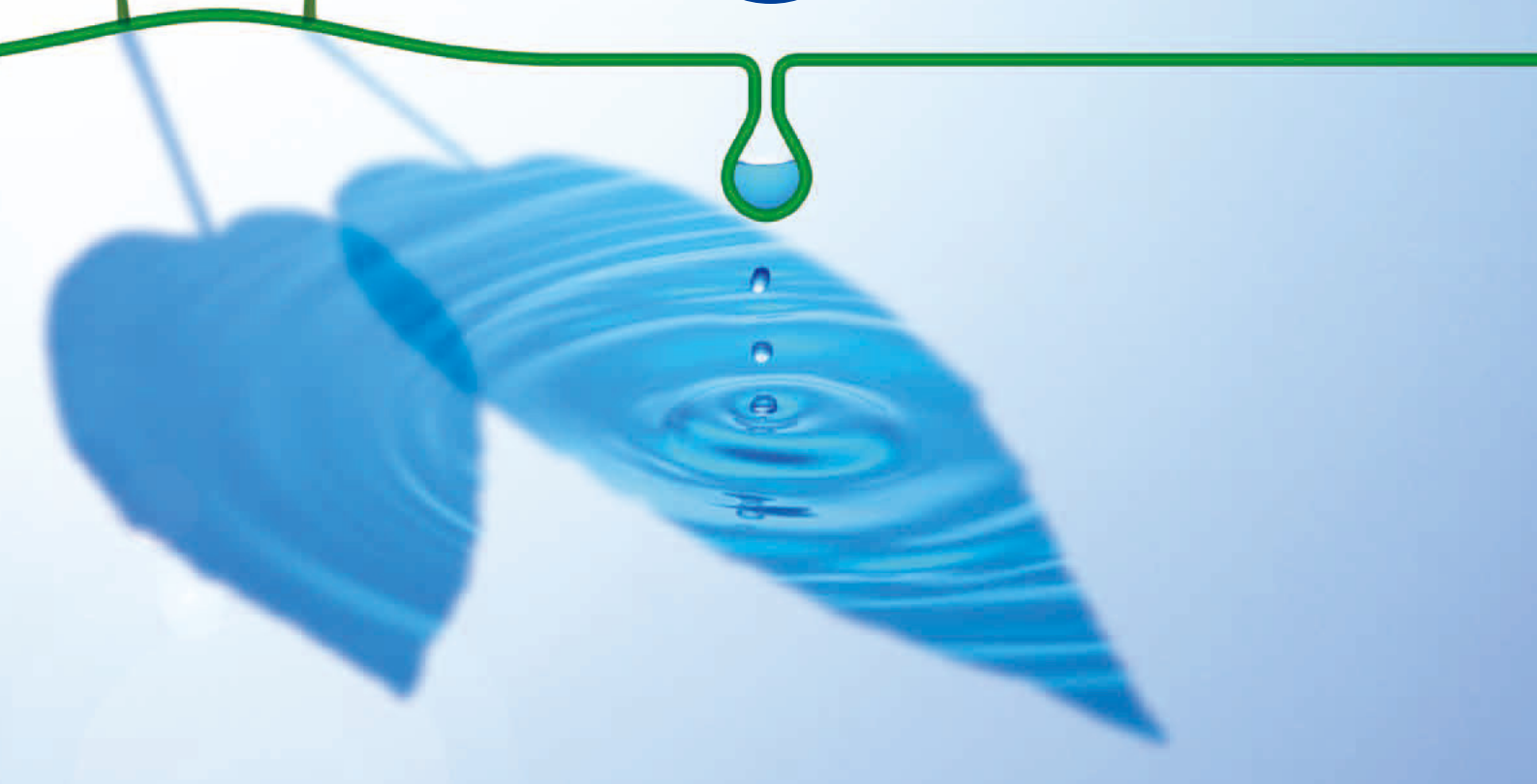


HIGH RESOLUTION CHROMATOGRAPHY PRODUCTS

DAISOGEL



DAISO

DAISOGEL

Prologue

Prologue

DAISO CO., LTD. is one of the leading silica gel manufacturers for liquid chromatography in the world. Our product range includes both irregularly and spherically shaped particles. Analytical and preparative grades are made by the same production method under carefully controlled conditions in order to assure consistent selectivity from lot to lot and between different particle sizes, which is essential for scale-up work.

DAISOGEL phases are used for various applications including medicines and pharmaceuticals, agricultural chemicals, food ingredients, biomolecules, liquid crystals and functional dyes.

DAISO has a long experience in the field of chromatographic separations and we are looking forward to solving your problems together with you.

Tight Quality Control

DAISO has a strict quality control system based on ISO 9002 for the silica gel manufacturing plant and DMF (Device Master File) of the FDA (Food and Drug Administration) for the plant in which the chemical modification is done. DAISO controls the quality of the raw materials and of the products at each manufacturing stage. We deliver only products which satisfy our severe specifications. We analyse the pore size, the surface area, the pore volume and the pore size distribution by BET and porosimetry, the particle size and its distribution by sedimentation method and electrical resistance method. Adding to that we measure the pH, the volatile matter and do selectivity tests for all phases. All relevant data of products we deliver are filed.

We also analyse metal impurities by XRF and ICP and observe surface conditions by microscope and scanning electron microscope.



Contents

Nomenclature of DAISOGEL	P 3
DAISOGEL HSA Series	P 4
DAISOGEL BIO Series	P 9
DAISOGEL ODS-BP Series	P17
DAISOGEL ODS-RPS Series	P21
DAISOGEL C8-P Series	P23
DAISOGEL C4-P Series	P24
DAISOGEL C1-P Series	P25
DAISOGEL APS-P Series	P26
DAISOGEL SP-P Series	P27
DAISOGEL SWP Series	P30
DP GUARD FILTER	P31
DAISOGEL Properties	P32
Directories of DAISO CO., LTD.	P33
Ordering Information	P34

How to interpret the letters and numbers in the **DAISOGEI product names**

Meaning

① shape of silica particles

variations: **SP** (spherical) or **IR** (irregular)

② pore size in Angstroms

variations: **60, 100, 120, 200, 300** or **1000, 2000** in the SWP (super wide pore) series

③ particle size in micrometers

variations: **3, 4, 5, 7, 10, 15, 20**, or e.g. **40/60** (range of particle sizes)

④ bonded phase

variations: see table below!

for example:

① **SP-** ② **120-** ③ **5-** ④ **C8-** ⑤ **P-** ⑥ **(NE)** ⑦ **W**

⑤ purity of the base silica

P is for ultra high purity (alone or as the last letter of the bonded phase) if **P** not stated, the product is based on high purity silica. Though it is not indicated, the new **BIO** and **HSA** series is based on ultra high purity silica

⑥ endcapping

variations: **(NE)** is for *non end-capped* or if **(NE)** not stated, the product is *endcapped*

⑦ for irregular (**IR**) silica

variations: **W** is for the *wet type* or if **W** is not stated, the product is *dry type*

④ bonded phase

ODS-BIO	designed for biopharmaceutical applications, novel bonding technique ensures strong resistance against alkalic and acidic conditions
(HSA) ODS-P	high surface area provides extremely high loadability
ODS-BP	low carbon content, suitable for hydrophilic and polar compound separation in up to 100 % aqueous eluents
ODS-RPS	high acidic resistance, suitable for organic compound separation
C8-BIO	new variation of the C8 phase, novel bonding technique ensures strong resistance against alkalic and acidic conditions
C8-P	for compounds too strongly retained on ODS phases
C4-BIO	new variation of the C4 phase, novel bonding technique ensures strong resistance against alkalic and acidic conditions
C4-P	moderate hydrophobicity makes it ideal for large biological molecule separation
C1-P	suitable for hydrophobic peptide and protein separation, GPC applications are possible depending on the eluent
APS-P	amino-propyl silane bonded phase for saccharide separation, or may be used for highly hydrophilic compound separation
—	if no bonded phase is indicated, the product is bare silica

DAISO GEL HSA Series

Prologue & Contents
 Nomenclature of DAISO GEL
 DAISO GEL HSA Series
 DAISO GEL BIO Series
 DAISO GEL ODS-RBP Series

SP-100-P

Product names and properties

The new member of the DAISO GEL base silica family is the SP-100-P series, available in 3, 5, 10 and 15 micron particle sizes. The 10 nm pore size provides extraordinary high surface area. Less than 600 milligram of SP-100-P has bigger surface area than a whole doubles tennis court.

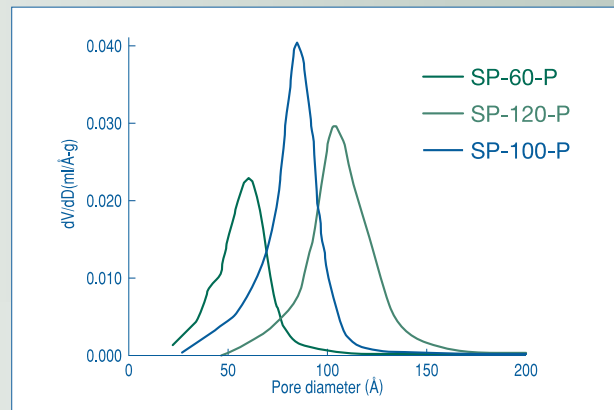
	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	Particle Size Distribution (D40/D90)
SP-100-3-P	10	3	1.1	450	≤1.25
SP-100-5-P	10	5	1.1	450	≤1.25
SP-100-10-P	10	10	1.1	450	≤1.30
SP-100-15-P	10	15	1.1	450	≤1.40

High Surface Area series / SP-100-P : optimal porosity

Porosity Comparison

Grade	Pore Diameter (nm)	Surface Area (m ² /g)	Pore Volume (ml/g)
SP-60	6	450	0.75
SP-120	12	300	1.00
SP-100	10	450	1.10

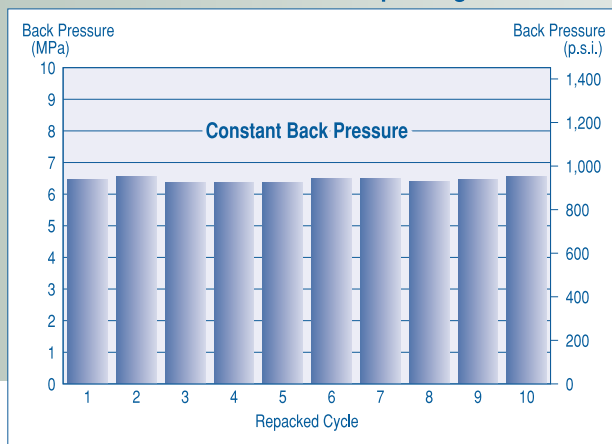
Pore Size Distribution



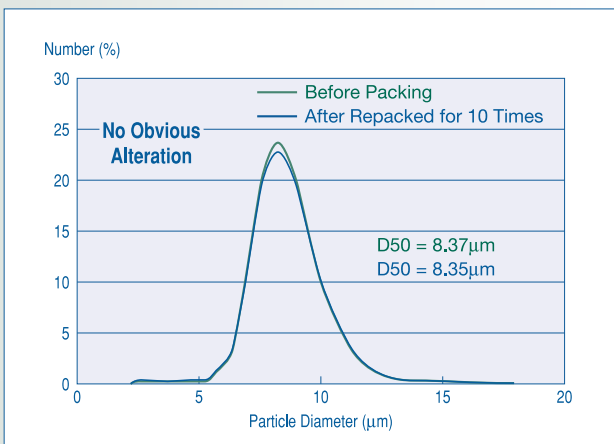
HSA Series

High Surface Area series / SP-100-P : mechanical strength for DAC column

Back Pressure in Repacking



Particle Size Alteration



Material: SP-100-10P (Lot No. 021118TSP); Column: Dynamic Axial Compression Column (50mm I.D.); Bed Length: 23cm (Packed 170g of Silica Gel); Mobile Phase: 2-Propanol (20°C); Flow Rate: 150ml/min; Piston Pressure: 10 MPa (100 Bar). Particle Size Distribution: measured by Coulter Counter.

DAISOGEL

HSA Series

SP-100-ODS-P

* Long retention and high loadability

* Superior performance for both hydrophilic and hydrophobic compounds

* Minimal silanol activity due to our new proprietary endcapping technology

The DAISOGEL SP-100-ODS-P series represents a high performance ODS phase based on a new type of silica gel developed to show long peak retention and high loadability, caused by its exceptionally high surface area.

The ODS bonding density is chosen with respect to optimal selectivity for both hydrophilic and hydrophobic compounds, enabling even the use of 100% aqueous eluents. Our proprietary endcapping technology minimises residual silanol groups to an amount which is below the detectable level. Silanol groups have negative effects on peak symmetry, particularly in case of basic compounds, and on chemical phaserobustness.

DAISOGEL SP-100-ODS-P series is available with particle sizes of 3, 5, 10 and 15 microns for both analytical as well as preparative applications.

Product names and properties

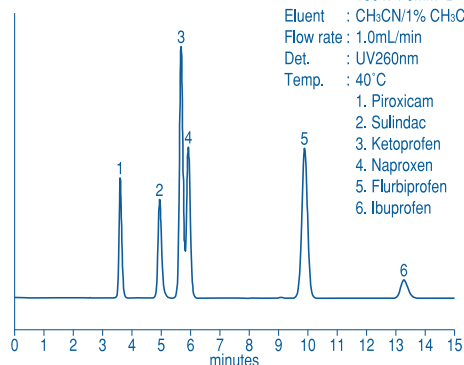
	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-100-3-ODS-P	10	3	1.1	450	17	50
SP-100-5-ODS-P	10	5	1.1	450	17	50
SP-100-10-ODS-P	10	10	1.1	450	17	500
SP-100-15-ODS-P	10	15	1.1	450	17	500

Applications

Non-steroidal anti-inflammatory drugs

Column : DAISOGEL SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/1% CH₃COOH aq=65/35
Flow rate : 1.0mL/min
Det. : UV260nm
Temp. : 40°C

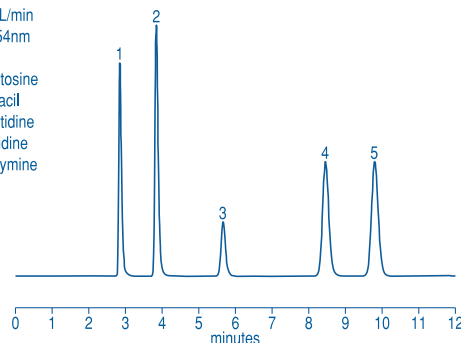
1. Piroxicam
2. Sulindac
3. Ketoprofen
4. Naproxen
5. Flurbiprofen
6. Ibuprofen

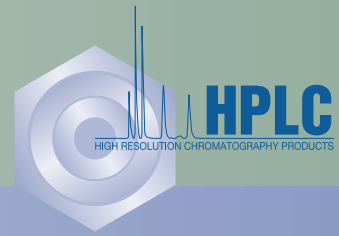


Nucleosides

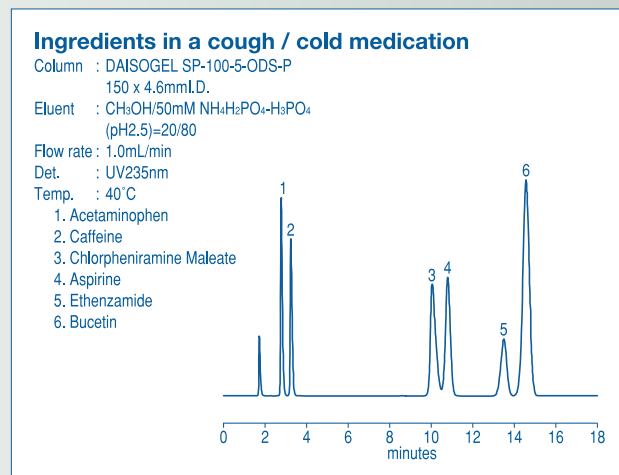
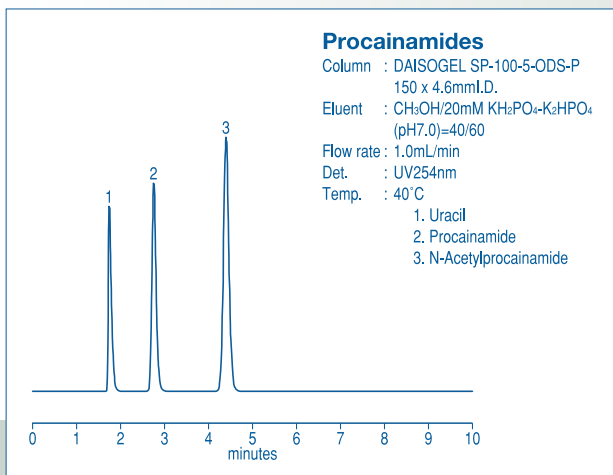
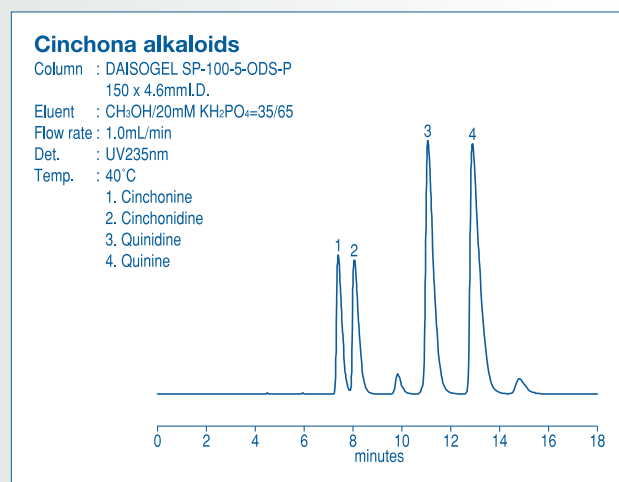
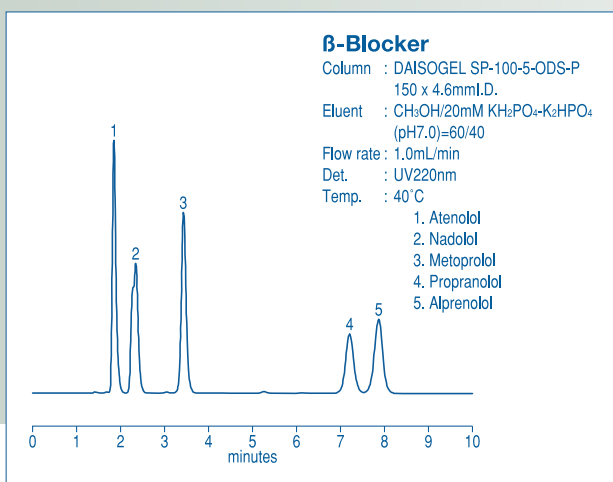
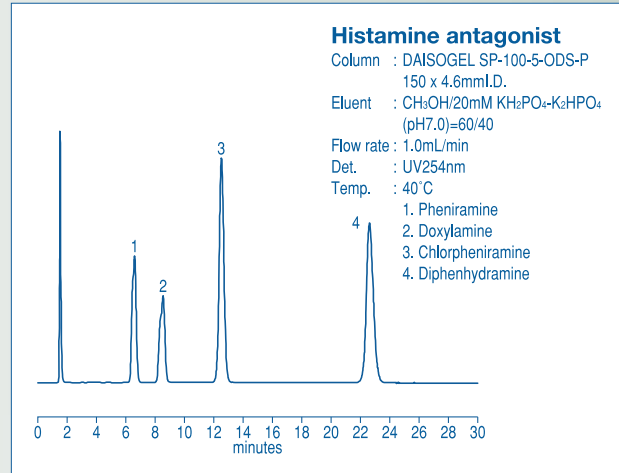
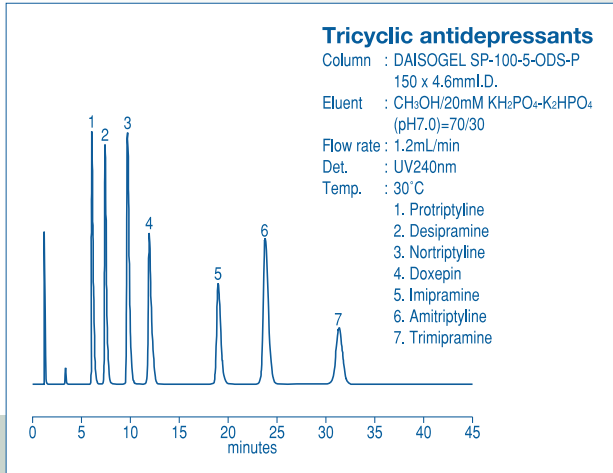
Column : DAISOGEL SP-100-5-ODS-P
250 x 4.6mm I.D.
Eluent : H₂O 100%
Flow rate : 1.0mL/min
Det. : UV254nm
Temp. : 40°C

1. Cytosine
2. Uracil
3. Cytidine
4. Uridine
5. Thymine





Applications



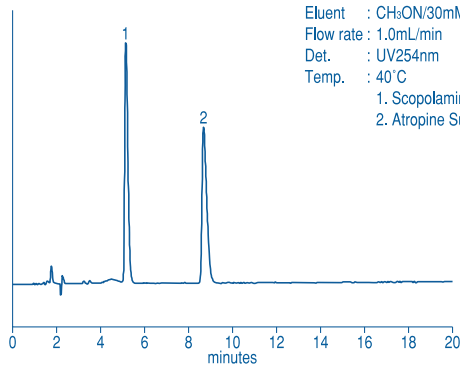
DAISOGEI HSA Series

SP-100-ODS-P

Applications

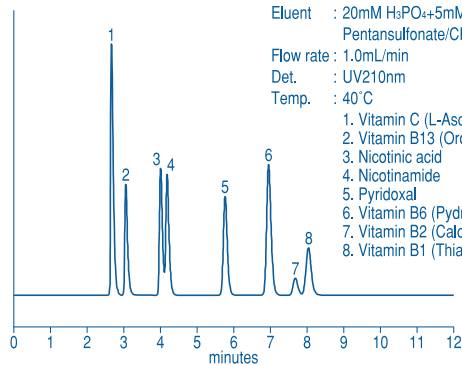
Anticholinergic drugs

Column : DAISOGEI SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/30mM NaH₂PO₄=15/85
Flow rate : 1.0mL/min
Det. : UV254nm
Temp. : 40°C
1. Scopolamine Hydrobromide
2. Atropine Sulfate



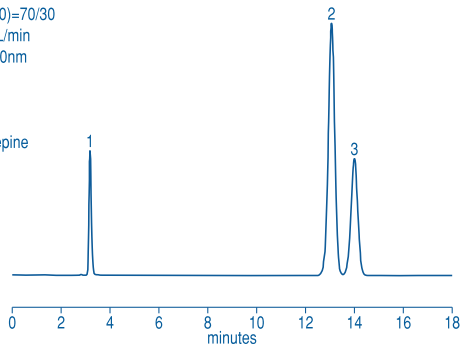
Water-soluble vitamins

Column : DAISOGEI SP-100-5-ODS-P
250 x 4.6mm I.D.
Eluent : 20mM H₃PO₄+5mM Sodium 1-Pentansulfonate/CH₃CN=92/8
Flow rate : 1.0mL/min
Det. : UV210nm
Temp. : 40°C
1. Vitamin C (L-Ascorbic acid)
2. Vitamin B13 (Orotic acid)
3. Nicotinic acid
4. Nicotinamide
5. Pyridoxal
6. Vitamin B6 (Pyridoxine)
7. Vitamin B2 (Calcium pantothenate)
8. Vitamin B1 (Thiamin)



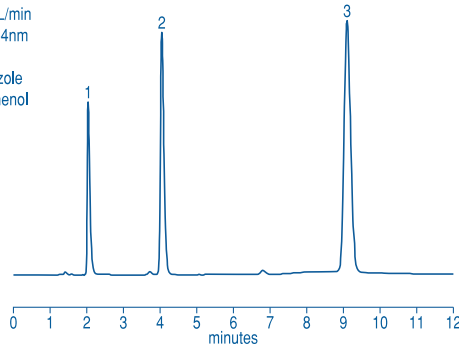
Antiepileptics

Column : DAISOGEI SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/20mM KH₂PO₄+K₂HPO₄
(pH7.0)=70/30
Flow rate : 1.0mL/min
Det. : UV220nm
Temp. : 30°C
1. Primidone
2. Phenytoin
3. Carbamazepine



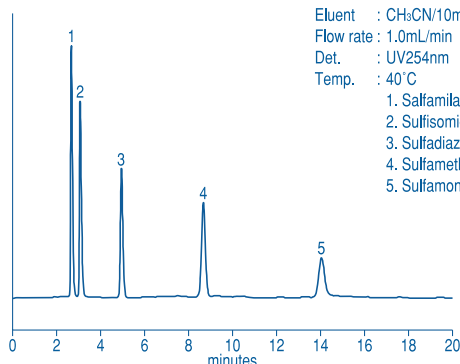
Fungicides

Column : DAISOGEI SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/30mM NH₂PO₄=65/35
Flow rate : 1.0mL/min
Det. : UV254nm
Temp. : 40°C
1. Thiabendazole
2. o-Phenylphenol
3. Biphenyl



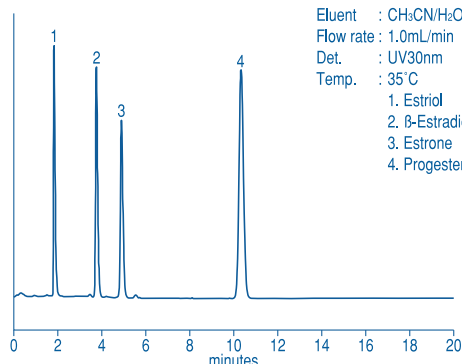
Sulfonamides

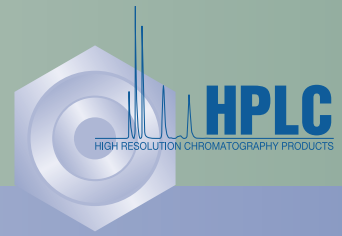
Column : DAISOGEI SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/10mM H₃PO₄=15/85
Flow rate : 1.0mL/min
Det. : UV254nm
Temp. : 40°C
1. Sulfamilamide
2. Sulfisomidine
3. Sulfadiazine
4. Sulfamethazine
5. Sulfamonomethoxine



Steroids

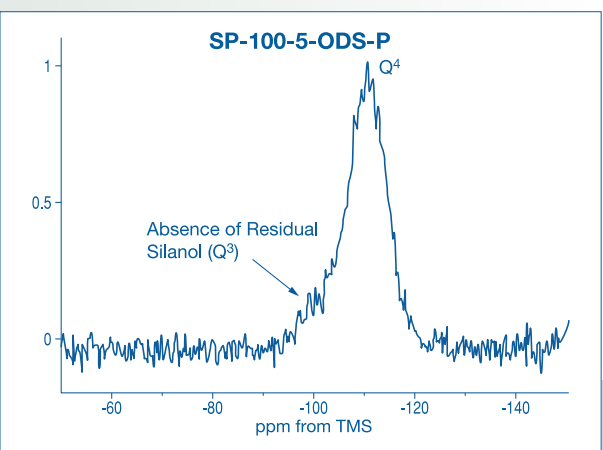
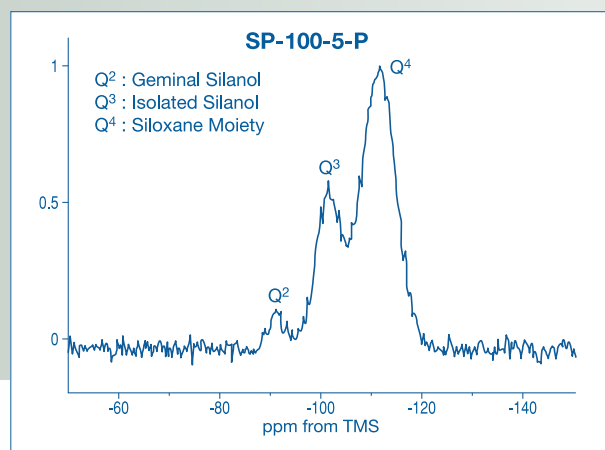
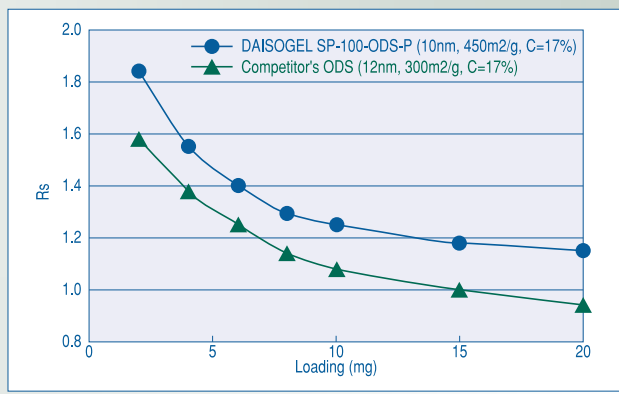
Column : DAISOGEI SP-100-5-ODS-P
150 x 4.6mm I.D.
Eluent : CH₃CN/H₂O=60/40
Flow rate : 1.0mL/min
Det. : UV30nm
Temp. : 35°C
1. Estriol
2. β-Estradiol
3. Estrone
4. Progesterone



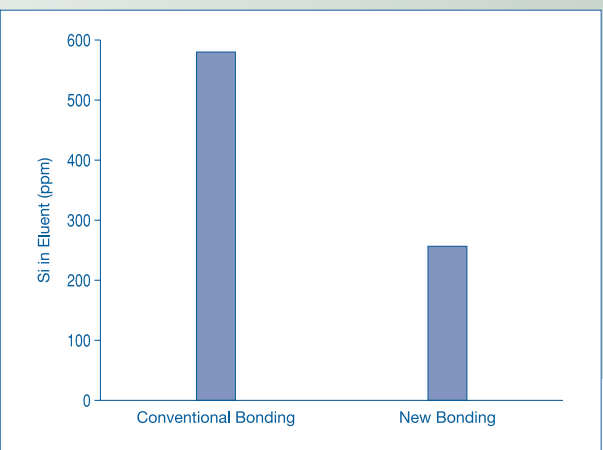
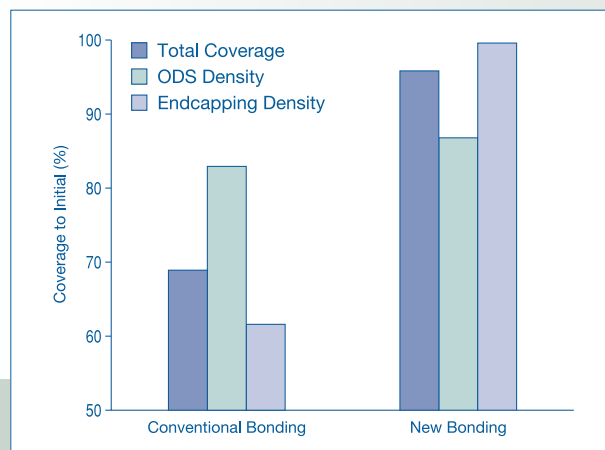


Superior loadability and resolution

Column : 250 x 20mm I.D. (Semi-prep size)
 Eluent : CH₃CN/H₂O/TFA=30/70/0.1 → 70/30/0.1 (20 min Linear, 5 min Hold)
 Flow Rate : 19mL / min
 Det. : UV270nm
 Temperature : Ambient
 Sample : Mixture of Econazole nitrate and Miconazole nitrate (each 20mg/mL in DMSO)



Measurement results of ²⁹Si-NMR show clear disappearance of silanol moiety after ODS modification and endcapping.



Acidic Resistance (pH1)

Column Size: 4.6mm I.D. x 150mm Length;
 Mobile Phase: CH₃CN/1% TFA (pH=1) = 10/90;
 Temperature: 70 °C; Flow: 0.5ml/min; Time for Purge: 20h.

Alkalic Resistance (pH12)

Column Size: 4.6mm I.D. x 150mm Length;
 Mobile Phase: CH₃CN/20mM Na₃PO₄-NaOH (pH=12) = 10/90;
 Temperature: 40 °C; Flow: 1.0ml/min; Time for Purge: 5h.

Durability against acidic and alkalic condition is improved dramatically compared with conventional bonding.

HSA Series

DAISOGEI BIO Series

SP-120-BIO

- * Suitable for purification of small peptides and other compounds
- * 12 nm pore size, narrow distribution range
- * Totally spherical particles made of ultra high purity silica gel
- * Featuring extended acidic and alkalic resistance, high durability

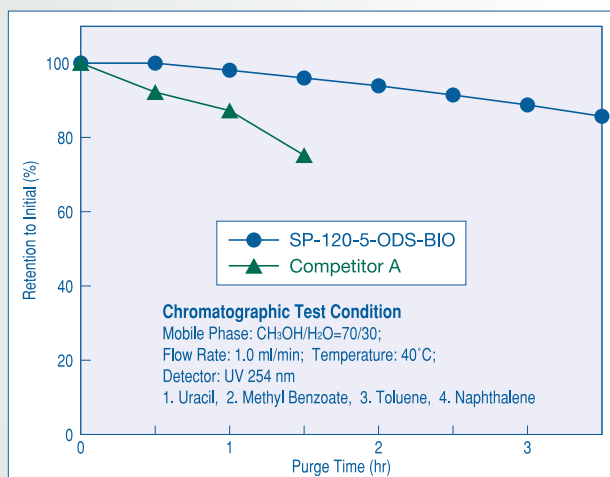
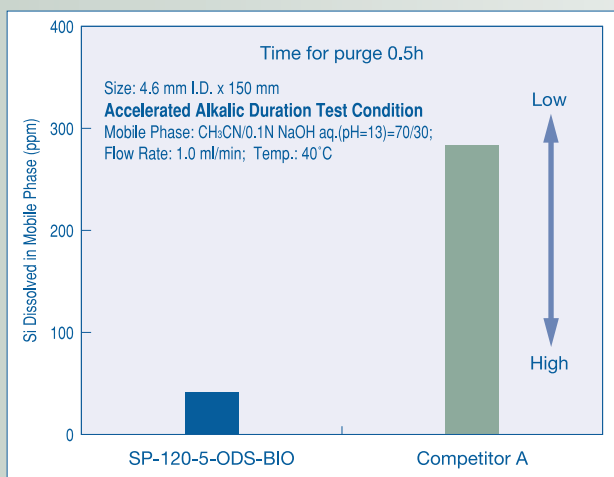
*12 nm pore size, narrow particle size distribution range, ultra high purity totally spherical silica gel
 The improved high density bonding and full endcapping makes it very suitable to separate or purify lower molecular weight compounds, especially smaller peptides. Because of the significant improvement in durability and acidic, alkalic resistance it can be used for extended period of time in acidic mobile phase condition and rinsed for recovery with NaOH containing buffer.
 The ODS phases are recommended for general use, first choice for unknown compounds.
 Available types: SP-120-ODS-BIO, SP-120-C8-BIO, SP-120-C4-BIO

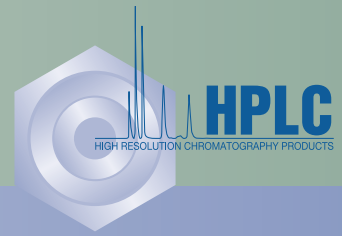
Product names and properties

	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-120-5-ODS-BIO	12	5	1.0	300	20	50
SP-120-10-ODS-BIO	12	10	1.0	300	20	500
SP-120-15-ODS-BIO	12	15	1.0	300	20	500
SP-120-20-ODS-BIO	12	20	1.0	300	20	500
SP-120-5-C8-BIO	12	5	1.0	300	12	50
SP-120-10-C8-BIO	12	10	1.0	300	12	500
SP-120-15-C8-BIO	12	15	1.0	300	12	500
SP-120-20-C8-BIO	12	20	1.0	300	12	500
SP-120-5-C4-BIO	12	5	1.0	300	9	50
SP-120-10-C4-BIO	12	10	1.0	300	9	500
SP-120-15-C4-BIO	12	15	1.0	300	9	500
SP-120-20-C4-BIO	12	20	1.0	300	9	500

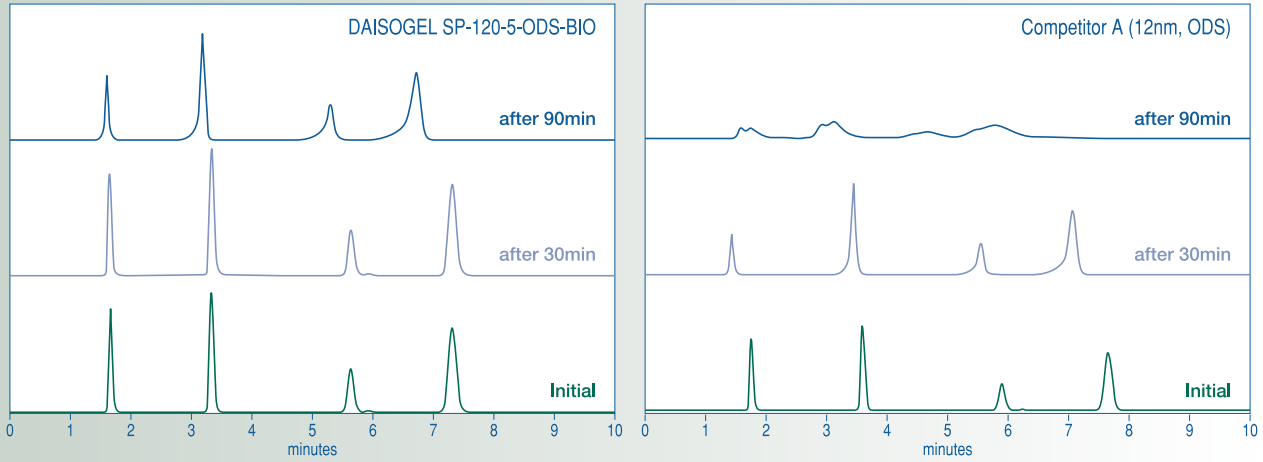
Superior alkalic and acidic resistance

Alkalic Resistance



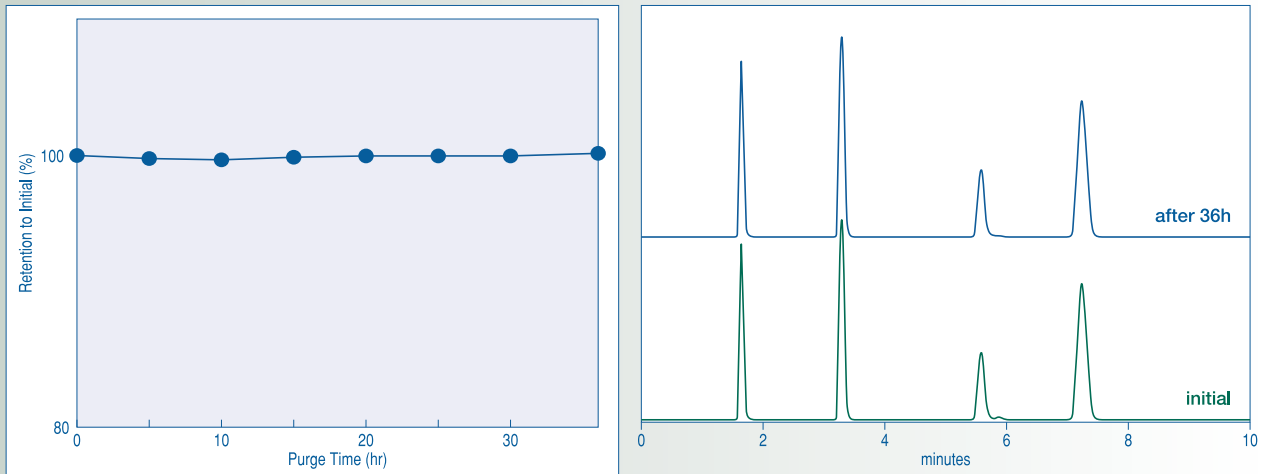


Comparison of Durability in Alkalic Environment



Size: 4.6 mm I.D. x 150 mm
Accelerated Alkalic Duration Test Condition
 Mobile Phase: CH₃CN/0.1N NaOH aq.(pH=13)=70/30; Flow Rate: 1.0 ml/min; Temp.: 40°C
Chromatographic Test Condition
 Mobile Phase: CH₃OH/H₂O=70/30; Flow Rate: 1.0 ml/min; Temperature: 40°C; Detector: UV 254 nm
 1. Uracil, 2. Methyl Benzoate, 3. Toluene, 4. Naphthalene

Acidic Resistance



Size: 4.6 mm I.D. x 150 mm
Accelerated Acidic Duration Test Condition
 Mobile Phase: CH₃CN/H₂O/TFA=70/30/1; Flow Rate: 1.0 ml/min; Temp.: 70°C
Chromatographic Test Condition
 Mobile Phase: CH₃OH/H₂O=70/30; Flow Rate: 1.0 ml/min; Temperature: 40°C; Detector: UV 254 nm
 1. Uracil, 2. Methyl Benzoate, 3. Toluene, 4. Naphthalene

DAISOGEI BIO Series

SP-200-BIO

- * Suitable for purification of medium molecular weight peptides and other compounds
- * Superior mechanical strength
- * Totally spherical particles made of ultra high purity silica gel
- * Featuring extended acidic and alkalic resistance, high durability

*20 nm pore size, narrow particle size distribution range, ultra high purity totally spherical silica gel
 The improved high density bonding and full endcapping makes it very suitable to separate or purify medium molecular weight compounds, especially insulin. Because of the significant improvement in durability and acidic, alkalic resistance it can be used for extended period of time in acidic mobile phase condition and rinsed for recovery with NaOH containing buffer.

The C8 phases are recommended for compounds too strongly retained on ODS phases.

Available types: SP-200-ODS-BIO, SP-200-C8-BIO, SP-200-C4-BIO

Product names and properties

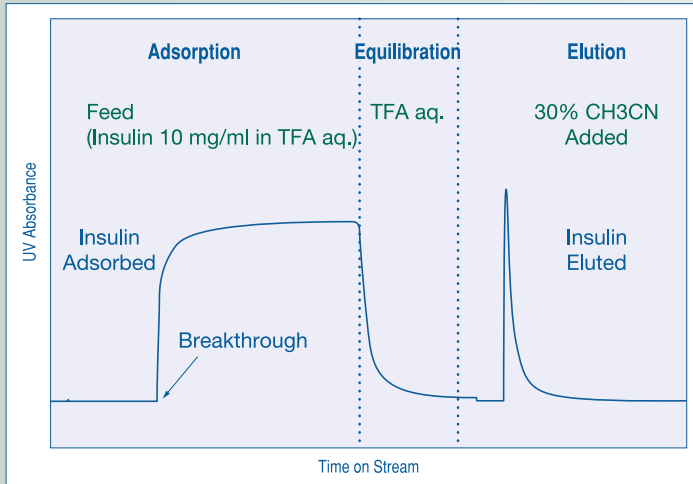
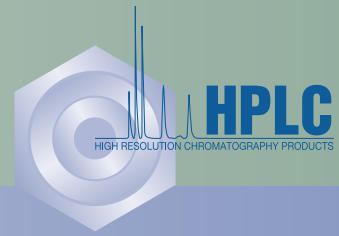
	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-200-5-ODS-BIO	20	5	1.1	200	15	50
SP-200-10-ODS-BIO	20	10	1.1	200	15	500
SP-200-15-ODS-BIO	20	15	1.1	200	15	500
SP-200-20-ODS-BIO	20	20	1.1	200	15	500
SP-200-5-C8-BIO	20	5	1.1	200	8	50
SP-200-10-C8-BIO	20	10	1.1	200	8	500
SP-200-15-C8-BIO	20	15	1.1	200	8	500
SP-200-20-C8-BIO	20	20	1.1	200	8	500
SP-200-5-C4-BIO	20	5	1.1	200	6	50
SP-200-10-C4-BIO	20	10	1.1	200	6	500
SP-200-15-C4-BIO	20	15	1.1	200	6	500
SP-200-20-C4-BIO	20	20	1.1	200	6	500

Superior mechanical strength



Particle Size Alteration

Material : SP-200-10-P
 Column : Dynamic Axial Compression column (50 mm I.D.)
 Packing Solvent : 2-Propanol
 Piston Pressure : 10 MPa
 Particle Size Distribution : Measured by Coulter Counter.

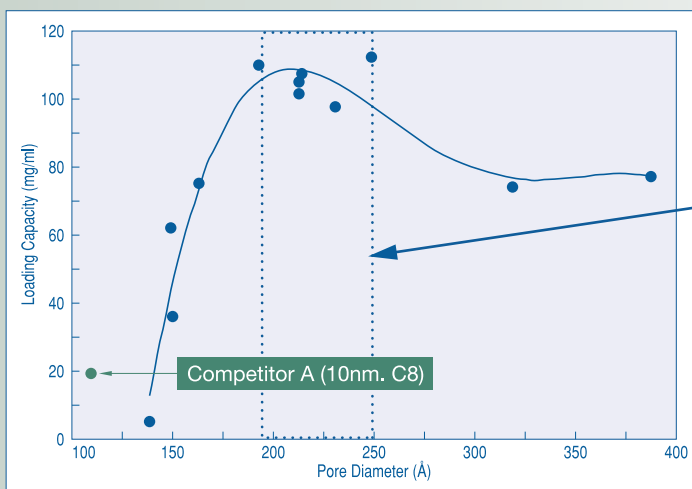
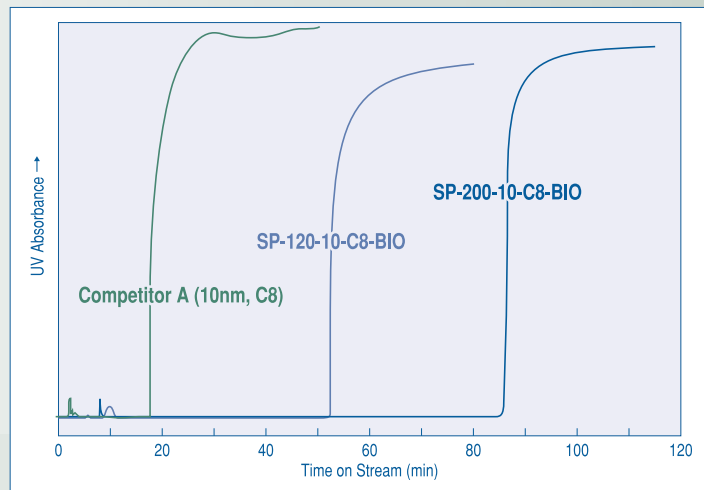


Conceptual Illustration of Theoretical Adsorption-Elution

Column Dimension : 4.6 mm I.D. x 250 mm Length

- Adsorption**
 Equilibration : 0.5% TFA aq
 Solute : Human Insulin (Recombinant, Wako, Japan)
 Concentration : 10 mg/ml
 Feed : Solute Dissolved in 0.5% TFA aq
 Flow Rate : 0.5 ml/min
 Temp. : 30°C
 Detector : UV 290 nm
- Desorption/Elution**
 Equilibration : 0.5% TFA aq
 Elution : CH₃CN/H₂O/TFA = 30/70/0.1
 Flow Rate : 0.5 ml/min
 Temp. : 30°C
 Detector : UV 300 nm.

Loading Capacity of Insulin Breakthrough Curve Comparison



Loading Capacity of Insulin Pore Diameter Correlation

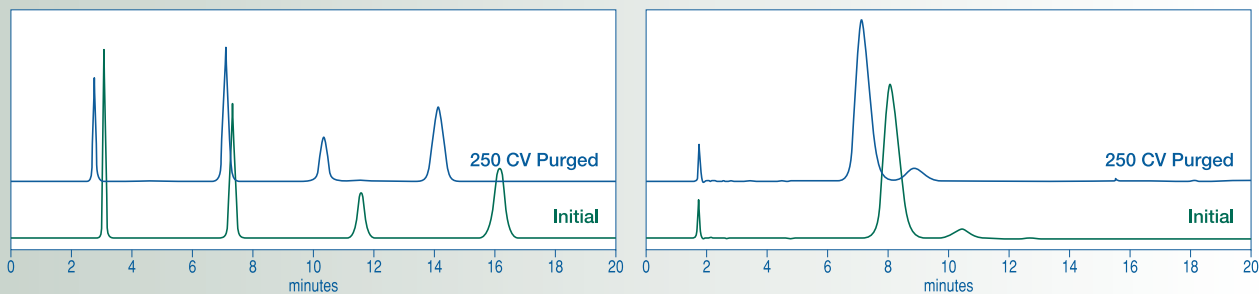
Optimum Pore Range for Insulin Molecule 19 - 25 nm

Loading Capacity = $F \times C_0 \times T_b / CV$
 F: Flow Rate;
 C₀: Concentration;
 T_b: Breakthrough Time;
 CV: Column Volume.

Chromatographic Evaluation after Alkalic Treatment

Alkalic Durability Evaluation

ColumnSize: 4.6 mm I.D. x 250 mm Length; Mobile Phase: Ethanol/0.1 N NaOH aq. (pH=13) = 70/30; Flow Rate: 2.0 ml/min; Temperature: ambient; Alkali purged: 250 Column Volume



Aromatic Standards

Mobile Phase: CH₃OH/H₂O = 55/45
Flow Rate: 1.0 ml/min; Temp.: 40°C; Detector: UV 254 nm;
1. Uracil, 2. Methyl Benzoate, 3. Toluene, 4. Naphthalene.

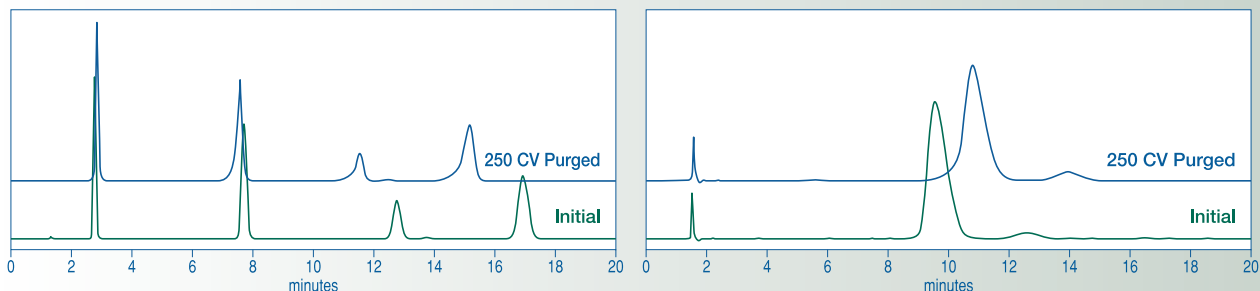
Insulin Separation

Mobile Phase: CH₃CN/H₂O/TFA = 30/70/0.1;
Flow Rate: 1.7 ml/min; Tempe.: 30°C; Detector: UV 220 nm;
Hydrolyzed Human Insulin ;
Concentration: 5 mg/ml; Injection: 5 µl.

Chromatographic Evaluation after Alkalic Treatment of Competitor A (10nm, C8)

Alkaline Durability Evaluation

ColumnSize: 4.6 mm I.D. x 250 mm Length; Mobile Phase: Ethanol/0.1 N NaOH aq. (pH=13) = 70/30; Flow Rate: 2.0 ml/min; Temperature: ambient; Alkali purged: 250 Column Volume

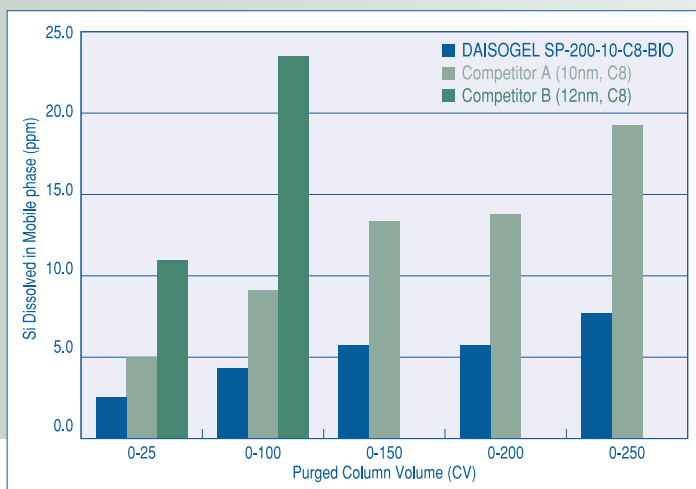


Aromatic Standards

Mobile Phase: CH₃OH/H₂O = 60/40
Flow Rate: 1.0 ml/min; Temp.: 40°C; Detector: UV 254 nm;
1. Uracil, 2. Methyl Benzoate, 3. Toluene, 4. Naphthalene.

Insulin Separation

Mobile Phase: CH₃CN/H₂O/TFA = 30/70/0.1;
Flow Rate: 1.7 ml/min; Tempe.: 30°C; Detector: UV 220 nm;
Hydrolyzed Human Insulin ;
Concentration: 5 mg/ml; Injection: 5 µl.

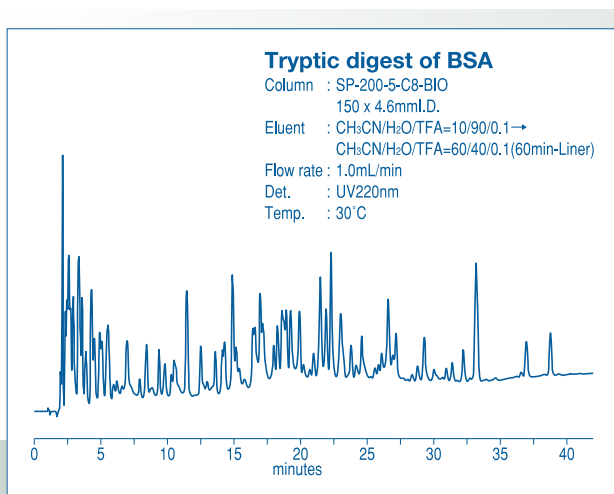
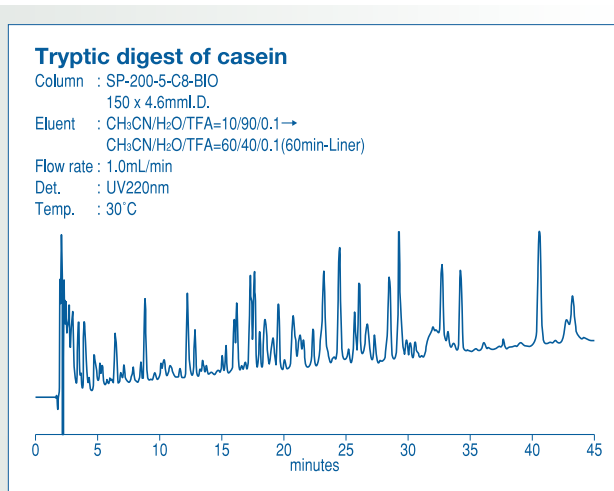
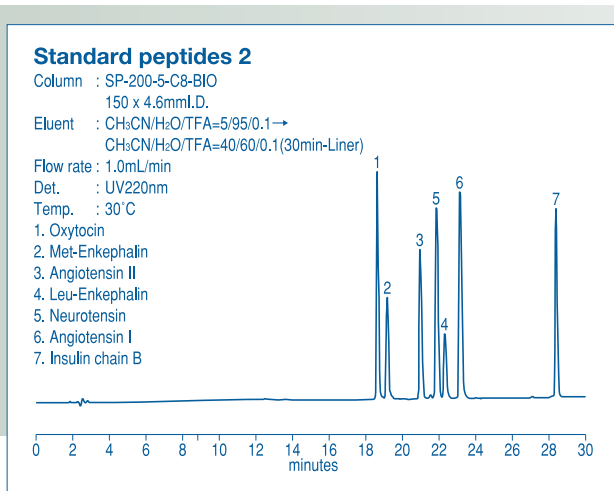
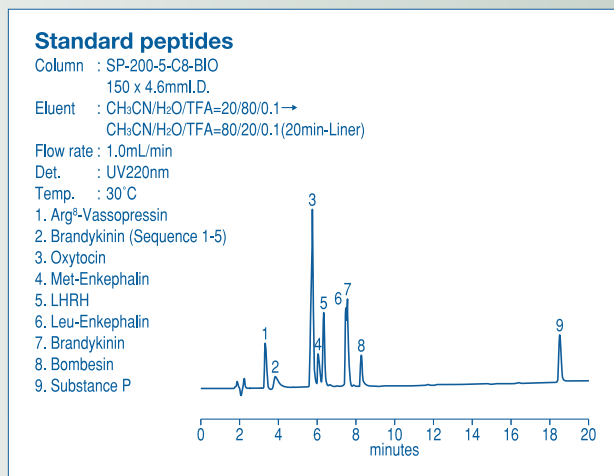
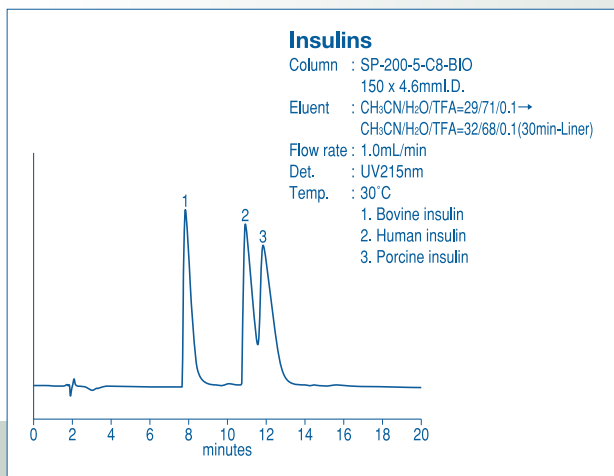


Alkalic Durability (pH=13) Comparison of Si Dissolved in Mobile Phase

Alkalic Durability Evaluation

Column Size: 4.6 mm I.D. x 250 mm Length
Mobile Phase: Ethanol/0.1 N NaOH aq. (pH=13) = 70/30;
Flow Rate: 2.0 ml/min; Temperature: ambient.
Elution was collected every 50 CV and Si dissolved was analyzed by ICP.

Applications



DAISOGEL

BIO Series

SP-300-BIO

for protein purification

e size, narrow distribution range

*** Totally spherical particles made of ultra high purity silica gel**

*** Featuring extended acidic and alkalic resistance, high durability**

***30 nm pore size, narrow particle size distribution range, ultra high purity totally spherical silica gel**

The improved high density bonding and full endcapping makes it very suitable to general use and to separate or purify high molecular weight compounds, especially proteins. Because of the significant improvement in durability and acidic, alkalic resistance it can be used for extended period of time in acidic mobile phase condition and rinsed for recovery with NaOH containing buffer.

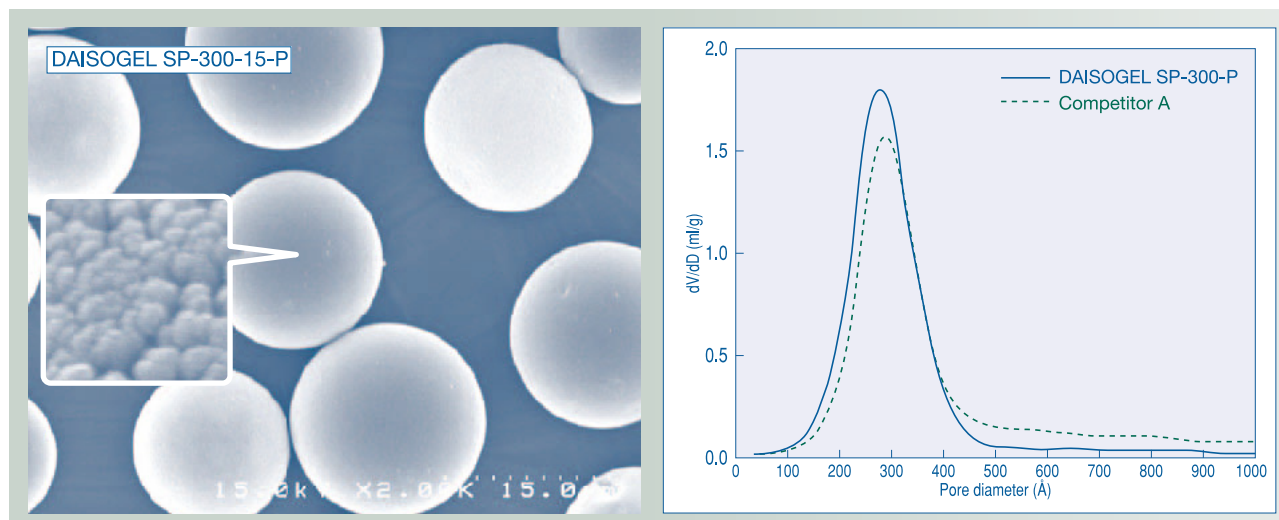
The C4 phases are recommended for compounds too strongly retained on ODS and C8 phases.

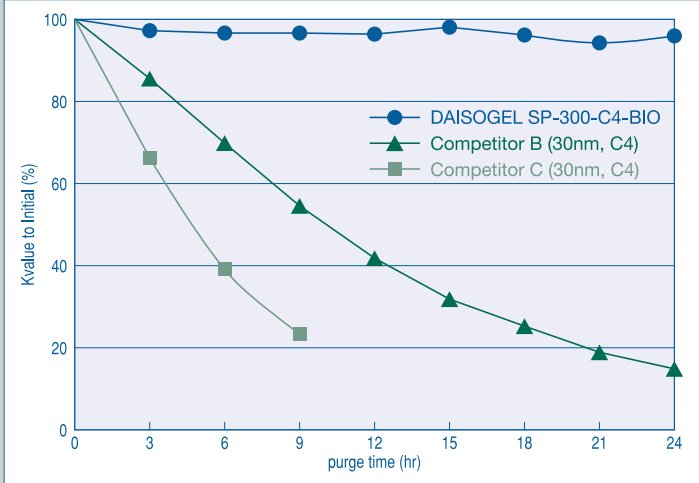
Available types: SP-300-ODS-BIO, SP-300-C8-BIO, SP-300-C4-BIO

Product names and properties

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-300-5-ODS-BIO	30	5	0.9	100	8	50
SP-300-10-ODS-BIO	30	10	0.9	100	8	500
SP-300-15-ODS-BIO	30	15	0.9	100	8	500
SP-300-20-ODS-BIO	30	20	0.9	100	8	500
SP-300-5-C8-BIO	30	5	0.9	100	6	50
SP-300-10-C8-BIO	30	10	0.9	100	6	500
SP-300-15-C8-BIO	30	15	0.9	100	6	500
SP-300-20-C8-BIO	30	20	0.9	100	6	500
SP-300-5-C4-BIO	30	5	0.9	100	3	50
SP-300-10-C4-BIO	30	10	0.9	100	3	500
SP-300-15-C4-BIO	30	15	0.9	100	3	500
SP-300-20-C4-BIO	30	20	0.9	100	3	500

Morphology and pore size distribution





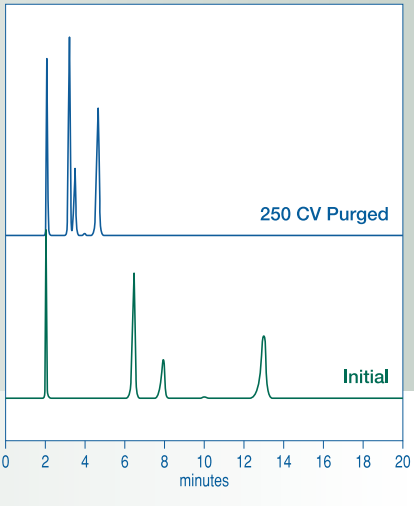
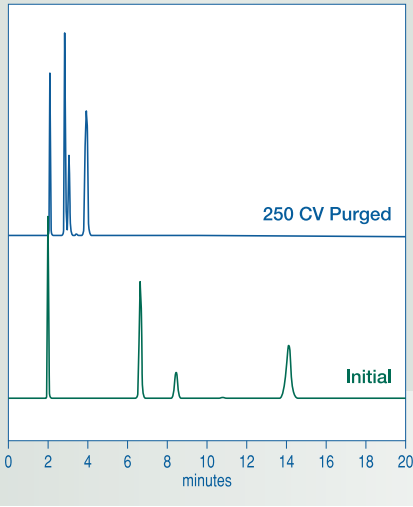
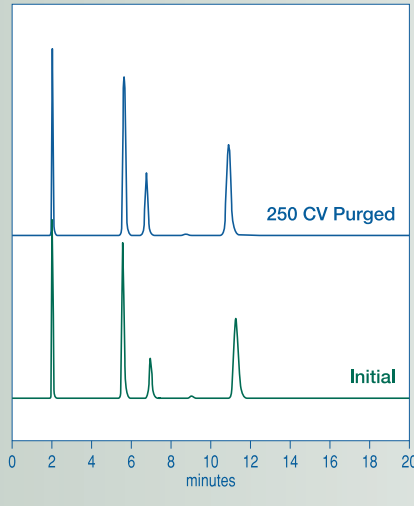
Comparison: Durability in Acidic Environment

Column Size : 4.6mm I.D. x 150mm Length
Accelerated Acidic Duration Test Condition
 Mobile Phase : CH₃CN/1.0% TFA aq. (pH=1.0) = 10/90
 Flow Rate : 1.0 ml/min
 Temperature : 70°C
 Purge time : 3h
Chromatographic Test Condition
 Mobile Phase : CH₃OH/H₂O=35/65
 Flow Rate : 1.0 ml/min
 Temperature : 40°C
 Detector : UV 254 nm
 Analyst : 1. Uracil
 2. Methyl Benzoate
 3. Toluene
 4. Naphthalene

DAISO GEL SP-300-C4-BIO

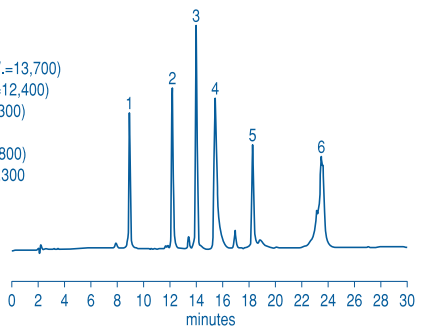
Competitor B (30nm, C4)

Competitor C (30nm, C4)



Standard proteins

Column : SP-300-5-C4-BIO
 150 x 4.6mm I.D.
 Eluent : A) CH₃CN/TFA=1000/1, B) H₂O/TFA=1000/1
 A/B=20/80 → A/B=60/40 (0-25 min)
 Flow rate : 1.0mL/min
 Det. : UV220nm
 Temp. : 35°C
 1. Ribonuclease A (M.W.=13,700)
 2. Cytochrome c (M.W.=12,400)
 3. Lysozyme (M.W.=14,300)
 4. BSA (M.W.=67,000)
 5. Myoglobin (M.W.=18,800)
 6. Ovalbumin (M.W.=45,300)



DAISOGEL ODS-BP Series

- * Suitable for hydrophilic compounds separation
- * Strong retention in aqueous condition
- * Longer lifetime in aqueous eluents

- * Different selectivity from ODS-RPS
- * Enhanced mechanical stability
- * Suitable for Dynamic Axial Compression Columns

ODS-BP phases are designed to show extended selectivity for hydrophilic and polar compounds which are either not or poorly retained on other phases. A proprietary modification technique avoids the matting-down effect of the C18 chains which conventional ODS-phases show at high water contents in the mobile phase, even if pure water is used. Typical applications are separations of biomolecules and metabolites such as oligosaccharides, amino acids, small peptides, nucleotides and organic acids. DAISOGEL ODS-BP phases are fully endcapped and show similar selectivity as conventional C18 phases when being used for separations of hydrophobic compounds with typical reversed phase eluents. DAISOGEL ODS-BP phases show stable base lines and high sensitivity even under neutral pH conditions and without buffer or counter-ion additives, which makes them appear especially suited for hyphenated techniques like LC-MS, where such additives disturb the detection.

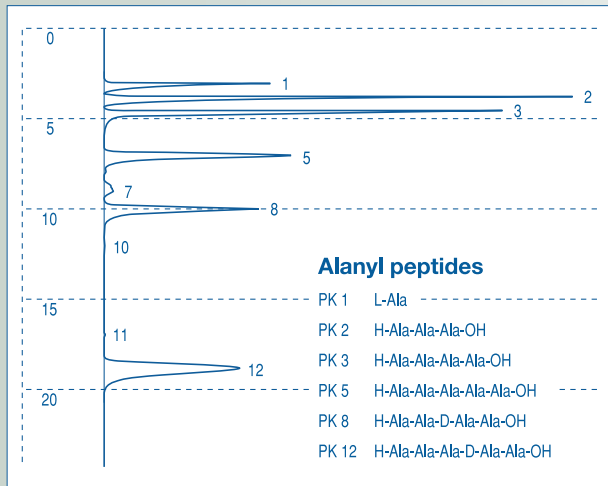


Product names and properties / analytical grades

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-120-3-ODS-BP	12	3	1.0	300	15	50
SP-120-4-ODS-BP	12	4	1.0	300	15	50
SP-120-5-ODS-BP	12	5	1.0	300	15	50
SP-120-7-ODS-BP	12	7	1.0	300	15	50
SP-200-3-ODS-BP	20	3	1.1	200	10	50
SP-200-5-ODS-BP	20	5	1.1	200	10	50

Product names and properties / preparative grades

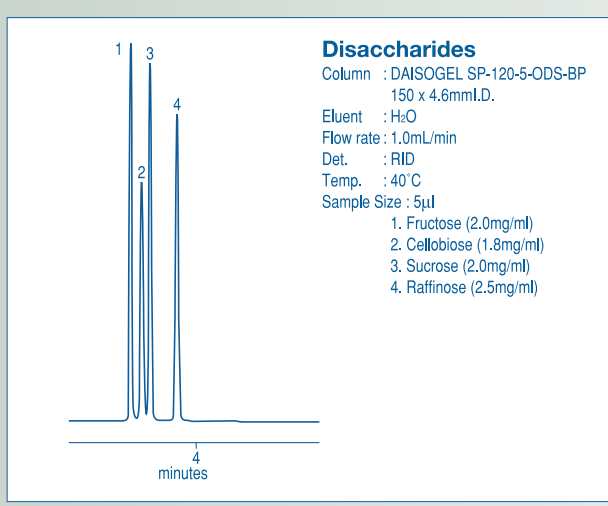
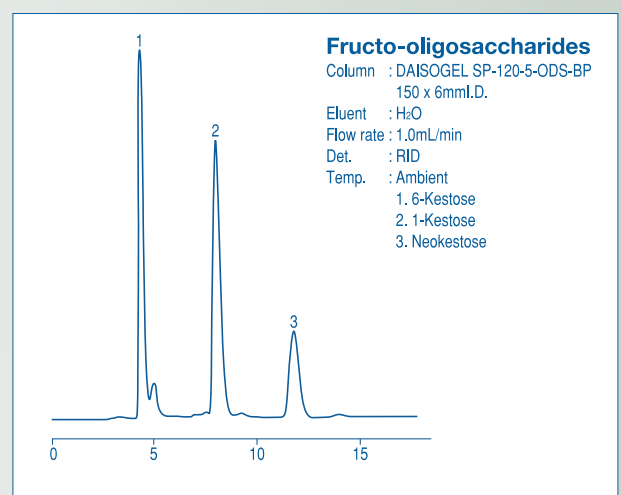
	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-120-10-ODS-BP	12	10	1.0	300	15	500
SP-120-15-ODS-BP	12	15	1.0	300	15	500
SP-120-20-ODS-BP	12	20	1.0	300	15	500
SP-120-40/60-ODS-B	12	50	1.0	300	15	500
SP-200-10-ODS-BP	20	10	1.1	200	10	500
SP-200-15-ODS-BP	20	15	1.1	200	10	500
SP-200-20-ODS-BP	20	20	1.1	200	10	500
SP-200-40/60-ODS-B	20	50	1.1	200	10	500



Alanine and its oligopeptides are separated on DAISO GEL ODS-BP using 100% water as eluent. The elution sequence corresponds with the number of amino acid units included in the each peptide. The diastereoisomer which contains the unnatural D-Ala in its structure shows a different retention time from the corresponding all-L-Ala peptide with the same number of amino acid residue.

Peptides were eluted on DAISO GEL SP-120-5-ODS-BP(6.0 x 150mm) with H₂O Flow rate, 1ml/min. Detector : UV214nm.

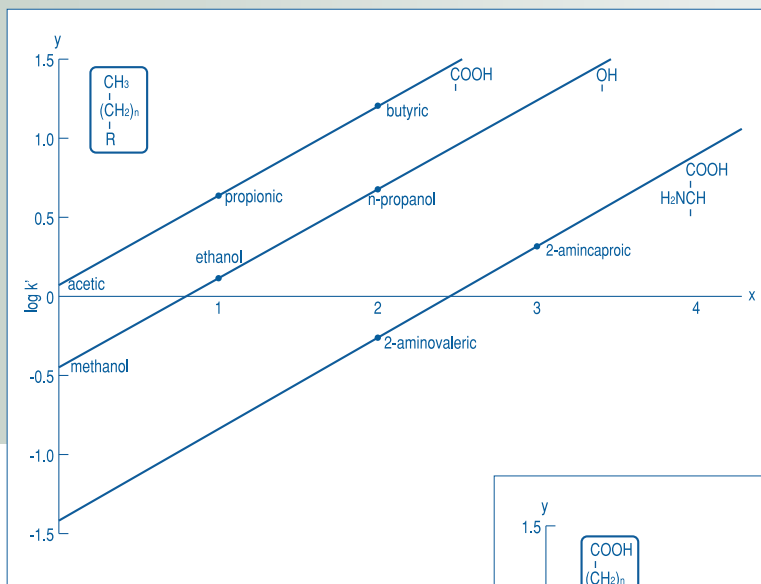
1-Kestose, 6-Kestose and Neokestose are position diastereoisomers which have the same molecular weight and are built up by the same monosaccharides, but they differ in the bonding position between sucrose and fructose. ODS-BP is sensitive to such small differences.



Disaccharides such as cellobiose and sucrose can be efficiently separated by ODS-BP. These disaccharides are composed of different monosaccharide units and exhibit different hydrophobicity. ODS-BP is capable of recognizing such a small differences.

DAISOGEL ODS-BP Series

Intensity of hydrophobic interaction of ODS-BP



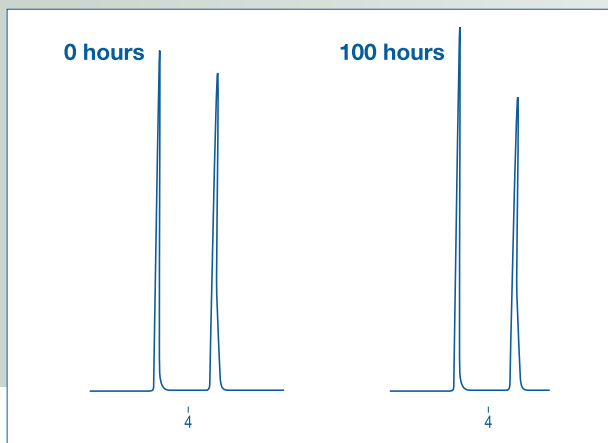
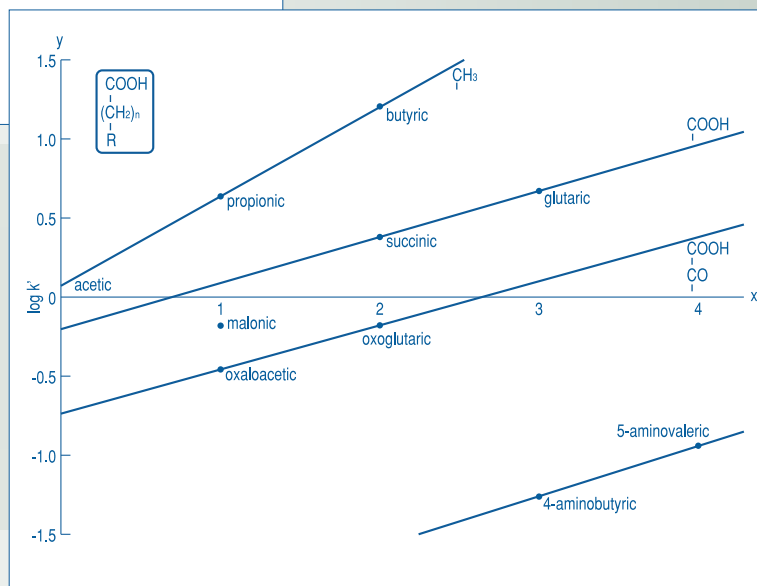
The figure shows the intensity of interaction between solutes and ODS-BP.

The x-axis shows the number of carbon atoms of the solute, the y-axis shows log k', which is calculated from the retention time of each solute. The fact that there is a linear relationship between these parameters proves that the retention mechanism of ODS-BP is based on van der Waals forces. Every side-chain added changes the hydrophobicity of the solute and influences the retention behavior.

ODS-BP Series

x : number of carbon atoms of the solute

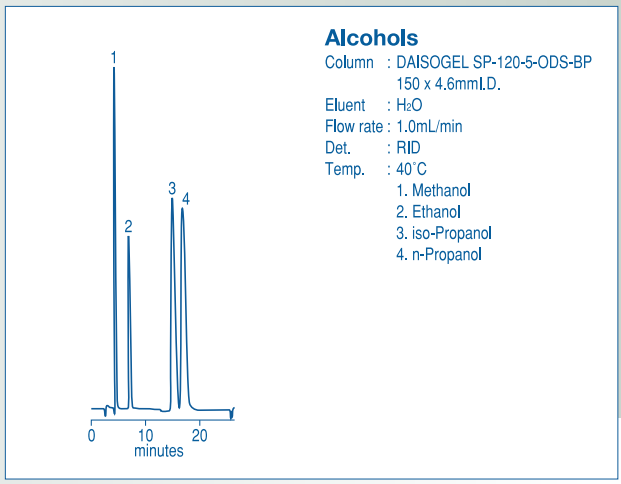
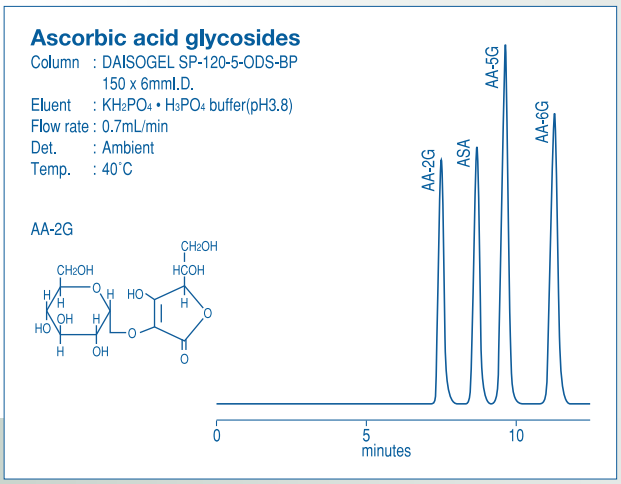
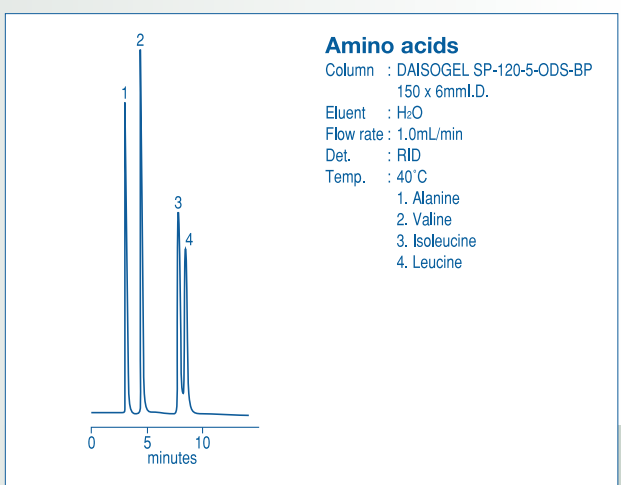
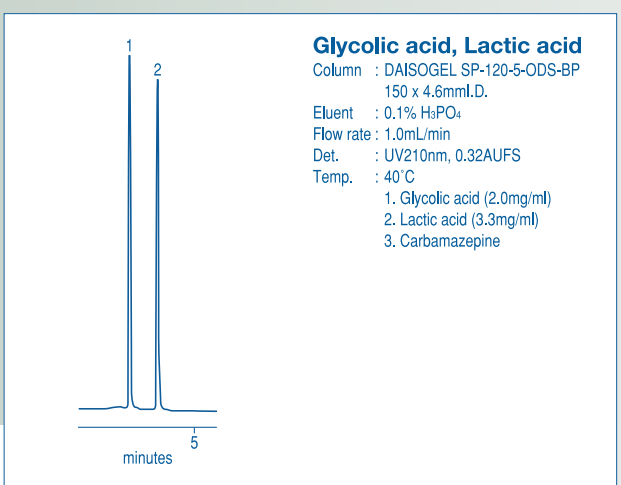
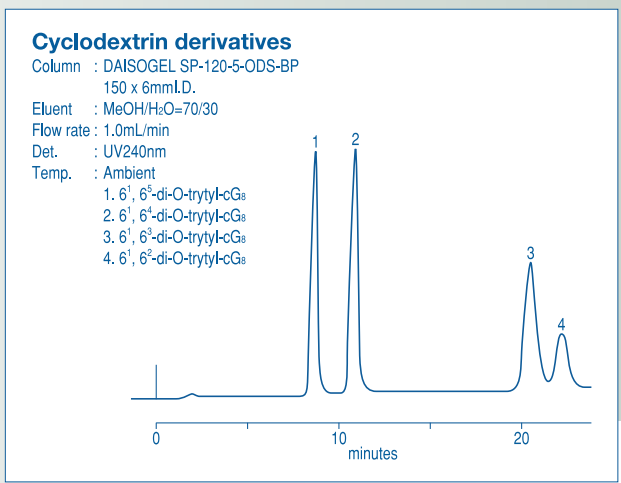
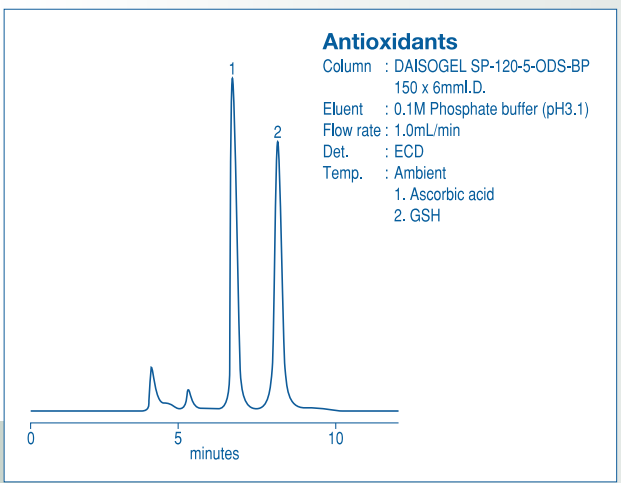
$$y : \log k' = \log \frac{RT_{\text{solute}} - RT_0}{RT_0}$$



	0 hours	after 100 hours
Pyridine kpy	0.704	0.686
Phenol kph	2.129	2.080
Separation α	3.024	3.032

There is no evidence of phase collapse of DAISOGEL ODS-BP with pure water. The test chromatogram of the pyridine/phenol separations shows that after 100 hours washing with water there was no change in selectivity or retention behavior.

Applications



DAISOGEL ODS-RPS Series

* High coverage and exhaustive endcapping
* Exceptional batch-to-batch reproducibility

* Enhanced mechanical stability
* Suitable for Dynamic Axial Compression columns

DAISOGEL ODS-RPS packings featuring maximum surface coverage are the ideal choice for a wide variety of organic compounds. Carefully controlled full endcapping leads to optimal performance with acidic, basic and chelating compounds. There is a choice of pore sizes between 6, 12, 20 and 30 nm. For analytical high speed applications 20 nm phases offer a good compromise between surface area available, separation speed on solvent consumption.

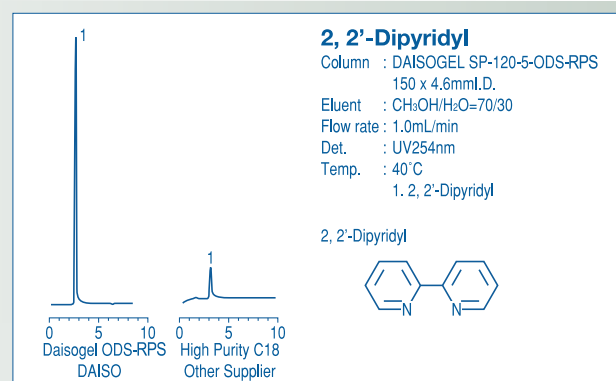
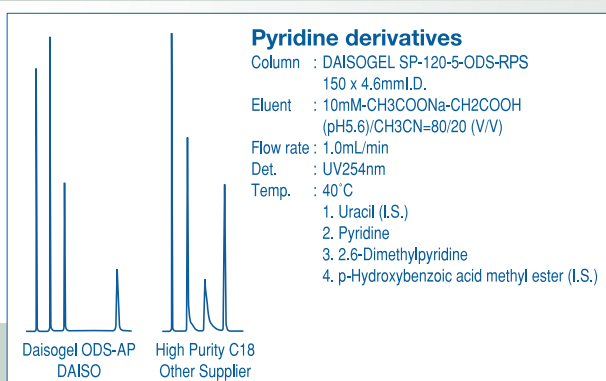
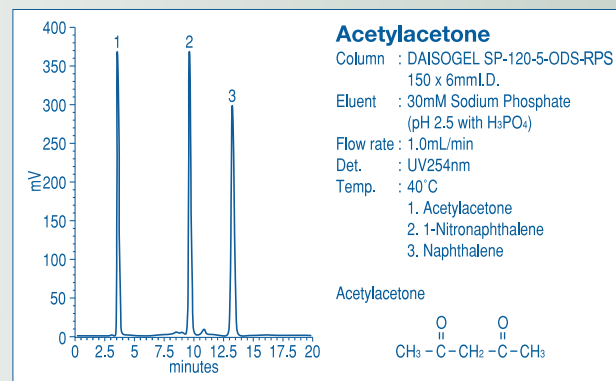
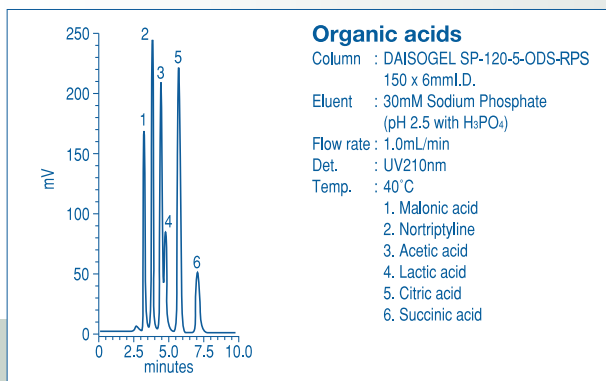
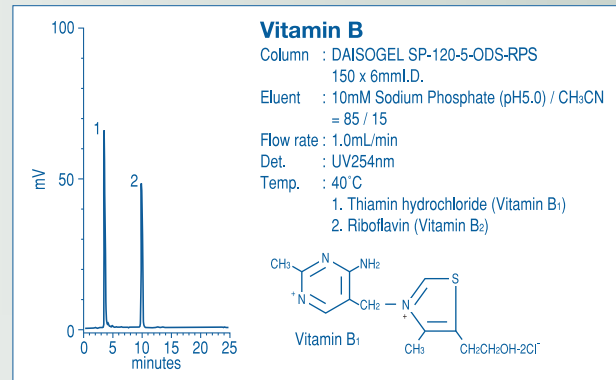
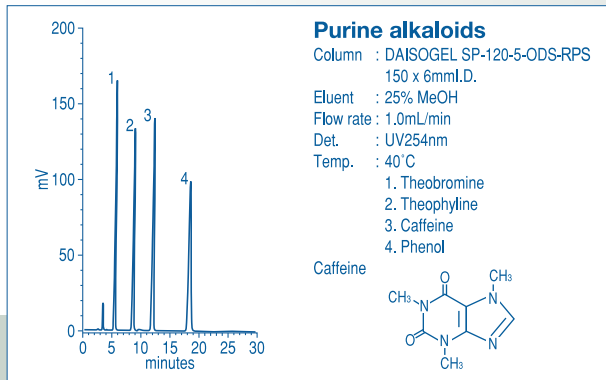
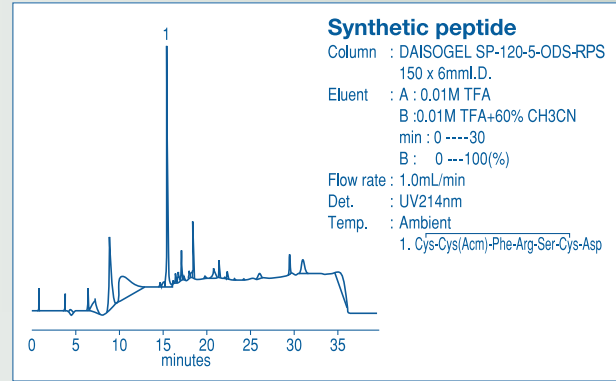
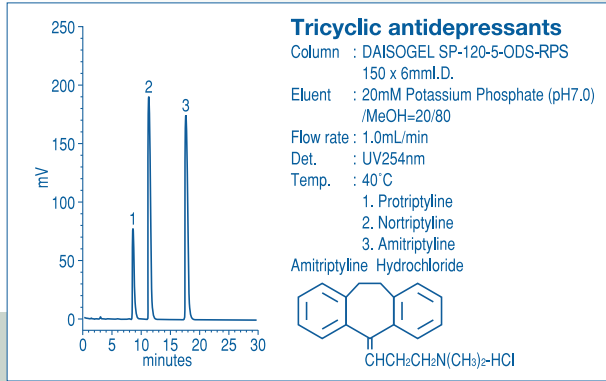
Product names and properties / analytical grades

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-3-ODS-RPS	6	3	0.75	450	19	50
SP-60-5-ODS-RPS	6	5	0.75	450	19	50
SP-120-3-ODS-RPS	12	3	1.0	300	17	50
SP-120-4-ODS-RPS	12	4	1.0	300	17	50
SP-120-5-ODS-RPS	12	5	1.0	300	17	50
SP-120-7-ODS-RPS	12	7	1.0	300	17	50
SP-200-3-ODS-RPS	20	3	1.1	200	12	50
SP-200-5-ODS-RPS	20	5	1.1	200	12	50
SP-300-3-ODS-RPS	30	3	0.9	100	7	50
SP-300-5-ODS-RPS	30	5	0.9	100	7	50

Product names and properties / preparative grades

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-10-ODS-RPS	6	10	0.75	450	19	500
SP-60-15-ODS-RPS	6	15	0.75	450	19	500
SP-60-20-ODS-RPS	6	20	0.75	450	19	500
SP-60-40/60-ODS-RPS	6	50	0.75	450	19	500
SP-120-10-ODS-RPS	12	10	1.0	300	17	500
SP-120-15-ODS-RPS	12	15	1.0	300	17	500
SP-120-20-ODS-RPS	12	20	1.0	300	17	500
SP-120-40/60-ODS-RPS	12	50	1.0	300	17	500
SP-200-10-ODS-RPS	20	10	1.1	200	12	500
SP-200-15-ODS-RPS	20	15	1.1	200	12	500
SP-200-20-ODS-RPS	20	20	1.1	200	12	500
SP-200-40/60-ODS-RPS	20	50	1.1	200	12	500
SP-300-10-ODS-RPS	30	10	0.9	100	9	500
SP-300-15-ODS-RPS	30	15	0.9	100	9	500
SP-300-20-ODS-RPS	30	20	0.9	100	9	500
SP-300-40/60-ODS-RPS	30	50	0.9	100	9	500

Applications



DAISOGEI

C8-P Series

DAISOGEI ODS-BP Series
 DAISOGEI ODS-RPS Series
 DAISOGEI C8-P Series
 DAISOGEI C4-P Series
 DAISOGEI C1-P Series

* Recommended for higher hydrophobic samples

* Most versatile reversed phase

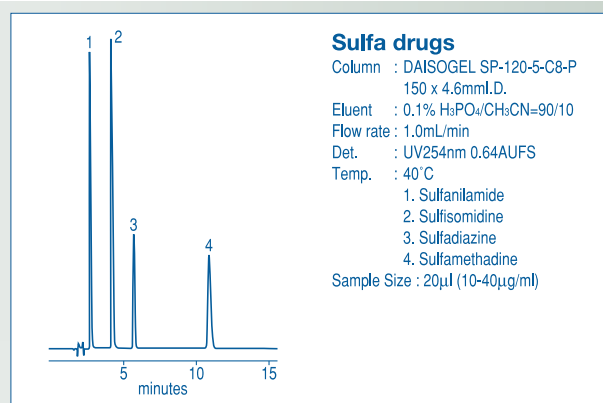
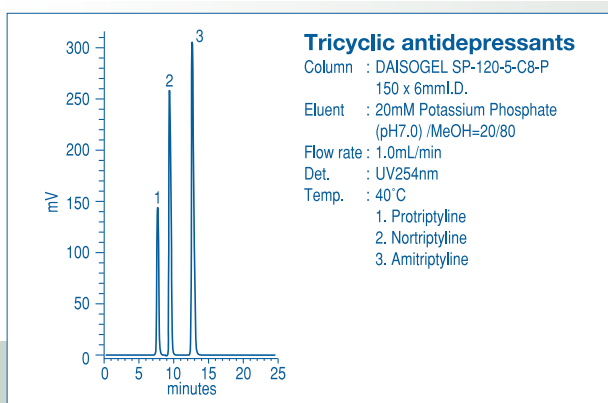
* Available in four porosities

DAISOGEI C8-P packing materials are bonded with octyl groups and are fully endcapped. They are recommended for compounds which are too strongly retained on C18 phases.

Four pore sizes, namely 6, 12, 20 and 30 nm are available to optimise the separation depending on the solutes' molecular size.

20 and 30 nm materials are widely used for larger molecules with higher hydrophobicity.

Applications



C8-P Series

Product names and properties

Analytical Grades	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-3-C8-P	6	3	0.75	450	14	50
SP-60-5-C8-P	6	5	0.75	450	14	50
SP-120-3-C8-P	12	3	1.0	300	10	50
SP-120-5-C8-P	12	5	1.0	300	10	50
SP-200-3-C8-P	20	3	1.1	200	7	50
SP-200-5-C8-P	20	5	1.1	200	7	50
SP-300-3-C8-P	30	3	0.9	100	4	50
SP-300-5-C8-P	30	5	0.9	100	4	50

Preparative Grades	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-10-C8-P	6	10	0.75	450	14	500
SP-60-15-C8-P	6	15	0.75	450	14	500
SP-60-20-C8-P	6	20	0.75	450	14	500
SP-60-40/60-C8	6	50	0.75	450	14	500
SP-120-10-C8-P	12	10	1.0	300	10	500
SP-120-15-C8-P	12	15	1.0	300	10	500
SP-120-20-C8-P	12	20	1.0	300	10	500
SP-120-40/60-C8	12	50	1.0	300	10	500
SP-200-10-C8-P	20	10	1.1	200	7	500
SP-200-15-C8-P	20	15	1.1	200	7	500
SP-200-20-C8-P	20	20	1.1	200	7	500
SP-200-40/60-C8	20	50	1.1	200	7	500
SP-300-10-C8-P	30	10	0.9	100	4	500
SP-300-15-C8-P	30	15	0.9	100	4	500
SP-300-20-C8-P	30	20	0.9	100	4	500
SP-300-40/60-C8	30	50	0.9	100	4	500

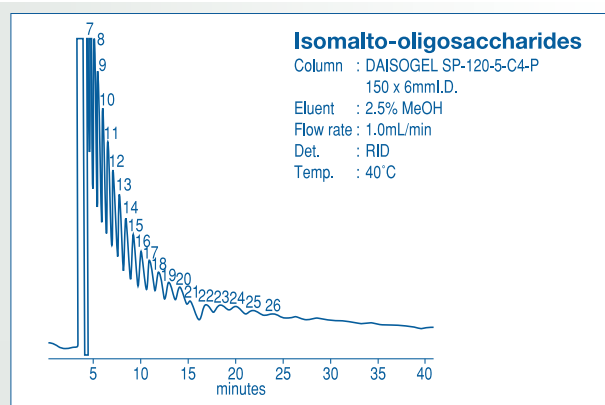
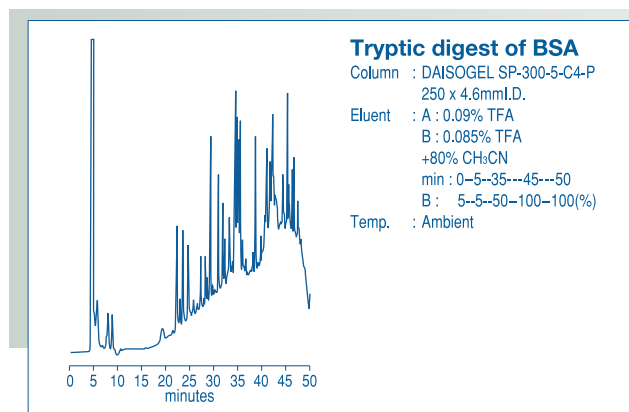
DAISOGEL C4-P Series

DAISOGEL ODS-RPS Series
 DAISOGEL C8-P Series
DAISOGEL C4-P Series
 DAISOGEL C1-P Series
 DAISOGEL AP-S-P Series

- * Recommended for biological separation
- * Quick separation of samples with wide range of hydrophobicity
- * Available in four porosities

DAISOGEL C4-P packing materials are bonded with butyl groups and show moderate hydrophobicity. They are available in four pore sizes, 6, 12, 20 and 30 nm to optimise the separations depending on the size of the solute. 12, 20, and 30 nm materials are suited for the separation of peptides and proteins. Especially, larger pore silicas with less surface area are used to avoid denaturation of proteins. The phases are also useful for separating components within a wide range of hydrophobicity in one shot.

Applications



Product names and properties

Analytical Grades	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-3-C4-P	6	3	0.75	450	10	50
SP-60-5-C4-P	6	5	0.75	450	10	50
SP-120-3-C4-P	12	3	1.0	300	7	50
SP-120-5-C4-P	12	5	1.0	300	7	50
SP-200-3-C4-P	20	3	1.1	200	5	50
SP-200-5-C4-P	20	5	1.1	200	5	50
SP-300-3-C4-P	30	3	0.9	100	3	50
SP-300-5-C4-P	30	5	0.9	100	3	50

Preparative Grades	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-10-C4-P	6	10	0.75	450	10	500
SP-60-15-C4-P	6	15	0.75	450	10	500
SP-60-20-C4-P	6	20	0.75	450	10	500
SP-60-40/60-C4	6	50	0.75	450	10	500
SP-120-10-C4-P	12	10	1.0	300	7	500
SP-120-15-C4-P	12	15	1.0	300	7	500
SP-120-20-C4-P	12	20	1.0	300	7	500
SP-120-40/60-C4	12	50	1.0	300	7	500
SP-200-10-C4-P	20	10	1.1	200	5	500
SP-200-15-C4-P	20	15	1.1	200	5	500
SP-200-20-C4-P	20	20	1.1	200	5	500
SP-200-40/60-C4	20	50	1.1	200	5	500
SP-300-10-C4-P	30	10	0.9	100	3	500
SP-300-15-C4-P	30	15	0.9	100	3	500
SP-300-20-C4-P	30	20	0.9	100	3	500
SP-300-40/60-C4	30	50	0.9	100	3	500

DAISOGEL C1-P Series

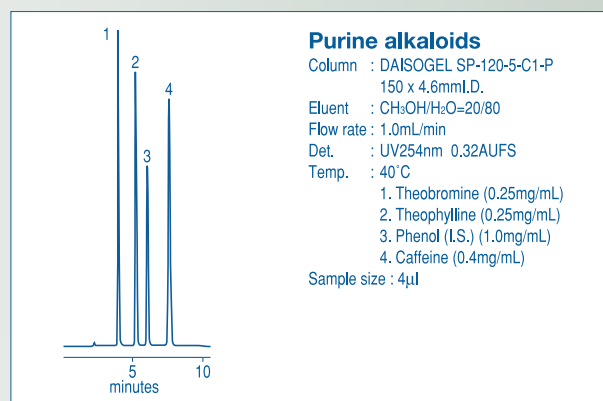
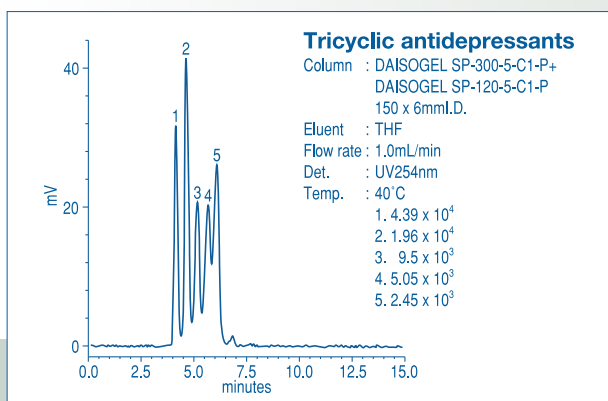


* Lowest hydrophobicity among alkyl-bonded phases
* Suitable for hydrophilic samples separation

* Useful for GPC depending on the eluent

DAISOGEL C1-P packing materials are bonded with trimethylmonochlorosilane using our ultra pure silica gel as base material. It has the lowest hydrophobicity among alkyl-bonded phases and is suited for the separation of hydrophobic peptides and proteins in reversed phase mode. Highly polar compounds are separated in normal phase mode. The phase is also useful for GPC depending on the choice of the eluent.

Applications



C1-P Series

Product names and properties

Analytical Grades	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-3-C1-P	6	3	0.75	450	6	50
SP-60-5-C1-P	6	5	0.75	450	6	50
SP-120-3-C1-P	12	3	1.0	300	5	50
SP-120-5-C1-P	12	5	1.0	300	5	50
SP-200-3-C1-P	20	3	1.1	200	3	50
SP-200-5-C1-P	20	5	1.1	200	3	50
SP-300-3-C1-P	30	3	0.9	100	2	50
SP-300-5-C1-P	30	5	0.9	100	2	50

Preparative Grades	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-10-C1-P	6	10	0.75	450	6	500
SP-60-15-C1-P	6	15	0.75	450	6	500
SP-60-20-C1-P	6	20	0.75	450	6	500
SP-60-40/60-C1	6	50	0.75	450	6	500
SP-120-10-C1-P	12	10	1.0	300	5	500
SP-120-15-C1-P	12	15	1.0	300	5	500
SP-120-20-C1-P	12	20	1.0	300	5	500
SP-120-40/60-C1	12	50	1.0	300	5	500
SP-200-10-C1-P	20	10	1.1	200	3	500
SP-200-15-C1-P	20	15	1.1	200	3	500
SP-200-20-C1-P	20	20	1.1	200	3	500
SP-200-40/60-C1	20	50	1.1	200	3	500
SP-300-10-C1-P	30	10	0.9	100	2	500
SP-300-15-C1-P	30	15	0.9	100	2	500
SP-300-20-C1-P	30	20	0.9	100	2	500
SP-300-40/60-C1	30	50	0.9	100	2	500

DAISOGE^L APS-P Series

DAISOGE^L C4-P Series
 DAISOGE^L C1-P Series
 DAISOGE^L APS-P Series
 DAISOGE^L SP-P Series
 DAISOGE^L SWP Series

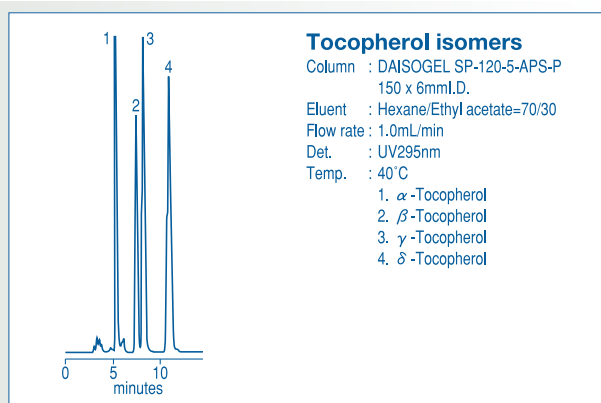
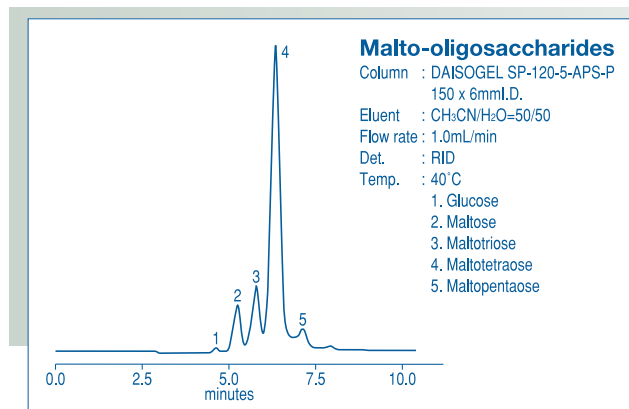
* Useful in both normal and reversed phase

* Useful as a support of special modification

* Recommended for basic compounds separation

DAISOGE^L APS-P packing materials are bonded with amino-propyl silane using our ultra pure spherical silica gel as base material. Depending on the choice of the eluent, it can both be used under normal and reversed phase mode. Especially, it is useful for saccharide separation using acetonitrile/water. The phase is also recommended for the separation of basic compounds under normal phase conditions, which could not be separated using unmodified silica gel. Simple eluents such as hexane / ethyl acetate or chloroform / methanol are used for the separation without any polar solvent additives.

Applications



Product names and properties

Analytical Grades	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-3-APS-P	6	3	0.75	450	5	50
SP-60-5-APS-P	6	5	0.75	450	5	50
SP-120-3-APS-P	12	3	1.0	300	4	50
SP-120-5-APS-P	12	5	1.0	300	4	50
SP-200-3-APS-P	20	3	1.1	200	3	50
SP-200-5-APS-P	20	5	1.1	200	3	50
SP-300-3-APS-P	30	3	0.9	100	2	50
SP-300-5-APS-P	30	5	0.9	100	2	50

Preparative Grades	Pore Size (nm)	Particle Size (μm)	Pore Volume (ml/g)	Surface Area (m ² /g)	% of Carbon	Minimum Lot (g)
SP-60-10-APS-P	6	10	0.75	450	5	500
SP-60-15-APS-P	6	15	0.75	450	5	500
SP-60-20-APS-P	6	20	0.75	450	5	500
SP-60-40/60-APS	6	50	0.75	450	5	500
SP-120-10-APS-P	12	10	1.0	300	4	500
SP-120-15-APS-P	12	15	1.0	300	4	500
SP-120-20-APS-P	12	20	1.0	300	4	500
SP-120-40/60-APS	12	50	1.0	300	4	500
SP-200-10-APS-P	20	10	1.1	200	3	500
SP-200-15-APS-P	20	15	1.1	200	3	500
SP-200-20-APS-P	20	20	1.1	200	3	500
SP-200-40/60-APS	20	50	1.1	200	3	500
SP-300-10-APS-P	30	10	0.9	100	2	500
SP-300-15-APS-P	30	15	0.9	100	2	500
SP-300-20-APS-P	30	20	0.9	100	2	500
SP-300-40/60-APS	30	50	0.9	100	2	500

DAISOGEL

SP-P Series



* *Ultra high purity silica*

* *Narrow particle size distribution*

* *Higher loading capacity*

* *Enhanced mechanical stability*

DAISOGEL SP-P (spherical ultra pure) series are based on spherical and totally porous silica gel with metal impurities specified to be less than 10 ppm each for Al, Fe, Ti and Zr. Its manufacturing process under strictly controlled conditions produces a material with reproducible distribution of particle and pore size and surface area. The presence of performance-degrading small pores is avoided.

DAISOGEL SP-P series packing materials for analytical applications are available in 3 μ m, 4 μ m and 5 μ m particle sizes.

Nowadays, preparative liquid chromatography is used for the purification of a wide range of high value products. DAISOGEL SP-P series packing materials for preparative chromatography feature narrow particle size distribution and ultra high silica purity. Using DAISOGEL, scale up is guaranteed by a using the same production procedure for all grades.

DAISOGEL SP-P series packing materials for preparative use are available in 7 μ m, 10 μ m, 15 μ m and 20 μ m.

High purity 40-60 μ m spherical silica is a cost effective alternative for medium and low pressure chromatography.

Product names and properties / analytical grades

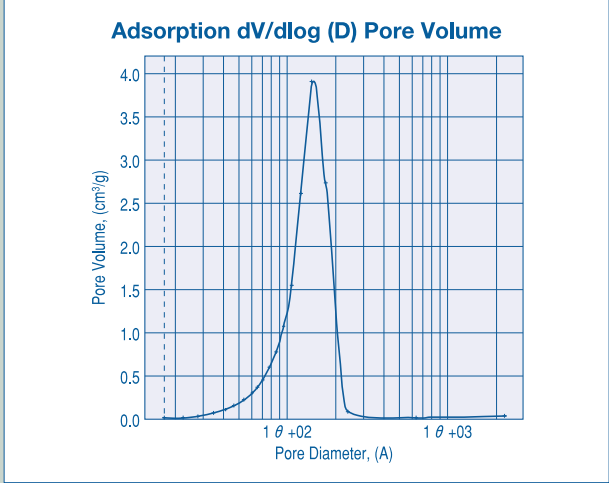
	Pore Size (nm)	Particle Size (μ m)	Particle Size Distribution (D40/D90)	Pore Volume (ml/g)	Surface Area (m ² /g)	Minimum Lot (g)
SP-60-3-P	6	3	≤ 1.25	0.75	450	50
SP-60-5-P	6	5	≤ 1.25	0.75	450	50
SP-120-3-P	12	3	≤ 1.25	1.0	300	50
SP-120-4-P	12	4	≤ 1.25	1.0	300	50
SP-120-5-P	12	5	≤ 1.25	1.0	300	50
SP-120-7-P	12	7	≤ 1.25	1.0	300	50
SP-200-3-P	20	3	≤ 1.25	1.1	200	50
SP-200-5-P	20	5	≤ 1.25	1.1	200	50
SP-300-3-P	30	3	≤ 1.25	0.9	100	50
SP-300-5-P	30	5	≤ 1.30	0.9	100	50

Product names and properties / preparative grades

	Pore Size (nm)	Particle Size (μ m)	Particle Size Distribution (D40/D90)	Pore Volume (ml/g)	Surface Area (m ² /g)	Minimum Lot (g)
SP-60-10-P	6	10	≤ 1.30	0.75	450	500
SP-60-15-P	6	15	≤ 1.40	0.75	450	500
SP-60-20-P	6	20	≤ 1.40	0.75	450	500
SP-60-40/60-P	6	50	≤ 1.60	0.75	450	500
SP-120-10-P	12	10	≤ 1.30	1.0	300	500
SP-120-15-P	12	15	≤ 1.40	1.0	300	500
SP-120-20-P	12	20	≤ 1.40	1.0	300	500
SP-120-40/60-P	12	50	≤ 1.60	1.0	300	500
SP-200-10-P	20	10	≤ 1.30	1.1	200	500
SP-200-15-P	20	15	≤ 1.40	1.1	200	500
SP-200-20-P	20	20	≤ 1.40	1.1	200	500
SP-200-40/60-P	20	50	≤ 1.60	1.1	200	500
SP-300-10-P	30	10	≤ 1.30	0.9	100	500
SP-300-15-P	30	15	≤ 1.40	0.9	100	500
SP-300-20-P	30	20	≤ 1.40	0.9	100	500
SP-300-40/60-P	30	50	≤ 1.60	0.9	100	500

DAISOGEL SP-P Series

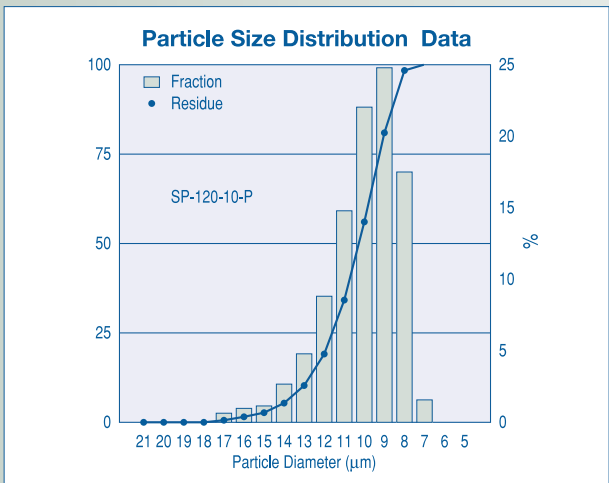
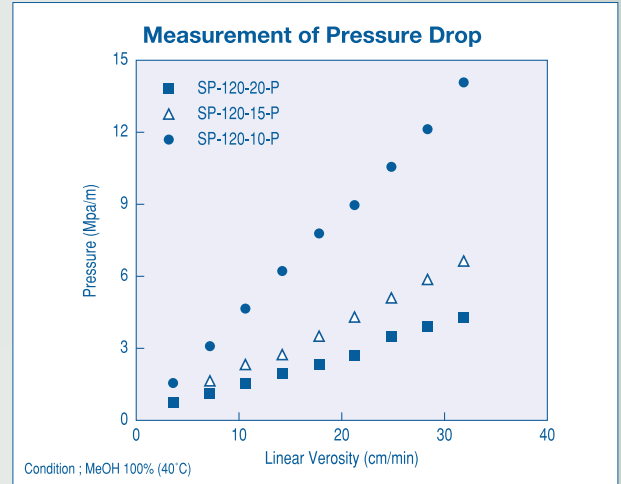
DAISOGEL C1-P Series
 DAISOGEL APS-P Series
 DAISOGEL SP-P Series
 DAISOGEL SWP Series
 DP GUARD FILTER



DAISOGEL's pore structure features the absence of performance-degrading micro pores which are not accessible by solute molecules and maximum surface area.

This leads to higher resolution for analytical applications and higher loading capacity for preparative applications.

Preparative grades packing material in the past have had a wide particle distribution. The advantage of DAISOGEL SP-P series packing material for preparative chromatography enables higher column efficiencies and lower operating pressure due to its narrow particle size distribution.



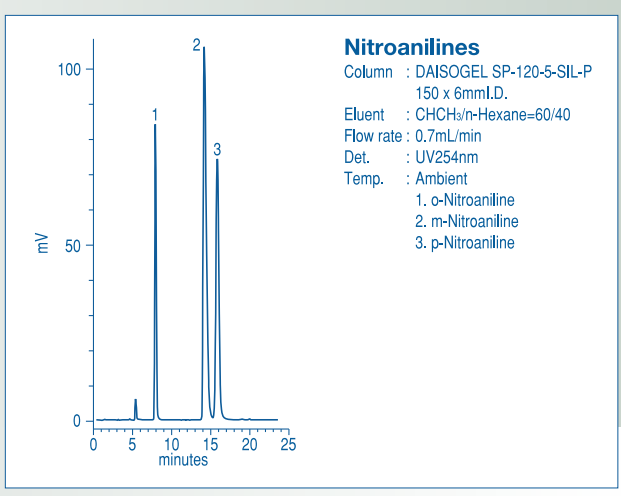
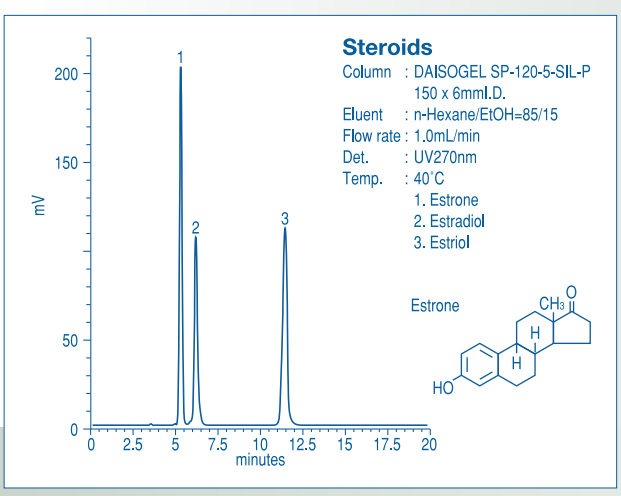
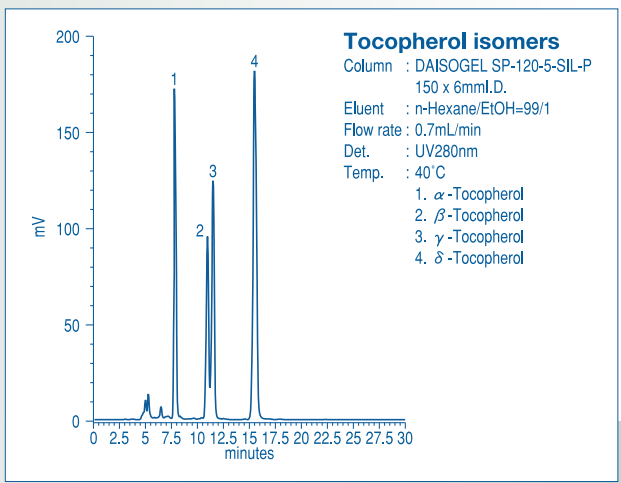
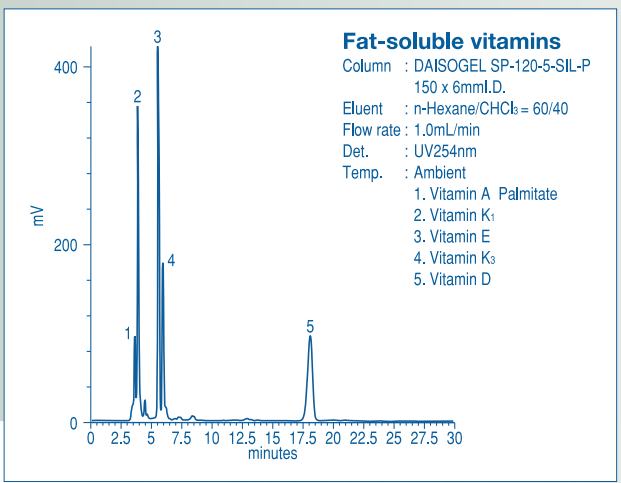
DAISOGEL SP-P packing's narrow particle size distribution provides better flow characteristics, improved column efficiency and longer column life.

SP-P Series

DAISOGEL SP-P Series

DAISOGE C1-P Series
 DAISOGE APS-P-P Series
 DAISOGE SP-P Series
 DAISOGE SWP Series
 DP GUARD FILTER

Applications



SP-P Series



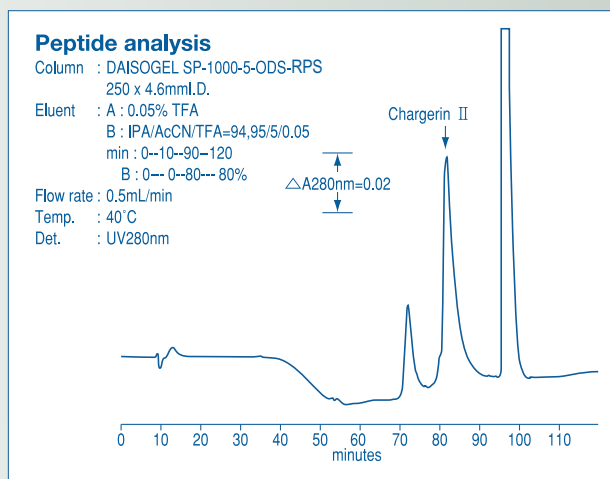
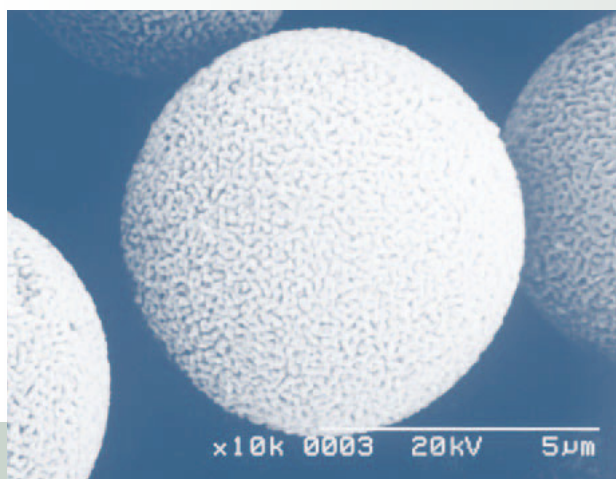
DAISOGEL SWP Series



DAISOGEL SWP (super wide pore) series are packing materials that feature consistent pore and particle size distribution, low metal contamination and enhanced mechanical stability, and are perfectly suited for the separation of very large molecules due to their wide-pore structure.

We offer DAISOGEL SWP packings with pore diameters of 100 nm and 200 nm for separating many interesting large molecules such as proteins, oligo nucleic acid and other biomolecules that could not be separated using conventional narrow pore silicas which are currently on the market.

DAISOGEL SWP series packings are available as unmodified silica as well as with numerous chemically bonded phases.



SWP Series

Product names and properties / analytical grades

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	Minimum Lot (g)
SP-1000-3	100	3	0.85	25	50
SP-1000-5	100	5	0.9	25	50
SP-1000-7	100	7	0.9	25	50
SP-2000-3	200	3	0.8	15	50
SP-2000-5	200	5	0.8	15	50
SP-2000-7	200	7	0.8	15	50

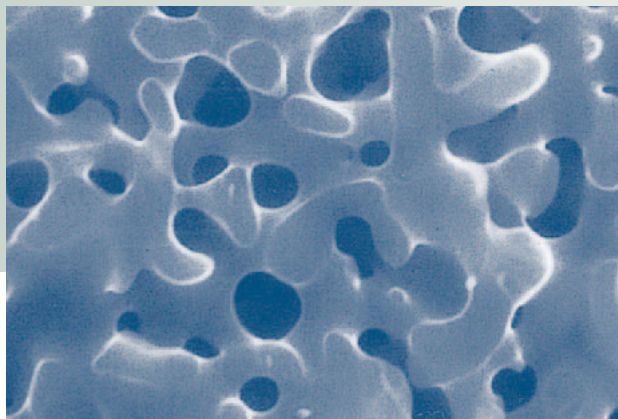
Product names and properties / preparative grades

	Pore Size (nm)	Particle Size (µm)	Pore Volume (ml/g)	Surface Area (m ² /g)	Minimum Lot (g)
SP-1000-10	100	10	0.9	25	500
SP-1000-15	100	15	0.9	25	500
SP-1000-20	100	20	0.9	25	500
SP-1000-40/60	100	50	0.95	25	500
SP-2000-10	200	10	0.8	15	500
SP-2000-15	200	15	0.8	15	500
SP-2000-20	200	20	0.8	15	500
SP-2000-40/60	200	50	0.8	15	500

DAISO GEL DP GUARD FILTER

DAISO GEL SP-P Series
 DAISO GEL SWP Series
 DP GUARD FILTER
 DAISO GEL Properties
 Directories of DAISO CO., LTD.

DP GUARD FILTER has two functions



Electron microscope photograph of the DP GUARD FILTER

--- guard column / --- line filter



Size of the DP GUARD FILTER
 2mmø x 2mmL, 4mmø x 2 & 4mmL
 Flow speed limits:
 from 0.05ml/min. to 20ml/min.

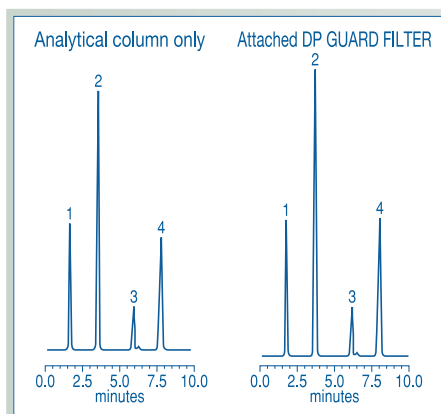
DP GUARD FILTER

Advantage of the DP GUARD FILTER

DP GUARD FILTER	○ (Good)	○ (Good)	○ (Good)	○ (Good)	○ (Good)
Silica gel packed guard column	× (Poor)	× (Poor)	× (Poor)	○ (Good)	○ (Good)
Sintering metal filter	○ (Good)	○ (Good)	○ (Good)	○ (Good)	× (Poor)

Specialties of the DP GUARD FILTER

- No increase of pressure drop**
 The pore's shape is like a penetrated cylinder. The pressure drop is about 1kgf/cm² for flow rate 1ml/min.(4mmø x 4mmL)
- Retention time / theoretical plate high**
 Very small surface area of porous glass and little diffusion in guard column.
 Very little decrease of theoretical plate and very little change of retention time.
- Effect of filtration**
 Pore size is 2µm. Filtrate impurities and no contamination on column.
 Opening rate of pore is much higher than sintered metal filter and very little choke happens.
- Effect of guard filter**
 The material is endcapped ODS modified porous glass and hydrophobic impurity is absorbed in the filter.



	N ₄	k ₄	As ₄ (10%)	RT ₄ min.	α		Press. kgf/cm ²
					3/2	4/3	
Analytical column only	12,200	3.85	1.03	7.883	2.327	1.427	64
Attached DP GUARD FILTER	11,700	3.77	1.04	7.893	2.324	1.425	65

Measuring condition

Packing	: DAISO GEL SP-120-5-ODS-RPS	Sample
Column	: 150 x 4.6mmI.D.	1 : Uracil
Eluent	: MeOH/H ₂ O=70/30	2 : Methyl Benzoate
Flow rate	: 1.0ml/min	3 : Toluene
Detect	: UV254nm 0.64AUFS	4 : Naphthalene
Temp.	: 40°C	

Why do we recommend DAISOGEL?

Because we truly believe in its superiority.

DAISOGEL is designed to make your scale up work easy. DAISOGEL is created in vast batches through a carefully monitored and tightly controlled process. Our proprietary fractionation method ensures very narrow particle size distribution ranges. Identical treatment, bonding and end capping of the different particle size fractions provides the same selectivity, retention characteristic and efficiency from analytical bench work up to the production level.

DAISOGEL is totally spherical, totally porous silica with smooth surface. The pores are evenly distributed and their shape is controlled. The mechanical stability of DAISOGEL is outstanding, tested to withstand repeated packing and re-packing.

DAISO is the manufacturer of even the raw material of our silica gel, enabling perfect control of impurities. The very low metal impurity level, the reduced number of electron donating surface silanols topped with monofunctional silanization of the ODS and some other types are the key for the high ligand density and over all chemical stability.

High loadability is the result of the optimized particle surface area, pore size, pore volume and pore size distribution.

DAISOGEL proudly shows the combination of high ligand density, high loadability and extreme mechanical strength.

Carbon content of DAISOGEL

Chose the most suitable modified phase for your application according to the carbon load!

The table below shows the carbon content (C %) of our regular products.

Carbon content of the DAISOGEL bonded phases in %				
Bonded phase	Pore size in nanometer			
	6 nm	12 nm	20 nm	30 nm
ODS-BIO-series	–	20	15	8
ODS-BP-series	–	15	10	–
ODS-RPS-series	19	17	12	9
C8-BIO-series	–	12	8	6
C8-P-series	14	10	7	4
C4-BIO-series	–	9	6	3
C4-P-series	10	7	5	3
C1-P-series	6	5	3	2
APS-P-series	5	4	3	2

If you could not find the perfect one for your application, please contact us! We may already have the phase or may manufacture for you in case of demand in sufficient amount.

Directories of DAISO CO., LTD.

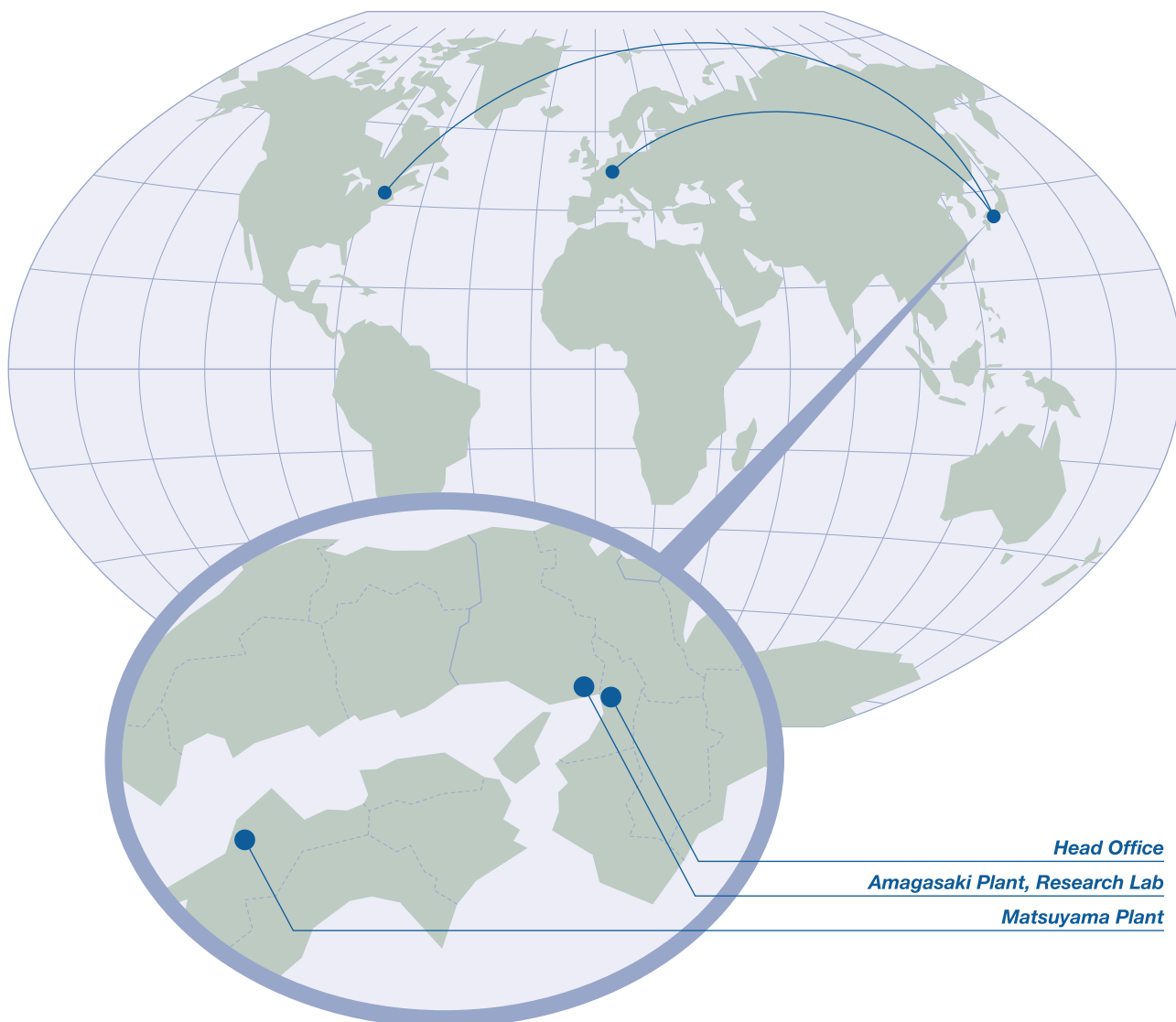
DAISO GEL SWP Series

DP GUARD FILTER

DAISO GEL Properties

Directories of DAISO CO., LTD.

Ordering Information



Head Office

1-10-8 Edobori, Nishi-ku, Osaka, 550-0002 Japan
Tel. +81-(0)6-6443-5996
Fax. +81-(0)6-6445-5787
E-mail : silica@daiso.co.jp

Düsseldorf Office / Germany

Immermannstrasse 56, 40210, Düsseldorf, Germany
Tel. +49-(0)211-353146
Fax. +49-(0)211-362286
E-mail : DaisoDuesseldorf@t-online.de

URL <http://www.daiso.co.jp>

Corporate Profile

Company Name : DAISO CO., LTD.
Establishment : November 9, 1915
(as OSAKA SODA CO., LTD.)
Changed the name in 1988
Capital : ¥10,029 million

Business Fields

Production, processing and sales of
pharmaceutical bulk, chiral compounds, silica gels,
and other fine chemicals
synthetic resins and rubbers
chlor-alkali products
inorganic/organic chemicals
housing materials
Plant engineering, construction and maintenance

Ordering Information



HOW TO INQUIRE

Please contact ;

DAISO CO., LTD. Fine Chemicals Division
1-10-8 Edobori, Nishi-ku, Osaka, 550-0002 Japan
Tel. +81-(0)6-6443-5996 Fax. +81-(0)6-6445-5787
e-mail silica@daiso.co.jp

Düsseldorf Representative Office
Immermannstrasse 56, 40210, Düsseldorf, Germany
Tel. +49-(0)211-353146 Fax. +49-(0)211-362286
e-mail DaisoDuesseldorf@t-online.de

When you inquire please provide ;

- * Product name
- * Quantity
- * Your name and address
- * Your fax, telephone number and e-mail address

After receiving your inquiry, we will send a quotation by fax or e-mail, which mentions price, availability, terms and conditions.

HOW TO ORDER

Please send request for Quotation and following Purchase Order to DAISO CO., LTD. Fine Chemicals Division (see above). Purchase Order shall include the following information:

- * Product name
- * Quantity
- * Purchase order number
- * Invoice and delivery address
- * Contact person, fax, telephone number and e-mail address

RETURNS

Returns are accepted only with prior authorisation. Please contact DAISO directly to obtain return information before shipment of goods to be returned.

All claims must be made within 10 business days after receipt of product.

All claims for damaged goods should be filed directly with the freight carrier. Save all packing materials until inspection has been made.

A 20% restocking charge will be made on cancelled orders or customer order error.

WARRANTY

DAISO CO., LTD. ("DAISO") products are manufactured and quality controlled to the highest standards and are warranted to be free of manufacturing defects. DAISO will accept for return or replacement on any silica packing which fails to meet the specifications for the silica packing.

DAISO products are not warranted against misuse, abuse or neglect. No other warranties or representations is implied or expressed by DAISO CO., LTD. for its products with respect to merchantability, fitness for a particular purpose or any other matter.

DAISO products are intended for laboratory or manufacturing use only, and not intended for clinical, diagnostic, food or home purpose. DAISO shall not under any circumstances be liable for any incidental, consequential, or compensatory damage arising from the use of, or in conjunction with, its products. The maximum liability which can be assumed by DAISO shall be limited to the invoice price of the product.

CHANGES

DAISO reserves the right to change prices, specifications, designs, etc, without notice and without liability for such changes.

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