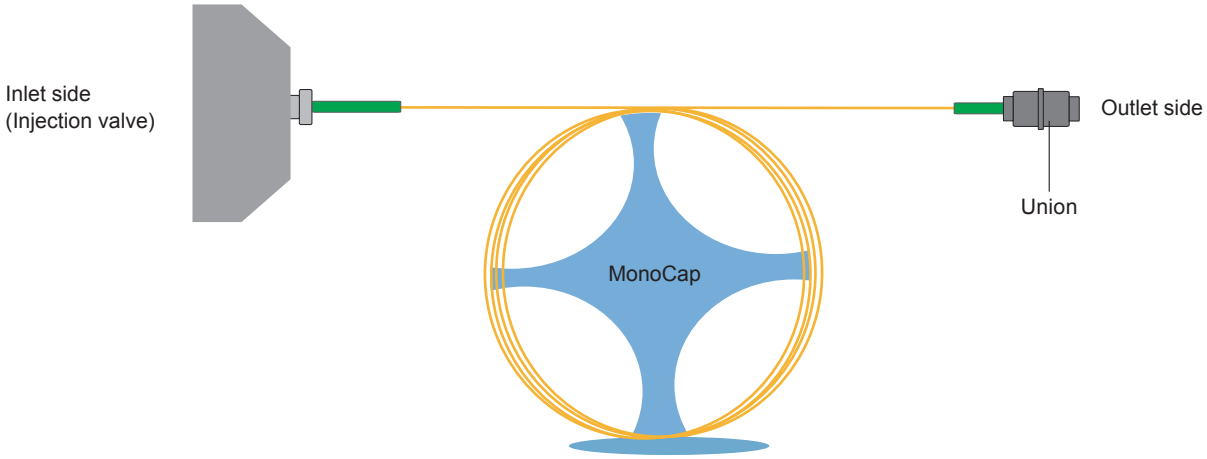
# How to Connect MonoCap Columns

## How to Connect MonoCap High Resolution Columns

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

### Example of how to connect

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



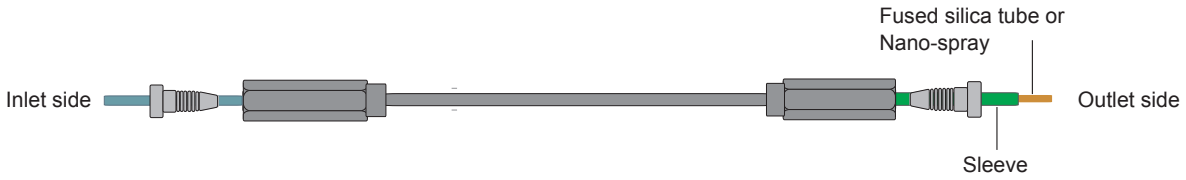
## How to Connect MonoCap (Metal Hardware) Columns

Connect the column inlet side to the piping from the auto sampler and the injection valve.
Connect the column outlet side to 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

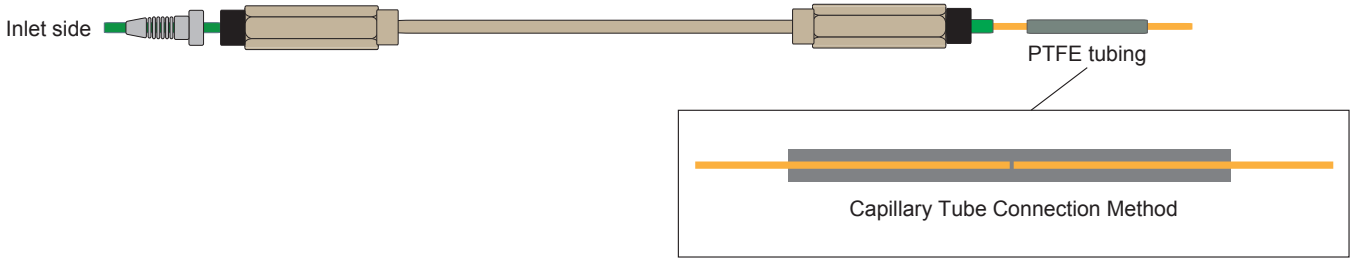
Connect the column inlet side to the piping from the auto sampler and the injection valve.
Using a union to connect the column outlet side to detector (UV, MS).

### <Example 1>

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

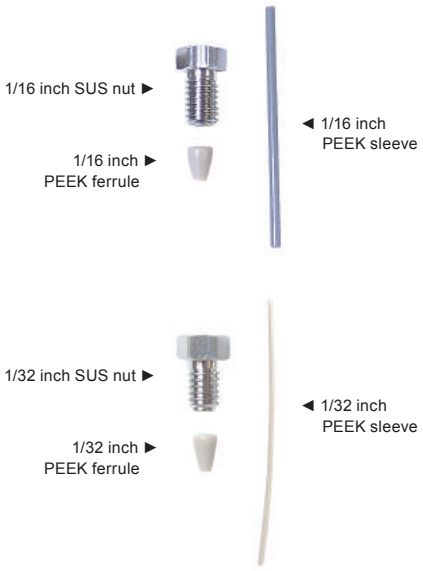

### <Example 2>

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

UH-432

UH-436

- **Specification**

  Applicable Tubing O.D. : 1/16 inch

  Maximum Pressure : 137.8 MPa (1378 bar) : SUS, 41.4 MPa (414 bar) : PEEK

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

* Fittings are attached

- **Specification**

  Applicable Tubing O.D. : 1/32 inch

  Maximum Pressure : 103 MPa (1030 bar) : UH-432, 34.5 MPa (345 bar) : MU.5XCPK

| 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 |
| MU.5XCPK | 1/32 inch Microvolume Connectors (PEEK) | | 150 | 6010-73570 |

* Fittings are attached

- **Specification**

  Applicable Tubing O.D. : 360 µm

  Maximum Pressure : 103 MPa (1030 bar) : SUS

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

* Fittings are attached

## Tubing for Capillary Columns

| | Applicable Columns' I.D. (mm) | Tubing Size | Length (m) | Qty. (pcs) | Cat. No. |
|---|---|---|---|---|---|
| Fused Silica Capillary Tubing | 0.05 - 0.3 | I.D. : 0.03 mm<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 |


Capillary EX-Nano
Inertsil ODS-3 3um
0.2 x 150 mm 6BI99042
GL Sciences Inc
Made in Japan
Capillary EX-Nano
Inertsil ODS-3 3um
0.05 x 50 mm 5MI50251
GL Sciences Inc
Made in Japan

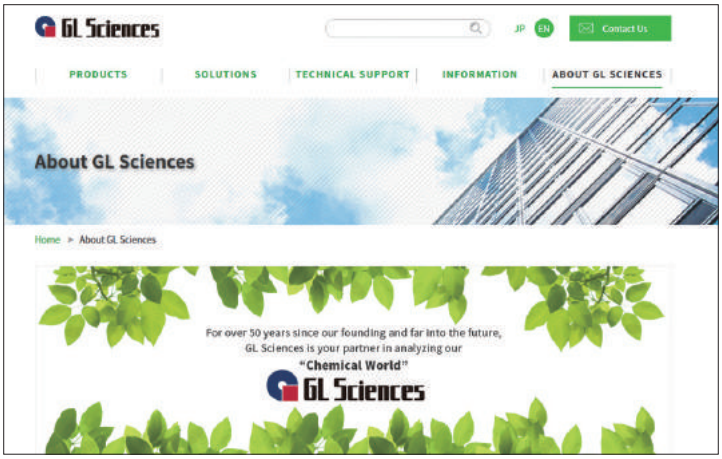
# Applications

# Applications

## Visit our website

We provide with technical support on our website. You can browse through or search GL Sciences' online library of LC applications, featuring chromatograms with method, conditions, sorted by technique and compound class by InertSearch and Technical Note.

https://www.glsciences.com/




## InertSearch

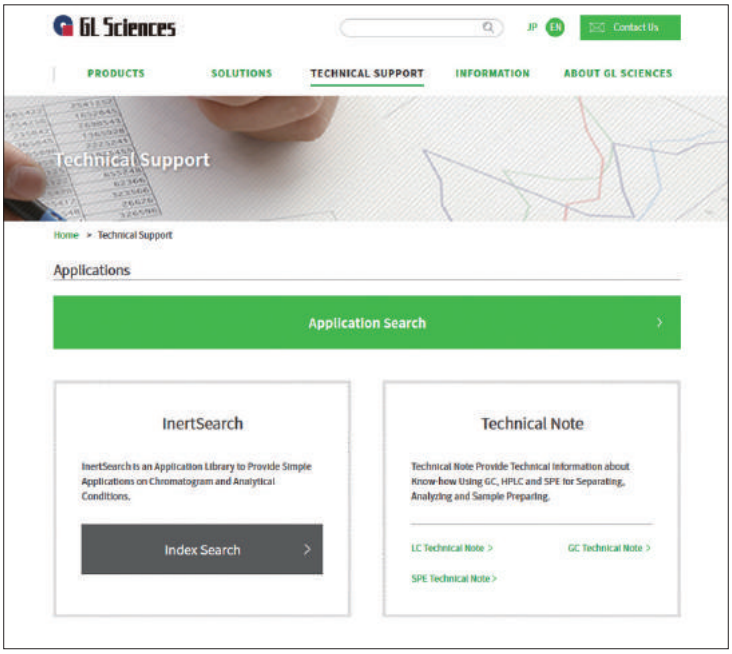
https://www.gls.co.jp/technique/app/inert_search.html

"InertSearch" is GL Sciences' onsite search engine for chromatographic data. A large number of chromatographic results of various analyses are available.

## Technical Note

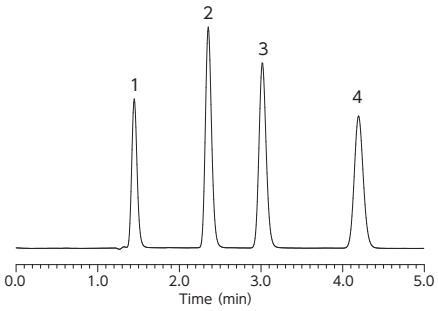
https://www.gls.co.jp/technique/app/lc_technical_note.html

"Technical Note" is a database of chromatographic results and useful information of various analyses. These files provide detailed explanation of each analysis which will help you greatly (e.g. method and instruction, chromatogram with analytic condition, chemical structure of compounds).



# Pharmacopeia

## *p*-Hydroxybenzoic acid ethyl ester (JP)

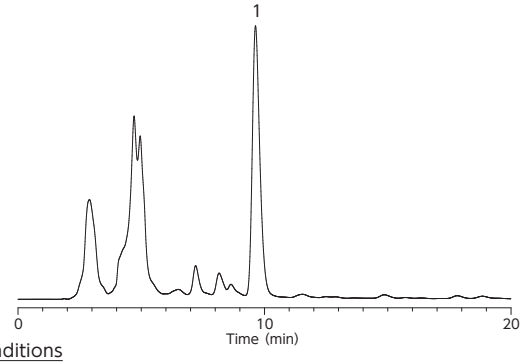



**Conditions**

Column : Inertsil ODS-4 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3OH$
B) 50 mM $KH_2PO_4$ im $H_2O$
A/B = 13/7, v/v
Flow Rate : 1.3 mL/min
Col. Temp. : 35 ℃
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

## Alycyrrhiza (JP)

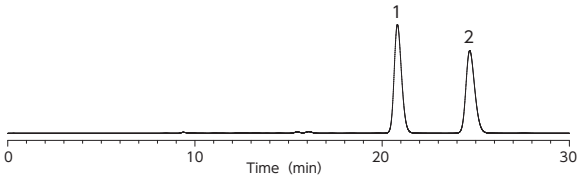



**Conditions**

Column : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$ B) 2.1 % $CH_3COOH$ in $H_2O$
A/B = 40/60, v/v
Flow Rate : 0.45 mL/min
Col. Temp. : 20 ℃
Detection : UV 254 nm
Injection Vol. : 20 μL
Data Source : LC InertSearch No. LB182

Sample :
1. Glycyrrhizic acid

## D-Mannitol (JP)

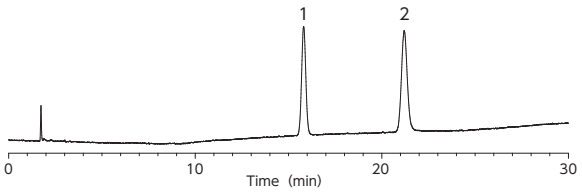



**Conditions**

Column : HAMILTON HC-75 ($Ca^{2+}$)
(9 mm, 300 x 7.8 mm I.D.)
Eluent : $H_2O$
Col.Temp. : 85 ℃
Detection : RI (40 ℃)
Injection Vol : 20 μL
Flow Rate : 0.5 mL/min
Data Source : LC Technical Note No. 147

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

## Polyvinyl alcohol-polyethylene glycol Graft copolymer

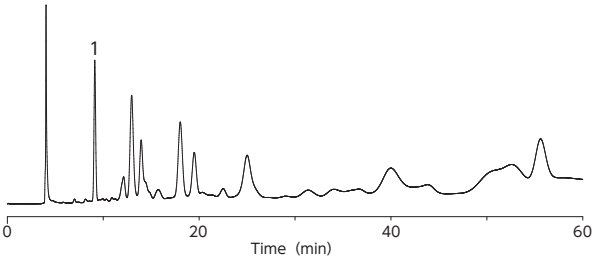



**Conditions**

Column : InertSustain C18
(5 μm, 250 × 4.0 mm I.D.)
Eluent : A) $H_2O/CH_3CN/CH_3OH$ = 18/1/1, v/v/v
B) $H_2O/CH_3CN/CH_3OH$ = 10/9/1, v/v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 30 ℃
Detection : UV 205 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LB228

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

## Povidone (JP)

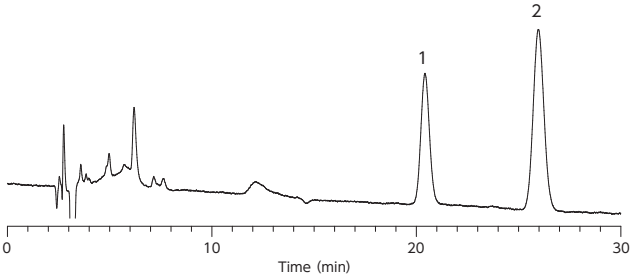



**Conditions**

Column : Hamilton HC-75 ($H^+$) 79642P
(9 μm, 300 × 7.8 mm I.D.)
Eluent : 0.1 % Perchloric acid in $H_2O$
Flow Rate : 1.0 mL/min
Col. Temp. : 35 ℃
Detection : UV 210 nm
Injection Vol. : 50 μL
Data Source : LC InertSearch No. LB434

Sample :
1. Formic acid

## Tranexamic Acid (JP)



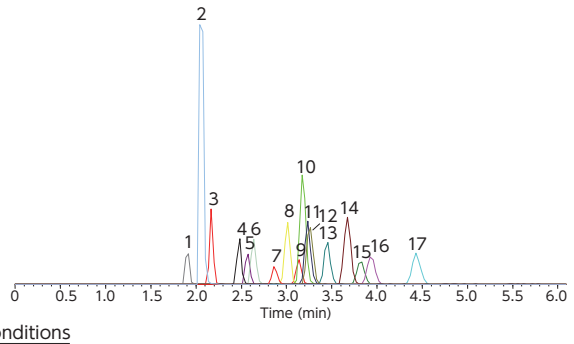

**Conditions**

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

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

## Pharmaceuticals

### Analysis of 17 Anti-depressant Drugs

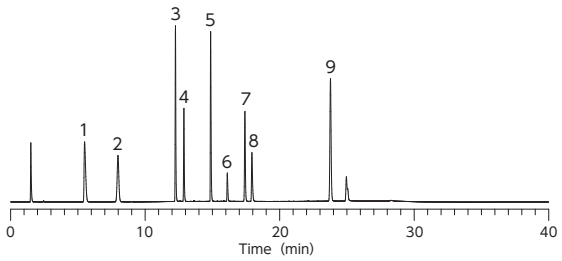



**Conditions**

Column : InertSustain C18 HP (3 μm,150 × 2.1 mm I.D.)
Eluent : A) 0.1 % HCOOH in $CH_3CN$
B) 0.1 % HCOOH in $H_2O$
A/B = 2/98 - 0.5 min - 40/60 - 5.5 min - 40/60, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 ℃
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

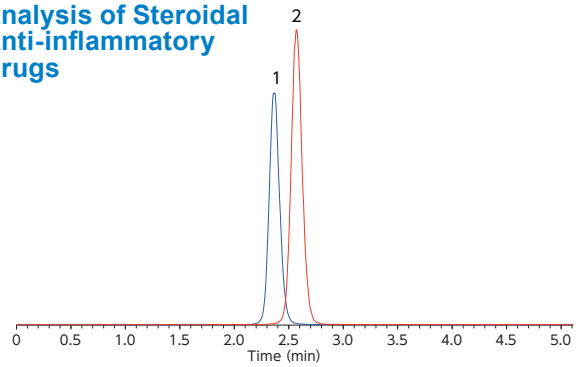



**Conditions**

Column : InertSustain C18 (3 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
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 ℃
Detection : UV 220 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LB400

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

### Analysis of Steroidal Anti-inflammatory Drugs

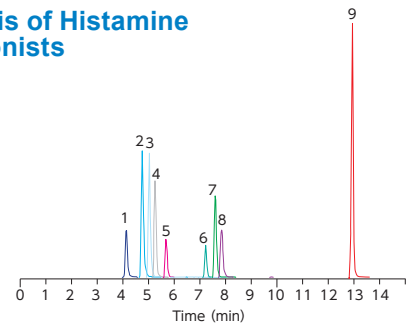



**Conditions**

Column : InertSustain Phenyl (2 μm, 50 × 2.1 mm I.D.)
Eluent : A) $CH_3OH$/HCOOH = 100/0.05, v/v
B) $H_2O$/HCOOH = 100/0.05, v/v
A/B = 40/60, v/v
Flow Rate : 0.6 mL/min
Col. Temp. : 40 ℃
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)
Injection Vol. : 5 μL
Data Source : LC InertSearch No. LB198

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

### Analysis of Histamine Antagonists

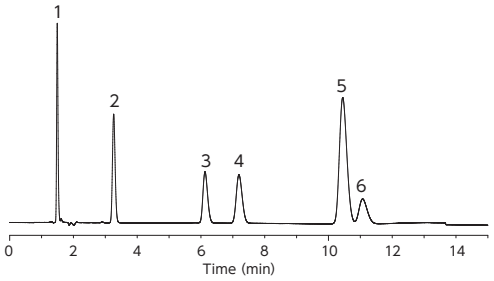



**Conditions**

Column : Inertsil ODS-4 (3 μm, 150 × 2.1 mm I.D.)
Eluent : A) $CH_3OH$
B) 2 mM $CH_3COONH_4$
A/B = 40/60 - 10 min - 95/5 - 2 min - 95/5, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 ℃
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

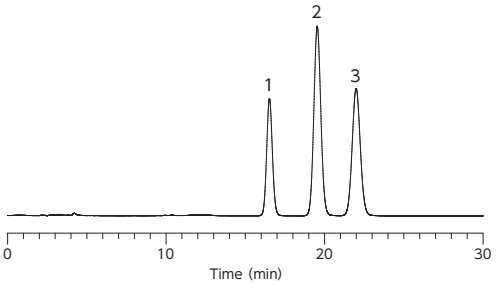



**Conditions**

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

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

### Analysis of Nonsteroidal Anti-inflammatory Drug



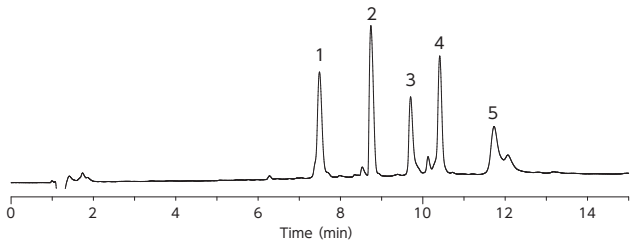

**Conditions**

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

Sample :
1. Ibuprofen
2. Diclofenac sodium
3. Indomethacin

# Biochemicals

## Protein

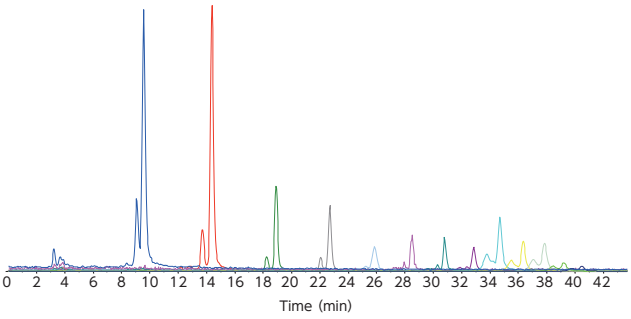



Conditions

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

## PA-Glucose Oligomer

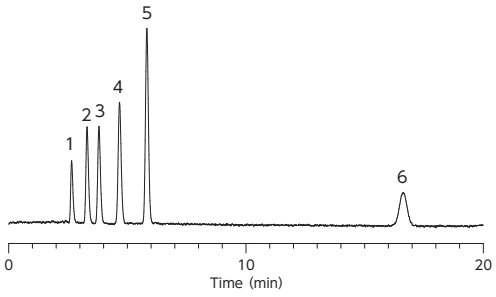



Conditions

Column : MonoCap Amide (250 mm × 0.2 mm I.D.)
Eluetnt : A) $CH_3CN$
B) 10 mM $CH_3COONH_4$ in $H_2O$
A/B = 80/20 - 20 min - 60/40, v/v
Flow Rate : 2 mL/min
Col. Temp. : ambient
Detection : Nano-ESI
Injection vol. : 100 nL

Sample :
PA-Glucose oligomer

## Analysis of ATP related Compounds

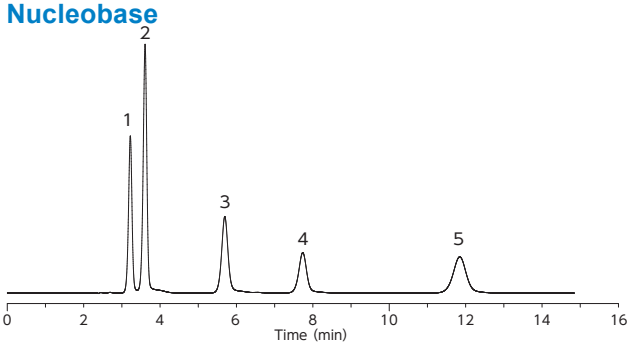



Conditions

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 ℃
Detection : UV 260 nm
Injection Vol. : 1 μL
Data Source : LC InertSearch No. LB380

Sample :
1. Inosinic acid
2. Adenosine triphosphate
3. Adenosine diphosphate
4. Adenosine monophosphate
5. Hypoxanthine
6. Inosine
(5 mg/L each)

## Nucleobase

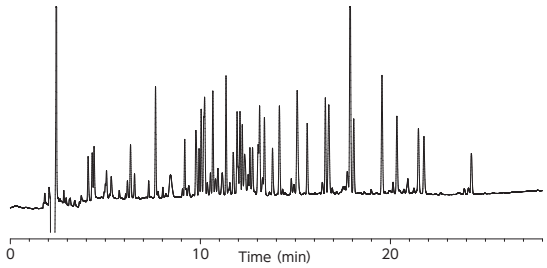



Conditions

Column : InertSustain Amide
(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 ℃
Detection : UV 254 nm

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

## Analysis of BSA Digests

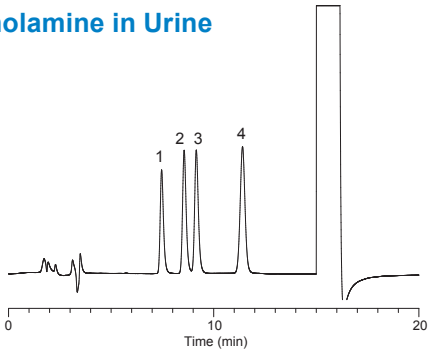



Conditions

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 ℃
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

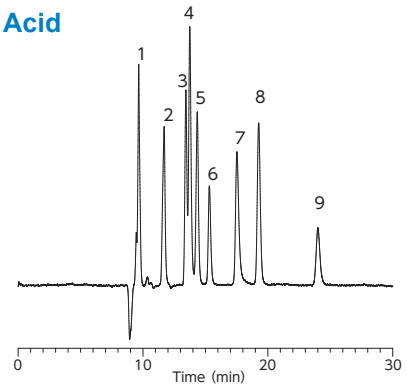
Column : Inertsil ODS-4
(5 μm, 250 × 3.0 mm I.D.)
Eluent : A) Acetate-citrate buffer *
: B) $CH_3CN$
A/B = 100/16, v/v
Flow Rate : 0.5 mL/min
Col. Temp : 35 °C
Detection : ECD 800 mV vs. Ag/AgCl
Injection Vol. : 20 μL
Data Source : LC Technical Note No. 93

Sample :
1. Norepinephrine (NE)
2. Epinephrine (E)
3. 3,4-dihydroxybenzylamine (DHBA, I.S.)
4. Dopamine (DA)
(100 ng/mL in 0.1 % Acetic acid solution each)

* : Acetate-citrate buffer :
Dissolve 0.82 g of anhydrous sodium acetate, 2.10 g of citric acid monohydrate and 0.50 g of sodium 1-octanesulfonate in 500mL of $H_2O$.

## Foods

### Organic Acid



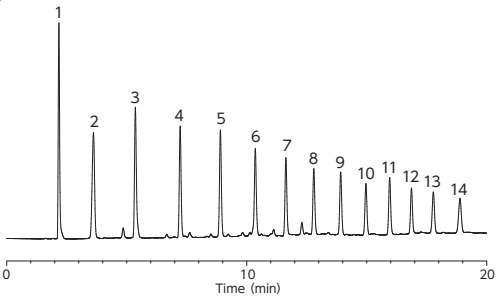

**Conditions**

| | |
|---|---|
| Column | : Inertsil Ph-3 (5 μm, 250 × 4.6 mm I.D.) + Inertsil CX (5 μm, 250 × 4.6 mm I.D.) |
| Eluent | : 3 mM $HClO_4$ in $H_2O$ |
| Reaction Reagent | : 0.1 mM BTB + 30 mM $Na_2HPO_4$ in $H_2O$ |
| Flow Rate | : 0.5 mL/min |
| Col. Temp. | : 35 ℃ |
| Detection | : VIS 440 nm |
| Injection Vol. | : 10 μL |
| Data Source | : LC Technical Note No. 24 |

Sample:
1. Phosphoric acid
2. Tartaric acid
3. Malic acid
4. Formic acid
5. Citric acid
6. Lactic acid
7. Acetic acid
8. Succinic acid
9. Pyroglutamic acid

(1 mg/mL each)

### Fatty Acid



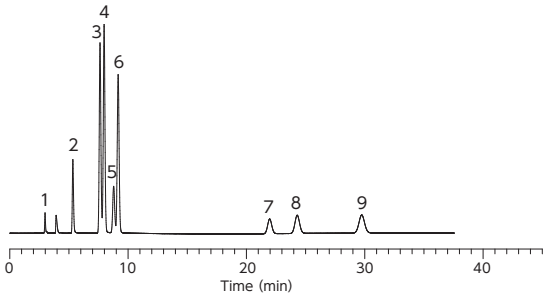

**Conditions**

| | |
|---|---|
| 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 ℃ |
| 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



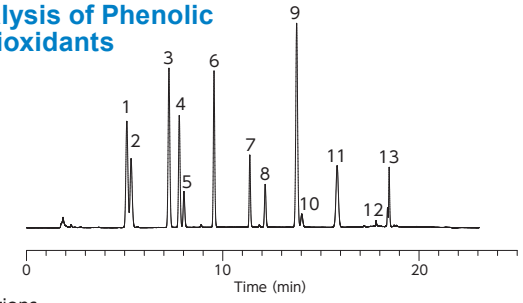

**Conditions**

| | |
|---|---|
| Column | : InertSustain Phenylhexyl (5 μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3CN$<br>B) 0.1% $H_3PO_4$ in $H_2O$<br>A/B = 15/85, v/v |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 ℃ |
| Detection | : UV 210 nm (GL-7452 PDA Detector) |
| Injection Vol. | : 10 μL |
| Data Source | : LC InertSearch No. LB238 |

Sample :
1. Ascorbic acid
2. Acesulfame potassium
3. Saccharin sodium
4. Caffeine
5. Aspartame
6. p-Hydroxybenzoic acid
7. Sorbic acid
8. Benzoic acid
9. Dehydroacetic acid

(10 mg/L each)

### Analysis of Phenolic Antioxidants



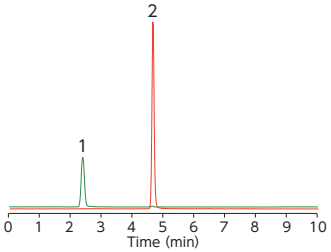

**Conditions**

| | |
|---|---|
| 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 ℃ |
| 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

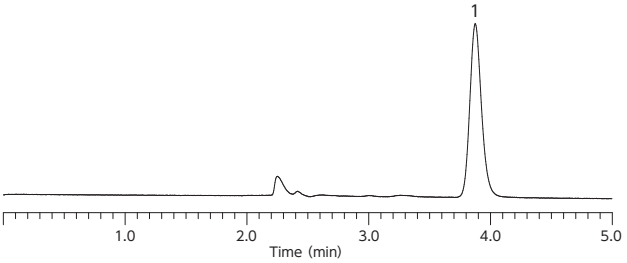



**Conditions**

| | |
|---|---|
| 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 ℃ |
| 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



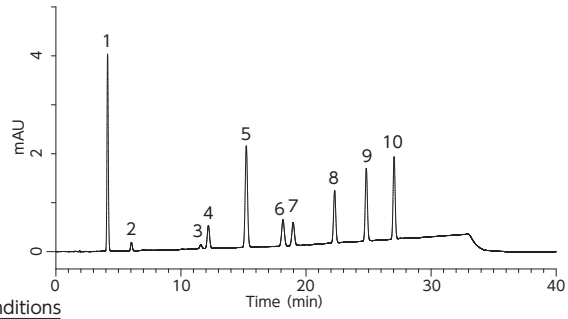

**Conditions**

| | |
|---|---|
| Column | : InertSustain Amide (5 μm, 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 ℃ |
| Detection | : UV 220 nm |
| Injection Vol. | : 5 μL |
| Data Source | : LC InertSearch No.LB466 |

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

# Foods

## Catechin in Tea

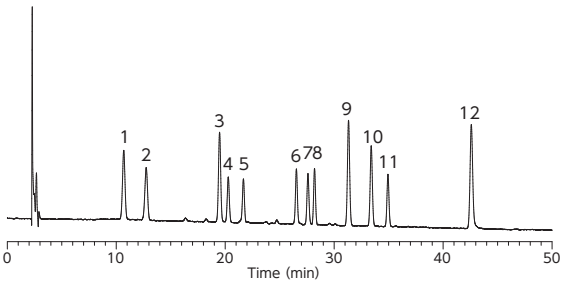



Conditions

Column : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3OH/CH_3CN$ = 9/1, v/v
B) 0.1 % $H_3PO_4$ in $H_2O$ (pH 2.1)
A/B = 10/90 - 15 min - 20/80 - 30 min - 40/60 - 30.1 min - 10/90 - 40 min - 10/90, v/v
Flow Rate : 1.0 mL/min
Col:Temp : 40 ℃
Detection : UV 280 nm
Injection Vol. : 10 μL
Data Source : LC Technical Note No. 145

Sample :
1. Gallic acid (GA)
2. Gallocatechin (GC)
3. Epigallocatechin (EGC)
4. Catechin (C)
5. Caffeine
6. Epigallocatechin gallate (EGCG)
7. Epicatechin (EC)
8. Gallocatechin gallate (GCG)
9. Epicatechin gallate (ECG)
10. Catechin gallate (CG)
(1 mg/L each)

## Isoflavone in Soybean

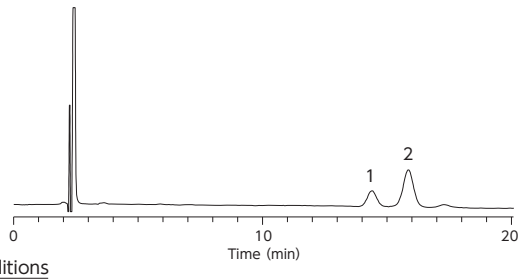



Conditions

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, v/v
Flow Rate : 1.5 mL/min
Col. Temp. : 35 ℃
Detection : PDA 254 nm
Injection : 10 μL
Data Source : LC Technical Note No. 66

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

## Carotene in Carrot Juice

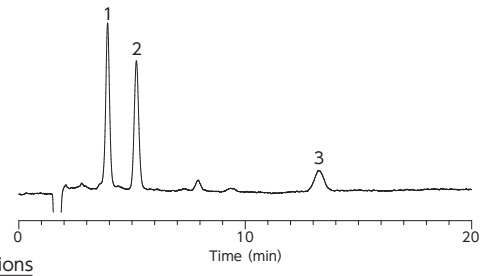



Conditions

Column : Inertsil ODS-P (5 μm, 250 × 4.6 mm I.D.)
Eluent : A) $CH_3OH$
B) Ethanol
A/B = 90/10, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 ℃
Detection : VIS 455 nm
Injection Vol. : 20 μL
Data Source : LC Technical Note No.28

Sample :
1. α-Carotene
2. β-Carotene

## Tetracycline



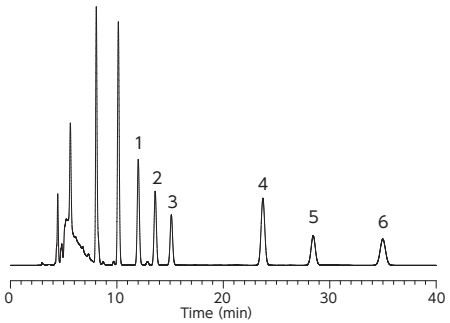

Conditions

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 ℃
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

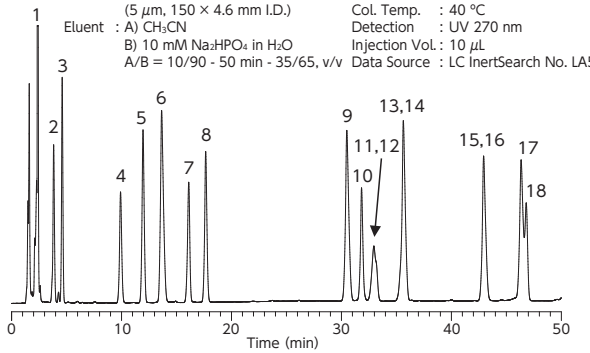
Column : Inertsil ODS-SP (5 μm, 250 × 4.6 mm I.D.)
Guard Column : Inertsil ODS-SP (5 μm, 10 × 4.0 mm I.D.)
Eluent : A) $CH_3CN$ B) $H_2O$ A/B= 65/35, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 ℃
Detection : FL Ex 325 nm Em 525 nm
Injection : 10 μL
Data Source : LC Technical Note No. 48

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

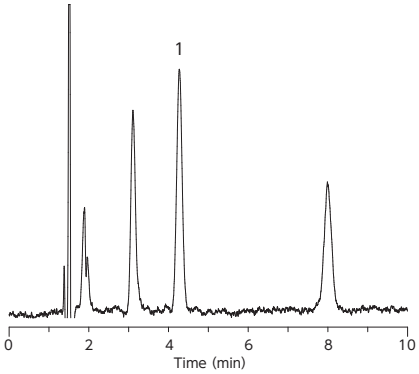
Column : Inertsil ODS-3 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
B) 10 mM $Na_2HPO_4$ in $H_2O$
A/B = 10/90 - 50 min - 35/65, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 270 nm
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LA509




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)

## Environment

### Analysis of Non-ionic Surfactant

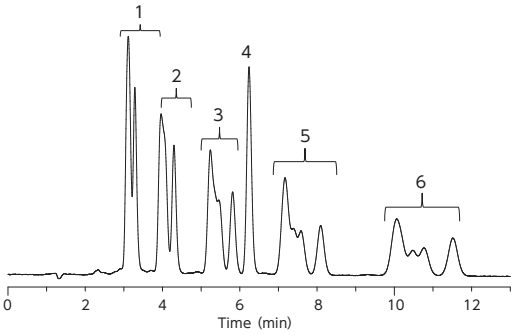



Conditions

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 ℃
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

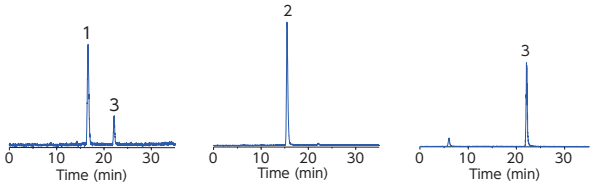



Conditions

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 ℃
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

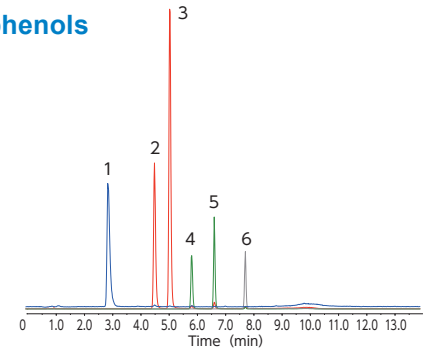



Conditions

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 ℃
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

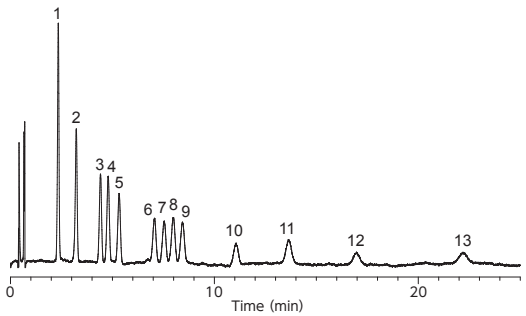



Conditions

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

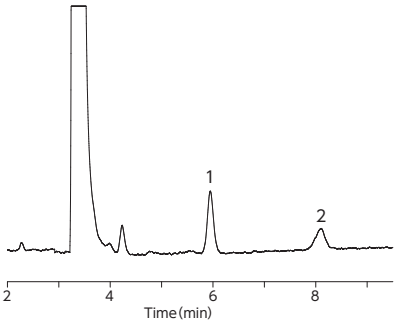



Conditions

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 ℃
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)

### Formaldehydes in Water




Conditions

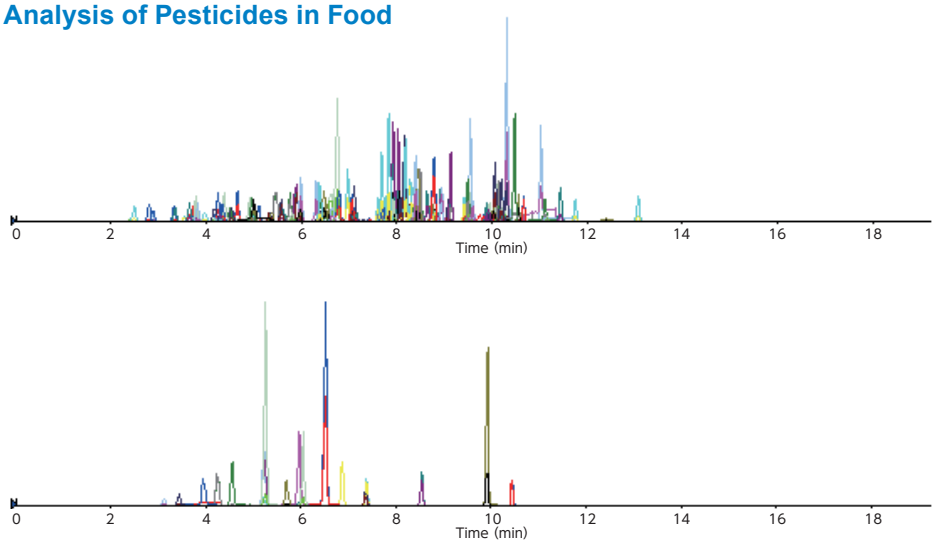
Column : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 50/50, v/v
Flow Rate : 1.0 mL/min
Col.Temp. : 40 ℃
Detection : UV 360 nm
Injection Vol. : 10 μL

Sample :
1.DNPH-Formaldehyde
2.DNPH-Acetaldehyde
(5 μg/L each)

# Pesticides

## Analysis of Pesticides in Food

Data provided by AB Sciex

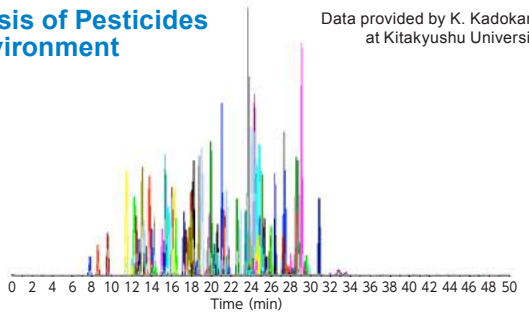



Conditions

| | |
|---|---|
| Column | : InertSustain C18 (2 μm, 100 × 2.1 mm I.D.) |
| Eluent | : A) $CH_3OH$ B) 2 mM $CH_3COONH_4$ in $H_2O$ A/B = 5/95 - 0.5 min - 30/70 - 9.5 min - 95/5 - 5 min - 95/5, v/v |
| Flow Rate | : 0.3 mL/min |
| Col.Temp. | : 40 ℃ |
| Detection | : LC/MS/MS (4000 QTRAP : ESI, MRM) |
| Injection Vol. | : 10 μL |
| Data Source | : LC Technical Note No. 129 |

## Analysis of Pesticides in Environment

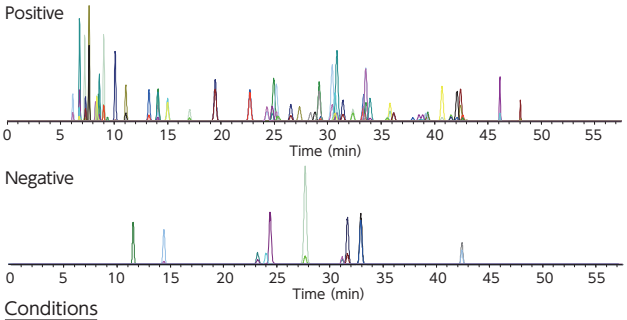
Data provided by K. Kadokami at Kitakyushu University




Conditions

| | |
|---|---|
| Column | : Inertsil ODS-4 HP (3 μm, 150 × 2.1 mm I.D.) |
| Eluent | : A) 5 mM $CH_3COONH_4$ in $CH_3OH$ B) 5 mM $CH_3COONH_4$ in $H_2O$ A/B = 5/95 - 30 min - 95/5 - 20 min - 95/5 , v/v |
| Flow Rate | : 0.3 mL/min |
| Col. Temp. | : 40 ℃ |
| Detection | : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM) |
| Injection Vol. | : 2.5 μL |
| Data Source | : LC InertSearch No. LA 843 |

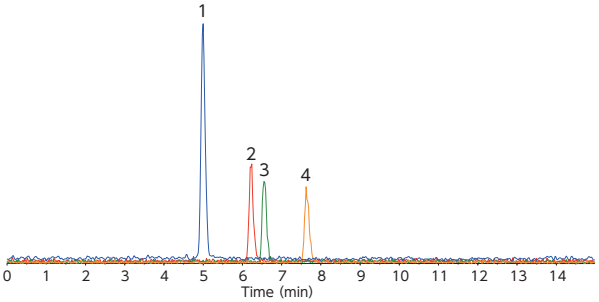
## Analysis of Pesticides in Water




Conditions

| | |
|---|---|
| Column | : InertSustain C18 (3 μm, 75 × 2.1 mm I.D.) |
| Eluent | : A) 5 mM $CH_3COONH_4$ in $CH_3OH$ B) 5 mM $CH_3COONH_4$ in $H_2O$ A/B = 5/95 - 4 min - 40/60 - 35 min - 75/25 - 5 min - 100/0 - 6 min, v/v |
| Flow Rate | : 0.15 mL/min |
| Col.Temp | : 40 ℃ |
| Sample.Temp. | : 5 ℃ |
| Detection | : LC/MS/MS (4000 QTRAP : ESI, MRM) |
| Injection Vol. | : 100 μL |
| Data Source | : LC Technical Note No.135 |

## Pesticides

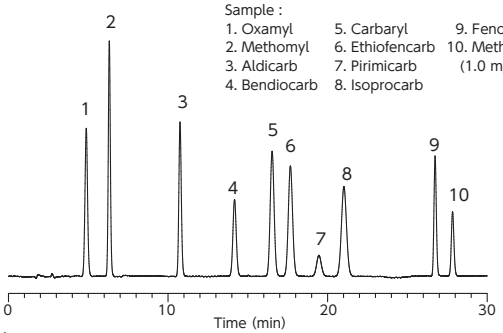



Conditions

| | |
|---|---|
| Column | : InertSustain Phenyl (3 μm, 150 × 2.1 mm I.D) |
| Eluent | : A) 0.1 % HCOOH in $CH_3CN$ B) 0.1 % HCOOH in $H_2O$ A/B = 40/60 - 10 min - 70/30 - 0.01 min - 40/60 - 5 min - 40/60, v/v |
| Flow Rate | : 0.3 mL/min |
| Col. Temp. | : 40 ℃ |
| Detection | : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM) |
| Injection Vol. | : 5 μL |
| Data Source | : LC InertSearch No. LB077 |

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

## Analysis of Carbamate Insecticides



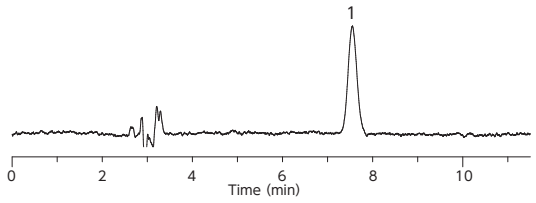

Sample :
1. Oxamyl
2. Methomyl
3. Aldicarb
4. Bendiocarb
5. Carbaryl
6. Ethiofencarb
7. Pirimicarb
8. Isoprocarb
9. Fenobucarb
10. Methiocarb
(1.0 mg/L each)

Conditions

| | |
|---|---|
| Column | : InertSustain C18 (5 μm, 250 × 4.6 mm I.D.) |
| Eluent | : A) $CH_3OH$ B) $H_2O$ A/B = 35/65 - 2 min - 35/65 - 0.1 min - 53/47- 18.4 min - 53/47 - 0.1 min - 70/30 - 9.4 min - 70/30 - 0.1 min - 35/65 - 9.9 min - 35/65, v/v |
| Reaction Reagent | : OPA reagent |
| Flow Rate | : 1.0 mL/min |
| Col. Temp. | : 40 ℃ |
| Detection | : FL Ex 339 nm Em 455 nm(0 - 18.5 min), Ex 312 nm Em 382 nm(18.6 - 20.1 min), Ex 339 nm Em 455 nm(20.2 - 30 min) |
| Injection Vol. | : 10 μL |
| Data Source | : LC InertSearch No. LA916 |

## Vitamins

### Vitamin A

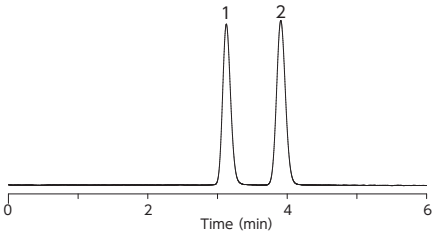



Conditions

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

Sample :
1. Retinol (50 μg/L)

### Vitamin B1

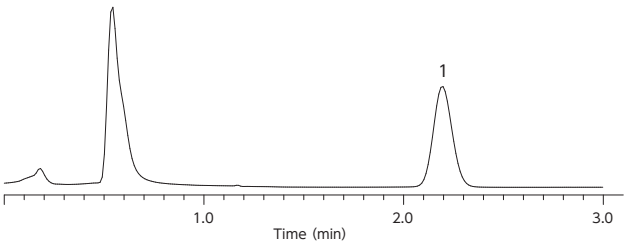



Conditions

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

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

### Vitamin C

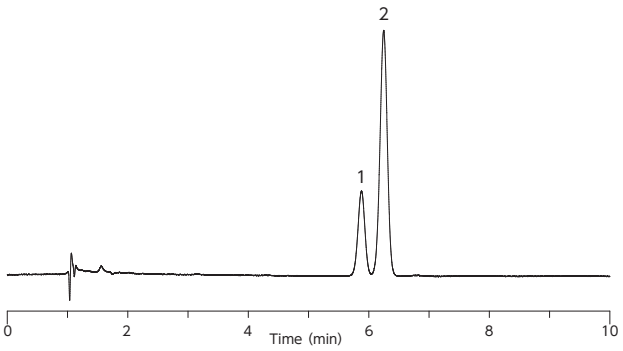



Conditions

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

Sample :
1. Ascorbic acid

### Vitamin D2, D3

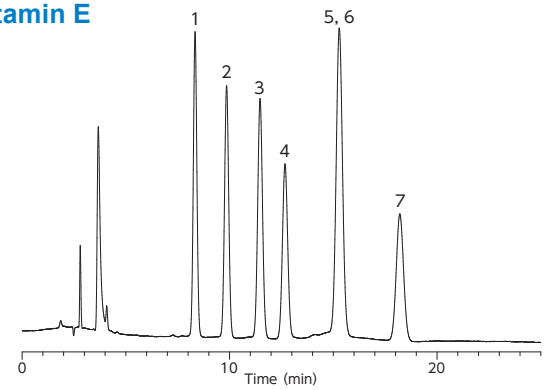



Conditions

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

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

### Vitamin E

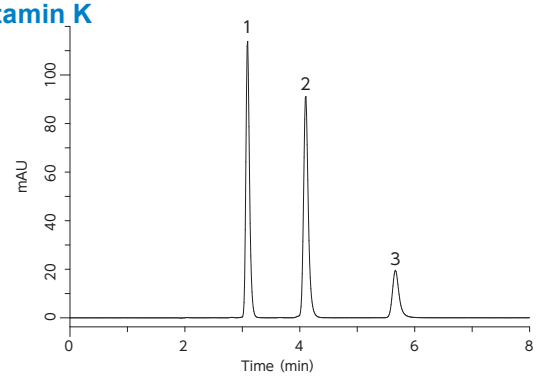



Conditions

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

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



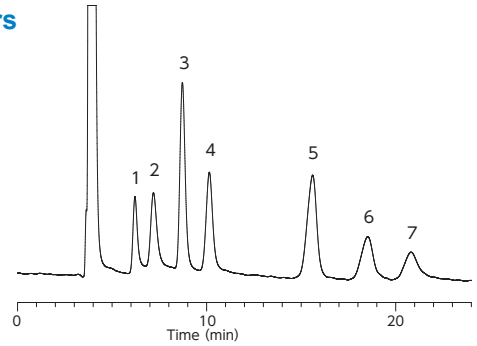

Conditions

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

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

# Others

## Sugars

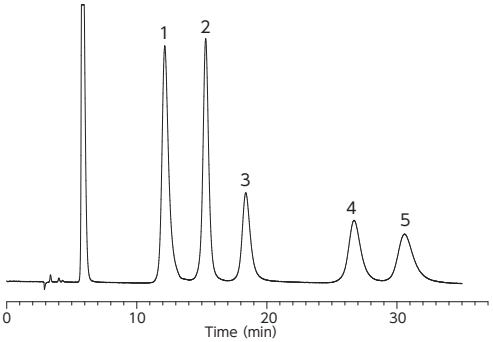



Conditions

Column : InertSustain NH2 (5 μm, 250 × 4.6 mm I.D.)
Eluent : A) $CH_3CN$
B) $H_2O$
A/B = 85/15, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 ℃
Detection : RI
Injection Vol. : 10 μL
Data Source : LC InertSearch No. LB180

Sample :
1. Rhamnose
2. Fucose
3. Fructose
4. Glucose
5. Sucrose
6. Maltose
7. Lactose
(10 mg/mL each)

## Sugar analysis with ECD

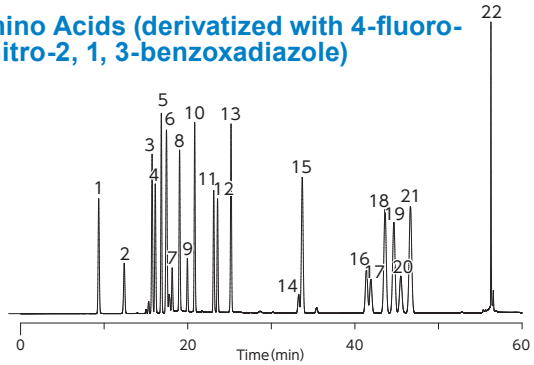



Conditions

Column : InertSphere Sugar-1 (5 μm, 150 × 4.6 mm I.D.)
Eluent : 100 mM NaOH* in $H_2O$
Flow Rate : 0.5 mL/min
Col. Temp. : 25 ℃
Detection : ECD Pulse Mode
Injection Vol. : 10 μL
Data Source : LC Technical Note No. 101

Sample :
1. Fucose
2. Glucose
3. Fructose
4. Lactose
5. Sucrose
(10 mg/L each)

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



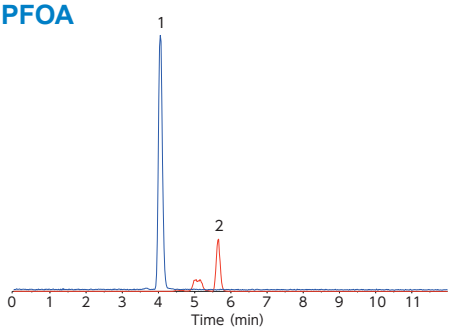

Conditions

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

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

Data Source : LC InertSearch No. LB470

## PFOS · PFOA

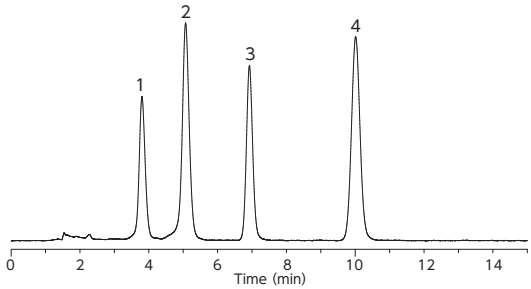



Conditions

Column : Inertsil ODS-4 (3 μm, 100 × 2.1 mm I.D.)
Eluent : A) 5 mM $CH_3COONH_4$ in $CH_3OH$
B) 5 mM $CH_3COONH_4$ in $H_2O$
A/B = 60/40 - 8 min - 75/25 - 0.1 min - 90/10 - 1.9 min - 90/10 - 0.1 min - 60/40 - 4.9 min - 90/10, v/v
Flow Rate : 0.6 mL/min
Col. Temp. : 40 ℃
Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)
Injection Vol. : 2 μL
Data Source : LC InertSearch No. LA864

Sample :
1. PFOA (Perfluorooctanoic acid)
2. PFOS (Perfluorooctanesulfonic acid)
(1 mg/L each)

## Analysis of Pre-column Derivatized Aflatoxin

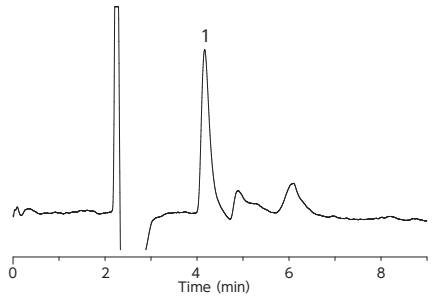



Conditions

Column : InertSustain C18 (5 μm, 150 × 4.6 mm I.D.)
Eluent : A) $CH_3OH$ B) $CH_3CN$ C) $H_2O$
A/B/C = 30/10/60, v/v/v (Premix)
Flow Rate : 1.0 mL/min
Col. Temp. : 40 ℃
Detection : FL Ex 365 nm Em 450 nm
Injection Vol. : 20 μL
Data Source : LC InertSearch No. LB107

Sample :
1. Aflatoxin G1
2. Aflatoxin B1
3. Aflatoxin G2
4. Aflatoxin B2
(5 ng/mL each)

## Hydrogen Peroxide




Conditions

Column : Inertsil CX (5 μm, 250 × 4.6 mm I.D.)
Flow Rate : 0.8 mL/min
Detection : ECD
Injection Vol. : 100 μL
Data Source : LC Technical Note No. 49

Sample :
1. Hydrogen peroxide ($H_2O_2$)
(10 μg/L)

# Cat.No. INDEX

## 5020

## 5020

# Cat.No. INDEX

## 5020

# Cat.No. INDEX

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## 6010

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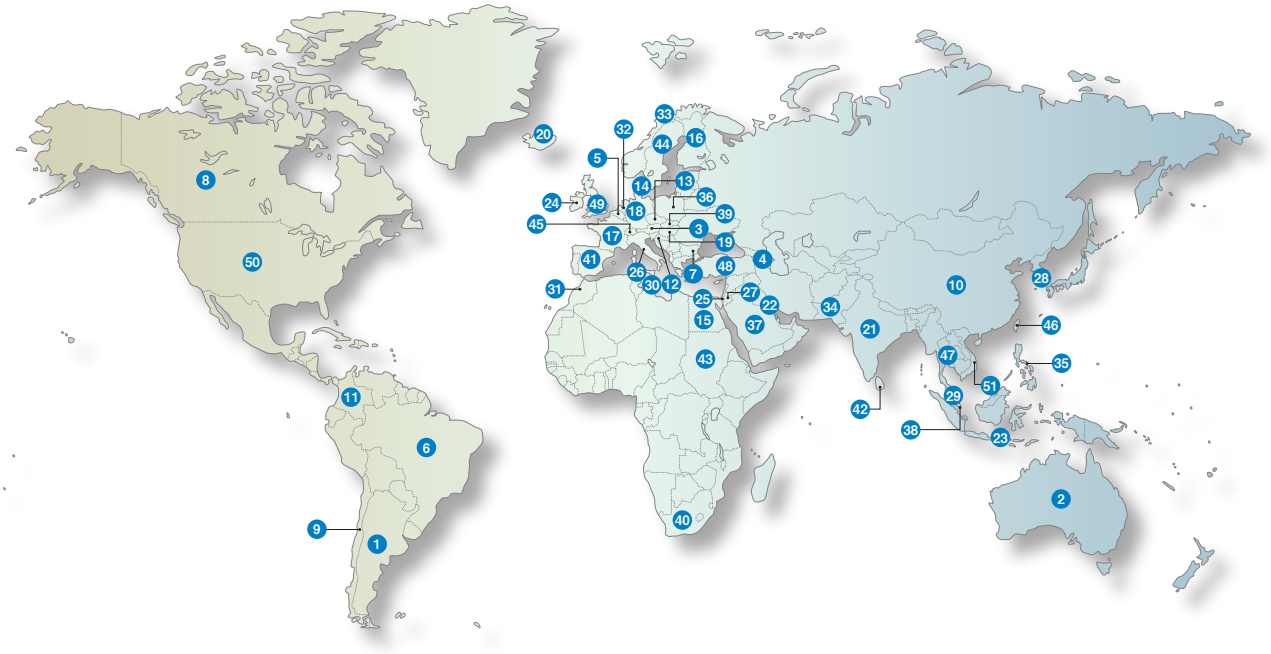


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