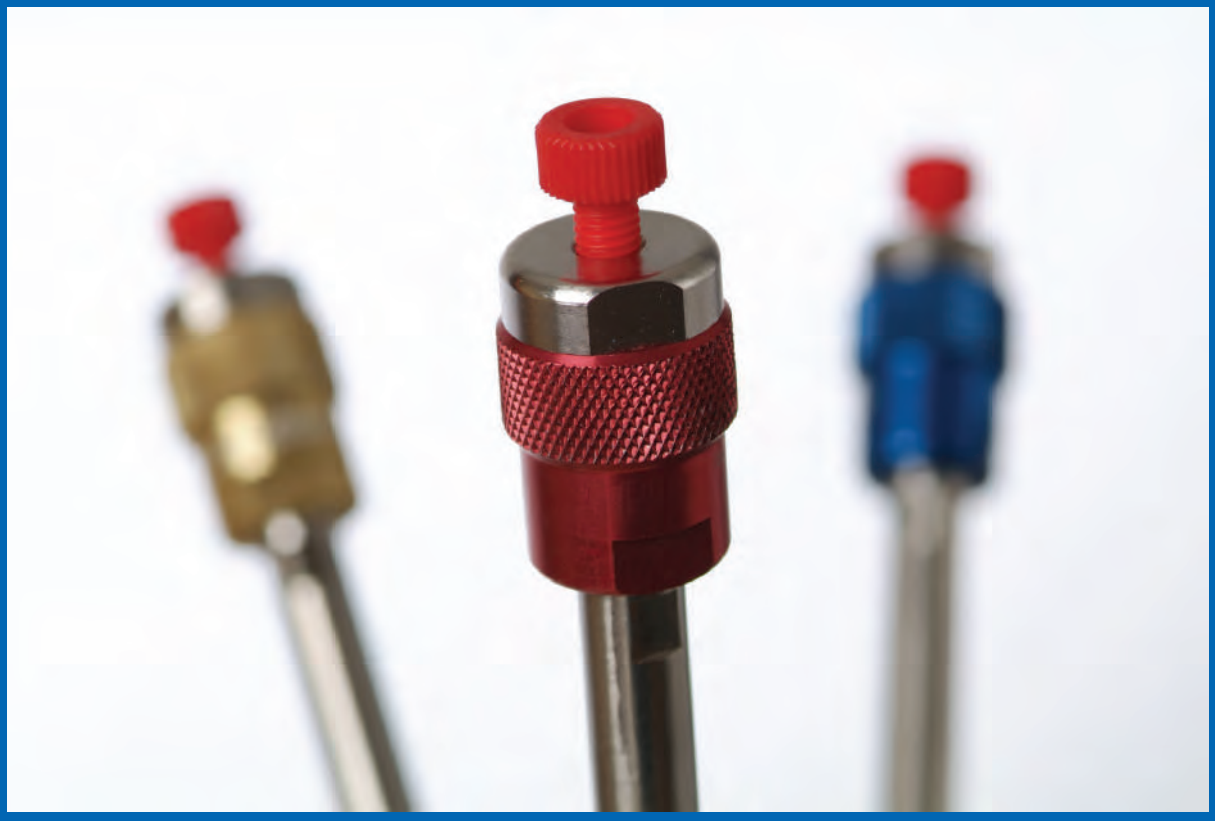



HAMILTON
HAMILTON

HPLC Chromatography

USP Column Listing

L1	Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 3 to 10 µm in diameter.	MEDITERRANEA SEA18 TRACER EXCEL 120 ODS A TRACER EXCEL 120 ODS B Brisa LC² C18 TRACER EXTRASIL ODS2 TRACER EXTRASIL ODS1 Advantix ODS Hyperpack ODS Hyperpack BASIC TSKgel ODS YMC PRO C18 HYPERSIL HyPURITY C18 LICHROSORB RP18 LICHROSPHER RP18 NUCLEOSIL 100 C18 NUCLEOSIL 120 C18 PARTISIL ODS3
L3	Porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 Si TRACER EXTRASIL Si PINNACLE Si HYPERSIL Si ULTRA Si PINNACLE Si LICHROSORB Si LICHROSPHER Si NUCLEOSIL 100 Si NUCLEOSIL 120 Si PARTISIL Si
L7	Octyl silane chemically bonded to totally porous microsilica particles, 5 to 10 µm in diamerer.	TRACER EXCEL 120 C8 TRACER EXTRASIL C8 Advantix C8 ULTRA C8 PINNACLE C8 TSKgel oCTYL HYPERSIL C8 LICHROSORB RP8 LICHROSPHER RP8 NUCLEOSIL 100 C8 NUCLEOSIL 120 C8
L8	An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 10 µm in diameter.	TRACER EXCEL 120 APS TRACER EXTRASIL NH2 TRACER EXCEL 120 C8 HYPERSIL NH2 LICHROSORB NH2 LICHROSPHER NH2 NUCLEOSIL 100 NH2 NUCLEOSIL 120 NH2
L9		TRACER EXTRASIL SCX PARTISIL SCX
L10	Nitrile groups chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 CN TRACER EXTRASIL CN HYPERSIL CPS HYPERSIL BDS CPS LICHROSORB CN LICHROSPHER CN NUCLEOSIL 100 CN NUCLEOSIL 120 CN
L11	Phenyl groups chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 PHENYL TRACER EXTRASIL PHENYL NUCLEOSIL 100 P
L13	Trimethylsilane chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 C1 TRACER EXTRASIL C1

L14	Silica gel, 10 µm in diameter, having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating.	TRACER EXTRASIL SAX
L15	Hexyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.	TRACER EXTRASIL C6
L16	Dimethyl silane chemically bonded to totally porous silica particles, 5 to 10 µm in diameter.	NUCLEOSIL 100 C2
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter.	HAMILTON HC-75 HYDROGEN FORM COREGEL 87H ORH-801 ION-300
L18	Amino and cyano groups chemically bonded to porous silica particles, 5 to 10 µm in diameter.	PARTISIL PAC
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 9 µm in diameter.	CARBOSEP CHO-820 CARBOSEP CHO-620 COREGEL 87-C CARBOSEP USP L19 CA HAMILTON HC-75 CALCIUM
L20	Dihydroxypropane groups chemically bonded to porous silica particles, 5 to 10 µm in diameter.	LICHROSORB DIOL LICHROSPHER DIOL
L21	A rigid, spherical styrene-divinylbenzene copolymer, 5 to 10 µm in diameter.	HAMILTON PRP-1
L22	A cation exchange resin made of porous polystyrene gel wifh sulfonic acid groups, about 10 µm in diameter.	HAMILTON PRP-X200
L23	An ion exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 10 µm in size.	HAMILTON PRP-X500
L24	A semi-rigid hydrophilic gel consisting of vinyl polymers with numerous hydroxyl groups on the matrix surface, 32 to 63µm in diameter.	TOYOPEARL HW, F Grade
L25	Packing having the capacity to separate compounds with a MW range from 100 to 5000 daltons (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base, crosslinked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable.	TSK-GEL G2500PW TSK-GEL G2500PWXL TSK-GEL G-Oligo PW
L26	Butyl silane chemically bonded to totally porous silica particles, 5 to 10 µm in diameter.	TRACER EXCEL 120 C4
L27	Porous silica particles, 30 to 50 µm in diameter.	Ymc-PACK SILICA 30/60
L30	Ethyl silane chemically bonded to a totally porous silica particle, 3 to 10 µm in diameter.	LICHROSORB RP-2
L33	Packing having the capacity to separate proteins of 4000 to 400000 daltons. It is spherical, silica-based and processed to provide pH stability.	TSK GEL SW AND SWXL SERIES
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, about 9 µm in diameter.	CARBOSEP CHO-682 HAMILTON HC-75 Pb
L37	Polymethacrylate gel packing having the capacity to separate proteins by molecular size over a range of 2,000–40,000Da MW	TSK-Gel G 3000 PWXL
L38	Methacrylate-based size exclusion packing for water-solubles	TSK-GEL PW/PWXL
L40	Cellulose tris-3,5-dimethylphenylcarb-amate coated porous silica particles, 5 to 20 µm in diameter	CHIRALCEL AD
L41	Immobilized alpha-acid glyco-protein on spherical silica particles, 5 µm in diameter	CHIRAL-AGP
L43	Pentafluoropehnyl groups chemically bonded to silica particles 5 to 10 µm in diameter	Hypersil GOLD PFP

TK New Hardware Design Column: Ultrafit™ System

New Hardware Design Column: Ultrafit™ System

The new Ultrafit™ design will make your work in the laboratory more comfortable and efficient. The Ultrafit™ system, as well as helping in the replacement of the frit at the column entrance, enables you to easily include either additional frits or a pre-column, always with the utmost simplicity and economy and in no way whatsoever is the quality of the separation affected.

In designing the Ultrafit™ column, the greatest care has been taken to cover all the aspects that may occur in the loss of efficiency of the column. As a result of all this, dead volumes have been reduced to a minimum, entered by the system by means of a high precision mechanism, with inlet and outlet holes of 0.2 mm and first-class tapers for the perfect distribution of the inlet and outlet flows, as seen in the three depicted Ultrafit™ options. The Ultrafit™ system enables a pre-column to be included without loss of efficiency, to columns as small as 30 x 4 mm packed with particles of 3 mm.

Moreover, the very best material has been selected for the construction of the column, with an ultra-shiny interior finish, of extremely low RMS, ensuring that no tube imperfection in the column will affect the quality of the separation.

Ultrafit™ System Efficiency

Column	Efficiency (N/m)	AS (10%)
mediterranea sea18 Column 3 µm 5 x 0,46 cm Ultrafit™ System	134904	1,11
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Prefilter Ultrafilter™	135042	1,05
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Precolumn Ultraguard™	137819	1,07

Chromatographic Conditions:
Column: mediterranea sea18 3 mm 5 x 0,46 cm
Eluant: Acetonitryle/Water 65:35
Flow: 0,9 ml/min
Det. UV 254 nm
Temp. Room
Sample: Acenaphthene 0,2 mg/ml

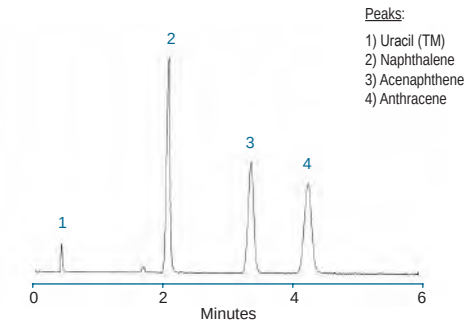
Ultrafit™ System Configuration

Ultrafit™

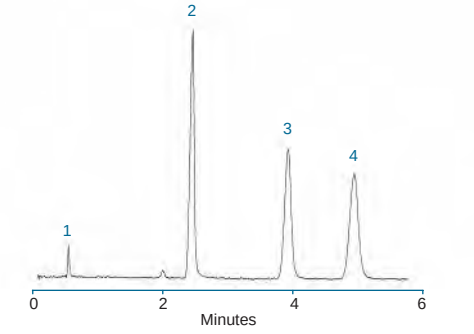
Ultrafit™ + Ultrafiter™

UltrafitT™ + Ultraguard™

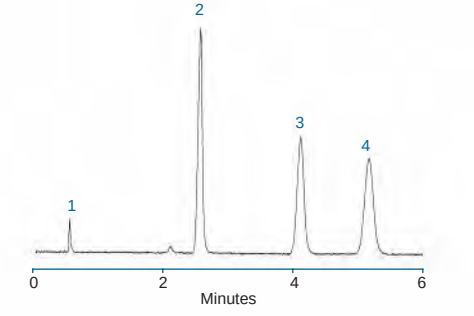
Our Columns Mediterranea™, Europa Peptides, Europa Proteins & Tracer Excel are built with the new Ultrafit ™ System



Column with Ultrafit™ System



Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Novacol™ Columns

To get HPLC columns with maximum efficiency and peak symmetry, Teknokroma uses tubing and connections designed and fully optimized to provide you superior performance than achievable with columns from the major manufacturers.

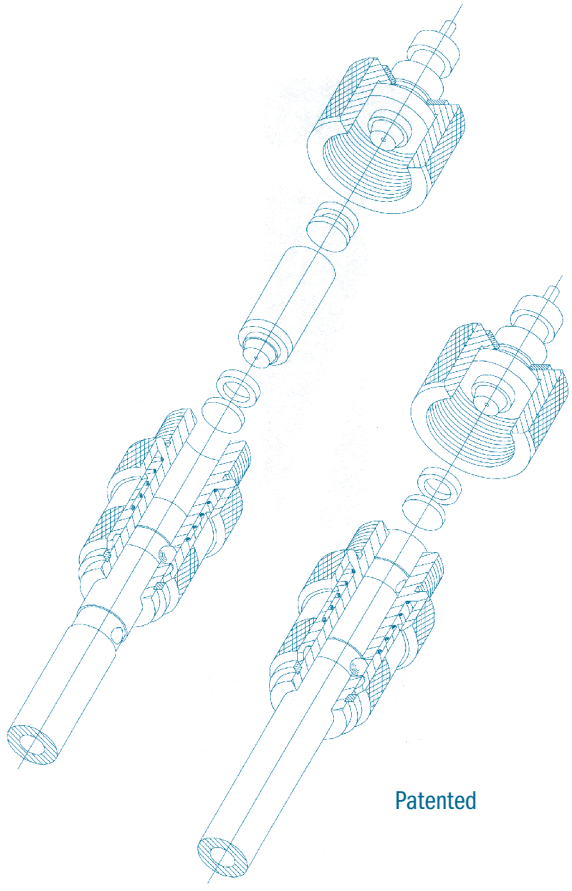
The Novacol™ columns, designed and manufactured by Teknokroma, use the best bonding reagents, packing support materials and proprietary Novabond™ procedures. Novacol™ tubing uniformity and polished interior finish generates higher efficiencies than columns from the major manufacturers.
The latest in current research trends in HPLC are included in Novacol™ columns; including smaller particle size, greater particle uniformity, reduced tubing internal diameters and shorter columns for LC-MS applications. Novacol™ columns are designed with a new generation of tubing interior surfaces, connections, end-fittings and packing procedures. Our Novabond™ proprietary procedures allows us to manufacture columns as small as 2mm ID with 3 µm particles and columns as short as 5cm long with 2mm ID with no loss in theoretical efficiency.

Our Novacol™ columns have added another new feature - the incorporation of Microtaper™ in the design and manufacture of our Novacol frits to optimize the correct sample filtering distribution at the entry and exit of the column.

Lastly, we designed Novacol™ columns to allow you to easily change frits without running the risk of affecting the column packing during the exchange. Novacol™ columns are compatible with all 10/32 Valco-type connections.

Novacol™ columns are available in a wide range of standard internal diameters (4.6, 4.0, 3.0, and 2.1mm ID) and various standard lengths (3, 5, 10, 12.5, 15, 20, 25, and 30cm), which allows you to adapt to all chromatographic modes: microbore, ultrafast and analytical.

Novafix™ HPLC Cartridge System



Teknokroma has designed and developed the original, patented Novafix™ Cartridge System for HPLC, which is the result of more than 14 years of experience researching and manufacturing Teknokroma HPLC columns.

Novafix™ Quality

Teknokroma has always achieved its best in offering top-quality products and services. This quality-excellence philosophy has helped Teknokroma achieve HPLC market leadership wherever its products are marketed. Our research scientists have utilized the same quality-excellence philosophy to meticulously design the new Novafix™ HPLC Cartridge System. Novafix™ Cartridges are made from chosen materials and select bonded packings that guarantee the greatest column efficiency, peak symmetry and reproducibility.

In addition, Teknokroma's proprietary Novabond™ packing procedures are the result of years of exhaustive research and detailed manufacturing of HPLC columns. Novabond packing procedures provide you with the best column efficiency, peak symmetry and column lifetime available on the market.

Novafix™ Easy Handling

The mechanism for rapid connection designed in the Novafix™ Cartridge System does not require you to use any tools for its assembly or dismantling. This design feature makes Novafix™ columns simple and easy to handle.

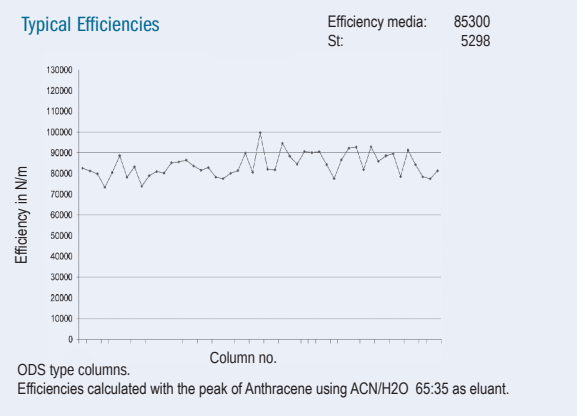
Novafix™ Functional Design

Without requiring any additional accessories, the Novafix Cartridge System permits the insertion a 1cm-long precolumn at the head of the analytical cartridge. This is achieved without introducing any dead volume, thereby maximizing column efficiency and peak symmetry.

Novafix™ Efficiency

The Novafix™ HPLC Cartridge supplies the highest theoretical efficiency. These typically high efficiencies are achieved due to the zero dead-volume connections and proprietary Novabond™ packing procedures.

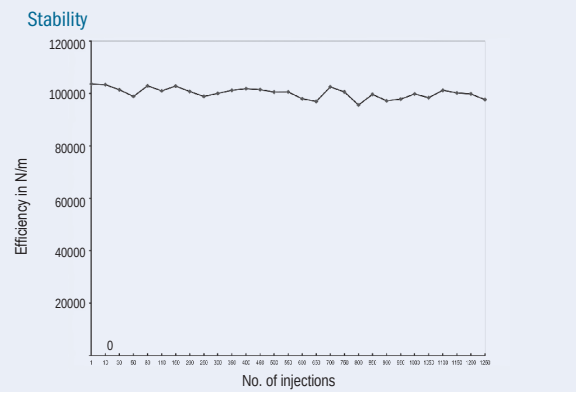
Particle size µm	Typical Efficiencies N/m
3	120-150.000
5	80-110.000
10	35-65.000



ODS type columns.
Efficiencies calculated with the peak of Anthracene using ACN/H2O 65:35 as eluant.

Novafix™ Stability

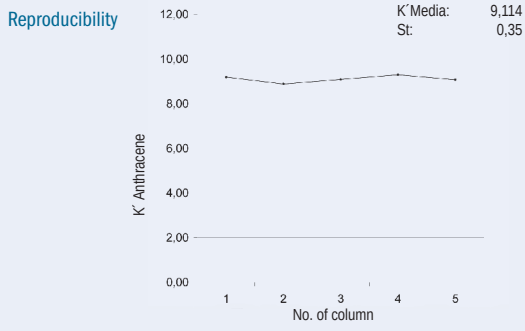
The design of the Novafix™ HPLC Cartridge System ensures not only maximum efficiencies, but also long useful lifetimes. Novafix™ Cartridges provide maximum stability for packing materials in the precolumn and analytical column cartridges, no matter how frequently the precolumn is exchanged.



Novafix™ HPLC Cartridge System

Novafix™ Reproducibility

In the Novafix™ cartridges manufacture, we only use the top valued packings of the market for guaranteeing the maximum reproducibility. That way the values of resolution, selectivity, efficacy and stability will repeat column by column and year by year, without requiring special modifications in the chromatographic method.



Values of K^1 for Anthracene obtained with different ODS type columns selected at random during the last two years.

Guard Cartridge

Function	Pkg	Cat.Nbr.
Silica	5 units	TR-015325
ODS	5 units	TR-015326
CN	5 units	TR-015327
NH_2	5 units	TR-015328
SAX	5 units	TR-015329
SCX	5 units	TR-015330
C8	5 units	TR-015510
Diol	5 units	TR-015511
C_6H_5	5 units	TR-015512
C1	5 units	TR-015513
Carbohid.	5 units	TR-015331
Anions	5 units	TR-015335

Kits and Accesories

Description	Cat.Nbr.
Holder: Connecting accessories : 2 units	TR-015323
Teflon seals: 10 units	TR-015324

Novafix™ Versatility

Teknokroma provides a wide range of bonded packing and configurations in the Novafix™ HPLC Cartridge System. This includes the most popular bonded packings on the market as well as packings for special applications. The Novafix Cartridge versatility of packings represents a great advantage over other cartridge systems that normally limit the range of packings to one or a few select packings.

- Packings of 3, 5 and 10 µm
- Lengths of 7.5, 15 and 25cm
- Different Internal diameters
- Packings of Tracer Excel, Tracer Extrasil, Lichrosorb, Lichrospher, Superspher.

Guarantee

At Teknokroma, we guarantee the maximum quality of our products. This starts with quality in the mechanical components and finishes with final computerized quality control tests on each Novafix HPLC cartridge. Our quality controls ensure that you will receive only those cartridges which conform to the high quality demanded in our Novafix Cartridge specifications.

Economy

To the criteria of maximum functionality and quality, we have also integrated the criterion of economy in the Novafix™ Cartridge System. The Novabond™ bonding and packing processes are rigidly controlled to produce superior yields of high-quality products. The Novabond™ processing makes NovafixNovafix™ Cartridges the most economical choice in the global HPLC market. This enables us to reduce the price even further with our “economy sets” of three NovafixNovafix™ Cartridges.

Microbore Columns

Low Dispersion Chromatography

Our experience in the manufacture of HPLC columns allow us to offer the possibility to work with this interesting chromatographic concept. These columns of 2 and 3mm of internal diameter, packed with the same packings than 3 and 5 µm analytical columns, contribute to an important solvents saving and at the time a detectability considerable increase.

Sensibility of Detection

Since the detectability depends on the grade of dilution of the sample while it passes through the column, a reduction of the internal diameter of the column redounds directly in a minor dilution and therefore in an increment of the detection sensibility.

Solvents Saving

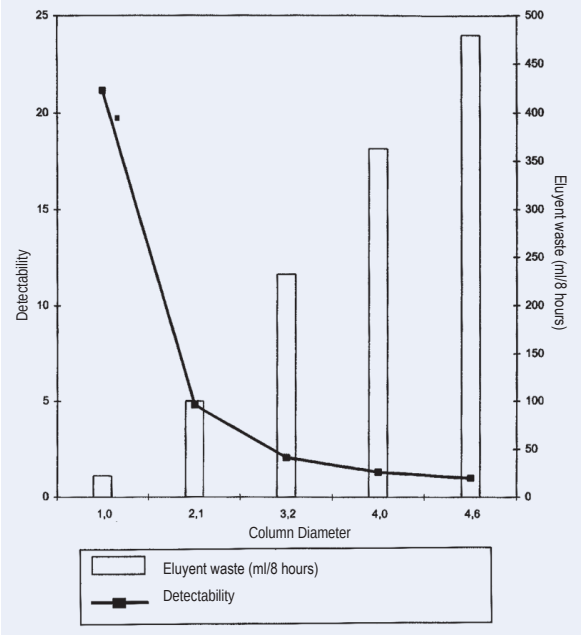
The same chromatogram obtained with a conventional 4,6 mm ID column working at 2 ml/min can be obtained with a flow of 0,4 ml/min when it is worked with a 2,1 mm ID microbore column. This represents a 80 % saving of the eluyent wasted in HPLC, which means that for a standard job in a chromatograph will represent a saving of 15 liters of solvent.

Instrumentation

The level of development achieved by the instrumentation of HPLC allows that these kind of columns can be used by most of the commercialized chromatographs.
In many cases, the 90 % of efficiency loss owed to the chromatograph system, can be eliminated simply with the optimization of connections and the capilar tubes that connect the injector to column and column to detector.

Column (mm)	Eluyent Waste	Detectability
4.6	480	1
4.0	363	1.322
3.2	232	2.066
2.1	100	4.798
1	22.68	21.16

Available also 1 mm internal diameter columns.
Please contact with your representative.



High-speed chromatography

The use of ultrarapid columns is ideal when short times of analyses are needed (0.5-3.0 min) and high efficiencies of separation. These columns 3-10 cm of length, are packed with spherical packs of 3 µm, and offer efficiencies of 5-15000 N column (equivalents to 120-150000 N/m), more than enough for the majority of separations.

Sensibility of detection

Reducing the size of particle the dispersion of the sample in the inside of the column decreases also.
In this way, the use of ultrarapid columns give a significant improvement of the limit of detection when compared with the one obtained with analytical conventional columns.

High resolution

Columns of 15-25 cm length packaged with 3 µm packs achieve efficiencies of over 30000 N/column, which can be very useful when very complex samples require high reparation capabilities.

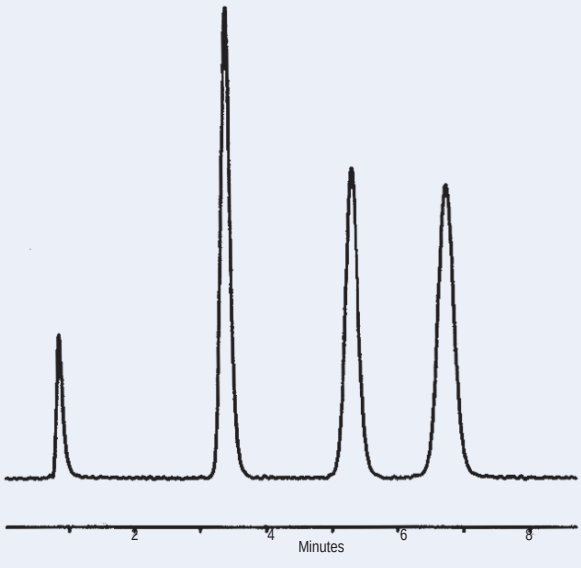
Economy

The reduced time of analysis that is achieved with these columns and therefore the elevated number of samples that can be processed per time unit, compared with conventional columns, allows optimizing to the full the performance of one chromatographic equipment. The extensive selection of available phases allows turning any chromatographic separation into ultrarapid, with all the advantages that this bears.

Instrumentation

The use of this kind of columns does not require any especial chromatographic equipment.

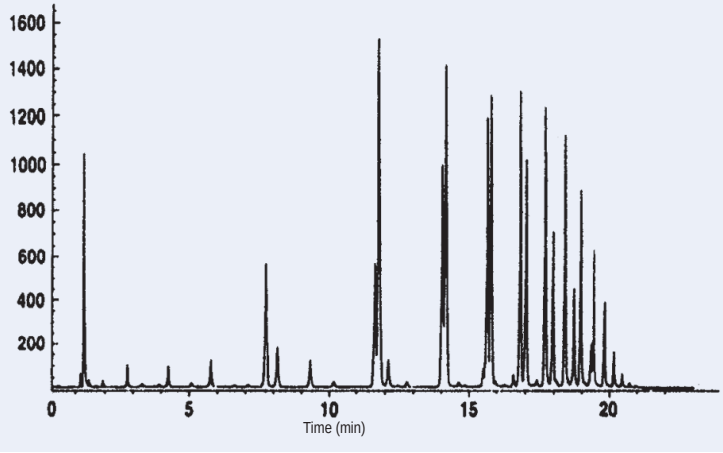
In some cases it may be necessary to optimize the system with the use of adequate conductions to minimize the efficiency losses due to extra-column dead volumes. Besides, thanks to the elevated number of plates (N/col) of these columns, it can be tolerated a certain loss of efficiency due to the system, without affecting greatly to the resolution.



Sample:
1. Uracil
2. Naphtalene
3. Acenaphthene
4. Anthracene

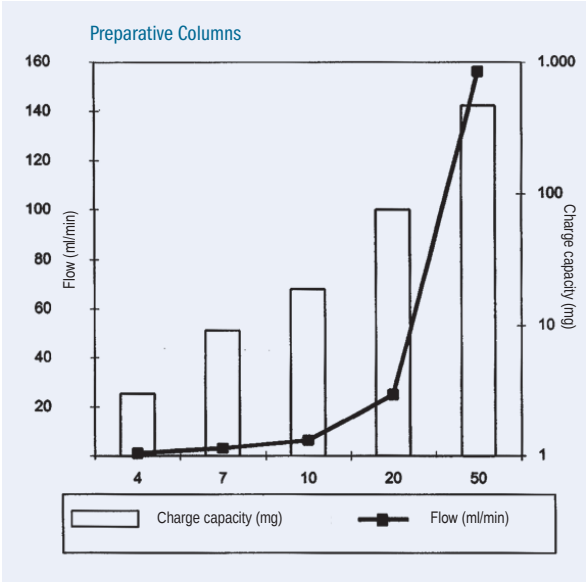
140,000 N m
4.900 N column
Time of analysis: 40 seg.

Column:	Tracer Extrasil ODS2 3µ 3,5 x 0,46 cm
Eluyent:	Acetonitrile/H20 65:35
Flow:	4.0 ml/min
Pressure:	110 bar
Sample volume:	10 µl
Temperature:	Amb.
Detection:	UV 254 nm



Sample :	Oligomeres of Polycarbonate
Column:	Nucleosil 120 3µ C-18 25 x 0.4 cm
Eluyent:	A: l0mM phosphoric acid B: Acetonitrile
Gradient:	70-100% of B in 30 min
Flow:	3.0 ml/min
Temperature:	70 ºC; Detection: UV 200 nm

TK Preparative Columns



Preparative Chromatography

Teknokroma has developed the semi-preparative columns with the same criteria of quality and versatility that has taken us to lead the market of HPLC analytical columns.

Versatility

Teknokroma offers the highest range of phases of the market, covering practically all kind of functional groups. This simplifies enormously the transposition from the analytical scale to the preparative.

Besides, a complete range of dimensions of column, from 7.8 mm to 21 mm of diameter, with lengths up to 25 cm and with a high selection of particle sizes, makes it easy the definition of the ideal configuration of column in relation to his volume capacity and the kind of chromatographic equipment available in the laboratory.

Quality

Teknokroma has selected only those materials that offer the maximum efficiency and reproducibility.
Each column is individually tested to guarantee that will fulfil the high standards of quality demanded, controlling the parameters of efficiency, peak symmetry and selectivity.

Analytical Quality Packing

The preparative columns packaged with 5 and 10 um analytical packing offer exactly the same benefit levels than the correspondent analytical columns.

Its high pressure packing ensures a high stability and consequently a long life use of the column.

Preparative quality packings

The packing of preparative quality are the recommended for 20 mm ID or upper columns. These packings are manufactured under the same quality standards, with the difference that they present a particle size normally bigger and a size dispersion not as adjusted as the analytical packings.

The result is an inferior cost of the column and, therefore, in many cases an optimized cost for preparative separations.
Higher diameters of column available.

All kind of preparative packings and process packings.
Consult our technical department.

(1 x 0,32cm)

Reference	Description
TR-C-160	Holder
TR-C-160K1	Holder + 2 cartridges ODS
TR-C-160K2	Holder + 2 cartridges Si
TR-C-160K3	Holder + 2 cartridges C8
TR-C-160K4	Holder + 2 cartridges NH2
TR-C-160K5	Holder + 2 cartridges SAX
TR-C-160K6	Holder + 2 cartridges CN
TR-C-160K7	Holder + 2 cartridges PAH
TR-C-160K8	Holder + 2 cartridges C6H5
TR-C-160K9	Holder + 2 cartridges CARBOHYDRATES
TR-C-160K10	Holder + 2 cartridges ANION
TR-C-160K11	Holder + 2 cartridges SCX
TR-C-160K12	Holder + 2 cartridges C2
TR-C-160K13	Holder + 2 cartridges 300 C4
TR-C-160K14	Holder + 2 cartridges 300 C8
TR-C-160K15	Holder + 2 cartridges DIOL
TR-C-160K16	Holder + 2 cartridges 300 C18
TR-C-160K17	Holder + 2 cartridges C4
TR-C-160K18	Holder + 2 cartridges PRP-1
TR-C-160K19	Holder + 2 cartridges PEPTIDE C18
TR-C-160K20	Holder + 2 cartridges C1
TR-C-160K21	Holder + 2 cartridges C6
TR-C-160-1	ODS Cartridges (5 units)
TR-C-160-2	Si Cartridges (5 units)
TR-C-160-3	C8 Cartridges (5 units)
TR-C-160-4	NH2 Cartridges (5 units)
TR-C-160-5	SAX Cartridges (5 units)
TR-C-160-6	CN Cartridges (5 units)
TR-C-160-7	PAH Cartridges (5 units)
TR-C-160-8	C6H5 Cartridges (5 units)
TR-C-160-9	CARBOHYDRATES Cartridges (5 units)
TR-C-160-10	ANION Cartridges (5 units)
TR-C-160-11	SCX Cartridges (5 units)
TR-C-160-12	C2 Cartridges (5 units)
TR-C-160-13	300C4 Cartridges (5 units)
TR-C-160-14	300C8 Cartridges (5 units)
TR-C-160-15	DIOL Cartridges (5 units)
TR-C-160-16	300C18 Cartridges (5 units)
TR-C-160-17	C4 Cartridges (5 units)
TR-C-160-18	PRP-1 Cartridges (5 units)
TR-C-160-19	PEPTIDE C18 Cartridges (5 units)
TR-C-160-20	C1 Cartridges (5 units)
TR-C-160-21	C6 Cartridges (5 units)

Guard Columns for HPLC Columns

- Interposed between the injector and the column these precolumns lengthen the life of the column and improve the reproducibility of their results.
- Packed with the most modern HPLC packings and Novabond™ proprietary packing procedures.
- Economic and easily replaced.
- For general use in any HPLC system.
- Packed at high pressure for maximum stability and duration.
- Their use does not imply any loss of efficiency, even with packings of 3 µm or with microbore columns of 2mm ID

BIOCOMPATIBLE Precolumns

- 100% biocompatible.
- Economical cartridge system with titanium frits.

Constructed in PEEK® and packed with de-activated silica: the steel holder also ensures a total biocompatibility by having every µm in contact with the mobile phase made of PEEK®.

Guard Column Cartridges, Biocompatible

2.0mm ID X 1 cm, 10 µm		
UP-C-280	Reversed Phase C18	3-pk
UP-C-282	Reversed Phase C18	10-pk
UP-C-753	Absorption Si	3-pk
UP-C-754	Absorption Si	10-pk
UP-C-755	Amino Phase NH_2	3-pk
UP-C-756	Amino Phase NH_2	10-pk
UP-C-757	Cyano Phase CN	3-pk
UP-C-758	Cyano Phase CN	10-pk

Guard Column Cartridges, Biocompatible

4.3mm ID X 1 cm, 5 µm		
UP-C-750	Reversed Phase C18	3-pk
UP-C-752	Reversed Phase C18	10-pk
UP-C-759	Absorption Si	3-pk
UP-C-760	Absorption Si	10-pk
UP-C-761	Amino Phase NH_2	3-pk
UP-C-762	Amino Phase NH_2	10-pk
UP-C-763	Cyano Phase CN	3-pk
UP-C-764	Cyano Phase CN	10-pk

Guard Column Cartridge Holders, Biocompatible

UP-C-270	High Pressure, Stainless Steel, with (2) F-200 Fittings
UP-C-283	Low Pressure, Teflon, with (2) P-200/P-245 Fittings

Cartridge Guard Column Kits

UP-C-281	2.0mm ID C18 Cartridges (6-pk) with (1) C-270	Assembly
UP-C-751	4.3mm ID C18 Cartridges (6-pk) with (1) C-270	Assembly

TK Guard Columns for HPLC

Europa™ Guardcolumns

Product	Description	Cat.Nbr.
Ultrafilter™,Ultrafit prefilter adaptor	*(frit not included)* 	TR-010067
Frits of 0.5 µm pore (10 units)		TR-010069
Frits of 2.0 µm pore (10 units)		TR-010070

Ultraguard™, Ultrafit Guardcolumn adaptor *(guard column not included)*		TR-010068
Guard Column Peptide C18 10 x 3.2 mm (5 units)		TR-C-160-19
Guard Column Protein 300 C18 10 x 3.2 mm (5 units)		TR-C-160-16
Guard Column Protein 300 C8 10 x 3.2 mm (5 units)		TR-C-160-14
Guard Column Protein 300 C4 10 x 3.2 mm (5 units)		TR-C-160-13

Tracer Excel™ Guardcolumns

Product	Description	Cat.Nbr.
Ultrafilter™,Ultrafit prefilter adaptor	*(frit not included)* 	TR-010067
Frits of 0.5 µm pore (10 units)		TR-010069
Frits of 2.0 µm pore (10 units)		TR-010070

Ultraguard™, Ultrafit Guardcolumn adaptor *(guard column not included)*		TR-010068
Guard Column ODS 10 x 3.2 mm (5 units)		TR-C-160-1
Guard Column Si 10 x 3.2 mm (5 units)		TR-C-160-2
Guard Column C8 x 3.2 mm (5 units)		TR-C-160-3
Guard Column NH2 10 x 3.2 mm (5 units)		TR-C-160-4
Guard Column CN 10 x 3.2 mm (5 units)		TR-C-160-6
Guard Column Ph 10 x 3.2 mm (5 units)		TR-C-160-8
Guard Column C4 10 x 3.2 mm (5 units)		TR-C-160-17
Guard Column C1 10 x 3.2 mm (5 units)		TR-C-160-20

mediterranea™ sea$_{18}$ Guardcolumns

Product	Description	Cat.Nbr.
Ultrafilter™,Ultrafit prefilter adaptor	*(frit not included)* 	TR-010067
Frits of 0.5 µm pore (10 units)		TR-010069
Frits of 2.0 µm pore (10 units)		TR-010070

Ultraguard™, Ultrafit Guardcolumn adaptor *(guard column not included)*		TR-010068
Guard Column Sea18 10 x 3.2 mm (5 units)		TR-010071
Guard Column Sea8 10 x 3.2 mm (5 units)		TR-010073
Guard Column Sea4 10 x 3.2 mm (5 units)		TR-010074

COLUMN-GUARD COLUMN CONNECTOR

- Economical
- Minimum dead volume
- This column-Guard Column connector is the ideal solution for this type of connection, as its dead volume is practically negligible.

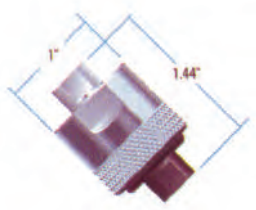
U-284 Union Column-Precolumn

Column-Guard Column connectors

Reference	Description
UP-U-284	Fingertight F-200 coupler, Delrin®, and .007˝ ID stainless steel tubing.
UP-U-287	Fingertight F-300 coupler, PEEK®, and .007˝ ID stainless steel tubing.

Semipreparative Guard Columns

- For semipreparative HPLC and SFC 1 cm I.D.



UP-C.1000. Holder for semipreparative cartridge

Reference	Description
UP-C-1000	Semi-Prep holder
TR-C-360K1	Semi-Prep cartridge ODS (2 units) + UP-C-1000 holder
TR-C-360K2	Semi-Prep cartridge Si (2 units) + UP-C-1000 holder
TR-C-360K3	Semi-Prep cartridge C8 (2 units) + UP-C-1000 holder
TR-C-360K4	Semi-Prep cartridge NH2 (2 units) + UP-C-1000 holder
TR-C-360K6	Semi-Prep cartridge CN (2 units) + UP-C-1000 holder
TR-C-360K13	Semi-Prep cartridge Protein C4 (2 units) + UP-C-1000 holder
TR-C-360K14	Semi-Prep cartridge Protein C8 (2 units) + UP-C-1000 holder
TR-C-360K16	Semi-Prep cartridge Protein C18 (2 units) + UP-C-1000 holder
TR-C-360K17	Semi-Prep cartridge Peptide C18 (2 units) + UP-C-1000 holder
TR-C-360K18	Semi-Prep cartridge Mediterranea Sea 18 (2 units) + UP-C-1000 holder
TR-C-360-1	Semi-Prep cartridge ODS (2 units)
TR-C-360-2	Semi-Prep cartridge Si (2 units)
TR-C-360-3	Semi-Prep cartridge C8 (2 units)
TR-C-360-4	Semi-Prep cartridge NH2 (2 units)
TR-C-360-6	Semi-Prep cartridge CN (2 units)
TR-C-360-13	Semi-Prep cartridge Protein C4 (2 units)
TR-C-360-14	Semi-Prep cartridge Protein C8 (2 units)
TR-C-360-16	Semi-Prep cartridge Protein C18 (2 units)
TR-C-360-17	Semi-Prep cartridge Peptide C18 (2 units)
TR-C-360-18	Semi-Prep cartridge Mediterranea Sea 18 (2 units)

Spares for Guard Column cartridges

Reference	Description
TR-C-1030	Stainless steel frit 2 µm
TR-C-1031	Titanium frit 2 µm

Preparative Guard Column

- Valuable prep column protection, 20-50mm ID
- Low Pressure Drop
- High performance sample distribution mechanism

Reference	Description
TR-C-260	Preparative Holder
TR-C-260K1	Prep cartridge ODS (2 units) + TR-C-260 Preparative Holder
TR-C-260K2	Prep cartridge Peptide C18 (2 units) + TR-C-260 Preparative Holder
TR-C-260K3	Prep cartridge C8 (2 units) + TR-C-260 Preparative Holder
TR-C-260K4	Prep cartridge NH2 (2 units) + TR-C-260 Preparative Holder
TR-C-260K6	Prep cartridge CN (2 units) + TR-C-260 Preparative Holder
TR-C-260K13	Prep cartridge Protein C4 (2 units) + TR-C-260 Preparative Holder
TR-C-260K14	Prep cartridge Protein C8 (2 units) + TR-C-260 Preparative Holder
TR-C-260K16	Prep cartridge Protein C18 (2 units) + TR-C-260 Preparative Holder
TR-C-260K17	Prep cartridge Si (2 units) + TR-C-260 Preparative Holder
TR-C-260K18	Prep cartridge Mediterranea Sea 18 (2 units) + TR-C-260 Preparative Holder
TR-C-260-1	Prep cartridge ODS (2 units)
TR-C-260-2	Prep cartridge Peptide C18 (2 units)
TR-C-260-3	Prep cartridge C8 (2 units)
TR-C-260-4	Prep cartridge NH2 (2 units)
TR-C-260-6	Prep cartridge CN (2 units)
TR-C-260-13	Prep cartridge Protein C4 (2 units)
TR-C-260-14	Prep cartridge Protein C8 (2 units)
TR-C-260-16	Prep cartridge Protein C18 (2 units)
TR-C-260-17	Prep cartridge Si (2 units)
TR-C-260-18	Prep cartridge Mediterranea Sea 18 (2 units)

Iso-Prep™ Filter for Preparative Columns

- Economical protection for preparative HPLC column and injector
- Precolumn/Inline filter functionality
- Stable to 8,000 psi
- Replaceable filters

Reference	Description
TR-C-260-F	In Line Filter
TR-C-260-FX	Replacement Filter (10 units)

mediterranea™ Sea_{18} New Generation HPLC Column

mediterranea sea 18
by Teknokroma

Introduction

The mediterranea™ sea18 column provides a performance level that, until now, has not been reached in efficiency, inertness, pH-robustness, reproducibility and reliability. mediterranea™ sea18 columns simplify and make your HPLC work more pleasant. You won't worry about the extreme basic or acidic natures of your samples with the mediterranea™ sea18 column.

The versatility of the mediterranea™ sea18 column will enable you to deal successfully with the immense variety of separations in the fields of pharmaceuticals, life sciences, environment, foods, etc.

Once every ten years, the world of chromatography experiences a revolutionary technology that surpasses all others and meets the expectations of chromatographic scientists.

Teknokroma has focused all its efforts and all its know-how, accumulated through more than 30 years of chromatographic research and development, in offering the global-best reverse phase HPLC packing mediterranea™ sea18.

While developing the mediterranea™ sea18 column we created two novel proprietary bonding & packing technologies. In order to demonstrate the global-best technology of mediterranea™ sea18, we compared chromatographic results from the world's most popular reverse-phase HPLC columns. We invite you to try our mediterranea™ sea18 when you experience less-than-satisfactory results with your favourite column.

Today there is still a consensus about the fact that the best material to use as chromatographic packing continues to be silica. The particles of this material are very physically resistant, enable multiple functions, present maximum levels of efficiency and are also compatible with practically all solvents.

Teknokroma has been concentrated on obtaining the best silica particle in the market. The silica particle on which the mediterranea™ sea18 column is based is the result of an optimisation process in which, starting off from extremely pure materials with unusual low metal content, a perfectly spherical, rigid and inert particle has been obtained. Furthermore, the "porification" process developed for these ends (Surface Enhanced Accessibility, SEA) has achieved a high surface without losing any of its properties of physical resistance while also showing a very high load capacity, ideal for preparatory scaled processes. Moreover, the obtained porous structure ensures the maximum transfer speed of the solutes between the stationary and mobile phases, resulting in a greater separation efficiency.

Let us demonstrate the superior chromatographic properties of the mediterranea™ sea18 column, so you will feel comfortable with the performance of the world's best reverse-phase HPLC column.

mediterranea™ Sea_{18} New Generation HPLC Column

Purity of Silica

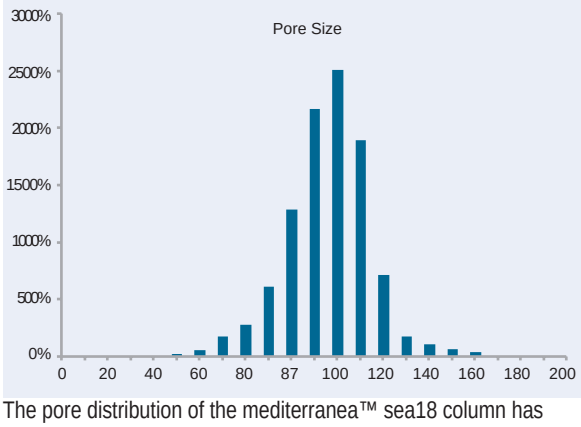
After evaluating many materials as a base for the global-best reverse phase chromatographic packing, the clear consensus is that the special characteristics of silica packings classify them as unsurpassable. No other packing material, apart from ultra-pure silica, achieves the perfect balance of physical resistance, functional use, chemical inertness, reproducibility and efficiency. Ultra-pure silica is also compatible with practically all solvents. Teknokroma concentrated on presenting the best silica particle to the HPLC market.

An essential condition for obtaining the global-best reverse phase packing is an extremely pure silica. The silica particle, on which the new mediterranea™ sea18 packing is based, is obtained from ultra-pure materials, using rigorously controlled manufacturing processes to ensure that the slightest possibility of contamination is avoided. The mediterranea™ sea18 silica required intensive optimisation of numerous processing factors to achieve a perfectly spherical, rigid and inert particle possessing unusually low metal content. The almost total absence of metals is one of the pillars over which the extraordinary properties of the mediterranea™ sea18 column reside.

Metals Content (ppm)

Metal	Values Obtained
Al	<1ppm
Fe	<1ppm
Ti	<1ppm
Zr	<1ppm

Porosity (Surface Enhanced Accessibility, SEA)



The pore distribution of the mediterranea™ sea18 column has been optimised by our own proprietary process called Surface Enhanced Accessibility (Sea). The Surface Enhanced Accessibility "porification" process creates high surface area without losing silica structural strength, chemical resistance, chemical inertness and high load capacity. Surface Enhanced Accessibility also ensures that practically 100% of the internal packing surface has been chemically bonded, endcapped, and is accessible to compounds being separated. Moreover, the Surface Enhanced Accessibility of mediterranea™ sea18 ensures the maximum transfer speed of the solutes between the stationary and mobile phases, resulting in a greater separation efficiency.

More than 98% of the silica surface area responsible for chromatographic separation of the sample is found inside the particle - within the pores. This explains the extreme importance of obtaining a very homogeneous pore distribution and the least possible number of nanopores. For most reverse-phase silica packings, these nanopores are not properly chemically bonded, endcapped or deactivated. So when nanopores are accessible to analytes, surface-analyte interactions frequently dominate. These surface-analyte interactions slow down the chromatographic process ("load transfer"), often resulting in decreased column efficiency. These treacherous nanopores may also negatively influence the phenomenon of dewetting which occurs with totally aqueous mobile phases.

Multifunctional Endcapping Deactivation (MED)

The endcapping process is a critical step in obtaining a perfectly deactivated mediterranea™ sea18 column. Our proprietary Multifunctional Endcapping Deactivation (MED) technology maximizes surface-bonding, blocking practically all the active centres that may have remained on the surface of the silica after bonding the C18 chains. Thanks to our new MED technology, the mediterranea™ sea18 column enjoys an unusual low level of silanol activity - helping you to obtain symmetrical peaks from even the most basic and acidic pharmaceuticals and their metabolites. mediterranea™ sea18 bonding chemistries will help you to achieve an extraordinary resistance and column lifetime when running at extreme pH levels.

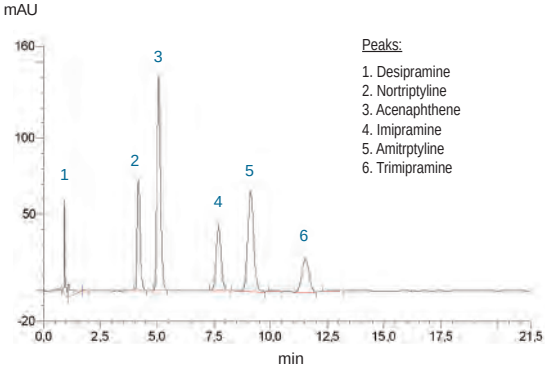
Moreover, the mediterranea™ sea18 column has been designed to show an excellent retention of polar compounds in a 100% aqueous environment without the problems of unwanted interactions which inefficiently endcapped conventional packings produce. Packing chemistry based on the new MED technology, "multifunctional endcapping deactivated", achieves levels of deactivation, resistance to extreme pH values and versatility in its chromatographic applications never reached by conventional or polar-embedded reverse phase packings. The MED technology has been rigorously developed to achieve the maximum reproducibility, with the objective that its chromatographic separations will be, column to column, exactly the same.

The obtained deactivation is shown when we make chromatograms of a group of Basic compounds in neutral pH conditions, including a neutral compound (acenaphthene) as a comparison. Of the four tested columns, the mediterranea™ sea18 is the one that shows the greatest efficiency, whether measuring with the acenaphthene or with a peak as difficult as that of amitriptilyne. The same occurs if we compare the asymmetry values of the peaks.

Column	As Acenaphtene	Ncol Acenaphtene	As Amitryptiline	Ncol Amitriptilyne
mediterranea™ sea18 5 µm 15 x 0,46	1,06	11031	1,21	8119
Xterra MSC18 5 µm 15 x 0,39	1,36	6476	1,32	4619
Gemini C18 5 µm 15 x 0,46	1,22	9524	1,23	7490
Nucleosil 100 C18 5 µm 15 x 0,46	1,07	7815	na	na

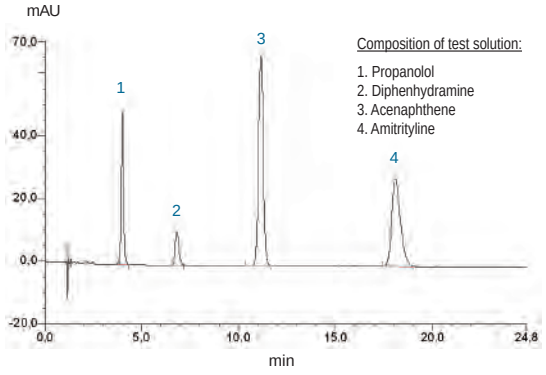
mediterranea™ Sea$_{18}$ New Generation HPLC Column

Tricyclic Anti-depressants

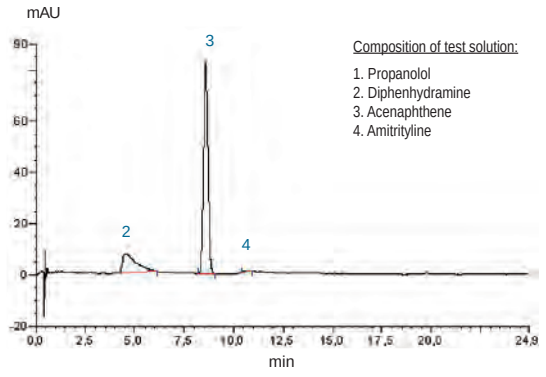


Column: mediterranea sea 18, 5 µm 15 x 0,46 cm
Eluent: Methanol/20mM K2HPO4 (pH 7.0) 70:30
Flow: 1ml/min
Room Temperature
Detection: UV 254 nm

Basic Compounds



Column A - mediterranea™ sea 18



Column B - The Competition

Column A: mediterranea sea 18, 5 µm 15 X 0,46 cm
Column B: Other column from market 5 µm 15 x 0,46 cm
Eluyent: Methanol/0,02M K2HPO4/KH2PO4 pH7,00 (75:25)
Room temperature
Flow: 1.4 ml/min
Detection: UV 254 nm

Aqueous Environments

The mediterranea sea18 packing is a 100% pure reverse phase with the added advantage of showing excellent retention of polar compounds and also enables work with 100% aqueous mobile phases without any limitation.

Most chromatographers agree that polar embedded packing have an advantage over conventional packings, in that they can work in 100% aqueous environments and separate basic compounds.

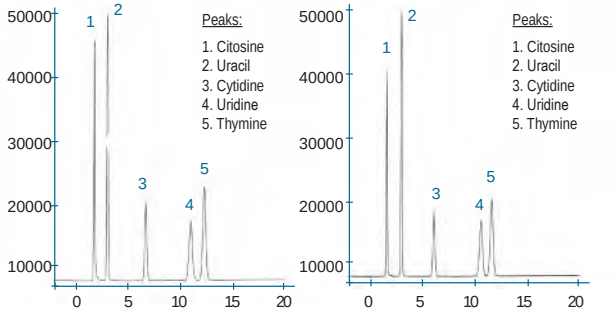
Nevertheless, these advantages are achieved at the expense of less retention for polar compounds, and poor column stability. Polar-embedded packings exhibit chromatographic behavior that cannot be considered as 100% reverse phase, since secondary interaction mechanisms may co-exist due to the nature of the unspecified polar groups anchored at the base of the hydrocarbon chains.

The mediterranea sea18 packing surpasses all the advantages of polar embedded packings by a wide margin and shows none of its inconveniences.
Furthermore, due to its specially optimised endcapping process (MED), the column has guaranteed pH-resistance, reproductibility and long life.

As can be seen, the chromatograms that are obtained after eluting the column with 100% water for more than 40 hours show no appreciable alteration in the retention times or in the efficiency of the chromatographed peaks.

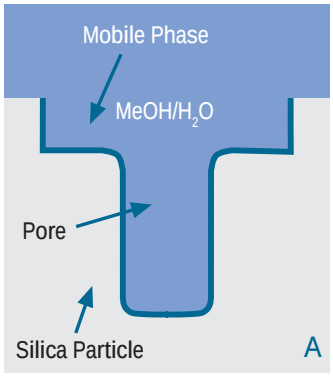
The mediterranea™ sea18 column also widely surpasses the stop flow test, designed to be able to show up the dewetting phenomenon that usually occurs in highly deactivated ODS-type columns, causing irreversible expulsion of water included in the packing pores. As can be seen in the data of five successive Stop Flow Test cycles no significant alterations are observed in the chromatographed peaks.

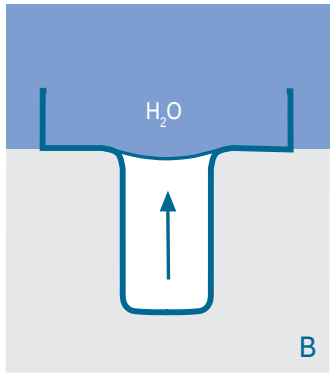
Aqueous Environments

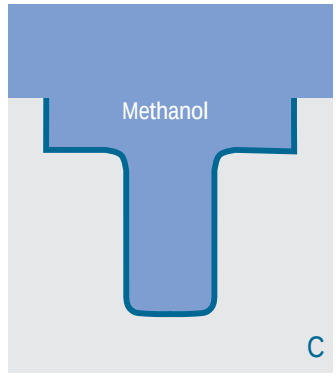


Column: mediterranea sea18 5 µm 15 X 0,46 cm
Movil Phase: H_2O
Flow: 1ml/min
Vol. Iny.:10 µl
Detectión: UV 254 nm

mediterranea™ Sea_{18} New Generation HPLC Column





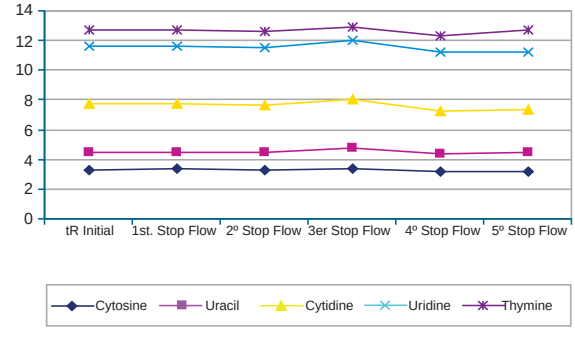


The phenomenon of "Dewetting"

When working with mixed mobile phases of an organic phase and water, for example Methanol/H2O, the pores of the packings are totally occupied with the mobile phase (A). However, when working with 100% H2O as the mobile phase in conventional reverse-phase columns, a phenomenon occurs with the expulsion of the mobile phase from the interior of the pore (B).The chromatographic effect that will be produced is a loss of retention and resolution of the chromatographic peaks since the solutes cannot enter the interior of the pores. These chromatographic losses can occur gradually or suddenly - making it difficult to restore to its initial conditions, especially with mostly aqueous mobile phases. (C).

This phenomenon is ruled by an equation which involves the pore's radius, the surface tension, the contact angle and the pressure exercised on the mobile phase. The surface tension and contact angle depends on the density of the bonded ligands and on their chemical functionality. The Stop Flow Test reproduces chromatographic run conditions by interrupting the flow of 100% aqueous mobile phase, the pressure goes to zero and favours the expulsion of water from the interior of the pores.

The mediterranea™ sea18 column surpasses this test with ease - the retention times of the five chromatographed compounds remain practically unaltered.



Stop Flow

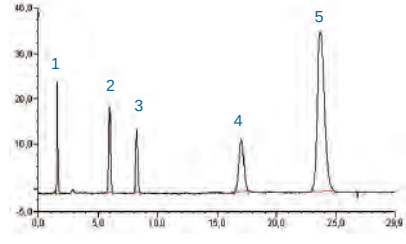
Compound		1st stop	2nd stop	3rd stop	4th stop	5th stop
	tR initial	**flow**	**flow**	**flow**	**flow**	**flow**
Cytosine	3,32	3,33	3,3	3,35	3,16	3,21
Uracil	4,45	4,45	4,44	4,75	4,36	4,44
Cytidine	7,73	7,73	7,63	8,00	7,24	7,34
Uridine	11,57	11,57	11,53	12,02	11,25	11,24
Thymine	12,70	12,7	12,62	12,87	12,35	12,70

NIST Test for HPLC Packing Characterization

The new mediterranea™ sea18 column has been subjected to the SRM870 test. This test, designed by the NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY and recently assessed by the experts committee of the USP (United States Pharmacopeia) is currently considered to be the most recommended for evaluating the most significant properties of a reverse phase column.

The high number of HPLC reverse phase packings available in the market and the big differences in their chromatographic behaviour has led to the need to design a characterisation and classification method for these packings.
This procedure uses a mixture of five organic components (uracil, toluene, ethylbenzene, quinizarin and amitriptyline) which are chromatographed using exact conditions of mobile phase, flow, and controlled temperatures.

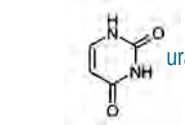
The detailed analysis of the different peaks obtained will enable an objective, and more importantly, standardised evaluation of the behaviour of the chromatographic packing and therefore anticipate its suitability in normal analytical work.

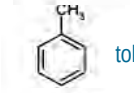


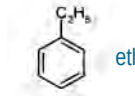
Peaks

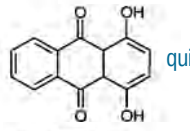
1. Uracil
2. Toluene
3. Ethylbenzene
4. Quinizarin
5. Amitriptyline

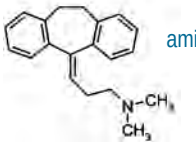
Tk mediterranea™ Sea$_{18}$ New Generation HPLC Column


uracil - dead volume marker


toluene - hydrophobic retention


ethylbenzene - methylene selectivity


quinizarin - activity towards chelating reagents


amitriptyline - activity towards bases

Uracil

This compound is commonly used as an indicator of the dead volume of the column (non-retained peak).

Toluene/Ethylbenzene

The selectivity factor between these two compounds can be used to characterise the differences between packings primarily due to solvophobic interactions. The absolute retention times of these compounds give an idea of the column reverse-phase strength. Both compounds can also be used to measure the quality of the packing through the number of theoretical plates.

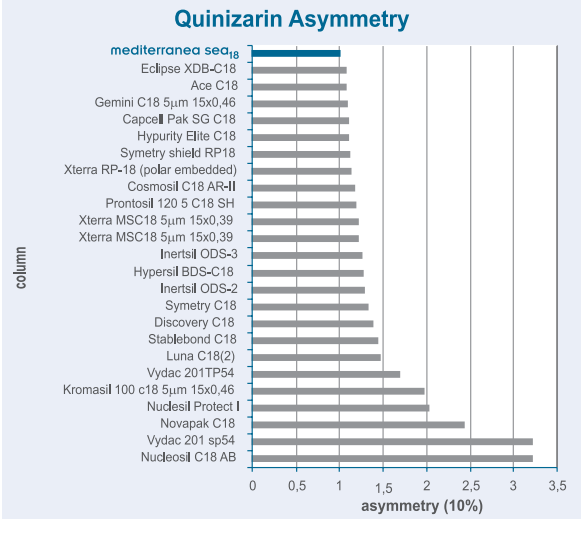
Quinizarin (1,4-dihydroanthraquinone)

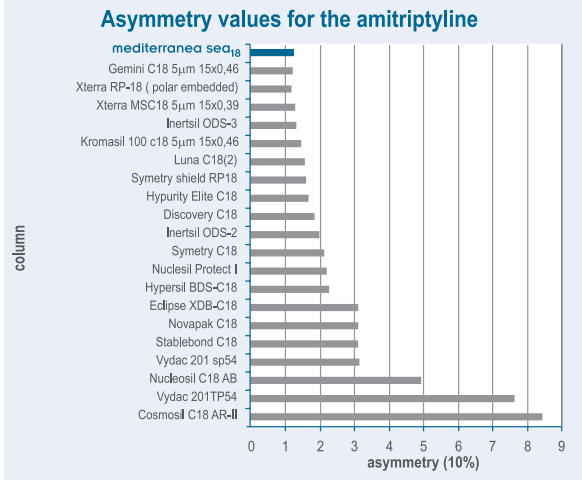
Quinizarin is a chelating compound and its behaviour in a reverse phase column is a clear indicator of the presence or absence of metals. A column of low activity will deliver symmetrical peaks whereas increasing surface activity exaggerates the tailing edge of the quinizarin peak - leading to higher asymmetry values.

Quinizarin normally elutes between the ethylbenzene and amitriptyline peaks. However, when the silica packing contains embedded polar groups they will retain this peak, causing it to elute after amitriptyline. In the mediterranea™ sea18 column, the quinizarin peak elutes with a perfect symmetrical form, indicating an extraordinary low level of metallic impurities.
According to quinizarin peak symmetry data obtained in our laboratories or published by the NIST (see Figure), the performance of the mediterranea™ sea18 column compares well with other popular reverse-phase packings.
The top-positioning of the mediterranea™ sea18 packing indicates the ultra-high purity of the optimized silica.Teknokroma´s ultra-pure silica is your guarantee of reproducibility and of the absence of secondary (and uncontrolled) mechanisms of interaction (common to popular polar-embedded columns).

Amitriptyline

This basic (pKa=9.4) anti-depressant is an excellent indicator of residual silica surface silanol-activity. Amitriptyline will elute as a symmetrical peak on a well-deactivated column as seen with the new mediterranea™ sea18. In comparison, many popular reverse-phase packings leave many residual silanols through insufficient endcapping; leading to widespread peak tailing or to complete disappearance from the chromatogram.
Proper amitriptyline elution is important in consideration of the number of basic compounds, particularly in the fields of pharmaceuticals and life science. In fact, it guarantees that the problems with tailing or complete peak disappearance will be almost eradicated - along with day-to-day laboratory adjustments and complex mobile phase systems designs. With mediterranea™ sea18 a simple pH adjustment will serve to correctly elute the most basic and acidic substances.
The comparison of asymmetry factors for mediterranea™ sea18 and other popular packings is a clear indication of deactivation. mediterranea™ sea18 enters the market with a deactivation level not previously achieved by other reverse-phase packings. The proprietary Multifunctional Endcapped Deactivation produces reproducible column-to-column peak symmetry for a wider variety of pharmaceutical compounds thanks to strict silica purity and batch-to-batch reproducibility.





mediterranea™ Sea$_{18}$ New Generation HPLC Column

Packaging Sample

Wide pH Range

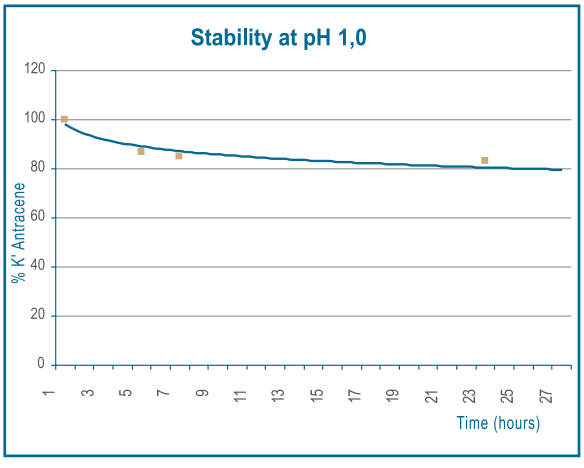
A perfectly spherical particle, a totally controlled pore design, a total lack of metallic traces, a well-studied process of phase bonding and final endcapping, all combine in achieving a packing with a resistance to extreme pH values not previously reached.

Until quite recently, silica packings were limited to working between pH 2 and pH 7 since below pH 2 the bonds between the C18 chains and the silica particle were hydrolysed, resulting in a gradual loss of retention capacity of the column. Above pH 7 the problem that arose was one of simply dissolving the silica, and therefore the pure destruction of the column.

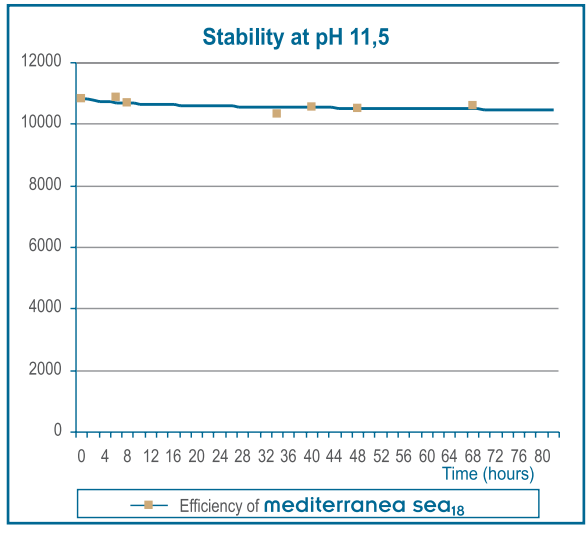
Using mediterranea™ sea18 packing makes it is possible to work with eluents from pH 1 to pH 12. Such unusual pH-resistance values have been secured as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield that impedes acidic and basic eluents from attacking the silica surface.
The pH stability graphs show the efficiency of the process.

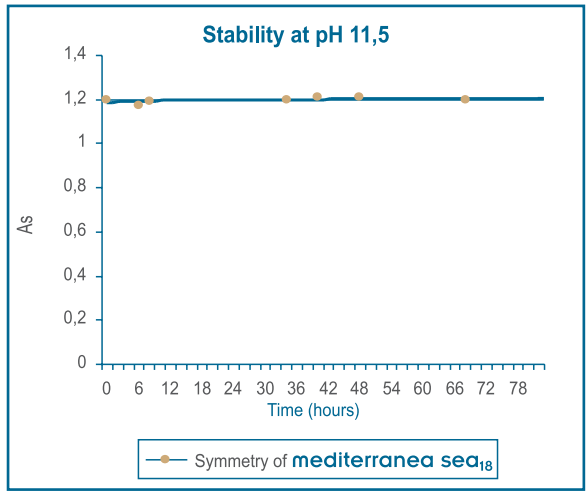
Eluting the mediterranea™ sea18 column for 78 hours at pH 11.5, showed no significant deterioration in terms of both efficiency and peak symmetry for diphenhydramine..

With an eluent as acid as pH 1, the column stabilises in a short period of time so that it will even be possible to work in these extreme conditions.



An eluent of ACN/TFA1% pH 1.0 (10:90) 1ml/min 25ºC is passed through the column at regular periods, checked with the reverse phase test and a retention comparison is made of the last anthracene peak.





An eluent of ACN//1- methylpyrrolidine 50mM pH 11,5 50:50, 1ml/min 25ºC is passed through the column. With the same eluent 10 ml of diphenhydramine (1mg/ml dissolved in water) is injected and the efficiency and symmetry of the peak is tested.

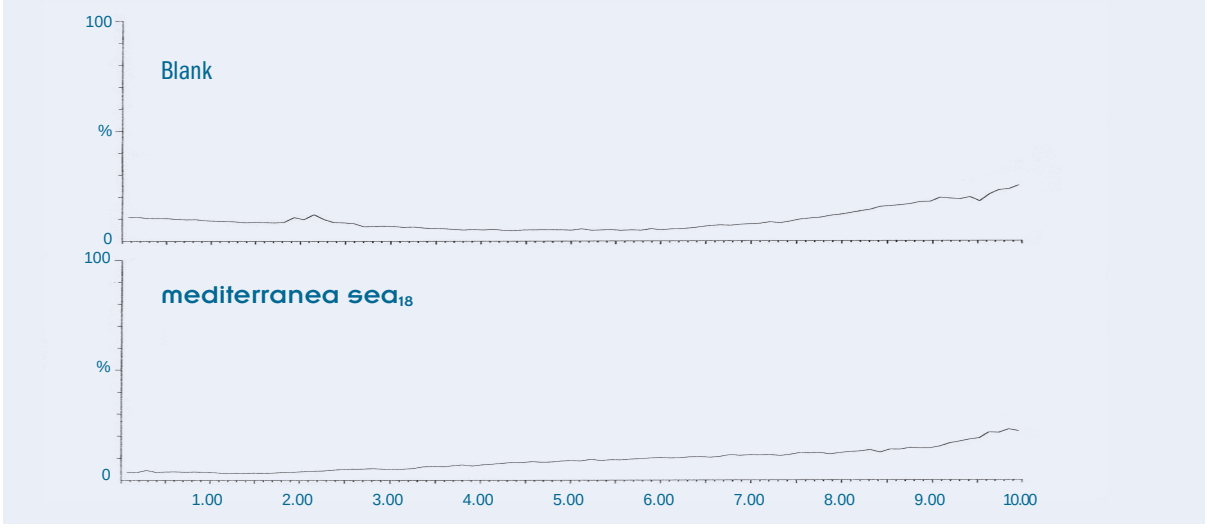
LC-MS Mediterranea™ Sea 18 Columns

The Multifunctional Endcapping Deactivation (MED) technology guarantees extreme stability for every mediterranea™ sea18 reverse-phase column. Chromatographic stability (peak symmetry, peak retention times, and peak efficiency) under low-to-high pH (pH 1-12) conditions is required for high-speed, high-throughput LC-MS. The mediterranea™ sea18 is the ideal LC-MS reverse-phase column for stable chromatographic separation of pharmaceuticals and their metabolites.

The technological features designed into the mediterranea™ sea18 column makes it extremely useful for LC-MS applications where packing stability is demonstrated by low column bleed and consistent chromatographic results. The combination of mediterranea™ sea18 technology on a 3mm ultra-pure silica-based packing enables LC-MS separations to be made speedily and with maximum productivity.

mediterranea™ Sea_{18} New Generation HPLC Column

Bleeding Profile Comparison



Assay by Instituto Químico de Sarriá I.Q.S. (Barcelona)

Chromatographic Conditions

Mobile Phase:	A: CH3CN (0,1% formic acid)
	B: Water (0,1% formic acid)
Elution Gradient:	5/95(A/B) linear up to 95:5 in 8 minutes,
	maintaining the final composition 2 minutes.
Flow:	0,5mL/min
Column Temperature:	25ºC

Conditions for MS Detection

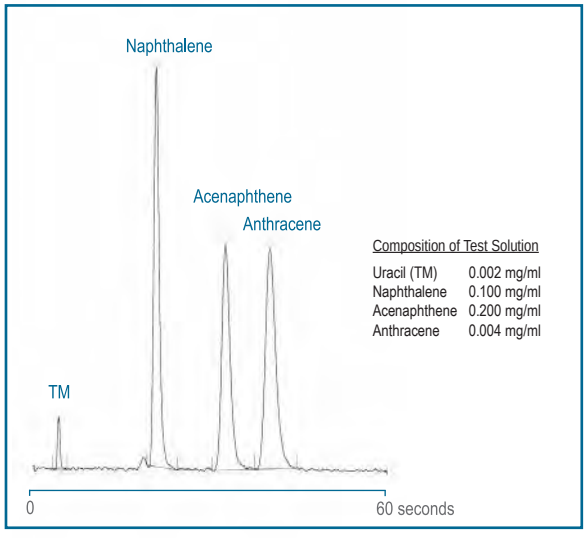
MS Instrument:	Waters ZMD
Capillary Voltage:	3kV (ESI positive)
Cone Voltage:	20V
Source block Temp:	100ºC
Desolvation Temp:	350ºC
Gas:	500l/h
Gas of cone:	35 l/h
Mass Range:	60 to100 amu

Ultra-Rapid Columns

Within the wide range of possible configurations , the mediterranea™ sea18 columns are available with 3 mm packing with lengths of 3, 5 and 10 cm and inner diameters of 2.1, 3.0, 4.0 and 4.6 mm. By maintaining high quality control and specifications in manufacturing the mediterranea™ sea18 packing, these columns enable you to do ultra-fast separations, with extremely high levels of productivity and reduced analysis times. Ultrarapid mediterranea™ sea18 columns will help you optimize your instrument time and give you more time to analyze data.

With Ultra-rapid column separations, total analysis times of less than one minute are common, even when using gradient elution methods, since the high porosity of the mediterranea™ sea18 packing enables rapid mobile phase equilibration times.

The combination of 3 mm mediterranea™ sea18 packing with the column diameter of 2.1 mm is recommended for high sensitivity LC/MS analyses. Many of these ultra-rapid LC-MS screening analyses utilize minute sample and solvent quantities - for which, the 3 mm mediterranea™ sea18 columns are ideal.



Chromatographic Conditions

Column:	mediterranea sea18 3 µm 3 x 0,46 cm
Eluant:	Acetonitrile/Water
Proportion:	65/35
Flow:	3.0 ml/min
Pressure:	70 bars
Vol Inyection:	0.5 ml
Temperature:	Room
Detectión:	UV 254 nm

mediterranea™ Sea$_{18}$ New Generation HPLC Column

Preparative Columns

The mediterranea™ sea18 columns are characterized by their total inertness, by their wide range of working mobile phase pH, and by their high loading capacity - a result of the SEA process control (Surface Enhanced Accessibility).
The mediterranea™ sea18 preparative columns are the natural choice when high-service preparative columns are required, and in high-speed preparative applications as in the case of Combinatorial Chemistry.

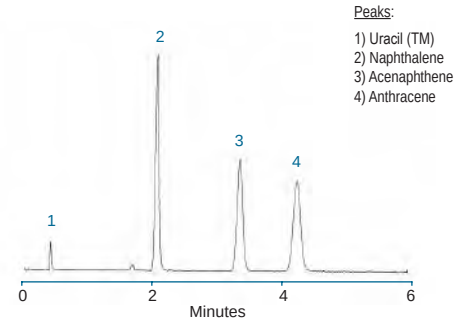
New Hardware Design for Mediterranea™ Column: Ultrafit™ System

The new Ultrafit™ design will make your work in the laboratory more comfortable and efficient. The Ultrafit™ system, as well as helping in the replacement of the frit at the column entrance, enables you to easily include either additional frits or a pre-column, always with the utmost simplicity and economy and in no way whatsoever is the quality of the separation affected.
In designing the Ultrafit™ column, the greatest care has been taken to cover all the aspects that may occur in the loss of efficiency of the column. As a result of all this, dead volumes have been reduced to a minimum, entered by the system by means of a high precision mechanism, with inlet and outlet holes of 0.2 mm and first-class tapers for the perfect distribution of the inlet and outlet flows, as seen in the three depicted Ultrafit™ options.
The Ultrafit™ system enables a pre-column to be included without loss of efficiency, to columns as small as 30 x 4 mm packed with particles of 3 mm.
Moreover, the very best material has been selected for the construction of the column, with an ultra-shiny interior finish, of extremely low RMS, ensuring that no tube imperfection in the column will affect the quality of the separation.

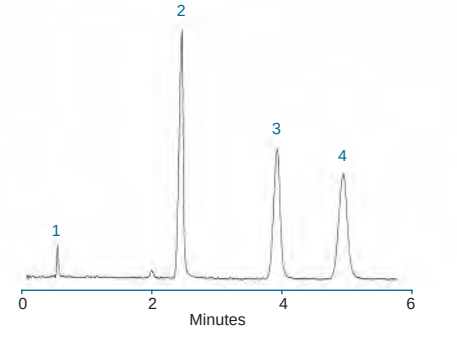
Ultrafit™ System Efficiency

Column	Efficiency (N/m)	AS (10%)
mediterranea sea18 Column 3 µm 5 x 0,46 cm Ultrafit™ System	134904	1,11
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Prefilter Ultrafilter™	135042	1,05
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Precolumn Ultraguard™	137819	1,07

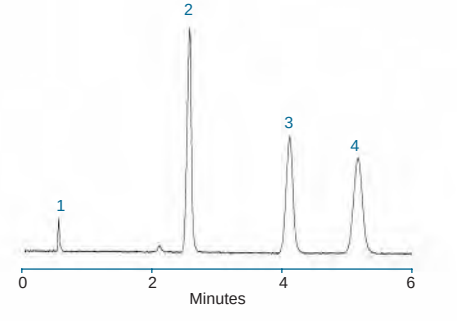
Chromatographic Conditions:
Column: mediterranea™ sea18 3 mm 5 x 0,46 cm
Eluant: Acetonitryle/Water 65:35
Flow: 0,9 ml/min
Det. UV 254 nm
Temp. Room
Sample: Acenaphthene 0.2 mg/ml



Column with Ultrafit™ System



Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Ultrafit™ System Configuration

Ultrafit™

Ultrafit™ + Ultrafiter™

UltrafitT™ + Ultraguard™

mediterranea™ Sea_{18} 5 µm HPLC Column

Analytical Columns 0.46 cm ID
mediterranea™ sea_{18} 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	3	0.46	TR-010000
mediterranea	Sea18	5	4	0.46	TR-010001
mediterranea	Sea18	5	5	0.46	TR-010002
mediterranea	Sea18	5	10	0.46	TR-010003
mediterranea	Sea18	5	15	0.46	TR-010004
mediterranea	Sea18	5	20	0.46	TR-010005
mediterranea	Sea18	5	25	0.46	TR-010006
mediterranea	Sea8	5	3	0.46	TR-010355
mediterranea	Sea8	5	4	0.46	TR-010356
mediterranea	Sea8	5	5	0.46	TR-010357
mediterranea	Sea8	5	10	0.46	TR-010358
mediterranea	Sea8	5	15	0.46	TR-010359
mediterranea	Sea8	5	20	0.46	TR-010360
mediterranea	Sea8	5	25	0.46	TR-010361
mediterranea	Sea4	5	3	0.46	TR-010362
mediterranea	Sea4	5	4	0.46	TR-010363
mediterranea	Sea4	5	5	0.46	TR-010364
mediterranea	Sea4	5	10	0.46	TR-010365
mediterranea	Sea4	5	15	0.46	TR-010366
mediterranea	Sea4	5	20	0.46	TR-010367
mediterranea	Sea4	5	25	0.46	TR-010368

Analytical Columns 0.40 mm ID
mediterranea™ sea_{18} 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	3	0.40	TR-010007
mediterranea	Sea18	5	4	0.40	TR-010008
mediterranea	Sea18	5	5	0.40	TR-010009
mediterranea	Sea18	5	10	0.40	TR-010010
mediterranea	Sea18	5	15	0.40	TR-010011
mediterranea	Sea18	5	20	0.40	TR-010012
mediterranea	Sea18	5	25	0.40	TR-010013
mediterranea	Sea8	5	4	0.40	TR-410368
mediterranea	Sea8	5	5	0.40	TR-410369
mediterranea	Sea8	5	10	0.40	TR-410370
mediterranea	Sea8	5	15	0.40	TR-410371
mediterranea	Sea8	5	20	0.40	TR-410372
mediterranea	Sea8	5	25	0.40	TR-410373
mediterranea	Sea4	5	3	0.40	TR-410374
mediterranea	Sea4	5	4	0.40	TR-410375
mediterranea	Sea4	5	5	0.40	TR-410376
mediterranea	Sea4	5	10	0.40	TR-410377
mediterranea	Sea4	5	15	0.40	TR-410378
mediterranea	Sea4	5	20	0.40	TR-410379
mediterranea	Sea4	5	25	0.40	TR-410380

Microbore Columns 0.21 cm ID
mediterranea™ sea_{18} 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	3	0.21	TR-010014
mediterranea	Sea18	5	5	0.21	TR-010015
mediterranea	Sea18	5	10	0.21	TR-010016
mediterranea	Sea18	5	15	0.21	TR-010017
mediterranea	Sea18	5	20	0.21	TR-010018
mediterranea	Sea8	5	3	0.21	TR-010381
mediterranea	Sea8	5	5	0.21	TR-010382
mediterranea	Sea8	5	10	0.21	TR-010383
mediterranea	Sea8	5	15	0.21	TR-010384
mediterranea	Sea8	5	20	0.21	TR-010385
mediterranea	Sea4	5	3	0.21	TR-010386
mediterranea	Sea4	5	5	0.21	TR-010387
mediterranea	Sea4	5	10	0.21	TR-010388
mediterranea	Sea4	5	15	0.21	TR-010389
mediterranea	Sea4	5	20	0.21	TR-010390

Microbore Columns 0.30 cm ID
mediterranea™ sea_{18} 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	3	0.30	TR-010019
mediterranea	Sea18	5	5	0.30	TR-010020
mediterranea	Sea18	5	10	0.30	TR-010021
mediterranea	Sea18	5	15	0.30	TR-010022
mediterranea	Sea18	5	20	0.30	TR-010023
mediterranea	Sea18	5	25	0.30	TR-010024
mediterranea	Sea8	5	3	0.30	TR-010391
mediterranea	Sea8	5	5	0.30	TR-010392
mediterranea	Sea8	5	10	0.30	TR-010393
mediterranea	Sea8	5	15	0.30	TR-010394
mediterranea	Sea8	5	20	0.30	TR-010395
mediterranea	Sea8	5	25	0.30	TR-010396
mediterranea	Sea4	5	3	0.30	TR-010397
mediterranea	Sea4	5	5	0.30	TR-010398
mediterranea	Sea4	5	10	0.30	TR-010399
mediterranea	Sea4	5	15	0.30	TR-010400
mediterranea	Sea4	5	20	0.30	TR-010401
mediterranea	Sea4	5	25	0.30	TR-010402

SemiPreparative Columns
mediterranea™ sea18 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	10	0.78	TR-010025
mediterranea	Sea18	5	15	0.78	TR-010026
mediterranea	Sea18	5	25	0.78	TR-010027
mediterranea	Sea18	5	10	1.00	TR-010028
mediterranea	Sea18	5	15	1.00	TR-010029
mediterranea	Sea18	5	25	1.00	TR-010030
mediterranea	Sea18	5	5	2.12	TR-010031
mediterranea	Sea18	5	10	2.12	TR-010032
mediterranea	Sea18	5	15	2.12	TR-010033
mediterranea	Sea18	5	25	2.12	TR-010034
mediterranea	Sea8	5	10	0.78	TR-010403
mediterranea	Sea8	5	15	0.78	TR-010404
mediterranea	Sea8	5	25	0.78	TR-010405
mediterranea	Sea8	5	10	1.00	TR-010406
mediterranea	Sea8	5	15	1.00	TR-010407
mediterranea	Sea8	5	25	1.00	TR-010408
mediterranea	Sea8	5	5	2.12	TR-010409
mediterranea	Sea8	5	10	2.12	TR-010410
mediterranea	Sea8	5	15	212	TR-010411
mediterranea	Sea8	5	25	2,12	TR-010412
mediterranea	Sea4	5	10	0.78	TR-010413
mediterranea	Sea4	5	15	0.78	TR-010414
mediterranea	Sea4	5	25	0.78	TR-010415
mediterranea	Sea4	5	10	1.00	TR-010416
mediterranea	Sea4	5	15	1.00	TR-010417
mediterranea	Sea4	5	25	1.00	TR-010418
mediterranea	Sea4	5	5	2.12	TR-010419
mediterranea	Sea4	5	10	2.12	TR-010420
mediterranea	Sea4	5	15	2.12	TR-010421
mediterranea	Sea4	5	25	2.12	TR-010422

Novafix™ Cartridges 0.40 cm ID
mediterranea™ sea18 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	5	7,5	0.40	TR-010035
mediterranea	Sea18	5	10	0.40	TR-010036
mediterranea	Sea18	5	15	0.40	TR-010037
mediterranea	Sea18	5	25	0.40	TR-010038
mediterranea	Sea8	5	7,5	0.40	TR-010423
mediterranea	Sea8	5	10	0.40	TR-010424
mediterranea	Sea8	5	15	0.40	TR-010425
mediterranea	Sea8	5	25	0.40	TR-010426
mediterranea	Sea4	5	7,5	0.40	TR-010427
mediterranea	Sea4	5	10	0.40	TR-010428
mediterranea	Sea4	5	15	0.40	TR-010429
mediterranea	Sea4	5	25	0.40	TR-010430

Ultrarapid Columns 0.46 cm ID
mediterranea™ sea18 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	3	3	0.46	TR-010039
mediterranea	Sea18	3	4	0.46	TR-010040
mediterranea	Sea18	3	5	0.46	TR-010041
mediterranea	Sea18	3	10	0.46	TR-010042
mediterranea	Sea18	3	15	0.46	TR-010043
mediterranea	Sea18	3	20	0.46	TR-010044
mediterranea	Sea18	3	25	0.46	TR-010045
mediterranea	Sea8	3	3	0.46	TR-010431
mediterranea	Sea8	3	4	0.46	TR-010432
mediterranea	Sea8	3	5	0.46	TR-010433
mediterranea	Sea8	3	10	0.46	TR-010434
mediterranea	Sea8	3	15	0.46	TR-010435
mediterranea	Sea8	3	20	0.46	TR-010436
mediterranea	Sea8	3	25	0.46	TR-010437
mediterranea	Sea4	3	3	0.46	TR-010438
mediterranea	Sea4	3	4	0.46	TR-010439
mediterranea	Sea4	3	5	0.46	TR-010440
mediterranea	Sea4	3	10	0.46	TR-010441
mediterranea	Sea4	3	15	0.46	TR-010442
mediterranea	Sea4	3	20	0.46	TR-010443
mediterranea	Sea4	3	25	0.46	TR-010444

Ultrarapid Columns 0.40 cm ID
mediterranea™ sea18 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	3	3	0.40	TR-010046
mediterranea	Sea18	3	4	0.40	TR-010047
mediterranea	Sea18	3	5	0.40	TR-010048
mediterranea	Sea18	3	10	0.40	TR-010049
mediterranea	Sea18	3	15	0.40	TR-010050
mediterranea	Sea18	3	20	0.40	TR-010051
mediterranea	Sea18	3	25	0.40	TR-010052
mediterranea	Sea8	3	3	0.40	TR-410431
mediterranea	Sea8	3	4	0.40	TR-410432
mediterranea	Sea8	3	5	0.40	TR-410433
mediterranea	Sea8	3	10	0.40	TR-410434
mediterranea	Sea8	3	15	0.40	TR-410435
mediterranea	Sea8	3	20	0.40	TR-410436
mediterranea	Sea8	3	25	0.40	TR-410437
mediterranea	Sea4	3	3	0.40	TR-410438
mediterranea	Sea4	3	4	0.40	TR-410439
mediterranea	Sea4	3	5	0.40	TR-410440
mediterranea	Sea4	3	10	0.40	TR-410441
mediterranea	Sea4	3	15	0.40	TR-410442
mediterranea	Sea4	3	20	0.40	TR-410443
mediterranea	Sea4	3	25	0.40	TR-410444

mediterranea™ Sea_{18} 3 µm HPLC Column

Microbore Columns 0.21 cm ID
mediterranea™ sea_{18} 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	3	3	0.21	TR-010053
mediterranea	Sea18	3	5	0.21	TR-010054
mediterranea	Sea18	3	10	0.21	TR-010055
mediterranea	Sea18	3	15	0.21	TR-010056
mediterranea	Sea18	3	20	0.21	TR-010057
mediterranea	Sea8	3	3	0.21	TR-010445
mediterranea	Sea8	3	5	0.21	TR-010446
mediterranea	Sea8	3	10	0.21	TR-010447
mediterranea	Sea8	3	15	0.21	TR-010448
mediterranea	Sea8	3	20	0.21	TR-010449
mediterranea	Sea4	3	3	0.21	TR-010450
mediterranea	Sea4	3	5	0.21	TR-010451
mediterranea	Sea4	3	10	0.21	TR-010452
mediterranea	Sea4	3	15	0.21	TR-010453
mediterranea	Sea4	3	20	0.21	TR-010454

Microbore Columns 0.30 cm ID
mediterranea™ sea_{18} 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	3	3	0.30	TR-010058
mediterranea	Sea18	3	5	0.30	TR-010059
mediterranea	Sea18	3	10	0.30	TR-010060
mediterranea	Sea18	3	15	0.30	TR-010061
mediterranea	Sea18	3	20	0.30	TR-010062
mediterranea	Sea8	3	3	0.30	TR-010455
mediterranea	Sea8	3	5	0.30	TR-010456
mediterranea	Sea8	3	10	0.30	TR-010457
mediterranea	Sea8	3	15	0.30	TR-010458
mediterranea	Sea8	3	20	0.30	TR-010459
mediterranea	Sea4	3	3	0.30	TR-010460
mediterranea	Sea4	3	5	0.30	TR-010461
mediterranea	Sea4	3	10	0.30	TR-010462
mediterranea	Sea4	3	15	0.30	TR-010463
mediterranea	Sea4	3	20	0.30	TR-010464

Novafix™ Cartridges 0.40 cm ID
mediterranea™ sea_{18} 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	3	7,5	0.40	TR-010063
mediterranea	Sea18	3	10	0.40	TR-010064
mediterranea	Sea18	3	15	0.40	TR-010065
mediterranea	Sea18	3	25	0.40	TR-010066
mediterranea	Sea8	3	7,5	0.40	TR-010465
mediterranea	Sea8	3	10	0.40	TR-010466
mediterranea	Sea8	3	15	0.40	TR-010467
mediterranea	Sea8	3	25	0.40	TR-010468
mediterranea	Sea4	3	7,5	0.40	TR-010469
mediterranea	Sea4	3	10	0.40	TR-010470
mediterranea	Sea4	3	15	0.40	TR-010471
mediterranea	Sea4	3	25	0.40	TR-010472

Other Products
mediterranea™ sea_{18}

Product	Description		Cat.Nbr.
Ultrafilter™, Ultrafit prefilter adaptor *(frit not included)*			TR-010067
Frits of 0.5 µm pore (10 units)		TR-010069	
Frits of 2.0 µm pore (10 units)		TR-010070	
Ultraguard™, Ultrafit Guardcolumn adaptor *(guard column not included)*			TR-010068
Guard Column Sea18 10 x 3.2 mm (5 units)			TR-010071
Guard Column Sea8 10 x 3.2 mm (5 units)			TR-010073
Guard Column Sea4 10 x 3.2 mm (5 units)			TR-010074

mediterranea™ Sea18 1.8 µm

- Ideal for LC-MS applications
- Fully scalable to Industrial Chromatography
- Compatible with 100% aqueous mobile phases
- Robustness and versatility
- Very high efficiency

mediterranea™ sea18 1.8 µm columns have been developed based on the same material as the recognized 5µm column. The result is a column with high efficiency, high reliability and full scalability from UHPLC analytical chromatography to industrial process chromatography.

mediterranea™ sea18 1.8 µm columns are available in 1.8, 2.2,3, 5, 10, and 15 µm.Its versatility allows the separation of both nonpolar and polar substances, and its robustness to extreme pH values (1.5 to 11) makes it the ideal column for methods development

mediterranea™ sea18 1.8 µm has been developed to offer the highest quality and reproducibility.Teknokroma checks rigorously both each packing batch and every single column.

UHPLC Columns
mediterranea™ sea$_{18}$ 1.8 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	1.8	5	0.21	TR-010902
mediterranea	Sea18	1.8	10	0.21	TR-010903
mediterranea	Sea18	1.8	15	0.21	TR-010906
mediterranea	Sea18	1.8	5	0.30	TR-010904
mediterranea	Sea18	1.8	10	0.46	TR-010907
mediterranea	Sea18	1.8	15	0.46	TR-010908

UHPLC Guardcolumns

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Holder + 2 Cartridges	C18	1.9	1	0.21	GL-5020-88246
2 Cartridges	C18	1.9	1	0.21	GL-5020-88240
Holder + 2 Cartridges	C18	1.9	1	0.30	GL-5020-88248
2 Cartridges	C18	1.9	1	0.30	GL-5020-88242


GL-5020-20382


JR-69330-05

mediterranea™ Sea18 2.2 µm

- Reduces analysis costs with no resolution loss
- Less backpressure than 1.8 µm columns
- High flow rates with no efficiency loss
- Reduces solvent consumption
- Ideal for LC-MS applications

mediterranea™ sea18 2.2 µm is a transitional column fully compatible with cutting-edge HPLC and UHPLC systems, radically improving analysis performance and halving retention times. The material used for the developement of mediterranea™ sea18 **2.2 µm** columns is an ultra-pure, metal-free, state-of-the-art silica gel packing, with a particle size of 2.2 µm and a pore size of 100Å. **mediterranea™ sea18 2.2 µm** uses state-of-the-art silica and the latest bonding and endcapping technology. Compatible with a 100% aqueous mobile phase and it stands extreme pH conditions (1 to 12).
mediterranea™ sea18 2.2 µm has been developed to offer the highest quality and reproducibility.Teknokroma checks rigorously both each packing batch and every single column.

UHPLC Columns
mediterranea™ sea$_{18}$ 2.2 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	2.2	5	0.21	TR-010900
mediterranea	Sea18	2.2	10	0.21	TR-010901
mediterranea	Sea18	2.2	15	0.21	TR-010921

UHPLC Guardcolumns

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Holder + 2 Cartridges	C18	2	1	0.21	GL-5020-20382
2 Cartridges	C18	2	1	0.21	GL-5020-20331
Holder + 2 Cartridges	C18	2	1	0.30	GL-5020-20399
2 Cartridges	C18	2	1	0.30	GL-5020-20348

UHPLC Guardcolumn Filter

Description	Pore µm	Inter.Volume µL	Cat.Nbr.
Stainless Steel Precolumn Filter	0.5	0.61	JR-69330-05
Stainless Steel Precolumn Filter	2	0.66	JR-69330-2
Stainless Steel Precolumn Filter	5	0.68	JR-69330-5

Brisa LC² HPLC Column

Latest technology Ultrapure Silica
Optimizes your analysis costs
Immediate delivery Analytical

New column Brisa LC²
"Limited Cost x Liquid Chromatography"

The material used for this column development is an ultrapure and metal free silica packing.
The pore size is 120 A and it´s available in 3 & 5 um particle size.

Brisa "LC²" is a fully "endcapped" free silanol silica with a broad usable pH range (2-11).

Brisa "LC²" has been designed to get the highest reproducibility and quality.
Teknokroma strictly controls each packing batch and each single column.

Analytical Columns
Brisa LC² 3 & 5 µm

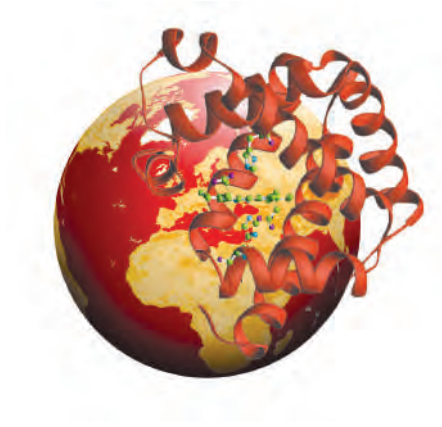
Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Brisa LC²	C18	5	15	0.46	TR-010480
Brisa LC²	C18	5	25	0.46	TR-010481
Brisa LC²	C18	3	15	0.46	TR-010498
Brisa LC²	C18	3	10	0.46	TR-010499

LC-MS Columns
Brisa LC² C18-MS 3 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Brisa LC²	C18-MS	3	5	0.21	TR-010496
Brisa LC²	C18-MS	3	10	0.21	TR-010497

Europa HPLC Column for Peptides and Proteins

by Teknokroma
Europa®



Introduction

Teknokroma introduces in the market the new line of Europa HPLC columns.

After the versatility of our popular mediterranea™ Sea 18 column that enables you to deal successfully with the inmense variety of separations in the fields of pharmaceuticals, life sciences, environment, foods, etc. Teknokroma has focused all its efforts and all its know-how, accumulated through more than 30 years of chromatographic research and development, in offering the best reverse phase HPLC packing for identification and purification of peptides and protein compounds.

Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today.

As a result of these, we launch into the market the Line of Europa HPLC columns, one of the best columns in the field of analysis of biomolecules.
The Europa HPLC columns for peptides and proteins, provide the best performance and unsurpassed efficiency, reliability and reproducibility.

There is still a consensus that the best material to use as chromatographic packing continues to be silica. The particles of silica material are physically resistant, enable multiple functions, present maximum levels of efficiency and are also compatible with practically all solvents.

Teknokroma has dedicated years of research and development in obtaining the best silica particle on the market. The silica particle on which the Europa columns is based is the result of an optimisation process, starting with extremely pure materials with unusually low metal content, and obtaining a perfectly spherical, rigid and inert particle.

Furthermore, the propietary “porification process” (Surface Enhanced Accessibility, SEA) for Europa silica has achieved high surface area without sacrificing important properties like physical resistence and high loading capacity- making it ideal for preparative-scale processing.
In addition, the Surface Enhanced Accessibility manufacturing process creates a porous structure that ensures maximum transfer speeds for solutes between the stationary and mobile phases-resulting in higher separation efficiency.

Our “Ultra-Fast” Europa columns are made in 3-5 cm length in order to get quick analytical results, whereas the “High Efficiency” columns are normally in 15-25 cm lengths to obtain best resolution.

The Teknokroma Europa Columns are uniquely designed with optimized pore size distribution; 120Å for Peptide and 300Å for the Protein Columns.

Europa columns are available for:

Peptides: Europa C18 with 0.21, 0.30, 0.40, 0.46, 0.78, 1.0 and 2.12 cm.

Proteins: Europa C18, C8 and C4 with 0.21, 0.30, 0.40, 0.46, 0.78, and 2.12 cm.

Purity of silica

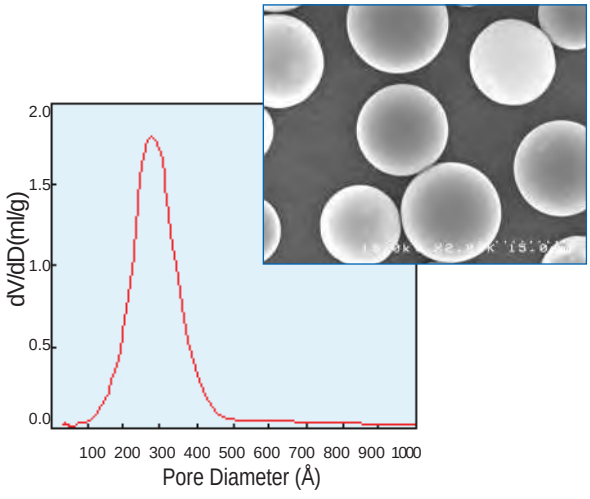
The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

For most reverse-phase silica packings, these nanopores are not properly chemically bonded, endcapped or deactivated. So when nanopores are accessible to the peptides and proteins, surface-peptide and protein interactions frequently dominate. These interactions often result in a decrease of column efficiency.

Europa HPLC Column for Peptides and Proteins

Europa Protein C4 Pore Distribution

Europa Protein C 4 300



Deactivation Process

Thanks to our propietary new Multifunctional Endcapping Deactivation (MED) technology used with our popular HPLC columns Mediterranea™ Sea 18, we obtain with the Europa packing a specially designed C4, C8 and C18 ligand configuration, that blocks practically all the active centres that may have remained on the surface of the silica.

As a result of this, Europa columns have an unusual low level of silanol activity, helping you to obtain symetrical peaks for the most basic and acidic compounds. The improved high density bonding and full endcapping make them suitable to separate or purify low molecular weight compounds (especially small peptides when using Europa Peptide column 120 Å) and separate or purify high molecular weight compounds, especially proteins when using Europa Protein column 300 Å.

Europa C 18 bonding chemistries will help you to achieve an extraordinary resistance and column lifetime when running at extreme pH levels.

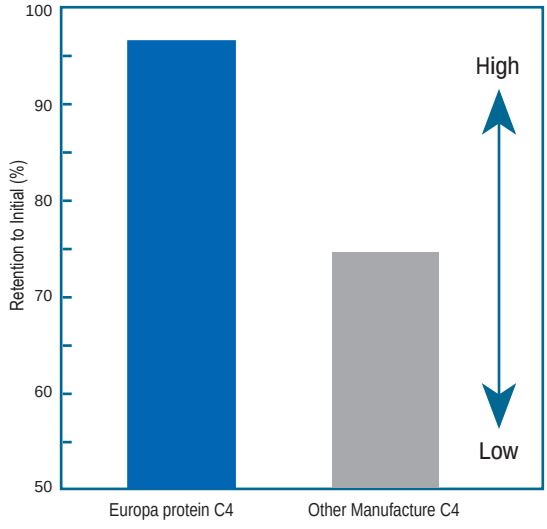
Wide pH Range

Using Europa C 18 packing materials it is possible to work with eluents from pH 1 to pH 12. Such unusual pH resistance values have been achieved as a result of phase bonding efficiency and a propietary endcapping process which provides a protective shield against acidic and basic eluents.
Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and can be used for an extended period of time.

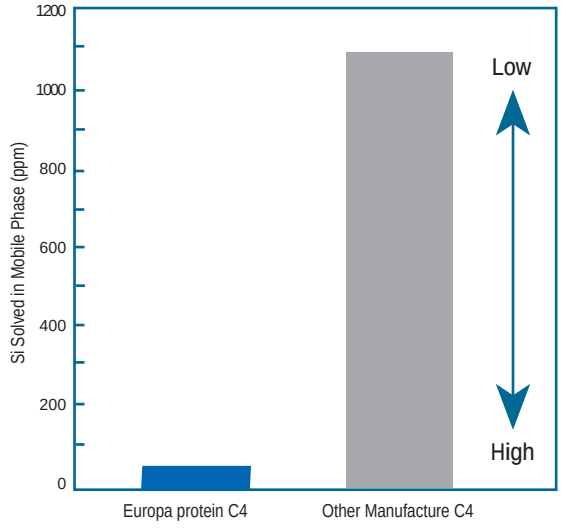
Europa Protein C4 Phase Stability

Phase stability of Europa Protein C4 columns has been checked purging one 25 x 0.78 cm column either with CH3CN/1%TFA 10:90 (pH=1)during 15 hours at 0.9 ml/min or with CH3CN/20 mM Na3PO4 10:90 (pH=12) during 3 hours at 1.7 ml/min.

Acid Resistance pH=1



Alkalil Resistance pH=12

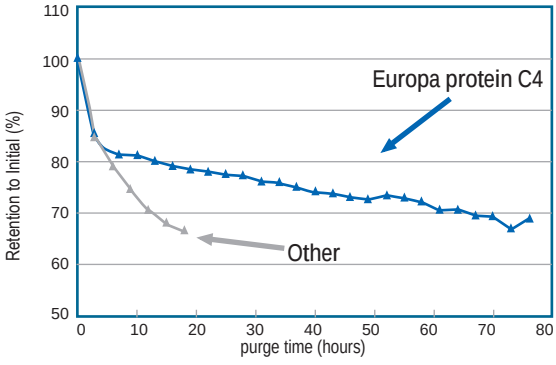


Europa HPLC Column for Peptides and Proteins

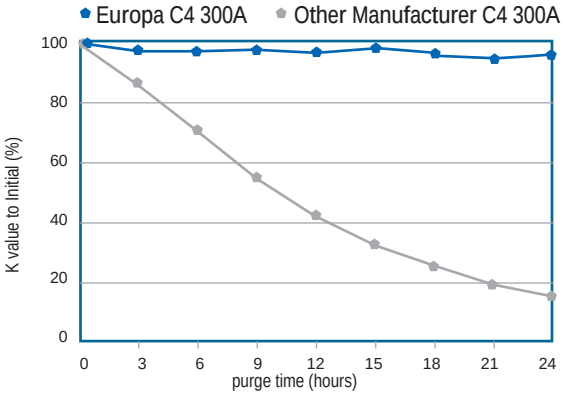
Durability comparison in Alkaline Medium/RT

The graphic bellow shows the durability of the column after more than 80 hours of purge time passing through one Europa Protein C4 column a flow rate of 1.0 ml of alkaline solution at pH 12, CH3CN/0.01NaOH 10/90 .

There is represented in the graphic the retention time of naftalene after every three hours of purge, using CH3CN / H2O 35:65 at 1.7 ml/min and 40ºC (UV detection at 254 nm). It is seen that after 80 hours, Europa columns still perform very well.

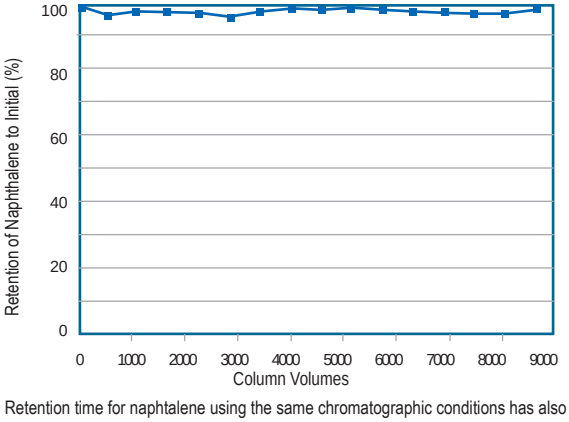


Durability comparison in Acidic Medium / *K value*



Durability of Europa C4 has also been compare against other manufacturers using a 15 x 0.46 cm column and CH3CN / 1.0% TFA in water 10:90 (pH=1) at 70ºC, and checking K values for naftalene every 3 hours.

Durability under Acidic Contition



Retention time for naphtalene using the same chromatographic conditions has also been controlled after up to 9000 column volumes of CH3CN / 0.05% TFA in water (pH=2) at a flow rate of 1.0 ml/min at room temperature. Column size was 15 x 0.46 cm

Europa C18 Peptide HPLC columns

We invite you to try our Europa C18 peptide column when you experience unsatisfactory results with your favorite column.

Europa C18 Peptide columns are suitable to separate or purify low molecular weight compounds, especially small peptides.

Europa HPLC columns for peptides provide a high performance that is unsurpassed in efficiency, reliability and reproducibility. Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today. Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and longer column life.

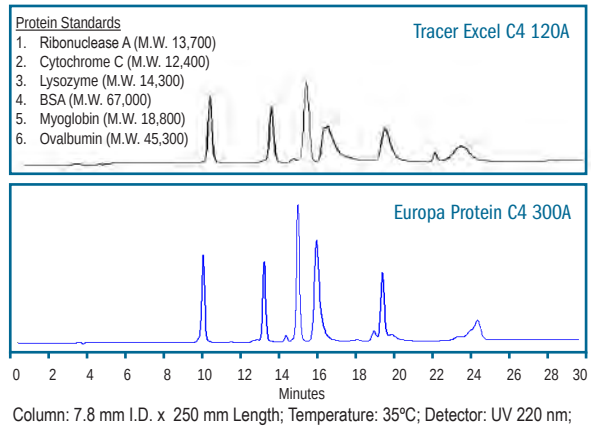
Our **"Ultra-Fast"** columns are made in 3-5 cm length in order to get quick analytical results, whereas the **"High Efficiency"** columns are normally in 15-25cm lengths to obtain the best resolution.

Specifications:

- Ultra high purity, totally spherical silica gel
- High density bonding for extreme performance proprietary fully end-capped silica
- Porous Size: 120 Å, narrow particle size distribution
- Surface Area 300 m^2/g
- % of Carbon 19 %
- High loading capacity of crude peptides
- Stable under basic and extreme acidic conditions
- Packed with 5µm sized silica particles

Microbore Columns are available in: 0.21, 0.30 cm ID
Analytical Columns are available in: 0.40 and 0.46 cm ID
Semi-Prep Columns are available in: 0.78 and 1.0 cm
Prep Columns are available in: 2.1 cm ID
Larger diameter available by request

Influence of Pore size in Peak Shape



Column: 7.8 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm; Mobile Phase: A) CH3CN/H2O/TFA = 20/80/0.1, B) CH3CN/H2O/TFA = 60/40/0.1, Linear Gradient from A to B in 25 min and hold for 10 min; Flow Rate: 1.7 ml/min.

Europa HPLC Column for Peptides and Proteins

Europa packaging

Europa C18 Peptide Analytical HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Peptide 120	C18	5	3	0.46	TR-010116
Europa Peptide 120	C18	5	4	0.46	TR-010117
Europa Peptide 120	C18	5	5	0.46	TR-010118
Europa Peptide 120	C18	5	10	0.46	TR-010119
Europa Peptide 120	C18	5	15	0.46	TR-010120
Europa Peptide 120	C18	5	20	0.46	TR-010121
Europa Peptide 120	C18	5	25	0.46	TR-010122
Europa Peptide 120	C18	5	3	0.40	TR-010123
Europa Peptide 120	C18	5	4	0.40	TR-010124
Europa Peptide 120	C18	5	5	0.40	TR-010125
Europa Peptide 120	C18	5	10	0.40	TR-010126
Europa Peptide 120	C18	5	15	0.40	TR-010127
Europa Peptide 120	C18	5	20	0.40	TR-010128
Europa Peptide 120	C18	5	25	0.40	TR-010129

Europa C18 Peptide Microbore HPLC Colums

Columns are particularly designed for LC/MS applications.
The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Peptide 120	C18	5	3	0.21	TR-010130
Europa Peptide 120	C18	5	5	0.21	TR-010131
Europa Peptide 120	C18	5	10	0.21	TR-010132
Europa Peptide 120	C18	5	15	0.21	TR-010133
Europa Peptide 120	C18	5	20	0.21	TR-010134
Europa Peptide 120	C18	5	3	0.30	TR-010135
Europa Peptide 120	C18	5	5	0.30	TR-010136
Europa Peptide 120	C18	5	10	0.30	TR-010137
Europa Peptide 120	C18	5	15	0.30	TR-010138
Europa Peptide 120	C18	5	20	0.30	TR-010139
Europa Peptide 120	C18	5	25	0.30	TR-010140

Europa C18 Peptide Semi Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Peptide 120	C18	5	10	0.78	TR-010141
Europa Peptide 120	C18	5	15	0.78	TR-010142
Europa Peptide 120	C18	5	25	0.78	TR-010143
Europa Peptide 120	C18	5	10	1.00	TR-010144
Europa Peptide 120	C18	5	15	1.00	TR-010145
Europa Peptide 120	C18	5	25	1.00	TR-010146

Europa C18 Peptide Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Peptide 120	C18	5	5	2.12	TR-010147
Europa Peptide 120	C18	5	10	2.12	TR-010148
Europa Peptide 120	C18	5	15	2.12	TR-010149
Europa Peptide 120	C18	5	25	2.12	TR-010150

Europa HPLC Column for Peptides and Proteins

Europa C18 Protein HPLC Columns

We invite you to try our Europa C18 Protein column when you experience unsatisfactory results with your favorite column.

Europa C18 Protein columns are designed and manufactured for identification and purification of proteins and for compounds with high molecular weight.

Europa HPLC columns for proteins provide a high performance that is unsurpassed in efficiency, reliability and reproducibility. Manufactured using novel proprietary technologies, analytical and preparative Europa columns are simply the best reverse phase columns available today.
Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and longer column life.

Our **"Ultra-Fast"** columns are made in 3-5 cm length in order to get quick analytical results, whereas the **"High Efficiency"** columns are normally in 15-25 cm lengths to obtain best resolution.

Specifications:

- Ultra high purity totally spherical silica gel provide a high resolution and excellent peak shape
- High loading capacity of crude proteins
- High density bonding for extreme performance proprietary fully end-capped silica
- Stable, featuring extended acidic and basic conditions
- Silica properties: ultra pure and totally spherical narrow distribution range and high density
- Fully end-capped silica
- Porous Size: 300Å narrow particle size distribution
- Surface Area 100 m^2/gr.
- % of Carbon 7 %
- Packed with 5µm sized silica particles
- Available as C4, C8, and C18 columns
- Microbore Columns are available in: 0.21, 0.30 cm I.D. Analytical Columns in: 0.40 and 0.46cm I.D. Semi-Prep in: 0.70-1.0cm Prep Columns in: 2.1cm and larger diameter by request

Europa C18 Protein Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C18	5	5	2.12	TR-010217
Europa Protein 300	C18	5	10	2.12	TR-010218
Europa Protein 300	C18	5	15	2.12	TR-010219
Europa Protein 300	C18	5	25	2.12	TR-010220

Europa C18 Protein Analytical HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C18	5	3	0.46	TR-010158
Europa Protein 300	C18	5	4	0.46	TR-010159
Europa Protein 300	C18	5	5	0.46	TR-010160
Europa Protein 300	C18	5	10	0.46	TR-010161
Europa Protein 300	C18	5	15	0.46	TR-010162
Europa Protein 300	C18	5	20	0.46	TR-010163
Europa Protein 300	C18	5	25	0.46	TR-010164
Europa Protein 300	C18	5	3	0.40	TR-010172
Europa Protein 300	C18	5	4	0.40	TR-010173
Europa Protein 300	C18	5	5	0.40	TR-010174
Europa Protein 300	C18	5	10	0.40	TR-010175
Europa Protein 300	C18	5	15	0.40	TR-010176
Europa Protein 300	C18	5	20	0,40	TR-010177
Europa Protein 300	C18	5	25	0.40	TR-010178

Europa C18 Protein Microbore HPLC Colums

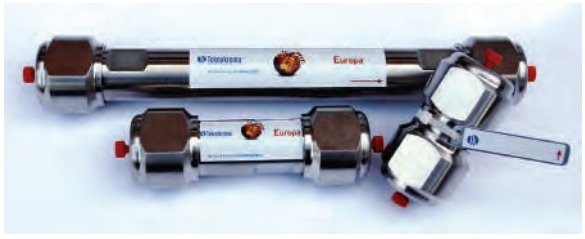
Columns are particularly designed for LC/MS applications.
The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C18	5	3	0.21	TR-010184
Europa Protein 300	C18	5	5	0.21	TR-010185
Europa Protein 300	C18	5	10	0.21	TR-010186
Europa Protein 300	C18	5	15	0.21	TR-010187
Europa Protein 300	C18	5	20	0.21	TR-010188
Europa Protein 300	C18	5	3	0.30	TR-010195
Europa Protein 300	C18	5	5	0.30	TR-010196
Europa Protein 300	C18	5	10	0.30	TR-010197
Europa Protein 300	C18	5	15	0.30	TR-010198
Europa Protein 300	C18	5	20	0.30	TR-010199
Europa Protein 300	C18	5	25	0.30	TR-010200

Europa C18 Protein Semi-Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C18	5	10	0.70	TR-010211
Europa Protein 300	C18	5	5	0.70	TR-010212
Europa Protein 300	C18	5	25	0.70	TR-010213
Europa Protein 300	C18	5	10	1.00	TR-010214
Europa Protein 300	C18	5	15	1.00	TR-010215
Europa Protein 300	C18	5	25	1.00	TR-010216

Europa HPLC Column for Peptides and Proteins



Semi preparative and Preparative Europa HPLC Columns

Europa C8 Protein HPLC Columns

Europa C8 columns are recommended for compounds too strongly retained on C18 Phases.

Europa C8 Protein Analytical HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	3	0.46	TR-010151
Europa Protein 300	C8	5	4	0.46	TR-010152
Europa Protein 300	C8	5	5	0.46	TR-010153
Europa Protein 300	C8	5	10	0.46	TR-010154
Europa Protein 300	C8	5	15	0.46	TR-010155
Europa Protein 300	C8	5	20	0.46	TR-010156
Europa Protein 300	C8	5	25	0.46	TR-010157
Europa Protein 300	C8	5	3	0.40	TR-010165
Europa Protein 300	C8	5	4	0.40	TR-010166
Europa Protein 300	C8	5	5	0.40	TR-010167
Europa Protein 300	C8	5	10	0.40	TR-010168
Europa Protein 300	C8	5	15	0.40	TR-010169
Europa Protein 300	C8	5	20	0,40	TR-010170
Europa Protein 300	C8	5	25	0.40	TR-010171

Europa C8 Protein Microbore HPLC Colums

Columns are particularly designed for LC/MS applications.
The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Europa C8 columns are recommended for compounds too strongly retained on C18 Phases.

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	3	0.21	TR-010179
Europa Protein 300	C8	5	5	0.21	TR-010180
Europa Protein 300	C8	5	10	0.21	TR-010181
Europa Protein 300	C8	5	15	0.21	TR-010182
Europa Protein 300	C8	5	20	0.21	TR-010183
Europa Protein 300	C8	5	3	0.30	TR-010189

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	5	0.30	TR-010190
Europa Protein 300	C8	5	10	0.30	TR-010191
Europa Protein 300	C8	5	15	0.30	TR-010192
Europa Protein 300	C8	5	20	0.30	TR-010193
Europa Protein 300	C8	5	25	0.30	TR-010194

Europa C8 Protein Semi-Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	10	0.70	TR-010201
Europa Protein 300	C8	5	15	0.70	TR-010202
Europa Protein 300	C8	5	25	0.70	TR-010203
Europa Protein 300	C8	5	10	1.00	TR-010204
Europa Protein 300	C8	5	15	1.00	TR-010205
Europa Protein 300	C8	5	25	1.0	TR-010206

Europa C8 Protein Preparative HPLC Colums

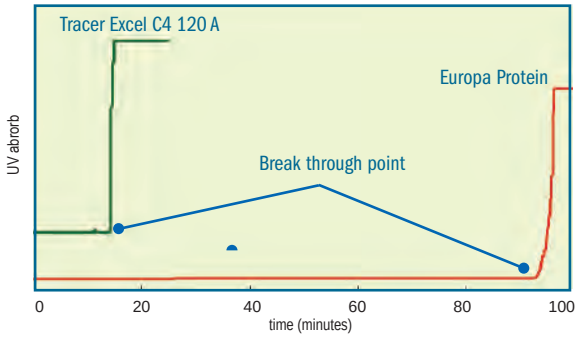
Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	5	2.12	TR-010207
Europa Protein 300	C8	5	10	2.12	TR-010208
Europa Protein 300	C8	5	15	2.12	TR-010209
Europa Protein 300	C8	5	25	2.12	TR-010210

For Guard Columns please refer to pages 209-211

Europa C4 Protein HPLC Columns

Europa Protein C4 300 A - Loading Capacity of BSA

Protein 300 exhibited the highest loading capacity for proteins

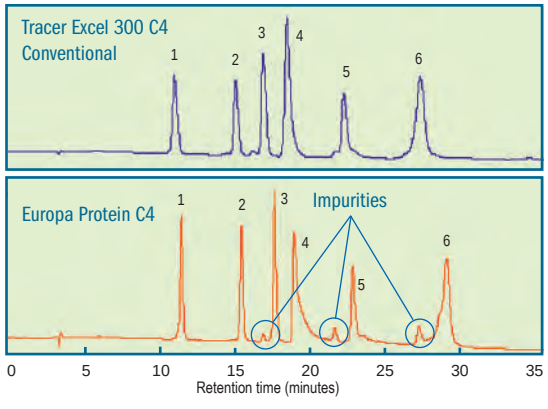


Column: 7 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

Europa Protein C4 300 A - Protein Separation Behaviors

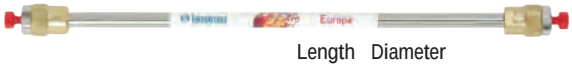
- Similar Hydrophobic Selectivity
- Higher Resolution

Protein Standards
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)



Colum: 6 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm;
Mobile Phase: A) CH3CN/H2O/TFA = 20/80/0.1, B) CH3CN/H2O/TFA = 60/40/0.1,
Linear Gradient from A to B in 25 min and hold for 10 min; Flow Rate: 1.7 ml/min.

Europa C4 Protein Analytical HPLC Colums



Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C4	5	3	0.46	TR-010081
Europa Protein 300	C4	5	4	0.46	TR-010082
Europa Protein 300	C4	5	5	0.46	TR-010083
Europa Protein 300	C4	5	10	0.46	TR-010084
Europa Protein 300	C4	5	15	0.46	TR-010085
Europa Protein 300	C4	5	20	0.46	TR-010086
Europa Protein 300	C4	5	25	0.46	TR-010087

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C4	5	3	0.40	TR-010088
Europa Protein 300	C4	5	4	0.40	TR-010089
Europa Protein 300	C4	5	5	0.40	TR-010090
Europa Protein 300	C4	5	10	0.40	TR-010091
Europa Protein 300	C4	5	15	0.40	TR-010092
Europa Protein 300	C4	5	20	0.40	TR-010093
Europa Protein 300	C4	5	25	0.40	TR-010094

Europa C4 Protein Microbore HPLC Colums

Columns are particularly designed for LC/MS applications.
The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C4	5	3	0.21	TR-010095
Europa Protein 300	C4	5	5	0.21	TR-010096
Europa Protein 300	C4	5	10	0.21	TR-010097
Europa Protein 300	C4	5	15	0.21	TR-010098
Europa Protein 300	C4	5	20	0.21	TR-010099
Europa Protein 300	C4	5	3	0.30	TR-010100
Europa Protein 300	C4	5	5	0.30	TR-010101
Europa Protein 300	C4	5	10	0.30	TR-010102
Europa Protein 300	C4	5	15	0.30	TR-010103
Europa Protein 300	C4	5	20	0.30	TR-010104
Europa Protein 300	C4	5	25	0.30	TR-010105

Europa C4 Protein Semi-Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C4	5	10	0.78	TR-010106
Europa Protein 300	C4	5	15	0.78	TR-010107
Europa Protein 300	C4	5	25	0.78	TR-010108
Europa Protein 300	C4	5	10	1.00	TR-010109
Europa Protein 300	C4	5	15	1.00	TR-010110
Europa Protein 300	C4	5	25	1.00	TR-010111

Europa C4 Protein Preparative HPLC Colums

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C4	5	5	2.12	TR-010112
Europa Protein 300	C4	5	10	2.12	TR-010113
Europa Protein 300	C4	5	15	2.12	TR-010114
Europa Protein 300	C4	5	25	2.12	TR-010115

Tracer Excel™

TRACER EXCEL™ is a range of totally new packings that employ the most advanced procedures of synthesis and chemical functionalization, resulting in some column packings that completely surpass other silica-based packings on the market.

To manufacture the silica particle, the basis of all TRACER EXCEL packings, we begin with materials of extreme purity and follow strictly controlled processes. In this way, we get a totally porous, spherically perfect particle, without surface irregularities and with an extremely low content of metals (Al, Fe, Ti and Zn).

The rigorous control of the process variables also allows us to obtain a material with a perfectly reproducible porosity and surface area, and with a practical absence of micropores. In other competitors' packings, these micropores cause chromatographic problems due to incomplete substitution of the support, while with TRACER EXCEL packings micropores are totally eliminated.

We are therefore able to offer you a complete line of HPLC packings with characteristics of reproducibility, purity, deactivation, fluido-dynamic behaviour and chemical and physical stability that are difficult to beat.

- Exceptional batch-to-batch reproducibility.
- Ultra-pure silica.
- Extremely low content of metals.
- Perfect sphericity.
- Meticulously controlled materials.
- Maximum pH range (between 1.5 and 11.0)
- 3, 5 and 10 µm particles
- Easily scaled-up, from microbore to preparative HPLC.
- Available with 300A pore size for biochromatography.
- Exceptional long lifetime.
- Wide range of packings.
- Fully deactivated after functional bonding.

TRACER EXCEL ODS-A

TRACER EXCEL ODS-A is a totally endcapped packing, notable for its extreme level of deactivation. This minimizes undesirable interactions when chromatographing strongly acidic or basic analytes or chelating compounds.

Additionally TRACER EXCEL ODS-A columns show extraordinary resistance to extreme pH values, between 1.5 to 11.0.

Maximum Stability

The chemical and structural stability of TRACER EXCEL columns leads to long useful lifetimes, even under extreme conditions where columns of most major manufacturers would suffer rapid degradation.

Total deactivation

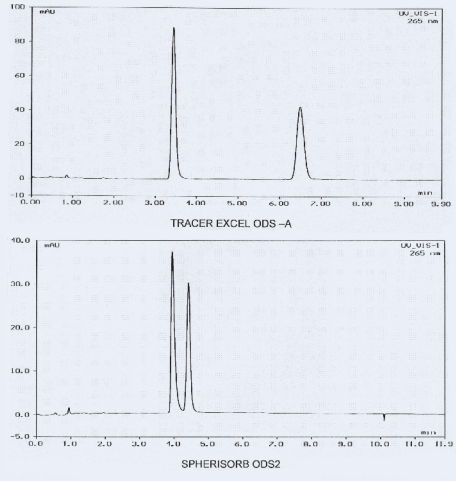
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

If the silica particle also contains significant quantities of metals, these markedly increase the acidity of these surface silanols, keeping them ionized even at low pHs. These conditions can cause deleterious effects on eluting chromatographic peaks.

The Pyridine/Phenol test is an excellent marker of the presence of these surface silanols. Under ideal conditions, the pyridine peak should elute before the phenol peak and should also elute with total symmetry without tailing. Furthermore, a broader separation between the two peaks indicates superior deactivation.

The TRACER EXCEL ODS-A column complies with the pyridine/phenol test better than other columns from major manufacturers. This demonstrates the extraordinary deactivation achieved with TRACER EXCEL ODS-A columns. Another test that demonstrates the quality of TRACER EXCEL ODS-A columns is the acidic compounds test. This type of compound yields evidence of the presence of chelating centres or points of ionic interchange that may be present in the silica particle.

Pyridine/Phenol test



Conditions of test

Eluant : Acetonitrile/Water, 30/70 1ml/min
Lambda: 265nm

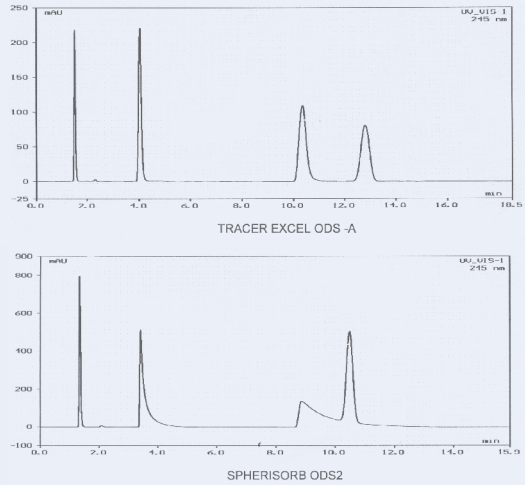
Composition:

Pyridine 2.1µl/ml
Phenol:14 mg/m

TRACER EXCEL columns show perfectly symmetrical peaks in contrast to the significant tailing which appears when this test is done with other columns on the market. Symmetrical peaks are achieved even when separating basic compounds.

Once again, TRACER EXCEL columns show, thanks to their exceptional level of deactivation, excellence in obtaining perfectly symmetrical peaks where other columns on the market clearly fail (giving peaks with pronounced tails or even irreversible adsorption).

Acid Compounds Test



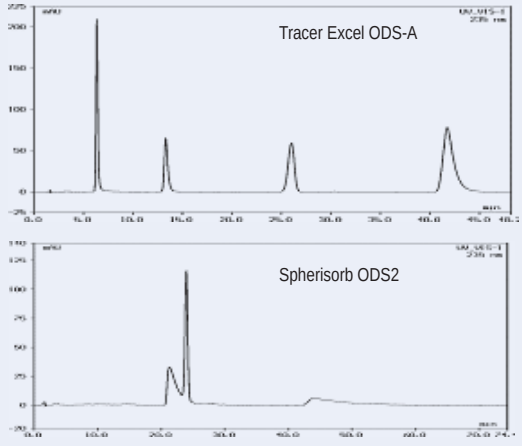
Conditions of test

Eluant : 20 mM KH2PO4pH3.2/CH3CN 65:35
1 ml/min. Temp 40ºC UV 245nm

Composition:

Uracil: 0.5mg/ml
Benzoic acid: 3.6 mg/ml
p-Ethylbenzoic acid: 0.9 mg/ml
Methylbenzene:3.0 mg/ml

Basic Compounds Test



Conditions of test

Tracer Excel ODS-A
Eluant : 20 mM KH2PO4pH7/CH2CN 35:65
1 ml/min. Temp 25ºC UV 235nm

Composition:

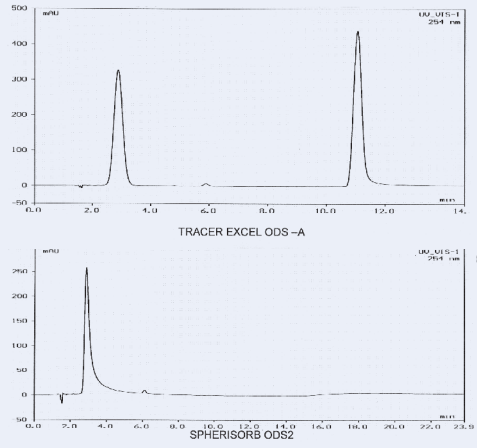
Propanolol: 0.08mg/ml
Diphenidramine :1.28 mg/ml
Acetonaphthalene: 0.2 mg/ml
Amyltryptilene: 0.3 mg/ml

Purity of material

All of the advantages of TRACER EXCEL columns have as a base the quality of the silica particle. No bonding process can mask silica of inferior quality. Only silica particles absolutely free of metallic impurities, with a pore-size and pore-distribution absolutely controlled and synthesized through fully optimized processes, can give bonded packings of the highest grade.

The 8-quinolinol/acetylacetone test demonstrates the difference in chromatographic behavior between TRACER EXCEL ODS-A and a competitor's column with a high content of metallic impurities for the chelating compound 8-quinolinol.

Metalic Trace Test



Conditions of test

Tracer Excel ODS-A
Eluant : 10 mM KH2PO4pH6.8/Metanol 60:40
1 ml/min. Temp 30ºC UV 254nm

Composition:

8-Quinolinol: 0.5mg/ml
Actetylacetone: 0.5mg/ml

Reproductibility

The high productivity which is now needed in analytical and governmental laboratories oblige everyone to use reliable HPLC equipment and reproducible columns.

TRACER EXCEL columns were developed with the final objective of achieving the very highest quality and reproducibility. Teknokroma's numerous and stringent process controls for every batch of packing fully guarantees high quality and exceptional reproducibility.

Tracer Excel ODS-B

TRACER EXCEL ODS-B

- Compatible with 100% aqueous eluant.
- Especially suitable for the separation of hydrophilic compounds.
- Strong retention in aqueous eluants.
- Long useful life with aqueous eluants
- Selectivity complementary to TRACER EXCEL ODS-A
- High mechanical stability
- Maximum versatility.

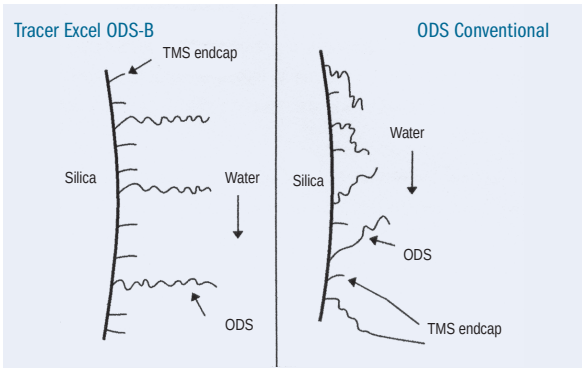
Based on the same principles as the TRACER EXCEL ODS-A columns, the TRACER EXCEL ODS-B column presents a high selectivity for hydrophilic and polar compounds, which are poorly retained on conventional ODS columns.

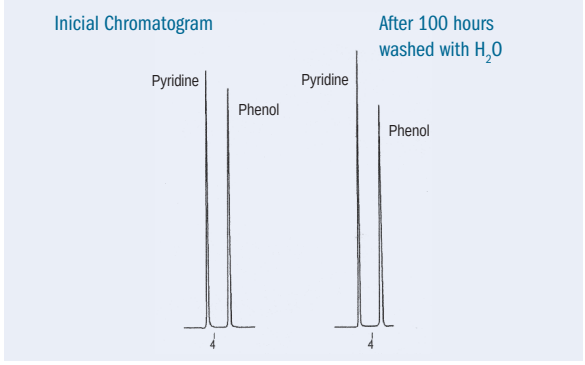
A special modification in the process of functionalizing the pure silica particle prevents the collapsing effect of the C18 chains when working with mainly aqueous eluants. So you can work with excellent chromatographic performance even when the percentage of the aqueous phase is 100%.

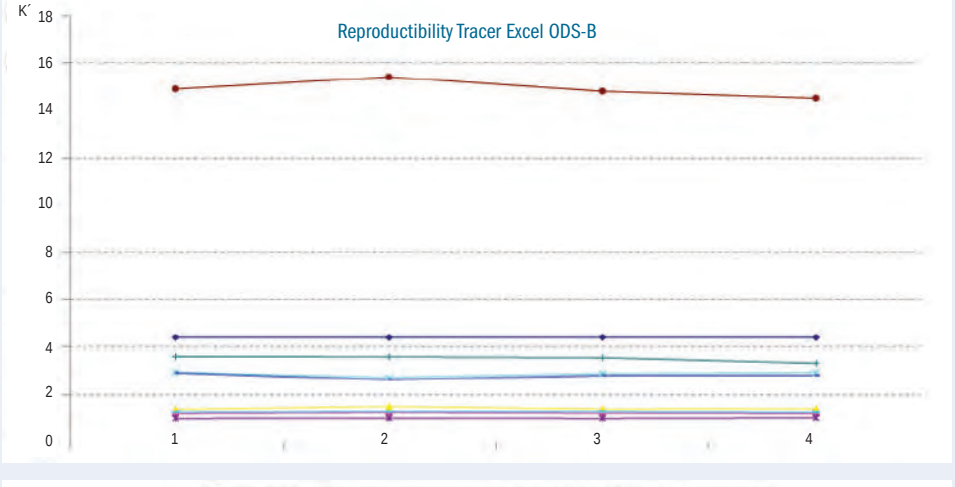
EFFECT OF AQUEOUS ELUTANTS ON THE ORGANIZATION OF HYDROCARBON CHAINS.

Generally, its field of application is the same as that of the TRACER EXCEL ODS-A, but its field of application is extended for samples which are especially difficult for conventional reversed phases, as is the case in separating oligosaccharides, amino acids, nucleotides and organic acids.

The special chromatographic conditions of TRACER EXCEL ODS-B also provide a specific selectivity for compounds which contain slightly polar groups in their structure.
This column is especially recommended for LC-MS in that, in many cases, the use of plugs or ionic blocking agents are avoided, which negatively affect detection when this technique is used.
As shown in the chromatogram, after more than 100 hours of operations with water no alteration is observed in retention times, selectivity or distortion in the peaks of pyridine and phenol - a clear indication that no collapse of the bonded phase functionality is adversely achieved with TRACER EXCEL ODS-B columns. Interestingly, the collapsing of bonded phase functionality with the majority of reversed phase columns on the market is typical under these conditions.



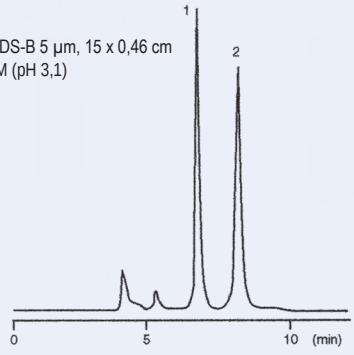




Antioxidants

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0,46 cm
Eluant: Phosphate Plug 0,1 M (pH 3,1)
Flow: 0,6 ml/min.
Detector: ECD

Sample: 1 Ascorbic Acid
2 GSH



Water Soluble Vitamins

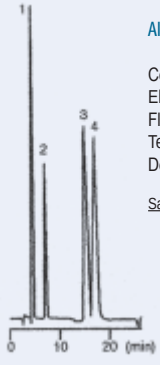
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0,46 cm
Eluant: Phosphate Plug 20 mM (pH 70)CH_3CN 95/5 cm
Flow: 0.6 ml/min.
Detector: UV 210 nm

Sample: 1 Calcium Pantothenate
2 Pyridoxine hydrochloride (B_6)
3 Nicotinamide

Glycolid Acid and Latic Acid

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: H_3PO_4 0.1%
Flow: 0.6 ml/min.
Temperature: 40ºC
Detector: UV 210 nm

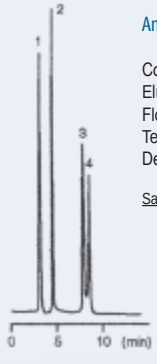
Sample: 1 Glycolic Acid
2 Lactic Acid



Alcohols

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0,46 cm
Eluant: H_2O
Flow: 0,6 ml/min.
Temperature: 40ºC
Detector: RID

Sample: 1 Methanol
2 Ethanol
3 Iso-Propanol
4 n-propanol



Aminoacids

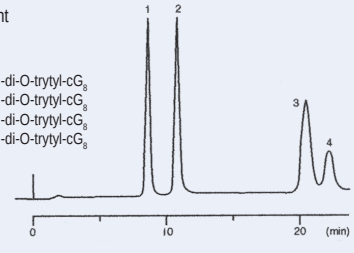
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: H_2O
Flow: 0.6 ml/min.
Temperature: 40ºC
Detector: RID

Sample: 1 Alanine
2 Valine
3 Isoleucine
4 Leucine

Cyclodextrin derivatives

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: MeOH/H_2O 70:30
Flow: 0.6 ml/min.
Temperature: ambient
Detector: UV240 nm

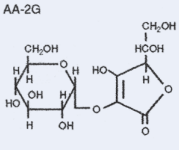
Sample: 1 6^1, 6^5 -di-O-trytyl-cG_8
2 6^1, 6^4 -di-O-trytyl-cG_8
3 6^1, 6^3 -di-O-trytyl-cG_8
4 6^1, 6^2 -di-O-trytyl-cG_8

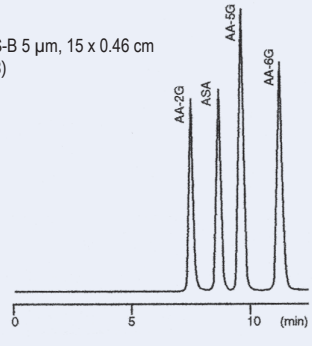


Ascorbic Acid and Glycosides

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: Phosphate Plug (pH 3,8)
Flow: 04 ml/min.
Temperature: Ambient
Detector:UV240 nm

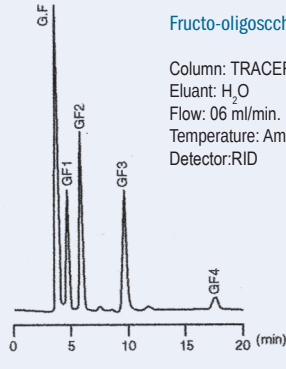
AA-2G





Fructo-oligosccharides

Column: TRACER EXCEL ODS-B 5 µm, 15 x 0,46 cm
Eluant: H_2O
Flow: 06 ml/min.
Temperature: Ambient
Detector:RID



Other Tracer Excel Packings

The extraordinary qualities of TRACER EXCEL packings have been extended to a full range of operations,covering practically all the chromatographer's needs.

Si	Material of the ultrapure silica particle,the basis of all the TRACER EXCEL range.
C8	This packing,made operative with octyl groups and totally endcapped,is extremely versatile. Its use is recommended for highly hydrophobic samples,which are retained excessively on ODS type packings. Developed on the same ultrapure silica as ODS-A and ODS-B,it is extremely reproducible and reliable.
C4	The same ultra pure silica of all the TRACER EXCEL range made operative with butyl groups,giving a moderately hydrophobic packing. Its principle field of application is the separation of peptides and proteins by reverse phase. In this case,the same packing is used with a 300 A porosity,more suitable for the large size of protein molecules. Another field where this packing can be highly recommended is when the sample contains compounds of a very different hydrophobic nature. This packing permits perfect separation of a sample with a single injection.
C1	The same ultrapure silica of the TRACER EXCEL range is given its special function with tri-methylchlorosilane to create a low hydrophobic reversed phase. Its field of application includes the separation of peptides and proteins by reversed phase. It can also be used as a packing for normal phase with highly polar compounds.
CN	The type CN packings are much appreciated as alternatives to ODS-type packings for their special selectivity , as well as for the possibility they offer for working in both chromatographic modes,normal and reverse phase. However, in comparison with the latter,they have always been characterised by a lesser reproducibility and a notably shorter useful life. Thanks to the extraordinary level of quality of the silica of the particle and the optimization reached by the actuating processes, the new packing TRACER EXCEL 120 CN has satisfactorily overcome these limitations, so giving the chromatogapher a completely reliable alternative. As a normal phase it is an excellent alternative to unsubstituted silica, given that retention times are much more reproducible, equilibration times much more rapid, and it does not suffer the problems of de-activation of silica itself.
NH_2	This packing, with chemically bonded groups of aminopropyl silane, can be used as a phase normal or reverse phase packing depending on the eluant used. It is recommended for separations of basic compounds under normal phase conditions. Additionally, the reactivity of the amino group makes it very suitable as a support for later modifications as for example in the synthesis of quiral phases. It is also very suitable for SFC applications
Ph	In the same way as the CN type packing, the packing substituted with dimethyl phenyl can be used in normal or reversed phase, being in this latter case a very useful alternative to ODS type packings since its aromatic groups give it a special selectivity when polar compounds are being chromatographed.
300 Angstrom	A complete range of packings with a pore diameter of 300 Angstrom units is available, ideal for undertaking separations of complex molecules of very high molecular weight, e.g. proteins and peptides.

General Properties of Tracer Excel Packings

	ODS-A	ODS-B	C8	C4	C1	CN	Ph	NH_2	SI
Size of pore in A units	120	120	120	120	120	120	120	120	120
Size of particle	3, 4, 5 & 10 µm	3, 4, 5 & 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm
Volume of pores in ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g
Surface area	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g
Purity of silica	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure
%C	17%	15%	10%	8%	5%	7%	9%	4%	
Type of phase	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional	Monofunctional and totally endcapped		Trifunctional	
Metallic impurities (Al, Fe, Ti, Zr)	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one

Tracer Excel 120

Analytical columns 0.4 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-416336	TR-416337	TR-416338	TR-416339	TR-416340
ODS-B	5	TR-416341	TR-416342	TR-416343	TR-416344	TR-416345
Si	5	TR-416356	TR-416357	TR-416358	TR-416359	TR-416360
C8	5	TR-416361	TR-416362	TR-416363	TR-416364	TR-416365
C4	5	TR-416366	TR-416367	TR-416368	TR-416369	TR-416370
C1	5	TR-416371	TR-416372	TR-416373	TR-416374	TR-416375
NH2	5	TR-416376	TR-416377	TR-416378	TR-416379	TR-416380
CN	5	TR-416381	TR-416382	TR-416383	TR-416384	TR-416385
Ph	5	TR-416386	TR-416387	TR-416388	TR-416389	TR-416390

Ultrarapid columns 0.4 cm I.D.
TRACER EXCEL 120/3 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	3	TR-413460	TR-413461	TR-413462	TR-413463	TR-413464
ODS-B	3	TR-413465	TR-413466	TR-413467	TR-413468	TR-413469
Si	3	TR-413470	TR-413471	TR-413472	TR-413473	TR-413474
C8	3	TR-413475	TR-413476	TR-413477	TR-413478	TR-413479
C4	3	TR-413480	TR-413481	TR-413482	TR-413483	TR-413484
C1	3	TR-413485	TR-413486	TR-413487	TR-413488	TR-413489
NH2	3	TR-413490	TR-413491	TR-413492	TR-413493	TR-413494
CN	3	TR-413495	TR-413496	TR-413497	TR-413498	TR-413499
Ph	3	TR-413500	TR-413501	TR-413502	TR-413503	TR-413504

Analytical columns 0.46 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-016336	TR-016337	TR-016338	TR-016339	TR-016340
ODS-B	5	TR-016341	TR-016342	TR-016343	TR-016344	TR-016345
Si	5	TR-016356	TR-016357	TR-016358	TR-016359	TR-016360
C8	5	TR-016361	TR-016362	TR-016363	TR-016364	TR-016365
C4	5	TR-016366	TR-016367	TR-016368	TR-016369	TR-016370
C1	5	TR-016371	TR-016372	TR-016373	TR-016374	TR-016375
NH2	5	TR-016376	TR-016377	TR-016378	TR-016379	TR-016380
CN	5	TR-016381	TR-016382	TR-016383	TR-016384	TR-016385
Ph	5	TR-016386	TR-016387	TR-016388	TR-016389	TR-016390

Ultrarapid columns 0.46 cm I.D.
TRACER EXCEL 120/4 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-B	4	TR-016351	TR-016352	TR-016353	TR-016354	TR-016355

Ultrarapid columns 0.4 cm I.D.
TRACER EXCEL 120/4 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	4	TR-416346	TR-416347	TR-416348	TR-416349	TR-416350
ODS-B	4	TR-416351	TR-416352	TR-416353	TR-416354	TR-416355

Ultrarapid columns 0.46 cm I.D.
TRACER EXCEL 120/3 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	3	TR-013415	TR-013416	TR-013417	TR-013418	TR-013419
ODS-B	3	TR-013420	TR-013421	TR-013422	TR-013423	TR-013424
Si	3	TR-013425	TR-013426	TR-013427	TR-013428	TR-013429
C8	3	TR-013430	TR-013431	TR-013432	TR-013433	TR-013434
C4	3	TR-013435	TR-013436	TR-013437	TR-013438	TR-013439
C1	3	TR-013440	TR-013441	TR-013442	TR-013443	TR-013444
NH2	3	TR-013445	TR-013446	TR-013447	TR-013448	TR-013449
CN	3	TR-013450	TR-013451	TR-013452	TR-013453	TR-013454
Ph	3	TR-013455	TR-013456	TR-013457	TR-013458	TR-013459

Microbore columns 0.21 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-B	5	TR-021353	TR-021354
Si	5	TR-021395	TR-021364
C8	5	TR-021365	TR-021366
C4	5	TR-021367	TR-021368
C1	5	TR-021369	TR-021370
NH2	5	TR-021371	TR-021372
CN	5	TR-021373	TR-021374
Ph	5	TR-021375	TR-021376

Other configurations available on demand

Microbore columns 0.21 cm I.D.
TRACER EXCEL 120/3 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-A	3	TR-021407	TR-021408
ODS-B	3	TR-021409	TR-021410
Si	3	TR-021411	TR-021412
C8	3	TR-021413	TR-021414
C4	3	TR-021415	TR-021416
C1	3	TR-021417	TR-021418
NH2	3	TR-021419	TR-021420
CN	3	TR-021421	TR-021422
Ph	3	TR-021423	TR-021424

Other configurations available on demand

Tracer Excel 120

Analytical columns 0.3 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-A	5	TR-021355	TR-021356
ODS-B	5	TR-021357	TR-021358
Si	5	TR-021381	TR-021382
C8	5	TR-021383	TR-021384
C4	5	TR-021385	TR-021386
C1	5	TR-021387	TR-021388
NH2	5	TR-021389	TR-021390
CN	5	TR-021391	TR-021392
Ph	5	TR-021393	TR-021394

Other configurations available on demand

Microbore columns 0.3 cm I.D.
TRACER EXCEL 120/3 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-A	3	TR-021425	TR-021426
ODS-B	3	TR-021427	TR-021428
Si	3	TR-021429	TR-021430
C8	3	TR-021431	TR-021432
C4	3	TR-021433	TR-021434
C1	3	TR-021435	TR-021436
NH2	3	TR-021437	TR-021438
CN	3	TR-021439	TR-021440
Ph	3	TR021441	TR-021442

Other configurations available on demand

NOVAFIX™ Cartridge 0.4 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm		
Function	µm	7.5 cm	15 cm	25 cm
ODS-A	5	TR-015693	TR-015694	TR-015695
ODS-B	5	TR-015696	TR-015697	TR-015698
Si	5	TR-015705	TR-015706	TR-015707
C8	5	TR-015708	TR-015709	TR-015710
C4	5	TR-015714	TR-015715	TR-015716
C1	5	TR-015717	TR-015718	TR-015719
NH2	5	TR-015720	TR-015721	TR-015722
CN	5	TR-015723	TR-015724	TR-015725
Ph	5	TR-015726	TR-015727	TR-015728

Other configurations available on demand

NOVAFIX™ Cartridge 0.4 cm I.D.
TRACER EXCEL 120/3 µm

		Length cm		
Function	µm	7.5 cm	15 cm	25 cm
ODS-A	3	TR-016427	TR-016428	TR-015731
ODS-B	3	TR-015732	TR-015733	TR-015734
Si	3	TR-015735	TR-015736	TR-015737
C8	3	TR-015738	TR-015739	TR-015740
C4	3	TR-015741	TR-015742	TR-015743
C1	3	TR-015744	TR-015745	TR-015746
NH2	3	TR-015747	TR-015748	TR-015749
CN	3	TR-015750	TR-015751	TR-015752
Ph	3	TR-015753	TR-015754	TR-015755

Other configurations available on demand

Semi-preparative columns 0.78 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm	
Function	µm	15 cm	25 cm
ODS-A	5	TR-016167	TR-016168
ODS-B	5	TR-016171	TR-016172
Si	5	TR-016175	TR-016176
C8	5	TR-016179	TR-016180
C4	5	TR-016183	TR-016184
C1	5	TR-016187	TR-016188
NH2	5	TR-016191	TR-016192
CN	5	TR-016195	TR-016196
Ph	5	TR-016199	TR-016200

Other configurations available on demand

Semi-preparative columns 1.0 cm I.D.
TRACER EXCEL 120/5 µm

		Length cm	
Function	µm	15 cm	25 cm
ODS-A	5	TR-016169	TR-016170
ODS-B	5	TR-016173	TR-016174
Si	5	TR-016177	TR-016178
C8	5	TR-016181	TR-016182
C4	5	TR-016185	TR-016186
C1	5	TR-016189	TR-016190
NH2	5	TR-016193	TR-016194
CN	5	TR-016197	TR-016198
Ph	5	TR-016201	TR-016202

Tracer Excel 300

Analytical columns 0.46 cm I.D.
TRACER EXCEL 300/5 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-016400	TR-016401	TR-016402	TR-016403	TR-016404
C8	5	TR-016400	TR-016406	TR-016407	TR-016408	TR-016409
C4	5	TR-016400	TR-016411	TR-016412	TR-016413	TR-016414

Analytical columns 0.4 cm I.D.
TRACER EXCEL 300/5 µm

		Length cm				
Function	µm	4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-416400	TR-416401	TR-416402	TR-416403	TR-416404
C8	5	TR-416405	TR-416406	TR-416407	TR-416408	TR-416409
C4	5	TR-416410	TR-416411	TR-416412	TR-416413	TR-416414

Analytical columns 0.21 cm I.D.
TRACER EXCEL 300/5 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-A	5	TR-012395	TR-012396
C8	5	TR-012397	TR-012398
C4	5	TR-012399	TR-012400

Analytical columns 0.3 cm I.D.
TRACER EXCEL 300/5 µm

		Length cm	
Function	µm	10 cm	20 cm
ODS-A	5	TR-021401	TR-021402
C8	5	TR-021403	TR-021404
C4	5	TR-021405	TR-021406

NOVAFIX™ Cartridge System 0.4 cm I.D.
TRACER EXCEL 300/5 µm

		Length cm		
Function	µm	7.5 cm	15 cm	25 cm
ODS-A	5	TR-416417	TR-416418	TR-416419
C8	5	TR-416420	TR-416421	TR-416422
C4	5	TR-416423	TR-416424	TR-416425

For Guard Columns please refer to pages 209-211

The new range of Tracer Extrasil packings has been specially developed to replace one of the most popular packings on the market (WS).
All the physical and chromatographic parameters evaluated show a total equivalence between both materials, and what is more important, this has been certified by the excellent results obtained by the many users who upto now have tried this packing.

Economy

Tracer Extrasil represents the most economical choice of HPLC packings.

Reproducibility

An advanced manufacturing process and a strict control of each one of its steps ensures a maximum reproducibility and efficiency in every one of the columns.

Guarantee

The confidence we have in our product enables us to offer a complete guarantee on these columns, so that if for any reason whatever a client thinks that a TRACER EXTRASIL column does not operate in an identical manner to the equivalent WS packing, we will refund his money.

Characteristics of the material

As shown in the following table,the new packing TRACER EXTRASIL is perfectly equivalent to the reference material in all its physicochemical characteristics.

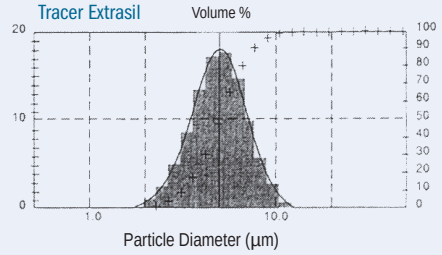
Characteristics

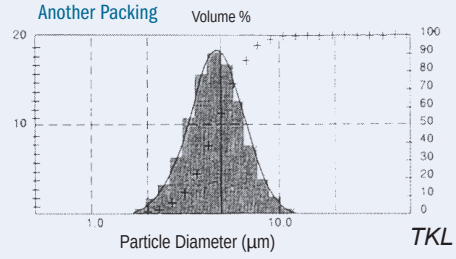
Tracer Extrasil **3,5 & 10 µm** 80 A 220 m^2/g	**Particle Size** **Pore Size** Surface area Carbon content	**WS Packing** **3,5 & 10 µm** 80 A 220 m^2/g
4%	C1	4%
6%	C6	6%
6%	C8	6%
7%	ODS-1	7%
12%	ODS-2	12%
3,5%	CN	3,5%
2%	NH2	2%
3,0%	Phenyl	3,0%
-	8AX	-
-	SCX	-

Distribution of particle size

In the development of this new material there has been special care in optimization of the size of the particle, given that this control is essential to get the best efficiency and stability in the packing.

The comparison made with the WS packing shows once more the total equivalence of these two materials.



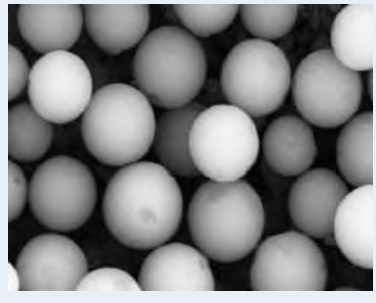


TKL 10015

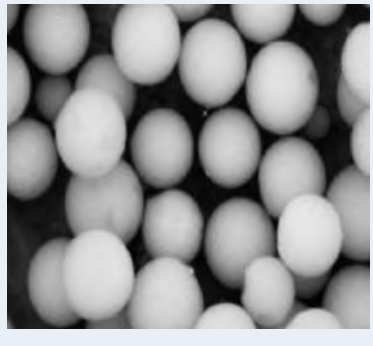
S.E.M. of the silica particle

The packing that results shows an almost perfect sphericity, as the images made by a scanning electron microscope show.

Tracer EXTRASIL



Another Packing



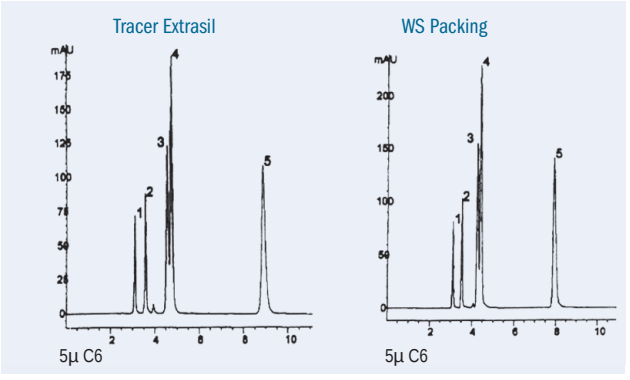
Applications

In addition to the complete agreement between the comparative data for both packings, the definitive proof comes from their comparison in a wide range of applications.

Tracer Extrasil

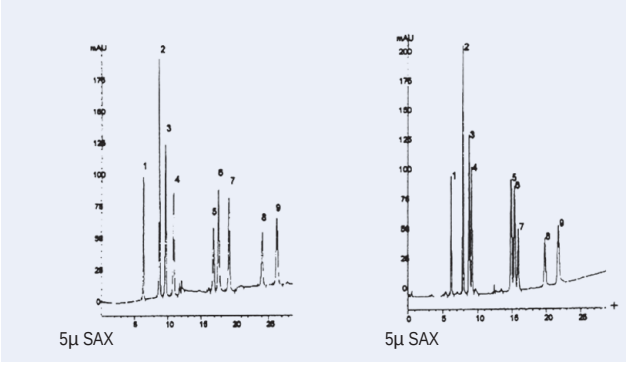
Catecolamines

Dimensions: 250 x 4.6 mm
Mobil Phase: CH2OH:25 mM KH2PO4 pH 2.0 (2:98)
Flow Rate: 1.0mL/min
Temperature: 40°C
Detection: UV@ 270nm
Sample:
1. Norepinephrine
2. Betametasone
3. Dopamine
4. L-DOPA
5. Serotonine



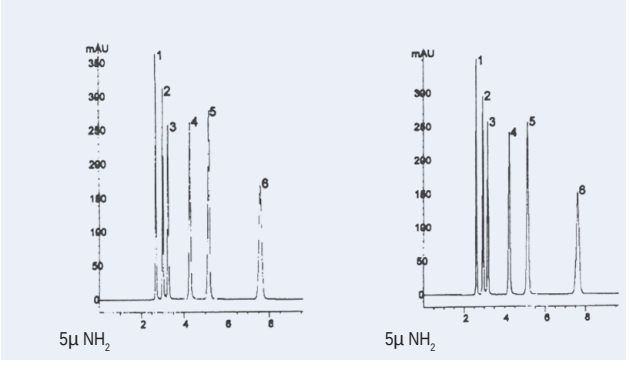
Nucleotides

Dimensions: 250 x 4.6 mm
Mobil Phase: A: 0.04M KH2PO4 pH 5.5
B: 0.5M KH2PO4TpH 5.5
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample:
1. β-NAD
2. IMP
3. GMP
4. AMP
5. GDP
6. ADP
7. NADP
8. ITP
9. ATP



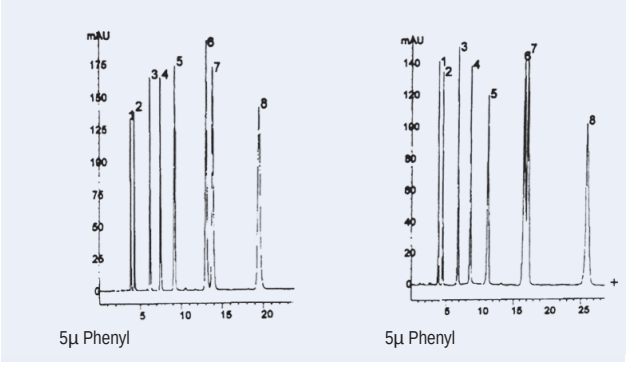
Corticosteroids

Dimensions: 250 x 4.6 mm
Mobil Phase: CH2Cl2:CH3OH (95:5)
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample:
1. Deoxicorticosterone Acetate
2. Desoxicorticosterone
3. Hidrocortisone 21-Acetate
4. Corticosterone
5. Cortisone
6. Hidrocortisone



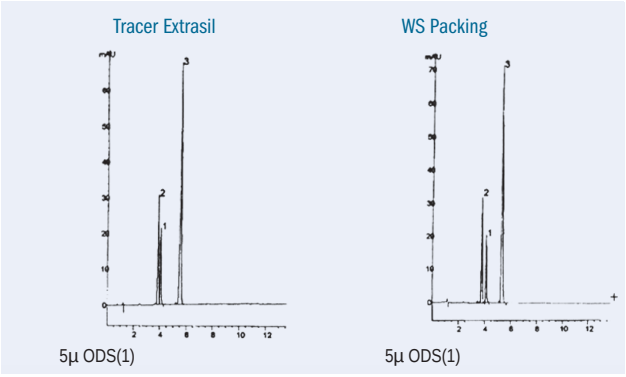
Aromatic Cetones

Dimensions: 250 x 4.6 mm
Mobil Phase: CH2 CN :CH2 O (33:67)
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample:
1. Benzamide
2. Alcohol Bencilic
3. Acetophenone
4. Methyl Benzoat
5. Phenetole
6. Naphtalene
7. Benzophenone
8. Biphenile



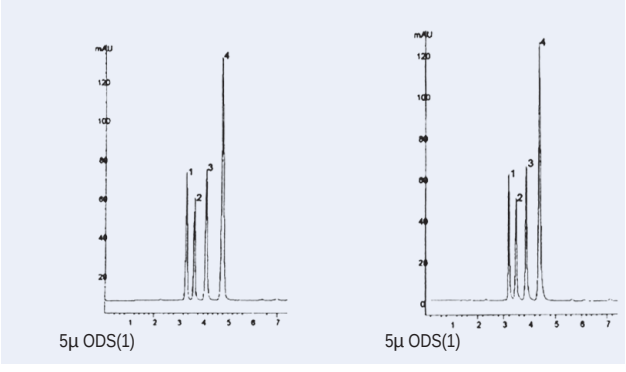
SRM 869

Dimensions: 250 x 4.6 mm
Mobil Phase: H2 O:CH3CN (15:85)
Flow Rate: 2.0mL/min
Temperature: 35°C
Detection: UV@ 260nm
Sample: 1. Benzo (a) pirene (BaP)
2. Phenantro (3,4-C)
2. Phenantrene (Ph Ph)
3. Tetrabenzonaphtalene
Tracer Extrasil ODS 2 aTBN/BaP = 1,77
Packing WS ODS-2 aTBN/BaP = 1,70



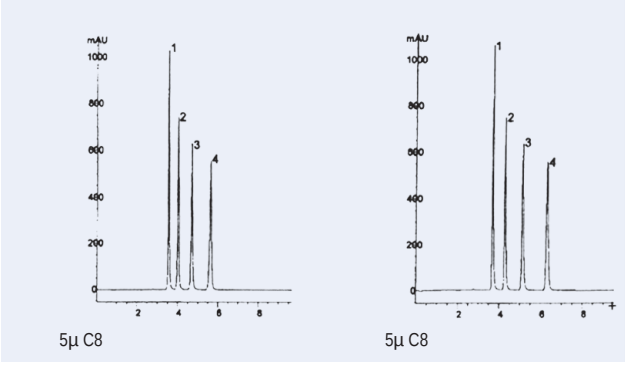
4-Hidroxibenzoates

Dimensions: 250 x 4.6 mm
Mobil Phase: H2 O:CH3CN (35:65)
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample: 1. Methyl-4-hidroxibenzoate
2. Ethyl-4-hidroxibenzoate
3. Propyl-4-hidroxibenzoate
4. Butyl-4-hidroxibenzoate



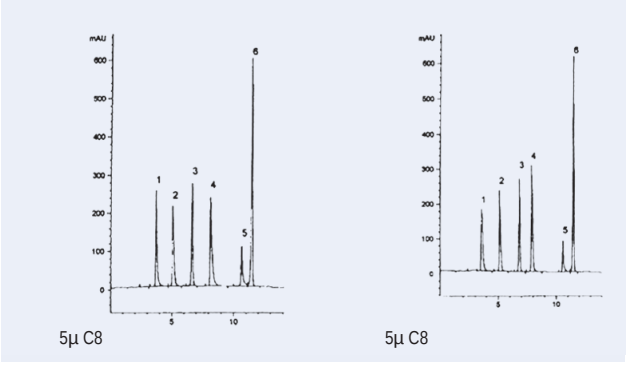
4-Hidroxibenzoates

Dimensions: 250 x 4.6 mm
Mobil Phase: H2 O:CH3CN (45:55)
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample: 1. Methyl- 4-hidroxibenzoate
2. Ethyl-4-hidroxibenzoate
3. Propyl-4-hidroxibenzoate
4. Butyl-4-hidroxibenzoate



Hidrosoluble Vitamines

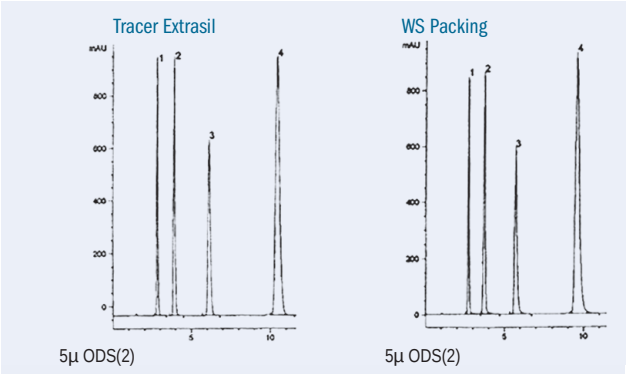
Dimensions: 150 x 4.6 mm
Mobil Phase: A: 5mM 1-Penta sodic nesulfonate in 0.1% H3PO4
B: 5mM 1-Sodic Pentanesulfonate in 0.1% H3PO4 in 80 % CH3CN A:B (97.5:2.5) to A:B (70:30) in 20 min.
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample: 1. Nicotinamine
2. Pyridoxal
3. Acide p-amynobenzaic
4. Tyamine
5. Folic Acid
6. Riboflavine



TK Tracer Extrasil

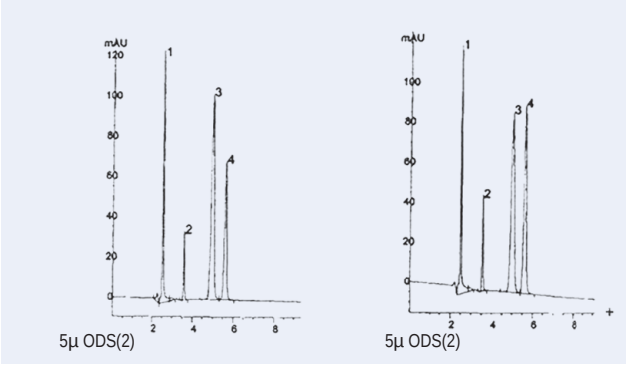
4-Hidroxibenzoat

Dimensions: 150 x 4.6 mm
Mobil Phase: H2 O:CH3CN (40:60)
Flow Rate: 1.0mL/min
Temperature: 40°C
Detection: UV@ 254nm
Sample:
1. Methyl-4-hidroxibenzoat
2. Ethyl-4-hidroxibenzoat
3. Propyl-4-hidroxibenzoat
4. Butyl-4-hidroxibenzoat



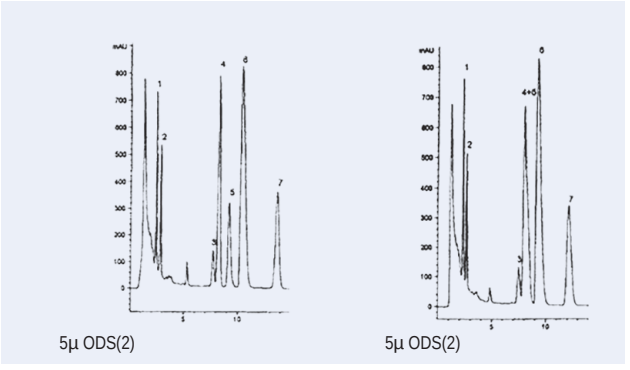
Polar Compounds

Dimensions: 250 x 4.6 mm
Mobil Phase: 25mM KH2PO4,pH 2.5
Flow Rate: 1.0mL/min
Temperature: 40°C
Detection: UV@ 230nm
Sample:
1. L-Cisteine
2. L-ascorbic Acid
3. Glutatione
4. Uric Acid



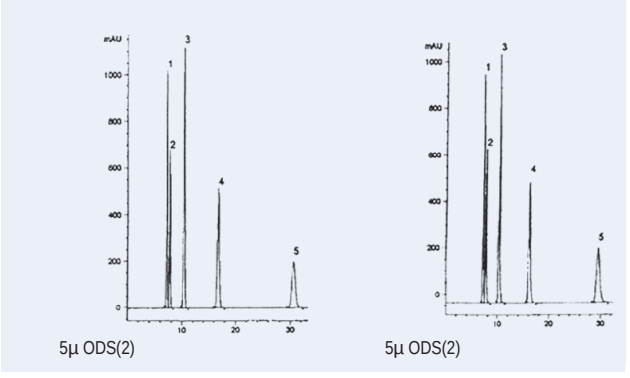
Liposoluble Vitamin

Dimensions: 150 x 4.6 mm
Mobil Phase: CH3CN:CH3OH (75:25)
Flow Rate: 1.3mL/min
Detection: UV@ 280nm
Sample:
1. Vitamine A
2. Vitamine A Acetate
3. Vitamine D2
4. Vitamine D3
5. Vitamine E
6. Vitamine E Acetate
7. Vitamine K1



Pesticides/Herbicides

Dimensions: 150 x 4.6 mm
Mobil Phase: H2 O:CH3CN (70:30)
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample:
1. Baygon™
2. Carbofuran
3. Carbanyl
4. Propham
5. Captan



Analytical columns Tracer EXTRASIL

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
ODS1	5	TR-016050	TR-416050	TR-016051	TR-416051	TR-016052	TR-416052	TR-016053	TR-416053	TR-016054	TR-416054
ODS2	5	TR-016055	TR-416055	TR-016056	TR-416056	TR-016057	TR-416057	TR-016058	TR-416058	TR-016059	TR-416059
Si	5	TR-016060	TR-416060	TR-016061	TR-416061	TR-016062	TR-416062	TR-016063	TR-416063	TR-016064	TR-416064
C1	5	TR-016065	TR-416065	TR-016066	TR-416066	TR-016067	TR-416067	TR-016068	TR-416068	TR-016069	TR-416069
C6	5	TR-016070	TR-416070	TR-016071	TR-416071	TR-016072	TR-416072	TR-016073	TR-416073	TR-016074	TR-416074
C8	5	TR-016075	TR-416075	TR-016076	TR-416076	TR-016077	TR-416077	TR-016078	TR-416078	TR-016079	TR-416079
CN	5	TR-016080	TR-416080	TR-016081	TR-416081	TR-016082	TR-416082	TR-016083	TR-416083	TR-016084	TR-416084
NH2	5	TR-016085	TR-416085	TR-016086	TR-416086	TR-016087	TR-416087	TR-016088	TR-416088	TR-016089	TR-416089
Phenyl	5	TR-016090	TR-416090	TR-016091	TR-416091	TR-016092	TR-416092	TR-016093	TR-416093	TR-016094	TR-416094
SAX	5	TR-016095	TR-416095	TR-016096	TR-416096	TR-016097	TR-416097	TR-016098	TR-416098	TR-016099	TR-416099
SCX	5	TR-016100	TR-416100	TR-016101	TR-416101	TR-016102	TR-416102	TR-016103	TR-416103	TR-016104	TR-416104
ODS1	10	TR-016105	TR-416105	TR-016106	TR-416106	TR-016107	TR-416107	TR-016108	TR-416108	TR-016109	TR-416109
ODS2	10	TR-016110	TR-416110	TR-016111	TR-416111	TR-016112	TR-416112	TR-016113	TR-416113	TR-016114	TR-416114
Si	10	TR-016115	TR-416115	TR-016116	TR-416116	TR-016117	TR-416117	TR-016118	TR-416118	TR-016119	TR-416119
C1	10	TR-016156	TR-416156	TR-016157	TR-416157	TR-016158	TR-416158	TR-016159	TR-416159	TR-016160	TR-416160
C6	10	TR-016120	TR-416120	TR-016121	TR-416121	TR-016122	TR-416122	TR-016123	TR-416123	TR-016124	TR-416124
C8	10	TR-016125	TR-416125	TR-016126	TR-416126	TR-016127	TR-416127	TR-016128	TR-416128	TR-016129	TR-416129
CN	10	TR-016130	TR-416130	TR-016131	TR-416131	TR-016132	TR-416132	TR-016133	TR-416133	TR-016134	TR-416134
NH2	10	TR-016135	TR-416135	TR-016136	TR-416136	TR-016137	TR-416137	TR-016138	TR-416138	TR-016139	TR-416139
SAX	10	TR-016151	TR-416151	TR-016152	TR-416152	TR-016153	TR-416153	TR-016154	TR-416154	TR-016155	TR-416155
SCX	10	TR-016146	TR-416146	TR-016147	TR-416147	TR-016148	TR-416148	TR-016149	TR-416149	TR-016150	TR-416150

Ultrarapid columns Tracer EXTRASIL

Function		Dimensions									
Particle size (µm)		4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
ODS 1	3	TR-013200	TR-413200	TR-013201	TR-413201	TR-013202	TR-413202	TR-013203	TR-413203	TR-013204	TR-413204
ODS 2	3	TR-013205	TR-413205	TR-013206	TR-413206	TR-013207	TR-413207	TR-013208	TR-413208	TR-013209	TR-413209
Si	3	TR-013210	TR-413210	TR-013211	TR-413211	TR-013212	TR-413212	TR-013213	TR-413213	TR-013214	TR-413214
C1	3	TR-013215	TR-413215	TR-013216	TR-413216	TR-013217	TR-413217	TR-013218	TR-413218	TR-013219	TR-413219
C6	3	TR-013220	TR-413220	TR-013221	TR-413221	TR-013222	TR-413222	TR-013223	TR-413223	TR-013224	TR-413224
C8	3	TR-013226	TR-413226	TR-013227	TR-413227	TR-013228	TR-413228	TR-013229	TR-413229	TR-013230	TR-413230
CN	3	TR-013231	TR-413231	TR-013232	TR-413232	TR-013233	TR-413233	TR-013234	TR-413234	TR-013235	TR-413235
NH2	3	TR-013236	TR-413236	TR-013237	TR-413237	TR-013238	TR-413238	TR-013239	TR-413239	TR-013240	TR-413240
Phenyl	3	TR-013241	TR-413241	TR-013242	TR-413242	TR-013243	TR-413243	TR-013244	TR-413244	TR-013245	TR-413245

Tracer Extrasil

Semi-Preparative columns Tracer EXTRASIL

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
ODS1	5	TR-014501	TR-014502	TR-014503	TR-014504
ODS2	5	TR-014505	TR-014506	TR-014507	TR-014508
Si	5	TR-014509	TR-014510	TR-014511	TR-014512
C1	5	TR-014513	TR-014514	TR-014515	TR-014516
C6	5	TR-014517	TR-014518	TR-014519	TR-014520
C8	5	TR-014521	TR-014522	TR-014523	TR-014524
CN	5	TR-014525	TR-014526	TR-014527	TR-014528
NH2	5	TR-014529	TR-014530	TR-014531	TR-014532
Phenyl	5	TR-014533	TR-014534	TR-014535	TR-014536
SAX	5	TR-014537	TR-014538	TR-014539	TR-014540
SCX	5	TR-014541	TR-014542	TR-014543	TR-014544
ODS1	10	TR-014545	TR-014546	TR-014547	TR-014548
ODS2	10	TR-014549	TR-014550	TR-014551	TR-014552
Si	10	TR-014553	TR-014554	TR-014555	TR-014556
C6	10	TR-014557	TR-014558	TR-014559	TR-014560
CN	10	TR-014565	TR-014566	TR-014567	TR-014568
NH2	10	TR-014569	TR-014570	TR-014571	TR-014572
Phenyl	10	TR-014573	TR-014574	TR-014575	TR-014576
SAX	10	TR-014577	TR-014578	TR-014579	TR-014580
SCX	10	TR-014581	TR-014582	TR-014583	TR-014584

Microbore columns Tracer EXTRASIL

Function		Dimensions			
Particle size (µm)		10 x 0.21 cm	20 x 0.21 cm	10 x 0.3 cm	20 x 0.3 cm
ODS1	5	TR-021200	TR-021201	TR-021236	TR-021237
ODS2	5	TR-021202	TR-021203	TR-021238	TR-021239
Si	5	TR-021204	TR-021205	TR-021240	TR-021241
C1	5	TR-021206	TR-021212	TR-021242	TR-021243
C6	5	TR-021207	TR-021208	TR-021244	TR-021245
C8	5	TR-021209	TR-021210	TR-021246	TR-021247
CN	5	TR-021211	TR-021213	TR-021248	TR-021249
NH2	5	TR-021214	TR-021215	TR-021250	TR-021251
Phenyl	5	TR-021216	TR-021217	TR-021252	TR-021253
SAX	5	TR-021218	TR-021219	TR-021254	TR-021255
SCX	5	TR-021220	TR-021221	TR-021256	TR-021257

Novafix™ Cartridge Tracer EXTRASIL

Function		Dimensions		
Particle size (µm)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
ODS1	3	TR-015666	TR-015667	TR-015668
ODS2	3	TR-015669	TR-015670	TR-015671
Si	3	TR-015672	TR-015673	TR-015674
C1	3	TR-015675	TR-015676	TR-015677
C6	3	TR-015678	TR-015679	TR-015680
C8	3	TR-015681	TR-015682	TR-015683
CN	3	TR-015684	TR-015685	TR-015686
NH2	3	TR-015687	TR-015688	TR-015689
Phenyl	3	TR-015690	TR-015691	TR-015692
ODS1	5	TR-015600	TR-015601	TR-015602
ODS2	5	TR-015603	TR-015604	TR-015605
Si	5	TR-015606	TR-015607	TR-015608
C1	5	TR-015609	TR-015610	TR-015611
C6	5	TR-015612	TR-015613	TR-015614
C8	5	TR-015615	TR-015616	TR-015617
CN	5	TR-015618	TR-015619	TR-015620
NH2	5	TR-015621	TR-015622	TR-015623
Phenyl	5	TR-015624	TR-015625	TR-015626
SCX	5	TR-015627	TR-015628	TR-015629
SAX	5	TR-015630	TR-015631	TR-015632
ODS1	10	TR-015633	TR-015634	TR-015635
ODS2	10	TR-015636	TR-015637	TR-015638
Si	10	TR-015639	TR-015640	TR-015641
C1	10	TR-015642	TR-015643	TR-015644
C6	10	TR-015645	TR-015646	TR-015647
CN	10	TR-015651	TR-015652	TR-015653
NH2	10	TR-015654	TR-015655	TR-015656
SCX	10	TR-015660	TR-015661	TR-015662
SAX	10	TR-015663	TR-015664	TR-015665

TEKNOKROMA CAN SUPPLY OTHER COMBINATIONS OF DIAMETER AND LENGTH ON APPLICATION

For Guard Columns please refer to pages 209-211

Due to its characteristics of pore size, surface area, percentage of covering (%C), and the kind of silica it is build of, it is the suitable alternative to Hypersil ODS packings. Its chromatographic behavior exactly reproduces the one of this popular packing, being able to transfer the chromatographic methods without any kind of adjustment.

5 Microns Packing
Analytical columns 45 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	3	0.46	TR-011000
Hyperpack	ODS	5	4	0.46	TR-011001
Hyperpack	ODS	5	5	0.46	TR-011002
Hyperpack	ODS	5	10	0.46	TR-011003
Hyperpack	ODS	5	15	0.46	TR-011004
Hyperpack	ODS	5	20	0.46	TR-011005
Hyperpack	ODS	5	25	0.46	TR-011006
Hyperpack	C8	5	3	0.46	TR-011021
Hyperpack	C8	5	4	0.46	TR-011022
Hyperpack	C8	5	5	0.46	TR-011023
Hyperpack	C8	5	10	0.46	TR-011024
Hyperpack	C8	5	15	0.46	TR-011025
Hyperpack	C8	5	20	0.46	TR-011026
Hyperpack	C8	5	25	0.46	TR-011027

5 Microns Packing
Analytical columns 40 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	3	0.4	TR-411000
Hyperpack	ODS	5	4	0.4	TR-411001
Hyperpack	ODS	5	5	0.4	TR-411002
Hyperpack	ODS	5	10	0.4	TR-411003
Hyperpack	ODS	5	15	0.4	TR-411004
Hyperpack	ODS	5	20	0.4	TR-411005
Hyperpack	ODS	5	25	0.4	TR-411006
Hyperpack	C8	5	3	0.4	TR-410081
Hyperpack	C8	5	4	0.4	TR-410082
Hyperpack	C8	5	5	0.4	TR-410083
Hyperpack	C8	5	10	0.4	TR-410084
Hyperpack	C8	5	15	0.4	TR-410085
Hyperpack	C8	5	20	0.4	TR-410086
Hyperpack	C8	5	25	0.4	TR-410087

5 Microns Packing
Microbore columns 2.1 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	3	0.21	TR-010272
Hyperpack	ODS	5	5	0.21	TR-010273
Hyperpack	ODS	5	10	0.21	TR-010274
Hyperpack	ODS	5	15	0.21	TR-010275
Hyperpack	ODS	5	20	0.21	TR-010276
Hyperpack	ODS	5	25	0.21	TR-010277
Hyperpack	C8	5	3	0.21	TR-011028
Hyperpack	C8	5	5	0.21	TR-011029
Hyperpack	C8	5	10	0.21	TR-011030
Hyperpack	C8	5	15	0.21	TR-011031
Hyperpack	C8	5	20	0.21	TR-011032
Hyperpack	C8	5	25	0.21	TR-011033

5 Microns Packing
Microbore columns 3.0 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	3	0.3	TR-010278
Hyperpack	ODS	5	5	0.3	TR-010279
Hyperpack	ODS	5	10	0.3	TR-010280
Hyperpack	ODS	5	15	0.3	TR-010281
Hyperpack	ODS	5	20	0.3	TR-010282
Hyperpack	ODS	5	25	0.3	TR-010283
Hyperpack	C8	5	3	0.3	TR-011160
Hyperpack	C8	5	5	0.3	TR-011034
Hyperpack	C8	5	10	0.3	TR-011035
Hyperpack	C8	5	15	0.3	TR-011036
Hyperpack	C8	5	20	0.3	TR-011037
Hyperpack	C8	5	25	0.3	TR-011038

5 Microns Packing
Semi-preparative columns HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	10	0.78	TR-010284
Hyperpack	ODS	5	15	0.78	TR-010285
Hyperpack	ODS	5	25	0.78	TR-010286
Hyperpack	ODS	5	10	1.00	TR-010287
Hyperpack	ODS	5	15	1.00	TR-010288

Hyperpack ODS

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	25	1.00	TR-010289
Hyperpack	ODS	5	5	2.12	TR-010290
Hyperpack	ODS	5	10	2.12	TR-010291
Hyperpack	ODS	5	15	2.12	TR-010292
Hyperpack	ODS	5	25	2.12	TR-010293
Hyperpack	C8	5	10	0.78	TR-011039
Hyperpack	C8	5	15	0.78	TR-011040
Hyperpack	C8	5	25	0.78	TR-011041
Hyperpack	C8	5	10	1.00	TR-011042
Hyperpack	C8	5	15	1.00	TR-011043
Hyperpack	C8	5	25	1.00	TR-011044
Hyperpack	C8	5	5	2.12	TR-011045
Hyperpack	C8	5	10	2.12	TR-011046
Hyperpack	C8	5	15	2.12	TR-011047
Hyperpack	C8	5	25	2.12	TR-011048

5 Microns Packing
Novafix™ Cartridges 4 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	5	7,5	0.4	TR-010294
Hyperpack	ODS	5	10	0.4	TR-010295
Hyperpack	ODS	5	15	0.4	TR-010296
Hyperpack	ODS	5	25	0.4	TR-010297
Hyperpack	C8	5	7,5	0.4	TR-011049
Hyperpack	C8	5	10	0.4	TR-011050
Hyperpack	C8	5	15	0.4	TR-011051
Hyperpack	C8	5	25	0.4	TR-011052

3 Microns Packing
Ultrarapid columns 4.6 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	3	3	0.46	TR-010298
Hyperpack	ODS	3	4	0.46	TR-010299
Hyperpack	ODS	3	5	0.46	TR-010300
Hyperpack	ODS	3	10	0.46	TR-010301
Hyperpack	ODS	3	15	0.46	TR-010302
Hyperpack	ODS	3	20	0.46	TR-010303
Hyperpack	ODS	3	25	0.46	TR-010304
Hyperpack	C8	3	3	0.46	TR-011053
Hyperpack	C8	3	4	0.46	TR-011054
Hyperpack	C8	3	5	0.46	TR-011055
Hyperpack	C8	3	10	0.46	TR-011056
Hyperpack	C8	3	15	0.46	TR-011057
Hyperpack	C8	3	20	0.46	TR-011058
Hyperpack	C8	3	25	0.46	TR-011059

3 Microns Packing
Analytical columns 4.0 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	3	3	0.4	TR-410298
Hyperpack	ODS	3	4	0.4	TR-410299
Hyperpack	ODS	3	5	0.4	TR-410300
Hyperpack	ODS	3	10	0.4	TR-410301
Hyperpack	ODS	3	15	0.4	TR-410302
Hyperpack	ODS	3	20	0.4	TR-410303
Hyperpack	ODS	3	25	0.4	TR-410304
Hyperpack	C8	3	4	0.4	TR-011060
Hyperpack	C8	3	5	0.4	TR-011061
Hyperpack	C8	3	10	0.4	TR-011062
Hyperpack	C8	3	15	0.4	TR-011063
Hyperpack	C8	3	20	0.4	TR-011064
Hyperpack	C8	3	25	0.4	TR-011065

3 Microns Packing
Microbore columns 2.1 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	3	3	0.21	TR-010305
Hyperpack	ODS	3	5	0.21	TR-010306
Hyperpack	ODS	3	10	0.21	TR-010307
Hyperpack	ODS	3	15	0.21	TR-010308
Hyperpack	ODS	3	20	0.21	TR-010309
Hyperpack	ODS	3	25	0.21	TR-010310
Hyperpack	C8	3	3	0.21	TR-011066
Hyperpack	C8	3	5	0.21	TR-011067
Hyperpack	C8	3	10	0.21	TR-011068
Hyperpack	C8	3	15	0.21	TR-011069
Hyperpack	C8	3	20	0.21	TR-011070
Hyperpack	C8	3	25	0.21	TR-011071

3 Microns Packing
Microbore columns 3.0 mm i.d. HYPERPACK

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack	ODS	3	3	0.3	TR-010311
Hyperpack	ODS	3	5	0.3	TR-010312
Hyperpack	ODS	3	10	0.3	TR-010313
Hyperpack	ODS	3	15	0.3	TR-010314
Hyperpack	ODS	3	20	0.3	TR-010315
Hyperpack	ODS	3	25	0.3	TR-010316
Hyperpack	ODS	3	3	0.3	TR-011072
Hyperpack	ODS	3	5	0.3	TR-011073
Hyperpack	ODS	3	10	0.3	TR-011074
Hyperpack	ODS	3	15	0.3	TR-011075
Hyperpack	ODS	3	20	0.3	TR-011076
Hyperpack	ODS	3	25	0.3	TR-011077

It reproduces with total fidelity the chromatographic behavior of the columns Hypersil BDS C18.
Available in 3 and 5µm and in all length and diameter configurations.

5 Microns Packing
Analytical columns 4.6 mm i.d. HYPERPACK BASIC

			Length	Diameter	
Packing	Funct.	µm	cm	cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	3	0.46	TR-011007
Hyperpack BASIC	ODS	5	4	0.46	TR-011008
Hyperpack BASIC	ODS	5	5	0.46	TR-011009
Hyperpack BASIC	ODS	5	10	0.46	TR-011010
Hyperpack BASIC	ODS	5	15	0.46	TR-011011
Hyperpack BASIC	ODS	5	20	0.46	TR-011012
Hyperpack BASIC	ODS	5	25	0.46	TR-011013
Hyperpack BASIC	C8	5	3	0.46	TR-011108
Hyperpack BASIC	C8	5	4	0.46	TR-011109
Hyperpack BASIC	C8	5	5	0.46	TR-011110
Hyperpack BASIC	C8	5	10	0.46	TR-011111
Hyperpack BASIC	C8	5	15	0.46	TR-011112
Hyperpack BASIC	C8	5	20	0.46	TR-011113
Hyperpack BASIC	C8	5	25	0.46	TR-011114

5 Microns Packing
Analytical columns 4.0 mm i.d. HYPERPACK BASIC

			Length	Diameter	
Packing	Funct.	µm	cm	cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	3	0.4	TR-411007
Hyperpack BASIC	ODS	5	4	0.4	TR-411008
Hyperpack BASIC	ODS	5	5	0.4	TR-411009
Hyperpack BASIC	ODS	5	10	0.4	TR-411010
Hyperpack BASIC	ODS	5	15	0.4	TR-411011
Hyperpack BASIC	ODS	5	20	0.4	TR-411012
Hyperpack BASIC	ODS	5	25	0.4	TR-411013
Hyperpack BASIC	C8	5	3	0.4	TR-411108
Hyperpack BASIC	C8	5	4	0.4	TR-411109
Hyperpack BASIC	C8	5	5	0.4	TR-411110
Hyperpack BASIC	C8	5	10	0.4	TR-411111
Hyperpack BASIC	C8	5	15	0.4	TR-411112
Hyperpack BASIC	C8	5	20	0.4	TR-411113
Hyperpack BASIC	C8	5	25	0.4	TR-411114

5 Microns Packing
Microbore columns 21 mm i.d. HYPERPACK BASIC

			Length	Diameter	
Packing	Funct.	µm	cm	cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	3	0.21	TR-010317
Hyperpack BASIC	ODS	5	5	0.21	TR-010318
Hyperpack BASIC	ODS	5	10	0.21	TR-010319
Hyperpack BASIC	ODS	5	15	0.21	TR-010320
Hyperpack BASIC	ODS	5	20	0.21	TR-010321
Hyperpack BASIC	ODS	5	25	0.21	TR-010322
Hyperpack BASIC	C8	5	3	0.21	TR-011115
Hyperpack BASIC	C8	5	5	0.21	TR-011116
Hyperpack BASIC	C8	5	10	0.21	TR-011117
Hyperpack BASIC	C8	5	15	0.21	TR-011118
Hyperpack BASIC	C8	5	20	0.21	TR-011119
Hyperpack BASIC	C8	5	25	0.21	TR-011120

5 Microns Packing
Microbore columns 3.0 mm i.d. HYPERPACK BASIC

			Length	Diameter	
Packing	Funct.	µm	cm	cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	3	0.3	TR-010323
Hyperpack BASIC	ODS	5	5	0.3	TR-010324
Hyperpack BASIC	ODS	5	10	0.3	TR-010325
Hyperpack BASIC	ODS	5	15	0.3	TR-010326
Hyperpack BASIC	ODS	5	20	0.3	TR-010327
Hyperpack BASIC	ODS	5	25	0.3	TR-010328
Hyperpack BASIC	C8	5	3	0.3	TR-011121
Hyperpack BASIC	C8	5	5	0.3	TR-011122
Hyperpack BASIC	C8	5	10	0.3	TR-011123
Hyperpack BASIC	C8	5	15	0.3	TR-011124
Hyperpack BASIC	C8	5	20	0.3	TR-011125
Hyperpack BASIC	C8	5	25	0.3	TR-011126

5 Microns Packing
Semi Preparative columns HYPERPACK BASIC

			Length	Diameter	
Packing	Funct.	µm	cm	cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	10	0.78	TR-010329
Hyperpack BASIC	ODS	5	15	0.78	TR-010330
Hyperpack BASIC	ODS	5	25	0.78	TR-010331
Hyperpack BASIC	ODS	5	10	1.00	TR-010332

Hyperpack Basic

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	15	1.00	TR-010333
Hyperpack BASIC	ODS	5	25	1.00	TR-010334
Hyperpack BASIC	ODS	5	5	2.12	TR-010335
Hyperpack BASIC	ODS	5	10	2.12	TR-010336
Hyperpack BASIC	ODS	5	15	2.12	TR-010337
Hyperpack BASIC	ODS	5	25	2.12	TR-010338
Hyperpack BASIC	C8	5	10	0.78	TR-011127
Hyperpack BASIC	C8	5	15	0.78	TR-011128
Hyperpack BASIC	C8	5	25	0.78	TR-011129
Hyperpack BASIC	C8	5	10	1.00	TR-011130
Hyperpack BASIC	C8	5	15	1.00	TR-011131
Hyperpack BASIC	C8	5	25	1.00	TR-011132
Hyperpack BASIC	C8	5	5	2.12	TR-011133
Hyperpack BASIC	C8	5	10	2.12	TR-011134
Hyperpack BASIC	C8	5	15	2.12	TR-011135
Hyperpack BASIC	C8	5	25	2.12	TR-011136

5 Microns Packing
Cartridge System 4 mm i.d. HYPERPACK BASIC

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	5	7,5	0.4	TR-010339
Hyperpack BASIC	ODS	5	10	0.4	TR-010340
Hyperpack BASIC	ODS	5	15	0.4	TR-010341
Hyperpack BASIC	ODS	5	25	0.4	TR-010342
Hyperpack BASIC	C8	5	7,5	0.4	TR-011137
Hyperpack BASIC	C8	5	10	0.4	TR-011138
Hyperpack BASIC	C8	5	15	0.4	TR-011139
Hyperpack BASIC	C8	5	25	0.4	TR-011140

3 Microns Packing
Analytical Columns 4.6 mm i.d. HYPERPACK BASIC

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	3	3	0.46	TR-011014
Hyperpack BASIC	ODS	3	4	0.46	TR-011015
Hyperpack BASIC	ODS	3	5	0.46	TR-011016
Hyperpack BASIC	ODS	3	10	0.46	TR-011017
Hyperpack BASIC	ODS	3	15	0.46	TR-011018
Hyperpack BASIC	ODS	3	20	0.46	TR-011019
Hyperpack BASIC	ODS	3	25	0.46	TR-011020
Hyperpack BASIC	C8	3	3	0.46	TR-011141
Hyperpack BASIC	C8	3	4	0.46	TR-011142
Hyperpack BASIC	C8	3	5	0.46	TR-011143
Hyperpack BASIC	C8	3	10	0.46	TR-011144
Hyperpack BASIC	C8	3	15	0.46	TR-011145
Hyperpack BASIC	C8	3	20	0.46	TR-011146
Hyperpack BASIC	C8	3	25	0.46	TR-011147

3 Microns Packing
Ultrarapid Columns 4.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	3	3	0.4	TR-411014
Hyperpack BASIC	ODS	3	4	0.4	TR-411015
Hyperpack BASIC	ODS	3	5	0.4	TR-411016
Hyperpack BASIC	ODS	3	10	0.4	TR-411017
Hyperpack BASIC	ODS	3	15	0.4	TR-411018
Hyperpack BASIC	ODS	3	20	0.4	TR-411019
Hyperpack BASIC	ODS	3	25	0.4	TR-411020
Hyperpack BASIC	C8	3	3	0.4	TR-411141
Hyperpack BASIC	C8	3	4	0.4	TR-411142
Hyperpack BASIC	C8	3	5	0.4	TR-411143
Hyperpack BASIC	C8	3	10	0.4	TR-411144
Hyperpack BASIC	C8	3	15	0.4	TR-411145
Hyperpack BASIC	C8	3	20	0.4	TR-411146
Hyperpack BASIC	C8	3	25	0.4	TR-411147

3 Microns Packing
Microbore Columns 2.1 mm i.d.HYPERPACK BASIC

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	3	3	0.21	TR-010343
Hyperpack BASIC	ODS	3	5	0.21	TR-010344
Hyperpack BASIC	ODS	3	10	0.21	TR-010345
Hyperpack BASIC	ODS	3	15	0.21	TR-010346
Hyperpack BASIC	ODS	3	20	0.21	TR-010347
Hyperpack BASIC	ODS	3	25	0.21	TR-010348
Hyperpack BASIC	C8	3	3	0.21	TR-011148
Hyperpack BASIC	C8	3	5	0.21	TR-011149
Hyperpack BASIC	C8	3	10	0.21	TR-011150
Hyperpack BASIC	C8	3	15	0.21	TR-011151
Hyperpack BASIC	C8	3	20	0.21	TR-011152
Hyperpack BASIC	C8	3	25	0.21	TR-011153

3 Microns Packing
Microbore Columns 3.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Hyperpack BASIC	ODS	3	3	0.3	TR-010349
Hyperpack BASIC	ODS	3	5	0.3	TR-010350
Hyperpack BASIC	ODS	3	10	0.3	TR-010351
Hyperpack BASIC	ODS	3	15	0.3	TR-010352
Hyperpack BASIC	ODS	3	20	0.3	TR-010353
Hyperpack BASIC	ODS	3	25	0.3	TR-010354
Hyperpack BASIC	C8	3	3	0.3	TR-011154
Hyperpack BASIC	C8	3	5	0.3	TR-011155
Hyperpack BASIC	C8	3	10	0.3	TR-011156
Hyperpack BASIC	C8	3	15	0.3	TR-011157
Hyperpack BASIC	C8	3	20	0.3	TR-011158
Hyperpack BASIC	C8	3	25	0.3	TR-011159

Nucleosil is a totally porous silica packing, which is available with a full range of substituents. For its high quality level it has come to be one of the most popular HPLC packings.

There are a great variety of particle sizes, so that practically all the field of chromatography is covered, from ultrarapid columns with packings of 3µm, to preparative scale, with packings of 25-40µm, the same selectivity being always maintained.
The packings of 3, 5, 10µm are characterized by their well adapted distribution of particle sizes, which produces a high efficiency and great stability in the HPLC columns.

The Nucleosil packings are also distinguished by their great stability when subject to extreme values of pH ,being able to work between pH 1 and 9. These values are unreachable by the majority of silica packings.

Analytical columns NUCLEOSIL 100

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-011331	TR-411331	TR-011333	TR-411333	TR-011335	TR-411335	TR-011337	TR-411337	TR-011339	TR-411339
C18	5	TR-011341	TR-411341	TR-011343	TR-411343	TR-011345	TR-411345	TR-011347	TR-411347	TR-011349	TR-411349
C8	5	TR-011351	TR-411351	TR-011353	TR-411353	TR-011355	TR-411355	TR-011357	TR-411357	TR-011359	TR-411359
P	5	TR-011361	TR-411361	TR-011363	TR-411363	TR-011365	TR-411365	TR-011367	TR-411367	TR-011369	TR-411369
C2	7	TR-016031	TR-416031	TR-016032	TR-416032	TR-016033	TR-416033	TR-016034	TR-416034	TR-016035	TR-416035
CN	5	TR-011371	TR-411371	TR-011373	TR-411373	TR-011375	TR-411375	TR-011377	TR-411377	TR-011379	TR-411379
Diol	7	TR-011391	TR-411391	TR-011393	TR-411393	TR-011395	TR-411395	TR-011397	TR-411397	TR-011399	TR-411399
NH2	5	TR-011381	TR-411381	TR-011383	TR-411383	TR-011385	TR-411385	TR-011387	TR-411387	TR-011389	TR-411389
NO2	5	TR-016036	TR-416036	TR-016037	TR-416037	TR-016038	TR-416038	TR-016039	TR-416039	TR-016040	TR-416040
N(CH3)2	5	TR-016041	TR-416041	TR-016042	TR-416042	TR-016043	TR-416043	TR-016044	TR-416044	TR-016045	TR-416045
SA	5	TR-011401	TR-411401	TR-011403	TR-411403	TR-011405	TR-411405	TR-011407	TR-411407	TR-011409	TR-411409
SB	5	TR-011411	TR-411411	TR-011413	TR-411413	TR-011415	TR-411415	TR-011417	TR-411417	TR-011419	TR-411419
Si	10	TR-016600	TR-416600	TR-016601	TR-416601	TR-016602	TR-416602	TR-016603	TR-416603	TR-016604	TR-416604
C18	10	TR-016605	TR-416605	TR-016606	TR-416606	TR-016607	TR-416607	TR-016608	TR-416608	TR-016609	TR-416609
C8	10	TR-016610	TR-416610	TR-016611	TR-416611	TR-016612	TR-416612	TR-016613	TR-416613	TR-016614	TR-416614
CN	10	TR-016615	TR-416615	TR-016617	TR-416617	TR-016618	TR-416618	TR-016619	TR-416619	TR-016620	TR-416620
NH2	10	TR-016621	TR-416621	TR-016622	TR-416622	TR-016623	TR-416623	TR-016624	TR-416624	TR-016625	TR-416625
NO2	10	TR-016626	TR-416626	TR-016627	TR-416627	TR-016628	TR-416628	TR-016629	TR-416629	TR-016630	TR-416630
SA	10	TR-016631	TR-416631	TR-016632	TR-416632	TR-016633	TR-416633	TR-016634	TR-416634	TR-016635	TR-416635
SB	10	TR-016636	TR-416636	TR-016637	TR-416637	TR-016638	TR-416638	TR-016639	TR-416639	TR-016640	TR-416640

Analytical columns NUCLEOSIL 120

Function		Dimensions									
Particle size (µm)		4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-016300	TR-416300	TR-016301	TR-416301	TR-016302	TR-416302	TR-016303	TR-416303	TR-016304	TR-416304
C18	5	TR-016305	TR-416305	TR-016306	TR-416306	TR-016307	TR-416307	TR-016308	TR-416308	TR-016309	TR-416309
C8	5	TR-016310	TR-416310	TR-016311	TR-416311	TR-016312	TR-416312	TR-016313	TR-416313	TR-016314	TR-416314
C4	5	TR-016162	TR-416162	TR-016163	TR-416163	TR-016164	TR-416164	TR-016165	TR-416165	TR-016166	TR-416166
P	7	TR-016315	TR-416315	TR-016316	TR-416316	TR-016317	TR-416317	TR-016318	TR-416318	TR-016319	TR-416319
CN	7	TR-016320	TR-416320	TR-016321	TR-416321	TR-016322	TR-416322	TR-016323	TR-416323	TR-016324	TR-416324
NH2	7	TR-016325	TR-416325	TR-016326	TR-416326	TR-016327	TR-416327	TR-016328	TR-416328	TR-016329	TR-416329
Si	10	TR-016641	TR-416641	TR-016642	TR-416642	TR-016643	TR-416643	TR-016644	TR-416644	TR-016645	TR-416645
C18	10	TR-016646	TR-416646	TR-016647	TR-416647	TR-016648	TR-416648	TR-016649	TR-416649	TR-016650	TR-416650
C8	10	TR-016651	TR-416651	TR-016652	TR-416652	TR-016653	TR-416653	TR-016654	TR-416654	TR-016655	TR-416655

Ultrarapid columns NUCLEOSIL

Function		Dimensions									
Particle size (µm)		4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
100 C18	3	TR-013110	TR-413110	TR-013111	TR-413111	TR-013112	TR-413112	TR-013113	TR-413113	TR-013119	TR-413119
120 C18	3	TR-013101	TR-413101	TR-013103	TR-413103	TR-013105	TR-413105	TR-013107	TR-413107	TR-013109	TR-413109
120 C8	3	TR-013115	TR-413115	TR-013116	TR-413116	TR-013117	TR-413117	TR-013118	TR-413118	TR-013124	TR-413124

Microbore columns NUCLEOSIL 100

Function		Dimensions			
Particle size (µm)		10 x 0.21 cm	20 x 0.21 cm	10 x 0.03 cm	20 x 0.03 cm
Si	5	TR-021125	TR-021126	TR-021258	TR-021259
C18	5	TR-021127	TR-021128	TR-021260	TR-021261
C8	5	TR-021129	TR-021130	TR-021262	TR-021263
C6 H5	5	TR-021131	TR-021132	TR-021264	TR-021265
C2	7	TR-021133	TR-021134	TR-021266	TR-021267
CN	5	TR-021135	TR-021136	TR-021268	TR-021269
Diol	7	TR-021137	TR-021096	TR-021270	TR-021271
NH2	5	TR-021097	TR-021098	TR-021272	TR-021273
NO2	5	TR-021099	TR-021100	TR-021274	TR-021275
N(CH3)2	5	TR-021101	TR-021102	TR-021350	TR-021276
SA	5	TR-021103	TR-021104	TR-021277	TR-021278
SB	5	TR-021105	TR-021106	TR-021279	TR-021280

Microbore columns NUCLEOSIL 120

Function		Dimensions			
Particle size (µm)		10 x 0.21 cm	20 x 0.21 cm	10 x 0.3 cm	20 x 0.3 cm
Si	5	TR-021115	TR-021116	TR-021283	TR-021284
C18	5	TR-021065	TR-021067	TR-021281	TR-021282
C8	5	TR-021117	TR-021118	TR-021285	TR-021286
C6 H5	7	TR-021119	TR-021120	TR-021287	TR-021288
CN	7	TR-021121	TR-021122	TR-021289	TR-021290
NH2	7	TR-021123	TR-021124	TR-021291	TR-021292

Semi-preparative columns NUCLEOSIL 120

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014294	TR-014296	TR-014298	TR-014300
C18	5	TR-014286	TR-014288	TR-014290	TR-014292
C8	5	TR-014302	TR-014304	TR-014306	TR-014308
C4	5	TR-014600	TR-014601	TR-014602	TR-014603
C6 H5	7	TR-014310	TR-014312	TR-014314	TR-014316
CN	7	TR-014318	TR-014320	TR-014322	TR-014324
NH2	7	TR-014326	TR-014328	TR-014330	TR-014332
Si	10	TR-014366	TR-014368	TR-014370	TR-014372
C18	10	TR-014358	TR-014360	TR-014362	TR-014364
C8	10	TR-014374	TR-014376	TR-014378	TR-014380

Semi-preparative columns NUCLEOSIL 100

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014476	TR-014477	TR-014478	TR-014479
C2	7	TR-014488	TR-014489	TR-014490	TR-014491
C8	5	TR-014484	TR-014485	TR-014486	TR-014487
C18	5	TR-014480	TR-014481	TR-014482	TR-014483
Phenyl	7	TR-014492	TR-014493	TR-014494	TR-014495
CN	5	TR-014496	TR-014497	TR-014498	TR-014499
Diol	7	TR-014585	TR-014586	TR-014587	TR-014588
NH2	5	TR-014589	TR-014590	TR-014591	TR-014592
N(CH3)2	5	TR-014597	TR-014598	TR-014599	TR-014769
SA	5	TR-014770	TR-014771	TR-014772	TR-014773
SB	5	TR-014774	TR-014775	TR-014776	TR-014777
NO2	5	TR-014593	TR-014594	TR-014595	TR-014596
Si	10	TR-014733	TR-014734	TR-014735	TR-014736
C8	10	TR-014737	TR-014738	TR-014739	TR-014740
C18	10	TR-014741	TR-014742	TR-014743	TR-014744
CN	10	TR-014745	TR-014746	TR-014747	TR-014748
NO2	10	TR-014749	TR-014750	TR-014751	TR-014752
NH2	10	TR-014753	TR-014754	TR-014755	TR-014756
N(CH3)2	10	TR-014757	TR-014758	TR-014759	TR-014760
SA	10	TR-014761	TR-014762	TR-014763	TR-014764
SB2	10	TR-014765	TR-014766	TR-014767	TR-014768

This traditional irregular packing is packed following completely opitimized methods, ensuring maximum efficiency, stability and reproductibility in all the columns.

With this irregular packing, the efficiencies normally obtained are of 30-40000 N/m for the 5 µm packings, and 50-70,000 N/m for the 5 µm.

Analytical columns LICHROSORB

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
RP-8	5	TR-011441	TR-411441	TR-011443	TR-411443	TR-011445	TR-411445	TR-011447	TR-411447	TR-011449	TR-411449
RP-18	5	TR-011431	TR-411431	TR-011433	TR-411433	TR-011435	TR-411435	TR-011437	TR-411437	TR-011439	TR-411439
RP-Select B	5	TR-016046	TR-416046	TR-016047	TR-416047	TR-011969	TR-411969	TR-016048	TR-416048	TR-011970	TR-411970
Diol	5	TR-011451	TR-411451	TR-011453	TR-411453	TR-011455	TR-411455	TR-011457	TR-411457	TR-011459	TR-411459
NH2	5	TR-011461	TR-411461	TR-011463	TR-411463	TR-011465	TR-411465	TR-011467	TR-411467	TR-011469	TR-411469
CN	5	TR-011471	TR-411471	TR-011473	TR-411473	TR-011475	TR-411475	TR-011477	TR-411477	TR-011479	TR-411479
RP-8	10	TR-011501	TR-411501	TR-011503	TR-411503	TR-011505	TR-411505	TR-011507	TR-411507	TR-011509	TR-411509
RP-18	10	TR-011491	TR-411491	TR-011493	TR-411493	TR-011495	TR-411495	TR-011497	TR-411497	TR-011499	TR-411499
Diol	10	TR-011511	TR-411511	TR-011513	TR-411513	TR-011515	TR-411515	TR-011517	TR-411517	TR-011519	TR-411519
CN	10	TR-011531	TR-411531	TR-011533	TR-411533	TR-011535	TR-411535	TR-011537	TR-411537	TR-011539	TR-411539

Novafix™ Cartridge LICHROSORB

Function		Dimensions		
Particle size	(µm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
RP-18	5	TR-015199	TR-015200	TR-015201
RP-8	5	TR-015202	TR-015203	TR-015204
Diol	5	TR-015205	TR-015206	TR-015207
NH2	5	TR-015208	TR-015209	TR-015210
CN	5	TR-015211	TR-015212	TR-015213
RP-Select B	5	TR-015345	TR-015346	TR-015347
RP-18	10	TR-015181	TR-015182	TR-015183
RP-8	10	TR-015184	TR-015185	TR-015186
Diol	10	TR-015187	TR-015188	TR-015189
CN	10	TR-015193	TR-015194	TR-015195
RP-Select B	10	TR-015561	TR-015562	TR-015563

Semi-preparative Tracer columns LICHROSORB

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
RP-18	7	TR-014429	TR-014431	TR-014433	TR-014436

For Guard Columns please refer to pages 209-211.
For precolumns of cartridge system Novafix please refer to page 205.

TK Lichrospher

Lichrospher´s spherical packing of 5 and 10 µm particle size, giving all the advantages that are common to all the spherical packings: high permeability, high efficiency and excellent column stability.

Analytical columns LICHROSPHER

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
Si 100	5	TR-011541	TR-411541	TR-011543	TR-411543	TR-011545	TR-411545	TR-011547	TR-411547	TR-011549	TR-411549
100 RP-18	5	TR-011551	TR-411551	TR-011553	TR-411553	TR-011555	TR-411555	TR-011557	TR-411557	TR-011559	TR-411559
100 RP-18 ec	5	TR-011561	TR-411561	TR-011563	TR-411563	TR-011565	TR-411565	TR-011567	TR-411567	TR-011569	TR-411569
100 RP-8	5	TR-011571	TR-411571	TR-011573	TR-411573	TR-011575	TR-411575	TR-011577	TR-411577	TR-011579	TR-411579
100 RP-8 ec	5	TR-011581	TR-411581	TR-011583	TR-411583	TR-011585	TR-411585	TR-011587	TR-411587	TR-011589	TR-411589
100 NH2	5	TR-011591	TR-411591	TR-011593	TR-411593	TR-011595	TR-411595	TR-011597	TR-411597	TR-011599	TR-411599
100 CN	5	TR-011601	TR-411601	TR-011603	TR-411603	TR-011605	TR-411605	TR-011607	TR-411607	TR-011609	TR-411609
100 Diol	5	TR-011611	TR-411611	TR-011613	TR-411613	TR-011615	TR-411615	TR-011617	TR-411617	TR-011619	TR-411619
60 RP-Select B	5	TR-016813	TR-416813	TR-016814	TR-416814	TR-016815	TR-416815	TR-016816	TR-416816	TR-016817	TR-416817
Si 100	10	TR-011621	TR-411621	TR-011623	TR-411623	TR-011625	TR-411625	TR-011627	TR-411627	TR-011629	TR-411629
100 RP-18	10	TR-011631	TR-411631	TR-011633	TR-411633	TR-011635	TR-411635	TR-011637	TR-411637	TR-011639	TR-411639
100 RP-18 ec	10	TR-011641	TR-411641	TR-011643	TR-411643	TR-011645	TR-411645	TR-011647	TR-411647	TR-011649	TR-411649
100 RP-8	10	TR-011651	TR-411651	TR-011653	TR-411653	TR-011655	TR-411655	TR-011657	TR-411657	TR-011659	TR-411659
100 RP-8 ec	10	TR-011661	TR-411661	TR-011663	TR-411663	TR-011665	TR-411665	TR-011667	TR-411667	TR-011669	TR-411669
100 CN	10	TR-011681	TR-411681	TR-011683	TR-411683	TR-011685	TR-411685	TR-011687	TR-411687	TR-011689	TR-411689
100 Diol	10	TR-011691	TR-411691	TR-011693	TR-411693	TR-011695	TR-411695	TR-011697	TR-411697	TR-011699	TR-411699
60 RP-Select B	10	TR-016808	TR-416808	TR-016809	TR-416809	TR-016810	TR-416810	TR-016811	TR-416811	TR-016812	TR-416812

Semi-preparative Tracer columns LICHROSPHER

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
RP-18	10	TR-014437	TR-014439	TR-014441	TR-014443
RP-18 EC	10	TR-014445	TR-014447	TR-014449	TR-014451

Microbore Tracer columns LICHROSPHER

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
RP-18	5	TR-021069	TR-021071	TR-021293	TR-021294
RP-18 EC	5	TR-021073	TR-021075	TR-021295	TR-021296

Novafix™ Cartridge LICHROSPHER

Function		Dimensions		
Particle size	(µm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 100	5	TR-015238	TR-015239	TR-015240
100 RP-18	5	TR-015241	TR-015242	TR-015243
100 RP-18 ec	5	TR-015244	TR-015245	TR-015246
100 RP-8	5	TR-015247	TR-015248	TR-015249
100 RP-8 ec	5	TR-015250	TR-015251	TR-015252
100 NH2	5	TR-015253	TR-015254	TR-015255
100 CN	5	TR-015256	TR-015257	TR-015258
100 Diol	5	TR-015259	TR-015260	TR-015261
60 RP-Select B	5	TR-015572	TR-015573	TR-015574
Si 100	10	TR-015214	TR-015215	TR-015216
100 RP-18	10	TR-015217	TR-015218	TR-015219
100 RP-18 ec	10	TR-015220	TR-015221	TR-015222
100 RP-8	10	TR-015223	TR-015224	TR-015225
100 RP-8 ec	10	TR-015226	TR-015227	TR-015228
100 NH2	10	TR-015229	TR-015230	TR-015231
100 CN	10	TR-015232	TR-015233	TR-015234
100 Diol	10	TR-015235	TR-015236	TR-015237
60 RP-Select B	10	TR-015569	TR-015570	TR-015571

Superspher - Tracer Carbohydrates

A totally porous spherical packing, with a particle size of 4µm, giving a compromise alternative between the packings of 3 and 5µm.

Novafix™ Cartridge SUPERSPHER

Function		Dimensions		
Particle size	(µm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 60	4	TR-015262	TR-015263	TR-015264
60 RP-8	4	TR-015265	TR-015266	TR-015267
100 RP-18	4	TR-015268	TR-015269	TR-015270
60 RP-8 ec	4	TR-015271	TR-015272	TR-015273
100 RP-18 ec	4	TR-015274	TR-015275	TR-015276

Analytical columns SUPERSPHER

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
Si 60	4	TR-011701	TR-411701	TR-011703	TR-411703	TR-011705	TR-411705	TR-011707	TR-411707	TR-011709	TR-411709
60 RP-8	4	TR-011711	TR-411711	TR-011713	TR-411713	TR-011715	TR-411715	TR-011717	TR-411717	TR-011719	TR-411719
100 RP-18	4	TR-011721	TR-411721	TR-011723	TR-411723	TR-011725	TR-411725	TR-011727	TR-411727	TR-011729	TR-411729
60 RP-8 ec	4	TR-011731	TR-411731	TR-011733	TR-411733	TR-011735	TR-411735	TR-011737	TR-411737	TR-011739	TR-411739
100 RP-18 ec	4	TR-011741	TR-411741	TR-011743	TR-411743	TR-011745	TR-411745	TR-011747	TR-411747	TR-011749	TR-411749

For Guard Columns please refer to pages 209-211

For precolumns of cartridge system Novafix please refer to page 205.

Tracer Carbohydrates

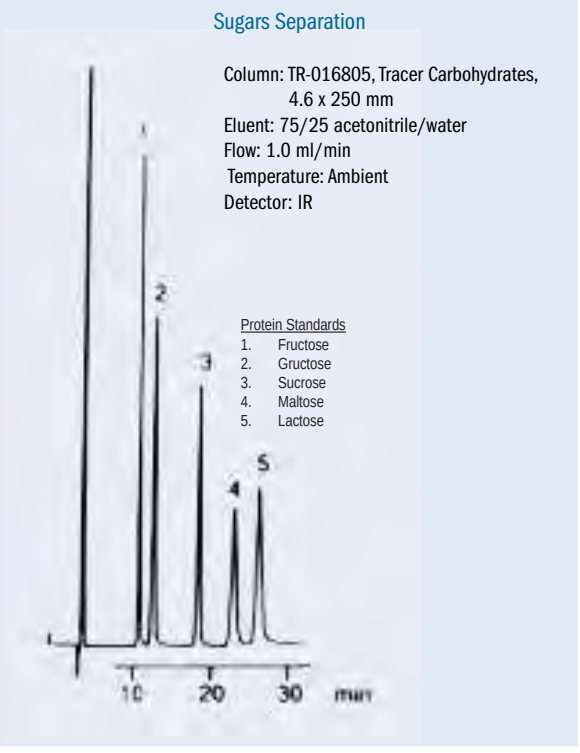
Tracer Carbohydrates column is based on a Polymeric Coating Chemically Bonded Silica Base packing, that includes in its structure primary amino groups.

This polymeric coating protects surface silica packing against attacks coming from aqueous/organic mobile phases used in the separation of sugars.

Keeping the selectivity of a conventional NH2 column, Tracer Carbohydrates have a longer lifetime.
This column can be also washed with eluents lightly basic to eliminate acidic impurities irreversibly linked with the packing that degrade very quickly any standard NH2 columns.

- Higher Stability
- Better resolution in disaccharides analysis

Sugars Separation



Carbohydrates Columns

Designed for Carbohydrates Analisys

Reference	Description	Particle Size µm	Dimensions cm
TR-016804	Tracer Carbohydrates	5 µm	15 x 0.46 cm
TR-016805	Tracer Carbohydrates	5 µm	25 x 0.46 cm

TK Partisil

Partisil´s high quality irregular packing with a very high surface area. Different degrees of coating for the ODS packings permit optimum selectivity.

Partisil ODS is 5% coated, while Partisil ODS2 has 15% and the Partisil ODS3 is covered by a 10% of carbon.

Analytical columns PARTISIL

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0,4 cm	25 x 0.46 cm	25 x 0.4 cm
Silica	5	TR-016205	TR-416205	TR-016206	TR-416206	TR-016207	TR-416207	TR-016208	TR-416208	TR-016209	TR-416209
ODS3	5	TR-016211	TR-416211	TR-016212	TR-416212	TR-016213	TR-416213	TR-016214	TR-416214	TR-016215	TR-416215
C8	5	TR-016217	TR-416217	TR-016218	TR-416218	TR-016219	TR-416219	TR-016220	TR-416220	TR-016221	TR-416221
PAC	5	TR-016222	TR-416222	TR-016223	TR-416223	TR-016224	TR-416224	TR-016225	TR-416225	TR-016226	TR-416226
Silica	10	TR-016227	TR-416227	TR-016228	TR-416228	TR-016229	TR-416229	TR-016230	TR-416230	TR-016231	TR-416231
ODS	10	TR-016330	TR-416330	TR-016331	TR-416331	TR-016332	TR-416332	TR-016333	TR-416333	TR-016334	TR-416334
ODS2	10	TR-011817	TR-411817	TR-011819	TR-411819	TR-011821	TR-411821	TR-011823	TR-411823	TR-011825	TR-411825
ODS3	10	TR-011827	TR-411827	TR-011829	TR-411829	TR-011831	TR-411831	TR-011833	TR-411833	TR-011835	TR-411835
PAC	10	TR-016232	TR-416232	TR-016233	TR-416233	TR-016234	TR-416234	TR-016235	TR-416235	TR-016236	TR-416236
SAX	10	TR-011837	TR-411837	TR-011839	TR-411839	TR-011841	TR-411841	TR-011843	TR-411843	TR-011845	TR-411845
SCX	10	TR-016237	TR-416237	TR-016238	TR-416238	TR-016239	TR-416239	TR-016240	TR-416240	TR-016241	TR-416241

TSK has available a wide range of columns with different percentages of coating, degree of endcapping, etc. which cover a wide field of applications.

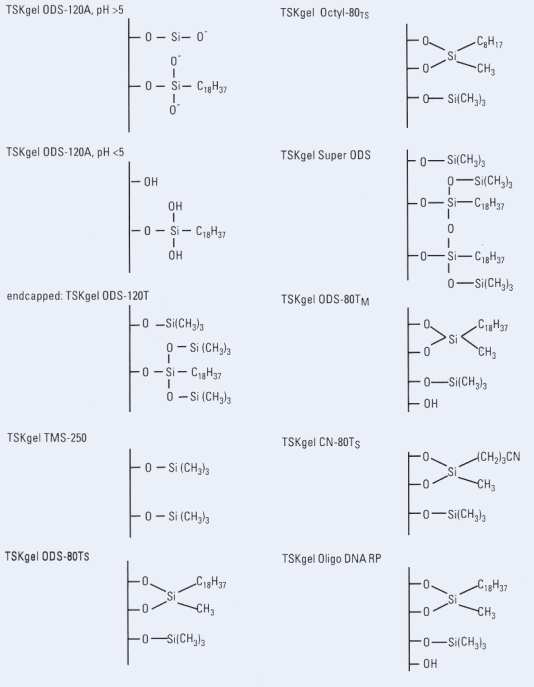
The nomenclature used by TosoHass describes each packing. Thus, for example, a packing ODS-80TM indicates a packing of 80A pores substituted with octadecylsilane groups. The letter T means that the packing has been processed by endcapping with TMS groups.

The letter A describes a packing without endcapping, and the letter M means that the coating is of a monolayer of C18 groups. If an S appears in the description it means that the packing is totally endcapping.

Properties of silica-based TSK-GEL RPC columns

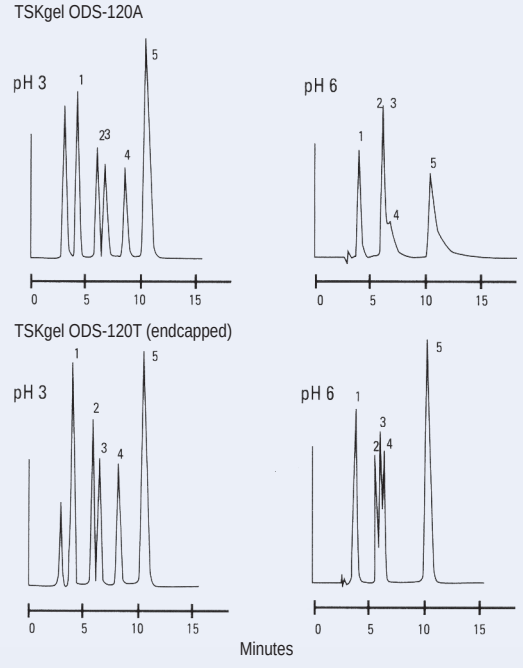
Column	Functional Group	Endcapped	% Carbon	Particle size (µm)	Pore size (µm)	Exclusion limit *(Da)*
ODS-80$_M$	C_{18} alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
ODS-80$_S$	C_{18} alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
OCTYL-80T$_S$	C_8 alkyl, monomeric	Yes	11%	5	80	10,000
CN-80T$_M$	CN, monomeric	Yes	8%	5	80	10,000
SUPER-ODS	C_{18} alkyl, polymeric	Yes	8%	2	110	20,000
SUPER-Octyl	C_{18} alkyl, polymeric	Yes	5%	2	110	20,000
SUPER-Phenyl	Phenyl, polymeric	Yes	3%	2	110	20,000
ODS-120T	C_{18} alkyl, polymeric	Yes	22%	5, 10, 20	120	100-10,000
ODS-120A	C_{18} alkyl, polymeric	No	22%	5, 10	120	100-10,000
TMS-250	C_1 alkyl, monomeric	Yes	5%	10	250	100-200,000
OligoDNA RP	C_{18} alkyl, monomeric	No	10%	5	250	up to 165,000

TSK-Gel bonded silica stationary phases



TKL 1016

Effect of pH and degree of endcapping on the resolution of catecholamines



Column: TSKgel ODS-120A, 4.6mm x 25cm
TSKgel ODS-120T, 4.6mm x 25cm
Sample: 1 norepinephrine, 2 epinephrine
3 3,4-dihydroxybenzylamine, 4 DL-DOPA,
5 dopamine-HCl
Elution: 0.1M phosphate buffer, pH 3.0 or 6.0
Flow rate: 1.0ml/min
Detection: UV @ 254nm

TSK Gel Reversed Phase - TSK Gel SUPER-ODS

Analytical Columns TSK Gel Reversed Phase

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (µm)
TH-18150	ODS-80T$_S$ 80A	2,0	15	5
TH-18151	ODS-80T$_S$ 80A	2,0	25	5
TH-17200	ODS-80T$_S$ 80A	4,6	7,5	5
TH-17201	ODS-80T$_S$ 80A	4,6	15	5
TH-17202	ODS-80T$_S$ 80A	4,6	25	5
TH-16651	ODS-80T$_M$ 80A	4,6	7,5	5
TH-08148	ODS-80T$_M$ 80A	4,6	15	5
TH-08149	ODS-80T$_M$ 80A	4,6	25	5
TH-17344	Octyl-80T$_S$ 80A	4,6	15	5
TH-17345	Octyl-80T$_S$ 80A	4,6	25	5
TH-17348	CN-80T$_S$ 80A	4,6	15	5
TH-17349	CN-80T$_S$ 80A	4,6	25	5
TH-07636	ODS-120A 120A	4,6	15	5
TH-07124	ODS-120A 120A	4,6	25	5
TH-18152	ODS-120T 120A	2,0	15	5
TH-18153	ODS-120T 120A	2,0	25	5
TH-07637	ODS-120T 120A	4,6	15	5
TH-07125	ODS-120T 120A	4,6	25	5
TH-07190	TMS-250 250A	4,6	7,5	10

Guard Columns TSK Gel Reversed Phase

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (µm)
TH-17242	ODS-80TS, Guard Cartridge, pk 3	3,2	5	1,5
TH-14100	Cartridge Holder	3,2		1,5

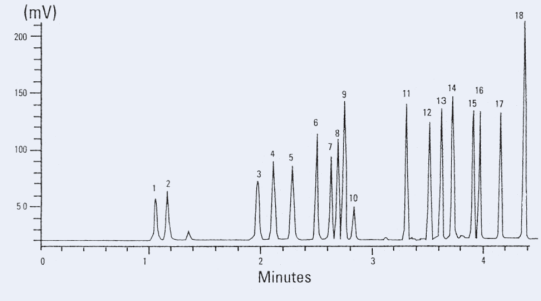
TSK Gel SUPER-ODS

- Efficiencies of 200,000N/m
- 2 µm particles
- Extremely short analysis times
- Reduced working pressures
- Lower costs of analysis

TSKgel Super-ODS is a reverse phase column that contains 2 µm particles of silica with 150 A pore size.

This column is the best choice when it is required to shorten the analysis time for all types of compounds up to 20,000 Daltons, including the most basic.

TSKgel Super-ODS for rapid separation of eighteen PTC-derivatized amino acids

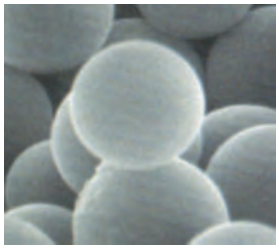


Column:	TSKGel Super-ODS (4.6mm x 10cm)
Sample:	1. Asp, 2 Glu, 3. Ser, 4. Gly, 5. His, 6. Arg, 7. Thr, 8. Ala, 9. Pro, 10. PTC-NH_2, 11. Try, 12. Val, 13. Met, 14. Cys, 15. Ile, 16. Leu, 17. Phe, 18. Lys
Elution:	CH_3CN/H_2O = 60/40 0min (b:5%), 4min (b:100%)
Flow Rate:	1.5mL/min
Detection	UV @ 254nm
Injection:	5µL
Temperature:	ambient

Ultrarapid columns TSKgel Super-ODS

Analytical and preparative column specifications, in reversed phase TSK-GEL.

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (µm)
TH-18154	Super-ODS, 110A	4,6	5	2
TH-18197	Super-ODS, 110A	4,6	10	2
TH-18275	Super-Octyl, 110A	4,6	5	2
TH-18176	Super-Octyl, 110A	4,6	10	2
TH-18177	Super-Phenyl, 110A	4,6	5	2
TH-18178	Super-Phenyl, 110A	4,6	10	2
TH-18206	Super-ODS Guard filter holder	10	2,6	For P/N 18207
TH-18207	Super-ODS Guard filter	4,0	2,6	For Super-ODS, Phenyl and -Octyl 2 µm pore size



YMC is known worldwide for the variety, versatility and quality of its HPLC packings. An attention centred originally in the analytical requirements of their clients has evolved to develop a full range of packings whose special selectivity characteristics have made them essential chromatographic tools in the fields of advanced techniques such as that of combinatorial chemistry, LC-MS, etc.

- Spherical materials of high purity, available in particle sizes between 3 and 150 µm.
- The largest range of substitutions,including packings substituted with 30 atom carbon chains, packings resistant to extreme pHs, etc.
- Manufacture in batches of more than 100 kg/batch, for a better reproducibility and scaling.
- Columns of all diameters between 0.05mm and 1000mm internal diameter (From nano-chromatography to industrial scale chromatography, passing through analytical and preparative.)

PRODUCT	CODE	PHASE (silica-based noted)	END-CAPPED	USP CLASS NO	PARTICLE SIZE (µm spherical)	PORE SIZE (nm)	CARBON LOAD (%C)	pH	TYPICAL APPLICATIONS
YMC30	CT	proprietary; polymeric bonding chemistry	proprietary	n/a	3.5	proprietary	proprietary	2-6	isomeric carotenes, retinols, steroids, fat-soluble vitamines
Pro C18	AS	latest generation C18 using ultrapure silica base (99.999%). with very low residual non-specific interactions	yes	L1	3.5	120	17	2-8	fat-soluble vitamins, antioxidants, metabolites, acidic, neutral, basic and chelating compounds
Pro C18 RS	RS	high carbon load with polymeric bonding C18, ultrapure silica base (99.999%)	yes	L1	3.5	80	22	1-10[2]	suitable for a wide range of samples including acidic and basic compounds
Hydrosphere C18	HS	based on the same ultrapure silica base as ProFamily, can be used in 100% aqueous eluent	yes	L1	3.5	120	12	2-8	strong polar compounds, antibiotics, catecholamines, nucleic acids, water-soluble vitanmins. Acidic, neutral, basic and chelating compounds
ODS-A	AA	one of YMC's international bestsellers, traditional high performance C18 column	yes	L1	3.5	120,200,300	17,12,6	2-7	pharmaceuticals, vitamins, amino acids, peptides, general purpose phase
ODS-AM	AM	strict QC controlled production provides a high performanc C18 column for validated methods operations	yes	L1	3.5	120	17	2-7	purines. phenols, PTC-amino acids, angiotensins. alkaloids
ODS-AQ	AQ	"hydrophilic" endcapping, for 100% aqueous eluent systems, substantially increased retention of polar compounds	yes	L1	3.5	120,200	14,11	2-6-5	strong polar compounds, pharmaceuticals, antibiotics, peptides and proteins, nucleic acids
J´sphere	JH,JM,JL	Cl8-family with differently controlled hydrophobicity for method development	yes	L1	4	80	22,14,9 (JH,JM,JL)	1-9 (H) 2-7 (M+L)	positional isomers. complexing agents, pharmaceuticals
ODS-AL	AL	traditional C18 for "mixed mode" separations	no	L1	3.5	120	17	2-6	Tocopherols, fat-soluble vitamins, disinfectants
Polymer C18	PC	polymethacrylate-matrix, stable towards shrinking and swelling. wide pH applicability	n/a	n/a	6.10	proprietary	C18=10%	2-12	Phenols, anilins. peptides in high pH, pharmaceuticals, quaternary amines
Pro C8	OS	latest generation C8 sing ultrapure silica base (99.999%1. with very low residual non-specific interactions	yes	L7	3.5	120	11	2-8	acidic, neutral, basic and chelating compounds, drugs and metabolites
C8 (Octyl)	OC	traditional C8. high coverage monomeric bonding chemistry	yes	L7	3.5	120,200,300	10,7,4	2-7	proteins and peptides, estrogens, general purpose phase
YMC Basic	BA	specifically designed for the separation of basic compounds	yes	L7	3.5	proprietary	7	2-7	basic molecules w/o modifiers, anilines, alkaloids, antidepressants
Phenyl	PH	monomeric bonded phenyl	yes	Lit	3.5	120,300	9.3	2-7	Phenols, fulwerenes, sweeteners
Pro C4	BS	latest generation C4 using ultrapure silica base (99.999% with ,very low residual non-specific interactions.	yes	L26	3.5	120	8	2-8	polar acidic, neutral, basic and chelating compounds, polar peptides
C4 (Butyl)	BU	traditional C,. high coverage monomeric bonding chemistry	yes	L26	3.5	120,200,300	7,5,2,5	2-7	biological separations, polar compounds
Protein-RP	PR	specifically designed to withstand exposure to TFA. good recovery rates	yes	L26	5	proprietary	proprietary	1.5-7	Proteins, peptides
C1 (TMS)[3]	TM	trimethyl silane, excellent hydrolytic stability	n/a	L13	3.5	120,300	4,3	2-7	water-soluble vitamins
PVA-SIL[3]	PV	polyvinyl alcohol bonded on silica support, suitable for normal or reversed phase applications	n/a	L24	5	120	n/a	2-9.5	Proteins, phospholipids, retinoids, lipids
Polyamin II (PBMN)	PS	mixed secondary and tertiary amino derivative gives improved hydrolic stability and alternative selectivity compared to conventional amino-phases, increased life time, rapid equilibration time	n/a	n/a	5	120	n/a	2-9	malto-oligosaccharides, tocopherols, nucleotldes, sugars
Amino[3]	NH	Primary amino derivative, high coverage monomeric bonding chemistry	n/a	L8	3.5	120	3	2.7	Sugars, nucleotides, water-soluble vitamins
Cyano[3]	CN	Traditional cyano derivative, useful also for SFC applications	yes	L10	3.5	120,300	7,2,5	2-7	Proteins, steroids, catechols
Diol[3]	DL	For aquous GPC or normal phase applications, high recovery for biological material	n/a	L20	5	60,120,200, 300	n/a	2-7	Peptides, proteins, malto-oligosaccharides
Silica	SL	Ultra high purity mechanical stability	n/a	L3	3.5	60,120,200, 300	n/a	n/a	small organic molecules, fat-soluble vitamins. tocopherols

YMC columns - Guide to IPC (International Product Code)

The following table provides a full listing of stationary phases and column dimensions available from YMC. However, please note that combinations of features cannot be selected at random, but only from the possible specifications for a chosen stationary phase.

Chemistry code		Pore size in nm		Particle shape		Particle size in (µm)		Length in nm		Inner diameter in nm	
YMC30	CT	6	06	spherical	S	3	03	10	01	0.05	E5
Pro C18	AS	8	08			4	04	20	02	0.075	E8
ProC18RS	RS	12	12	irregular	I	5	05	33	03	0.1	FO
Hydrosphere C18	HS	20	20			6	06	50	05	0.2	GO
ODS-A	AA	30	30					75	L5	0.3	HO
ODS-AM	AM	100	A0			5/15	11	100	I 10	0.5	JO
ODS-AQ	AQ	proprietary	99			10/20	16	125	R5	0.8	MO
J'sphere ODS-H80	JH					15/30	21	150	15	1.0	01
J'sphere ODS-M80	JM					30/50	41	250	25	2.1	02
J'sphere ODS-L80	JL					50	50			3.0	03
ODS-AL	AL					75	75	300	30	4.0	04
Polymer C18	PC					63/210	A4	500	50	4.6	46
Pro C8	OS					150	AS	1000	AO	6.0	06
C8 (Octyl)	OC					350	C5	1500	AS	8.0	08
YMCbasic	BA							2000	BO	10	10
Phenyl	PH					5/20	12			20	20
Pro C4	BS					1 0/25	17			30	30
C4 (Butyl)	BU					40/63	52				
Protein-RP	PR					63/210	A4			40	40
C1 (TMS)	TM									50 (2000 psi)	52
PVA-SIL	PV									70 (2000 psi)	72
Polyamine II	PB									100 (2000 psi)	A2
Amino	NH									150 (2000 psi)	B2
Cyano	CN									200 (2000 psi)	C2
Diol	DL										
Silica	SL										
Chiral K	CK										
Chiral L	CL										
Chiral NEA (R)	NR										
Chiral NEA (S)	NS										
Chiral CD BR a	DA										
Chiral CD BR f3	DB										
Chiral CD BR y	DG										
Chiral Prep CD ST	ST										
Chiral Prep CD PM	PM										

Example:
For ordering a YMC-Pack Pro C18 column with 12 nm pore size, 3 µm particle size, 50 mm length and 2.1 mm ID the corresponding product number will be: AS12S030502. Should you require assistance, please contact us.

HALO™ column packings are not made the typical way. Instead, the particles packed into HALO columns are manufactured using Fused-Core particle technology that was specially developed to deliver hyper-fast chromatographic separations while avoiding the reliability issues so often associated with fast HPLC (Figure 1).

The ability of HALO to generate hyper-fast separations comes not only from their small particle size (2.7 µm) but also from the unique Fused-Core particle technology that creates a 0.5 µm porous shell fused to a solid core particle. As mobile phase flow rate is increased to speed-up a separation, the slow mass transfer of solute molecules inside the particles limits resolving power. Fused-Core particle technology addresses this limitation by providing an incredibly small path (0.5 µm) for diffusion of solutes into and out of the stationary phase, thereby reducing the time solute molecules spend inside the particles and minimizing a major barrier to fast chromatographic separations (Figure 2).

HALO columns deliver over 50% more separating power (theoretical plates) than a column of the same length packed with 3.5 µm particles and more than twice the plates of a column acked with 5 µm particles (Figure 3).

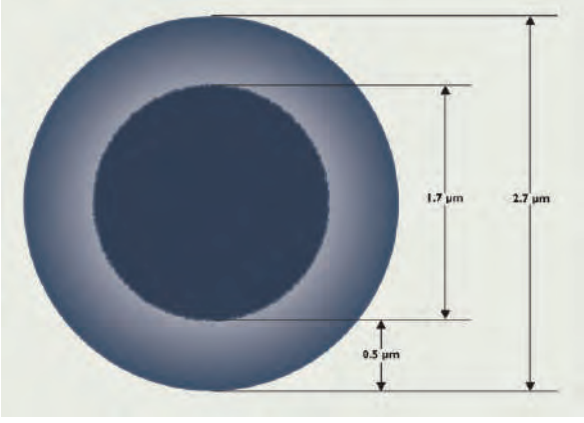


Figure1-Fused-CoreParticleTechnology

Fused-Core particle technology was developed by Jack Kirkland to produce HPLC columns that provide faster separations and higher
sample throughput without sacrificing column ruggedness and reliability.
As the name implies, Fused-Core particles are manufactured by "fusing" a porous silica layer onto a solid silica particle.

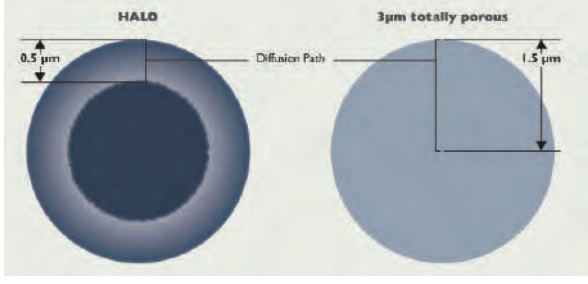


Figure 2 - The shorter diffusion path of HALO reduces axial dispersion

The shorter diffusion path of HALO particles reduces axial dispersion of solutes and minimizes peak broadening. A Halo particle has only a 0.5 µm diffusion path compared to the approximately 1.5 µm diffusion path of a 3 µm totally porous particle. Because of the shorter diffusion path, the performance advantages of HALO become even more apparent when separating larger solute molecules and operating at faster mobile phase flow rates.

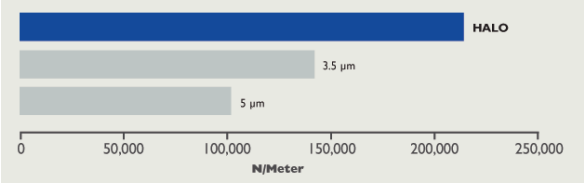
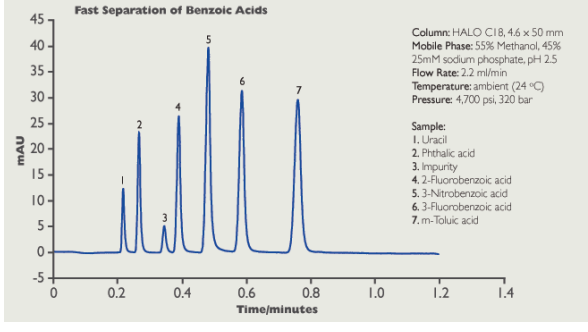


Figure 3. HALO columns deliver more separating power

HALO columns deliver over 50% more separating power (plates) than columns of the same length packed with 3.5 µm particles and more than twice the separating power of columns packed with 5µm particles.
Note: N/Meter values were calculated at the optimum mobile phase linear velocity for each of these stationary phases. Naphthalene was used as the test probe and the mobile phase conditions used were 60% acetonitrile and 40% water at 24 oC.

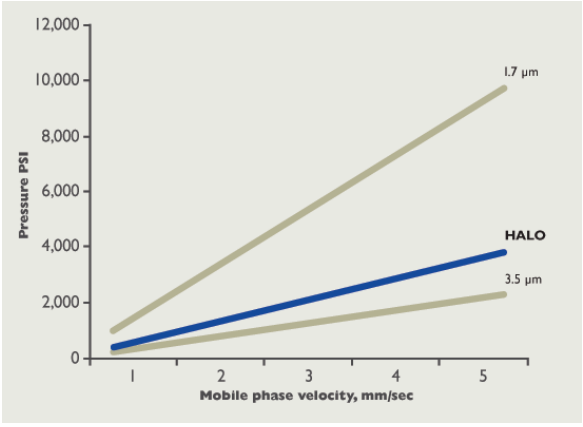


HALO columns are designed for hyper-fast separations so that higher sample throughput can be achieved. In this example, the HALO column separated seven compounds in less than 48 seconds with better than baseline resolution for all peak pairs.

HALO™ HyperFast HPLC Column

Halo columns do not require ultra-high pressure

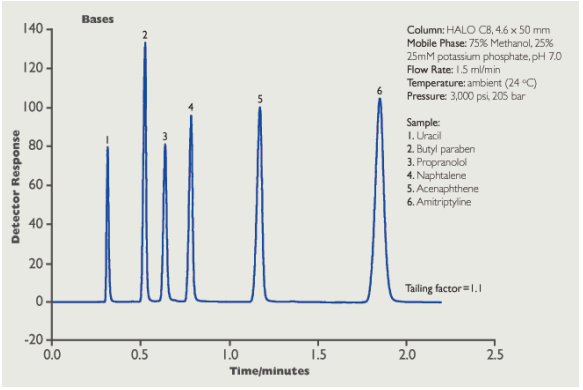
Fused-Core particle technology produces hyper-fast columns that can be used on practically all HPLC systems. Figure 7 provides a comparison of system back pressure for the HALO column versus other fast HPLC columns. Columns packed with stationary phases smaller than 2 µm often require pressures in excess of what is achievable with typical HPLC instrumentation. A very real bonus that comes with using a HALO column is that expensive ultra-high pressure instrumentation does not have to be purchased and new laboratory protocols do not have to be developed. HALO columns can turn almost any HPLC system into a high speed workhorse for your lab.



Most HPLC systems have operating pressure limits of 6,000 psi (400 bar), or less. As the column packing particle size decreases, the column back pressure increases rapidly.
To use columns packed with sub-2 µm size particles at their optimum flow rate, pressure that exceeds 6,000 psi is often encountered. This necessitates purchasing very expensive "ultra-pressure" equipment to achieve optimum performance. HALO columns, even though they do generate slightly higher back pressure than columns packed with 3.5 µm particles, can be used with most existing HPLC equipment.

Halo is base-deactivated for excellent peak shape

HALO stationary phases are made using ultra-pure reagents and "Type B" silica. The peak shapes for bases and acids are excellent on HALO columns because metal contamination has been virtually eliminated and interference from silanol groups has been minimized (see figure bellow). Because of the elimination of "secondary retention" of solutes from metal contamination or silanol interaction, column-to-column reproducibility is also excellent.



Peak tailing due to trace metals or silanol groups is essentially non-existent on HALO stationary phases. The examples here show the excellent peak shape that can be achieved for either bases or acids when using a HALO column. The conditions used for the bases were chosen to encourage any potential silanol interference. Note the excellent peak shape for amitriptyline under these conditions.

Halo Specifications

Stationary Phase Support
- Ultra-pure, "Type B" silica
- 1.7 µm solid core particle with a 0.5 µm porous silica layer fused to the surface
- 150 m^2/gram surface area
- 90 Å pore size

Bonded Phase
- Monomeric bonding chemistry
- Densely bonded phase
- Maximized endcapping
- C18: Octadecyldimethylsilane, 3.5 µmoles/m2
- C8: Octyldimethylsilane, 3.7 µmoles/m2
- pH Range: 2 to 9

Maximum Pressure: 9,000 psi, 600 Bar

Ordering Information

Column Dimensions	HALO C18	HALO C8
2.1 x 30mm	HAL-92812-302	HAL-92812-308
2.1 x 50mm	HAL-92812-402	HAL-92812-408
2.1 x 75mm	HAL-92812-502	HAL-92812-508
2.1 x 100mm	HAL-92812-602	HAL-92812-608
2.1 x 150mm	HAL-92812-702	HAL-92812-708
3.0 x 30mm	HAL-92813-302	HAL-92813-308
3.0 x 50mm	HAL-92813-402	HAL-92813-408
3.0 x 75mm	HAL-92813-502	HAL-92813-508
3.0 x 100mm	HAL-92813-602	HAL-92813-608
3.0 x 150mm	HAL-92813-702	HAL-92813-708
4.6 x 30mm	HAL-92814-302	HAL-92814-308
4.6 x 50mm	HAL-92814-402	HAL-92814-408
4.6 x 75mm	HAL-92814-502	HAL-92814-508
4.6 x 100mm	HAL-92814-602	HAL-92814-608
4.6 x 150mm	HAL-92814-702	HAL-92814-708

Zirconia or zirconium dioxide (Zr02) is a metal oxide that exists in a variety of crystalline and amorphic forms. The chief advantage of Zirconia in comparison with the traditional silica base packings is its unique and specific selectivity as well as outstanding thermal stability and chemical resistance.

In contrast to silica, Zirconium is totally stable within the complete pH range (0-14) and allows operation at temperatures as high as 200°C.

With respect to the polymeric packings on the market, Zirconia has an advantage in its exceptional mechanical resistance, and in not having the problems of incompatibility with certain organic solvents as is the case with the polymeric packings.

Available in a variety of particle sizes, between 3 and 20 µm, the operation of separations from ultrarapid to semi preparative is possible.

- Superior selectivity and better chromatographic peaks in the separation of basic compounds.
- Easy transfer of methods from conventional ODS columns.
- Stable between pHs of 1 to 14.
- Excellent thermal stability for rapid separations.
- High efficiency (> 120,000 plates/metre.)

Zirchrom™ -PDB

Composed of particles of ultra -stable Zirconia, coated with fine layer of cross linked polybutadiene. Its selectivity for non-ionizable compounds is similar to that of traditional packings C8 or C18. In the case of ionizable compounds, multiple secondary interactions can help the appropriate resolution of analytes, permitting a practically unlimited adjustment of operating conditions.

Thanks to its thermal stability, times of analysis can be reduced by half simply by raising the operating temperature into the 50°C range.

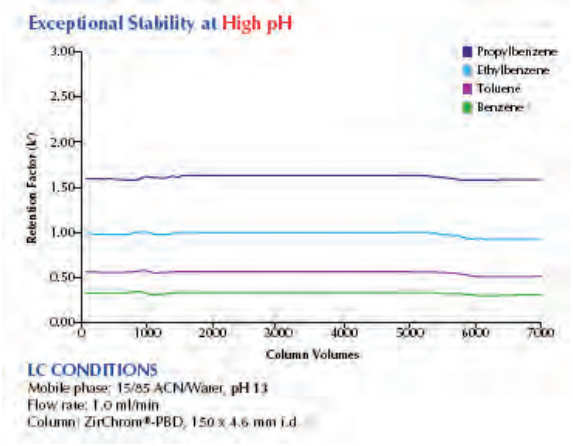
DiamondBond™ -CI8

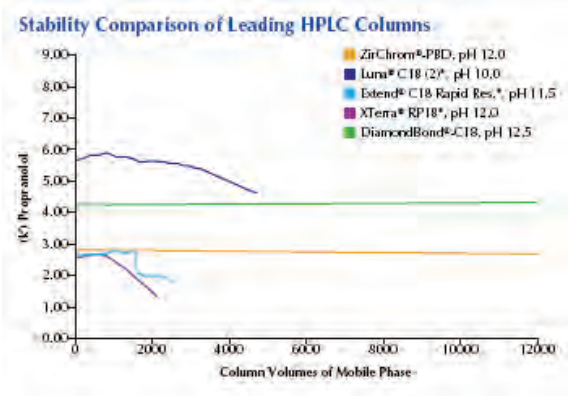
- Excellent selectivity for acidic compounds.
- pH stable between 1 and 14
- Excellent thermal stability for rapid analyses.

This packing contains CI8 groups co-valently bonded to the carbon coated surface of the Zirconia. The extreme strength of the carbon-carbon bonds practically eliminates any bleeding of the column whatever, improving derived from the base line, preventing falls in retention times and bettering the sensitivity in all LC/MS applications.

References

The catalogue references for Zirchrom R are made in the following way: PPP-XXYY, where PPP is the number of the phase, XX is the length of the column and YY is the diameter of the same. For example,DBOI-I546 describes a column of 15 cm by 4.6 mm containing DiamondBond -CI8.





Column Format

5 cm Columns	***15 cm Columns***	***GuardColumnsHolders***
0521 (5 cm x 2.1 mm)	1521 (15 cm x 2.1 mm)	852-00 (use with 2.1 mm)
0546 (5 cm x 4.6 mm)	1546 (15 cm x 4.6 mm)	850-00 (use with 4.6 mm)

10 cm Columns	***Guard Columns***
1021 (10 cm x 2.1 mm)	G20 (use with 2.1 mm)
1046 (10 cm x 4.6 mm)	G20 (use with 4.6 mm)

Ordering Information

Phase Number	Phase Name	Mode of use
DB01	DiamondBond-C18	Reversed-Phase
ZR01	ZirChrom-CARB	Reversed-Phase
ZR02	ZirChrom-PHASE	Normal Phase and SEC
ZR03	ZirChrom-PBD	Reversed-Phase
ZR04	ZirChrom-WCX	Weak cation-Exchange
ZR06	ZirChrom-SAX	Strong Anion-Exchange
ZR07	ZirChrom-SHAX	Strong Anion-Exchange
ZR08	ZirChrom-PEZ	Cation-Exchange for Proteins
ZR09	ZirChrom-PS	Reversed-Phase

Hamilton PRP™-C18 Reversed-Phase HPLC

Benefits of the Hamilton PRP™-C18 HPLC Columns:

- Excellent mechanical and thermal stability (> 100°C)
- Can be regenerated in high acidic or basic concentrations (1 M)
- High-efficiency reversed-phase separations in nearly any mobile phase or pH
- Performs extreme application not possible with traditional ODS C18 columns

High-Efficiency Separations at Any pH

The Hamilton PRP™-C18 is a new HPLC column designed to provide high-efficiency, reversed-phase separations over an extended column life in nearly any mobile phase or pH. The rigid stationary phase has excellent mechanical and thermal stability, does not experience shrinking or swelling, and is completely inert to most conditions commonly encountered in reversed-phase chromatography.

The Hamilton PRP-C18 Column is a durable and effective column for general purpose HPLC and is especially well-suited for specialized applications in the clinical, pharmaceutical, environmental, food, forensics, and life sciences industries.

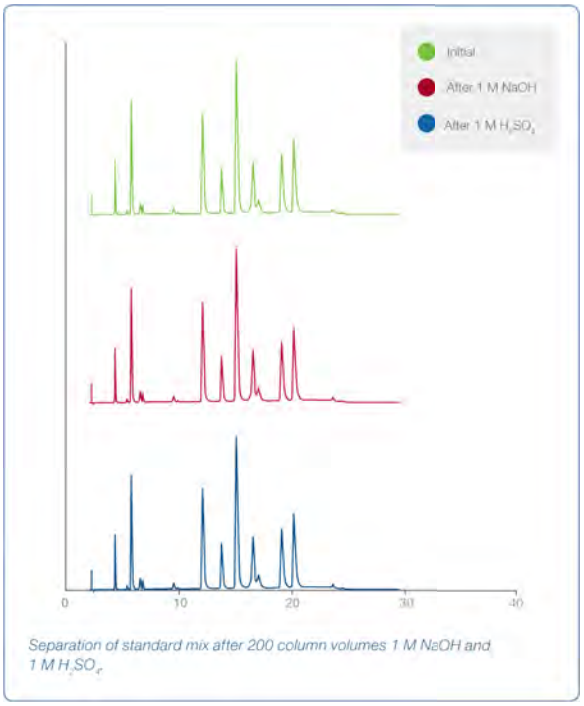
Rugged Design

The PRP-C18 column has similar mechanical stability and separation efficiency to that of a traditional octadecylsilane (ODS); however, the PRP-C18 stationary phase does not strip, bleed, or dissolve under the most extreme conditions (e.g., pH 1–13, temperatures > 100°C). It will perform reliably and reproducibly throughout an extended column lifetime, regardless of mobile phase conditions. These characteristics allow for an expanded mobile phase repertoire for use in methods development or aggressive regeneration procedures.

No pH Limitations

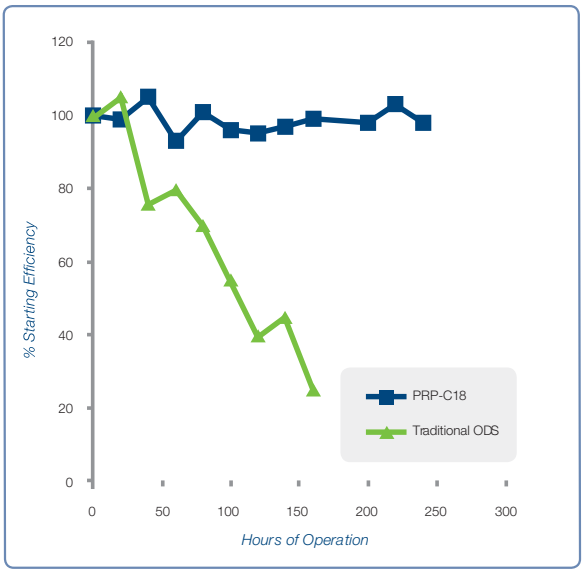
Mobile phase pH is a powerful tool in methods development for ionizable solutes. Separation of amines and other organic bases, which includes more than 70% of all drug compounds, has been a problem for a long time. The PRP-C18 column gives chromatographers the ability to employ an alkaline mobile phase (i.e., pH > 11) that allows for the separation of basic solutes in their neutral forms, expanding the window for elution and often greatly simplifying the process of methods development

Benefits of the Hamilton PRP™-C18 HPLC Columns:



Separation of standard mix after 200 column volumes 1 M NaOH and 1 M H_2SO_4

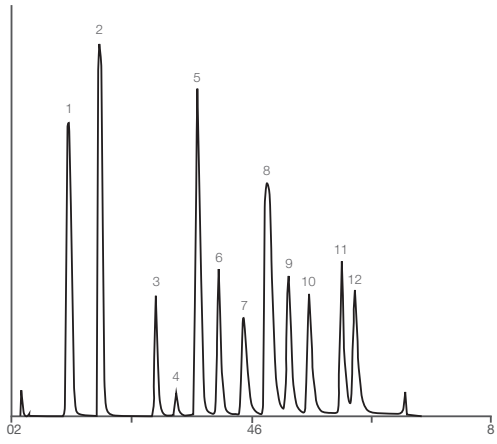
High pH Column Lifetime Comparison



Experimental Conditions

Column: PRP-C18, 4.1 x 50 mm, 5 µm
Instrumentation: Agilent 1100 quaternary pump with UV detector
Standards: Acetone, phenol, benzyl alcohol, benzene, toluene, ethylbenzene, propylbenzene, naphthalene, pentylbenzene, hexylbenzene
Mobile phase A: 0.2% Phosphoric acid
Mobile phase B: A + 95% ACN
Gradient: 5 to 100% B in 20 minutes
Flow rate: 2 mL/min
Temperature: Ambient
Injection volume: 2 µL

Fast Gradient Elution



Separation of 12 standards in a short, 5 minute linear acetonitrile gradient.

Dimensions / Particle Size

I.D. X Length	5 (µm)	10 (µm	12-20 (µm)
2.1 x 50 mm	HA-79672		
2.1 x 50 mm PEEK	HA-79679		
2.1 x 150 mm	HA-79673		
2.1 x 150 mm PEEK	HA-79680		
2.1 x 250 mm	HA-79674		
2.1 x 250 mm PEEK	HA-79681		
4.6 x 50 mm	HA-79675		
4.6 x 50 mm PEEK	HA-79682		
4.6 x 150 mm	HA-79676		
4.6 x 150 mm PEEK	HA-79683		
4.6 x 250 mm	HA-79677		
4.6 x 250 mm PEEK	HA-79684		
21.2 x 250 mm	HA-79678		
Bulk Resin (1 gram)	HA-79791	HA-79792	HA-79793

PRP-C18 Guard Columns Ordering Information

Part Number	Description
HA-79685	Analytical Guard Column Starter Kit (1 holder, 2 cartridges), Stainless Steel
HA-79685	Analytical Guard Column Starter Kit (1 holder, 2 cartridges), Stainless Steel
HA-79686	Analytical Guard Column Replacement Cartridges (5/pk), Stainless Steel
HA-79687	Analytical Guard Column Starter Kit (1 holder, 2 cartridges), PEEK
HA-79688	Analytical Guard Column Replacement Cartridges (5/pk), PEEK
HA-79689	Semi-prep/Preparative Guard Column Starter Kit (1 holder, 1 cartridge), Stainless Steel
HA-79690	Semi-prep/Preparative Guard Column Replacement Kit (2/pk), Stainless Steel

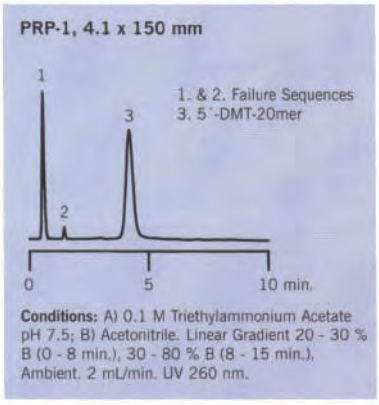
Hamilton PRP-3 HPLC Columns

Polymeric packing of 300 A pore size, specially for the separation of proteins by reversed phase.

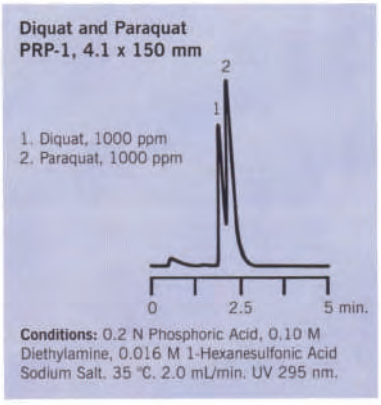
- Stable at pHs between 0 and 14.
- Total absence of silanols.
- Excellent column lifetime (the support can be cleaned with strong acids or bases to eliminate sample residues).
- 100% compatible with whatever organic solvent.
- Particle sizes from 3µm for highly efficient separations

What Types of Samples can PRP-3 Columns separate?

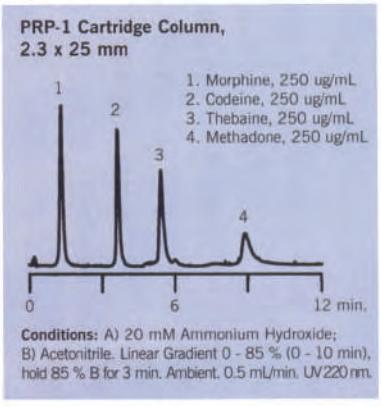
Peptides



Proteins



Proteins



PRP-3 Reversed Phase

PRP-3 Reveresed Phase I.D. X Length	Particle Size 3 (µm)	 10 (µm)
2.1 x 150 mm		HA-79392
4.1 x 150 mm		HA-79466

PRP-3 Guard Columns

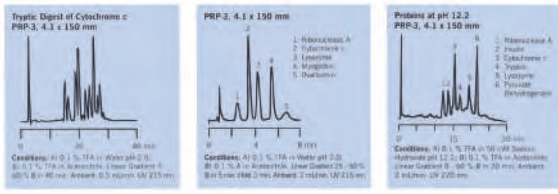
PRP-3 Reveresed Phase I.D. X Length	Particle Size 3 (µm)	 10 (µm)
Starter Kits (1 holder, 2 cartridges)	HA-79461	HA-79393
Replacement cartridges (5/pk)	HA-79454	HA-79395

PRP-3 Reversed Phase

PRP-3 Reveresed Phase I.D. X Length	Particle Size 10 (µm)	 12 (µm)
4.1 x 250 mm	HA-79794	
4.6 x 150 mm*	HA-79382	
4.6 x 250 mm*	HA-79574	
7.0 x 305 mm	HA-79468	
10.0 x 250 mm	HA-79526	
21.5 x 250 mm		HA-79469

**** PEEK Hardware***

Hamilton PRP®-h5 Polymer HPLC Columns



- Chemical Stability
- Full Range stability
- Enhanced Sample Recovery

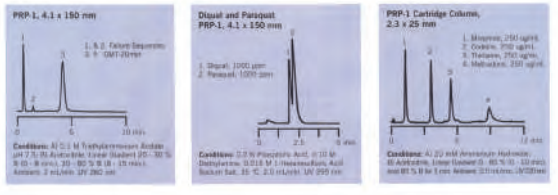
The PRP-h5 HPLC column line from Hamilton offers a robust alternative to silica based and traditional polymer HPLC columns for oligonucleotide and protein separations.

Total Compatibility

The PRP-h5 is a high performance, polymeric, reversed-phase column that delivers separations of a wide variety of analytes under the most extreme
analytical conditions. Virtually any organic solvent and mobile phase additives can be employed to optimize analyte separation.

Extended Column Life

Mobile phases with pH ranging from 1 to 13 can be used without damaging or degrading the stationary phase. This wide pH range opens up more
possibilities of solvents and buffers that can be used to elucidate a great separation.



Technical Data

Material:	Cross-linked poly(styrene-co-divinylbenzene) polymer
Particle size:	5 µ
Pore size:	300 Å

Ordering Information

Column	PRP-h5 (300Å)			
I.D.	50 (mm)	100 mm	150 mm	250 mm
2.1 mm ID		HA-79270	HA-79271	
4.6 mm ID	HA-79261	HA-79262	HA-79272	HA-79273
10 mm ID		HA-79263	HA-79274	

Guard Columns

Cat.No.	Description
HA-79267	Analytical Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79268	Analytical Replacement Cartridges (5/pk)
HA-79277	Semiprep/Prep Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79278	Simiprep/Prep Replacement Cartridges (2/pk)

Bulk Resin

Cat.No.	Description
HA-79280	12-20 µm Bulk Resin (1 Gram)

HAMILTON PRP-X400 Analysis for Gliphosate

Gliphosate and of metabolite amniomethylphosphonic acid in drinking waters. (EPA 547).

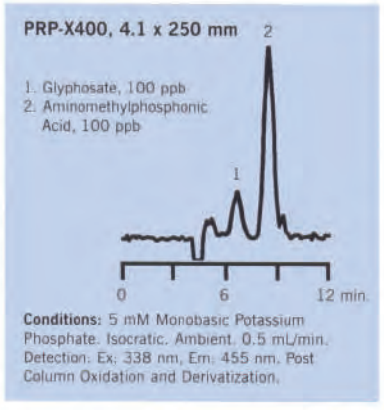
The column PRP-X400, a packing of polystyrene-divinyl-benzeno sulphonate with 7µm particle diameter and 2.5 meq./gm, separates both compounds according to their ionic charges in less than 10 minutes. The detection requires a post-column oxidation and derivization.

This column improves on the recommendation of the EPA547 given that it does not require thermostating at 65°C ,eliminates the use of methanol, and also demonstrates a significantly shorter analysis time.

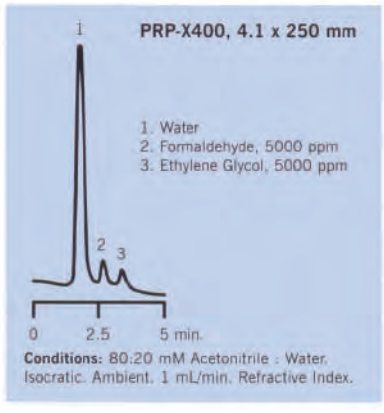
- Analysis times eight minutes less in comparison with other columns.
- Detection of levels of 1Oppb with the technique of post -column derivization with OPA.
- Applicable to other separations like ethylene glycol.
- Hamilton recommend the column PRP-X400 for the analysis of the herbicides.

What Types of Samples can PRP-Infinity Columns separate?

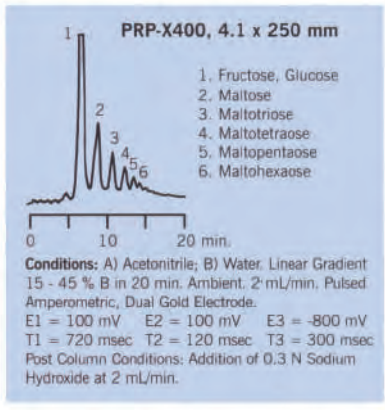
Glyphosate



Ethylene Glycol



Corn Syrup



Ordering Information

PRP-X400

Cat.No.	Description
HA-79398	PRP-X400 7 µm 150 x 2.1 mm
HA-79717	PRP-X400 7 µm 150 x 4.1 mm
HA-79473	PRP-X400 7 µm 250 x 4.1 mm
HA-79387	PRP-X400 7 µm 250 x 4.6 mm (PEEK)
HA-79376	Guard Columns Starter Kit (Holder + 2 Cartridges) (PEEK)
HA-79377	Replacement cartridges (5/pk) (PEEK)
HA-79459	Guard Columns Starter Kit for analysis of Glifosate
HA-79452	Replacement cartridges (5/pk) for analysis of Glifosate

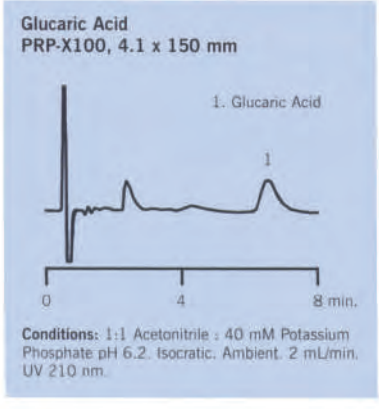
Hamilton Columns for the Analysis of Anions

Hamilton columns are an excellent choice for the technique of ionic chromatography due to their high efficiency, strength and economy.

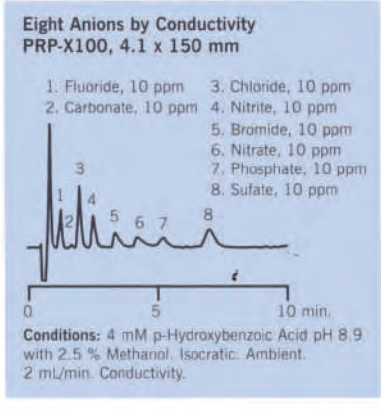
- Easily separate all the anions specified in the EPA300 .0 Part A.
- Perfect separation of the fluoride anion
- Permits the use of organic eluants, facilitating column cleaning.
- Stable at pHs between 0 and14.
- The PRP-X110 column is recommended for ionic chromatography with direct conductivity or UV detection.
- The PRP-X 110S column is recommended for ion suppression analysis.
- Available in a wide range of column dimensions and particle sizes.

What Types of Samples can PRP-X100 Columns separate?

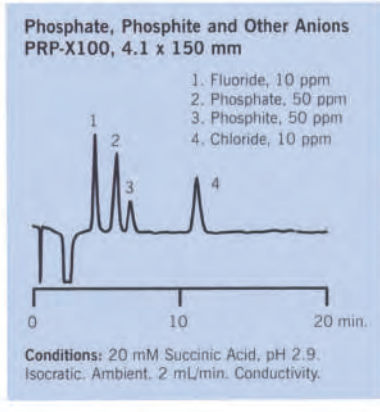
Anticancer Agents



Common Anions



Common Anions



Ordering Information

PRP-X100 Anion Exchange		
I.D. X Length	3 (µm)	7 (µm)
1.0 x 50 mm		HA-79775
1.0 x 100 mm		HA-79776
4.1 x 150 mm		HA-79732
4.1 x 250 mm		HA-79734
4.6 x 150 mm*		HA-79738

A list of compounds (and their chromatograms) that have been separated using PRP-X110 and PRP-X110S columns can be found on the Hamilton Company web site at http://www.hamiltoncompany.com.

PRP-X100 Anion Exchange	I.D. X I.D. X Length
	7 (µm)
2.1 x 100 mm	HA-79743
2.1 x 150 mm	HA-79745
2.1 x 250 mm	HA-79747
4.1 x 100 mm	HA-79731
4.1 x 150 mm	HA-79733
4.1 x 250 mm	HA-79735
4.6 x 250 mm*	HA-79741

** PEEK Hardware*

Guard Columns

PRP Guard Columns for:	Steel columns	PEEKcolumns
Starter Kits (1 holder, 2 cartridges)	HA-79726	HA-79727
Replacement Cartridges (5/pk)	HA-79728	HA-79729

Concise Separations ICSep Columns

ICSep Columns for Organic Acid Analysis

The technique of ion exclusion is preferred for the separation of weakly ionizable types such as the organic acids and the alcohols. Concise Separations has developed a full range of columns that for efficiency and specificity are unique when dealing with this class of separations.

- Polymeric substrate.
- High Efficiency.
- High resolution.
- Separate organic acids, carbohydrates and alcohols on a single column.
- Extremely resistant and with a long useful lifetime.

Column	Dimensions	Cat.No.
COREGEL 87H1	7,8 X 100 mm	TG-ICE-99-5861
COREGEL 87H3	7,8 X 300 mm	TG-ICE-99-9861
COREGEL 107H	7,8 X 300 mm	TG-ICE-99-9866
COREGEL 64H	7,8 X 300 mm	TG-ICE-99-9860
ION-310	6,5 X 150 mm	TG-ICE-99-7752
ION-300	7,8 X 300 mm	TG-ICE-99-9850
ORH 801	6,5 X 300 mm	TG-ICE-99-9754
WINE ANALYSIS WA-1	7,8 X 300 mm	TG-ICE-99-9810
ARH 601	6,5 X 100 mm	TG-ICE-99-5753

Precolumns for every type of column available on application.

Compound	Coregel 87 H @ 85 ºC (units in minutes)	Coregel 64 H @ 65 ºC (units in minutes)	ION-300 @ 65 ºC (units in minutes)	ORH-801 @ 45 ºC (units in minutes)
Acetic acid	13.8	15.0	14.9	10.4
Acetoacetic acid	n/d	n/d	n/d	10.2
Aconitic acid	8.6	9.8	10.7	7.2
Acrylic acid	15.9	17.7	17.9	13.1
Adiptic acid	12.5	15.1	15.8	11.6
Butanol	32.9	35.1	25.2	18.4
Butyric acid	18.4	21.0	20.8	15.2
Citraconic acid	10.1	11.0	11.5	n/d
Citric acid	7.5	8.0	8.6	5.5
Ethanol	21.4	21.7	20.6	14.6
Formic acid	12.9	13.8	13.9	9.6
Fumaric acid	11.5	13.4	14.7	10.0
2-Furoic acid	22.1	26.9	29.0	22.0
Glucoronic acid	n/d	n/d	n/d	5.3
Glycolic acid	11.4	13.0	12.9	8.5
Glucoxylic acid	9.2	9.7	10.3	6.5
Hydroxybutyric acic	12.8	14.0	14.1	9.5
Iso-butyric acid	17.3	19.6	19.5	14.0
Itaconic acid	11.1	12.8	13.4	9.1
Keto-butyric acid	n/d	n/d	11.4	7.4
Keto-gutaric acid	7.8	8.2	n/d	5.6
Keto-valeric acid	11.7	12.6	13.1	8.6
Lactic acid	11.9	12.9	11.6	8.7
Maleic acid	8.2	8.6	9.0	5.9
Malic acid	8.8	9.6	10.3	6.6
Malonic acid	9.3	10.0	10.7	6.9
Methanol	18.7	19.0	18.7	12.9
Methylglutaic acid	11.8	13.9	14.5	10.0
Methylsuccinic acid	10.9	12.5	13.0	8.8
Oxalic acid	6.7	6.6	n/d	4.5
Propanol	25.9	26.7	22.2	16.1
Propionic acid	15.8	17.4	17.4	12.3
Pyruvic acid	9.2	9.5	9.9	6.3
Quinic acid	9.4	10.3	11.4	6.9
Shikimic acid	10.5	11.8	12.9	8.2
Succinic acid	10.4	11.7	12.2	8.2
Tartaric acid	8.0	8.6	9.5	5.9

Flow rate: 0.6 mL/minute. n/d = not determined

CARBOSep Columns for Carbohydrates Analysis

CARBOSep is the name of the complete range of columns that Transgenomic has developed for the analysis of carbohydrates. These columns employ the technique called lingand-exchange for the separation of mono-, di,-and oligosaccharides of upto 15 glucose units.

In this technique it is the different metals bonded to the polymeric matrix of the packing which react selectively with the weakly negatively charged hydroxyls of the sugar molecules. The selectivity is controlled by means of the appropriate choice of resin type and of the metallic species bonded to it, as well as other factors, such as the temperature of the column.

CARBOSep is the most complete range, and with the best efficiency of all those on the market.

Column	Dimensions	Cat.No.
CARBOSep CHO-620	6,5 X 300 mm	TG-CHO-99-9753
CARBOSep CHO-611 OH	6,5 X 150 mm	TG-CHO-99-7752
CARBOSep CHO-411	7,8 X 300 mm	TG-CHO-99-9850
CARBOSep CHO-611	6,5 X 300 mm	TG-CHO-99-9751
CARBOSep USP-19 CA-FORM	4,0 X 250 mm	TG-CHO-99-8453
CARBOSep CHO-682	7,8 X 200 mm	TG-CHO-99-8854
CARBOSep CHO-682	7,8 X 300 mm	TG-CHO-99-9854
CARBOSep CHO-820	7,8 X 200 mm	TG-CHO-99-8855
CARBOSep CHO-820	7,8 X 300 mm	TG-CHO-99-9855
COREGEL 87P	7,8 X 300 mm	TG-CHO-99-9864
COREGEL 87N	7,8 X 300 mm	TG-CHO-99-9863
COREGEL 87K	7,8 X 300 mm	TG-CHO-99-9862
COREGEL 87C	7,8 X 300 mm	TG-CHO-99-9860
COREGEL 87MM	7,8 X 300 mm	TG-CHO-99-9865
COREGEL 42Ag	7,8 X 300 mm	TG-CHO-99-9851

Precolumns for every type of column available on application.

Carbohydrate Columns Specifications Chart

Column	Application	Form	**Particle size** (µm)	Typical Mobile Phase	Recom´d Rate Flow (mL/min)	Recom´d Temp (ºC)
CARBOSepCHO-411	oligosaccharides up to DP10, corn syrup, molasses	sodium	20	water	0.4	75
CARBOSepCHO-611	oligosaccharides up to DP5	sodium	10	water	.05	90
CARBOSepCHO-611 OH	mono and oligosaccharides w/PAD detection	sodium	10	sodium hydroxide	0.5	90
CARBOSepCHO-620	high fructose corn syrup, mono-, di-, trisaccharides and sugar alcohols	calcium	10	water	0.5	90
CARBOSepCHO-682	mono and disaccharides, sucrose, maltose lactose	lead	7	water	0.4	80
CARBOSepCHO-820	mono and disaccharides, sucrose, maltose lactose	calcium	8	water	0.5	90
CARBOSepCORGEL- 87C	simple sugars, sugar alcohols	calcium	9	water	0.6	85
ICSepCORGEL 87H1	fast analysis of organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
ICSepCORGEL 87H3	organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
CARBOSepCORGEL- 42Ag	oligosaccharides up to DP11	silver	20	water	0.4	75
CARBOSepCORGEL- 47K	beet sugar, cane sugar, corn syrup, molasses	potassium	8	water	0.6	85
CARBOSepCORGEL- 87N	beet sugars, mono and oligosaccharides	sodium	8	water	0.6	85
CARBOSepCORGEL- 87P	pentose, hexose, monosaccharides, alcohols	lead	8	water	0.8	85
CARBOSep USPL19	USP L-19 specifications for separationof sorbitol and mannitol	calcium	9	water	0.2	30
CARBOSepCORGEL- 87MM	mono, di, and trisaccharides, and sugar alcohols	calcium/sodium	8	water	0.5	85
ICSep ION300	glucose and fructose in organic acid mixtures	hydrogen	8	sulfuric acid	0.4	70
ICSep ION310	grape must analysis	hydrogen	8	sulfuric acid	0.8	50

Mobile Phase: 100% water. Flow Rate: 0.5 mL/minute. Temperature 90ºC

Concise Separations CARBOSep Columns

CARBOSep Columns for Carbohydrates Analysis

CARBOSep is the name of the complete range of columns that Transgenomic has developed for the analysis of carbohydrates. These columns employ the technique called lingand-exchange for the separation of mono-, di,-and oligosaccharides of upto 15 glucose units.

In this technique it is the different metals bonded to the polymeric matrix of the packing which react selectively with the weakly negatively charged hydroxyls of the sugar molecules. The selectivity is controlled by means of the appropriate choice of resin type and of the metallic species bonded to it, as well as other factors, such as the temperature of the column.

CARBOSep is the most complete range, and with the best efficiency of all those on the market.

Column	Dimensions	Cat.No.
CARBOSep CHO-620	6,5 X 300 mm	TG-CHO-99-9753
CARBOSep CHO-611 OH	6,5 X 150 mm	TG-CHO-99-7752
CARBOSep CHO-411	7,8 X 300 mm	TG-CHO-99-9850
CARBOSep CHO-611	6,5 X 300 mm	TG-CHO-99-9751
CARBOSep USP-19 CA-FORM	4,0 X 250 mm	TG-CHO-99-8453
CARBOSep CHO-682	7,8 X 200 mm	TG-CHO-99-8854
CARBOSep CHO-682	7,8 X 300 mm	TG-CHO-99-9854
CARBOSep CHO-820	7,8 X 200 mm	TG-CHO-99-8855
CARBOSep CHO-820	7,8 X 300 mm	TG-CHO-99-9855
COREGEL 87P	7,8 X 300 mm	TG-CHO-99-9864
COREGEL 87N	7,8 X 300 mm	TG-CHO-99-9863
COREGEL 87K	7,8 X 300 mm	TG-CHO-99-9862
COREGEL 87C	7,8 X 300 mm	TG-CHO-99-9860
COREGEL 87MM	7,8 X 300 mm	TG-CHO-99-9865
COREGEL 42Ag	7,8 X 300 mm	TG-CHO-99-9851

Precolumns for every type of column available on application.

Carbohydrate Columns Specifications Chart

Column	Application	Form	Particle size (µm)	Typical Mobile Phase	Recom´d Rate Flow (mL/min)	Recom´d Temp (°C)
CARBOSepCHO-411	oligosaccharides up to DP10, corn syrup, molasses	sodium	20	water	0.4	75
CARBOSepCHO-611	oligosaccharides up to DP5	sodium	10	water	.05	90
CARBOSepCHO-611 OH	mono and oligosaccharides w/PAD detection	sodium	10	sodium hydroxide	0.5	90
CARBOSepCHO-620	high fructose corn syrup, mono-, di-, trisaccharides and sugar alcohols	calcium	10	water	0.5	90
CARBOSepCHO-682	mono and disaccharides, sucrose, maltose lactose	lead	7	water	0.4	80
CARBOSepCHO-820	mono and disaccharides, sucrose, maltose lactose	calcium	8	water	0.5	90
CARBOSepCORGEL- 87C	simple sugars, sugar alcohols	calcium	9	water	0.6	85
ICSepCORGEL 87H1	fast analysis of organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
ICSepCORGEL 87H3	organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
CARBOSepCORGEL- 42Ag	oligosaccharides up to DP11	silver	20	water	0.4	75
CARBOSepCORGEL- 47K	beet sugar, cane sugar, corn syrup, molasses	potassium	8	water	0.6	85
CARBOSepCORGEL- 87N	beet sugars, mono and oligosaccharides	sodium	8	water	0.6	85
CARBOSepCORGEL- 87P	pentose, hexose, monosaccharides, alcohols	lead	8	water	0.8	85
CARBOSep USPL19	USP L-19 specifications for separationof sorbitol and mannitol	calcium	9	water	0.2	30
CARBOSepCORGEL- 87MM	mono, di, and trisaccharides, and sugar alcohols	calcium/sodium	8	water	0.5	85
ICSep ION300	glucose and fructose in organic acid mixtures	hydrogen	8	sulfuric acid	0.4	70
ICSep ION310	grape must analysis	hydrogen	8	sulfuric acid	0.8	50

MobilePhase:100%water.FlowRate:0.5mL/minute.Temperature90°C

Concise Sep. Ion Chromagography CARBOSep Columns

Compound	CHO-620 (units in minutes)	CHO-611 (units in minutes)	CHO-682 (units in minutes)	COREGEL 87H (units in minutes)	COREGEL 87P (units in minutes)	COREGEL 87N (units in minutes)	COREGEL 87K (units in minutes)	COREGEL 87C (units in minutes)
Arabinose	10.64	11.08	23.95	12.08	16.32	12.64	14.72	13.92
Digitoxose	10.26	10.18	21.95	--	15.48	11.40	12.32	14.19
Fructose	10.07	10.33	25.84	11.25	16.96	11.61	13.31	13.63
Fucose	10.57	10.96	24.16	12.80	16.44	12.34	14.39	13.82
Galactose	9.58	10.22	22.32	11.12	15.16	11.44	13.36	13.82
Glucose	8.72	9.53	19.14	10.57	13.38	10.72	12.55	11.17
Mannose	9.79	10.27	25.50	11.13	16.76	11.57	13.74	12.76
Rhamnose	9.64	9.88	22.56	11.94	15.26	11.08	12.83	12.86
Sorbose	9.50	9.93	22.38	10.08	15.24	11.08	12.66	12.86
Tagatose	11.53	10.29	--	11.15	20.80	11.36	12.82	16.46
Xylose	9.56	10.34	20.64	11.32	14.42	11.77	13.69	12.32
Cellobiose	6.65	7.17	15.58	8.43	10.98	7.90	9.26	8.94
Lactose	7.01	7.51	17.37	8.77	11.84	8.18	9.63	9.44
Lactulose	7.57	7.85	20.70	9.00	13.24	8.48	10.08	10.17
Melibiose	6.99	7.46	17.63	8.56	12.02	8.19	9.72	9.36
Trehalose	6.70	7.14	15.98	8.64	11.20	7.85	9.02	9.07
Sucrose	6.76	7.27	15.70	--	11.10	7.99	9.11	9.09
Maltose	6.89	7.37	16.61	8.57	11.54	8.08	9.48	9.17
Ribitol	10.94	10.13	30.72	12.44	20.44	11.26	11.84	15.55
Arabitol	12.32	10.52	39.82	12.65	25.24	11.64	12.10	18.36
Galactitol	13.05	10.23	52.43	11.80	31.60	11.15	11.61	20.46
Myo-inositol	10.82	11.01	35.58	11.02	20.06	12.48	14.08	14.27
Lactitol	8.55	7.87	33.23	9.26	19.50	8.45	9.34	12.17
Maltitol	8.54	7.68	30.38	9.00	17.76	8.28	9.06	12.22
Mannitol	11.84	9.90	40.03	11.66	24.98	10.81	11.42	17.81
Sorbitol	13.64	10.38	56.56	11.77	33.40	11.32	11.86	21.34
Xylitol	13.93	11.01	51.15	12.82	31.10	12.16	12.64	21.30
Amiprylose	4.50	4.20	--	6.86	9.46	5.74	6.42	7.68
Melezitose	5.78	6.01	13.85	--	13.08	6.81	7.82	8.20
Maltotriose	5.91	6.22	15.17	7.72	10.54	6.98	8.16	8.28
Raffinose	5.86	6.10	14.40	--	10.22	6.88	7.92	8.24
Stachyose	5.28	5.39	13.41	--	9.58	6.33	7.28	7.77
Maltotetrose	5.37	5.54	14.07	7.30	9.84	6.42	7.46	7.80
Maltopentose	5.00	5.08	13.08	7.10	9.34	6.11	7.02	7.53
Maltohexose	4.78	4.87	12.24	7.00	8.80	5.94	6.74	7.38
Maltoheptose	4.66	4.60	11.74	6.96	8.52	5.84	6.61	7.28
Nitrate	4.55	4.20	10.30	6.85	8.40	5.70	6.40	7.30

MobilePhase:100%water.FlowRate:0.5mL/minute.Temperature90ºC

TK Concise Separations Ion Chromagography

The resins used by Concise Separations for the chromatography of inorganic ionic species (cations and anions) are composed of a macroporous co-polymer of polystyrene-divinylbenzene.

Those substituted with alkyl or alkyl quaternary ammonia are used for the separation of anions using carbonate type eluants. The resins substituted with sulphonic or carboxylic acids are used in the separation of cations employing acidic eluants.

- Polymeric substrate.
- Compatibility with organic solvents.
- High efficiency.
- Reproducibility.
- pH stability from 0 to 14.

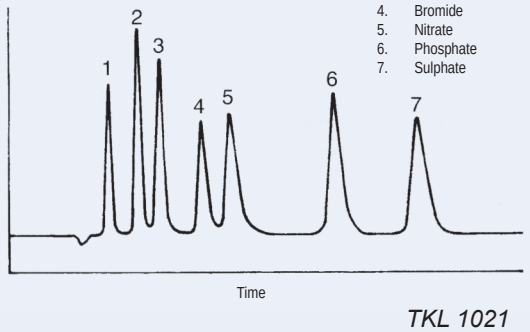
Anions by E.P.A. Method 300.0(a)

Conditions:

Column: ICSep AN300
Eluent: 1.7nM Sodium Carbonate, 1.8nM Sodium Bicarbonate
Flow rate: 2.0 mL/min
Detection: suppressed conductivity

Sample:

1. Fluoride
2. Chloride
3. Nitrite
4. Bromide
5. Nitrate
6. Phosphate
7. Sulphate



TKL 1021

Transgenomic Column	Competitive Columns	Application
ICSepAN300	Dionex AS4A	F-, Cl-, NO_2-, Br-, NO_3-, HPO_4^{2-},SO_4^{2-}, By E.P.A. Method 300.0(a)
ICSepANI	Dionex AS9-HC	F-, Cl-, NO_2-, Br-, NO_3-, HPO_4^{2-},SO_4^{2-}, Low molecular weight, Organic acids in medium to high ionic strength matrices Cr(lll), Cr(VI)asCr03-,Cr042-
ICSepANSC	Dionex AS4A-SC	Polyvalent Phosphates, Arsenate, Sulfite Selenate, Arsenite, Selenite, F-,Cl-, NO_2-, Br-, NO_3- , HPO_4^{2-},SO_4^{2-}, Low molecular weight, Organic acids
ICSepANISC	Dionex AS9-HC	F-, Cl, NO_2-, Br-, NO_3-, HPO_4^{2-}, SO_4^{2}, Low molecular weight, Organic acids in medium to high ionic strength matrices
ICSepAN2	Dionex AS14	Arsenate, Sulfite, Selenate, Arsenite, Selenite F-, Cl-, NO_2-, Br-, NO_3-, HPO_4^{2-},SO_4^{2-}, Low molecular weight Organic acids
ICSepAN300B	Dionex AS9	F-, Cl-, NO_2-, Br, NO_3-, HPO_4^{2-}, SO_4^{2-}, ClO_2-, ClO_3-, BrO_3-
ICSepCN2	Dionex CS15	Li^+, Na^+, K^+, Rb^+, Cs^+, Mg^{2+}, Ca^{2+}, NH^{4+}, Cu^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, $Cd2^+$, Pb^{2+}, Mn^{2+}, Fe^{2+}, Fe^{3+}

ICSep Ordering Information

Description	Cat.No.
ICSep AN2,4.6mm x 250mm	TG-ANX-99-8515
ICSep AN2 Guard Column, 4.6mm x 50mm	TG-ANX-99-3515
ICSep AN2 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0015
ICSepAN1,4.6mm x 250mm	TG-ANX-99-8511
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010
ICSep AN1-SC, 4.6mm x 250mm	TG-ANX-99-8514
ICSep AN1-SC Guard Column,4.6mm x 50mm	TG-ANX-99-3514
ICSep AN1-SC Guard Cartridges, 3/pk, 3.0mm x10mm	TG-ANX-99-0014
ICSep AN300,5.5mmx 150mm	TG-ANX-99-7613
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010

Description	Cat.No.
ICSep AN2,4.6mm x 250mm	TG-ANX-99-8515
ICSep AN300B, 4.6mm x 250mm	TG-ANX-99-8516
ICSep AN300B Guard Column, 4.6mm x 50mm	TG-ANX-99-3516
ICSep AN300B Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0016
ICSep ANSC, 4.6mm x 250mm	TG-ANX-99-8512
ICSep ANSC Guard Column, 4.6mm x 50mm	TG-ANX-99-3512
ICSep ANSC Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0012
ICSep ION-120,4.6mm x 120mm	TG-ANX-99-6550
ICSep ION-120 Guard Kit, 4.0mm x 24mm	TG-ANX-99-2350
ICSep ION-120 Guard Cartridges, 3/pk, 4.0mm x 24mm	TG-ANX-99-0090
ICSep CN2,3.2mm x 100mm	TG-CTX-99-5250
ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350
ICSep CN2 FA, 4.6mm x 50mm	TG-CTX-99-3550
ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350

The TSK-GEL (SEC) columns include both types of molecular exclusion chromatography: GFC or Gel Filtration Chromatography for the separation of water soluble polymers, and GPC (Gel Permeation Chromatography) for polymeric compounds soluble in organic solvents.

TSK-GEL SW;TSK-GEL SWXL and TSK-GEL Super SW for the analysis of peptides and proteins by Gel Filtration Chromatography.

The silica based TSK columns are the best choice for the separation by molecular size of peptides and proteins thanks to their high efficiency, low adsorption, and their well defined and controlled distribution of pore size.
The SW columns, of 10µm particle size, have been the most popular since their introduction in the year 1978, and now constitute a market standard. The SWXL are improved on the earlier ones, due to their particle size of 5 microns, which, while maintaining efficiency, cuts analysis time by half. Finally, the columns SuperSW, with 4 micron particles of high efficiency, allows operation with columns of 4.6 mm I.D., acheiving a spectacular increase of efficiency and detection sensitivity.

Analytical and preparative TSK-Gel Size Exclusion Silica based products

Cat.No.	Description	ID	Length	Particle
Void Columns for each column size		**(mm)**	**(cm)**	**size(µm)**
Guard columns				
TH-08805	SW Guard column, Glass	8.0	4.0	10
TH-14465	SW Guard column, Glass	20.0	4.0	20
TH-18762	Super, SW Guard column	4.6	3.5	4
TH-08543	SW_{XL} Guard column	6.0	4.0	7
TH-05371	SW Guard column	7.5	7.5	10
Bulk packing				
TH-08544	SW_{XL} Top-Off, 1g wet gel			5
TH-06819	SW Top-Off, 1g wet gel			10

Analytical and preparative TSK-Gel Size Exclusion Silica based products

Cat.No.	Description	ID	Length	Particle
Void Columns for each column size		**(mm)**	**(cm)**	**size(µm)**
Glass columns				
TH-16214	CQ-PAK TSK 200GL	8.0	15	5
TH-16216	CQ-PAK TSK 300GL	8.0	15	5
TH-08799	G2000SW, Glass	8.0	30	10
TH-08800	G3000SW, Glass	8.0	30	10
TH-08801	G4000SW, Glass	8.0	30	13
Stainless steel columns				
TH-18674	Super SW2000	4.6	30	4
TH-18675	Super SW3000	4.6	30	4
TH-08540	$G2000SW_{XL}$	7.8	30	5
TH-08541	$G3000SW_{XL}$	7.8	30	5
TH-08542	$G4000SW_{XL}$	7.8	30	8
TH-16215	QC-PAK TSK 200	7.8	15	5
TH-16049	QC-PAK TSK 300	7.8	15	5
TH-05788	G2000SW	7.5	30	10
TH-05789	G3000SW	7.5	30	10
TH-05790	G4000SW	7.5	30	13
TH-05102	G2000SW	7.5	60	10
TH-05103	G3000SW	7.5	60	10
TH-05104	G4000SW	7.5	60	13

Pore sizes: Super SW2000, CQ-PAK TSK 200, $G2000SW_{XL}$ = 125A, Super SW3000, CQ PAK TSK 300, G3000SW, and $G3000SW_{XL}$ = 250A, G4000SW and G4000SWXL = 450A.

Properties and separation rates for TSK-GEL SW-type packings

			Molecular weight of sample (DA)		
TSKgel packing	**Particle size (µm)**	**Pore size (a)**	**Globular proteins**	**Dextrans**	**Polyethylene glycols and oxiodes**
Super SW2000	4	125	$5,000 - 1.5 \times 10^5$	$1,000 - 3 \times 10^4$	500 - 15,000
$G2000SW_{XL}$	5	125	$5,000 - 1.5 \times 10^5$	$1,000 - 3 \times 10^4$	500 - 15,000
QC-PAK TSK 200	5	125	$5,000 - 1.5 \times 10^5$	$1,000 - 3 \times 10^4$	500 - 15,000
G2000SW	10, 13	125	$5,000 - 1.5 \times 10^5$	$1,000 - 3 \times 10^4$	500 - 15,000
Super SW3000	4	250	$1 \times 10^4 - 5 \times 10^5$	$2,000 - 7 \times 10^4$	$1,000 - 3.5 \times 10^4$
G 3000 SW_{XL}	5	250	$1 \times 10^4 - 5 \times 10^5$	$2,000 - 7 \times 10^4$	$1,000 - 3.5 \times 10^4$
QC-PAK TSK 300	5	250	$1 \times 10^4 - 5 \times 10^5$	$1,000 - 3 \times 10^4$	$1,000 - 3.5 \times 10^4$
G 3000 SW	10	250	$1 \times 10^4 - 5 \times 10^5$	$2,000 - 7 \times 10^4$	$1,000 - 3.5 \times 10^4$
$G4000SW_{XL}$	8	450	$2 \times 10^4 - 7 \times 10^6$	$4,000 - 5 \times 10^5$	$2,000 - 2.5 \times 10^5$
G4000SW	13, 17	450	$2 \times 10^4 - 7 \times 10^6$	$4,000 - 5 \times 10^5$	$2,000 - 2.5 \times 10^5$

Data generated using the following conditions:
Columns: Two 4 µm, 4.6mm x 30cm TSK-GEL Super SW columns in series, two 5 µm, 7.8mm x 30cm TSK-FEL SW_{XL} columns in series; two 10 µm, 7.5mm x 60cm TSK-GEL SW columns in series.
Elution: Globular proteins: 0.3M NaCl in 0.1M (0.05M for SW_{XL} columns) phosphate buffer, pH 7
Dextrans and polyethylene glycols and oxides (PEOs): distilled water

TSK-GEL PW and TSK-GEL PW$_{XL}$ Columns

for Molecular Exclusion (GFC) of water soluble polymers.

The PW columns, with a spherical packing of porous hydrophilic methacrylate, are the most suitable for molecular exclusion of water soluble synthetic polymers, as they have a more linear calibration curve, a wider range of application and a lower absorption than the SW type columns.

They also demonstrate an excellent mechanical and chemical stability, enabling operation within a pH range of 2 to 12, and can be used with upto 50% of organic solvent as eluant.

Analytical and preparative TSK-Gel Size Exclusion polymer based column

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Molecular weight of sample				
Guard columns				
TH-08034	Oligo Guard Column	6.0	4.0	12.0
TH-08033	PW$_{XL}$ Guard Column	6.0	4.0	12.0
TH-06763	PW-L Guard Column	7.5	7.5	12.0
TH-06762	PW-L Guard Column	7.5	7.5	12.0
Bulk packing				
TH-08035	PWXL Top-Off, 1g wet resin		10.0	

Analytical and preparative TSK-Gel Size Exclusion polymer based column

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Stainless steel columns				
TH-08031	G-Oligo-PW	7.8	30	6
TH-08032	G-DNA-PW	7.8	30	10
TH-08020	G2500PW$_{XL}$	7.8	30	6
TH-08021	G3000PW$_{XL}$	7.8	30	6
TH-08022	G4000PW$_{XL}$	7.8	30	10
TH-08023	G5000PW$_{XL}$	7.8	30	10
TH-08024	G6000PW$_{XL}$	7.8	30	13
TH-08025	GMPW$_{XL}$	7.8	30	13
TH-05760	G1000PW	7.5	30	10
TH-05761	G2000PW	7.5	30	10
TH-08028	G2500PW	7.5	30	10
TH-05762	G3000PW	7.5	30	10
TH-05763	G4000PW	7.5	30	17
TH-05764	G5000PW	7.5	30	17
TH-05765	G6000PW	7.5	30	17
TH-08026	GMPW	7.5	30	17
TH-05105	G2000PW	7.5	60	10
TH-08029	G2500PW	7.5	60	10
TH-05106	G3000PW	7.5	60	10
TH-05107	G4000PW	7.5	60	17
TH-05108	G5000PW	7.5	60	17
TH-05109	G6000PW	7.5	60	17
TH-08027	GMPW	7.5	60	17

Properties and separation rates for TSK-GEL PW-type packiings

			Molecular weight of sample (DA)		
TSKgel packing	**Particle size (µm)**	**Average Pore size (a)**	**Polyethylene glycols & oxides**	**Dextrans****	**Globular proteins**
G1000PW	10	< 100	up to 1,000	---	<2,000
G2000PW	10, 17, 20	125	up to 2,000	---	<5,000
G2500PW$_{XL}$	6	< 200	up to 3,000	---	<8,000
G2500PW	10, 17, 20				
G3000PW$_{XL}$	6	200	up to 5 x 10^4	up to 6 x 10^4	500 - 8 x 10^5
G4000PW$_{XL}$	10	500	2,000 - 3 x 10^4	1,000 - 7 x 10^5	1 x 10^4 - 1.5 x 10^6
G4000PW	17, 22				
G5000PW$_{XL}$	10	1000	4,000 - 1 x 10^6	5 x 10^4 - 2.5 x 10^6	< 1 x 10^7
G5000PW	17, 20, 22				
G6000PW$_{XL}$	13	< 1000	4 x 10^4 - 8 x 10^6	5 x 10^5 - 5 x 10^7	< 2 x 10^8
G6000PW	17, 25				
GMPW$_{XL}$	13	< 100 - 1,000	500 - 8 x 10^6	< 5 x 10^7	< 2 x 10^8
GMPW	17				
G-Oligo-PW	6	125	up to 3,000	---	< 3,000
G-DNA-PW	10	< 1,000	4 X 10^4 - 8 X 10^6	< 5 X 10^7	< 2 X 10^8

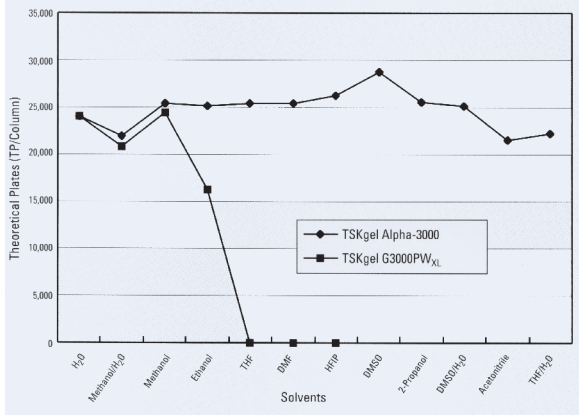
Data generated using the following conditions:
Column: TSK-GEL PW columns, 7.5mm x 60cm; TSKgelPW$_{XL}$, G-Oligo-PW & G-DNA-PW, 7.8MM x 30cm
Elution: Pollyethylene glycols and oxides: distilled water, dextrans and proteins: 0.2M phosphate buffer, pH 6.8.
Flow rate: 1.0mL/min
Note: * Larger particle sizes of each group are for 21.5mm x 60cm semi-preparative and 55mm or 108mm x 60cm preparative columns.
** Maximum separation range determined from estimated exclusion limits.

TSK-GEL Alpha Columns

for Molecular Exclusion of polymers soluble in water and in orgamic media.

A new hydrophilic polyvinyl resin with extraordinary chemical and physical properties allows operation with aqueous as well as organic eluants without the appearance of any phenomenon of "swelling" common to other polymeric packings.

Additionally, absorptions due to hydrophobic inter-actions common to other columns of styrene-divinyl benzene are avoided. This even permits the chromatography of polymers soluble in methanol.



Conditions of solvent change

Flow Rate:	1.0mL/min
Temperature:	25ºC
Time of purge:	8k

Conditions for TP measurement

Sample:	ethylene glycol
Flow rate:	1.0mL/min
Temperature:	25ºC
Detection:	RI

TSK-Gel Alpha Series

Cat.No.	Description	ID	Length	Particle
Molecular weight of sample		(mm)	(cm)	size(µm)
Stainless Steel columns				
TH-18339	Alpha-2500	7.8	30	7
TH-18340	Alpha-3000	7.8	30	7
TH-18341	Alpha-4000	7.8	30	10
TH-18342	Alpha-5000	7.8	30	10
TH-18343	Alpha-6000	7.8	30	13
TH-18344	Alpha-M (mixed bed)	7.8	30	13
Guard columns				
TH-18345	Alpha Guard column	6	4	13

Exclusion limits for TSK-GEL Alpha Series columns

Exclusion limit (Da for various standards and eluents)

Column	Particle size (µm)	PEO[a]/H_2O	PS[b]/10mM liBr in DMF	PEG[c]/10nM LiBr in MeOH
Alpha-2500	7	5×10^3	1×10^4	1×10^4
Alpha-3000	7	9×10^4	1×10^5	6×10^4
Alpha-4000	10	$\times 10^5$	1×10^6	3×10^6
Alpha-5000	10	1×10^6	7×10^6	N.D.
Alpha-6000	13	$> 1 \times 10^7$	$> 1 \times 10^7$	N.D.
Alpha-M	13	$> 1 \times 10^7$	$> 1 \times 10^7$	N.D.

N.D = not determined
a Polyethylene oxide
b Polystyrene Divinyl Benzene
c Polyethylene glycol

TSK-GEL H6, TSK-GEL H8 ...

for Molecular Exclusion Chromatography

All the range is made of porous, spherical particles of highly crosslinked polystyrene-divinylbenzene.

H6, H8, and XL designate different sizes of particle and therefore of efficiency. The polymer of the HHR series has special properties of chemical resistance, giving an exceptional resistance to the most diverse organic solvents, so making the column much more versatile than the majority of those on the market.

We also have available Multipore columns, which cover a wide range of molecular weights and give excellent linearity.

Properties of H-type columns

TSKgel column	Average Pore Size (A)	Exclusion limit*	Temperature (ºC)	Application area
G1000H6, H8, H_{XL}	15	1 X 10^3	60	small molecules, oligomers
G1000H H_{HR}	15	< 1.5 X 10^3	140	small molecules, oligomers
G2000H6, H8, H_{XL}	20	1 X 10^4	60	oligomers
G2000H H_{HR}	20	< 4 X 10^3	140	oligomers
G2500H6, H8, H_{XL}	30	2 X 10^4	60	oligomers
G2500H H_{HR}	30	< 1.2 X 10^4	140	oligomers
G3000H6, H8, H_{XL}	75	6 X 10^4	60	oligomers, polymers
G3000H H_{HR}	75	< 3 X 10^4	140	oligomers, polymers
G4000H6, H8, H_{XL}	200	4 X 10^5	80	polymers
G4000H H_{HR}	200	< 1.5 X 10^5	140	polymers
G5000H6, H8, H_{XL}	650	4 X 10^6	80	polymers
G5000H H_{HR}	650	< 1.5 X 10^6	140	polymers
G6000H6, H8, H_{XL}		4 X 10^7	80	polymers
G6000H H_{HR}		< 1 X 10^7	140	polymers
G7000H6, H8, H_{XL}		4 X 10^8 **	80	polymers
G7000H H_{HR}		< 1.5 X 10^7	140	polymers
GMH_{HR}-L (mixzed bed)	4 - 500	< 1 X 10^4	140	oligomers with low MW range
GMH_{HR}-N		< 1.5 X 10^5	140	polymers with medium MW range
GMH_{HR}-M		< 1 X 10^6	140	polymers with broad MW range
GMH6, H_{XL}		4 X 10^8 **	80	polymers with BROADMW range
GMH_{XL}-L		4 X 10^8 **	80	high resolution of MW polymers with a total profile of high MW polymers
GMH6, -HT, H_{XL}- HT (Mixed bed/high temperature)		4 X 10^8 **	140	high temperature separations of polymers with broad MW range
MultiporeH_{XL}-m	Wide pore distribution	500 to 2 X 10^6	60	polymers with broad MW range

* *polystyrene standards*
** *estimate*

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Stainless Steel columns				
TH-17352	G1000H_{HR}	7.8	30	5
TH-17353	G2000H_{HR}	7.8	30	5
TH-17354	G2500H_{HR}	7.8	30	5
TH-17355	G3000H_{HR}	7.8	30	5
TH-17356	G4000H_{HR}	7.8	30	5
TH-17357	G5000H_{HR}	7.8	30	5
TH-17358	G6000H_{HR}	7.8	30	5
TH-17359	G7000H_{HR}	7.8	30	5
TH-17362	GMH_{HR}-L mixed bed	7.8	30	5
TH-18055	GMH_{HR}-N mixed-bed	7.8	30	5
TH-17392	GMH_{HR}-M mixed-bed	7.8	30	5
TH-17360	GMH_{HR}-H mixed-bed	7.8	30	5
TH-18393	GMH_{HR}-H(S) mixed-bed	7.8	30	13

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Stainless Steel columns				
TH-16131	G1000H_{XL}	7.8	30	5
TH-16134	G2000H_{XL}	7.8	30	5
TH-16135	G2500H_{XL}	7.8	30	5
TH-16136	G3000H_{XL}	7.8	30	6
TH-16137	G4000H_{XL}	7.8	30	6
TH-16652	GMH_{XL}-L mixed bed	7.8	30	6
TH-16138	G5000H_{XL}	7.8	30	9
TH-16139	G6000H_{XL}	7.8	30	9
TH-16140	G7000H_{XL}	7.8	30	9
TH-16141	GMH_{XL}- mixed-bed	7.8	30	9
TH-07112	GMH_{XL}- HT	7.8	30	13
TH-18403	Multipore H_{XL}- M	7.8	30	5
TH-05362	G1000H8	7.5	30	10
TH-05363	G2000H8	7.5	30	10
TH-06717	G2500H8	7.5	30	10
TH-05364	G3000H8	7.5	30	10
TH-05365	G4000H8	7.5	30	10

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)	Use
Guard columns					
TH-18404	MultiporeH_{XL}-M guard column	6.0	4.0	5	For P/N TH-18403
TH-07113	HXL-L Guard column	6.0	4.0	7	For G1000H_{XL} through GMH_{XL}-L
TH-13727	H_{XL}-H Guard column	6.0	4.0	5	For G5000H_{XL} through GMH_{XL}
TH-05156	H8 Guard column	7.5	7.5	10	For 7.5mm ID H8
TH-05157	H6 Guard column	7.5	7.5	13	For 7.5mm ID H6
TH-05158	HM Guard column	7.5	7.5	40	For 7.5mm ID GMBH6 & P/N TH-07112 (order with ODCB)
TH-17368	Guard column H_{HR}-L and H_{HR}	6.0	4.0	5	For G1000-4000H_{HR} and P/N TH-17362
TH-17369	Guard column H_{HR}-H and H_{HR}	6.0	4.0	5	For G5000-7000H_{HR} and P/Ns 18055, 17392 and 17360

TSK COLUMNS FOR IONIC INTERCHANGE AND HYDROPHOBIC INTERACTION ON DEMAND

TSK-GEL Columns
for Ionic Exchange (IEC)

TosoBioScience offer the largest range of high efficiency columns for the analysis and separation of biomolecules using the chromatographic technique of anionic and cationic interchange.

These columns, with silica or methacrylate spherical packings, with controlled porosity and substituted with different interchange groups allow the resolution of proteins, peptides, oligonucleotides derived from DNA and RNA and other fragments of nucleic acids.

We also include a line of polymeric packings of polystyrene-divinylbenzene appropriately substituted for the separation and analysis of low molecular weight molecules such as sugars, aminoacids,etc.

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Glass columns: polymer-based				
TH-14010	CM-5PW Glass, 1000 A	5.0	5.0	10
TH-14011	CM-5PW Glass, 1000 A	8.0	7.5	10
TH-14012	CM-5PW Glass, 1000 A	20.0	15.0	13
TH-13062	SP-5PW Glass, 1000 A	5.0	5.0	10
TH-08803	SP-5PW Glass, 1000 A	8.0	7.5	10
TH-14017	SP-5PW Glass, 1000 A	20.0	15.0	13
PEEK Columns				
TH-19686	BioAssist S, 1300 A	4.6	5.0	7

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Stainless Steel Columns, polymer based				
TH-13068	CM-5PW, 1000 A	7.5	7.5	10
TH-14021	CM-5PW, 1000 A	21.5	15.0	13
TH-18758	SP-5PW, 1000 A	2.0	7.5	10
TH-07161	SP-5PW, 1000 A	7.5	7.5	10
TH-07575	SP-5PW, 1000 A	21.5	15.0	13
TH-07934	SP-5PW, 1000 A	55.0	20.0	20
TH-13076	SP-NPR, nonporous	4.6	3.5	2.5
TH-07156	SCX (Na^+)	6.0	15.0	5
TH-07158	SCX (H^+)	7.8	30.0	5
TH-16653	OApak-A, 1000 A	7.8	30.0	5
Stainless Steel Columns, silica based				
TH-07165	SP-2SW, 125 A	4.6	25.0	5
TH-07167	CM-2SW, 125 A	4.6	25.0	5
TH-07162	SP-3SW, 250 A	7.5	7.5	10

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)	Use
Guard columns					
TH-13069	CM-5PW Guardgel Kit			20	For P/N TH-13068
TH-16094	CM-5PW Prep Guardgel Kit			20	For P/N TH-14021
TH-14024	CM-5PW Guardet Kit, Glass			20	For P/Ns 14010 and TH-14011
TH-14068	CM-5PW Guard Column, Glass	20.00	2.0	13	For P/N TH-14012
TH-07211	SP-5PW Guardgel Kit			20.0	For P/N TH-07161
TH-42153	SP-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18758
TH-08807	SP-5PW Guardgel Kit, Glass			20	For P/Ns TH-13062 and TH-08803
TH-14467	SP-5PW Guad Column, Glass	20.0	2.0	13	For P/N TH-14017
TH-16093	SP-5PW Prep Guardgel Kit			20	For P/N TH-07575
TH-07932	SP-5PW Guard Column	45.0	5.0	20	For P/N TH-07934
TH-07650	CM-SW Guardgel Kit			20	For P/Ns TH-07167 and TH-07162
TH-16654	OApak-P Guard Column	6.0	4.0	10	For P/N TH-16653
TH-19308	Guard cartridge holder	2.0	1.5		For all 2mm ID Guard cartridges

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Glass columns: polymer-based				
TH-13061	DEAE-5PW Glass, 1000 A	5.0	5.0	10
TH-08802	DEAE-5PW Glass, 1000 A	8.0	7.5	10
TH-14016	DEAE-5PW Glass, 1000 A	20.0	15.0	13
TH-18386	SuperQ-5PW Glass, 1000 A	8.0	7.5	10
PEEK Column				
TH-19685	BioAssist Q, 4000 A	4.6	5.0	10
Stainless Steel Columns, polymer based				
TH-13075	DEAE-NPR, nonporous	4.6	3.5	2.5
TH-18249	DNA-NPR, nonporous	4.6	7.5	2.5
TH-42151	DNA-NPR, nonporous	7.5	7.5	2.5

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Stainless Steel Columns, polymer based				
TH-18757	DEAE-5PW, 1000 A	2.0	7.5	10
TH-07164	DEAE-5PW, 1000 A	7.5	7.5	10
TH-07574	DEAE-5PW, 1000 A	21.5	15.0	13
TH-07930	DEAE-5PW, 1000 A	55.0	20.0	20
TH-18257	SuperQ-5PW, 1000 A	7.5	7.5	10
TH-18387	SuperQ-5PW, 1000 A	21.5	15.0	13
TH-08639	Sugar AXI, 60 A	4.6	15.0	8
TH-08640	Sugar AXG, 60 A	4.6	15.0	10
TH-07157	SAX	6.0	15.0	5
Stainless Steel Columns, silica-based				
TH-07166	QAE-2SW, 125 A	4.6	25.0	5
TH-18761	DEAE-2SW, 125 A	2.0	25.0	5
TH-07168	DEAE-2SW, 125 A	4.6	25.0	5
TH-07163	DEAE-3SW, 250 A	7.5	7.5	10

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)	Use
Guard columns					
TH-17088	DEAE-NPR Guard Column	4.6	0.5	5	For P/N TH-13075
TH-18253	DNA-NPR Guard Column	4.6	0.5	5	For P/N TH-18249
TH-18388	SuperQ-5PW Guardgel Kit			20	For P/N TH-18257
TH-18389	SuperQ-5PW Guardgel Kit, Glass			20	For P/N TH-18386
TH-18390	SuperQ-5PW Guardgel Kit			20	For P/N TH-18387
TH-17210	DEAE-5PW Guardgel Kit			20	For P/N TH-07164
TH-42152	DEAE-5PW Guard Cartrodge	2.0	1.0	10	For P/N TH-18757
TH-08806	DEAE-5PW Guardgel Kit, Glass			20	For P/Ns TH-13061 and TH-08802
TH-14466	DEAE-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14016
TH-16092	DEAE-5PW Prep Guardgel Kit			20	For P/N TH-07574
TH-07928	DEAE-5PW Guard Column	45.0	5.0	20	For P/N TH-07930
TH-07648	DEAE-SW Guardgel Kit			20	For P/Ns TH-07168 and TH-07163
TH-42154	DEAE-2SW Guard Cartridge	2.0	1.0	5	For P/N TH-18761
TH-19308	Guard Cartridge Holder	2.0	1.5		For all 2 mm ID guard cartridges

TSK-GEL Columns

for Hydrophobic Interaction Chemistry (HIC)

The great advantage over separations by reverse phase consists in the extremely mild elution conditions which protect the stability of the most sensitive proteins.
TOSO have three different columns available for HIC: TSK-GEL Phenyl-5PW. TSK-GEL Ether-5PW, and TSK-GEL Butyl -NPR.

The two first have as support the packing TSK-GEL G5000PW to which have been bonded respectively phenyl or oligoethylene-glycol groups.

The TSK-GEL Butyl -NPR columns are based on the same materials as the previous but with a non porous particle which is of a size of only 2.5 microns. The very high efficiencies that this column offers make it ideal for high speed applications.

TSK Hydrophobic Interaction Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Glass columns: polymer-based				
TH-14013	Ether-5PW Glass, 1000 A	5.0	5.0	10
TH-14014	Ether-5PW Glass, 1000 A	8.0	7.5	10
TH-14015	Ehter-5PW Glass, 1000 A	20.0	15.0	13
TH-13063	Phenyl-5PW Glass, 1000 A	5.0	5.0	10
TH-08804	Phenyl-5PW Glass, 1000 A	8.0	7.5	10
TH-14018	Phenyl-5PW Glass, 1000 A	20.0	15.0	13
Stainless Steel Columns				
TH-18760	Ether-5PW, 1000 A	2.0	7.5	10
TH-18641	Ether-5PW, 1000 A	7.5	7.5	10
TH-08642	Ether-5PW, 1000 A	21.5	15.0	13
TH-16255	Ether-5PW, 1000 A	55.0	20.0	20
TH-18759	Phenyl-5PW, 1000 A	2.0	7.5	10
TH-07573	Phenyl-5PW, 1000 A	7.5	7.5	10
TH-07656	Phenyl-5PW, 1000 A	21.5	15.0	13
TH-07938	Phenyl-5PW, 1000 A	55.0	20.0	20
TH-14947	Butyl-NPR, nonporous	4.6	3.5	2.5

TSK Hydrophobic Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)	Use
Guard Column products					
TH-42156	Ether-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18760
TH-14025	Ether-5PW Guardgel Kit, Glass			20	For P/Ns TH-14013 and TH-14014
TH-08643	Ether-5PW Guardgel Kit			20	For P/N TH-08641
TH-16091	Ether-5PW Prep Guardgel Kit			20	For P/N TH-08642
TH-14470	Ether-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14015
TH-16253	Ether-5PW Guard Column	45.0	5.0	20	For P/N TH-16255
TH-42155	Phenyl-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18759
TH-08808	Phenyl-5PW Guardgel Kit, Glass			20	For P/Ns TH-08804 and TH-13063
TH-07652	Phenyl-5PW Guardgel Kit			20	For P/N TH-07573
TH-16095	Phenyl-5PW Prep Guardgel Kit			20	For P/N TH-07656
TH-14469	Phenyl-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14018
TH-07936	Phenyl-5PW Guard Column	45.0	5.0	20	For P/N TH-07938
TH-19308	Guard Cartridge Holder	2.0	1.5		For all 2mm ID Guard Cartridges