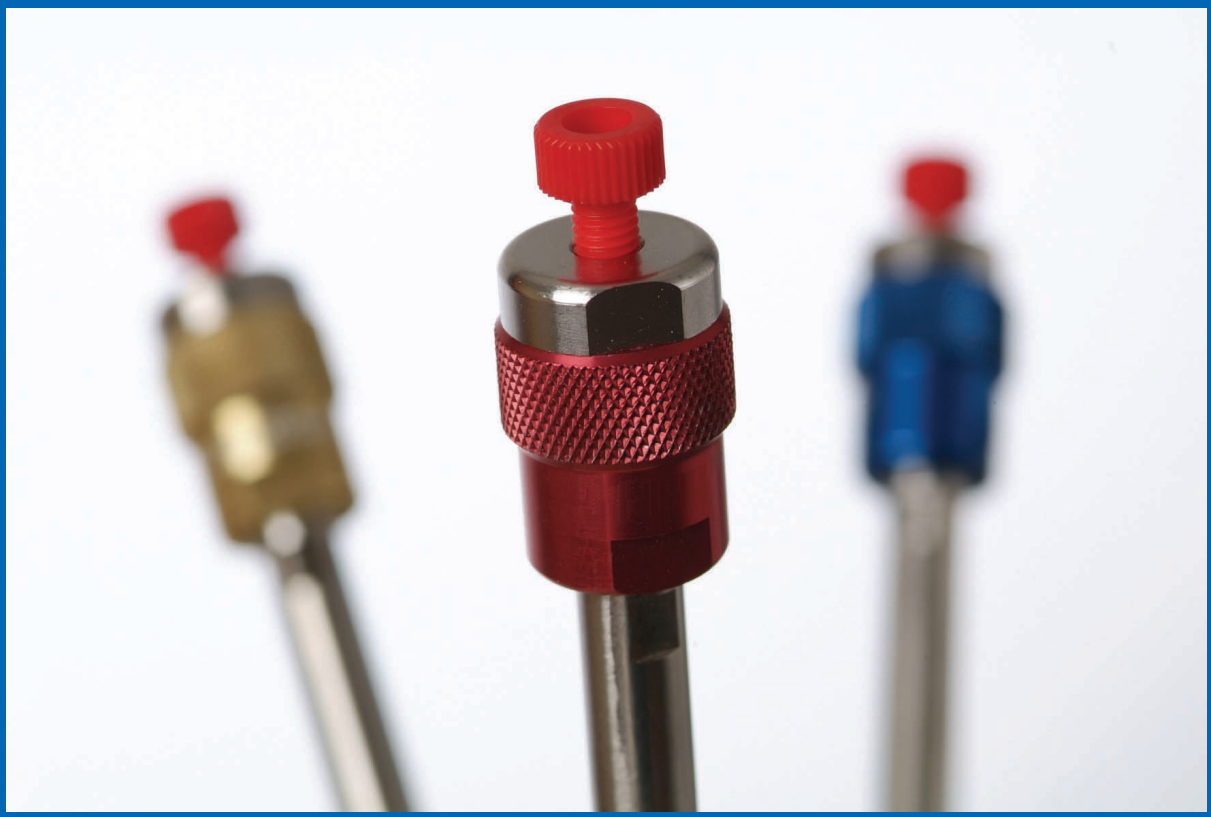



HAMILTON
HAMILTON

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 TRACER EXTRASIL ODS2 TRACER EXTRASIL ODS1 Advantix ODS Hyperpack ODS Hyperpack BASIC TSKgel ODS YMC PRO C18 HYPERSIL HYPERSIL BDS 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

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

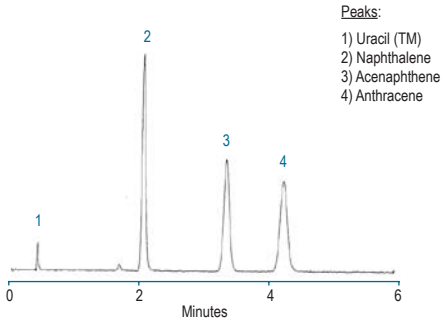
Ultrafit™ System Configuration

Ultrafit™

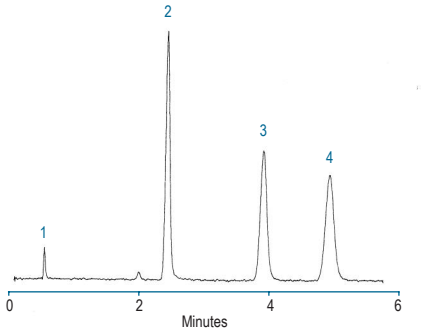
Ultrafit™ + Ultrafiter™

Ultrafit™ + Ultraguard™

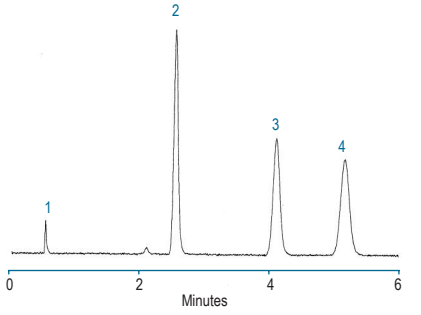
Our Columns Mediterranea™, Europa Peptides, Europa Proteins & Tracer Excel are built with the new Ultrafit ™ System



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.

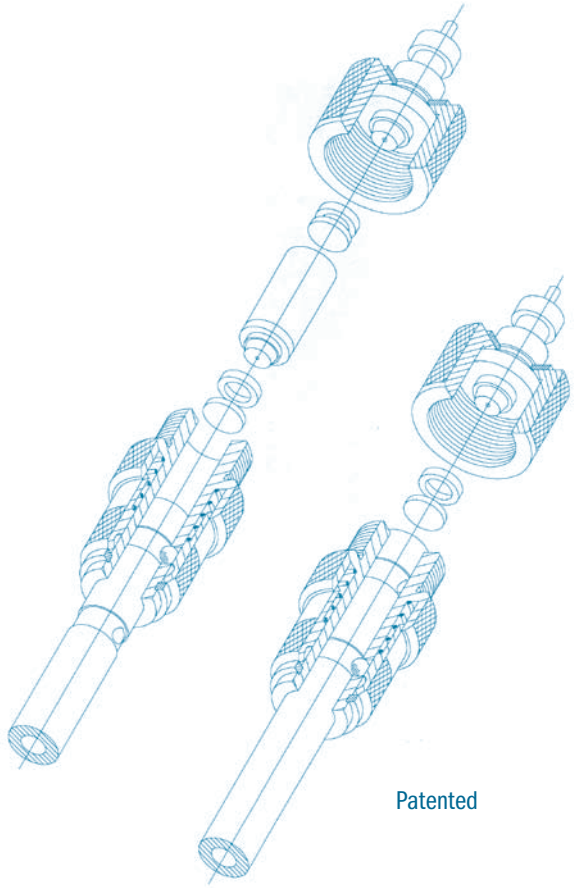
The Novacol™ columns, designed and manufactured by Teknokroma, use the best bonding reagents, packing support materials and proprietary Novabond™ procedures. Novacol™ tubing uniformity and polished interior finish generates higher efficiencies than columns from the major manufacturers.
The latest in 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



Patented

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.

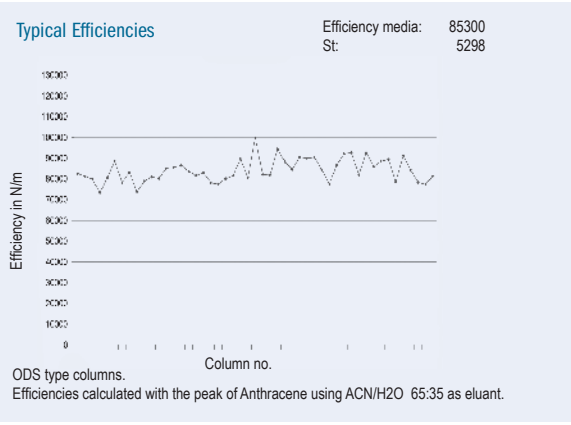
Novafix™ Functional Design

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.

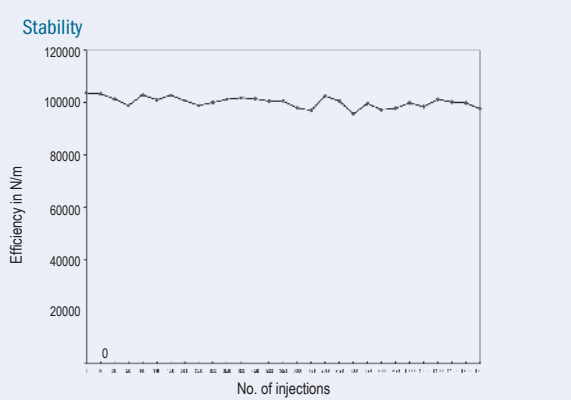
Particle size µm	Typical Efficiencies N/m
3	120-150.000
5	80-110.000
10	35-65.000



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

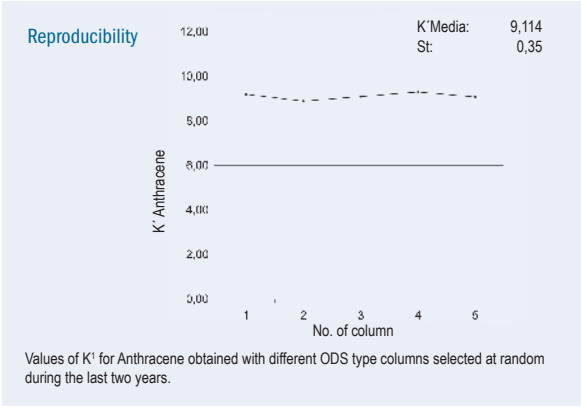
Novafix™ Stability

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™ 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' 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**
C-8	5 units	**TR-015510**
Diol	5 units	**TR-015511**
C_6H_5	5 units	**TR-015512**
C-1	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, Nucleosil, Lichrosorb, Lichrospher, Superspher, Partisil, etc.**

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

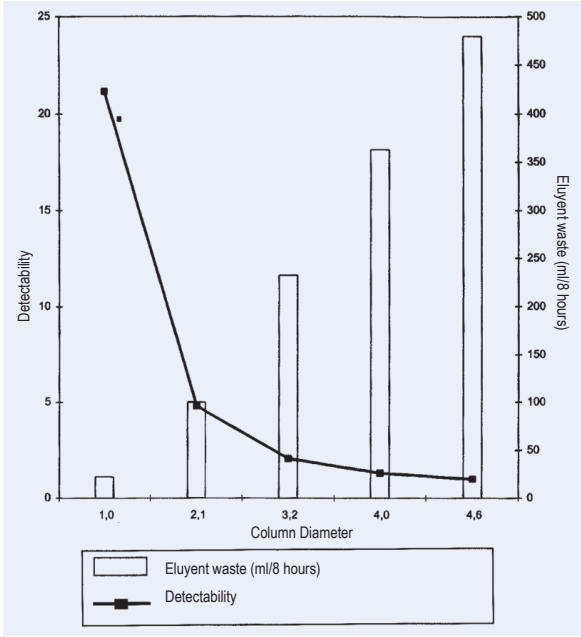
Since the detectability depends on the grade of dilution of the sample while it passes through the column, a reduction of the internal diameter of the column redounds directly in a minor dilution and therefore in an increment of the detection sensibility.

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.

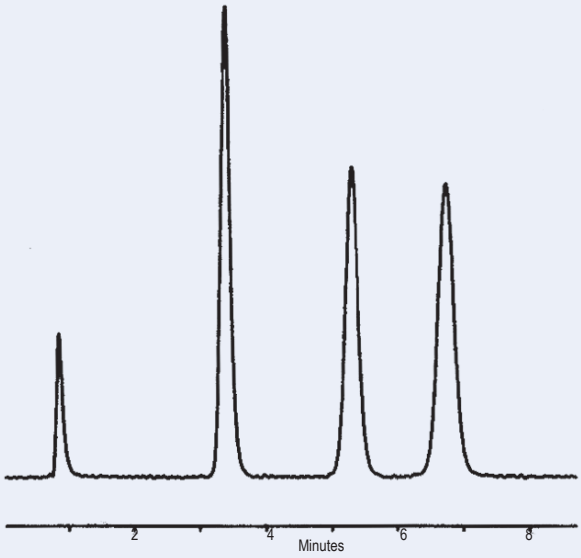
Economy

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.

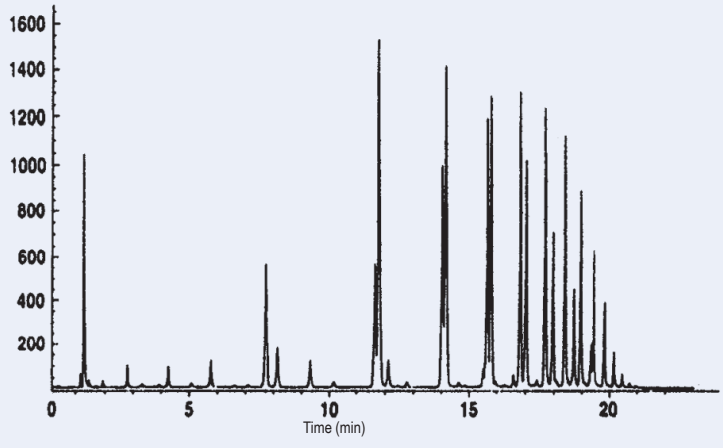


Sample:
1. Uracil
2. Naphtalene
3. Acenaphthene
4. Anthracene

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

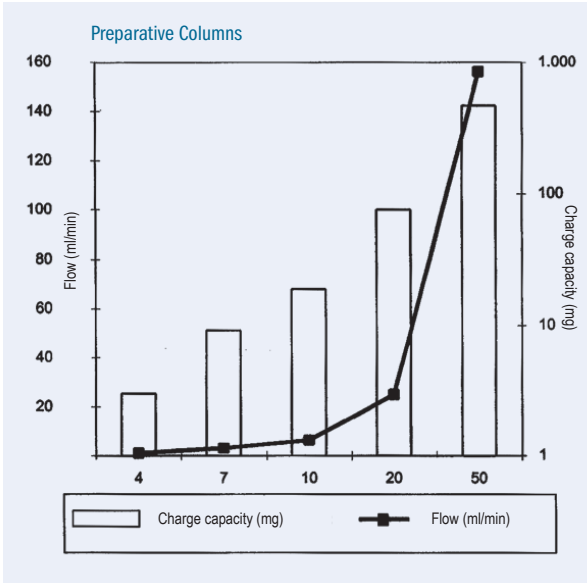
Column: Tracer Extrasil ODS2 3µ 3,5 x 0,46 cm

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

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.

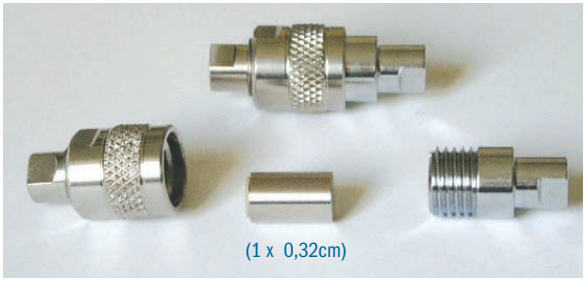
Its high pressure packing ensures a high stability and consequently a long life use of the column.

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

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.

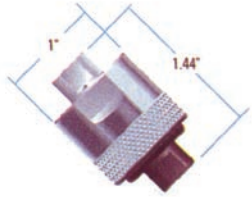
U-284 Union Column-Precolumn

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

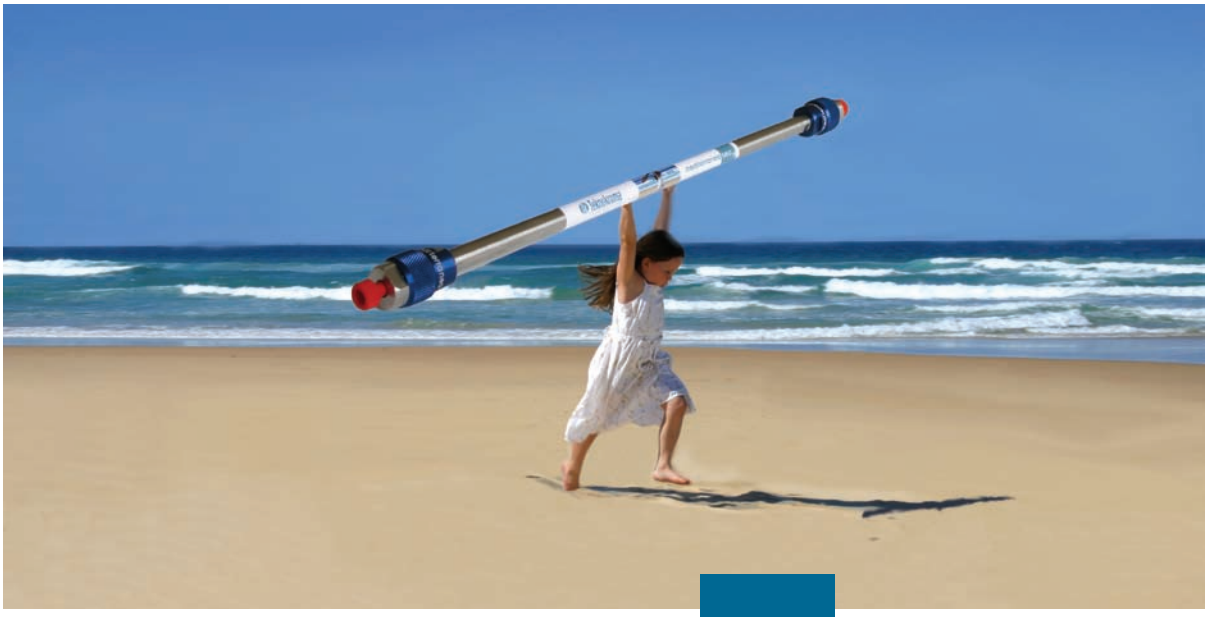
Reference	Description
TR-C-260	Preparative Holder
TR-C-260K1	Prep cartridge ODS (2 units) + TR-C-260 Preparative Holder
TR-C-260K2	Prep cartridge Peptide C18 (2 units) + TR-C-260 Preparative Holder
TR-C-260K3	Prep cartridge C8 (2 units) + TR-C-260 Preparative Holder
TR-C-260K4	Prep cartridge NH2 (2 units) + 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.

Purity of Silica

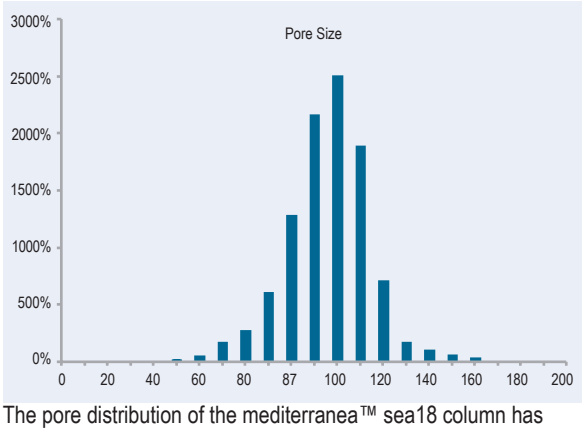
After evaluating many materials as a base for the global-best reverse phase chromatographic packing, the clear consensus is that the special characteristics of silica packings classify them as unsurpassable. No other packing material, apart from ultra-pure silica, achieves the perfect balance of physical 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.

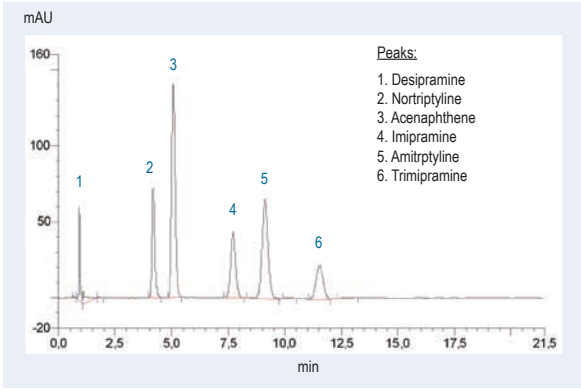
Moreover, the mediterranea™ sea18 column has been designed to show an excellent retention of polar compounds in a 100% aqueous environment without the problems of unwanted interactions which inefficiently endcapped conventional packings produce. Packing chemistry based on the new MED technology, "multifunctional 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

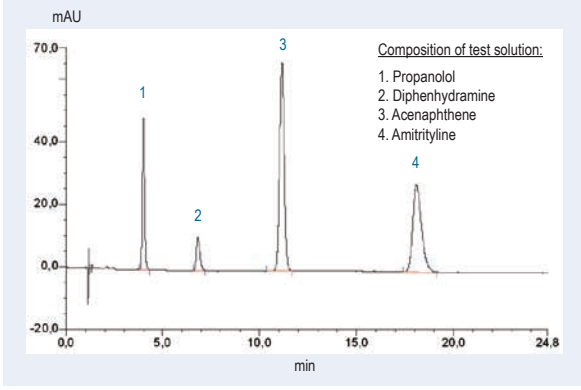
TK mediterranea™ Sea$_{18}$ New Generation HPLC Column

Tricyclic Anti-depressants

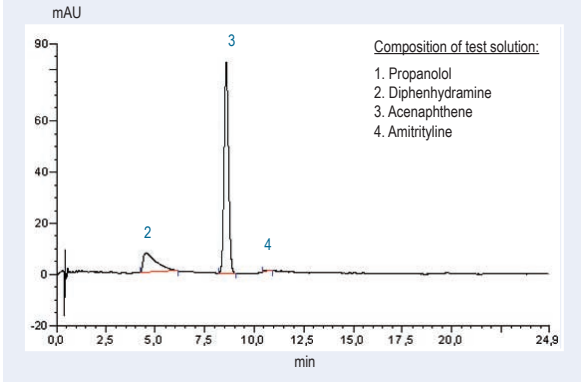


Column: **mediterranea sea 18**, 5 µm 15 x 0,46 cm
Eluent: Methanol/20mM K2HPO4 (pH 7.0) 70:30
Flow: 1ml/min
Room Temperature
Detection: UV 254 nm

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.

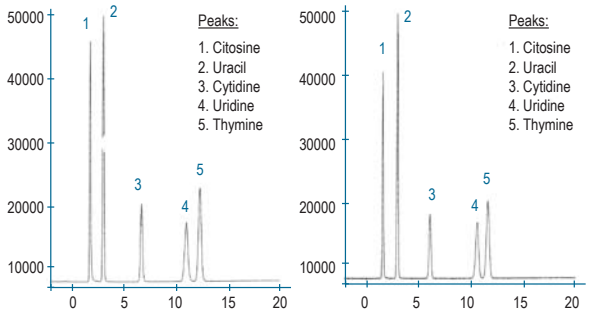
Nevertheless, these advantages are achieved at the expense of less retention for polar compounds, and poor column stability. Polar-embedded packings exhibit chromatographic behavior that cannot be considered as 100% reverse phase, since secondary interaction mechanisms may co-exist due to the nature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

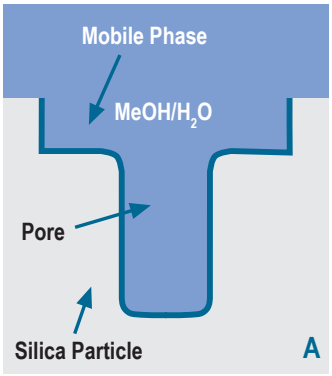
The mediterranea™ sea18 column also widely surpasses the stop flow test, designed to be able to show up the dewetting phenomenon that usually occurs in highly deactivated ODS-type columns, causing irreversible expulsion of water included in the packing pores. As can be seen in the data of five successive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

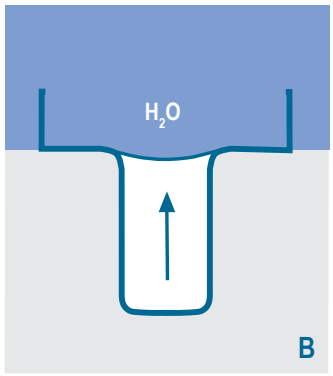
Aqueous Environments

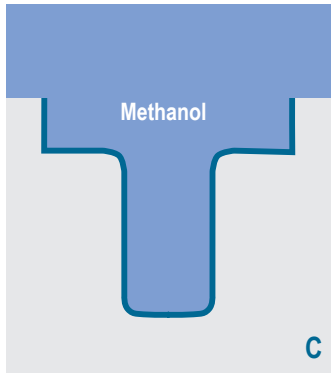


Column: **mediterranea sea18** 5 µm 15 X 0,46 cm
Movil Phase: H_2O
Flow: 1ml/min
Vol. Iny.:10 µl
Detectión: UV 254 nm

mediterranea™ Sea_{18} New Generation HPLC Column





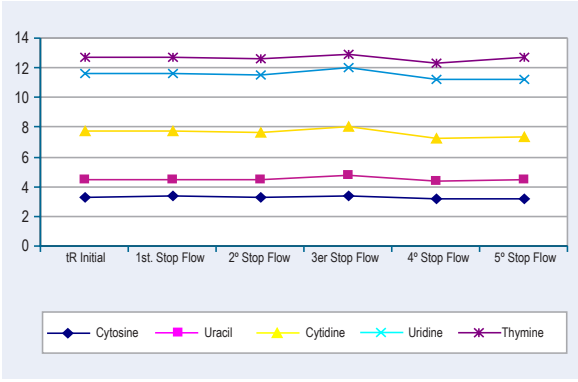


The phenomenon of "Dewetting"

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

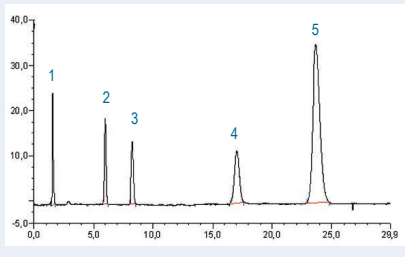
Compound	tR initial	1st stop flow	2nd stop flow	3rd stop flow	4th stop flow	5th stop flow
Cytosine	3,32	3,33	3,3	3,35	3,16	3,21
Uracil	4,45	4,45	4,44	4,75	4,36	4,44
Cytidine	7,73	7,73	7,63	8,00	7,24	7,34
Uridine	11,57	11,57	11,53	12,02	11,25	11,24
Thymine	12,70	12,7	12,62	12,87	12,35	12,70

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.

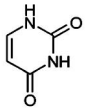
The detailed analysis of the different peaks obtained will enable an objective, and more importantly, standardised evaluation of the behaviour of the chromatographic packing and therefore anticipate its suitability in normal analytical work.



Peaks

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

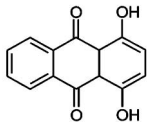
Tk mediterranea™ Sea$_{18}$ New Generation HPLC Column



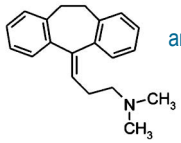
uracil - dead volume marker

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.

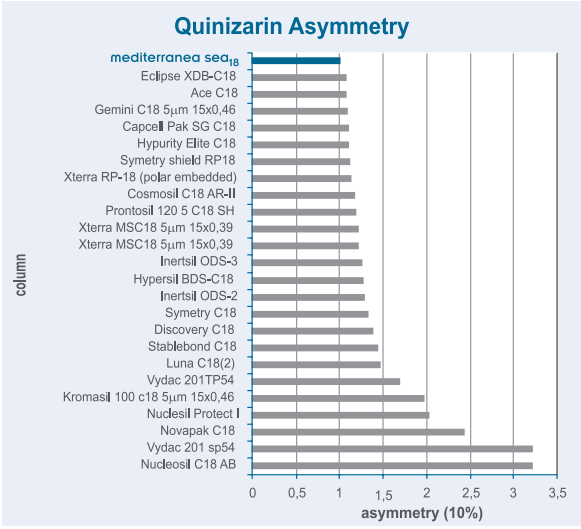
Quinizarin (1,4-dihydroanthraquinone)

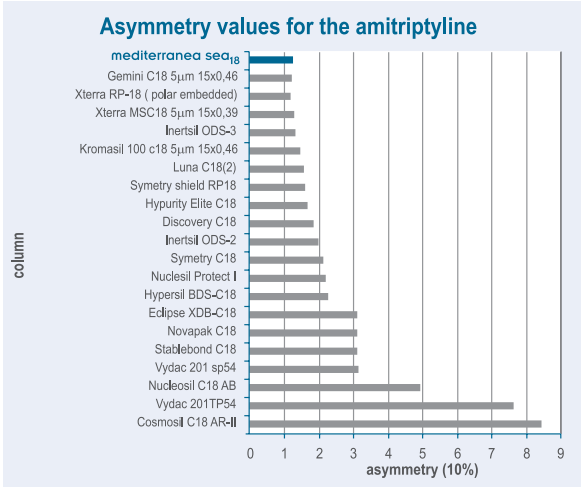
Quinizarin is a chelating compound and its behaviour in a reverse phase column is a clear indicator of the presence or absence of metals. A column of low activity will deliver symmetrical peaks whereas increasing surface activity exaggerates the tailing edge of the quinizarin peak - leading to higher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

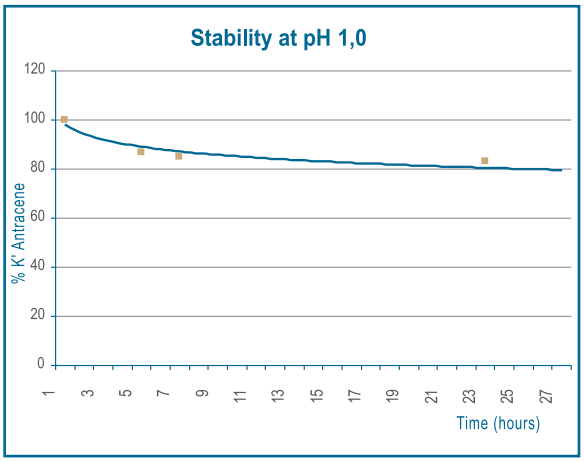
A perfectly spherical particle, a totally controlled pore design, a total lack of metallic traces, a well-studied process of phase bonding and final endcapping, all combine in achieving a packing with a resistance to extreme pH values not previously reached.

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.

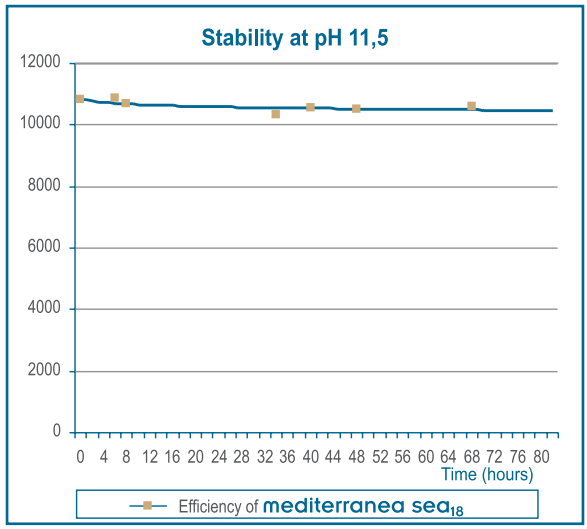
Using mediterranea™ sea18 packing makes it is possible to work with eluents from pH 1 to pH 12. Such unusual pH-resistance values have been secured as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield that impedes acidic and basic eluents from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

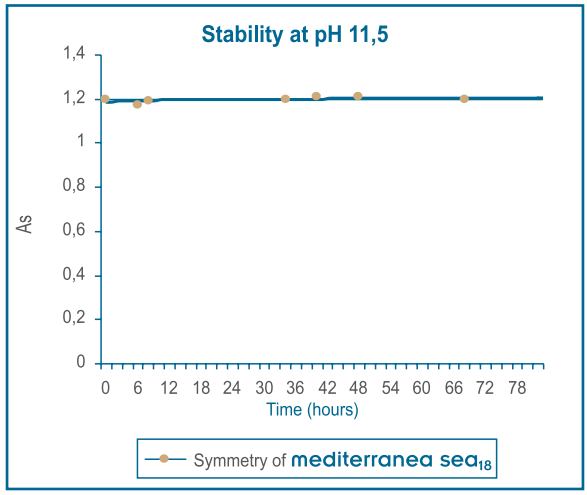
Eluting the mediterranea™ sea18 column for 78 hours at pH 11.5, showed no significant deterioration in terms of both efficiency and peak symmetry for diphenhydramine..

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.

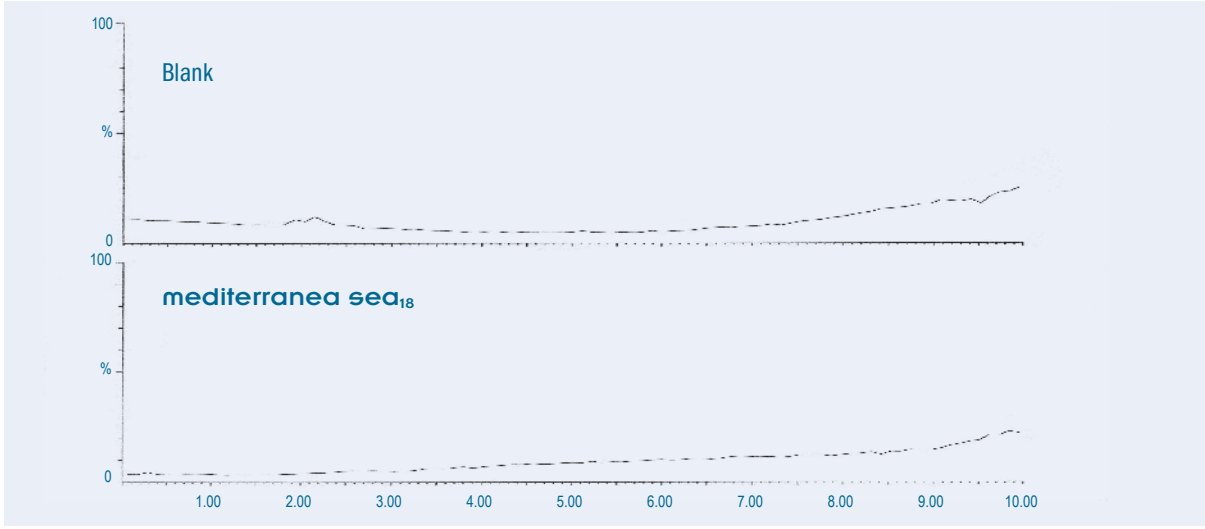
LC-MS Mediterranea™ Sea 18 Columns

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.

TK 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

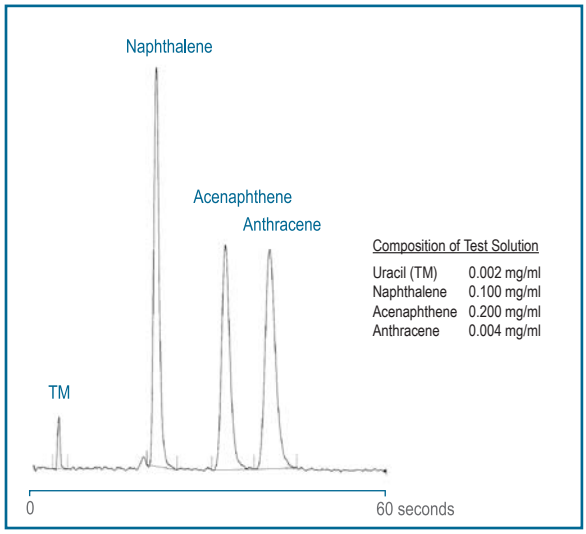
MS Instrument: Waters ZMD
Capillary Voltage: 3kV (ESI positive)
Cone Voltage: 20V
Source block Temp: 100ºC
Desolvation Temp: 350ºC
Gas: 500l/h
Gas of cone: 35 l/h
Mass Range: 60 to100 amu

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.

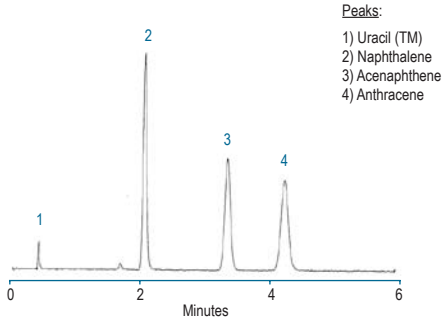
New Hardware Design for Mediterranea™ Column: Ultrafit™ System

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.

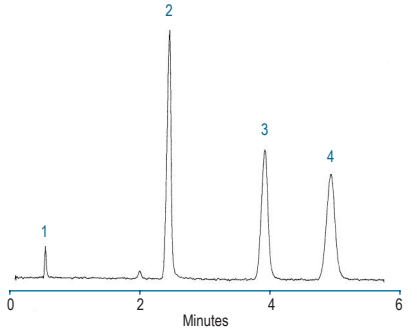
Ultrafit™ System Efficiency

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

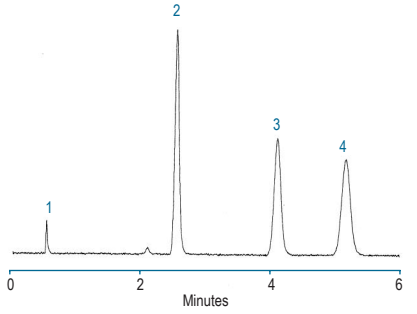
Chromatographic Conditions:
Column: mediterranea™ sea18 3 mm 5 x 0,46 cm
Eluant: Acetonitryle/Water 65:35
Flow: 0,9 ml/min
Det. UV 254 nm
Temp. Room
Sample: Acenaphthene 0.2 mg/ml



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} New Generation 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

mediterranea™ Sea_{18} New Generation HPLC Column

SemiPreparative Columns
mediterranea™ sea_{18} 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™ sea_{18} 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™ sea_{18} 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™ sea_{18} 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™ Sea18 New Generation HPLC Column

Microbore Columns 0.21 cm ID
mediterranea™ sea18 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™ sea18 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™ sea18 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**

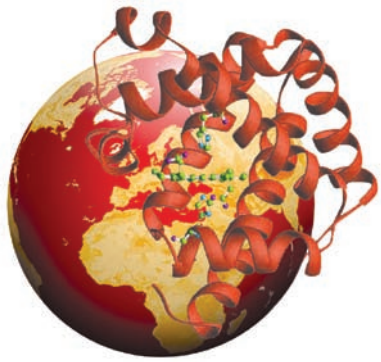
Other Products
mediterranea™ sea18

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**

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

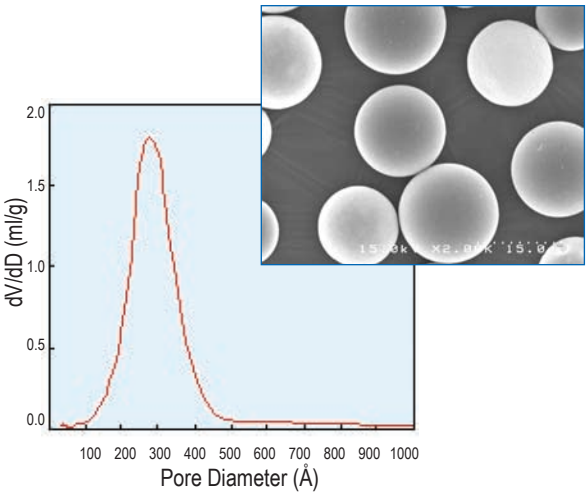
The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

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.

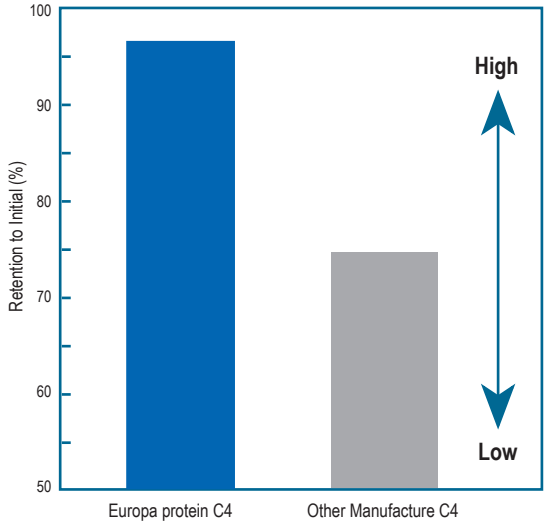
Wide pH Range

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.

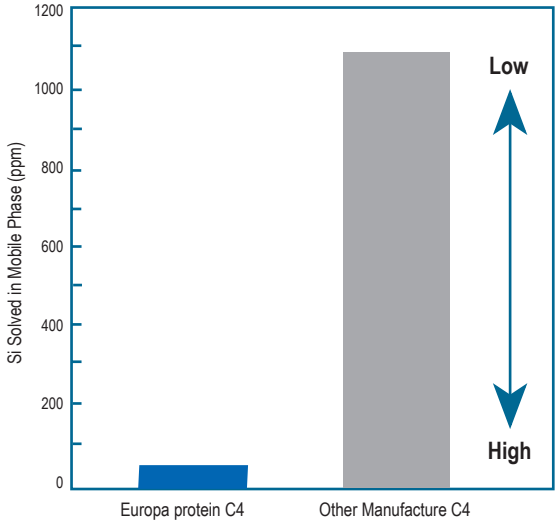
Europa Protein C4 Phase Stability

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

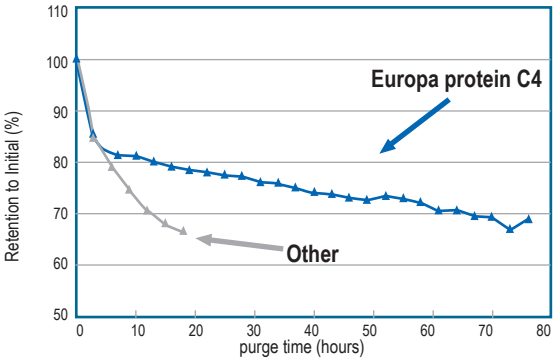


Europa HPLC Column for Peptides and Proteins

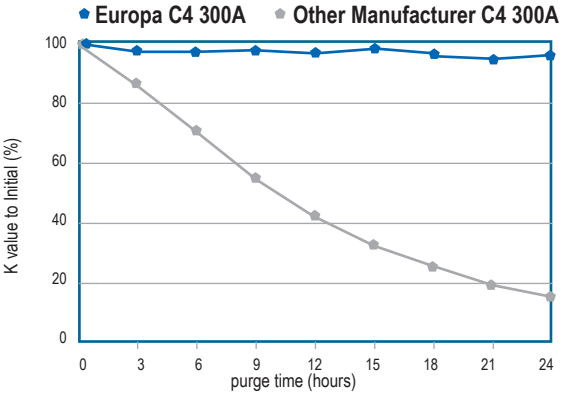
Durability comparison in Alkaline Medium/RT

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.

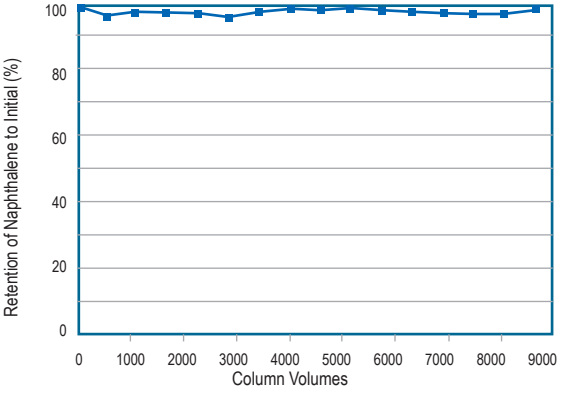


Durability comparison in Acidic Medium / *K value*



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.

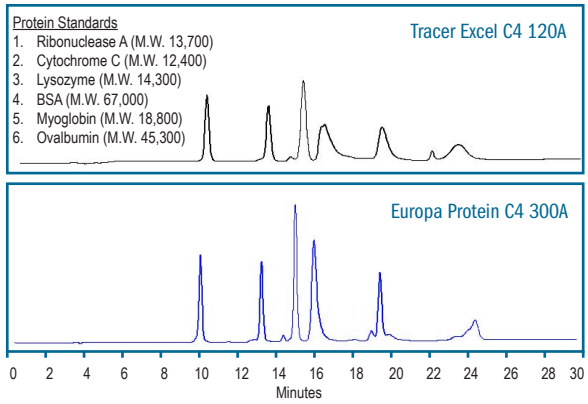
Our **"Ultra-Fast"** columns are made in 3-5 cm length in order to get quick analytical results, whereas the **"High Efficiency"** columns are normally in 15-25cm lengths to obtain the best resolution.

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 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 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 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

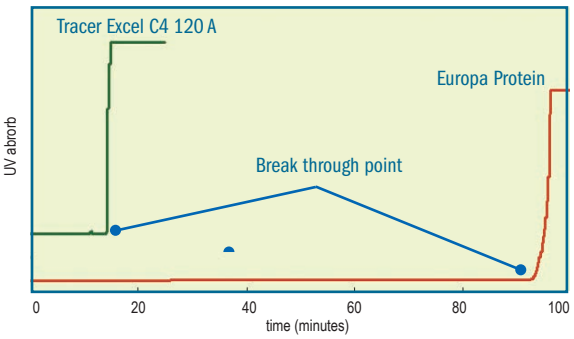
Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Europa Protein 300	C8	5	5	2.12	**TR-010207**
Europa Protein 300	C8	5	10	2.12	**TR-010208**
Europa Protein 300	C8	5	15	2.12	**TR-010209**
Europa Protein 300	C8	5	25	2.12	**TR-010210**

For Guard Columns please refer to pages 197-199

Europa C4 Protein HPLC Columns

Europa Protein C4 300 A - Loading Capacity of BSA

Protein 300 exhibited the highest loading capacity for proteins

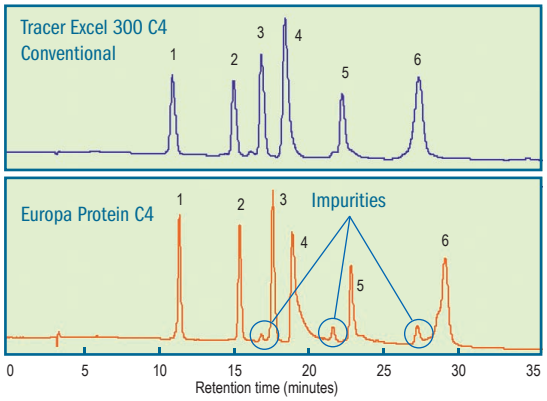


Column: 7 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

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
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

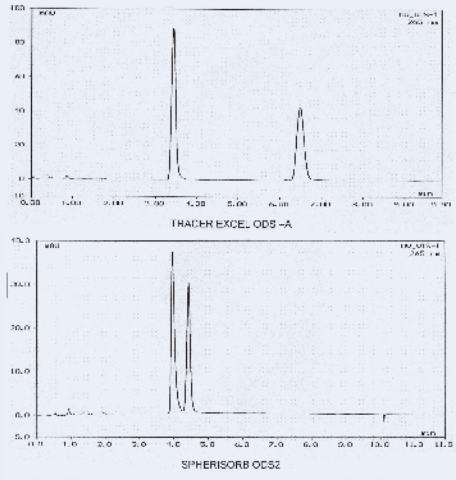
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

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

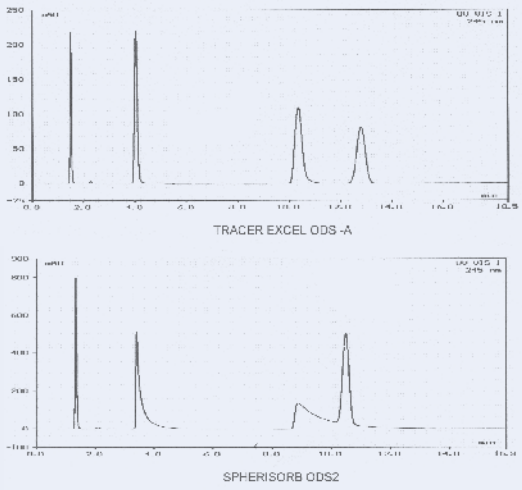
Composition:

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



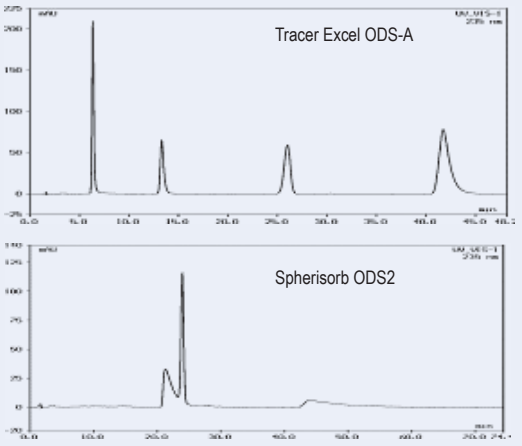
Conditions of test

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:

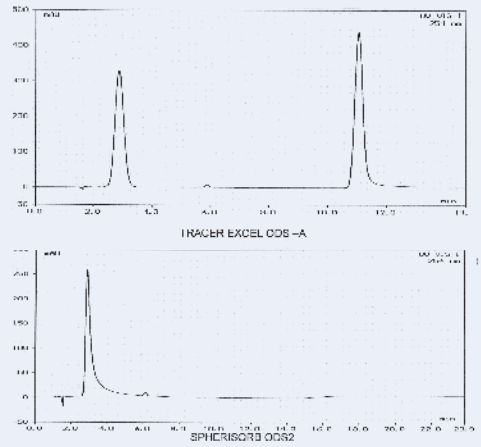
Propanolol: 0.08mg/ml
Diphenidramine :1.28 mg/ml
Acetonaphthalene: 0.2 mg/ml
Amyltryptilene: 0.3 mg/ml

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.

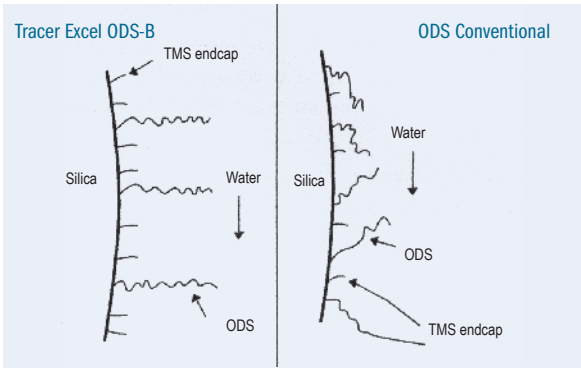
Based on the same principles as the TRACER EXCEL ODS-A columns, the TRACER EXCEL ODS-B column presents a high selectivity for hydrophilic and polar compounds, which are poorly retained on conventional ODS columns.

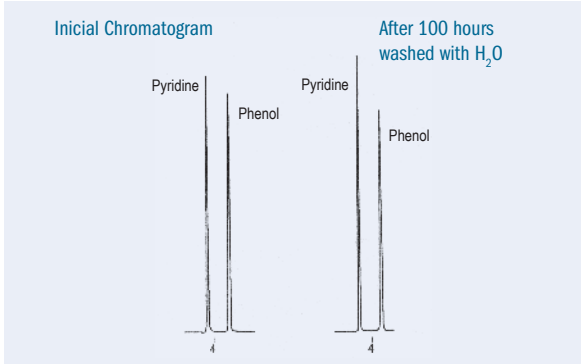
A special modification in the process of functionalizing the pure silica particle prevents the collapsing effect of the C18 chains when working with mainly aqueous eluants. So you can work with excellent chromatographic performance even when the percentage of the aqueous phase is 100%.

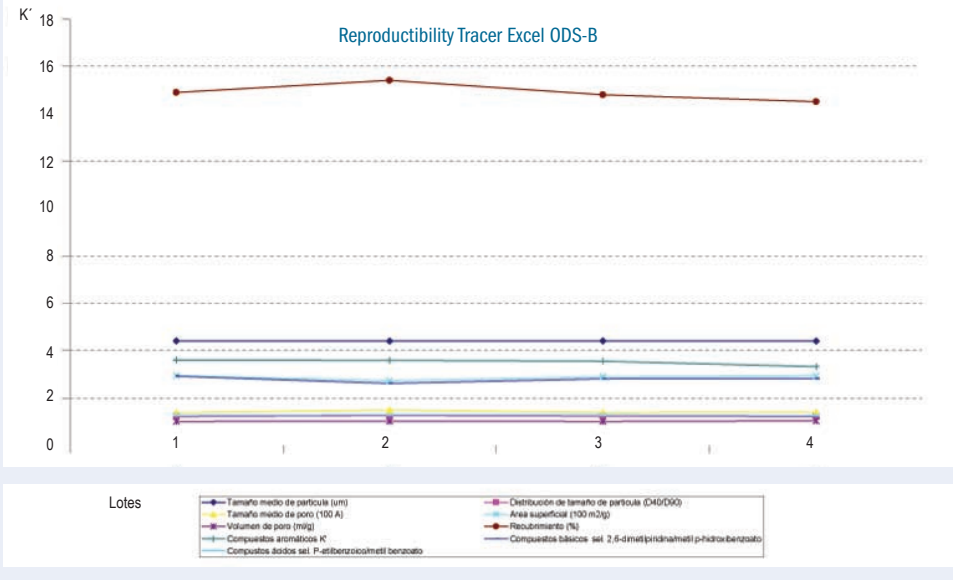
EFFECT OF AQUEOUS ELUTANTS ON THE ORGANIZATION OF HYDROCARBON CHAINS.

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.



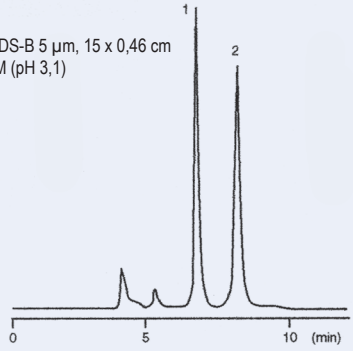




Antioxidants

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

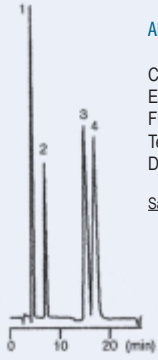
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0,46 cm
Eluant: Phosphate Plug 20 mM (pH 70)CH_3CN 95/5 cm
Flow: 0.6 ml/min.
Detector: UV 210 nm

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: 40°C
Detector: UV 210 nm

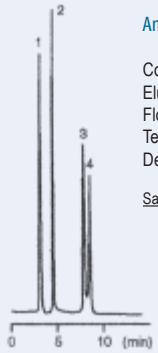
Sample: 1 Glycolic Acid
2 Lactic Acid



Alcohols

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

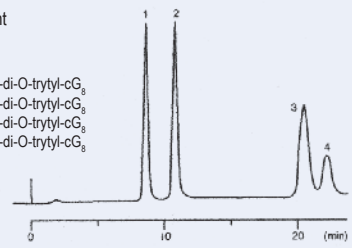
Sample: 1 Methanol
2 Ethanol
3 Iso-Propanol
4 n-propanol



Aminoacids

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

Sample: 1 Alanine
2 Valine
3 Isoleucine
4 Leucine



Cyclodextrin derivatives

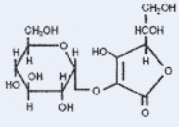
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: MeOH/H_2O 70:30
Flow: 0.6 ml/min.
Temperature: ambient
Detector: UV240 nm

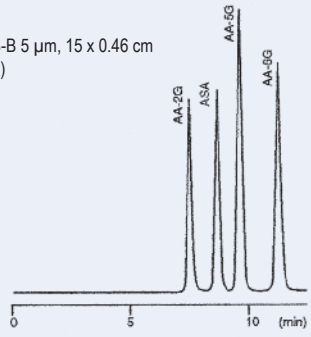
Sample: 1 $6^1, 6^5$ -di-O-trytyl-cG_8
2 $6^1, 6^4$ -di-O-trytyl-cG_8
3 $6^1, 6^3$ -di-O-trytyl-cG_8
4 $6^1, 6^2$ -di-O-trytyl-cG_8

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

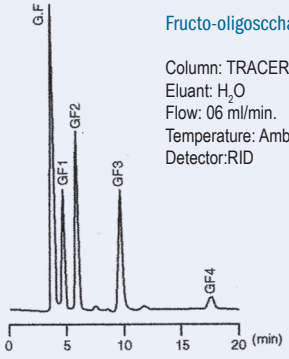
AA-2G





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, 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	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 120/3 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

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-01543
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	10 cm	20 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

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 197-198

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.

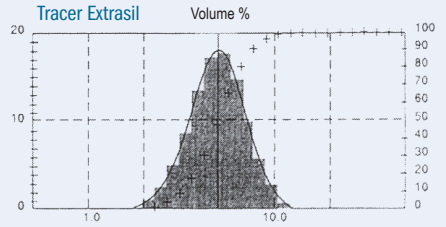
Characteristics

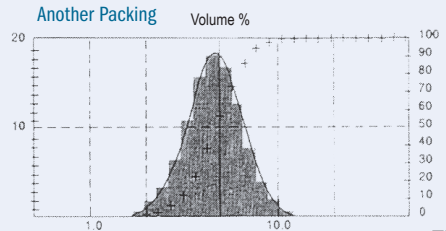
Tracer Extrasil 3,5 & 10 µm 80 A 220 m^2/g	Particle Size Pore Size Surface area Carbon content	WS Packing 3,5 & 10 µm 80 A 220 m^2/g
4%	C1	4%
6%	C6	6%
6%	C8	6%
7%	ODS-1	7%
12%	ODS-2	12%
3,5%	CN	3,5%
2%	NH2	2%
3,0%	Phenyl	3,0%
-	8AX	-
-	SCX	-

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.



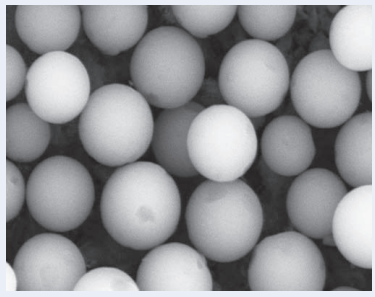


TKL 10015

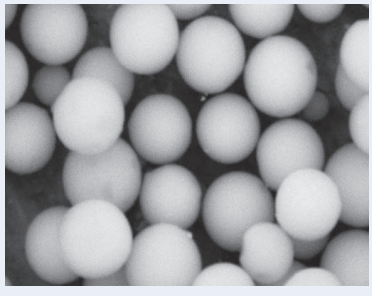
S.E.M. of the silica particle

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

Tracer EXTRASIL



Another Packing



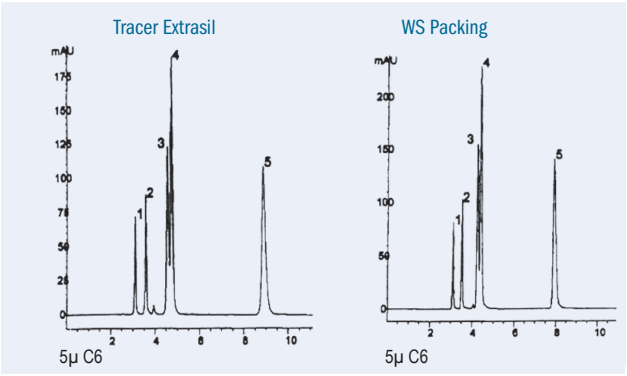
Applications

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.

TK Tracer Extrasil

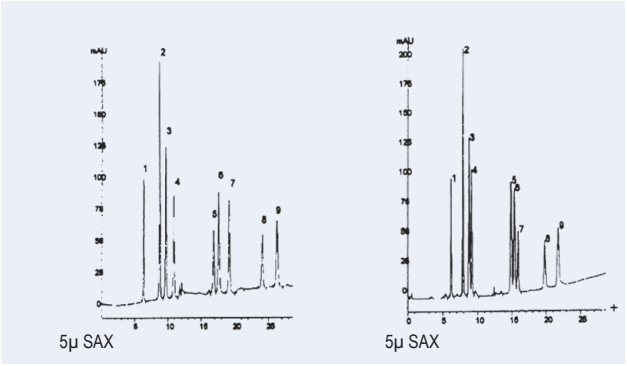
Catecolamines

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



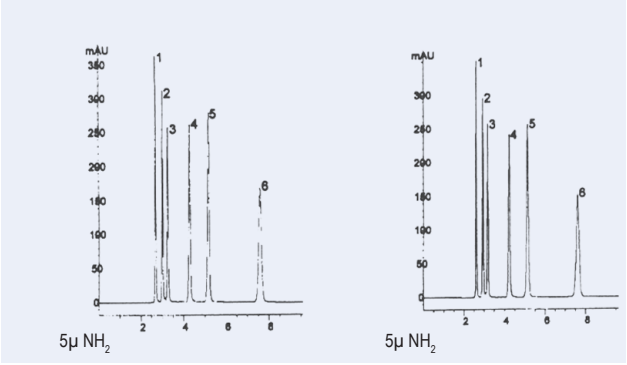
Nucleotides

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



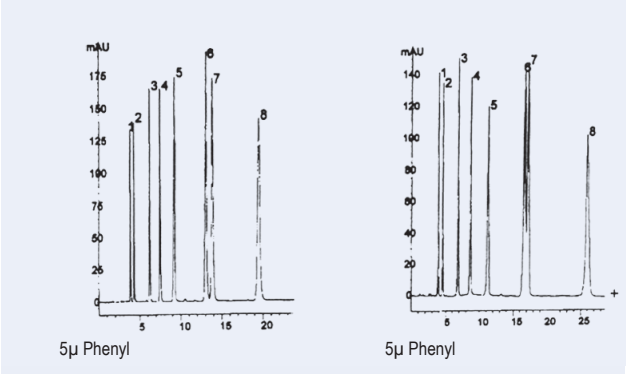
Corticosteroids

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



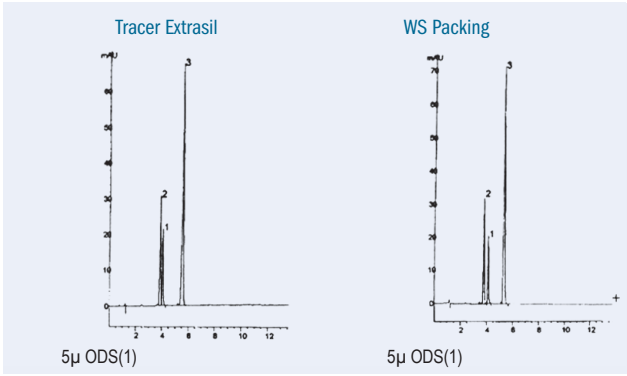
Aromatic Cetones

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



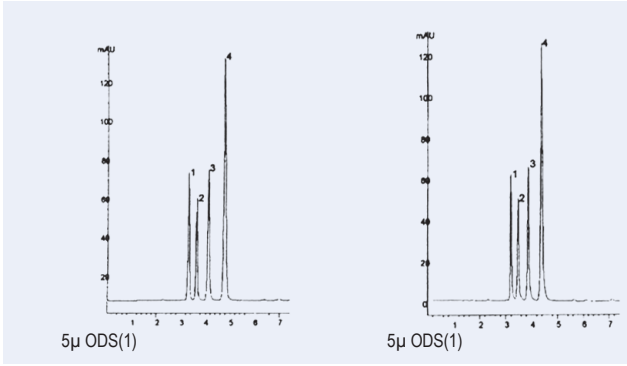
SRM 869

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



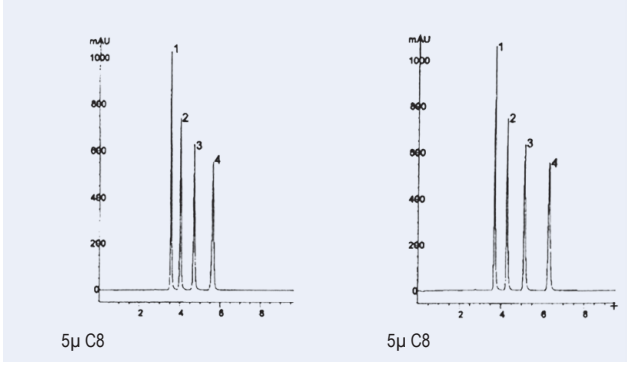
4-Hidroxibenzoates

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



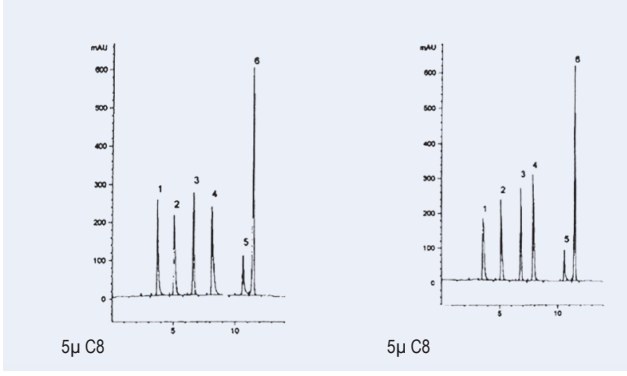
4-Hidroxibenzoates

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

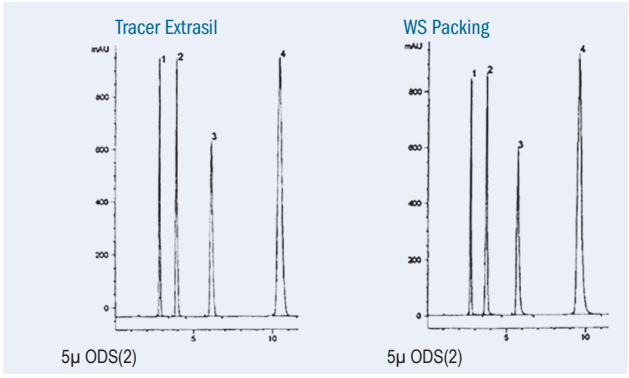
Dimensions: 150 x 4.6 mm
Mobil Phase: A: 5mM 1-Penta sodic nesulfonate in 0.1% H3PO4
B: 5mM 1-Sodic Pentanesulfonate in 0.1% H3PO4 in 80 % CH3CN A:B (97.5:2.5) to A:B (70:30) in 20 min.
Flow Rate: 1.0mL/min
Detection: UV@ 254nm
Sample: 1. Nicotinamine
2. Pyridoxal
3. Acide p-amynobenzaic
4. Tyamine
5.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



Tracer Extrasil

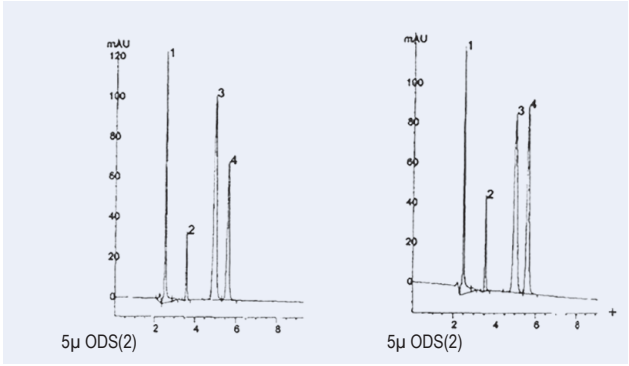
4-Hidroxibenzoat

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



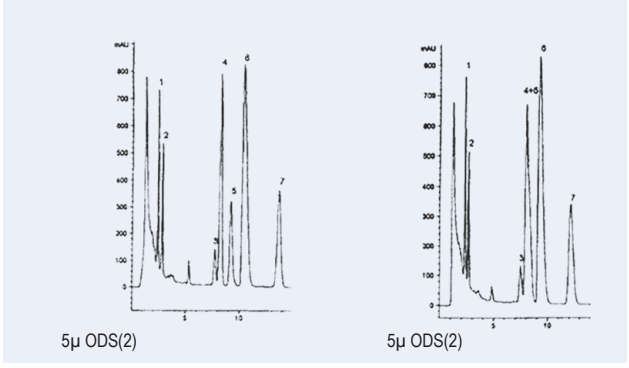
Polar Compounds

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



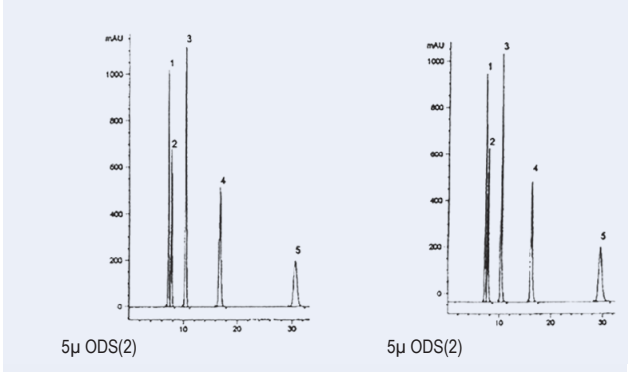
Liposoluble Vitamin

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
C-1	5	TR-016065	TR-416065	TR-016066	TR-416066	TR-016067	TR-416067	TR-016068	TR-416068	TR-016069	TR-416069
C-6	5	TR-016070	TR-416070	TR-016071	TR-416071	TR-016072	TR-416072	TR-016073	TR-416073	TR-016074	TR-416074
C-8	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
C-1	10	TR-016156	TR-416156	TR-016157	TR-416157	TR-016158	TR-416158	TR-016159	TR-416159	TR-016160	TR-416160
C-6	10	TR-016120	TR-416120	TR-016121	TR-416121	TR-016122	TR-416122	TR-016123	TR-416123	TR-016124	TR-416124
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

Semi-Preparative columns Tracer EXTRASIL

Function	Particle size (µm)	Dimensions 15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
ODS 1	5	TR-014501	TR-014502	TR-014503	TR-014504
ODS 2	5	TR-014505	TR-014506	TR-014507	TR-014508
Si	5	TR-014509	TR-014510	TR-014511	TR-014512
C - 1	5	TR-014513	TR-014514	TR-014515	TR-014516
C - 6	5	TR-014517	TR-014518	TR-014519	TR-014520
C - 8	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
ODS 1	10	TR-014545	TR-014546	TR-014547	TR-014548
ODS 2	10	TR-014549	TR-014550	TR-014551	TR-014552
Si	10	TR-014553	TR-014554	TR-014555	TR-014556
C - 6	10	TR-014557	TR-014558	TR-014559	TR-014560
C N	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	Particle size (µm)	Dimensions 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
C-1	5	TR-021206	TR-021212	TR-021242	TR-021243
C-6	5	TR-021207	TR-021208	TR-021244	TR-021245
C-8	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	Particle size (µm)	Dimensions 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
C-1	3	TR-015675	TR-015676	TR-015677
C-6	3	TR-015678	TR-015679	TR-015680
C-8	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
C-1	5	TR-015609	TR-015610	TR-015611
C-6	5	TR-015612	TR-015613	TR-015614
C-8	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
C-1	10	TR-015642	TR-015643	TR-015644
C-6	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 198-199