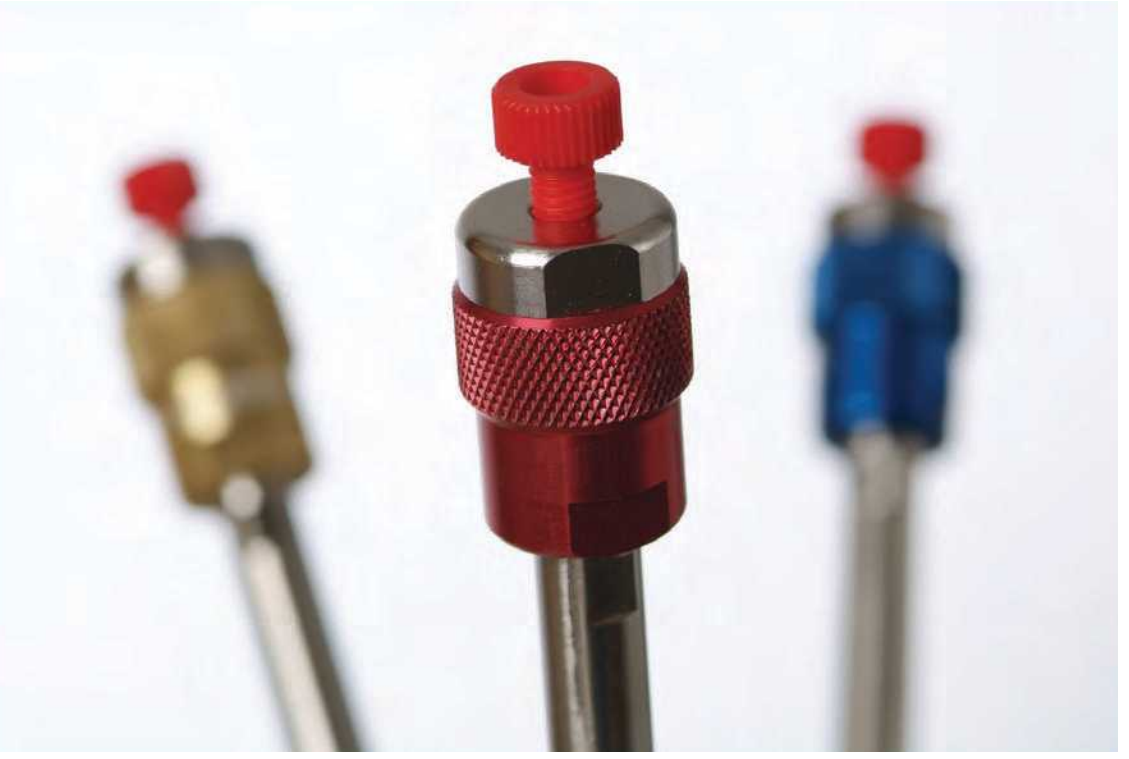
Teknokroma®

Professionally Friendly

COLUMNAS HPLC



USP Column Listing

L1	Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 3 to 10 µm in diameter.	MEDITERRANEA SEA18 TRACER EXCEL 120 ODS A TRACER EXCEL 120 ODS B Brisa LC^2 C18 TRACER EXTRASIL ODS2 TRACER EXTRASIL ODS1 Advantix ODS Hyperpack ODS Hyperpack BASIC TSKgel ODS YMC PRO C18 HYPERSIL HyPURITY C18 LICHROSORB RP18 LICHROSPHER RP18 NUCLEOSIL 100 C18 NUCLEOSIL 120 C18 PARTISIL ODS3
L3	Porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 Si TRACER EXTRASIL Si PINNACLE Si HYPERSIL Si ULTRA Si PINNACLE Si LICHROSORB Si LICHROSPHER Si NUCLEOSIL 100 Si NUCLEOSIL 120 Si PARTISIL Si
L7	Octyl silane chemically bonded to totally porous microsilica particles, 5 to 10 µm in diamerer.	TRACER EXCEL 120 C8 TRACER EXTRASIL C8 Advantix C8 ULTRA C8 PINNACLE C8 TSKgel oCTYL HYPERSIL C8 LICHROSORB RP8 LICHROSPHER RP8 NUCLEOSIL 100 C8 NUCLEOSIL 120 C8
L8	An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 10 µm in diameter.	TRACER EXCEL 120 APS TRACER EXTRASIL NH2 TRACER EXCEL 120 C8 HYPERSIL NH2 LICHROSORB NH2 LICHROSPHER NH2 NUCLEOSIL 100 NH2 NUCLEOSIL 120 NH2
L9		TRACER EXTRASIL SCX PARTISIL SCX
L10	Nitrile groups chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 CN TRACER EXTRASIL CN HYPERSIL CPS HYPERSIL BDS CPS LICHROSORB CN LICHROSPHER CN NUCLEOSIL 100 CN NUCLEOSIL 120 CN
L11	Phenyl groups chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 PHENYL TRACER EXTRASIL PHENYL NUCLEOSIL 100 P
L13	Trimethylsilane chemically bonded to porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 C1 TRACER EXTRASIL C1

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

Hardware Design Column: Ultrafit™ System

New Hardware Design Column: Ultrafit™ System

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

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

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

Ultrafit™ System Efficiency

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

Chromatographic Conditions:

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

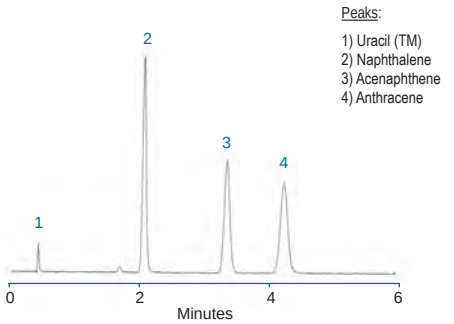
Ultrafit™ System Configuration

Ultrafit™

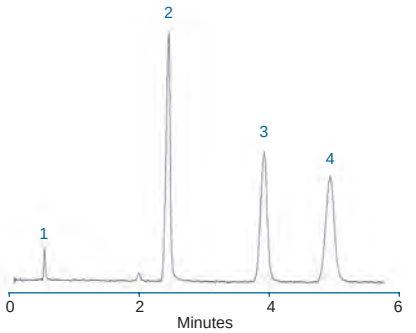
Ultrafit™ + Ultrafiter™

UltrafitT™ + Ultraguard™

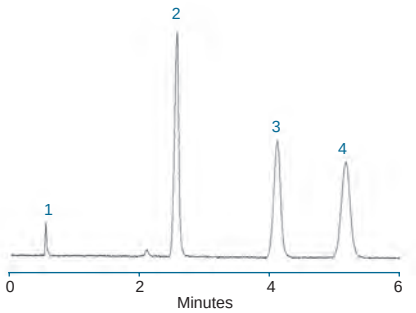
Our Columns Mediterranea™, Europa Peptides, Europa Proteins & Tracer Excel are built with the new Ultrafit ™ System



Column with Ultrafit™ System



Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Novacol™ Columns

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

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

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

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

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

Microbore Columns

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.

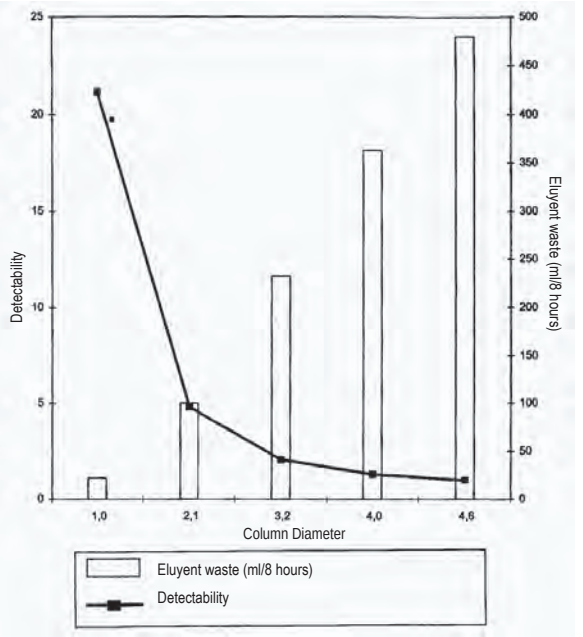
Instrumentation

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.



Ultrarapid Columns

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.

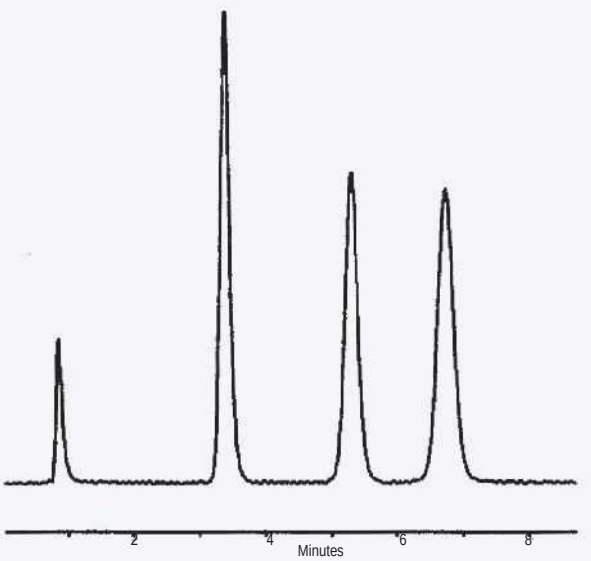
Economy

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.

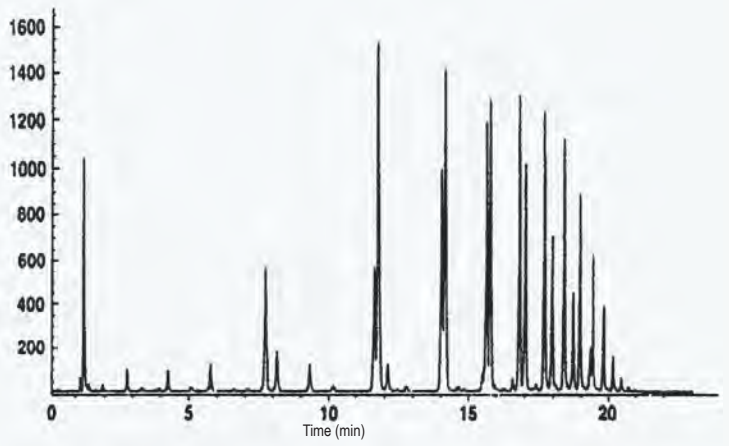


Sample:
1. Uracil
2. Naphtalene
3. Acenaphthene
4. Anthracene

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

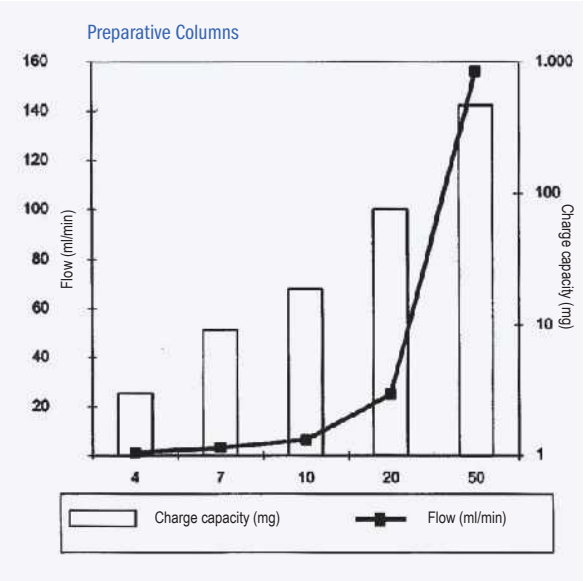
Column: Tracer Extrasil ODS2 3µ 3,5 x 0,46 cm

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.

Guard Columns for HPLC

Guard Column 1 cm x 0,32 cm

(1 cm x 0,32cm)

Reference	Description
TR-C-160	Holder for 1 cm guard columns
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 Column 1 cm x 0,40 cm

(1 cm x 0,40 cm)

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

Guard Columns for HPLC

Guard Column 2 cm x 0,32 cm

(2 cm x 0,32 cm)

Reference	Description
TR-C-460	Holder for 2 cm guard columns
TR-C-460K1	Holder + 2 cartridges ODS
TR-C-460K2	Holder + 2 cartridges Si
TR-C-460K3	Holder + 2 cartridges C8
TR-C-460K4	Holder + 2 cartridges NH2
TR-C-460K5	Holder + 2 cartridges SAX
TR-C-460K6	Holder + 2 cartridges CN
TR-C-460K7	Holder + 2 cartridges PAH
TR-C-460K8	Holder + 2 cartridges C6H5
TR-C-460K9	Holder + 2 cartridges CARBOHYDRATES
TR-C-460K10	Holder + 2 cartridges ANION
TR-C-460K11	Holder + 2 cartridges SCX
TR-C-460K12	Holder + 2 cartridges C2
TR-C-460K13	Holder + 2 cartridges 300 C4
TR-C-460K14	Holder + 2 cartridges 300 C8
TR-C-460K15	Holder + 2 cartridges DIOL
TR-C-460K16	Holder + 2 cartridges 300 C18
TR-C-460K17	Holder + 2 cartridges C4
TR-C-460K18	Holder + 2 cartridges PRP-1
TR-C-460K19	Holder + 2 cartridges PEPTIDE C18
TR-C-460K20	Holder + 2 cartridges C1
TR-C-460K21	Holder + 2 cartridges C6
TR-C-460-1	ODS Cartridges (5 units)
TR-C-460-2	Si Cartridges (5 units)
TR-C-460-3	C8 Cartridges (5 units)
TR-C-460-4	NH2 Cartridges (5 units)
TR-C-460-5	SAX Cartridges (5 units)
TR-C-460-6	CN Cartridges (5 units)
TR-C-460-7	PAH Cartridges (5 units)
TR-C-460-8	C6H5 Cartridges (5 units)
TR-C-460-9	CARBOHYDRATES Cartridges (5 units)
TR-C-460-10	ANION Cartridges (5 units)
TR-C-460-11	SCX Cartridges (5 units)
TR-C-460-12	C2 Cartridges (5 units)
TR-C-460-13	300C4 Cartridges (5 units)
TR-C-460-14	300C8 Cartridges (5 units)
TR-C-460-15	DIOL Cartridges (5 units)
TR-C-460-16	300C18 Cartridges (5 units)
TR-C-460-17	C4 Cartridges (5 units)
TR-C-460-18	PRP-1 Cartridges (5 units)
TR-C-460-19	PEPTIDE C18 Cartridges (5 units)
TR-C-460-20	C1 Cartridges (5 units)
TR-C-460-21	C6 Cartridges (5 units)

Guard Column 2 cm x 0,40 cm

(2 cm x 0,40 cm)

Reference	Description
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TR-C-460K1-4	Holder + 2 cartridges ODS
TR-C-460K2-4	Holder + 2 cartridges Si
TR-C-460K3-4	Holder + 2 cartridges C8
TR-C-460K4-4	Holder + 2 cartridges NH2
TR-C-460K5-4	Holder + 2 cartridges SAX
TR-C-460K6-4	Holder + 2 cartridges CN
TR-C-460K7-4	Holder + 2 cartridges PAH
TR-C-460K8-4	Holder + 2 cartridges C6H5
TR-C-460K9-4	Holder + 2 cartridges CARBOHYDRATES
TR-C-460K10-4	Holder + 2 cartridges ANION
TR-C-460K11-4	Holder + 2 cartridges SCX
TR-C-460K12-4	Holder + 2 cartridges C2
TR-C-460K13-4	Holder + 2 cartridges 300 C4
TR-C-460K14-4	Holder + 2 cartridges 300 C8
TR-C-460K15-4	Holder + 2 cartridges DIOL
TR-C-460K16-4	Holder + 2 cartridges 300 C18
TR-C-460K17-4	Holder + 2 cartridges C4
TR-C-460K18-4	Holder + 2 cartridges PRP-1
TR-C-460K19-4	Holder + 2 cartridges PEPTIDE C18
TR-C-460K20-4	Holder + 2 cartridges C1
TR-C-460K21-4	Holder + 2 cartridges C6
TR-C-460-1-4	ODS Cartridges (5 units)
TR-C-460-2-4	Si Cartridges (5 units)
TR-C-460-3-4	C8 Cartridges (5 units)
TR-C-460-4-4	NH2 Cartridges (5 units)
TR-C-460-5-4	SAX Cartridges (5 units)
TR-C-460-6-4	CN Cartridges (5 units)
TR-C-460-7-4	PAH Cartridges (5 units)
TR-C-460-8-4	C6H5 Cartridges (5 units)
TR-C-460-9-4	CARBOHYDRATES Cartridges (5 units)
TR-C-460-10-4	ANION Cartridges (5 units)
TR-C-460-11-4	SCX Cartridges (5 units)
TR-C-460-12-4	C2 Cartridges (5 units)
TR-C-460-13-4	300C4 Cartridges (5 units)
TR-C-460-14-4	300C8 Cartridges (5 units)
TR-C-460-15-4	DIOL Cartridges (5 units)
TR-C-460-16-4	300C18 Cartridges (5 units)
TR-C-460-17-4	C4 Cartridges (5 units)
TR-C-460-18-4	PRP-1 Cartridges (5 units)
TR-C-460-19-4	PEPTIDE C18 Cartridges (5 units)
TR-C-460-20-4	C1 Cartridges (5 units)
TR-C-460-21-4	C6 Cartridges (5 units)

Guard Columns for HPLC

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 Guard Columns

- 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

Europa™ Guard Columns

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™ Guard Columns

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 Guard Columns

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**

Guard Columns for HPLC

Ultraguard™, Ultrafit Guardcolumn adaptor **TR-010068**
(guard column not included)

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.

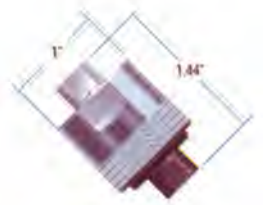
U-284 Union Column-Precolumn

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 HPLC Column

Introduction

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

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

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

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

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

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

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

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

mediterranea™ Sea HPLC Column

Purity of Silica

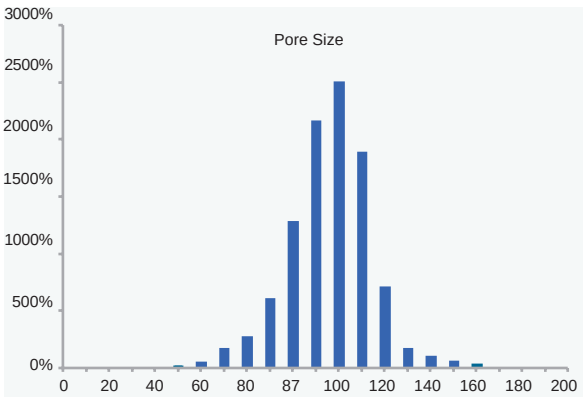
After evaluating many materials as a base for the global-best reverse phase chromatographic packing, the clear consensus is that the special characteristics of silica packings classify them as unsurpassable. No other packing material, apart from ultra-pure silica, achieves the perfect balance of physical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

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

Metals Content (ppm)

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

Porosity (Surface Enhanced Accessibility, SEA)



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

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

Multifunctional Endcapping Deactivation (MED)

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

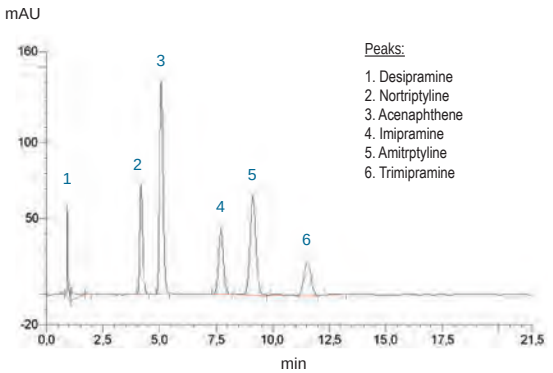
Moreover, the mediterranea™ sea18 column has been designed to show an excellent retention of polar compounds in a 100% aqueous environment without the problems of unwanted interactions which inefficiently endcapped conventional packings produce. Packing chemistry based on the new MED technology, "multifunctional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

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

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

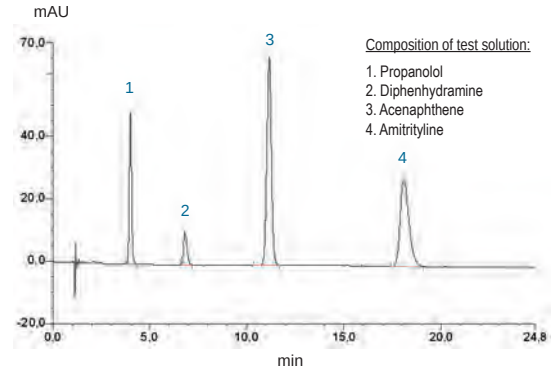
mediterranea™ Sea HPLC Column

Tricyclic Anti-depressants

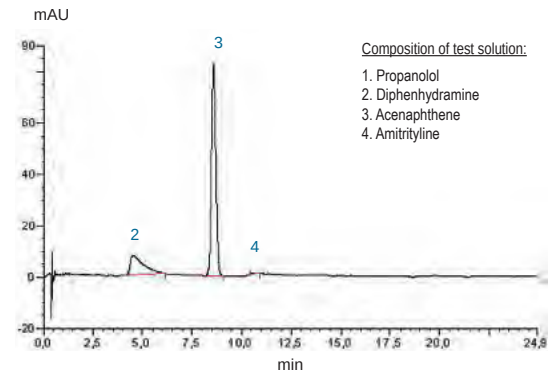


Column: **mediterranea sea 18**, 5 µm 15 x 0,46 cm
Eluent: Methanol/20mM K2HPO4 (pH 7.0) 70:30
Flow: 1ml/min
Room Temperature
Detection: UV 254 nm

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.

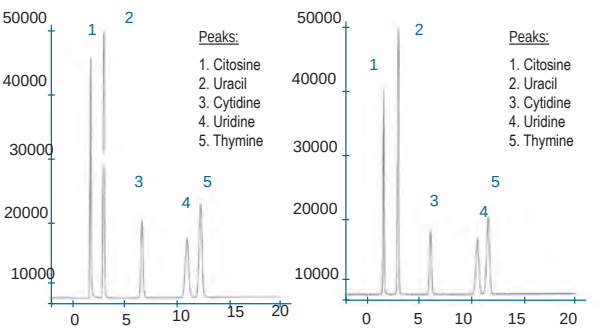
Nevertheless, these advantages are achieved at the expense of less retention for polar compounds, and poor column stability. Polar-embedded packings exhibit chromatographic behavior that cannot be considered as 100% reverse phase, since secondary interaction mechanisms may co-exist due to the nature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

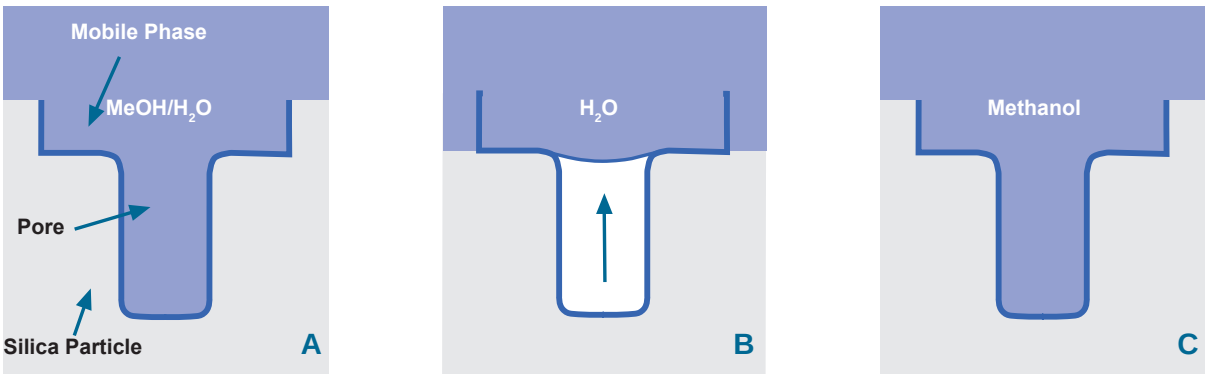


Initial

Final after 40 hours of 100% H_2O

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 HPLC Column



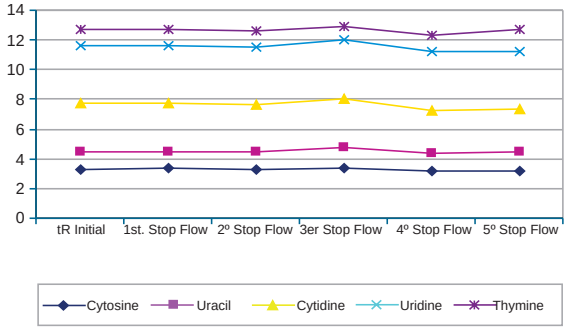
The phenomenon of "Dewetting"

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



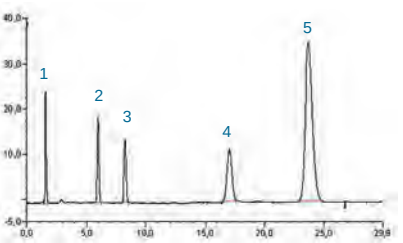
Compound	tR initial	1st stop flow	2nd stop flow	3rd stop flow	4th stop flow	5th stop flow
Cytosine	3,32	3,33	3,3	3,35	3,16	3,21
Uracil	4,45	4,45	4,44	4,75	4,36	4,44
Cytidine	7,73	7,73	7,63	8,00	7,24	7,34
Uridine	11,57	11,57	11,53	12,02	11,25	11,24
Thymine	12,70	12,7	12,62	12,87	12,35	12,70

NIST Test for HPLC Packing Characterization

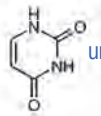
The new mediterranea™ sea18 column has been subjected to the SRM870 test. This test, designed by the NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY and recently assessed by the experts committee of the USP (United States Pharmacopeia) is currently considered to be the most recommended for evaluating the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

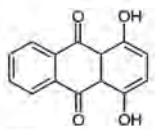


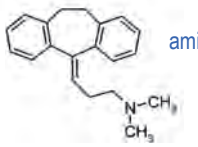
Peaks
1. Uracil
2. Toluene
3. Ethylbenzene
4. Quinizarin
5. Amitriptyline


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.

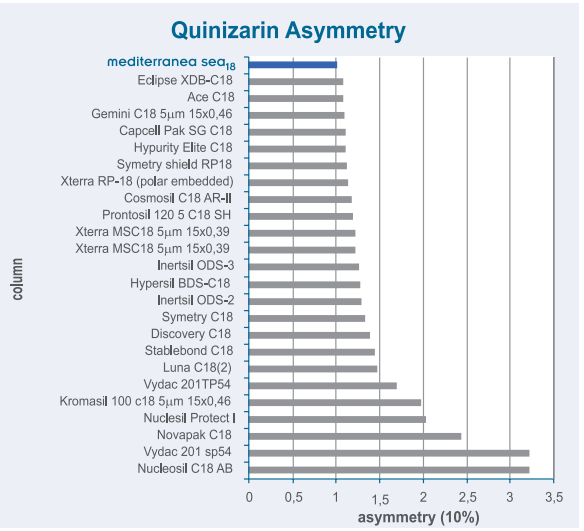
Quinizarin (1,4-dihydroanthraquinone)

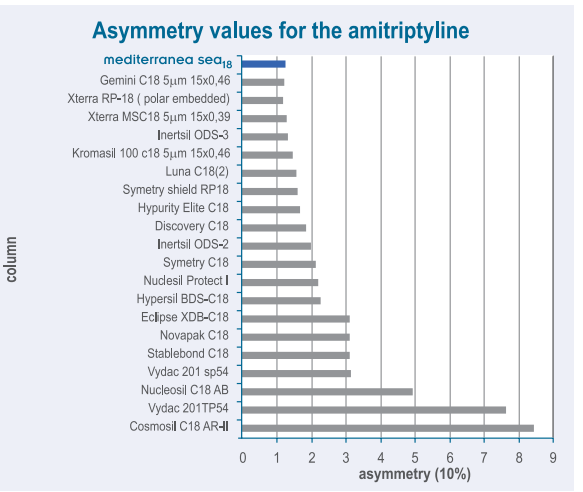
Quinizarin is a chelating compound and its behaviour in a reverse phase column is a clear indicator of the presence or absence of metals. A column of low activity will deliver symmetrical peaks whereas increasing surface activity exaggerates the tailing edge of the quinizarin peak - leading to higher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

Packaging Sample

Wide pH Range

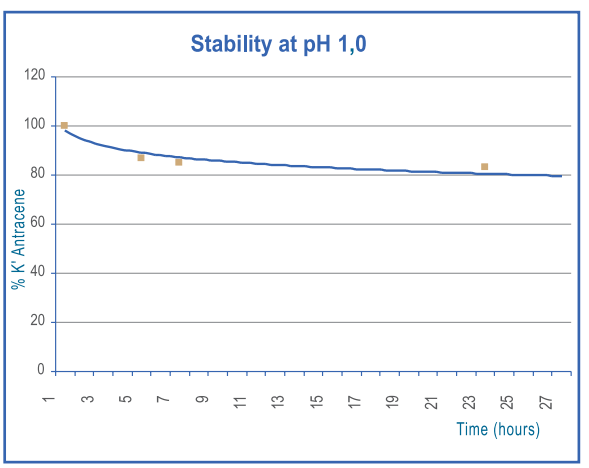
A perfectly spherical particle, a totally controlled pore design, a total lack of metallic traces, a well-studied process of phase bonding and final endcapping, all combine in achieving a packing with a resistance to extreme pH values not previously reached.

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.

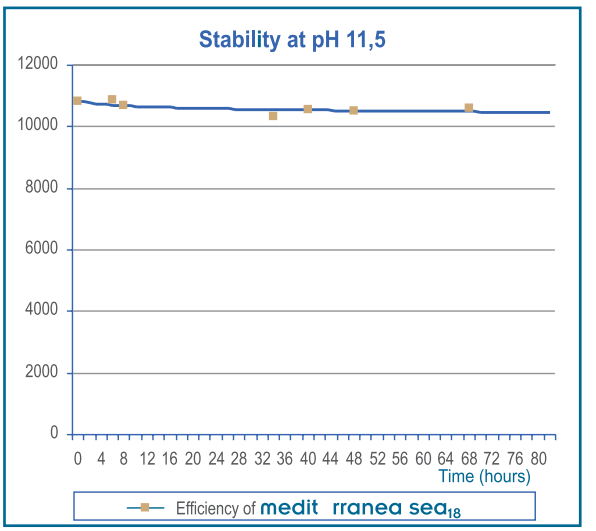
Using mediterranea™ sea18 packing makes it is possible to work with eluents from pH 1 to pH 12. Such unusual pH-resistance values have been secured as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield that impedes acidic and basic eluents from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

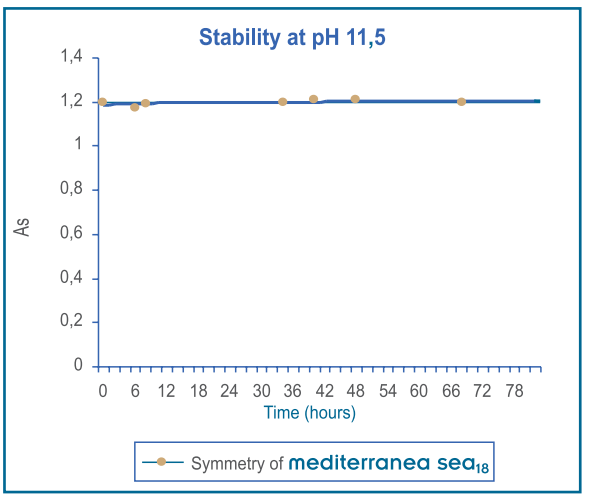
Eluting the mediterranea™ sea18 column for 78 hours at pH 11.5, showed no significant deterioration in terms of both efficiency and peak symmetry for diphenhydramine..

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 de of the last anthracene peak.





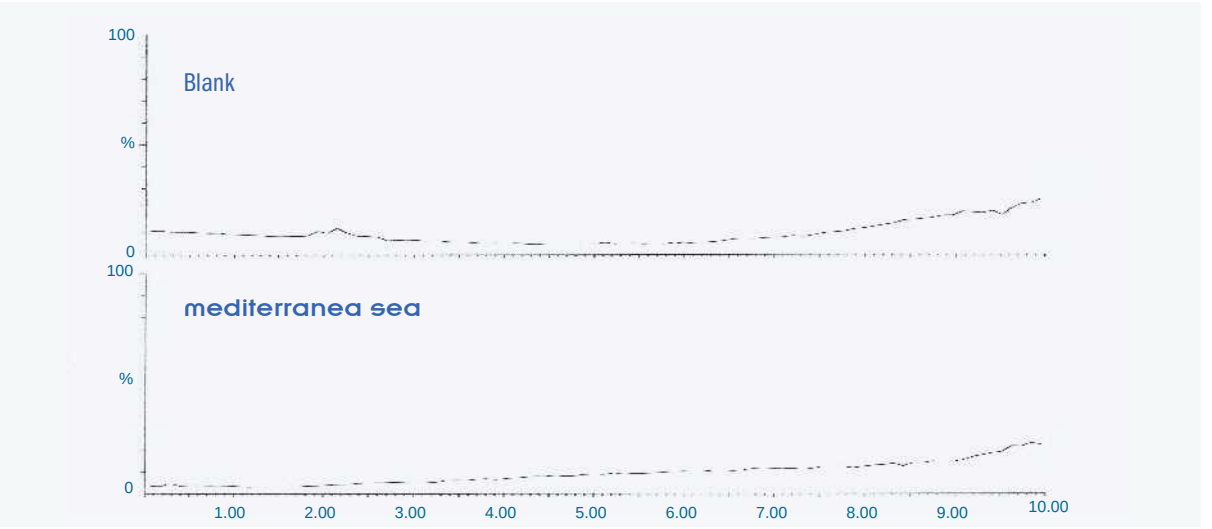
An eluent of ACN//1- methylpyrrolidine 50mM pH 11,5 50:50, 1ml/min 25ºC is passed through the column. With the same eluent 10 ml of diphenhydramine (1mg/ml dissolved in water) is injected and the efficiency and symmetry of the peak is tested.

LC-MS Mediterranea™ Sea 18 Columns

The Multifunctional Endcapping Deactivation (MED) technology guarantees extreme stability for every mediterranea™ sea18 reverse-phase column.
Chromatographic stability (peak symmetry, peak retention times, and peak efficiency) under low-to-high pH (pH 1-12) conditions is required for high-speed, high-throughput LC-MS. The mediterranea™ sea18 is the ideal LC-MS reverse-phase column for stable chromatographic separation of pharmaceuticals and their metabolites.
The technological features designed into the mediterranea™ sea18 column makes it extremely useful for LC-MS applications where packing stability is demonstrated by low column bleed and consistent chromatographic results. The combination of mediterranea™ sea18 technology on a 3mm ultra-pure silica-based packing enables LC-MS separations to be made speedily and with maximum productivity.

mediterranea™ Sea 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

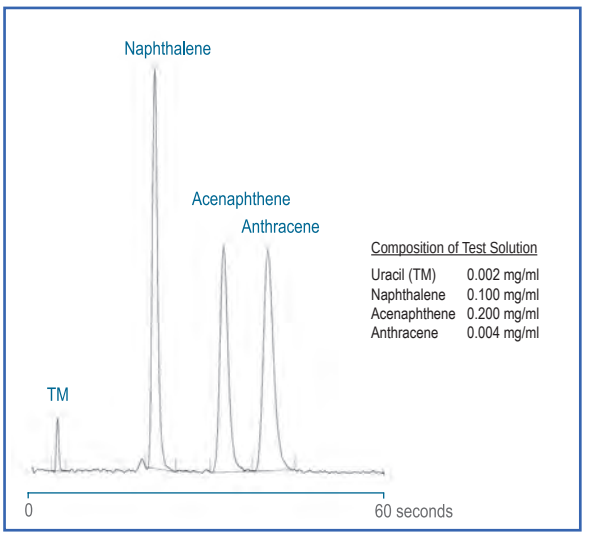
MS Instrument: Waters ZMD
Capillary Voltage: 3kV (ESI positive)
Cone Voltage: 20V
Source block Temp: 100ºC
Desolvation Temp: 350ºC
Gas: 500l/h
Gas of cone: 35 l/h
Mass Range: 60 to100 amu

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 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.

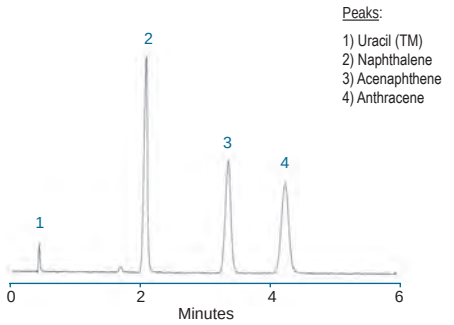
New Hardware Design for Mediterranea™ Column: Ultrafit™ System

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.

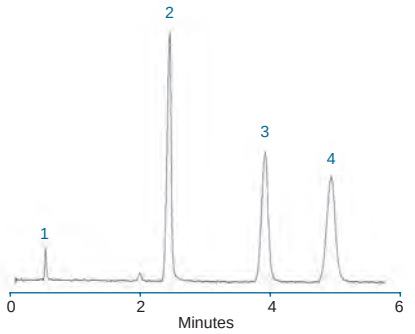
Ultrafit™ System Efficiency

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

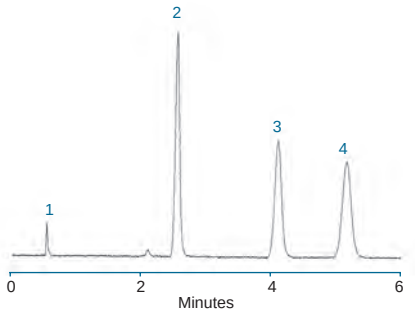
Chromatographic Conditions:
Column: mediterranea™ sea18 3 mm 5 x 0,46 cm
Eluant: Acetonitryle/Water 65:35
Flow: 0,9 ml/min
Det. UV 254 nm
Temp. Room
Sample: Acenaphthene 0.2 mg/ml



Column with Ultrafit™ System



Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Ultrafit™ System Configuration

Ultrafit™

Ultrafit™ + Ultrafiter™

UltrafitT™ + Ultraguard™

mediterranea™ Sea 5 µm HPLC Column

Analytical Columns 0.46 cm ID
mediterranea™ sea 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 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 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 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 3 & 5 µm HPLC Column

SemiPreparative Columns
mediterranea™ sea 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**

Ultrarapid Columns 0.46 cm ID
mediterranea™ sea 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 3 µm

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

mediterranea™ Sea 3 µm HPLC Column

Microbore Columns 0.21 cm ID
mediterranea™ sea 3 µm

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

Microbore Columns 0.30 cm ID
mediterranea™ sea 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**

Other Products
mediterranea™ sea

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

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

mediterranea™ Sea UHPLC Columns

mediterranea™ Sea18 1.8 µm

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

mediterranea™ sea18 1.8 µm columns have been developed based on the same material as the recognized 5µm column.The result is a column with high efficiency, high reliability and full scalability from UHPLC analytical chromatography to industrial process chromatography.
mediterranea™ sea18 1.8 µm columns are available in 1.8, 2.2,3, 5, 10, and 15 µm. Its versatility allows the separation of both nonpolar and polar substances, and its robustness to extreme pH values (1.5 to 11) makes it the ideal column for methods development
mediterranea™ sea18 1.8 µm has been developed to offer the highest quality and reproducibility.Teknokroma checks rigorously both each packing batch and every single column.

UHPLC Columns
mediterranea™ sea 1.8 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	1.8	5	0.21	**TR-010902**
mediterranea	Sea18	1.8	10	0.21	**TR-010903**
mediterranea	Sea18	1.8	15	0.21	**TR-010906**
mediterranea	Sea18	1.8	5	0.30	**TR-010904**
mediterranea	Sea18	1.8	10	0.30	**TR-010909**
mediterranea	Sea18	1.8	5	0.46	**TR-010905**
mediterranea	Sea18	1.8	10	0.46	**TR-010907**
mediterranea	Sea18	1.8	15	0.46	**TR-010908**

UHPLC Guardcolumns

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

GL-5020-20382

JR-69330-05

mediterranea™ Sea18 2.2 µm

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

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

UHPLC Columns
mediterranea™ sea 2.2 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
mediterranea	Sea18	2.2	5	0.21	**TR-010900**
mediterranea	Sea18	2.2	10	0.21	**TR-010901**
mediterranea	Sea18	2.2	15	0.21	**TR-010921**
mediterranea	Sea18	2.2	5	0.30	**TR-010941**
mediterranea	Sea18	2.2	10	0.30	**TR-010942**
mediterranea	Sea18	2.2	5	0.46	**TR-010930**
mediterranea	Sea18	2.2	10	0.46	**TR-010935**

UHPLC Guardcolumns

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

UHPLC Guardcolumn Filter

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

Brisa LC² HPLC Column

Latest technology Ultrapure Silica
Optimizes your analysis costs
Immediate delivery Analytical

Column Brisa LC²
"Limited Cost x Liquid Chromatography"

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

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

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

Analytical Columns
Brisa LC² 3 & 5 µm

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

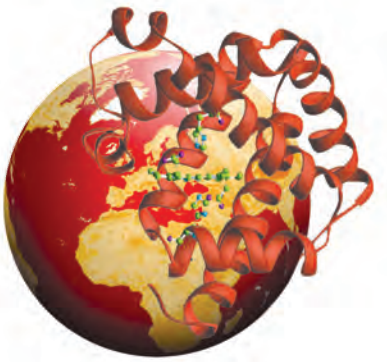
UHPLC Columns
Brisa LC² C18-MS 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Brisa LC²	C18-MS	1.8	5	0.21	**TR-010490**
Brisa LC²	C18-MS	2.2	5	0.21	**TR-010493**

LC-MS Columns
Brisa LC² C18-MS 3 & 5 µm

Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Brisa LC²	C18-MS	3	5	0.21	**TR-010496**
Brisa LC²	C18-MS	3	10	0.21	**TR-010497**
Brisa LC²	C18-MS	5	15	0.10	**TR-010485**
Brisa LC²	C18-MS	5	15	0.21	**TR-010486**
Brisa LC²	C18-MS	5	25	0.21	**TR-010487**

Europa HPLC Column for Peptides and Proteins



Introduction

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

After the versatility of our popular **mediterranea™** 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 40 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

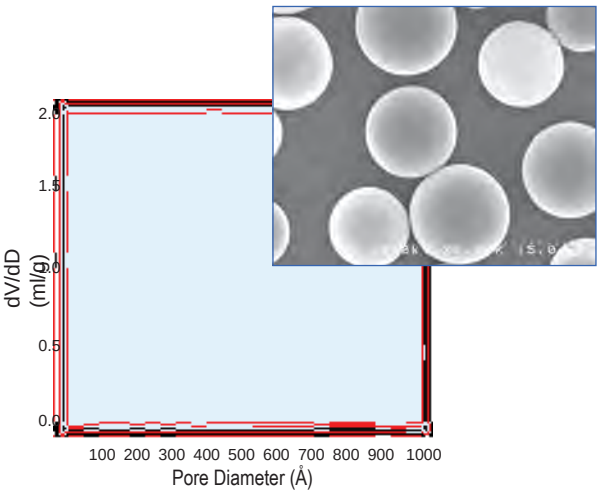
The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

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.

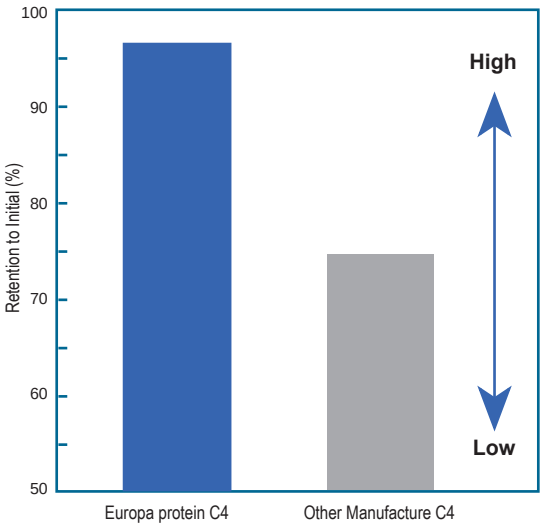
Wide pH Range

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.

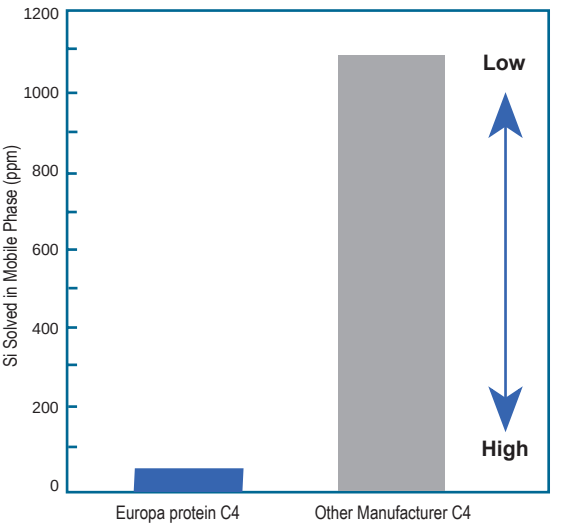
Europa Protein C4 Phase Stability

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



Alkali Resistance pH=12

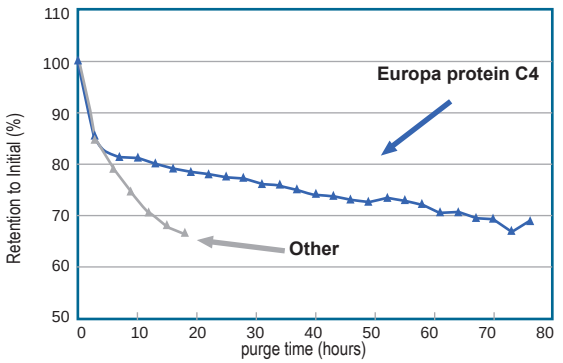


Europa HPLC Column for Peptides and Proteins

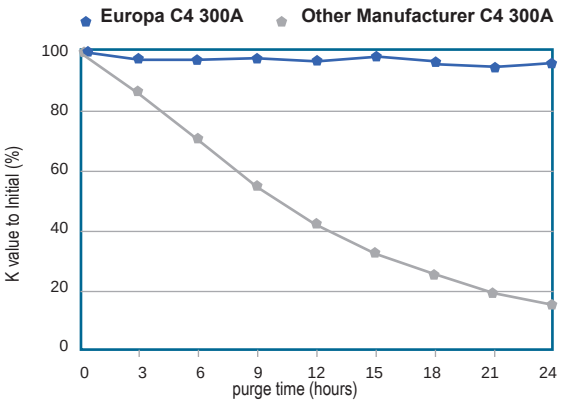
Durability comparison in Alkaline Medium/RT

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.

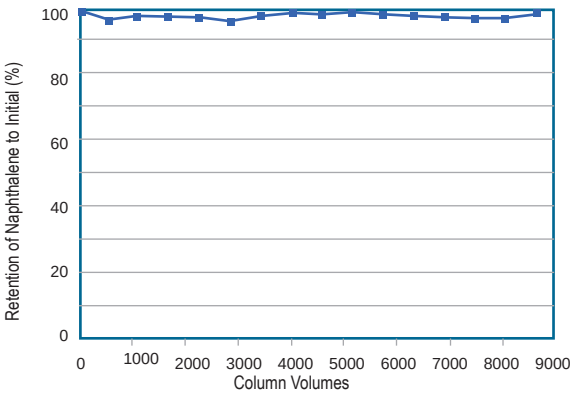


Durability comparison in Acidic Medium / K value



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.

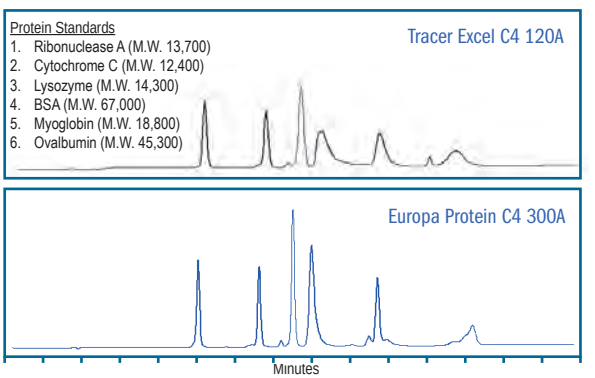
Our **"Ultra-Fast"** columns are made in 3-5 cm length in order to get quick analytical results, whereas the **"High Efficiency"** columns are normally in 15-25cm lengths to obtain the best resolution.

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**

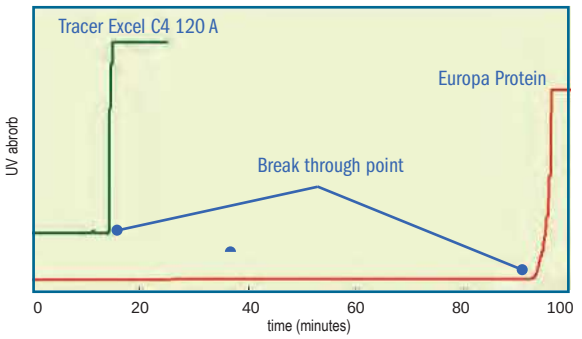
For Guard Columns please refer to pages 193-196

Europa HPLC Column for Peptides and Proteins

Europa C4 Protein HPLC Columns

Europa Protein C4 300 Å - Loading Capacity of BSA

Protein 300 exhibited the highest loading capacity for proteins

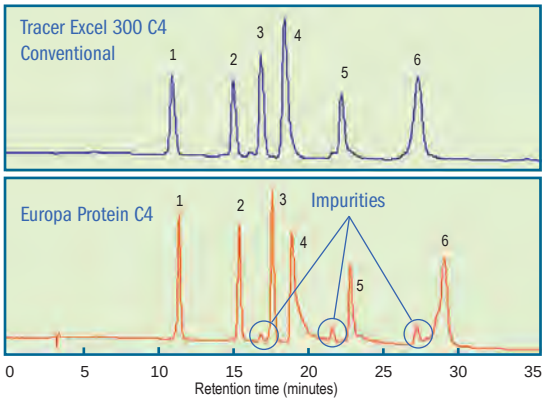


Column: 7 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

Europa Protein C4 300 Å - Protein Separation Behaviors

- **Similar Hydrophobic Selectivity**
- **Higher Resolution**

Protein Standards
1. Ribonuclease A (M.W. 13,700)
2. Cytochrome C (M.W. 12,400)
3. Lysozyme (M.W. 14,300)
4. BSA (M.W. 67,000)
5. Myoglobin (M.W. 18,800)
6. Ovalbumin (M.W. 45,300)



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

Europa C4 Protein Analytical HPLC Colums

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

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

Europa C4 Protein Microbore HPLC Colums

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

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

Europa C4 Protein Semi-Preparative HPLC Colums

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

Europa C4 Protein Preparative HPLC Colums

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

TRACER EXCEL™ 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

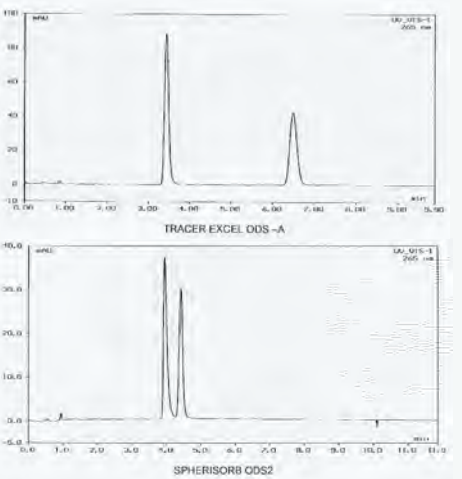
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

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:

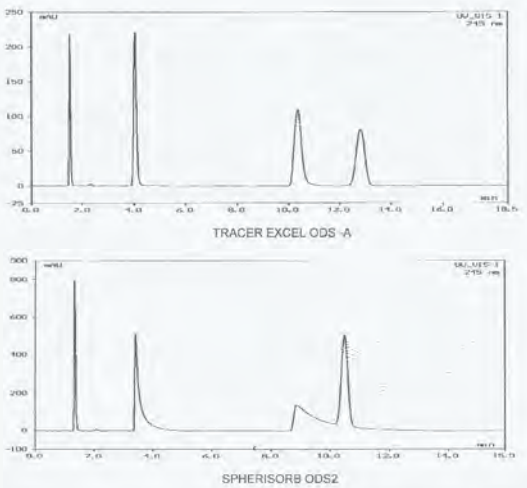
Pyridine 2.1µl/ml
Phenol:14 mg/m

Tracer Excel™

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



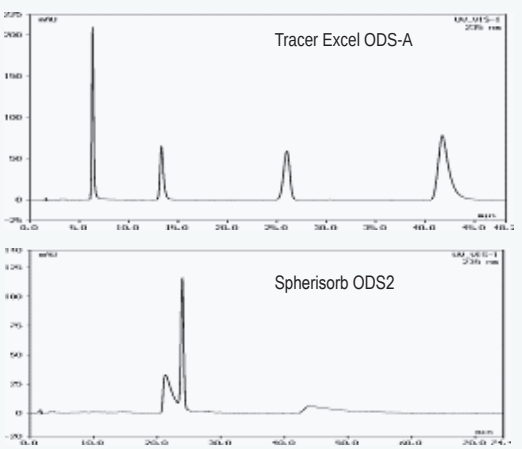
Conditions of test

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:

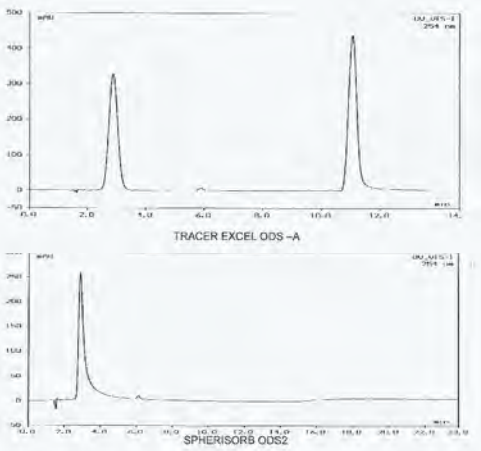
Propanolol: 0.08mg/ml
Diphenidramine :1.28 mg/ml
Acetonaphthalene: 0.2 mg/ml
Amyltryptilene: 0.3 mg/ml

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

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

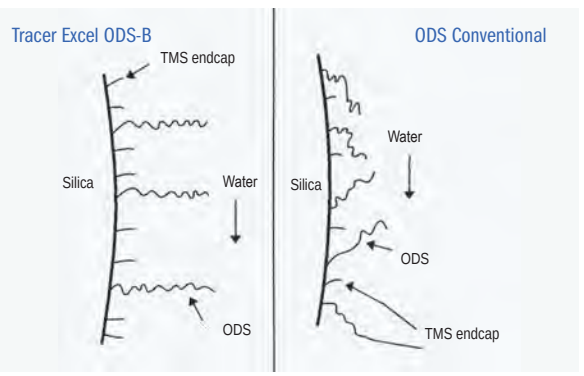
Based on the same principles as the TRACER EXCEL ODS-A columns, the TRACER EXCEL ODS-B column presents a high selectivity for hydrophilic and polar compounds, which are poorly retained on conventional ODS columns.

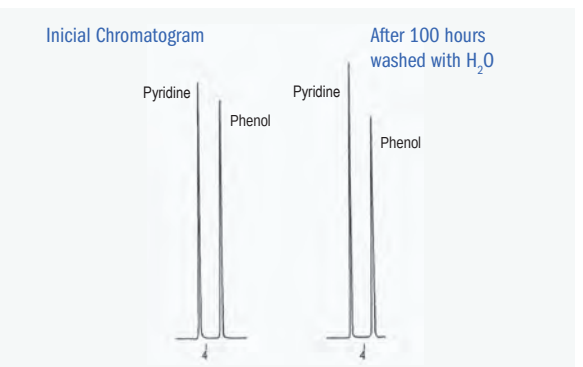
A special modification in the process of functionalizing the pure silica particle prevents the collapsing effect of the C18 chains when working with mainly aqueous eluants. So you can work with excellent chromatographic performance even when the percentage of the aqueous phase is 100%.

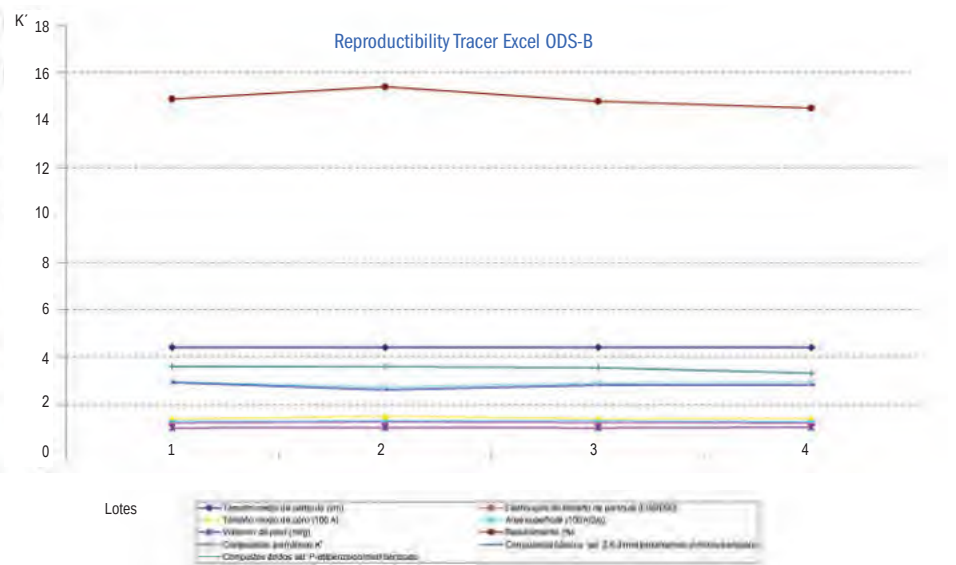
Generally, its field of application is the same as that of the TRACER EXCEL ODS-A, but its field of application is extended for samples which are especially difficult for conventional reversed phases, as is the case in separating oligosaccharides, amino acids, nucleotides and organic acids.

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.

EFFECT OF AQUEOUS ELUTANTS ON THE ORGANIZATION OF HYDROCARBON CHAINS.





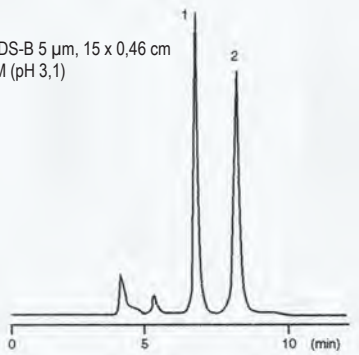


Tracer Excel ODS-B

Antioxidants

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

Sample: 1 Ascorbic Acid
2 GSH



Water Soluble Vitamins

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

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

Glycolid Acid and Latic Acid

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

Sample: 1 Glycolic Acid
2 Lactic Acid

Alcohols

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

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

Aminoacids

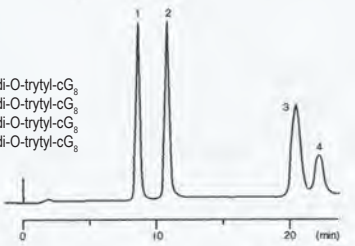
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: H_2O
Flow: 0.6 ml/min.
Temperature: 40ºC
Detector: RID

Sample: 1 Alanine
2 Valine
3 Isoleucine
4 Leucine

Cyclodextrin derivatives

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

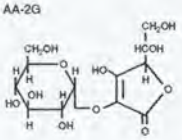
Sample: 1 $6^1, 6^5$ -di-O-trytyl-cG_8
2 $6^1, 6^4$ -di-O-trytyl-cG_8
3 $6^1, 6^3$ -di-O-trytyl-cG_8
4 $6^1, 6^2$ -di-O-trytyl-cG_8

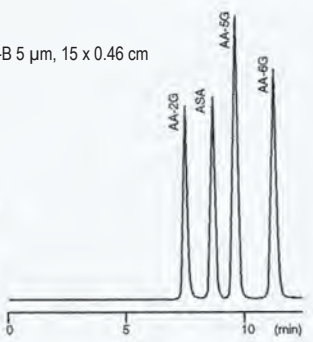


Ascorbic Acid and Glycosides

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

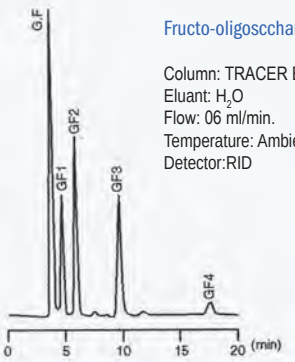
AA-2G





Fructo-oligosccharides

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



Other Tracer Excel Packings

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

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

General Properties of Tracer Excel Packings

	ODS-A	ODS-B	C8	C4	C1	CN	Ph	NH_2	SI
Size of pore in A units	120	120	120	120	120	120	120	120	120
Size of particle	3, 4, 5 & 10 µm	3, 4, 5 & 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm
Volume of pores in ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g
Surface area	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g	300 m^2/g
Purity of silica	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure
%C	17%	15%	10%	8%	5%	7%	9%	4%	
Type of phase	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional	Monofunctional and totally endcapped		Trifunctional	
Metallic impurities (Al, Fe, Ti, Zr)	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one
USP	L1	L1	L7	L26	L13	L10	L11	L8	L3

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

		Length cm					
Function	**µm**	**4 cm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-416336	TR-417000	TR-416337	TR-416338	TR-416339	TR-416340
ODS-B	5	TR-416341	TR-417002	TR-416342	TR-416343	TR-416344	TR-416345
Si	5	TR-416356	TR-417004	TR-416357	TR-416358	TR-416359	TR-416360
C8	5	TR-416361	TR-417006	TR-416362	TR-416363	TR-416364	TR-416365
C4	5	TR-416366	TR-417008	TR-416367	TR-416368	TR-416369	TR-416370
C1	5	TR-416371	TR-417010	TR-416372	TR-416373	TR-416374	TR-416375
NH2	5	TR-416376	TR-417012	TR-416377	TR-416378	TR-416379	TR-416380
CN	5	TR-416381	TR-417014	TR-416382	TR-416383	TR-416384	TR-416385
Ph	5	TR-416386	TR-417016	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**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	3	TR-413460	TR-417018	TR-413461	TR-413462	TR-413463	TR-413464
ODS-B	3	TR-413465	TR-417020	TR-413466	TR-413467	TR-413468	TR-413469
Si	3	TR-413470	TR-417022	TR-413471	TR-413472	TR-413473	TR-413474
C8	3	TR-413475	TR-417024	TR-413476	TR-413477	TR-413478	TR-413479
C4	3	TR-413480	TR-417026	TR-413481	TR-413482	TR-413483	TR-413484
C1	3	TR-413485	TR-417028	TR-413486	TR-413487	TR-413488	TR-413489
NH2	3	TR-413490	TR-417030	TR-413491	TR-413492	TR-413493	TR-413494
CN	3	TR-413495	TR-417032	TR-413496	TR-413497	TR-413498	TR-413499
Ph	3	TR-413500	TR-417034	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**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-016336	TR-025000	TR-016337	TR-016338	TR-016339	TR-016340
ODS-B	5	TR-016341	TR-025002	TR-016342	TR-016343	TR-016344	TR-016345
Si	5	TR-016356	TR-025004	TR-016357	TR-016358	TR-016359	TR-016360
C8	5	TR-016361	TR-025006	TR-016362	TR-016363	TR-016364	TR-016365
C4	5	TR-016366	TR-025008	TR-016367	TR-016368	TR-016369	TR-016370
C1	5	TR-016371	TR-025010	TR-016372	TR-016373	TR-016374	TR-016375
NH2	5	TR-016376	TR-025012	TR-016377	TR-016378	TR-016379	TR-016380
CN	5	TR-016381	TR-025014	TR-016382	TR-016383	TR-016384	TR-016385
Ph	5	TR-016386	TR-025016	TR-016387	TR-016388	TR-016389	TR-016390

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

		Length cm					
Function	**µm**	**4 cm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	4	TR-025018	TR-025020	TR-025022	TR-025024	TR-025026	TR-025028
ODS-B	4	TR-016351	TR-025030	TR-016352	TR-016353	TR-016354	TR-016355

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

		Length cm					
Function	**µm**	**4 cm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	4	TR-416346	TR-417036	TR-416347	TR-416348	TR-416349	TR-416350
ODS-B	4	TR-416351	TR-417038	TR-416352	TR-416353	TR-416354	TR-416355

Tracer Excel 120

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

		Length cm					
Function	**µm**	**4 cm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	3	**TR-013415**	**TR-025034**	**TR-013416**	**TR-013417**	**TR-013418**	**TR-013419**
ODS-B	3	**TR-013420**	**TR-025036**	**TR-013421**	**TR-013422**	**TR-013423**	**TR-013424**
Si	3	**TR-013425**	**TR-025038**	**TR-013426**	**TR-013427**	**TR-013428**	**TR-013429**
C8	3	**TR-013430**	**TR-025040**	**TR-013431**	**TR-013432**	**TR-013433**	**TR-013434**
C4	3	**TR-013435**	**TR-025042**	**TR-013436**	**TR-013437**	**TR-013438**	**TR-013439**
C1	3	**TR-013440**	**TR-025044**	**TR-013441**	**TR-013442**	**TR-013443**	**TR-013444**
NH2	3	**TR-013445**	**TR-025046**	**TR-013446**	**TR-013447**	**TR-013448**	**TR-013449**
CN	3	**TR-013450**	**TR-025048**	**TR-013451**	**TR-013452**	**TR-013453**	**TR-013454**
Ph	3	**TR-013455**	**TR-025050**	**TR-013456**	**TR-013457**	**TR-013458**	**TR-013459**

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

		Length cm				
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-B	5	**TR-025060**	**TR-021353**	**TR-025078**	**TR-021354**	**TR-025096**
Si	5	**TR-025062**	**TR-021395**	**TR-025080**	**TR-021364**	**TR-025098**
C8	5	**TR-025064**	**TR-021365**	**TR-025082**	**TR-021366**	**TR-025100**
C4	5	**TR-025066**	**TR-021367**	**TR-025084**	**TR-021368**	**TR-025102**
C1	5	**TR-025068**	**TR-021369**	**TR-025086**	**TR-021370**	**TR-025104**
NH2	5	**TR-025070**	**TR-021371**	**TR-025088**	**TR-021372**	**TR-025106**
CN	5	**TR-025072**	**TR-021373**	**TR-025090**	**TR-021374**	**TR-025108**
Ph	5	**TR-025074**	**TR-021375**	**TR-025092**	**TR-021376**	**TR-025110**

Other configurations available on demand

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

		Length cm				
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	3	**TR-025114**	**TR-021407**	**TR-025134**	**TR-021408**	**TR-025154**
ODS-B	3	**TR-025116**	**TR-021409**	**TR-025136**	**TR-021410**	**TR-025156**
Si	3	**TR-025118**	**TR-021411**	**TR-025138**	**TR-021412**	**TR-025158**
C8	3	**TR-025120**	**TR-021413**	**TR-025140**	**TR-021414**	**TR-025160**
C4	3	**TR-025122**	**TR-021415**	**TR-025142**	**TR-021416**	**TR-025162**
C1	3	**TR-025124**	**TR-021417**	**TR-025144**	**TR-021418**	**TR-025164**
NH2	3	**TR-025126**	**TR-021419**	**TR-025146**	**TR-021420**	**TR-025166**
CN	3	**TR-025128**	**TR-021421**	**TR-025148**	**TR-021422**	**TR-025168**
Ph	3	**TR-025130**	**TR-021423**	**TR-025150**	**TR-021424**	**TR-025170**

Other configurations available on demand

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

		Length cm			
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**
ODS-A	5	**TR-025200**	**TR-021355**	**TR-025220**	**TR-021356**
ODS-B	5	**TR-025202**	**TR-021357**	**TR-025222**	**TR-021358**
Si	5	**TR-025204**	**TR-021381**	**TR-025224**	**TR-021382**
C8	5	**TR-025206**	**TR-021383**	**TR-025226**	**TR-021384**
C4	5	**TR-025208**	**TR-021385**	**TR-025228**	**TR-021386**
C1	5	**TR-025210**	**TR-021387**	**TR-025230**	**TR-021388**
NH2	5	**TR-025212**	**TR-021389**	**TR-025232**	**TR-021390**
CN	5	**TR-025214**	**TR-021391**	**TR-025234**	**TR-021392**
Ph	5	**TR-025216**	**TR-021393**	**TR-025236**	**TR-021394**

Other configurations available on demand

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

		Length cm			
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**
ODS-A	3	**TR-025240**	**TR-021425**	**TR-025260**	**TR-021426**
ODS-B	3	**TR-025242**	**TR-021427**	**TR-025262**	**TR-021428**
Si	3	**TR-025244**	**TR-021429**	**TR-025264**	**TR-021430**
C8	3	**TR-025246**	**TR-021431**	**TR-025266**	**TR-021432**
C4	3	**TR-025248**	**TR-021433**	**TR-025268**	**TR-021434**
C1	3	**TR-025250**	**TR-021435**	**TR-025270**	**TR-021436**
NH2	3	**TR-025252**	**TR-021437**	**TR-025272**	**TR-021438**
CN	3	**TR-025254**	**TR-021439**	**TR-025274**	**TR-021440**
Ph	3	**TR-025256**	**TR021441**	**TR-025276**	**TR-021442**

Other configurations available on demand

Tracer Excel 120

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

		Length cm			
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**25 cm**
ODS-A	5	**TR-025280**	**TR-025300**	**TR-016167**	**TR-016168**
ODS-B	5	**TR-025282**	**TR-025302**	**TR-016171**	**TR-016172**
Si	5	**TR-025284**	**TR-025304**	**TR-016175**	**TR-016176**
C8	5	**TR-025286**	**TR-025306**	**TR-016179**	**TR-016180**
C4	5	**TR-025288**	**TR-025308**	**TR-016183**	**TR-016184**
C1	5	**TR-025290**	**TR-025310**	**TR-016187**	**TR-016188**
NH2	5	**TR-025292**	**TR-025312**	**TR-016191**	**TR-016192**
CN	5	**TR-025294**	**TR-025314**	**TR-016195**	**TR-016196**
Ph	5	**TR-025296**	**TR-025316**	**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**	**5 cm**	**10 cm**	**15 cm**	**25 cm**
ODS-A	5	**TR-025320**	**TR-025340**	**TR-016169**	**TR-016170**
ODS-B	5	**TR-025322**	**TR-025342**	**TR-016173**	**TR-016174**
Si	5	**TR-025324**	**TR-025344**	**TR-016177**	**TR-016178**
C8	5	**TR-025326**	**TR-025346**	**TR-016181**	**TR-016182**
C4	5	**TR-025328**	**TR-025348**	**TR-016185**	**TR-016186**
C1	5	**TR-025330**	**TR-025350**	**TR-016189**	**TR-016190**
NH2	5	**TR-025332**	**TR-025352**	**TR-016193**	**TR-016194**
CN	5	**TR-025334**	**TR-025354**	**TR-016197**	**TR-016198**
Ph	5	**TR-025336**	**TR-025356**	**TR-016201**	**TR-016202**

Other configurations available on demand

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

		Length cm					
Function	**µm**	**4 cm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-016400	TR-025360	TR-016401	TR-016402	TR-016403	TR-016404
C8	5	TR-016405	TR-025362	TR-016406	TR-016407	TR-016408	TR-016409
C4	5	TR-016410	TR-025364	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**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-416400	TR-417040	TR-416401	TR-416402	TR-416403	TR-416404
C8	5	TR-416405	TR-417042	TR-416406	TR-416407	TR-416408	TR-416409
C4	5	TR-416410	TR-417044	TR-416411	TR-416412	TR-416413	TR-416414

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

		Length cm				
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-025376	TR-012395	TR-025382	TR-012396	TR-025388
C8	5	TR-025378	TR-012397	TR-025384	TR-012398	TR-025390
C4	5	TR-025380	TR-012399	TR-025386	TR-012400	TR-025392

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

		Length cm				
Function	**µm**	**5 cm**	**10 cm**	**15 cm**	**20 cm**	**25 cm**
ODS-A	5	TR-025396	TR-021401	TR-025402	TR-021402	TR-025408
C8	5	TR-025398	TR-021403	TR-025404	TR-021404	TR-025410
C4	5	TR-025400	TR-021405	TR-025406	TR-021406	TR-025412

For Guard Columns please refer to pages 193-196

Tracer Extrasil

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.

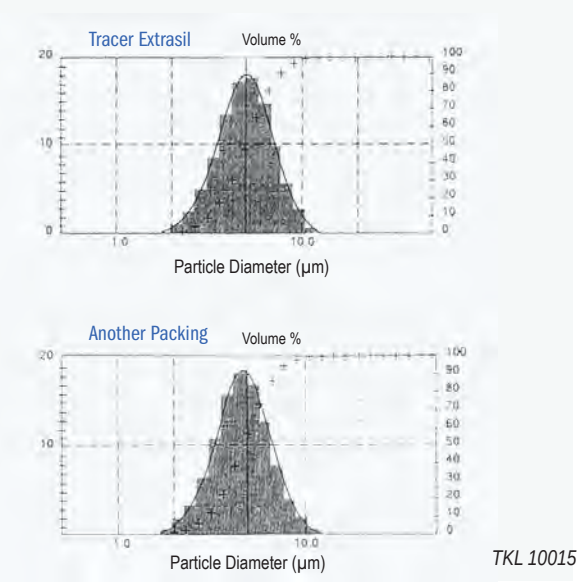
Characteristics

Tracer Extrasil 3,5 & 10 µm 80 A 220 m²/g	Particle Size Pore Size Surface area Carbon content	WS Packing 3,5 & 10 µm 80 A 220 m²/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%
-	SAX	-
-	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.

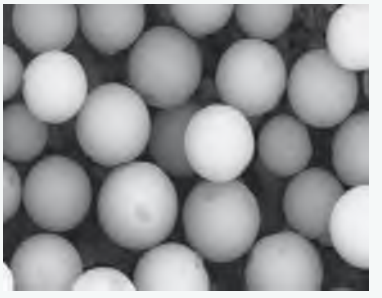


TKL 10015

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



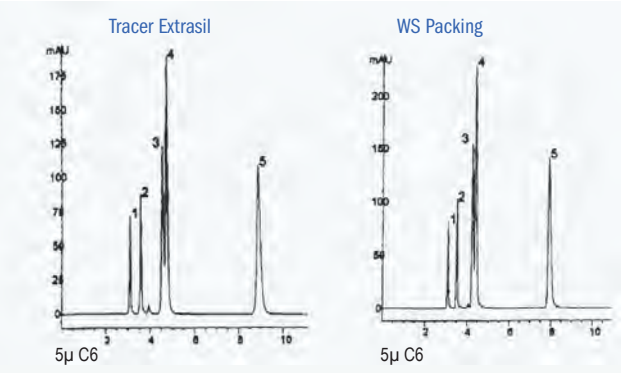
Another Packing

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.

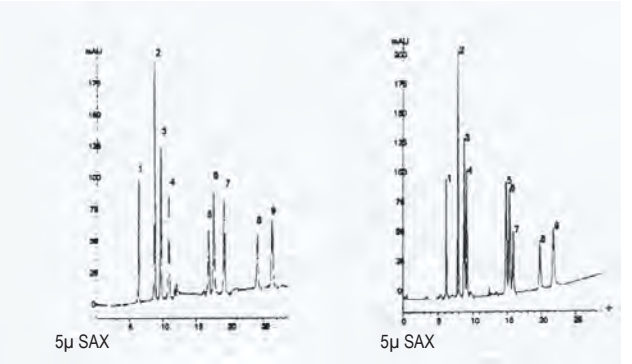
Catecholamines

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



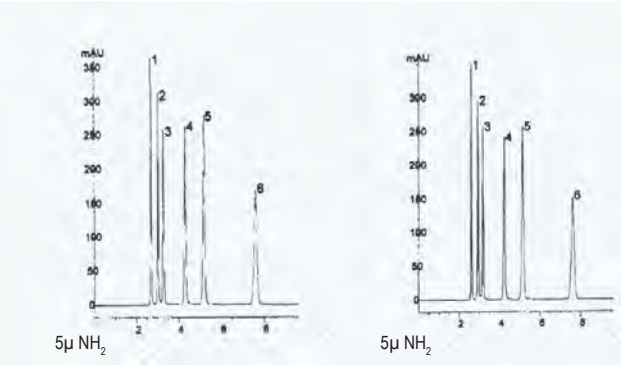
Nucleotides

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



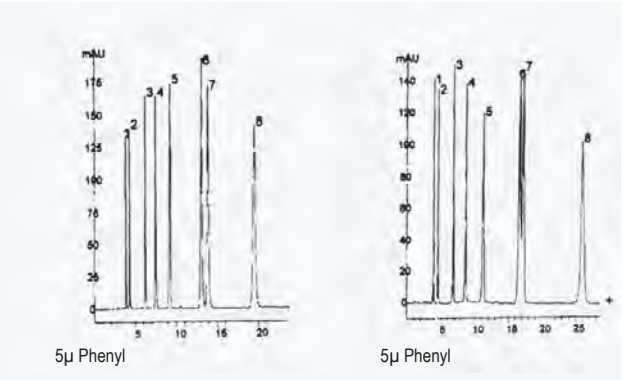
Corticosteroids

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 Ketones

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

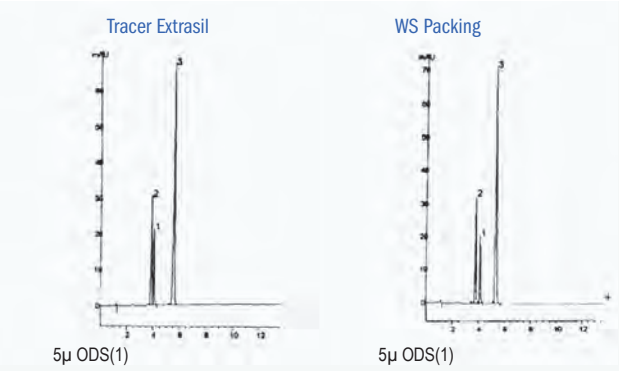


Tracer Extrasil

SRM 869

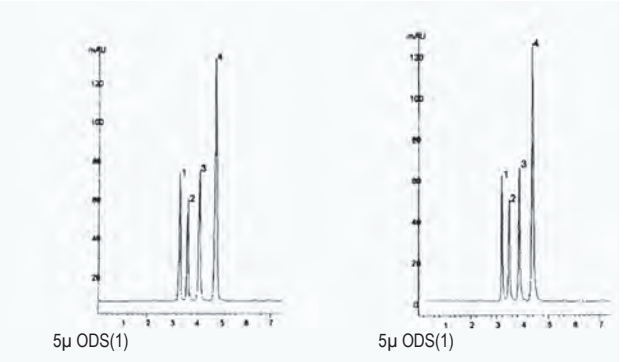
Dimensions: 250 x 4.6 mm
Mobil Phase: H2 O:CH3CN (15:85)
Flow Rate: 2.0mL/min
Temperature: 35°C
Detection: UV@ 260nm
Sample: 1. Benzo (a) pirene (BaP)
2. Phenantro (3,4-C)
2. Phenantrene (Ph Ph)
3. Tetrabenzonaphtalene

Tracer Extrasil ODS 2 aTBN/BaP = 1,77
Packing WS ODS-2 aTBN/BaP = 1,70



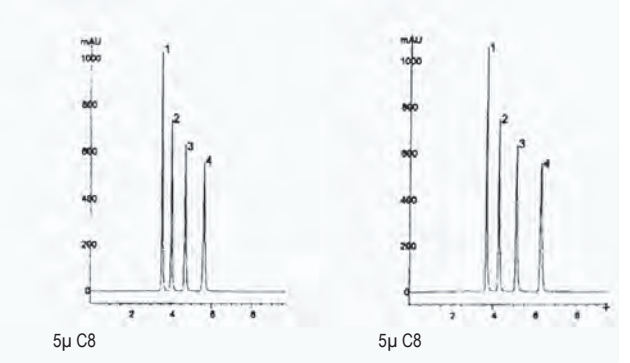
4-Hydroxybenzoates

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



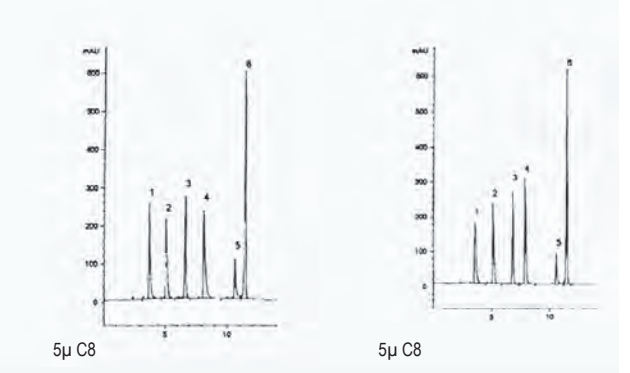
4-Hydroxybenzoates

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



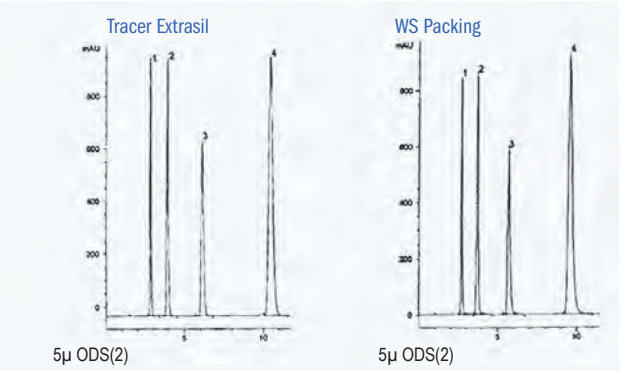
Hydrosoluble Vitamines

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



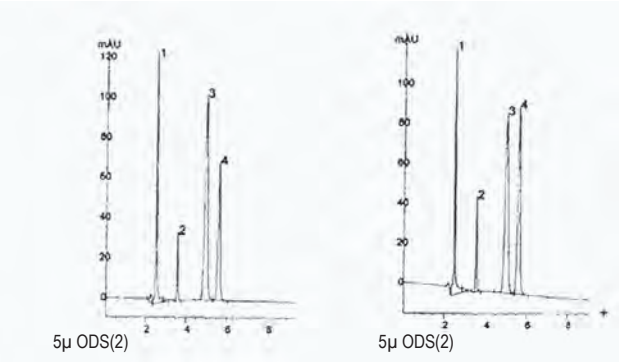
4-Hydroxybenzoat

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



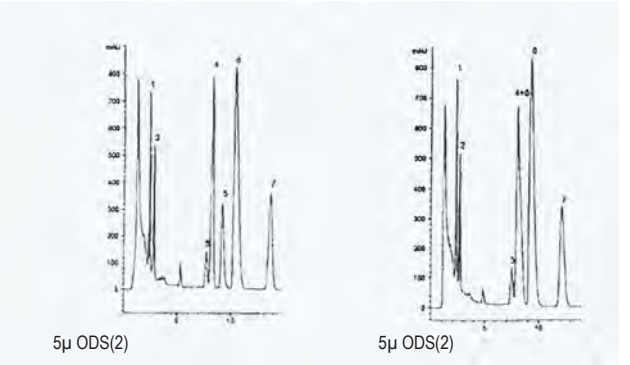
Polar Compounds

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



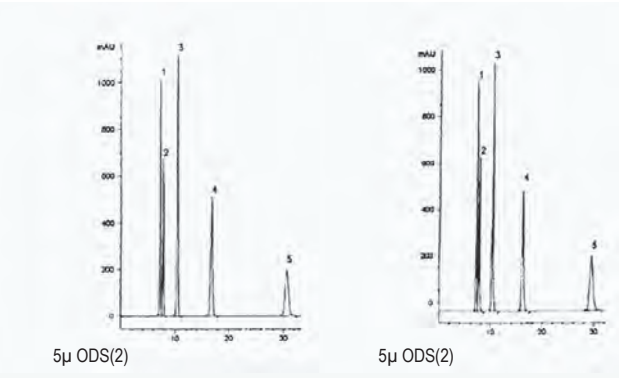
Liposoluble Vitamines

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



Tracer Extrasil

Analytical columns Tracer EXTRASIL

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

Ultrarapid columns Tracer EXTRASIL

Function		Dimensions					
Particle size	(µm)	4 x 0.46 cm	4 x 0.4 cm	5 x 0.46 cm	5 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm
ODS 1	3	TR-013200	TR-413200	TR-025420	TR-417050	TR-013201	TR-413201
ODS 2	3	TR-013205	TR-413205	TR-025422	TR-417052	TR-013206	TR-413206
Si	3	TR-013210	TR-413210	TR-025424	TR-417054	TR-013211	TR-413211
C1	3	TR-013215	TR-413215	TR-025426	TR-417056	TR-013216	TR-413216
C6	3	TR-013220	TR-413220	TR-025428	TR-417058	TR-013221	TR-413221
C8	3	TR-013226	TR-413226	TR-025430	TR-417060	TR-013227	TR-413227
CN	3	TR-013231	TR-413231	TR-025432	TR-417062	TR-013232	TR-413232
NH2	3	TR-013236	TR-413236	TR-025434	TR-417064	TR-013237	TR-413237
Phenyl	3	TR-013241	TR-413241	TR-025436	TR-417066	TR-013242	TR-413242

Function		Dimensions					
Particle size	(µm)	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-013202	TR-413202	TR-013203	TR-413203	TR-013204	TR-413204
ODS 2	3	TR-013207	TR-413207	TR-013208	TR-413208	TR-013209	TR-413209
Si	3	TR-013212	TR-413212	TR-013213	TR-413213	TR-013214	TR-413214
C1	3	TR-013217	TR-413217	TR-013218	TR-413218	TR-013219	TR-413219
C6	3	TR-013222	TR-413222	TR-013223	TR-413223	TR-013224	TR-413224
C8	3	TR-013228	TR-413228	TR-013229	TR-413229	TR-013230	TR-413230
CN	3	TR-013233	TR-413233	TR-013234	TR-413234	TR-013235	TR-413235
NH2	3	TR-013238	TR-413238	TR-013239	TR-413239	TR-013240	TR-413240
Phenyl	3	TR-013243	TR-413243	TR-013244	TR-413244	TR-013245	TR-413245

Microbore columns Tracer EXTRASIL

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

TEKNOKROMA CAN SUPPLY OTHER COMBINATIONS OF DIAMETER AND LENGTH ON APPLICATION

For Guard Columns please refer to pages 193-196

Semi-Preparative columns Tracer EXTRASIL

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

Hyperpack ODS

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

5 Microns Packing
Analytical columns 0.46 cm i.d. HYPERPACK

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

5 Microns Packing
Analytical columns 0.4 cm i.d. HYPERPACK

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

5 Microns P
Microbore c ACK

Packing F	Cat.Nbr.
Hyperpack	**TR-010272**
Hyperpack	**TR-010273**
Hyperpack	**TR-010274**
Hyperpack	**TR-010275**
Hyperpack	**TR-010276**
Hyperpack	**TR-010277**
Hyperpack	**TR-011028**
Hyperpack	**TR-011029**
Hyperpack	**TR-011030**
Hyperpack	**TR-011031**
Hyperpack	**TR-011032**
Hyperpack	**TR-011033**

5 Microns P
Microbore c K

Packing F	Cat.Nbr.
Hyperpack	**TR-010278**
Hyperpack	**TR-010279**
Hyperpack	**TR-010280**
Hyperpack	**TR-010281**
Hyperpack	**TR-010282**
Hyperpack	**TR-010283**
Hyperpack	**TR-011160**
Hyperpack	**TR-011034**
Hyperpack	**TR-011035**
Hyperpack	**TR-011036**
Hyperpack	**TR-011037**
Hyperpack	**TR-011038**

5 Microns P
Semi-prepa

Packing F	Cat.Nbr.
Hyperpack	**TR-010284**
Hyperpack	**TR-010285**
Hyperpack	**TR-010286**
Hyperpack	**TR-010287**
Hyperpack	**TR-010288**

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

3 Microns Packing
Ultrarapid columns 0.46 cm i.d. HYPERPACK

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

3 Microns Packing
Analytical columns 0.4 cm i.d. HYPERPACK

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

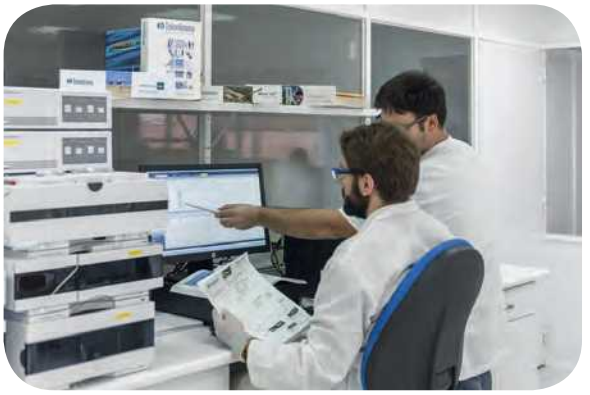
3 Microns Packing
Microbore columns 0.21 cm i.d. HYPERPACK

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

3 Microns Packing
Microbore columns 0.3 cm i.d. HYPERPACK

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

Hyperpack Basic



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

5 Microns Packing
Analytical columns 0.46 cm i.d. HYPERPACK BASIC

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

5 Microns Packing
Analytical columns 0.4 cm i.d. HYPERPACK BASIC

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

5 Microns Packing
Microbore columns 0.21 cm i.d. HYPERPACK BASIC

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

5 Microns Packing
Microbore columns 0.3 cm i.d. HYPERPACK BASIC

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

5 Microns Packing
Semi Preparative columns HYPERPACK BASIC

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

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

5 Microns Packing
Cartridge System 0.4 cm i.d. HYPERPACK BASIC

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

3 Microns Packing
Analytical Columns 0.46 cm i.d. HYPERPACK BASIC

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

3 Microns Packing
Ultrarapid Columns 0.4 cm i.d. HYPERPACK BASIC

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

3 Microns Packing
Microbore Columns 0.21 cm i.d.HYPERPACK BASIC

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

3 Microns Packing
Microbore Columns 0.3 cm i.d. HYPERPACK BASIC

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

Lichrosorb

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

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

Analytical columns LICHROSORB

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

Semi-preparative Tracer columns LICHROSORB

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

For Guard Columns please refer to pages 193-196

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

Analytical columns LICHROSPHER

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

Semi-preparative Tracer columns LICHROSPHER

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

Microbore Tracer columns LICHROSPHER

Function		Dimensions			
Particle size(µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 0.3 cm	25 x 0.3 cm
RP-18	5	TR-021069	TR-021071	TR-021293	TR-021294
RP-18 EC	5	TR-021073	TR-021075	TR-021295	TR-021296

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

Analytical columns SUPERSPHER

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

For Guard Columns please refer to pages

Tracer Carbohydrates

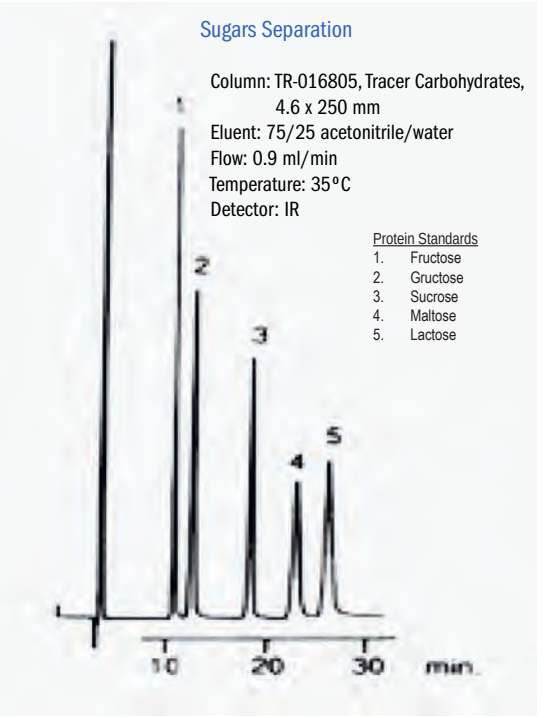
Tracer Carbohydrates

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

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

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

- Higher Stability
- Better resolution in disaccharides analysis



Carbohydrates Columns

Designed for Carbohydrates Analisys

Reference	Description	Particle Size µm	Dimensions cm
TR-016804	Tracer Carbohydrates	5 µm	15 x 0.46 cm
TR-016805	Tracer Carbohydrates	5 µm	25 x 0.46 cm
TR-416804	Tracer Carbohydrates	5 µm	15 x 0.40 cm
TR-416805	Tracer Carbohydrates	5 µm	25 x 0.40 cm

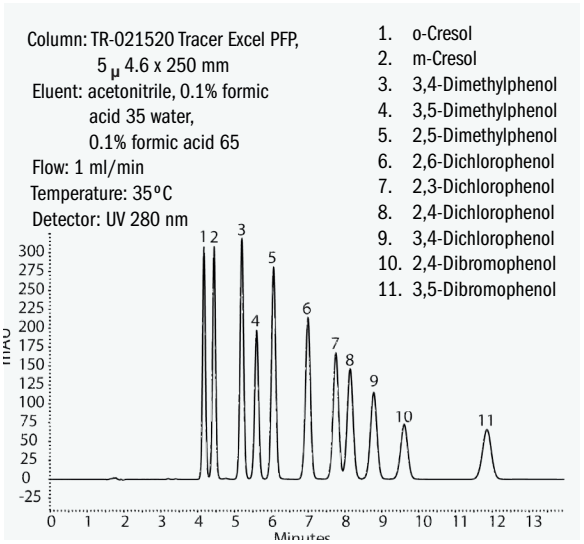
Tracer Excel PFP & PAH

Tracer Excel PFP

Excel PFP is a endcapped stationary phase with unique selectivity that can be useful for separating halogen-containing compounds, polar analytes, and compounds that contain minor structural differences. Excel PFP can be used at high temperatures (50ºC) over a pH range of 2-8.

- Ideal for HPLC and UHPLC
- Different selectivity from C18 or C8 with polar interaction and π-π interaction that plays a major role in the separation
- Superior chemical durability
- Identical selectivity over different particle sizes
- USP L43
- Particle: 5 µm
- Pore Size: 120 Å
- Carbon Load: 11%
- End-Cap: yes
- Surface Area: 300 m2/g
- pH Range: 2.5 to 8
- Maximum Temperature: 80 °C

Excel PFP have a retention and selectivity of charged bases, electronegative compounds, and amine-containing compounds. Unlike a conventional cyano column. This versatile column is also compatible with highly aqueous mobile phases.



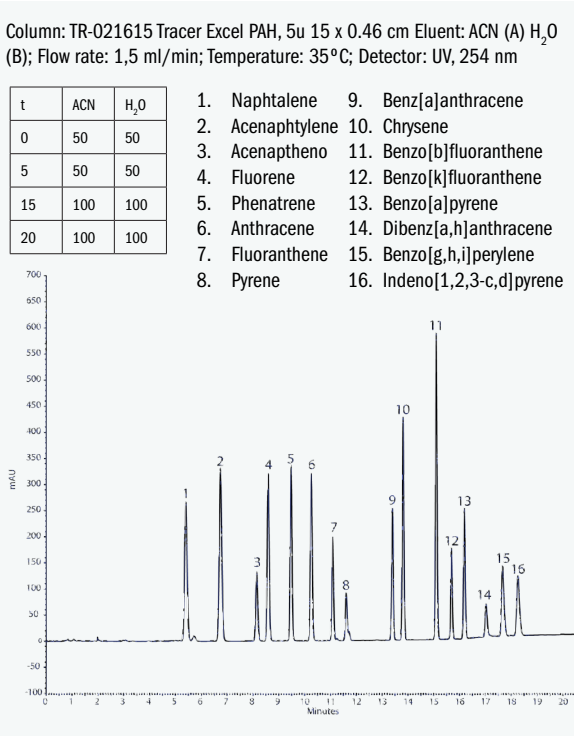
Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Tracer Excel PFP	PFP	5	15	0.46	**TR-021515**
Tracer Excel PFP	PFP	5	25	0.46	**TR-021520**

Tracer Excel PAH

Ultra High pure silica particle, Excel PAH is a polymeric C18 bonded phase that creates a three-dimensional network stationary phase with an optimal selectivity for PAHs separations.

Excel PAH provides a base-line resolution of 16 PAHs priority pollutants in EPA Method 610.

- USP: L1 polymeric C18 Bonding
- Particle size: 5 µm
- Pore size: 300 Å
- Surface Area: 100 m2/g
- Carbon Load: 28%
- PH Range: 2-8



Packing	Funct.	µm	Length cm	Diameter cm	Cat.Nbr.
Tracer Excel PAH	PAH	5	15	0.46	**TR-021615**
Tracer Excel PAH	PAH	5	25	0.46	**TR-021620**

Equipamientos Analíticos S.A
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