Teknokroma®

Professionally Friendly

The *Fresh Breeze* of Chromatography

Chromatography Products Catalogue

Professionally Friendly

The *Fresh Breeze* of Chromatography

Corporate Information

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It is a pleasure to introduce you our Chromatography Products Catalogue, the result of our clear objetive in order to be closer to you in a professional and also friendly way.

Just a few words to explain the basis of our relatinship objectives.

The confidence shown to us by our clients over more than 40 years is due to our constant policy of surpassing their expectations.

To the quality of our products and services we have always added the value of our understanding of our clients necessities, a personalized technical consultancy and a human relationship which goes beyond the merely commercial.

Our positive attitude to our clients requirements has allowed us to learn from their experiences and to direct this flow of expertise towards an ever greater improvement of our services. It is this attitude to achieve whatever is required that is the backbone of our daily work.

At Teknokroma, each and every one of us who form the team would like to thank you for your confidence in us shown over so many years. It is this confidence that strenghtens our convictions, and helps us each day to be closer to you.

Above all, we want to share with you our great challenge. In this complex global era, it is our guidance towards each of our clients that will allow us to build a true personal relationship between us, which can only lead to the greatest mutual advantage.

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Número de certificado/Certificate No.: 254088-2018-AQ-ESP-ENAC

Fecha Inicial de Certificación/Initial date: 01 febrero 2010
Fecha de caducidad del último ciclo de certificación/ Expiry date of last certification cycle: 14 septiembre 2018
Fecha de la última recertificación/ Date of last recertification: 15 octubre 2018

Validez/Valid: 17 diciembre 2018 - 17 diciembre 2021

Se certifica que el sistema de gestión de/This is to certify that the management system of

TEKNOKROMA ANALÍTICA, S.A.

Camí de Can Calders, 14, 08173, Sant Cugat del Vallés, Barcelona, Spain

es conforme a la Norma del Sistema de Gestión de Calidad/ has been found to conform to the Quality Management System standard:

ISO 9001:2015

Este certificado es válido para el siguiente campo de aplicación:

Fabricación de columnas y consumibles para cromatografía, venta y asistencia técnica de productos, instrumentos y reactivos para laboratorios de diagnóstico, clínicos, industriales y de investigación.

This certificate is valid for the following scope:

Manufacturing of columns and consumables for chromatography, sales and technical assistance of products, instruments and reagents for diagnostic, clinical, industrial and research laboratories.

Lugar y fecha/Place and date:
Barcelona, 19 noviembre 2018

ENAC CERTIFICACIÓN Nº 03/C-SC005

Oficina de emisión/ For the Certification Body
DNV GL – Business Assurance
Edificio Isbiza Mas Blau, C/ Garrotxa 6-8, 3º 1ª, El Prat de Llobregat, 08820, Barcelona, Spain

Ana del Río Salgado
Representante de la dirección/ Management Representative

El incumplimiento de las condiciones establecidas en el Contrato puede dar lugar a la cancelación del certificado/ Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

All brands named in this catalogue belong to their corresponding owner.

Teknokroma

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CHROMATOGRAPHY PRODUCTS

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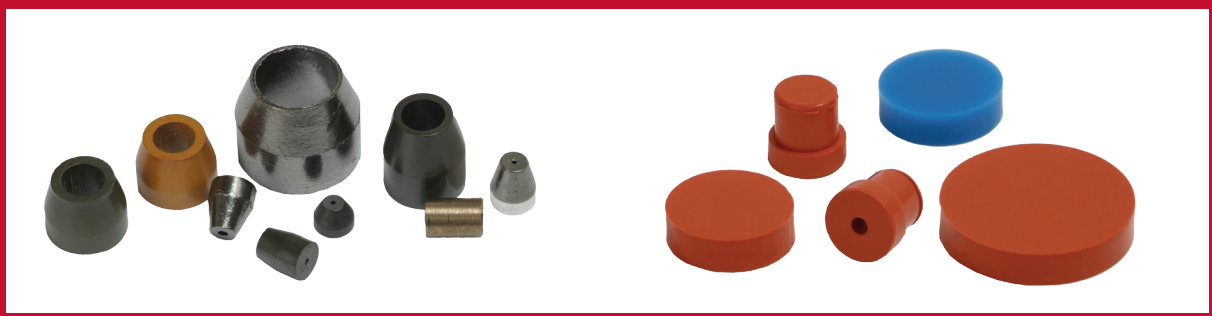
Teknokroma Contact Data




Single Position Baseplate

Index Gas Chromatography

Gas Chromatography

Teknokroma Capillary Columns

Teknokroma has been at the forefront of chromatographic developments in Spain. From its beginnings at 1978, and in order to find the right solutions to the wide array of analytical problems that appear daily in a laboratory, Teknokroma has always been involved in the Spanish and European market, not only with columns from the leading world manufactures, but also of those of our own manufacture.

A few years ago, Teknokroma introduced the basic line of high resolution capillary columns (Teknokroma columns) which were very well received in the market.
Due to the on going research effort carried out by our Research Department in collaboration with the Consejo Superior de Investigaciones Científicas (CSIC) and the Instituto Químico de Sarriá (IQS) and the support obtained from various public administrations (CDTI, CIDEM, MINER and FCTAC) we have been able to continuously update and expand our product line with other stationary phases.

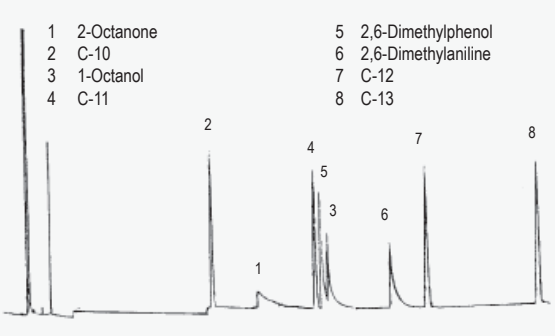
All of our columns are manufactured according to a strict established protocol, and within the ISO 9001:2000 quality rules.

Stage 1: Hydrothermal treatment
Stage 2: Deactivation process
Stage 3: Coating, bonding and crosslinking
Stage 4: Quality control

Stage 1: Hydrothermal Treatment

Teknokroma starts its manufacturing process with the selection of the best possible fused silica tubing. This tube presents an extremely reduced tolerance of internal diameters and has a polyimide outer coating capable of withstanding the highest temperatures without loss of its flexible mechanical characteristics. Each one of the batches of silica used in the process is conveniently characterized as an essential step to set the Hydrothermal treatment conditions (Fig. 1) that will give rise to a surface containing a high and constant density of silanol groups, which will later be properly deactivated.
This treatment is indispensable, as the different capillary tubing manufactured batches present a very low and irregularly distributed silanol group density due to the high temperature manufacturing process (~2200ºC).

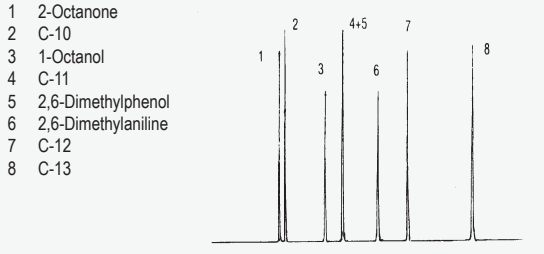
Fig. 1. Verification of Hydrothermal Treatment



Stage 2: Deactivation process

The deactivation process, which is different for each type of stationary phase, is carefully controlled (fig. 2), ensuring that the tubing surface has acquired the necessary chemical inertness and surface tension in order to be able to proceed with the second stage of stationary phase deposition. This step also facilitates the introduction of specific functional groups on the tubing wall which are very useful for the later binding of the stationary phase or to give the columns a given end point characteristics.

Fig. 2. Deactivation Stage (Intermediate Test)



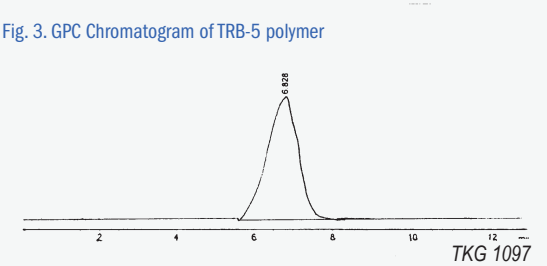
Stage 3: Coating, bonding and crosslinking

Stationary phase selection for optimum wetting of the column is a critical point in regards to column quality. Teknokroma uses extremely pure polymers for its phases, in order to guarantee that our columns will respond to the requirements that our customers expect in terms of efficiency, reproducibility, stability and minimal bleeding.

The polymers used are carefully fractionated to eliminate the low molecular weight components and trace catalyst. This results in a higher thermal stability and lower bleeding. Then, these polymers are tested by means of spectroscopic (FTIR, UV, NMR), chromatographic (GPC) techniques and by differential thermal analysis. Fig. 3 shows the molecular exclusion chromatography of the polymer TRB-5 with its corresponding thermogravimetric curve in Fig. 4.

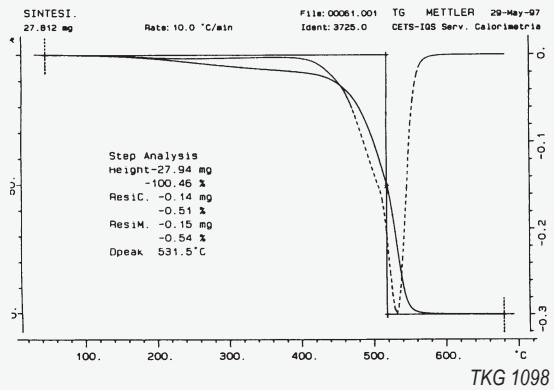
The crosslinking and bonding of the stationary phase is achieved by avoiding the use of peroxides which are the cause of many of the problems related to residual activity due to phase degradation and thermal instability exhibited in numerous imported columns.

Fig. 3. GPC Chromatogram of TRB-5 polymer



The fact that a given stationary phase is crosslinked and/ or chemically bonded to the capillary tube inner wall allows, if necessary, the recovery or regeneration of an accidentally contaminated column by washing it with the adequate series of solvents.

Fig. 4. DTA Curve of TRB-polymer



TKG 1098

Stage 4. Quality Control

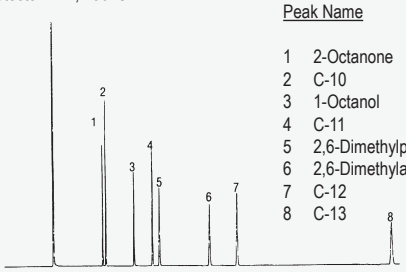
S E L E C T P R O V E N Q U A L I T Y

When you buy a Teknokroma capillary column you receive a product designed and manufactured in our laboratory with the aim to help you solve your analytical problems and which meets all of our quality criteria.
At the same time you obtain from our Technical Department at Teknokroma the assurance that we will be at your side to help you with all the problems and concerns experience in the lab.

Remember that each column is individually tested and the accompanying test data is the proof that the column meets our quality specifications and thus we expect it to meet your demands. Each one of the columns obtained by this process is rigorously controlled by means of a strict Quality Control Test (fig. 5 and 6), which ensures that you will receive a guaranteed quality product.

Fig. 5 Quality Control Test

Column: **TRB-5**, 60m x 0.25 mm ID x 0.25 µm
Carrier gas: He, 25 psi
Oven: 110°C (Isothermal)
Injection: 1µL , split 1:100, 250ºC
1µL , SP-4-7300 test Approx. 5 ng of each compound on column
Detector: FID, 250°C



Peak Name	
1	2-Octanone
2	C-10
3	1-Octanol
4	C-11
5	2,6-Dimethylphenol
6	2,6-Dimethylaniline
7	C-12
8	C-13

TKG 1099

Stationary Phase

The selection of the ideal column for a given analysis may look like a complex problem since we need to be right on the selection of the polarity of the stationary phase as well as column length, internal diameter and film thickness.
The polarity of the stationary phase is chosen depending on the kind of compounds you wish to separate. Non polar phases, such as TRB-1 and TRB-5, separate compounds by their boiling points. Intermediate polarity phases such as TRB-WAX, TRB-1701, combine retention by boiling point with the more selective interaction through hydrogen bridges or dipolar moments, etc., and thus provide a higher selectivity. The principal mechanisms of polar phases such as TR-CN100 (Cyanosilicone with 100% of cyano propyl groups) lie in the dipole-dipole interactions between the functional groups of the stationary phase and those from the substances to be separated. These type of phases retain polar compounds more than non polar ones.

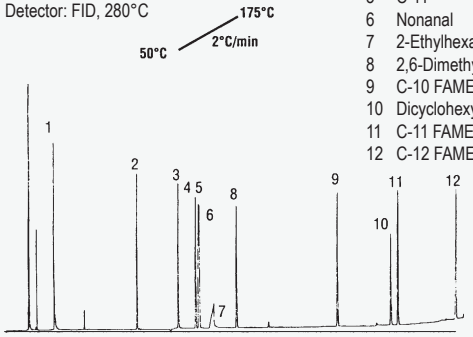
In general, non polar phases are more thermally stable than the polar phases. In other words, the higher the column polarity, the lower its thermal stability. Most of the Teknokroma columns are cross-linked, which results in high thermal stability.
The cross-linking in a stationary phase produces slight changes in the physicochemical characteristics of the phase as well as in its polarity relative to the uncross-linked phase. Thus TEKNOKROMA also offers in its catalog columns with non bonded phases that show the selectivity of the original phase (for instance TR-SE30, TR-SE54, TR-20M, etc.).

Length

The efficiency of a chromatographic column (number of theoretical plates per meter) is a function of its length. The standard length used for most of the separations is 25-30 meters. With this length one can obtain a high efficiency with relative short times of analysis. Columns of 15m are used for rapid control analyses, reaction monitoring, etc. as well as for the chromatography of high molecular weight substances while columns of 50-60 m, 100 m or 150 m are used for very complex samples. Teknokroma exclusively manufactures a 150 m column for detail analyses of

Fig. 6. GROB test

Column: **TRB-5**, 30m x 0.25 mm ID x 0.25 µm
Carrier gas: He, 12 psi
Injection: 1µL, Grob Test, split 1:100, 260ºC
Detector: FID, 280°C



Peak Name	
1	2,3-Butanediol
2	C-10
3	1-Octanol
4	2,6-Dimethylphenol
5	C-11
6	Nonanal
7	2-Ethylhexanoic acid
8	2,6-Dimethylaniline
9	C-10 FAME
10	Dicyclohexylamine
11	C-11 FAME
12	C-12 FAME

TKG 1100

petroleum and essential oil hydrocarbons. As a general rule, we can say that in a constant temperature chromatographic analysis, the number of theoretical plates and analysis time are directly proportional to the column length while resolution is directly proportional to the square root of the theoretical plates. Thus, we need to take into account that when we double column length, its resolution only increases by 40% whereas analysis time doubles.

Internal Diameter

The column internal diameter is inversely proportional to its separation power. The smaller the diameter, the larger the efficiency and thus a higher resolution but at the same time the loading capacity decreases.
For samples containing a large number of substances where you may need a given resolution, it is recommended to use small internal diameter columns (0.20-0.25 mm) and for samples with a high range of concentrations higher internal diameter columns are recommended (0.32-0.53 mm) since these larger diameters allow for the injection of a higher sample amount.

Columns of 0.53 mm ID (semicapillary) have a loading capacity similar to that of packed columns, which they replace in many analyzes, with better resolution, higher chemical inertness and lower analysis time.
The 0.32-0-53 mm ID columns can be used with either the injector for capillary columns or with the packed column injector, due to the high flow-rates at which they can operate.

In the increasingly used GC-MS systems it is recommended to work with small ID columns (0.10mm, 0.15mm, 0.18mm, 0.20 mm and 0.22 mm) so as not to exceed the capacity of the vacuum system. Recently, capillary columns of 0.1 mm ID have appeared on the market. These generate high plate numbers or, in other words, to reduce analysis time without losing resolution. The high efficiency of these columns (7000-10000 plates/meter) allows the resolution of complex samples using shorter column lengths, thus with very short analysis times, with the resulting cost reduction for the laboratory. Evidently, their loading capacity is a limiting factor and in order to obtain the best performance from these columns we need to take into account instrumental factors (injector-detector).

Film Thickness

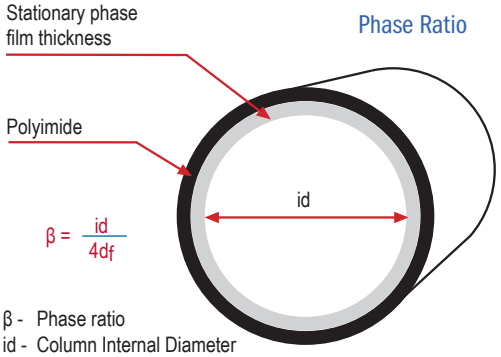
The film thickness of the stationary phase deposited inside the capillary column exerts an influence on the number of effective theoretical plates that can be obtained with the column for a given separation, on its loading capacity, on the bleed level and on the elution temperature of a compound.
A film thickness of 0.25-0.32 µm is the standard thickness allowing for a compromise between loading capacity and resolution; and for the injection of samples with a wide volatility range.

Thick films increase retention of the most volatile components whereas thin films provide faster elution at lower temperatures. As a general rule, thin films (0.1 µm) must be used for compounds with a high molecular weight such as triglycerides, antioxidants, etc., which have elution temperatures over 300°C. Thick films must be used for low boiling substances because thick films increase the interaction between the substances and the stationary phase. Specifically, 3-5 µm films are used to separate solvents, gases, and very volatile substances at room temperature or lower.

When the thickness of the stationary phase increases, thermal stability decreases, and thus the bleed level is higher which will limit the maximum operating temperature of the column.

The β factor defines the relation between the column internal diameter and the stationary phase thickness, thereby helping you to select the most appropriate column for your analysis.

In addition, the β factor allows for the easy exchange of columns since, for a given analysis with the same stationary phase, similar β factors will result in the same or very similar retention times and capacity factors. Of course, this implies taking into account the column loading capacity (phase thickness and internal diameter).



β - Phase ratio
id - Column Internal Diameter
d_f - Film thickness (µm)

Factor β

β	Column suitable for the separation of:
>400	High molecular weight compounds
100 - 400	All purpose use
<100	Volatile compounds of low molecular weight

Bleed Level

The bleed level of stationary phase from a capillary column is the parameter which will determine the level of sensitivity in a given assay. It is directly related to the amount of stationary phase in the column and thus with the film thickness. It also increases exponentially with temperature (fig.7).

A low bleed level will allow you to work without problems with the whole range of modern high sensitivity detectors and at the same time will result in less contamination. This will also allow the quantification of high boiling point or high molecular weight compounds which are analyzed by means of high temperature gradients.

Teknokroma Capillary Columns

Maximum Efficiency

All manufacturing stages for capillary columns have been optimized in order to be able to offer our customers columns of very high efficiency.

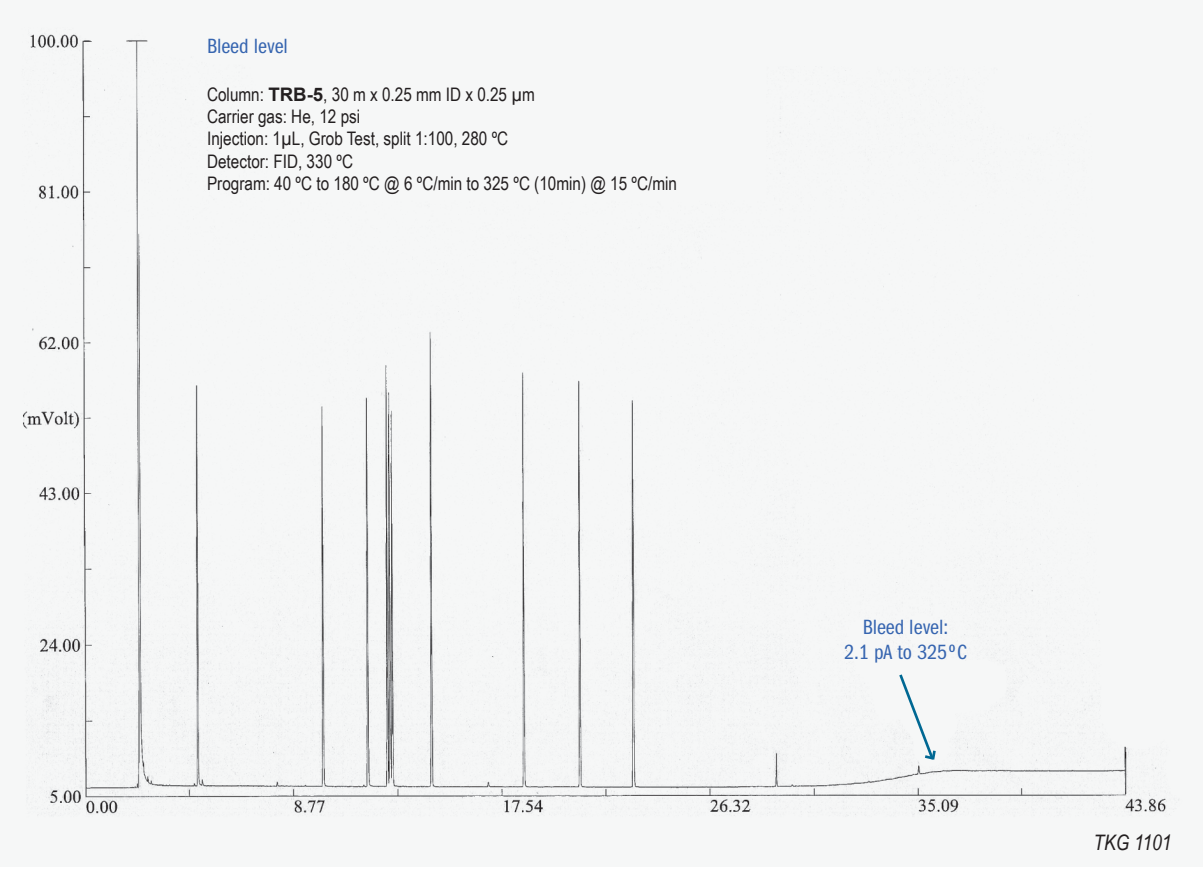
Wide Stationary Phase Selection

Teknokroma incorporates in its catalogue a selection of capillary columns prepared with the stationary phases most commonly used in the field of gas chromatography (Table 1).

Maximum Reproducibility

When you select a Teknokroma column for your analyses you can be assured that each of the steps in the production process has been thoroughly controlled to ensure that there are no deviations from the established quality parameters. All of the steps incorporate the maximum possible automation procedures. This translates into a high reproducibility level with regards to the chromatographic performance of our columns.

Internal diameter (mm)	Theoretical Plates (N/m)
0,10	7.000 - 9.000
0,20	4.700 - 5.500
0,25	3.300 - 4.600
0,32	2.700 - 3.700
0,53	1.400 - 2.200



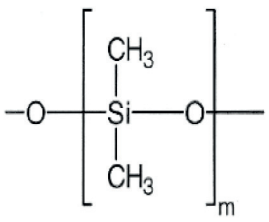
	TEKNOKROMA	PHASE COMPOSITION	USP CODE	AGILENT	PHENOMENEX	RESTEK	SGE	SUPELCO (MERCK)
Ultra Low bleed & Ultra Inertness (MS) Applications	Sapiens-1MS	100% Dimethyl Polysiloxane	G1, G2, G9, G38	DB1-MS UI, HP-1 MS UI, VF-1MS	ZB-1 Plus	Rxi-1MS	SOL-GEL-1MS	SLB-1MS
	Sapiens-5MS	95% Dimethyl - 5% Diphenyl polysiloxane	G27, G36, G41	HP-5 MS UI	ZB-5 Plus	Rxi-5MS		
	Sapiens-X5MS	Silphenylene Phase equivalent to SAPIENS-5MS		DB-5MS UI, VF-5MS	ZB-5 Plus	Rxi-5Sil MS	BPX5	SLB-5MS
	Sapiens-WAX.MS	100% Polyethylene Glycol (PEG)	G14, G15, G16, G20, G39, G47	VF-WAXMS, DB-WAX UI, DB-WAX.MS	ZB-WAX Plus	STABILWAX MS	SolGel-WAX	SupelcoWAX 10
	Sapiens-624MS	Silphenylene phase eq. to 6% Cyanopropylphenyl polysiloxane	G43	DB-624 UI, VF-624MS, VF-1301MS, DB-Select 624 UI, for <467>		Rxi-624SilMS	BPX-Volatile	
	Sapiens-200	35% Trifluropropyl-methylpolysiloxane	G6	DB-200, DB-210		Rtx-200		
Ultra Low bleed (MS) applications	TRB-1MS	100% Dimethyl Polysiloxane	G1, G2, G9, G38	HP-1MS, DB-1MS, CP-Sil 5 CB MS	ZB-1MS	Rtx-1MS	SOLGEL-1MS, BPX-1	Equity-1
	TRB-5MS	95% Dimethyl - 5% Diphenyl Polysiloxane	G27, G36, G41	HP-5MS, PAS-5, VF-5MS, CP-Si 8 CB MS	ZB-5MS i	Rtx-5 MS		Equity-5
	Meta.X5	Silphenylene phase eq. to 5% Phenylpolysiloxane		HP-5TA,DB-5MS, CP-Sil 8 CB Low Bleed/MS VF-5MS	ZB-5MS	Rtx-5Sil MS	BPX5, BP5M	
	Meta.X5 Triazine	Silphenylene phase (proprietary phase)						
	Meta.XLB	Silphenylene phase (proprietary phase)		DB-XLB, VF-XMS	ZB-XLB	Rxi-XLB		MDN 12
Low bleed High Temperature	Sapiens-WAX.HT	100% Polyethylene Glycol	G14, G15, G16, G20, G39, G47				SolGel-WAX	
	TRB-1HT/TKM-1HT	100% Dimethyl Polysiloxane	G1, G2, G9, G38	DB-1HT, Select Mineral Oil	ZB-1HT Inferno, ZB-1XT SimDist	Rxi-1HT, Stx-1HT	BPX1	
	TKM-1HTSimDist	100% Dimethyl Polysiloxane	G1, G2, G9, G38	DB-HT SimDist, CP-SimDist ultimetal	ZB-1HT Inferno, ZB-1XT SimDist	MXT-1HT SimDist	BPX1	HT5
	TRB-5HT/TKM-5HT	95% Dimethyl - 5% Diphenyl Polysiloxane	G27, G36, G41	DB-5HT, VF-5HT	ZB-5HT Inferno	Rxi-5HT, MXT-5HT	HT5	HT5
	TRB-50HT	50% Diphenyl- 50% Dimethyl Polysiloxane	G3, G17	DB-17ht, CP-TAP		Rtx-65TG, MXT-65TG	BPX50	
	TRB-BIODIESEL/TKM	Proprietary Bonded and crosslinked phase		Biodiesel, Select Biodiesel	ZB-Bioethanol	Rtx-Biodiesel		MET-Biodiesel
Low bleed General aplications	TRB-1	100% Dimethyl Polysiloxane	G1, G2, G9, G38	HP-1, HP101, Ultra-1, DB-1, CP-Sil 5 CB	ZB-1	Rtx-1	BP1	SPB-1, Equity-1
	TRB-SULFUR	100% Dimethyl Polysiloxane	G1, G2, G9, G38	CP-Select CB for Sulfur, CP-Sil 5CB for sulfur				SPB-1Sulfur
	TRB-PETROL	100% Dimethyl Polysiloxane	G1, G2, G9, G38	CP-Sil PONA CB, DB-PETRO, HP-1	ZB-DHA-PONA	Rtx-DHA-100	BP1 PONA	Petrocol DH
	TRB-50.2PONA	100% Dimethyl Polysiloxane	G1, G2, G9, G38	HP-PONA, CP-SIL PONA CB, HP-1	ZB-DHA-PONA	Rtx-DHA-50	BP1 PONA	Petrocol DH 50.2
	TRB-2887/ TKM-2887	100% Dimethyl Polysiloxane	G1, G2, G9, G38	DB-2887	ZB-1HT Inferno, ZB-1XT SimDist	Rtx-2887, MXT-2887	BPX1, BP1 PONA	Petrocol-2887 Petrocol-EX2887
	TRB-Petro.150	100% Dimethyl Polysiloxane	G1, G2, G9, G38	DB-1, CP-Sil PONA CB	ZB-DHA-PONA	Rtx-DHA-150	BP1 PONA	Petrocol DH 150
	TRB-5	95% Dimethyl - 5% Diphenylpolysiloxane	G27, G36, G41	HP-5,Ultra-2,DB-5, CP-SIL 8 CB	ZB-5	Rtx-5	BP5	SPB-5, MDN-5
	TRB-STEROL	95% Dimethyl - 5% Diphenylpolysiloxane	G27, G36, G41					SAC-5
	MetAMINE-VOL	Proprietary Bonded and crosslinked phase		CP-Volamine		Rtx-Volatile Amine		

	TEKNOKROMA	PHASE COMPOSITION	USP CODE	AGILENT	PHENOMENEX	RESTEK	SGE	SUPELCO (MERCK)
Low Bleed General applications (FID/ECD)	TRB-5AMINE	95% Dimethyl - 5% Diphenyl Polysiloxane	G27	CP-Sil 8 CB for amines		Rtx-5Amine		PTA-5
	TRB-5.625	95% Dimethyl - 5% Diphenyl Polysiloxane	G27	DB-5.625				PTE-5
	TRB-G27	95% Dimethyl - 5% Diphenyl Polysiloxane	G27			Rtx-G27		G27
	MTI-5	5% Phenyl - 95% Methyl Polysiloxane	G27	HP-5MSi		Rxi-5MS		PTE-5
	TRB-1301	94% Dimethyl -6% Cyanopropyl-Phenyl Polysiloxane	G43	HP-1301, DB-1301, CP-1301	ZB-624	Rtx-1301	BP624	SPB-1301
	TRB-624	94% Dimethyl -6% Cyanopropyl-Phenyl Polysiloxane	G43	HP-624, DB-624, CP-Select 624 CB	ZB-624	Rtx-624, Rtx-1301	BP624	OVI-G43, SPB-624
	TRB-G43	94% Dimethyl -6% Cyanopropyl-Phenyl Polysiloxane	G43	HP-624, DB-624, CP-Select 624 CB, DB-624UI	ZB-624	Rtx-G43	BP624	OVI-G43
	TRB-14	14% Diphenyl - 86% Dimethyl Polysiloxane		CP-Sil 13 CB				
	TRB-20	20% Diphenyl - 80% Dimethyl Polysiloxane	G28, G32			Rtx-20		SPB-20
	TRB-35	35% Diphenyl - 65% Dimethyl Polysiloxane	G42	HP-35,DB-35	ZB-35	Rtx-35		SPB-35
	TRB-1701	14% Cyanopropyl-Phenyl-86% Dimethyl Polysiloxane	G46	HP-1701,PAS-1701, DB-1701, CP-Sil 19 CB	ZB-1701	Rtx-1701	BP10	SPB-1701, Equity 1701
	TRB-225	50% Cyanopropyl-Phenyl-50% Dimethyl Polysiloxane	G7, G19	HP-225, DB-225, CP-Sil 43 CB		Rtx-225	BP225	SPB-225
	TRB-50	50% Diphenyl- 50% Dimethyl Polysiloxane	G3, G17	HP-50+, DB-17, CP-Sil 24 CB, DB-EUPh	ZB-50	Rtx-50, Rxi-17		SPB-50, SPB-2250
	TRB-F50	50% Trifluoropropyl - 50% Methyl Polysiloxane	G6	DB-210,DB-200		Rtx-200		
	TRB-PAG	50% Polyethylene - 50% Polypropylene Glycol	G18					PAG
	SupraWAX-280	100% Polyethylene Glycol	G14, G15, G16, G20, G39, G47	DB-WAX etr			SolGel-WAX	SupelcoWAX-10
	TRB-WAX	100% Polyethylene Glycol	G14, G15, G16, G20, G39, G47	HP-20M,HP-InnoWAX DB-WAX,Carbowax 20M, CP-WAX 52 CB, HP-WAX	ZB-WAX	StabilWAX, Rtx-WAX	BP20	CarboWAX 20M
	TRB-FFAP	Polyethylene Glycol esterified with nitroteraphtalic acid	G25, G35	HP-FFAP,DB-FFAP, CP-WAX 58 FFAP CB	ZB-FFAP	StabilWAX-DA	BP21	Nukol, SPB-1000
	TR-WAX.DB	Treated Polyethylene Glycol for basic compounds		CAM,HP-BasicWAX, CP-WAX 51 CB for amines, CP-WAX for volatile amines		StabilWAX-DB		CarboWAX-Amine
	TRB-WAXOmega	100% Polyethylene Glycol (PEG)				FameWAX		OmegaWAX
	Meta.WAX	100% Polyethylene Glycol (PEG)		HP-WAX,DB-WAX, CP-WAX 57 CB, DB-WAX FF	ZB-WAX	Rtx-WAX	BP20	Nukol
	Meta.WAX 400	100% Polyethylene Glycol (PEG)	G20	CP-Carbowax 400				
	TR-CN100	100% Cyanopropyl Polysiloxane	G5	SelectFAME, CP-Sil 88, HP-88	ZB-FAME, ZB-88	Rt-2330, Rt-2560	BPX-70, BPX-90	SP-2340, SP-2380, SP-2560, SP-2330
	TR-CRESOL	Proprietary Nonbonded phase		CP-Cresol				
	TR-17	Poly (Methyl Phenylsiloxane)	G3	HP-17, DB-17	ZB-50	Rxi-17		SPB-17
	TRB-608	Proprietary Bonded and crosslinked phase		HP-608, DB-608			BP608	SPB-608
	TR-TCEP	1,2,3-tris (2-cyanoethoxy) propane		CP-TCEP		Rt-TCEP		TCEP
	Meta.VOC	Proprietary Bonded and crosslinked phase		DB-502.2, HP-VOC		Rtx-502.2, Rtx-Volatile		VOCOL
	MetaBLOOD 1 & MetaBLOOD 2	Proprietary Bonded and crosslinked phase		DB-ALC1, DB-ALC2	ZB-BAC1, ZB-BAC2	Rtx-BAC1, Rtx-BAC2, Rtx-BAC 1 Plus, Rtx-BAC2 Plus		

Teknokroma Capillary Columns

Line of SAPIENS Capillary Columns

- We are pleased to introduce a superb new generation of capillary columns.
- Columns for today's demanding applications
- Our columns are able to compete with the best columns in the market, with ultra-low bleed and high inertness with respect to active, acid and basic compounds.



Structure of Poly (dimethyl) siloxane

SAPIENS-1MS

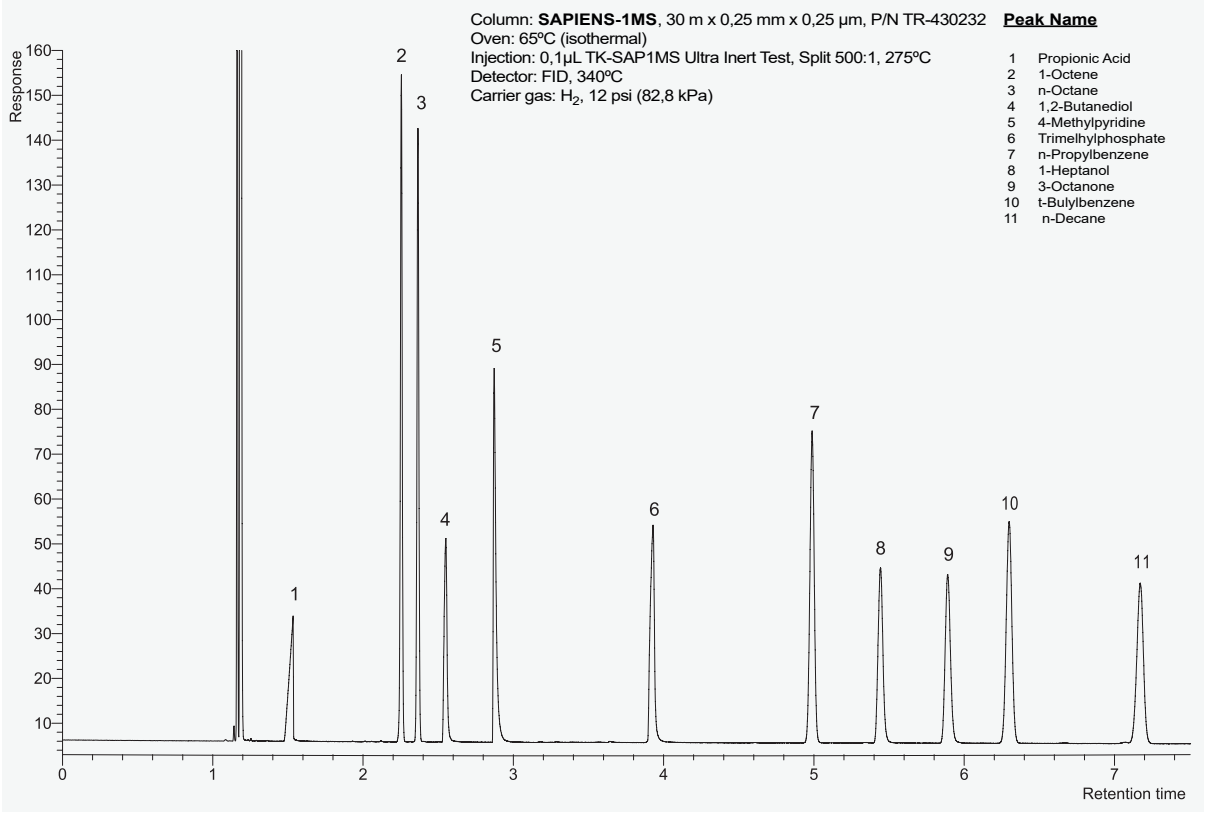
100% Dimethyl polysiloxane, bonded and crosslinked phase, manufactured with MSP technology

- General purpose non polar column
- Ultra low bleed, improved signal-to-noise ratio for GC-MS
- Excellent chemical inertness and thermal stability making it ideal for trace analysis and GC/MS
- Solvent rinsable
- Developed with a new integral technology
- Molecular Stabilization Process incorporated (MSP)
- Highest inertness for polar, acid and basic compounds
- Guaranteed reproducibility between batches
- Perfect for use with Retention Time Locking (RTL) software

SAPIENS-1MS Equivalent Phase

Agilent: DB1-MS UI, HP-1 MS UI, VF-1MS
Restek: Rxi-1MS
Phenomenex: ZB-1Plus
GL Sciences: InertCap 1MS
Sigma-Aldrich: SLB-1MS
SGE: SOL-GEL-1MS
Macherey-Nagel: OPTIMA-1MS Accent

SAPIENS-1MS: Ultra Inert Test, Good peak (TK-SAP1MS). Shape and response for all active compounds

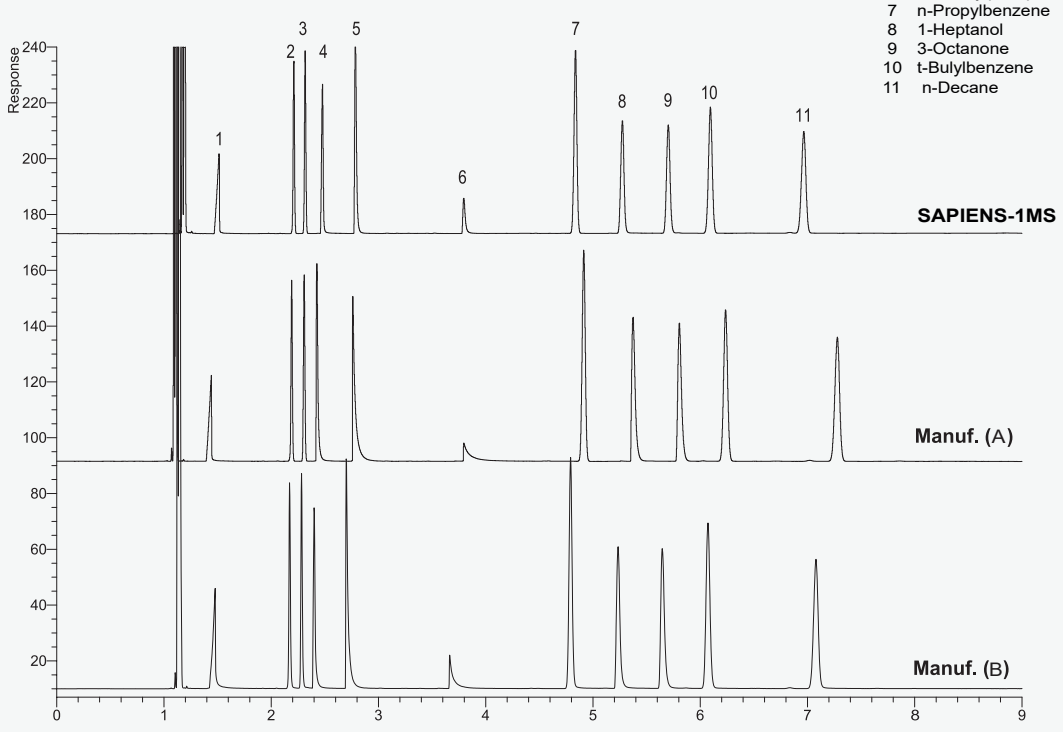


SAPIENS-1MS: Ultra Inert Test (TK-SAP1MS) Performance against major ultra inert column manufacturers

Column: **SAPIENS-1MS**, 30 m x 0,25 mm x 0,25µm TR-430232
Oven: 65ºC (isothermal)
Injection: 0,1µL TK-SAP1MS Ultra Inert Test, Split 500:1, 275ºC
Detector: FID, 340ºC
Carrier gas: H_2,12 psi (82,8 kPa)

Peak Name

1 Propionic Acid
2 1-Octene
3 n-Octane
4 1,2-Butanediol
5 4-Methylpyridine
6 Trimelhylphosphate
7 n-Propylbenzene
8 1-Heptanol
9 3-Octanone
10 t-Bulylbenzene
11 n-Decane

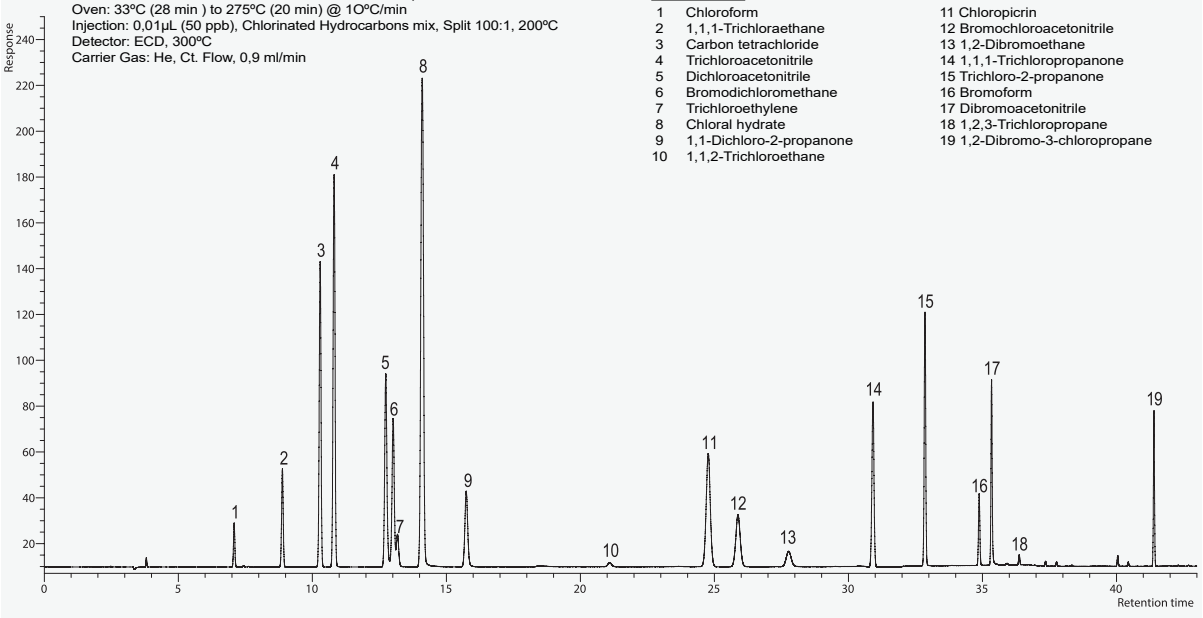


SAPIENS-1MS: Analysis chlorinated solvents and desifection by-products (EPA 551.1)

Column: **SAPIENS-1MS**, 30 m x 0,25 mm x 1,0 µm, P/N TR-431032
Oven: 33ºC (28 min) to 275ºC (20 min) @ 1OºC/min
Injection: 0,01µL (50 ppb), Chlorinated Hydrocarbons mix, Split 100:1, 200ºC
Detector: ECD, 300ºC
Carrier Gas: He, Ct. Flow, 0,9 ml/min

Peak Name

1 Chloroform
2 1,1,1-Trichloraethane
3 Carbon tetrachloride
4 Trichloroacetonitrile
5 Dichloroacetonitrile
6 Bromodichloromethane
7 Trichloroethylene
8 Chloral hydrate
9 1,1-Dichloro-2-propanone
10 1,1,2-Trichloroethane
11 Chloropicrin
12 Bromochloroacetonitrile
13 1,2-Dibromoethane
14 1,1,1-Trichloropropanone
15 Trichloro-2-propanone
16 Bromoform
17 Dibromoacetonitrile
18 1,2,3-Trichloropropane
19 1,2-Dibromo-3-chloropropane



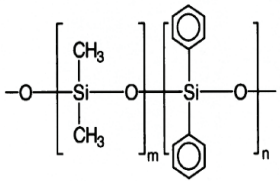
SAPIENS-1MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325/350	**TR-430141**
	20	0,10	-60 to 325/350	**TR-430181**
0,18	20	0,18	-60 to 325/350	**TR-430984**
	20	0,36	-60 to 325/350	**TR-433484**
0,20	12	0,33	-60 to 325/350	**TR-4333B9**
	25	0,33	-60 to 325/350	**TR-433329**
0,25	15	0,25	-60 to 325/350	**TR-430212**
	30	0,25	-60 to 325/350	**TR-430232**
	30	0,50	-60 to 325/350	**TR-430532**
	30	1,00	-60 to 325/350	**TR-431032**
	60	0,25	-60 to 325/350	**TR-430262**
0,32	15	0,25	-60 to 325/350	**TR-430213**
	25	0,52	-60 to 325/350	**TR-435223**
	30	0,25	-60 to 325/350	**TR-430233**
	30	1,00	-60 to 325/350	**TR-431033**

SAPIENS-5MS

95% Dimethyl - 5% diphenylpolysiloxane, bonded and crosslinked phase

- Ultra low bleed and high chemical inertness
- Excellent thermal stability
- Selectivity identical to TRB-5
- Minimum peak tailing for active analystes. Specifically tested for chemical inertness towards active compounds
- Ideal for trace analysis by GC/MS. Improves mass spectral integrity and quantitation at low concentrations.

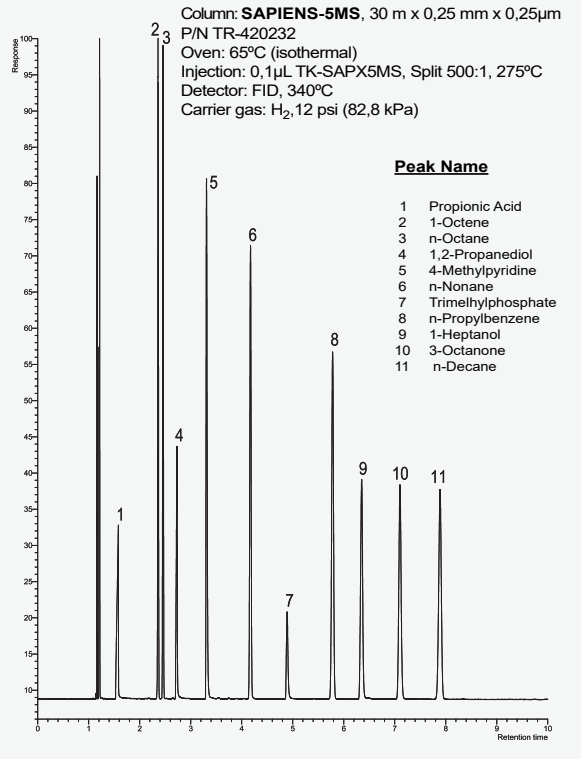


Structure of poly (dimethyl-diphenyl) siloxane

SAPIENS-5MS Equivalent Phase

Agilent: HP-5 MS UI
Restek: Rxi-5MS
Phenomenex: ZB-5Plus
Macherey-Nagel: OPTIMA-5MS

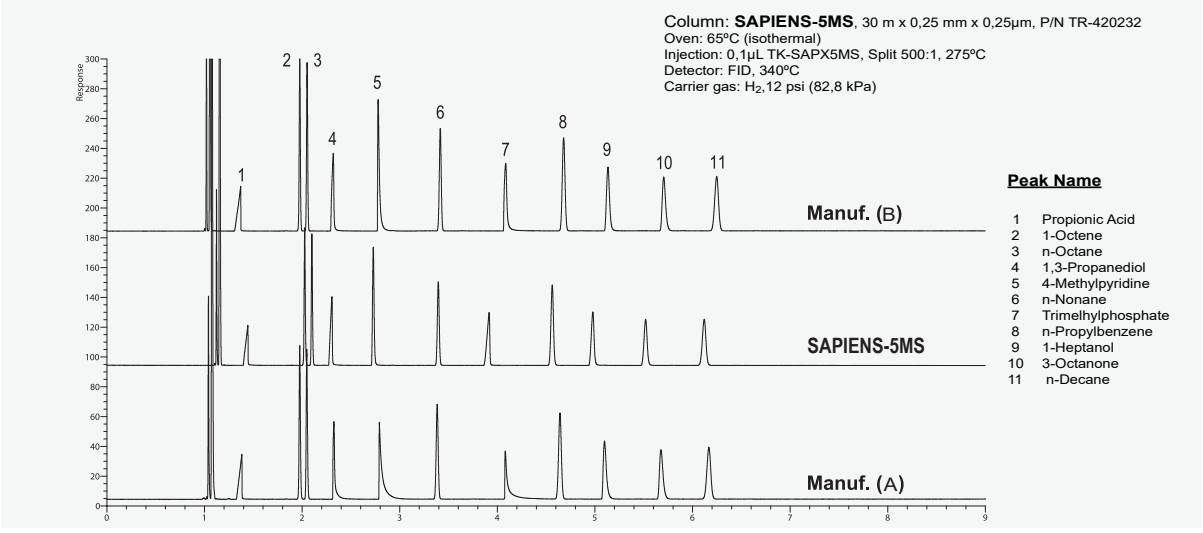
SAPIENS-5MS: Ultra Inert Test (TK-SAPX5MS). Excellent performance for all key compounds



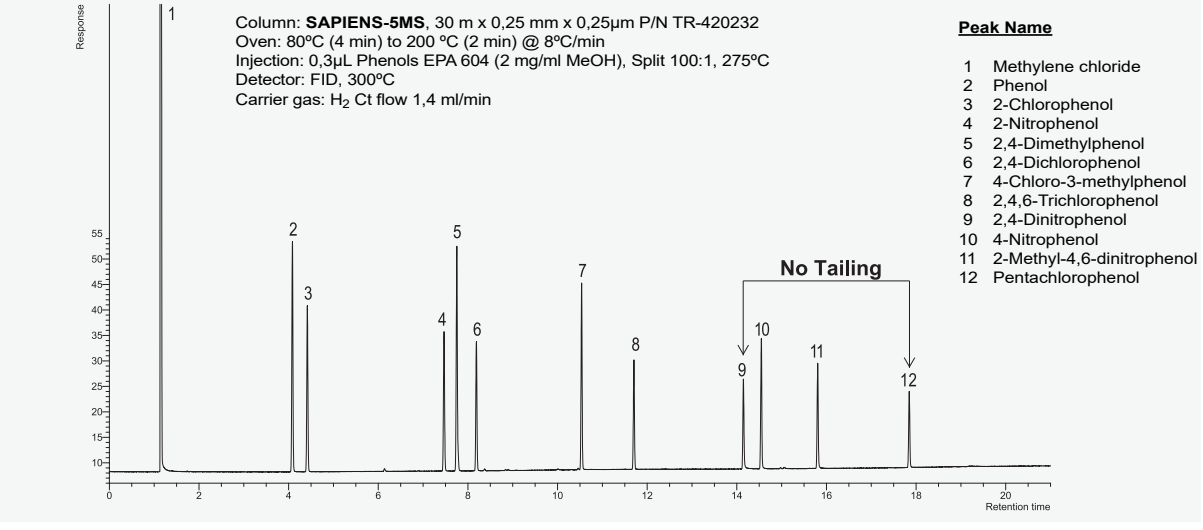
Ultra Inert Test TK-SAPX5MS (composition)

Elution	Compound	Key Control Parameter
1	Propionic Acid	Basicity
2	1-Octene	Polarity
3	n-Octane	Hydrocarbon
4	1,2-Propanediol	Silanol
5	4-Methylpyridine	Acidity
6	n-Nonane	Hydrocarbon
7	Trimelhylphosphate	Acidity
8	n-Propylbenzene	Hydrocarbon
9	1-Heptanol	Silanol
10	3-Octanone	Polarity
11	n-Decane	Hydrocarbon

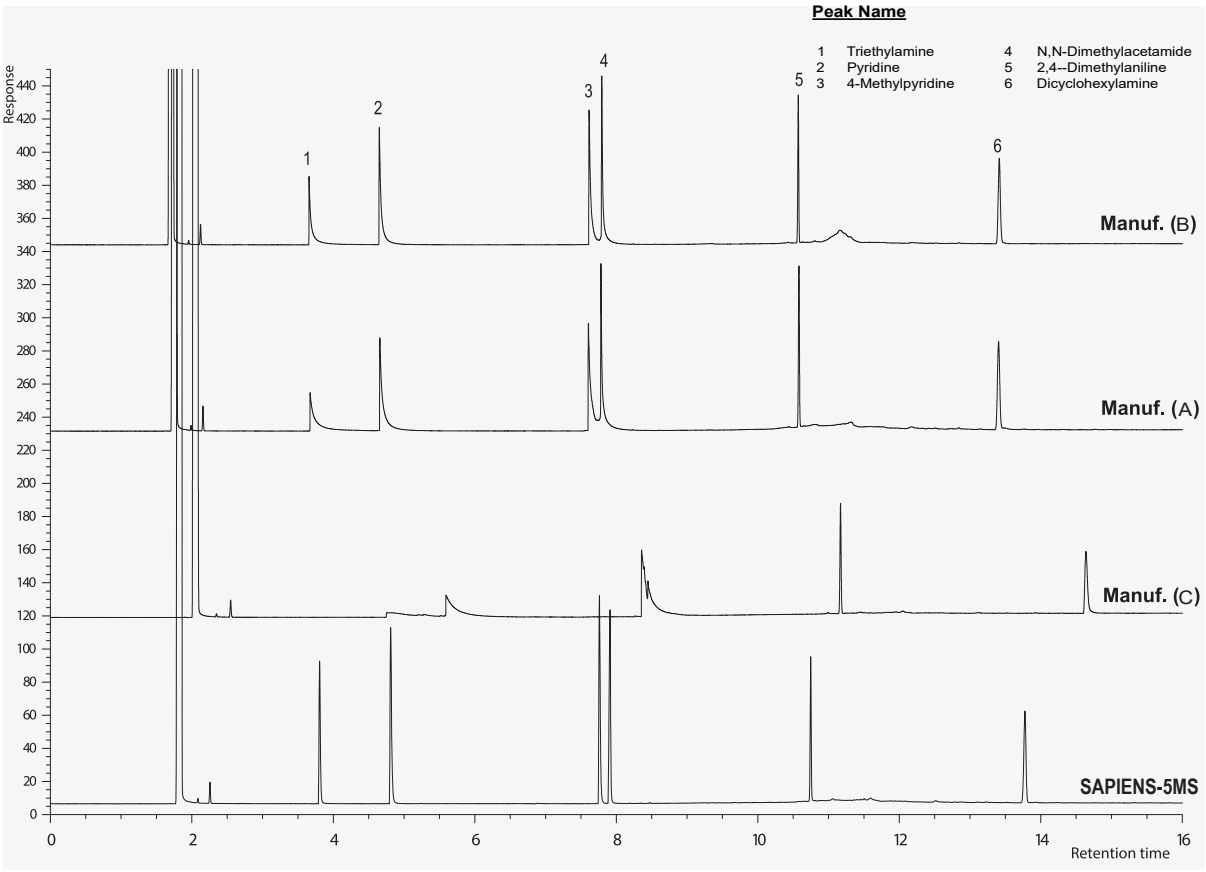
SAPIENS-5MS: Ultra Inert Test (TK-SAPX5MS). Performance against major ultra inert column manufacturers
Excellent performance for all key compounds



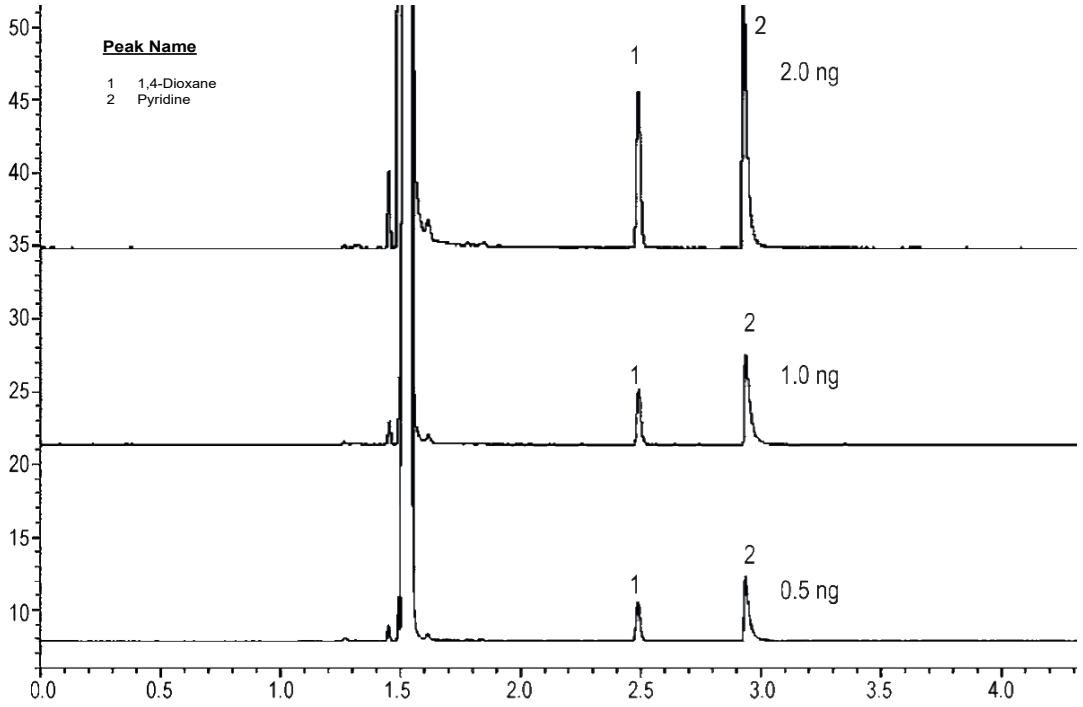
SAPIENS-5MS: Acidity Test - Perfect peak shapes



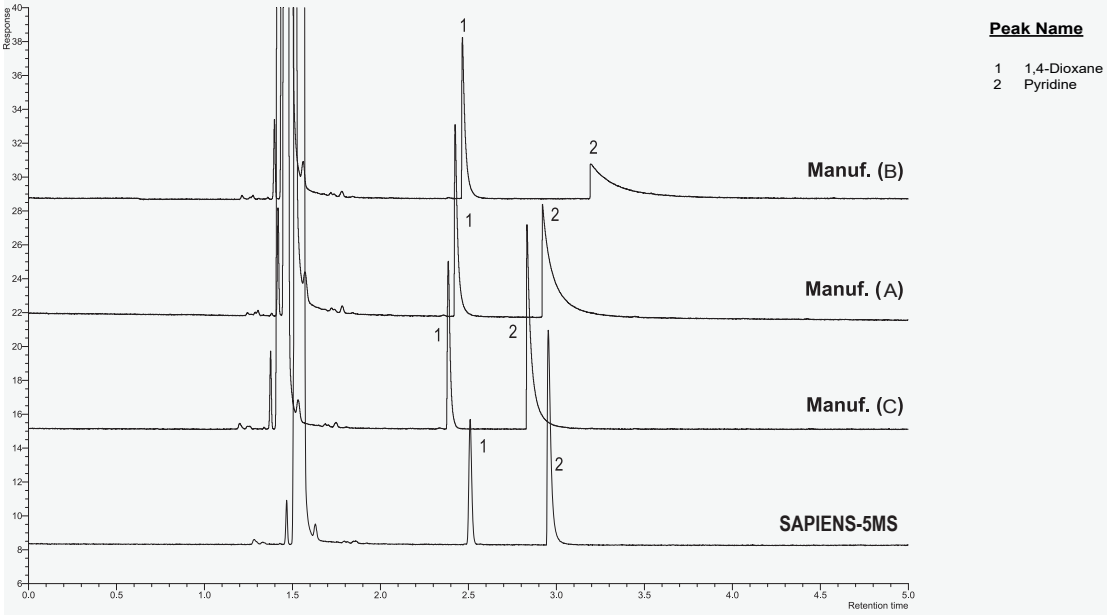
SAPIENS-5MS: Basicity test Performance against major ultra inert column manufacturers



SAPIENS-5MS: High column inertness for 1,4-dioxane and pyridine
No retention time shifts for pyridine at low concentration (no surface activity)

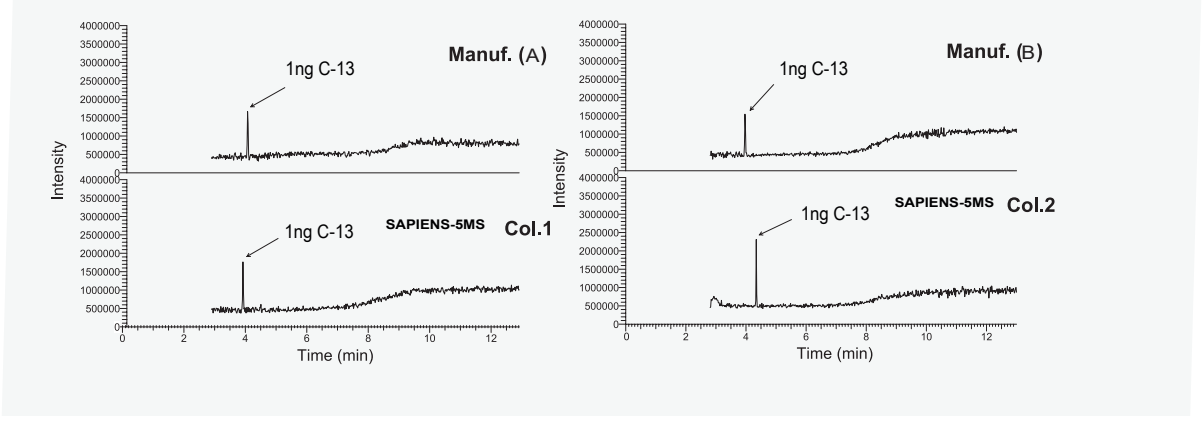


SAPIENS-5MS: 1,4-dioxane and pyridine Performance against major ultra inert column manufacturers



SAPIENS-5MS: Bleed (GC-MS) comparison test

Bleed Curves related to 1 ng of tridecane in MS detector



SAPIENS-5MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325/350	**TR-420141**
	20	0,10	-60 to 325/350	**TR-420181**
0,18	20	0,18	-60 to 325/350	**TR-420984**
0,20	12	0,33	-60 to 325/350	**TR-4233B9**
	25	0,33	-60 to 325/350	**TR-423329**
0,25	15	0,25	-60 to 325/350	**TR-420212**
	30	0,25	-60 to 325/350	**TR-420232**
	30	0,50	-60 to 325/350	**TR-420532**
	30	1,00	-60 to 325/350	**TR-421032**
	60	0,25	-60 to 325/350	**TR-420262**
0,32	30	0,25	-60 to 325/350	**TR-420233**
	30	1,00	-60 to 325/350	**TR-421033**

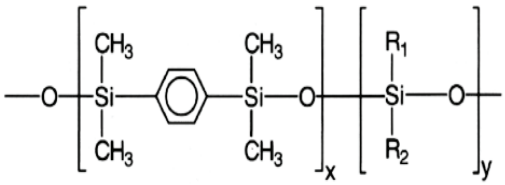
SAPIENS-X5MS

Polysiloxane containing p-silphenylene

- Ideal column for semivolatile compounds.
- selectivity similar to Meta.X5
- New generation of column incorporates arylene groups in the polymer structure to provide improved thermal stability, reduced column bleed and optimal resolution for aromatic compounds.
- Stringent quality control test guarantees total and optimal signal/ noise ratio for the more active compounds such as 2,4-dinitropherol, 4-nitroaniline and pentachlorophenol that normally suffer adsorption problems.

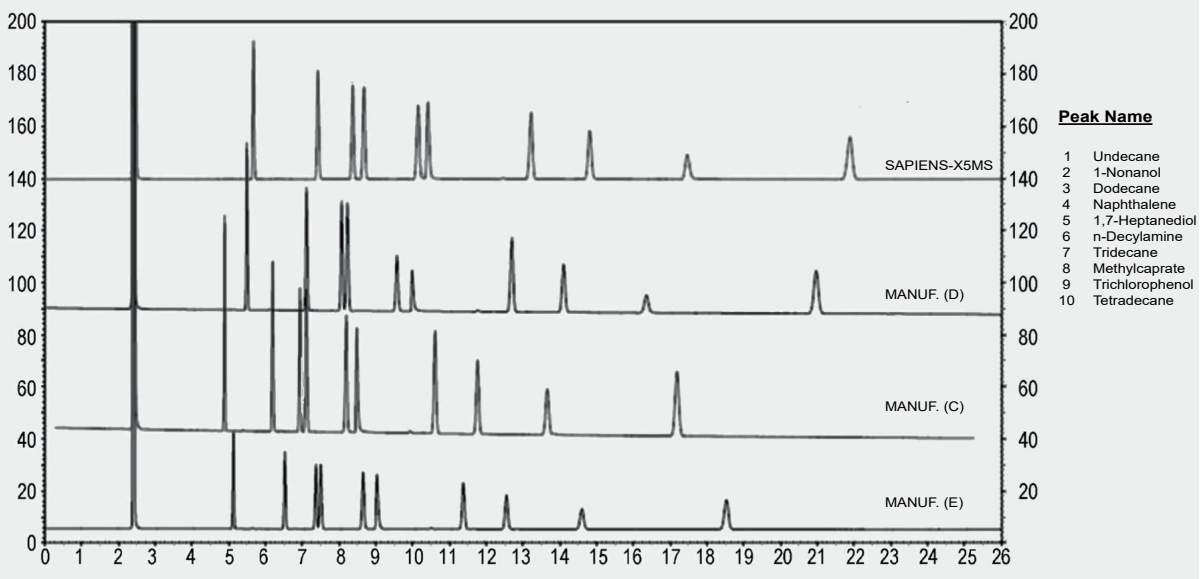
SAPIENS-X5MS Equivalent Phase

Agilent: DB-5MS UI, VF-5MS
Restek: Rxi-5Sil MS
Phenomenex: ZB-5Plus
SGE: BPX5
Sigma-Aldrich: SLB-5MS
Macherey-Nagel: OPTIMA-5MS Accent

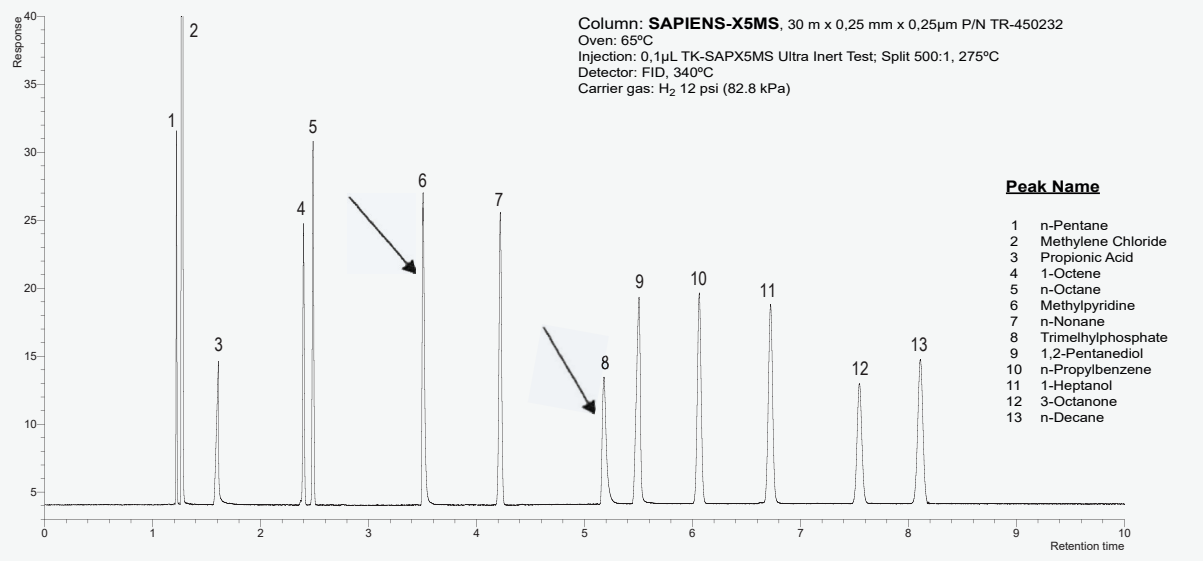


Structure of Polysiloxane containing p-silphenylene

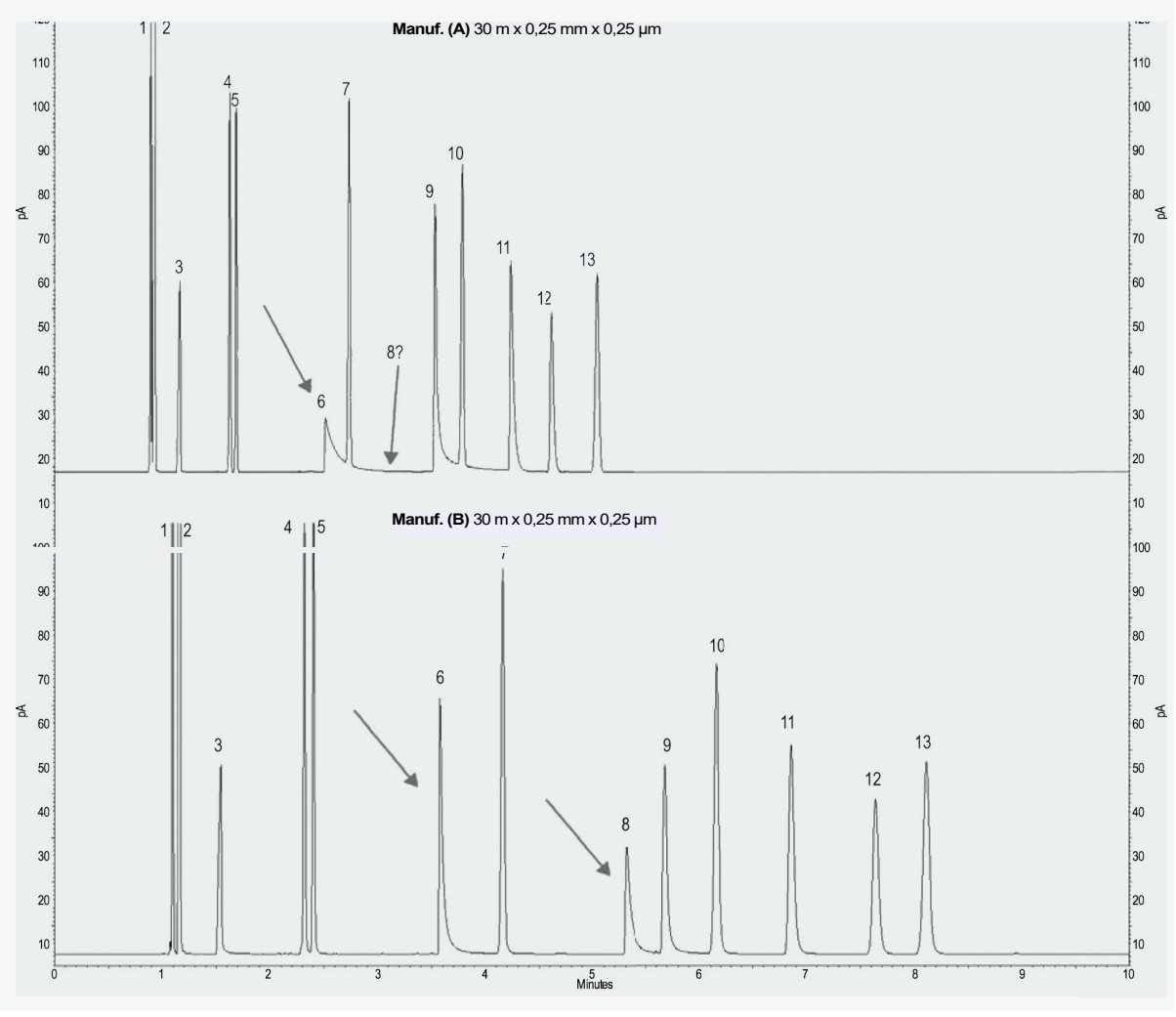
SAPIENS-X5MS: Clasical Inertness Test comparison vs major manufacturers
All columns are good

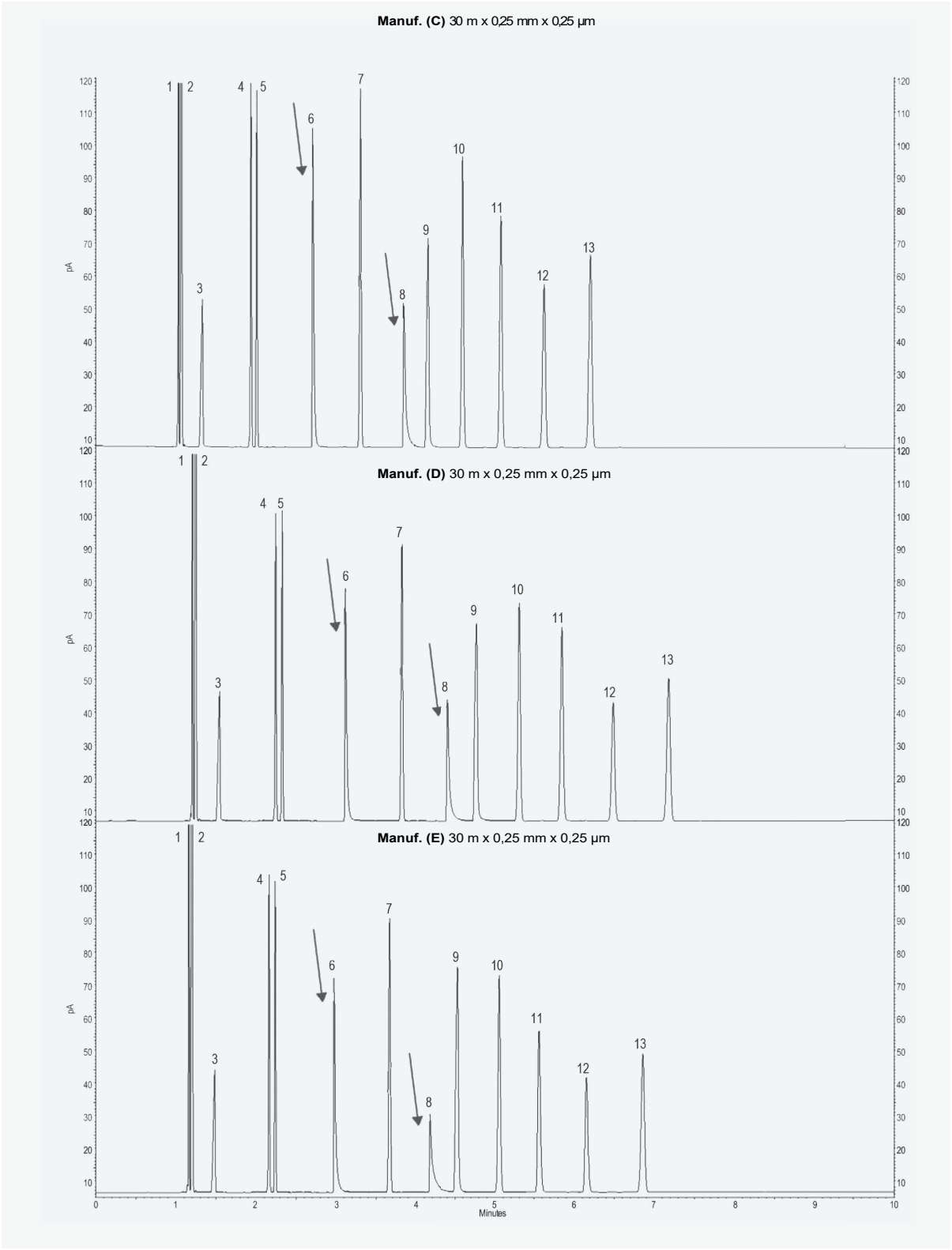


SAPIENS-X5MS: Ultra Inert Test * Performance against major ultra inert column manufacturers
Superior quality and peak shape for all active compounds *(J.Luong et al. J.Sep.Sci. 2007)



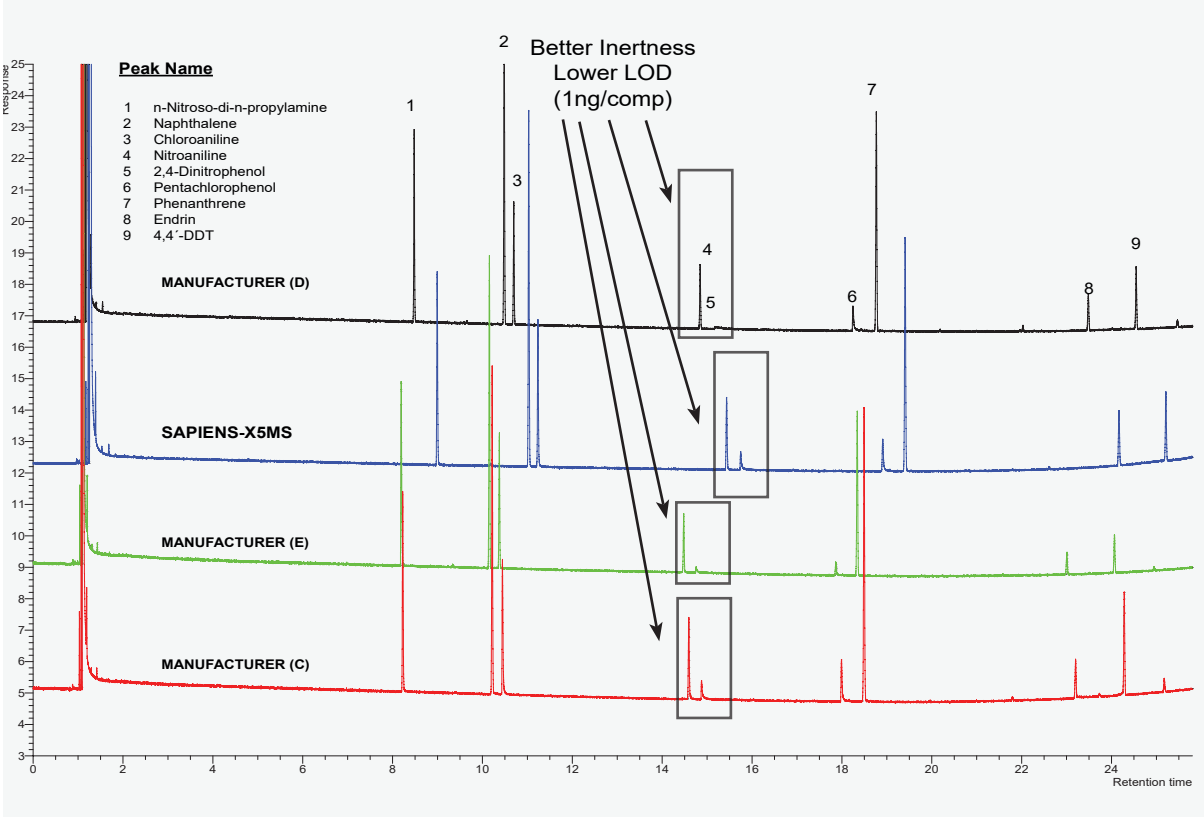
All columns are very good with a classical test but not all are excellent against a more demanding test



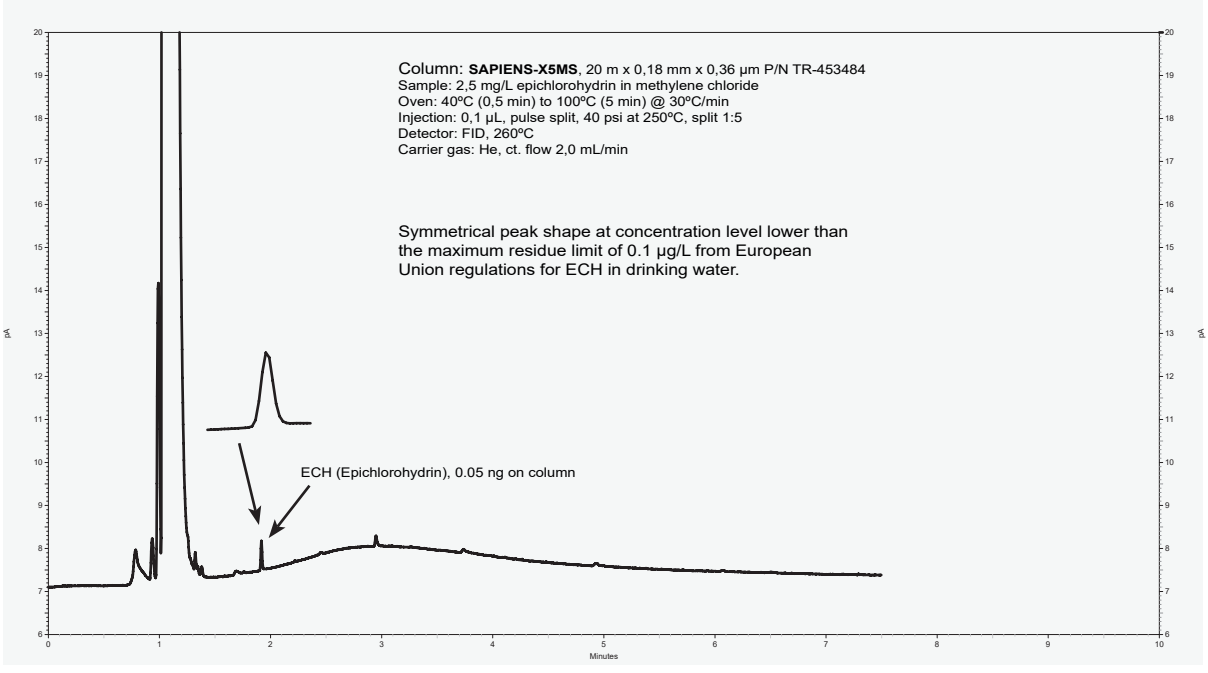


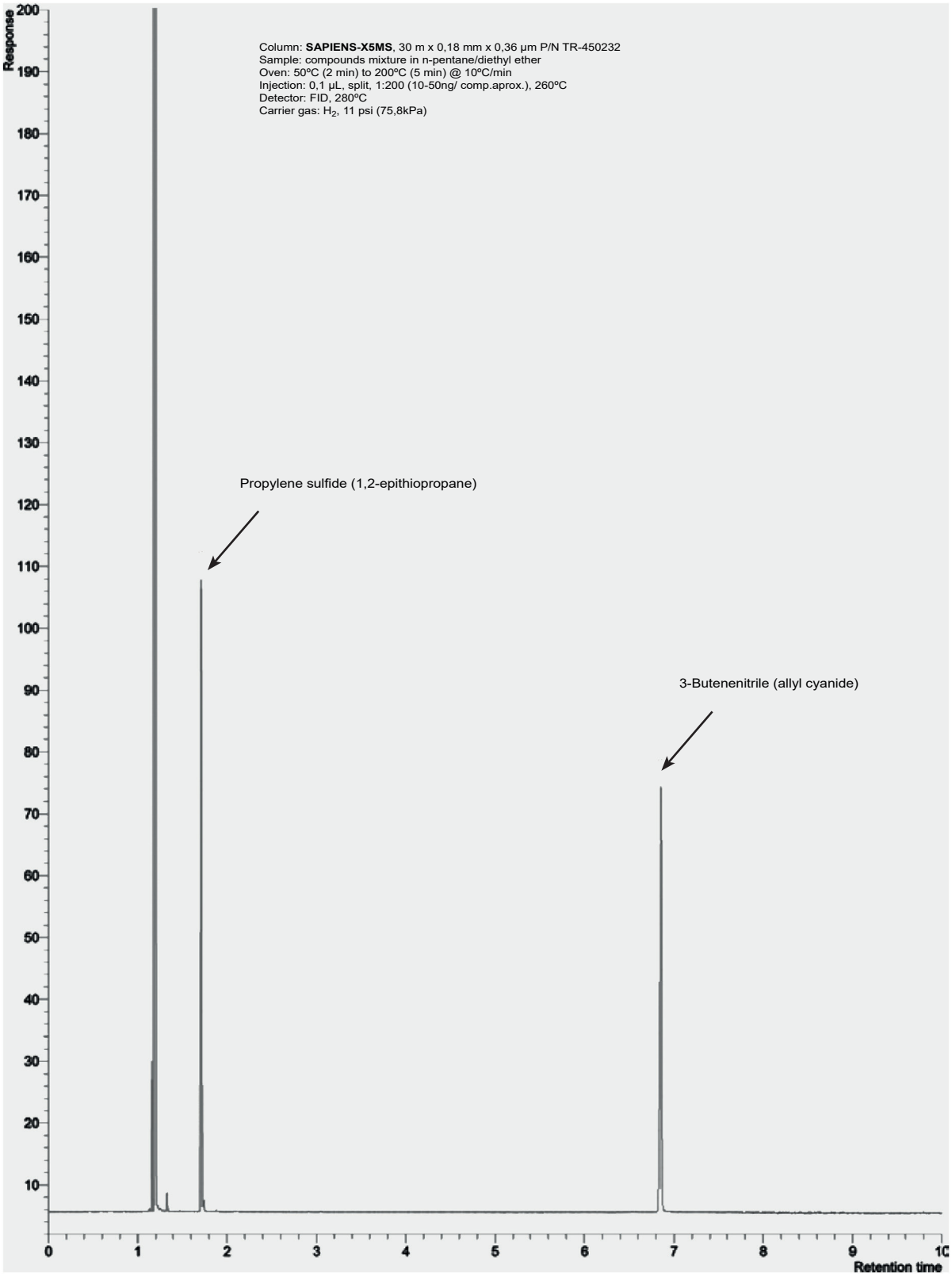
* Columns used for comparsion are from: Agilent, Phenomenex, Supelco, SGE and Restek (listed in random order)

SAPIENS-X5MS: Alinines, Phenols and Pesticides test Performance against major ultra inert column manufacturers
Improved performance for active compounds



SAPIENS-X5MS: Epichlorohydrin GC analysis in drinking water with SAPIENS-X5MS column




Column: SAPIENS-X5MS, 30 m x 0,18 mm x 0,36 µm P/N TR-450232
Sample: compounds mixture in n-pentane/diethyl ether
Oven: 50ºC (2 min) to 200ºC (5 min) @ 10ºC/min
Injection: 0,1 µL, split, 1:200 (10-50ng/ comp.aprox.), 260ºC
Detector: FID, 280ºC
Carrier gas: H2, 11 psi (75,8kPa)
Propylene sulfide (1,2-epithiopropane)
3-Butenenitrile (allyl cyanide)
Response
Retention time

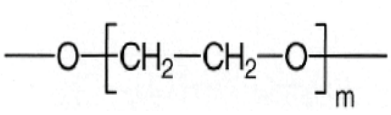
SAPIENS-X5MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325/350	**TR-450141**
	20	0,10	-60 to 325/350	**TR-450181**
0,18	20	0,18	-60 to 325/350	**TR-450984**
	20	0,36	-60 to 325/350	**TR-453484**
0,25	15	0,25	-60 to 325/350	**TR-450212**
	15	1,00	-60 to 325/350	**TR-451012**
	25	0,25	-60 to 325/350	**TR-450222**
	30	0,25	-60 to 325/350	**TR-450232**
	30	0,50	-60 to 325/350	**TR-450532**
	30	1,00	-60 to 325/350	**TR-451032**
	50	0,25	-60 to 325/350	**TR-450252**
	60	0,25	-60 to 325/350	**TR-450262**
	60	1,00	-60 to 325/350	**TR-451062**
0,32	15	0,25	-60 to 325/350	**TR-450213**
	30	0,25	-60 to 325/350	**TR-450233**
	30	0,50	-60 to 325/350	**TR-450533**
	30	1,00	-60 to 325/350	**TR-451033**
	60	1,00	-60 to 325/350	**TR-451063**

SAPIENS-WAX.MS

100% polyethylene glycol, bonded and cross-linked phase

- Specifically designed for polar compounds
- Lower bleed for trace analysis
- Solvent rinsable
- Equivalent to USP G14, G15, G16, G20, G39, G47 phases

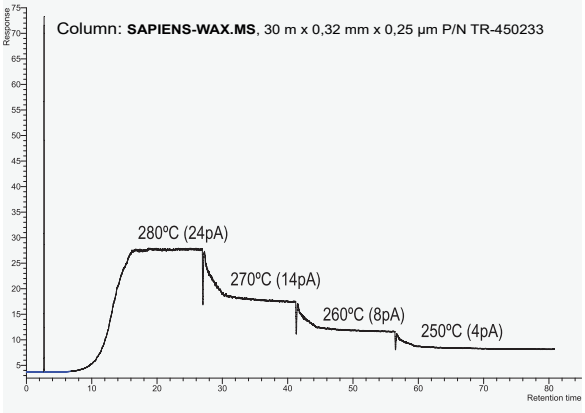


Structure of of Polyethylene glycol

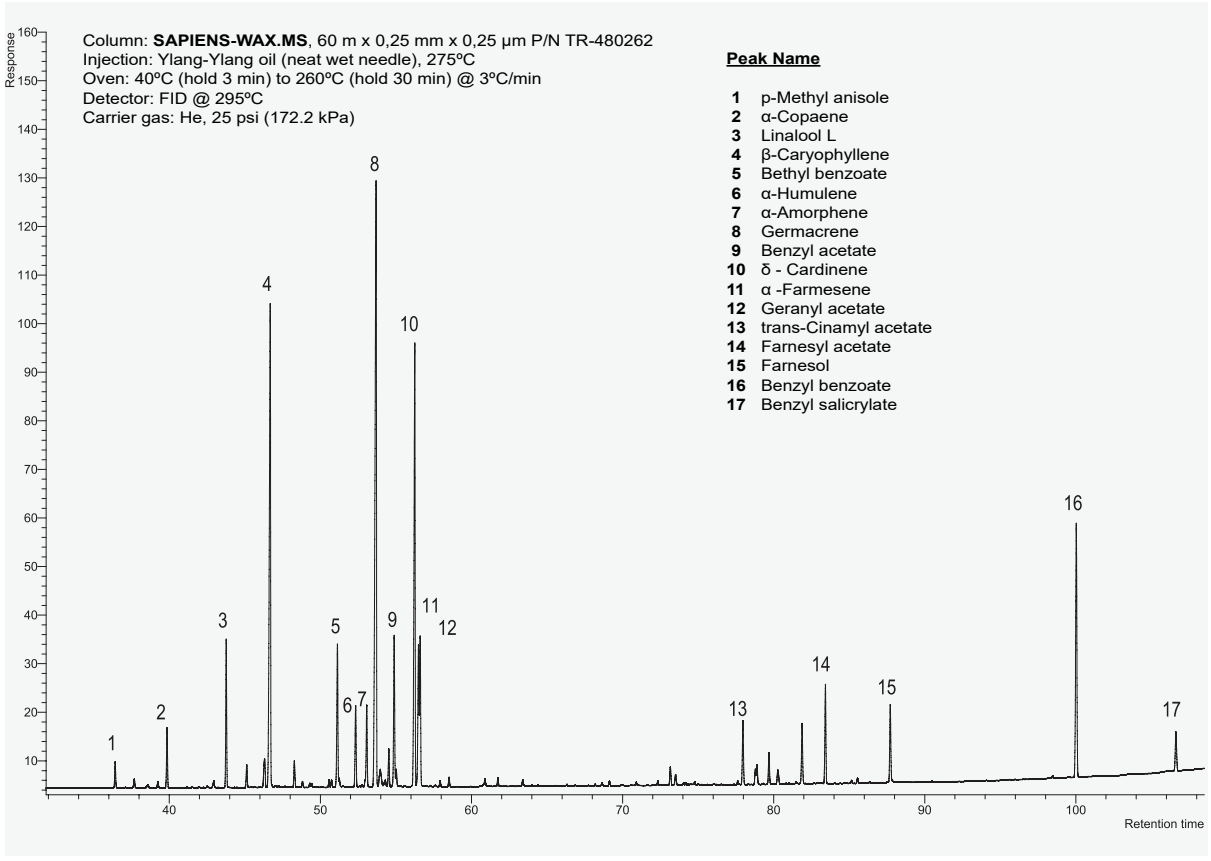
SAPIENS-WAX.MS Equivalent Phase

Agilent: VF-WAXms, DB-WAX UI, DB-WAX.MS
Restek: STABILWAX MS
Phenomenex: ZB-WAX Plus
Supelco: Supelcowax-10
SGE: SOLGEL-WAX
Macherey-Nagel: OPTIMA-WAXplus

SAPIENS-WAX.MS: Bleed vs Temperature



SAPIENS-WAX.MS: Ylang-Ylang Oil by GC-FID



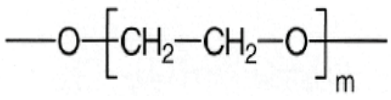
SAPIENS-WAX.MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	35 to 280	**TR-480141**
	10	0,20	35 to 280	**TR-482141**
	20	0,10	35 to 280	**TR-480181**
0,25	15	0,25	35 to 280	**TR-480212**
	15	0,50	35 to 280	**TR-480512**
	25	0,20	35 to 280	**TR-482122**
	30	0,25	35 to 280	**TR-480232**
	30	0,50	35 to 280	**TR-480532**
	30	1,00	35 to 280	**TR-481032**
	60	0,25	35 to 280	**TR-480262**
0,32	30	0,25	35 to 280	**TR-480233**
	30	0,50	35 to 280	**TR-480533**
	30	1,00	35 to 280	**TR-481033**
	60	0,25	35 to 280	**TR-480263**
	60	0,50	35 to 280	**TR-480563**
	60	1,00	35 to 280	**TR-481063**

SAPIENS-WAX.HT

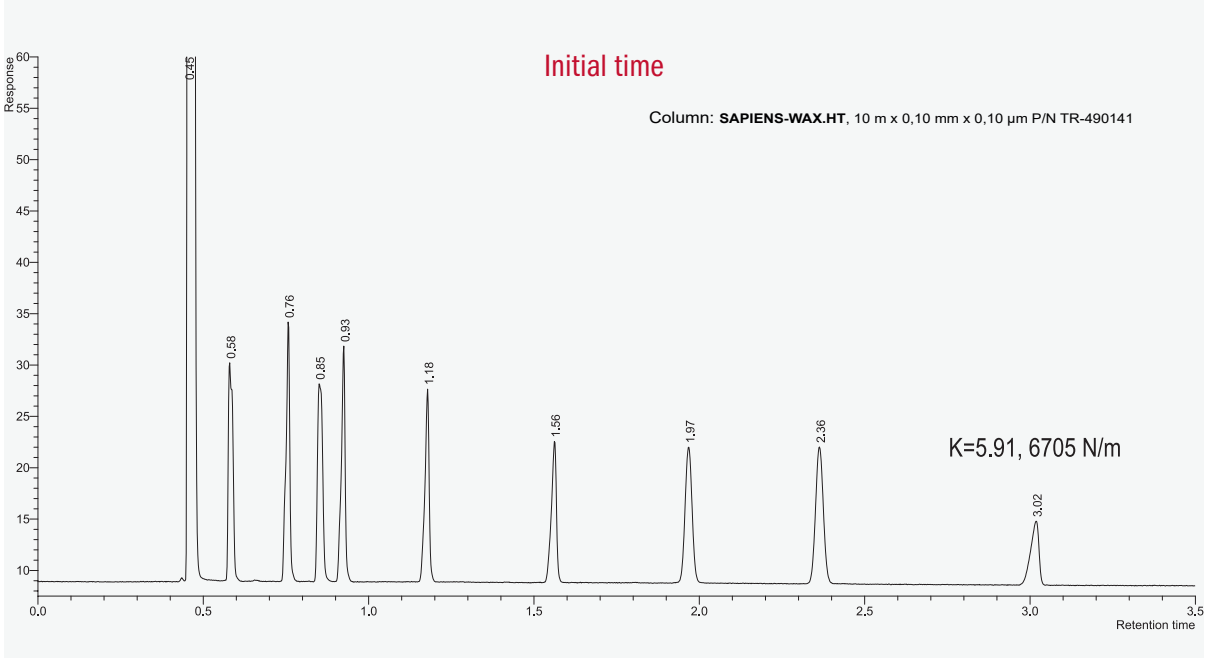
Polyethylene glycol that can withstand up to 300 ºC

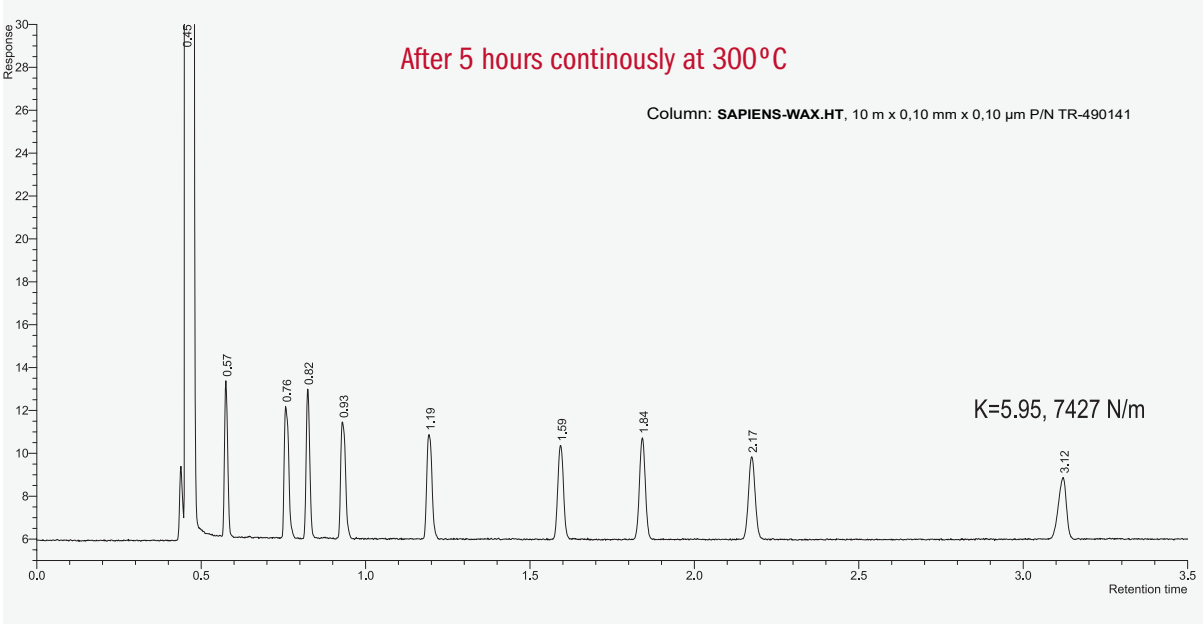
- Specifically designed for Fast GC and GC x GC analysis
- MSP High Performance



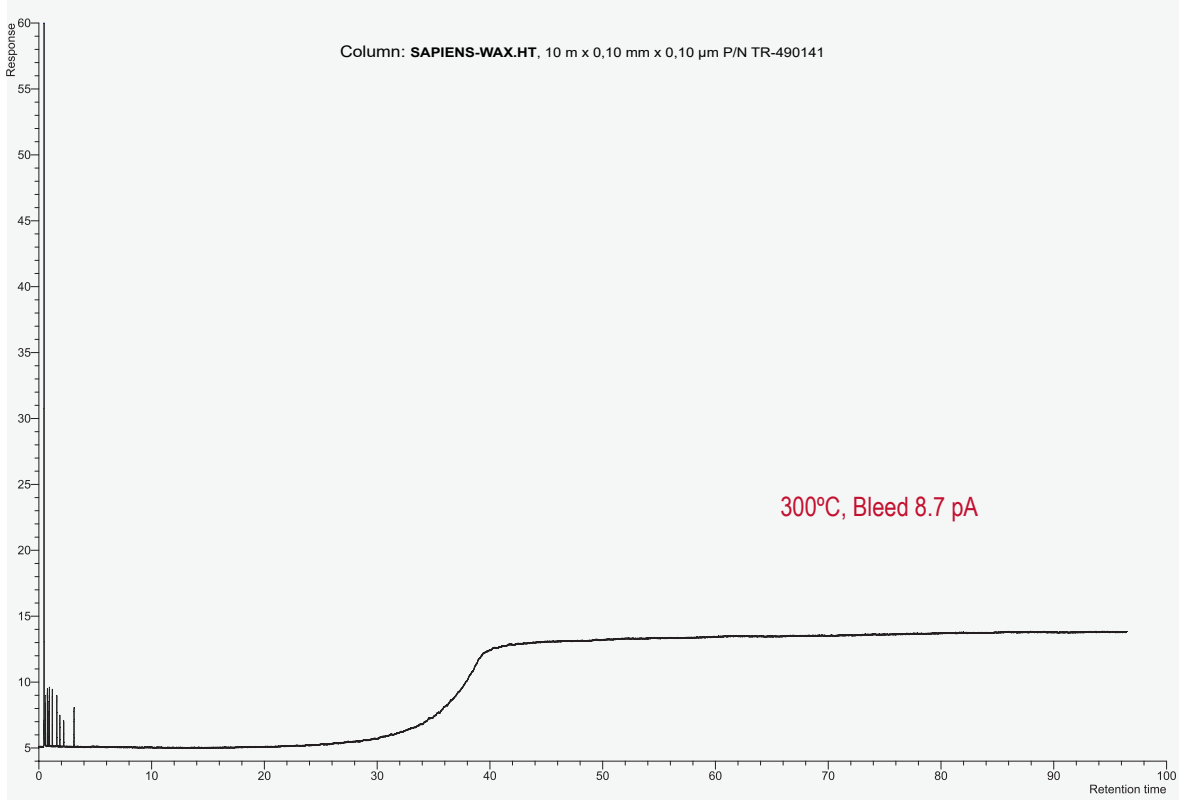
Structure of Polyethylene glycol

SAPIENS-WAX.HT: After 5hrs continuously at 300ºC no degradation of the stationary phase is detected





SAPIENS-WAX.HT: Bleeding at 300ºC



SAPIENS-WAX.HT

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	2	0,10	35 to 300	**TR-4901D1**
	5	0,10	35 to 300	**TR-4901A1**
	10	0,10	35 to 300	**TR-490141**

SAPIENS-624MS

Silphenylene phase equivalent to 94% methyl-6% cyanopropylphenyl, polysiloxane bonded and cross-linked

- Intermediate polarity
- Highly inert, excellent chromatographic performance for acidic, basic and polar compounds
- Low bleed column especially design for superior thermal stability up to 280ºC
- Suitable for environmental analysis of organic volatile compounds and residual solvents in pharmaceutical products
- Meets specifications of USP <467> and PhEur 2.4.24
- Phase equivalent to USP G43

SAPIENS-624MS Equivalent Phase G43

Agilent: DB-624UI, VF-624MS, VF-1301MS, DB-Select 624UI for <467>

Restek: Rxi-624SilMS

SGE: BPX-Volatile

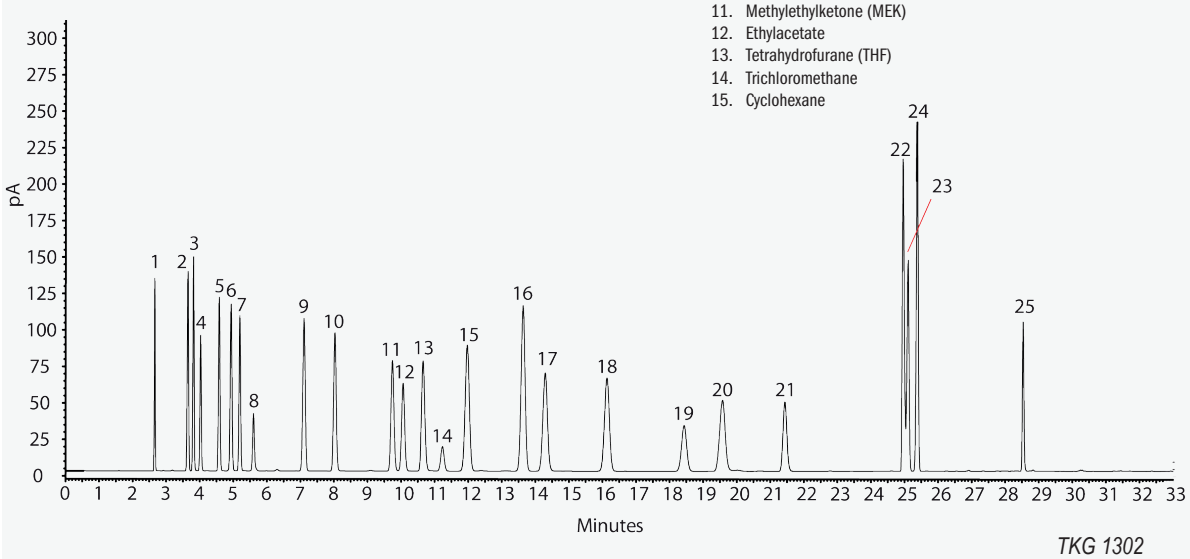
SAPIENS-624MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	1,00	-20 to 260/280	**TR-591084**
0,20	25	1,12	-20 to 260/280	**TR-591129**
0,25	30	1,40	-20 to 260/280	**TR-591432**
	60	1,40	-20 to 260/280	**TR-591462**
0,32	30	1,80	-20 to 260/280	**TR-591833**
	60	1,80	-20 to 260/280	**TR-591863**
0,53	30	3,00	-20 to 260/280	**TR-593035**
	60	3,00	-20 to 260/280	**TR-593065**
	75	3,00	-20 to 260/280	**TR-593075**
	105	3,00	-20 to 260/280	**TR-5930K5**

SAPIENS-624MS: Residual Solvents

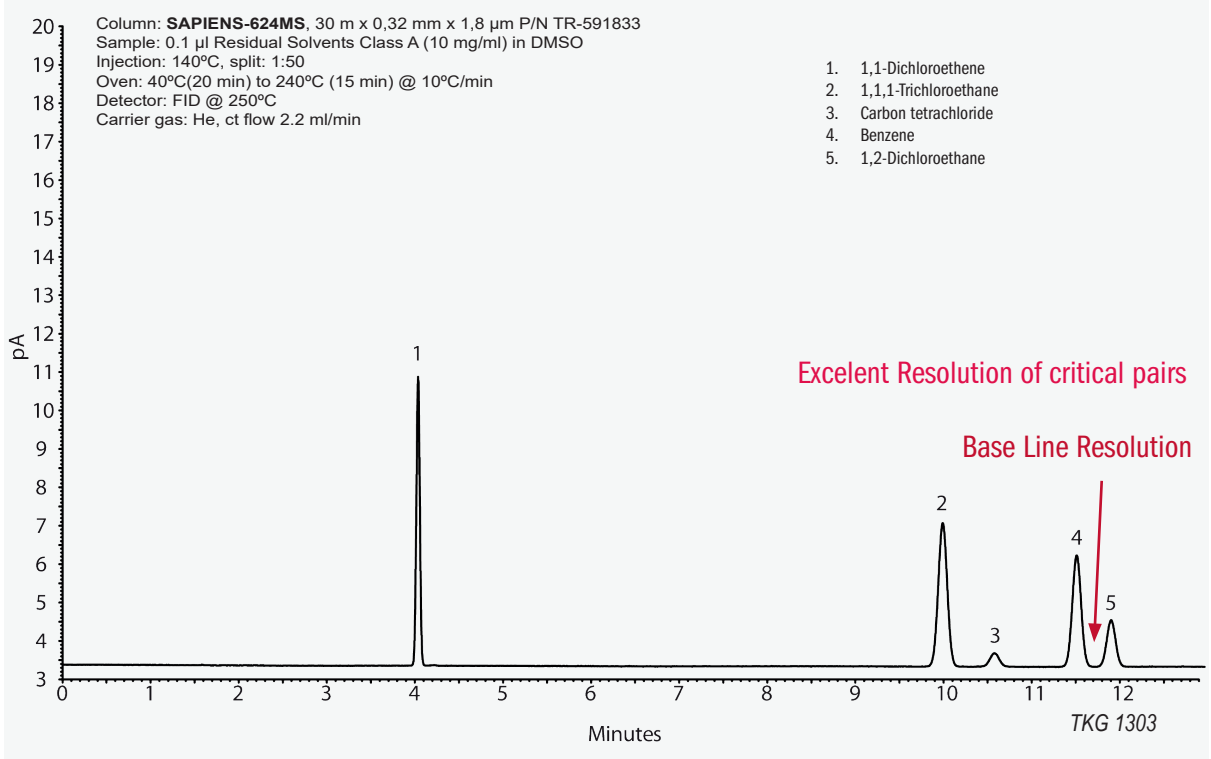
Column: **SAPIENS-624MS**, 30 m x 0,32 mm x 1,8 µm, P/N TR-591833
Sample: 0.1 µl Residual Solvent mix (0,1%)
Injection: 260ºC, Split: 1:50
Detector: FID @ 260ºC
Carrier gas: He, 10 psi
Oven: 35ºC (20 min) to 150ºC (2min) @ 12ºC/min

1. Methanol
2. Pentane
3. Ethanol
4. Diethylether
5. Acetone
6. 2-Propanol
7. Acetonitrile
8. Dichloromethane
9. n-Hexane
10. 1-Propanol
11. Methylethylketone (MEK)
12. Ethylacetate
13. Tetrahydrofurane (THF)
14. Trichloromethane
15. Cyclohexane
16. Benzene
17. 2-Methylpropanol
18. Heptane
19. Trichloroethylene
20. n-Butanol
21. 1,4-Dioxane
22. Methylisobutylketone (MIBK)
23. Pyridine
24. Toluene
25. N,N-Dimethylformamide

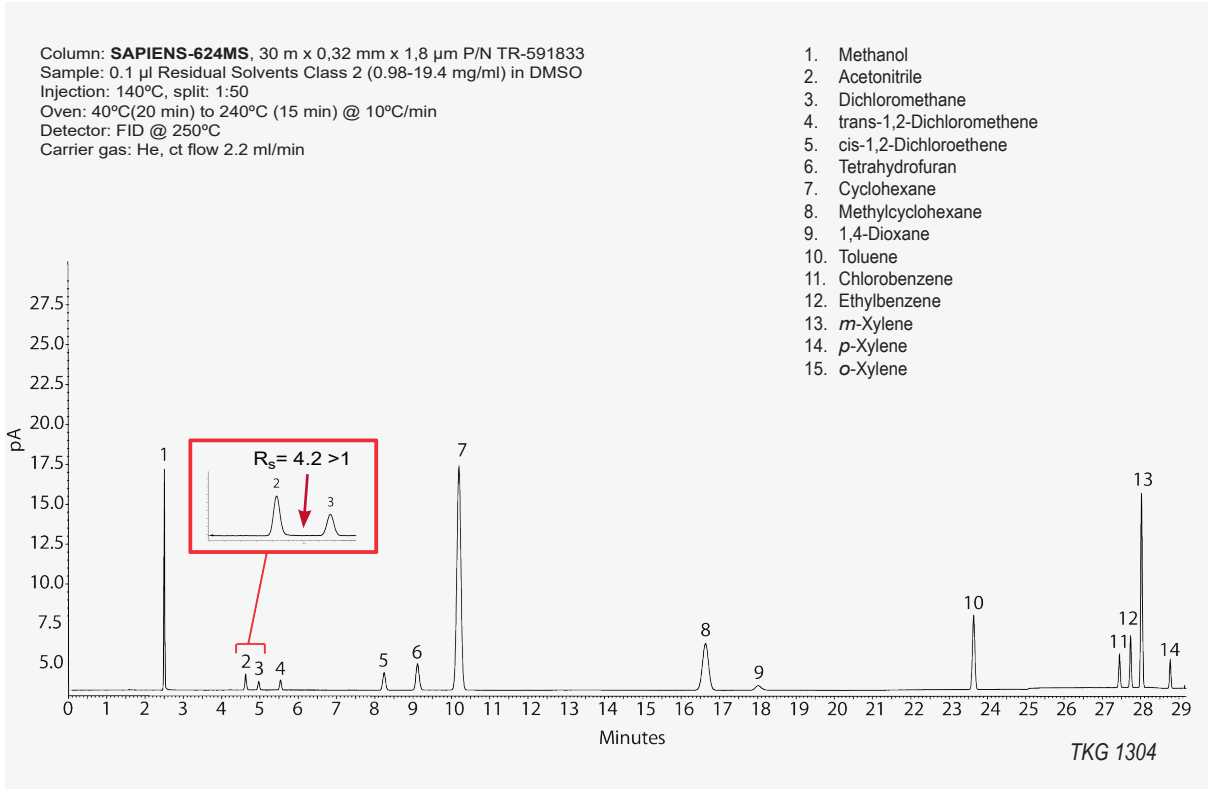


TKG 1302

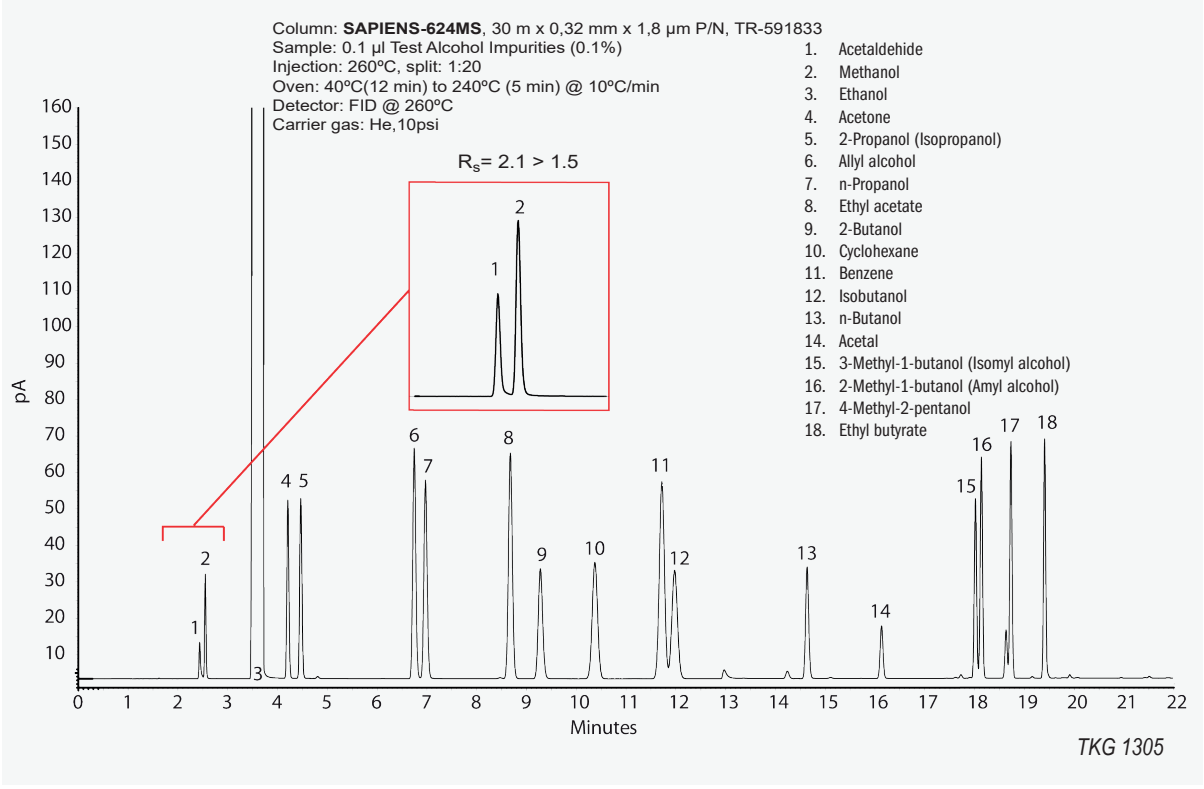
SAPIENS-624MS: USP <467> Residual Solvents Class 1



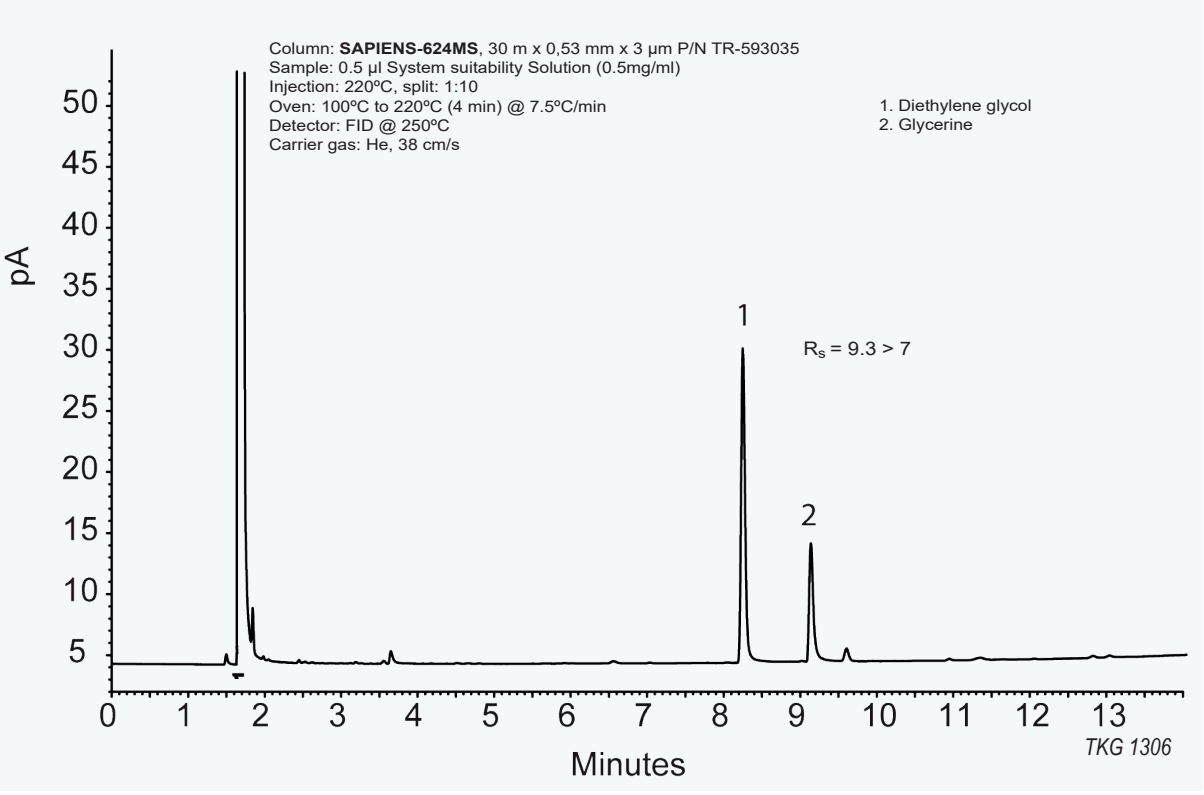
SAPIENS-624MS: USP <467> Residual Solvents Class 2



SAPIENS-624MS: EuPh Ethanol Impurities



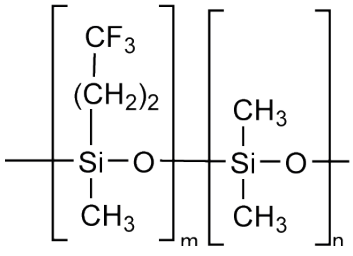
SAPIENS-624MS: USP Glycerin monograph; Related compounds System Suitability Solution



SAPIENS-200

35% Trifluropropyl-methyl polysiloxane, bonded and cross-linked phase

- Intermediate polarity
- Unique selectivity based on the high electron acceptance of fluorine atoms
- Column of choice for the separation of compounds with electron-donor groups such as ketones, esters, nitriles, secondary and tertiary amines, nitro and chlorinated compounds, PAHs, CFCs and silanes
- Low bleed, ideal for NPD, ECD and MS detectors



Structure of Poly (dimethyltrifluoropropylmethyl) siloxane

SAPIENS-200 Equivalent Phase

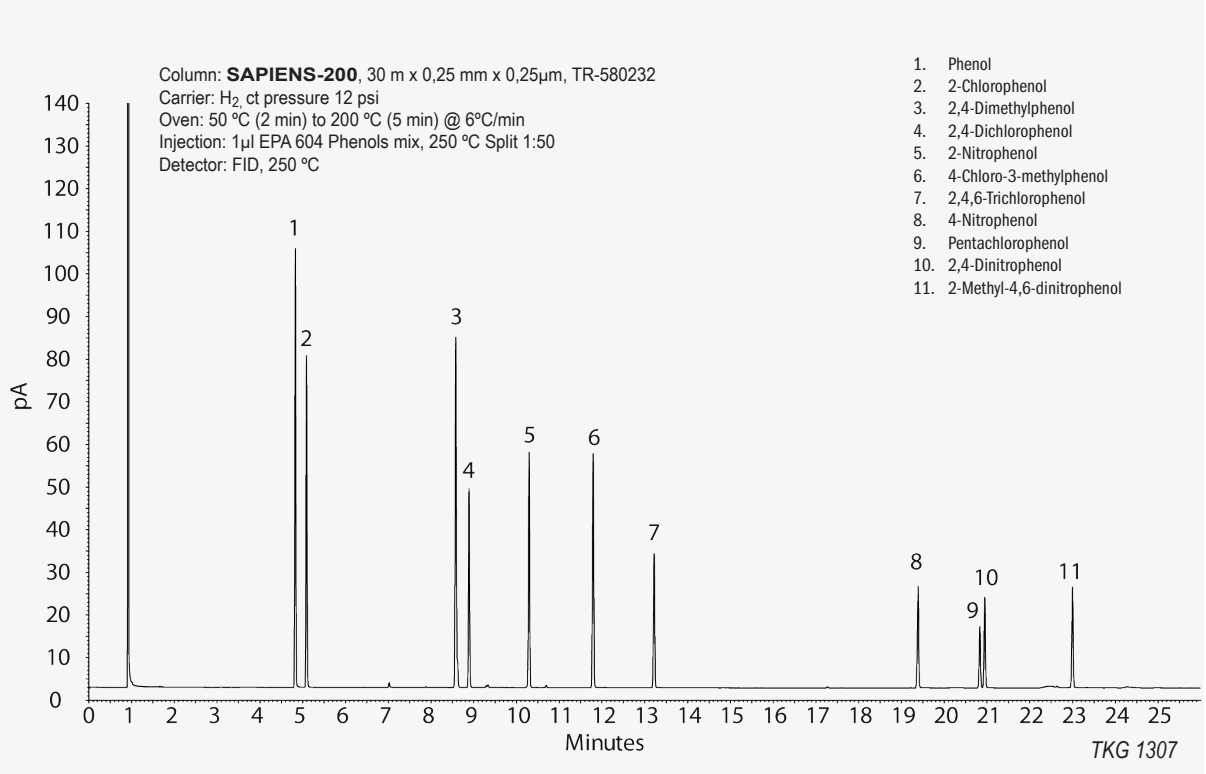
Agilent: DB-200

Restek: Rtx-200

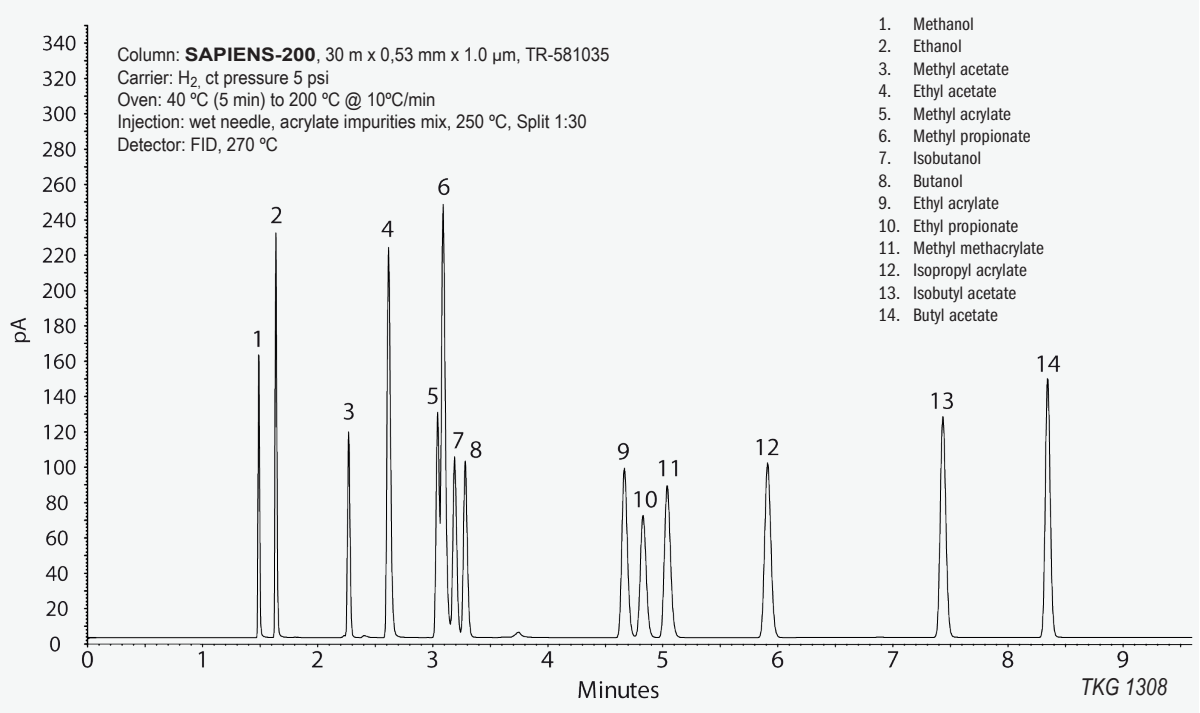
SAPIENS-200

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,25	30 to 300/320	**TR-580212**
	30	0,25	30 to 300/320	**TR-580232**
	60	0,25	30 to 300/320	**TR-580262**
	30	0,50	30 to 300/320	**TR-580532**
	60	0,50	30 to 300/320	**TR-580562**
	30	1,00	30 to 280/300	**TR-581032**
	60	1,00	30 to 280/300	**TR-581062**
0,32	30	0,25	30 to 300/320	**TR-580233**
	60	0,25	30 to 300/320	**TR-580263**
	30	0,50	30 to 300/320	**TR-580533**
	60	0,50	30 to 300/320	**TR-580563**
	30	1,00	30 to 280/300	**TR-581033**
	60	1,00	30 to 280/300	**TR-581063**
	30	1,80	30 to 270/300	**TR-581833**
	60	1,80	30 to 270/300	**TR-581863**
0,53	30	0,25	30 to 300/320	**TR-580235**
	60	0,25	30 to 300/320	**TR-580265**
	30	0,50	30 to 300/320	**TR-580535**
	60	0,50	30 to 300/320	**TR-580565**
	30	1,00	30 to 280/300	**TR-581035**
	60	1,00	30 to 280/300	**TR-581065**
	60	3,00	30 to 260/280	**TR-583065**

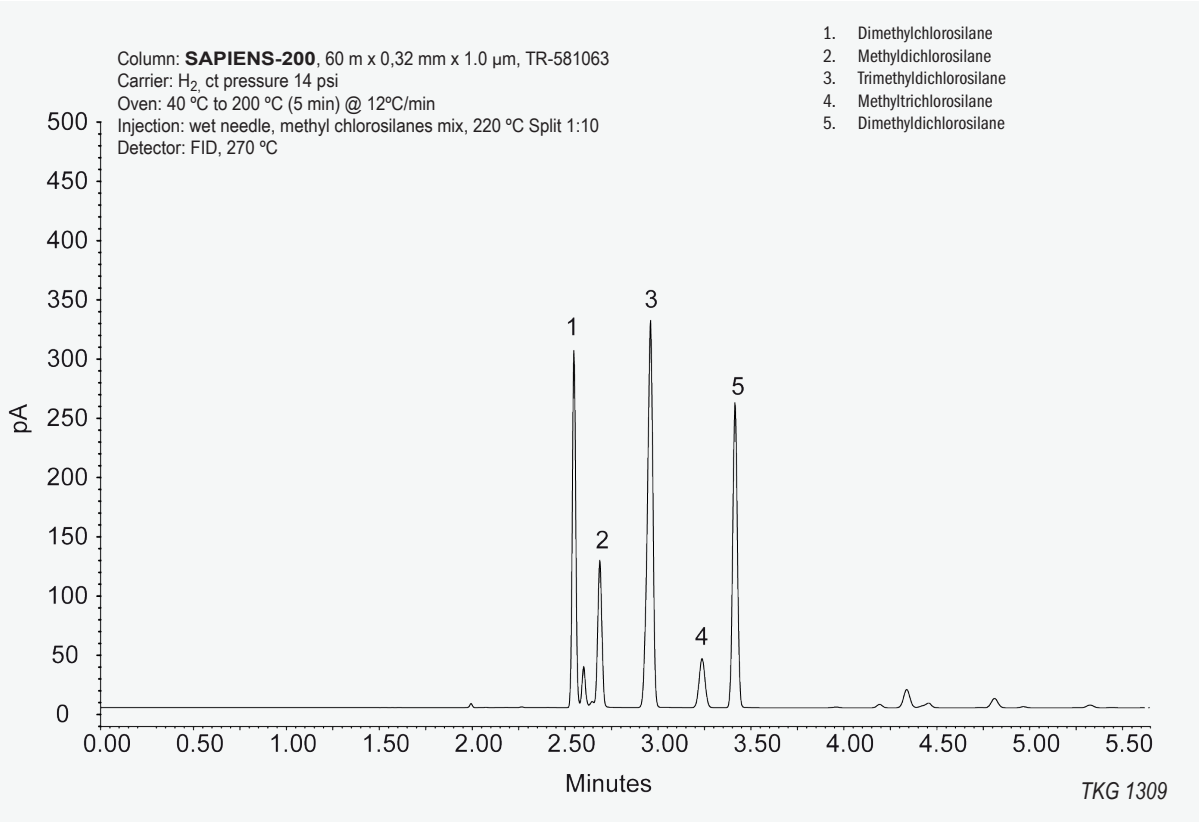
SAPIENS-200: EPA 604 Phenols



SAPIENS-200: Acrylate Impurities



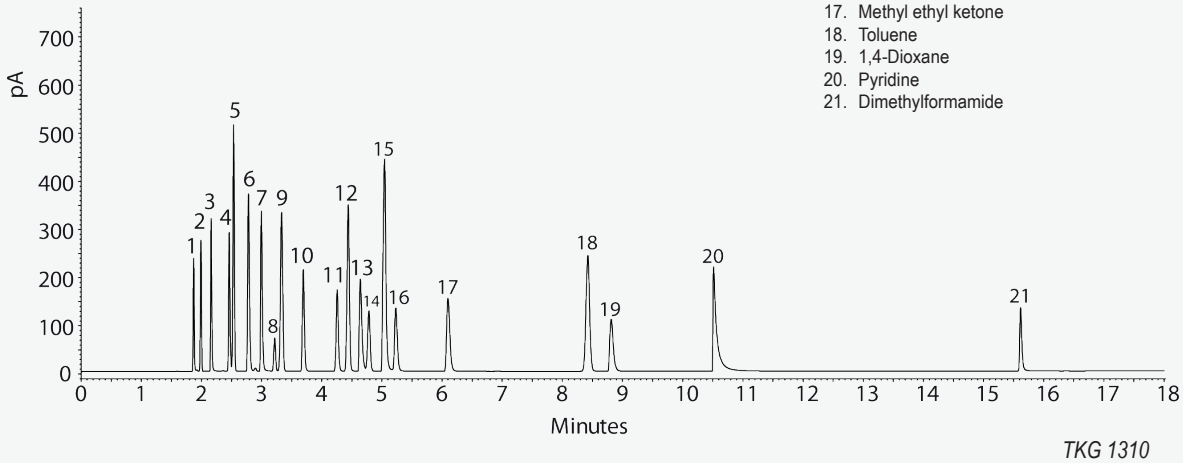
SAPIENS-200: Methyl Chlorosilanes



SAPIENS-200: Solvents

Column: **SAPIENS-200,** 30m x 0.32mm x 1.0um, TR-581033
Injection: solvents mix, wet needle, 250ºC, split 1:50
Carrier gas: He, ct. pressure 10psi (68.9kPa)
Oven program: 40ºC (8min) to 150ºC @ 12ºC/min
Detector: FID, 300ºC

1. Methanol
2. n-Pentane
3. Ethanol
4. Isopropanol
5. Methylene chloride
6. t-Butanol
7. n-Propanol
8. Chloroform
9. Cyclohexane
10. Acetone
11. Acetonitrile
12. Benzene
13. Tetrahydrofuran
14. Trichloroethylene
15. n-Butanol
16. Ethylacetate
17. Methyl ethyl ketone
18. Toluene
19. 1,4-Dioxane
20. Pyridine
21. Dimethylformamide

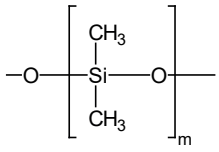


TKG 1310

TRB-1

100% Dimethyl polysiloxane, bonded and crosslinked phase

- 100% Dimethyl polysiloxane
- Non-polar phase
- Column for general use
- High thermal stability
- Ideal column for the analysis of petrochemical products and industrial solvents



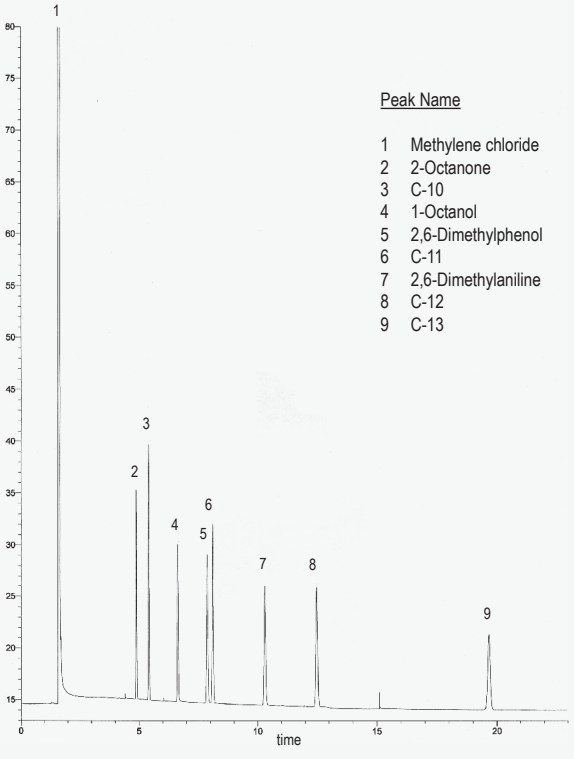
Structure of Poly (dimethyl) siloxane

TRB-1 Equivalent Phase

Agilent: HP-1, HP-101, ULTRA-1, DB-1, CP-SIL 5 CB
Supelco: SPB-1, EQUITY-1
Restek: Rtx-1
SGE: BP-1
Macherey-Nagel: OPTIMA-1

TRB-1: Test

Column: **TRB-1**, 25m x 0.15mm x 1.2µm, P/N TR-111226
Oven: 145ºC (isothermal)
Injection: 1 µL Test SP-4-7300, split 1:100, 280ºC
Carrier gas: H_2, ct pressure 22 psi (151.6 kPa)
Detector: FID, 300ºC



Peak Name

1 Methylene chloride
2 2-Octanone
3 C-10
4 1-Octanol
5 2,6-Dimethylphenol
6 C-11
7 2,6-Dimethylaniline
8 C-12
9 C-13

TKG 1102

TRB-1

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	5	0,12	-60 to 325/350	**TR-1107A1**
	10	0,10	-60 to 325/350	**TR-110141**
	10	0,40	-60 to 320/340	**TR-110441**
	20	0,10	-60 to 325/350	**TR-110181**
	20	0,40	-60 to 320/340	**TR-110481**
	40	0,20	-60 to 325/350	**TR-1121C1**
	40	0,40	-60 to 320/340	**TR-1104C1**

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	10	0,18	-60 to 325/350	**TR-110944**
	10	0,20	-60 to 325/350	**TR-112144**
	10	0,40	-60 to 325/350	**TR-110444**
	20	0,18	-60 to 325/350	**TR-110984**
	20	0,40	-60 to 325/350	**TR-110484**
	40	0,40	-60 to 325/350	**TR-1104C4**

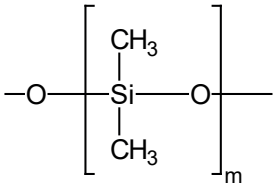
Teknokroma Capillary Columns

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,20	12	0,33	-60 to 325/350	**TR-1133B9**
	15	0,15	-60 to 325/350	**TR-111319**
	15	0,35	-60 to 325/350	**TR-110319**
	15	0,50	-60 to 325/350	**TR-110519**
	25	0,15	-60 to 325/350	**TR-111329**
	25	0,33	-60 to 325/350	**TR-113329**
	25	0,35	-60 to 325/350	**TR-110329**
	25	0,50	-60 to 325/350	**TR-110529**
	30	0,15	-60 to 325/350	**TR-111339**
	30	0,35	-60 to 325/350	**TR-110339**
	30	0,50	-60 to 325/350	**TR-110539**
	50	0,15	-60 to 325/350	**TR-111359**
	50	0,33	-60 to 325/350	**TR-113359**
	50	0,35	-60 to 325/350	**TR-110359**
	60	0,15	-60 to 325/350	**TR-111369**
	60	0,50	-60 to 325/350	**TR-110569**
0,25	15	0,10	-60 to 325/350	**TR-110112**
	15	0,25	-60 to 325/350	**TR-110212**
	15	0,50	-60 to 325/350	**TR-110512**
	15	1,00	-60 to 325/340	**TR-111012**
	25	0,10	-60 to 325/350	**TR-110122**
	25	0,25	-60 to 325/350	**TR-110222**
	25	0,50	-60 to 325/350	**TR-110522**
	25	1,00	-60 to 320/340	**TR-111022**
	30	0,10	-60 to 325/350	**TR-110132**
	30	0,25	-60 to 325/350	**TR-110232**
	30	0,50	-60 to 325/350	**TR-110532**
	30	1,00	-60 to 320/340	**TR-111032**
	50	0,10	-60 to 325/350	**TR-110152**
	50	0,25	-60 to 325/350	**TR-110252**
	50	0,50	-60 to 325/350	**TR-110552**
	50	1,00	-60 to 320/340	**TR-111052**
	60	0,10	-60 to 325/350	**TR-110162**
	60	0,25	-60 to 325/350	**TR-110262**
	60	0,50	-60 to 325/350	**TR-110562**
	60	1,00	-60 to 325/350	**TR-111062**
	100	1,00	-60 to 325/350	**TR-111092**
	105	1,00	-60 to 325/350	**TR-1110K2**
0,32	15	0,10	-60 to 325/350	**TR-110113**
	15	0,25	-60 to 325/350	**TR-110213**
	15	0,50	-60 to 325/350	**TR-110513**
	15	1,00	-60 to 325/350	**TR-111013**
	15	3,00	-60 to 280/300	**TR-113013**
	25	0,10	-60 to 325/350	**TR-110123**
	25	0,25	-60 to 325/350	**TR-110223**
	25	0,50	-60 to 325/350	**TR-110523**
	25	1,00	-60 to 325/350	**TR-111023**
	25	3,00	-60 to 280/300	**TR-113023**
	30	0,10	-60 to 325/350	**TR-110133**
	30	0,25	-60 to 325/350	**TR-110233**
	30	0,50	-60 to 325/350	**TR-110533**
	30	1,00	-60 to 325/350	**TR-111033**
	30	3,00	-60 to 280/300	**TR-113033**
	50	0,10	-60 to 325/350	**TR-110153**
	50	0,25	-60 to 325/350	**TR-110253**
	50	0,50	-60 to 325/350	**TR-110553**
	50	1,00	-60 to 325/350	**TR-111053**
	50	3,00	-60 to 280/300	**TR-113053**
	60	0,10	-60 to 325/350	**TR-110163**
	60	0,25	-60 to 325/350	**TR-110263**
	60	0,50	-60 to 325/350	**TR-110563**
	60	1,00	-60 to 325/350	**TR-111063**
	60	3,00	-60 to 280/300	**TR-113063**
	60	5,00	-60 to 260/280	**TR-115063**
0,53	10	2,65	-60 to 300/310	**TR-112645**
	15	0,10	-60 to 320/340	**TR-110115**
	15	0,50	-60 to 320/340	**TR-110515**
	15	1,50	-60 to 310/330	**TR-111515**
	15	3,00	-60 to 270/290	**TR-113015**
	15	5,00	-60 to 270/290	**TR-115015**
	15	7,00	-60 to 260/280	**TR-117015**
	25	0,10	-60 to 320/340	**TR-110125**
	25	0,50	-60 to 320/340	**TR-110525**
	25	1,50	-60 to 310/330	**TR-111525**
	25	3,00	-60 to 270/290	**TR-113025**
	25	5,00	-60 to 270/290	**TR-115025**
	30	0,10	-60 to 320/340	**TR-110135**
	30	0,50	-60 to 320/340	**TR-110535**
	30	0,88	-60 to 310/330	**TR-110835**
	30	1,50	-60 to 310/330	**TR-111535**
	30	2,65	-60 to 270/290	**TR-112635**
	30	3,00	-60 to 270/290	**TR-113035**
	30	5,00	-60 to 270/290	**TR-115035**
	30	7,00	-60 to 260/280	**TR-117035**
	50	0,10	-60 to 320/340	**TR-110155**
	50	0,50	-60 to 320/340	**TR-110555**
	50	1,50	-60 to 310/330	**TR-111555**
	50	3,00	-60 to 270/290	**TR-113055**
	50	5,00	-60 to 270/290	**TR-115055**
	60	0,10	-60 to 320/340	**TR-110165**
	60	0,50	-60 to 320/340	**TR-110565**
	60	1,50	-60 to 310/330	**TR-111565**
	60	3,00	-60 to 270/290	**TR-113065**
	60	5,00	-60 to 270/290	**TR-115065**
	60	7,00	-60 to 240/260	**TR-117065**
	100	3,00	-60 to 270/290	**TR-113095**
	105	3,00	-60 to 270/290	**TR-1130K5**

TRB-1HT/TKM-1HT

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- Non-polar phase
- Produced specially for high temperature analyses (Max. temp. 400ºC)
- Available in fused silica (TRB-1HT) and metal tubing (TKM-1HT) add "**M**" at the end of the desired P/N
- Uses: analysis of compounds with high boiling point, triglycerides, waxes, etc.



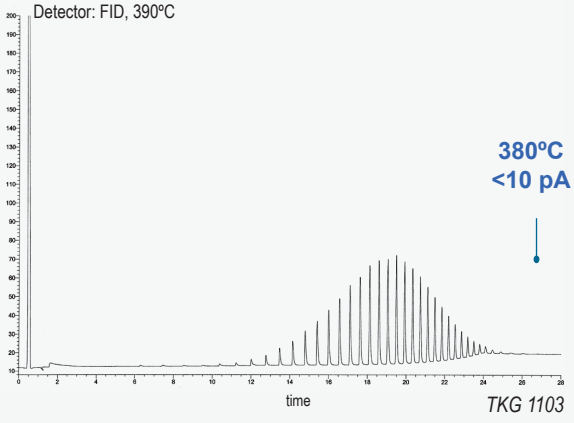
Structure of Poly (dimethyl) siloxane

TRB-1HT Equivalent Phase

Agilent: DB-1HT, Select Mineral Oil
Restek: Stx-1HT, Rxi-1HT
Phenomenex: ZB-1HT Inferno, ZB-XTSimDist
SGE: BPX1

TRB-1HT

Column: Retention Gap (intermediate polarity) 5 m x 0,53 mm (TR-200055) + **TRB-1HT** (TR-610113) 15 m x 0.32 mm x 0.10 µm
Oven: 50ºC (2 min) to 380ºC (5 min) @ 15ºC/min
Injection: 0,3 µL Poliwax 655 (0,1% in CS2), on column (sec. cool 30 s), 280ºC
Carrier gas: H_2, ct flow 2mL/min
Detector: FID, 390ºC



TRB-1HT

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,10	-60 to 400	**TR-610112**
	30	0,10	-60 to 400	**TR-610132**
0,32	15	0,10	-60 to 400	**TR-610113**
	30	0,10	-60 to 400	**TR-610133**

TKM-1HT SimDist

100% Dimethyl polysiloxane, bonded and crosslinked phase.

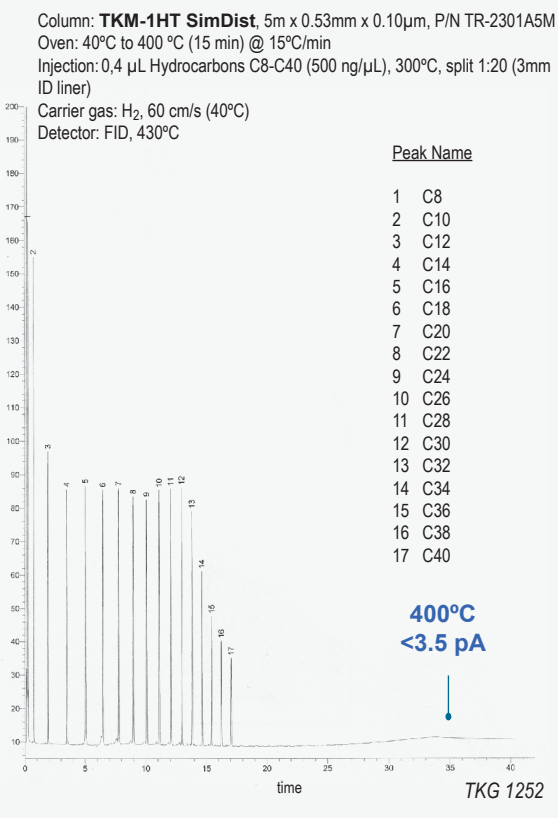
- True methyl silicone polarity
- Unbreakable, specially treated stainless steel
- Maximum temperature 430ºC
- Low bleed at 400ºC (Typical values of 4-6 pA)
- Distillation range C6 to C120

TKM-1HT SimDist Equivalent Phase

Agilent: DB-HT SimDist, CP-SimDist Ultimetal
Restek: MXT-1HT SimDist
Phenomenex: ZB-1HT Inferno, ZB-XTSimDist
SGE: BPX1
SUPELCO: HT5

TKM-1HT SimDist

Column: **TKM-1HT SimDist**, 5m x 0.53mm x 0.10µm, P/N TR-2301A5M
Oven: 40ºC to 400 ºC (15 min) @ 15ºC/min
Injection: 0,4 µL Hydrocarbons C8-C40 (500 ng/µL), 300ºC, split 1:20 (3mm ID liner)
Carrier gas: H_2, 60 cm/s (40ºC)
Detector: FID, 430ºC



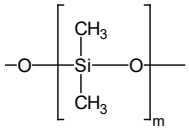
TKM-1HT SimDist

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	5	0,10	-60 to 400/430	**TR-2301A5M**
	5	0,15	-60 to 400/430	**TR-2313A5M**

TRB-1MS

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- These columns gives identical selectivity to the TRB-1, fulfil column bleed specifications that make them compatible with analysis of trace components with GC/MS. Therefore, the standard column of 30 m x 0.25 mm x 0.25 µm has a guaranteed maximum bleed of 4 pA at 320 °C
- Great chemical inertness towards active compounds and excellent thermal stability
- Improved signal/noise ratio, which enables greater sensitivity with MS, ECD, NPD, SCD, etc. detectors and provides greater precision in quantitative analysis at trace levels
- Less column bleed means less detectors contamination and faster column conditioning



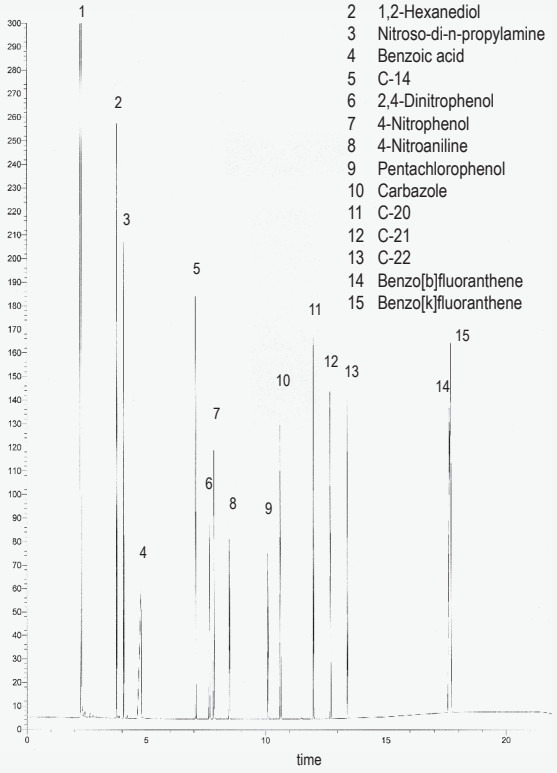
Structure of Poly (dimethyl) siloxane

TRB-1MS: MX5 Test

Column: **TRB-1MS**, 60m x 0.25mm x 0.25µm, P/N TR-510262
Oven: 100ºC to 325 ºC (5 min) @ 6ºC/min
Injection: 1µL Test MX5 (10 to 20 ng/comp. on column), split 1:100, 280ºC
Carrier gas: H_2, ct pressure 25 psi (172 kPa).
Detector: FID, 340 ºC

Peak Name

1 Methylene chloride
2 1,2-Hexanediol
3 Nitroso-di-n-propylamine
4 Benzoic acid
5 C-14
6 2,4-Dinitrophenol
7 4-Nitrophenol
8 4-Nitroaniline
9 Pentachlorophenol
10 Carbazole
11 C-20
12 C-21
13 C-22
14 Benzo[b]fluoranthene
15 Benzo[k]fluoranthene



TKG 1104

TRB-1MS Equivalent Phase

Agilent: HP-1MS, DB-1MS, VF-1MS, CP-SIL 5 CB MS
Restek: Rtx-1MS
Phenomenex: ZB-1MS
Macherey-Nagel: OPTIMA-1MS, OPTIMA-1MS Accent
Supelco: EQUITY-1
SGE: SOLGEL-1MS, BPX-1

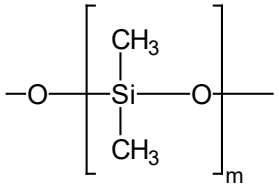
TRB-1MS

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325/350	**TR-510141**
	10	0,40	-60 to 325/350	**TR-510441**
	20	0,10	-60 to 325/350	**TR-510181**
	20	0,40	-60 to 325/350	**TR-510481**
0,18	20	0,18	-60 to 325/350	**TR-510984**
	40	0,18	-60 to 325/350	**TR-5109C4**
0,20	12	0,33	-60 to 325/350	**TR-5133B9**
	15	0,33	-60 to 325/350	**TR-513319**
	25	0,33	-60 to 325/350	**TR-513329**
	30	0,33	-60 to 325/350	**TR-513339**
	50	0,33	-60 to 325/350	**TR-513359**
	60	0,33	-60 to 325/350	**TR-513369**
0,25	15	0,10	-60 to 325/350	**TR-510112**
	15	0,25	-60 to 325/350	**TR-510212**
	15	1,00	-60 to 325/350	**TR-511012**
	30	0,10	-60 to 325/350	**TR-510132**
	30	0,25	-60 to 325/350	**TR-510232**
	30	1,00	-60 to 325/350	**TR-511032**
	60	0,10	-60 to 325/350	**TR-510162**
	60	0,25	-60 to 325/350	**TR-510262**
	60	1,00	-60 to 325/350	**TR-511062**
0,32	15	0,10	-60 to 325/350	**TR-510113**
	15	0,25	-60 to 325/350	**TR-510213**
	15	0,50	-60 to 325/350	**TR-510513**
	15	1,00	-60 to 325/350	**TR-511013**
	60	1,00	-60 to 325/350	**TR-511062**
	30	0,10	-60 to 325/350	**TR-510133**
	30	0,25	-60 to 325/350	**TR-510233**
	30	0,50	-60 to 325/350	**TR-510533**
	30	1,00	-60 to 325/350	**TR-511033**
	60	0,10	-60 to 325/350	**TR-510163**
	60	0,25	-60 to 325/350	**TR-510263**
	60	0,50	-60 to 325/350	**TR-510563**
	60	1,00	-60 to 325/350	**TR-511063**
0,53	15	0,50	-60 to 320/340	**TR-510515**
	15	1,00	-60 to 320/340	**TR-511015**
	15	1,50	-60 to 310/330	**TR-511515**
	30	0,50	-60 to 320/340	**TR-510535**
	30	1,00	-60 to 320/340	**TR-511035**
	30	1,50	-60 to 310/330	**TR-511535**

TRB-SULFUR

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- Column specially designed for the analysis of sulphurous compounds (in natural gas, petrol derivates, wines, beer, etc.)
- Guaranteed thermal stability, with low column bleed



Structure of Poly (dimethyl) siloxane

TRB-SULFUR Equivalent Phase

Agilent: CP-Select CB for Sulfur, CP-Sil 5CB for Sulfur
Supelco: SPB-1 SULFUR

TRB-SULFUR

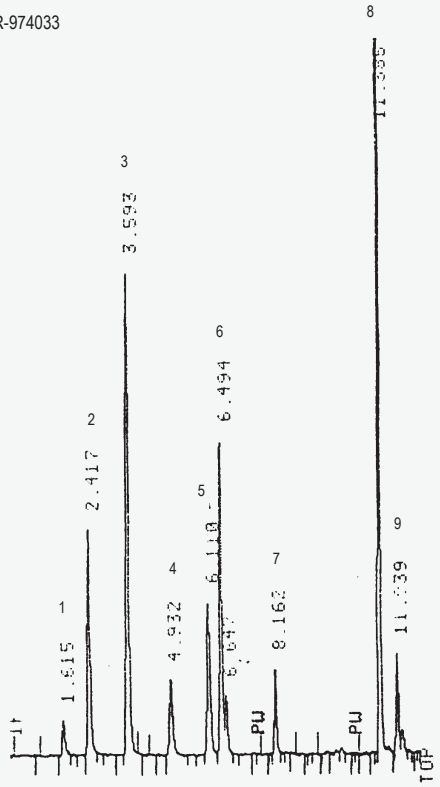
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	30	4,00	-60 to 270/290	**TR-974033**

TRB-SULFUR: MERCAPTANS

Column: **TRB-SULFUR** , 30 m x 0.32 mm x 4.0 µm, TR-974033

Peak Name

1 SH2
2 Methyl mercaptan
3 Ethyl mercaptan
4 2-Propylmercaptan
5 Terbutyl mercaptan
6 Methyl ethyl sulfide
7 1-Propylmercaptan
8 2-Butyl mercaptan
9 T.H.T.

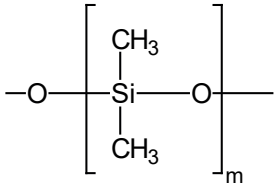


TKG 1105

TRB-PETROL

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- Column for analyzing complex mixtures of hydrocarbons according to the ASTM regulations (American Society for Testing and Materials)
- Sufficient resolution power to undertake PNA, PONA and PIANO analysis



Structure of Poly (dimethyl) siloxane

TRB-PETROL Equivalent Phase

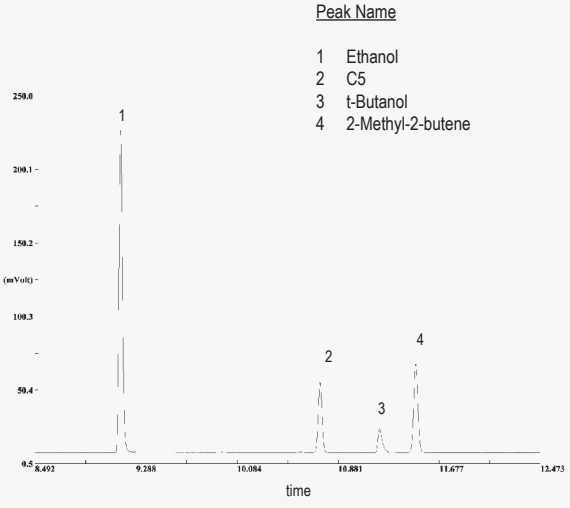
Agilent: DB-Petro,HP-1, CP-Sil PONA CB
Supelco: Petrocol DH
Phenomenex: ZB-DHA-PONA
Restek: Rtx-DHA-100
SGE: BP1 PONA

TRB-PETROL

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	100	0,50	-60 to 300/320	**TR-110592**

TRB-PETROL (PONA column) meets all ASTM specifications

	ASTM D-6730 Specifications
C5 efficiency (total theoretical plates): 618.503	450.000-550.000
K (C5): 0.47	0.45-0.50
t-Butanol skewness: 1.62	>1.00 - < 5.00
Resolution t-Butanol/2-Methylbutene-2: 4.41	3.25-5.25

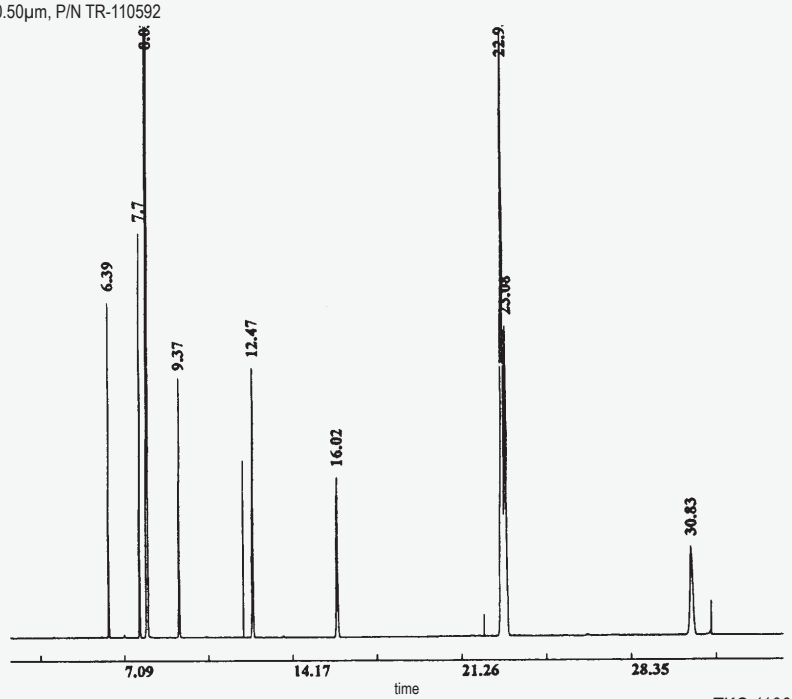


TKG 1254

TRB-PETROL: HYDROCARBONS

Column: **TRB-PETROL**, 100m x 0.25mm x 0.50µm, P/N TR-110592
Oven: 60°C (isothermal)
Injector: 260°C
Carrier gas: H_2, 34 psi
Injection: Test for hydrocarbons, split (1:100)
Detector: FID, 260°

tr (min.)	Compound
6.39	n-Hexane
7.70	Benzene
8.03	Cyclohexane
9.37	n-Heptane
12.47	Toluene
16.02	n-Octane
22.93	m-Xylene
23.08	p-Xylene
30.83	n-Nonane

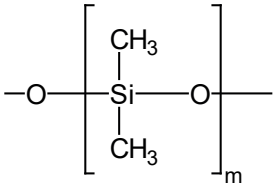


TKG 1106

TRB-50.2PONA

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- Column designed for the complete analysis of PONA hydrocarbons (Paraffins, Olefins, Naphthenes and Aromatics) in petrol-derived products according to the ASTM regulations, method D5134



Structure of Poly (dimethyl) siloxane

TRB-50.2PONA Equivalent Phase

Agilent: HP-PONA, CP-SIL PONA CB, HP-1
Supelco: Petrocol DH 50.2
Restek: Rtx-DHA-50
SGE: BP1 PONA
Phenomenex: ZB-DHA-PONA

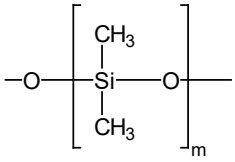
TRB-50.2PONA

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,20	50	0,50	-60 to 320/340	**TR-110559**

TRB-2887 / TKM-2887

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- Designed specifically for simulated distillation according to the ASTM method D2887
- Available in fused silica (TRB-2887) and metal Tubing (TKM-2887)



Structure of Poly (dimethyl) siloxane

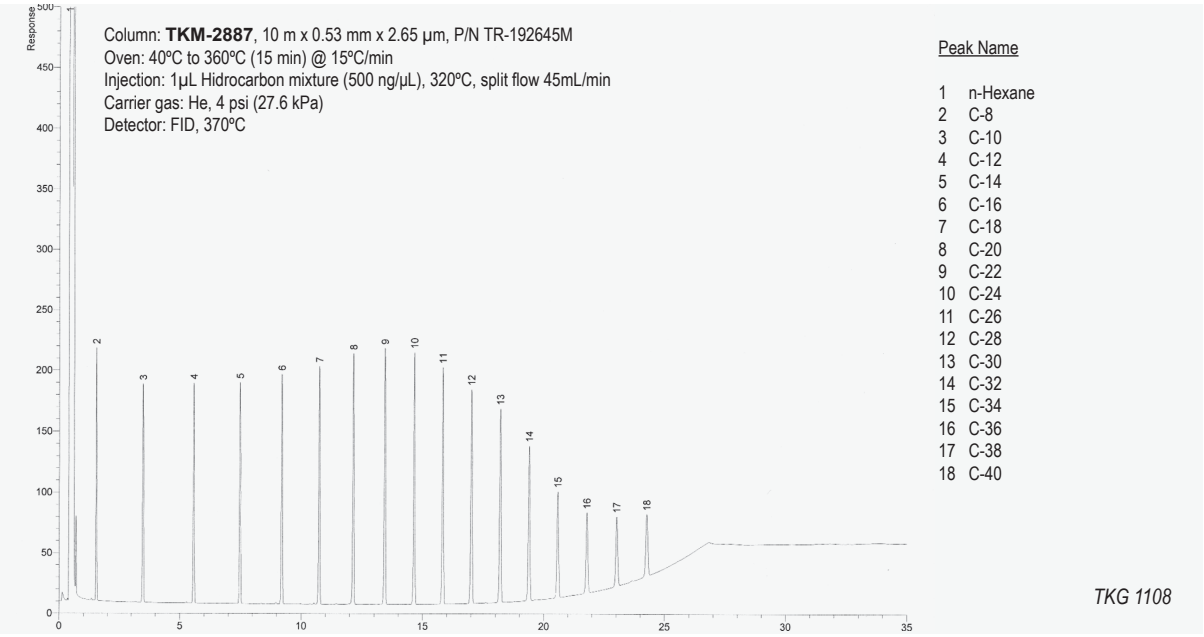
TRB-2887/ TKM-2887 Equivalent Phase

Agilent: DB-2887
Supelco: Petrocol-2887; Petrocol-EX2887
Restek: Rtx-2887, MXT-2887
Phenomenex: ZB-1HT Inferno, ZB-1XT SimDist
SGE: BPX1, BP1 PONA

TRB-2887/ TKM-2887

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	10	2,65	-60 to 340/360	**TR-192645**
0,53	10	2,65	-60 to 360/400	**TR-192645M**

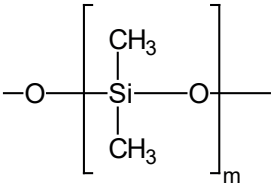
TKM-2887: HYDROCARBONS C6-C40



TRB-Petro.150

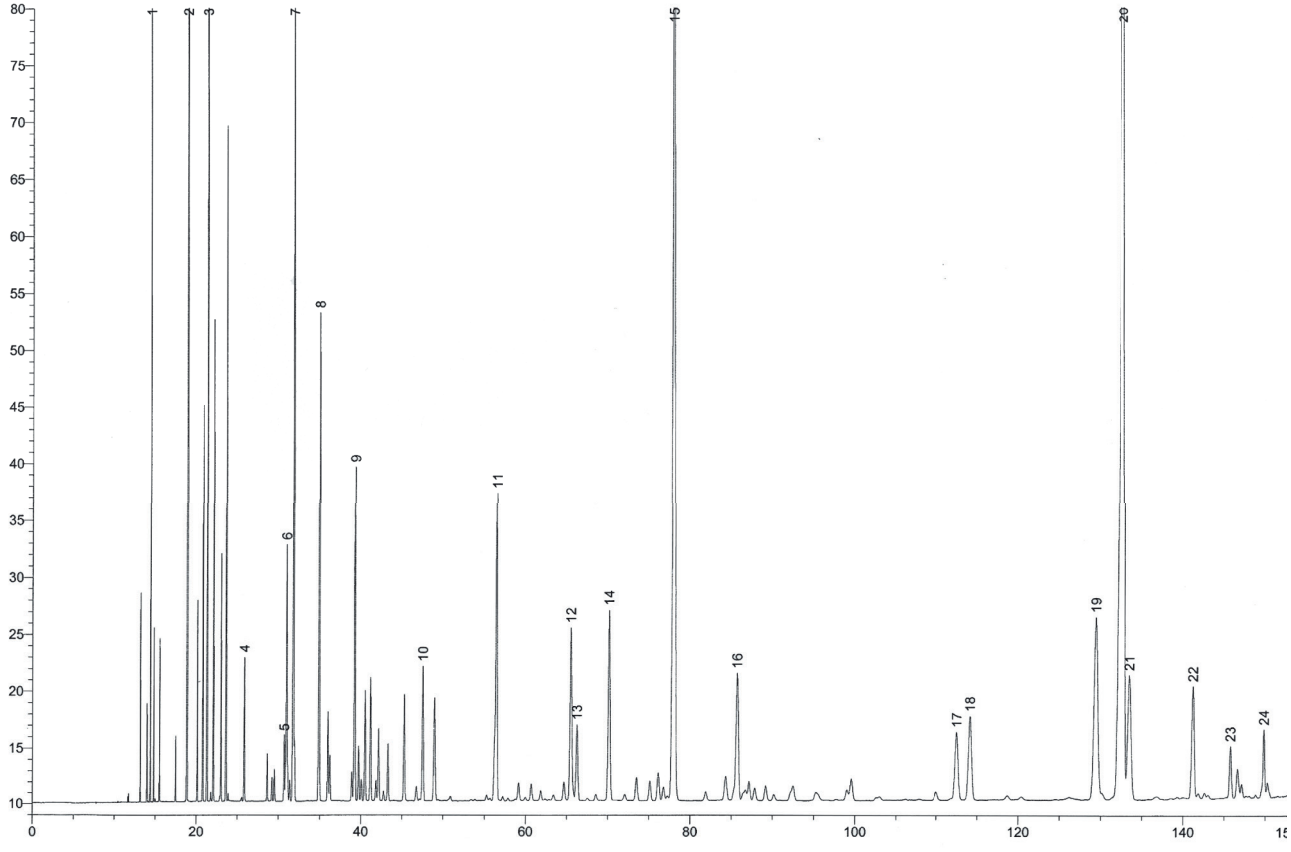
100% Dimethyl polysiloxane, bonded and crosslinked phase.

- Maximum resolution for hydrocarbon analysis



Structure of Poly (dimethyl) siloxane

TRB-PETRO.150



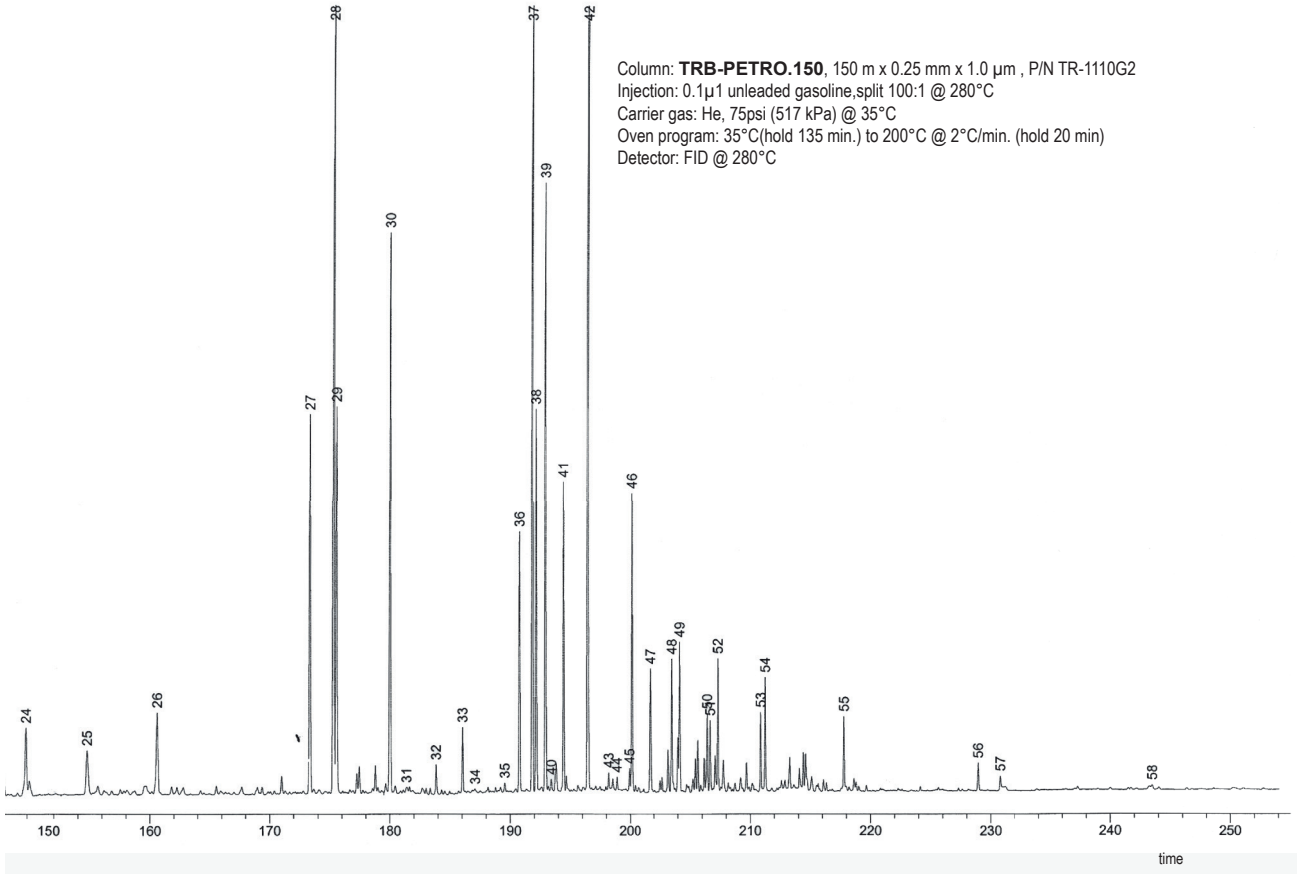
1	n-Butane	11	Benzene	21	2,3,3- Trimethylpentane
2	Isopentane	12	2-Methylhexane	22	2,3-Dimethylhexane
3	n-Pentane	13	2,3-Dimethylpentane	23	2-Methylheptane
4	2,2-Dimethylbutane	14	3-Methylhexane	24	3-Methylheptane
5	Cyclopentane	15	2,2,4- Trimethylpentane	25	2-Methyl-1-heptene
6	2,3-Dimethylbutane	16	n-Heptane	26	n-Octane
7	2-Methylpentane	17	2,5-Dimethylhexane	27	Ethylbenzene
8	3-Methylpentane	18	2,4-Dimethylhexane	28	m-Xylene
9	n-Hexane	19	2,3,4-Trimethylpentane	29	p-Xylene
10	2,4-Dimethylpentane	20	Toluene	30	o-Xylene

TRB-Petro.150 Equivalent Phase

Agilent: DB-1, CP-Sil PONA CB
Supelco: Petrocol DH 150
Restek: Rtx-DHA-150
Phenomenex: ZB-DHA-PONA
SGE: BP1 PONA

TRB-Petro.150

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	**1**50	1,00	-60 to 300/320	**TR-1110G2**



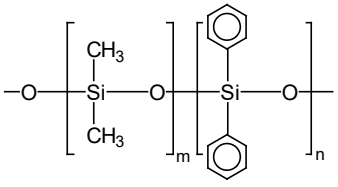
31 1-Nonene
32 n-Nonane
33 Isopropylbenzene
34 3,3,5- Trimethylheptane
35 2,4,5- Trimethylheptane
36 n-Propylbenzene
37 1-Methyl-3-ethylbenzene
38 1-Methyl-4-ethylbenzene
39 1,3,5-Trimethylbenzene
40 3,3,4- Trimethylheptane
41 1-Methyl-2-ethylbenzene
42 1,2,4- Trimethylbenzene
43 Isobuthylbenzene
44 sec-Buthylbenzene
45 n-Decane
46 1,2,3- Trimethylbenzene
47 Indane
48 1,3-Diethylbenzene
49 n-Butylbenzene
50 1,4-Dimethyl-2-ethylbenzene
51 1,3- Dimethyl-4-ethylbenzene
52 1,2-Dimethyl-4-ethylbenzene
53 1,2,4,5- Tetramethylbenzene
54 1,2,3,5-Tetramethylbenzene
55 Naphthalene
56 2-Methylnaphthalene
57 1-Methylnaphthalene
58 Dimethylnaphthalenes

TKG 1107

TRB-5

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Most versatile and universal stationary phase in the gas chromatography analysis field
- Characteristic affinity towards compounds with aromatic rings.
- Great thermal stability and chemical inertness for analizing acidic and basic compounds
- Ideal for analysis in the environmental field; dioxines, PCB´s, PCT´s, polyaromatic compounds, phenols, herbicides, organochlorinated and organophosphorus pesticides, aromatic hydrocarbons, solvents, drugs, oils,etc...



Structure of Poly (dimethyldiphenyl) siloxane

TRB-5 Equivalent Phase

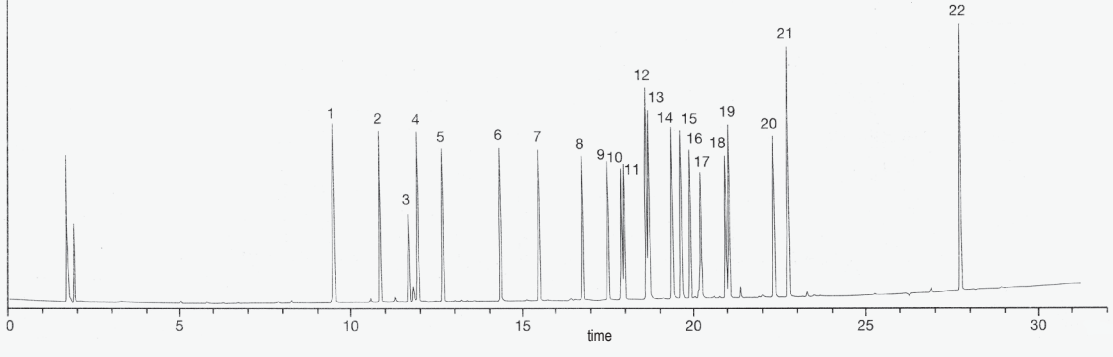
Restek: Rtx-5
Agilent: HP-5, Ultra-2, DB-5, CP-SIL8CB
Supelco: SPB-5, MDN-5
Macherey-Nagel: OPTIMA-5
Phenomenex: ZB-5
SGE: BP5

TRB-5: CHLORINATED PESTICIDES

Column: **TRB-5**, 30 m x 0.25 mm x 0.25 µm, P/N TR-120232
Injection: 1µL chlorinated pesticides mixture, splitless @ 230ºC (25-270 ppb on column)
Oven: 150ºC to 225ºC (10 min.) @ 2ºC/min
Carrier gas: H_2, ct pressure 12 psi (87.7 kPa) 150ºC
Detector: ECD, 310ºC

Peak Name

1	2,4,5,6-Tetrachloro-*m*-xylene	12	4,4´- DDE
2	γ-BHC	13	Dieldrin
3	δ-BHC	14	Endrin
4	Heptachlor	15	4,4´- DDD
5	Aldrin	16	Endosulfan II
6	β-BHC	17	4,4´- DDT
7	δ-BHC	18	Endrin aldehyde
8	Heptachlor epoxide	19	Endosulfan sulfate
9	Endosulfan I	20	Methoxychlor
10	γ-Chlordane	21	Endrin ketone
11	α-Chlordane	22	Decachlorobiphenyl



TKG 1109

TRB-5

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325/350	**TR-120141**
	10	0,17	-60 to 320/350	**TR-121941**
	10	0,33	-60 to 320/350	**TR-123341**
	10	0,40	-60 to 320/350	**TR-120441**
	20	0,10	-60 to 325/350	**TR-120181**
	20	0,40	-60 to 320/350	**TR-120481**
0,18	10	0,18	-60 to 325/350	**TR-120944**
	10	0,40	-60 to 325/350	**TR-120444**
	20	0,18	-60 to 325/350	**TR-120984**
	20	0,40	-60 to 325/350	**TR-120484**
	40	0,18	-60 to 325/350	**TR-1209C4**
0,20	12	0,18	-60 to 325/350	**TR-1233B9**
	15	0,15	-60 to 325/350	**TR-121319**
	15	0,35	-60 to 325/350	**TR-120319**
	15	0,50	-60 to 325/350	**TR-120519**
	25	0,15	-60 to 325/350	**TR-121329**
	25	0,33	-60 to 325/350	**TR-123329**
	25	0,35	-60 to 325/350	**TR-120329**
	25	0,50	-60 to 325/350	**TR-120529**
	30	0,15	-60 to 325/350	**TR-121339**
	30	0,35	-60 to 325/350	**TR-120339**
	30	0,50	-60 to 325/350	**TR-120539**
	50	0,15	-60 to 325/350	**TR-121359**
	50	0,33	-60 to 325/350	**TR-123359**
	50	0,35	-60 to 325/350	**TR-120359**
	50	0,50	-60 to 325/350	**TR-120559**
	60	0,15	-60 to 325/350	**TR-121369**
	60	0,35	-60 to 325/350	**TR-120369**
	60	0,50	-60 to 325/350	**TR-120569**
0,25	15	0,10	-60 to 325/350	**TR-120112**
	15	0,25	-60 to 325/350	**TR-120212**
	15	0,50	-60 to 325/350	**TR-120512**
	15	1,00	-60 to 320/350	**TR-121012**
	25	0,10	-60 to 325/350	**TR-120122**
	25	0,25	-60 to 325/350	**TR-120222**
	25	0,50	-60 to 325/350	**TR-120522**
	25	1,00	-60 to 320/350	**TR-121022**
	30	0,10	-60 to 325/350	**TR-120132**
	30	0,25	-60 to 325/350	**TR-120232**
	30	0,50	-60 to 325/350	**TR-120532**
	30	1,00	-60 to 320/350	**TR-121032**
	50	0,10	-60 to 325/350	**TR-120152**
	50	0,25	-60 to 325/350	**TR-120252**
	50	0,50	-60 to 325/350	**TR-120552**
	50	1,00	-60 to 320/350	**TR-121052**
	60	0,10	-60 to 325/350	**TR-120162**
	60	0,25	-60 to 325/350	**TR-120262**
	60	0,50	-60 to 325/350	**TR-120562**
	60	1,00	-60 to 325/350	**TR-121062**
0,32	15	0,10	-60 to 325/350	**TR-120113**
	15	0,25	-60 to 325/350	**TR-120213**

TRB-5

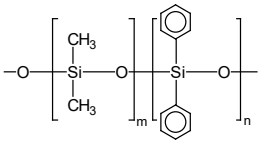
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	15	0,50	-60 to 325/350	**TR-120513**
	15	1,00	-60 to 325/350	**TR-121013**
	15	3,00	-60 to 280/350	**TR-123013**
	25	0.10	-60 to 325/350	**TR-120123**
	25	0,25	-60 to 325/350	**TR-120223**
	25	0,50	-60 to 325/350	**TR-120523**
	25	1,00	-60 to 325/350	**TR-121023**
	25	3,00	-60 to 280/350	**TR-123023**
	30	0,10	-60 to 325/350	**TR-120133**
	30	0,25	-60 to 325/350	**TR-120233**
	30	0,50	-60 to 325/350	**TR-120533**
	30	1,00	-60 to 325/350	**TR-121033**
	30	3,00	-60 to 280/350	**TR-123033**
	50	0,10	-60 to 325/350	**TR-120153**
	50	0,25	-60 to 325/350	**TR-120253**
	50	0,50	-60 to 325/350	**TR-120553**
	50	1,00	-60 to 325/350	**TR-121053**
	50	3,00	-60 to 280/350	**TR-123053**
	60	0,10	-60 to 325/350	**TR-120163**
	60	0,25	-60 to 325/350	**TR-120263**
	60	0,50	-60 to 325/350	**TR-120563**
	60	1,00	-60 to 325/350	**TR-121063**
	60	3,00	-60 to 280/350	**TR-123063**
0,53	10	2,65	-60 to 270/290	**TR-122645**
	15	0,10	-60 to 320/340	**TR-120115**
	15	0,50	-60 to 320/340	**TR-120515**
	15	1,50	-60 to 310/330	**TR-121515**
	15	3,00	-60 to 270/290	**TR-123015**
	15	5,00	-60 to 270/290	**TR-125015**
	25	0,10	-60 to 320/340	**TR-120125**
	25	0,50	-60 to 320/340	**TR-120525**
	25	1,50	-60 to 310/330	**TR-121525**
	25	3,00	-60 to 270/290	**TR-123025**
	25	5,00	-60 to 270/290	**TR-125025**
	30	0,10	-60 to 320/340	**TR-120135**
	30	0,50	-60 to 320/340	**TR-120535**
	30	0,88	-60 to 310/330	**TR-120835**
	30	1,50	-60 to 310/330	**TR-121535**
	30	2,65	-60 to 270/290	**TR-122635**
	30	3,00	-60 to 270/290	**TR-123035**
	30	5,00	-60 to 270/290	**TR-125035**
	50	0,10	-60 to 320/340	**TR-120155**
	50	0,50	-60 to 320/340	**TR-120555**
	50	1,50	-60 to 310/330	**TR-121555**
	50	3,00	-60 to 270/290	**TR-123055**
	50	5,00	-60 to 270/290	**TR-125055**
	60	0,10	-60 to 320/340	**TR-120165**
	60	0,50	-60 to 320/340	**TR-120565**
	60	1,50	-60 to 310/330	**TR-121565**
	60	3,00	-60 to 270/290	**TR-123065**
	60	5,00	-60 to 270/290	**TR-125065**

Teknokroma Capillary Columns

TRB-5HT / TKM-5HT

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Produced specially for analysis at high temperature up to 400ºC
- Available in fused silica (TRB-5HT) and metal tubing (TKM-5HT) add "**M**" at the end of the desired P/N
- Excellent symmetry for compounds with high boiling points
- For analysis of waxes, triglycerides, sterol esters, polyoxyethylenated alcohols, etc.



Structure of Poly (dimethyldiphenyl) siloxane

TRB-5HT Equivalent Phase

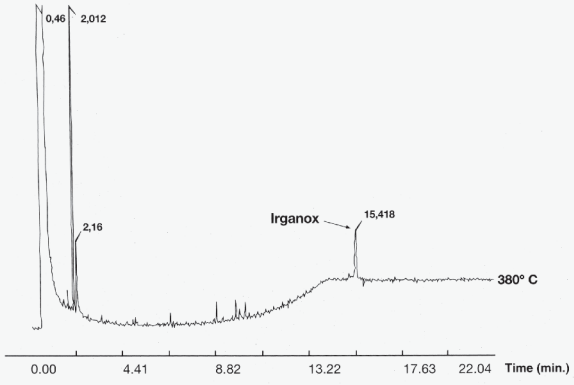
Agilent: DB-5HT, VF-5HT
Phenomenex: ZB-5HT Inferno
Restek: Rxi-5HT, MTX-5HT

TRB-5HT

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,10	-60 to 400	**TR-620112**
	30	0,10	-60 to 400	**TR-620132**
0,32	15	0,10	-60 to 400	**TR-620113**
	30	0,10	-60 to 400	**TR-620133**

TRB-5HT: Irganox ® 1010

Column: **TRB-5HT,** 15m x 0,25 mm x 0,10 µm, P/N TR-620112
Injection: 1µL (Irganox 1010, 12 mg/ml chloroform), split (1:60), 370ºC
Carrier gas: H2, 6psi (41,3 kPa)
Oven: 150°C to 380ºC (10 min) @ 30°C/min
Detector: FID to 390°C

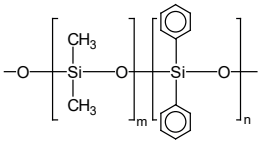


TKG 1110

TRB-STEROL

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Column specifically designed for the analysis of complex mixtures of sterols, from either animal or plant origin.
- The deactivation layer developed by Teknokroma, guarantees high chemical inertness and low bleeding level.
- Allows analysis of sterols without derivatization.
- Column specifically tested for sterols



Structure of Poly (dimethyldiphenyl) siloxane

TRB-STEROL Equivalent Phase

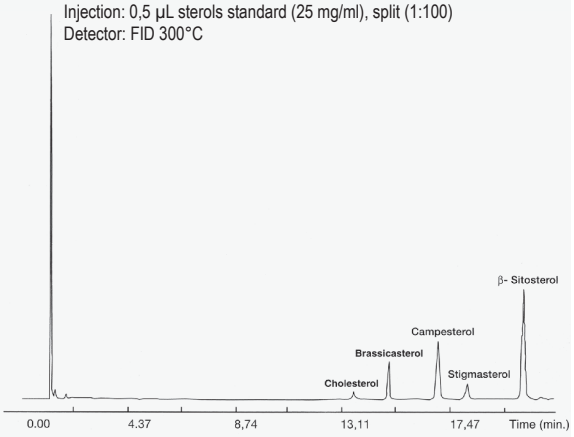
Supelco: SAC-5

TRB-STEROL

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,22	30	0,22	-60 to 325-350	**TR-182238**
	30	0,12	-60 to 325-350	**TR-180738**

TRB-STEROL: Sterols

Column: **TRB-STEROL,** 30m x 0,22 mm x 0,22 µm, P/N TR-182238
Oven: 265ºC
Injector: 280ºC
Carrier gas: H2, 18 psi (124 kPa)
Injection: 0,5 µL sterols standard (25 mg/ml), split (1:100)
Detector: FID 300°C

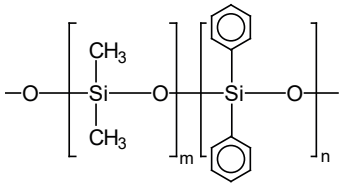


TKG 1111

TRB-5MS

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Same polarity as TRB-5, but the polymer synthesis, the deactivation process and the bonding and crosslinking procedures have been optimized to obtain minimum bleeding and exceptional chemical inertness. Ideal for MS detectors.
- The bleeding specifications for a column of 30 m x 0,25 mm x 0,25 µm (P/N 520232) indicate that it is lower than 4 pA at 320ºC.
- Column recommended to work with any selective detector



Structure of Poly (dimethyldiphenyl) siloxane

TRB-5MS Equivalent Phase

Restek: Rtx-5ms
Agilent: HP-5MS, CP-Sil8-CB MS, PAS-5
Supelco: Equity-5
Macherey-Nagel: OPTIMA-5ms
Phenomenex: ZB-5MSi

TRB-5MS

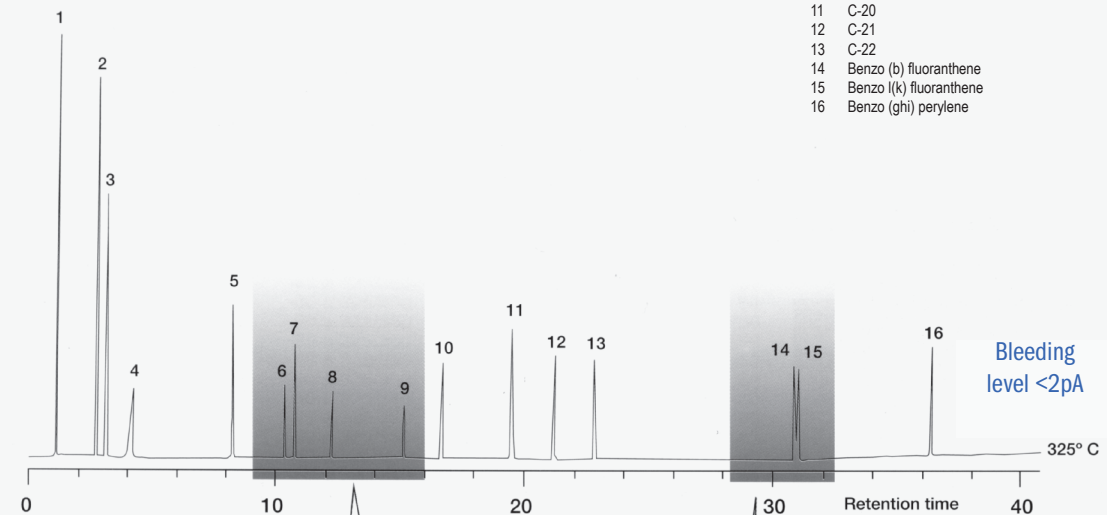
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	-60 to 325-350	**TR-520141**
	10	0,40	-60 to 325-350	**TR-520441**
	20	0,10	-60 to 325-350	**TR-520181**
	20	0,40	-60 to 325-350	**TR-520481**
0,18	20	0,18	-60 to 325-350	**TR-520984**
	40	0,18	-60 to 325-350	**TR-5209C4**
0,20	12	0,33	-60 to 325-350	**TR-5233B9**
	15	0,33	-60 to 325-350	**TR-523319**
	25	0,33	-60 to 325-350	**TR-523329**
	30	0,33	-60 to 325-350	**TR-523339**
	50	0,33	-60 to 325-350	**TR-523359**
	60	0,33	-60 to 325-350	**TR-523369**
0,25	15	0,10	-60 to 325-350	**TR-520112**
	15	0,25	-60 to 325-350	**TR-520212**
	15	1,00	-60 to 325-350	**TR-521012**
	30	0,10	-60 to 325-350	**TR-520132**
	30	0,25	-60 to 325-350	**TR-520232**
	30	1,00	-60 to 325-350	**TR-521032**
	60	0,10	-60 to 325-350	**TR-520162**
	60	0,25	-60 to 325-350	**TR-520262**
	60	1,00	-60 to 325-350	**TR-521062**
0,32	15	0,10	-60 to 325-350	**TR-520113**
	15	0,25	-60 to 325-350	**TR-520213**
	15	0,50	-60 to 325-350	**TR-520513**
	15	1,00	-60 to 325-350	**TR-521013**
	30	0,10	-60 to 325-350	**TR-520133**
	30	0,25	-60 to 325-350	**TR-520233**
	30	0,50	-60 to 325-350	**TR-520533**
	30	1,00	-60 to 325-350	**TR-521033**
	60	0,10	-60 to 325-350	**TR-520163**
	60	0,25	-60 to 325-350	**TR-520263**
	60	0,50	-60 to 325-350	**TR-520563**
	60	1,00	-60 to 325-350	**TR-521063**
0,53	15	0,50	-60 to 320-340	**TR-520515**
	15	1,00	-60 to 320-340	**TR-521015**
	15	1,50	-60 to 310-330	**TR-521515**
	30	0,50	-60 to 320-340	**TR-520535**
	30	1,00	-60 to 320-340	**TR-521035**
	30	1,50	-60 to 310-330	**TR-521535**

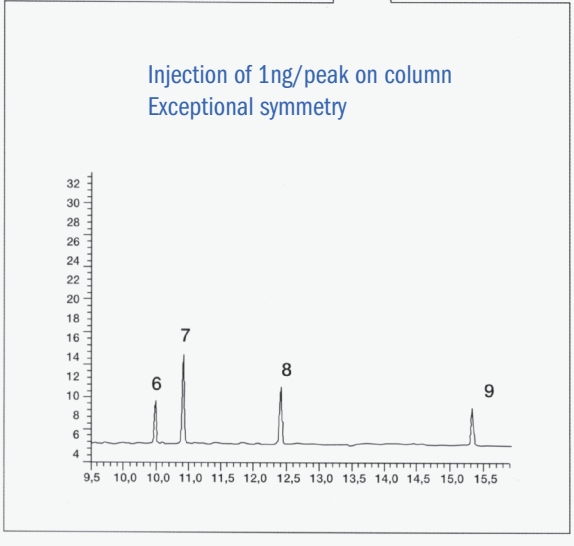
The TRB-5MS column has an excellent resolution and symmetry in all polarity range, for neutral, acid and basic compounds. All these substances that appear in the analysis of semivolatile traces (for example, EPA official methods) can be analyzed in only one column.

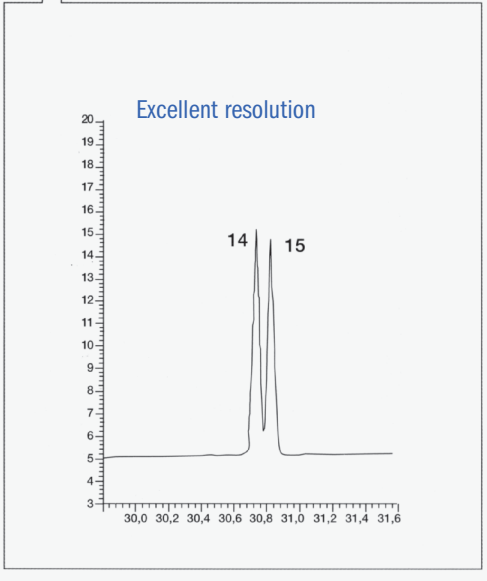
TRB-5MS: Test MX5

Column: **TRB-5MS,** 30 m x 0,25 mm x 0,25 µm, P/N TR-520232
Injection: 1µL, split (1:100), 5 to 10 ng/comp. on column, 280°C
Carrier gas: H_2, 12 psi (87,7 kPa)
Oven: 100°C to 325°C (5 min) @ 6°C/min
Detector: FID, 300°C
Sample: Test MX5

Peak	Name
1	Methylene chloride
2	1,2-Hexanediol
3	Nitroso-di-n-propylamine
4	Benzoic acid
5	C-14
6	2,4-Dinitrophenol
7	4-Nitrophenol
8	4-Nitroaniline
9	Pentachlorophenol
10	Carbazole
11	C-20
12	C-21
13	C-22
14	Benzo (b) fluoranthene
15	Benzo l(k) fluoranthene
16	Benzo (ghi) perylene





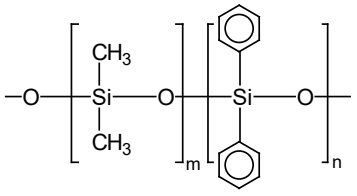


TKG 1112

TRB-5AMINE

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Column specially designed for the analysis of amines
- Proprietary deactivation that minimizes absorption and tailing of basic compounds, like alkylamines, alcoholamines, basic pharmaceuticals, aromatic amines, etc.
- Selectivity and thermal stability equivalent to the TRB-5 columns



Structure of Poly (dimethyldiphenyl) siloxane

TRB-5AMINE Equivalent Phase

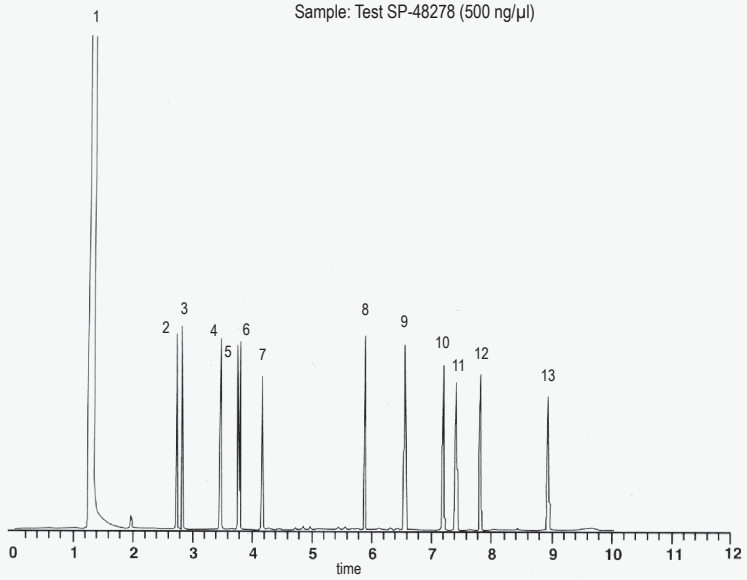
Agilent: CP-Sil 8 CB for Amines
Restek: Rtx-5Amine
Supelco: PTA-5
Macherey-Nagel: OPTIMA-5A

TRB-5AMINE

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,50	-60 to 300/315	**TR-210512**
	15	1,00	-60 to 300/315	**TR-211012**
	30	0,50	-60 to 300/315	**TR-210532**
	30	1,00	-60 to 300/315	**TR-211032**
	60	0,50	-60 to 300/315	**TR-210562**
	60	1,00	-60 to 300/315	**TR-211062**
0,32	15	0,50	-60 to 300/315	**TR-210513**
	15	1,00	-60 to 300/315	**TR-211013**
	15	1,50	-60 to 290/305	**TR-211513**
	30	0,50	-60 to 300/315	**TR-210533**
	30	1,00	-60 to 300/315	**TR-211033**
	30	1,50	-60 to 290/305	**TR-211533**
	60	0,50	-60 to 300/315	**TR-210563**
	60	1,00	-60 to 300/315	**TR-211063**
	60	1,50	-60 to 290/305	**TR-211563**
0,53	15	1,00	-60 to 290/305	**TR-211015**
	15	3,00	-60 to 280/295	**TR-213015**
	30	1,00	-60 to 290/305	**TR-211035**
	30	3,00	-60 to 280/295	**TR-213035**
	60	1,00	-60 to 290/305	**TR-211065**
	60	3,00	-60 to 280/295	**TR-213065**

TRB-5AMINE: Amines Test

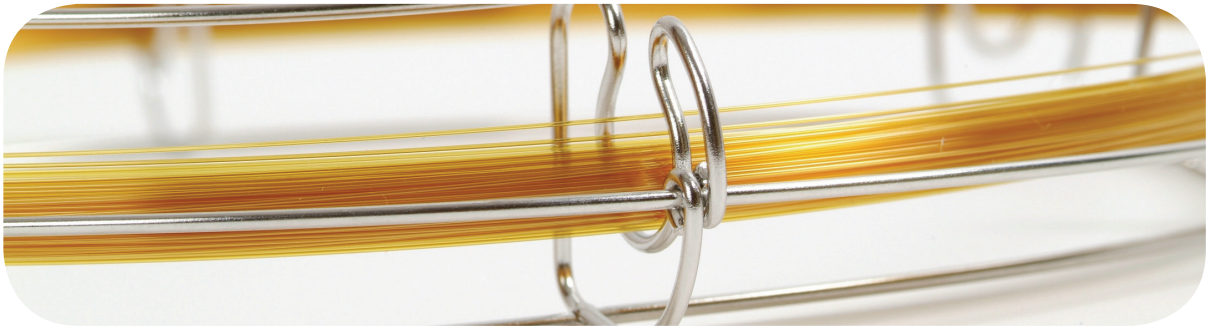
Column: **TRB-5AMINE**, 30 m x 0.25 mm x 0.50 µm , P/N TR-210532
Injection: 1 µL (split 1:50), 280ºC
Carrier gas: H2, 12 psi (87.7 kPa)
Oven: 100ºC to 280ºC (5 min) @ 20 ºC/min
Detector: FID, 300ºC
Sample: Test SP-48278 (500 ng/µl)



Peak Name

1 Methyl tert-butyl ether
2 Benzylamine
3 n-Octylamine
4 n-Nonylamine
5 2,4-Dimethylaniline
6 2,6-Dimethylaniline
7 n-Decylamine
8 C-15
9 C-16
10 C-17
11 Tri-n-hexylamine
12 C-18
13 C-20

TKG 1113



MetAmine-VOL

- For separation of volatile amines (optimized separation) and alcohols.
- Fully compatible with water samples
- Good peak shape for volatile alcohols

MetAmine-VOL Equivalent Phase

Agilent: CP-Volamine
Restek: Rtx-Volatile Amine

MetAmine-VOL

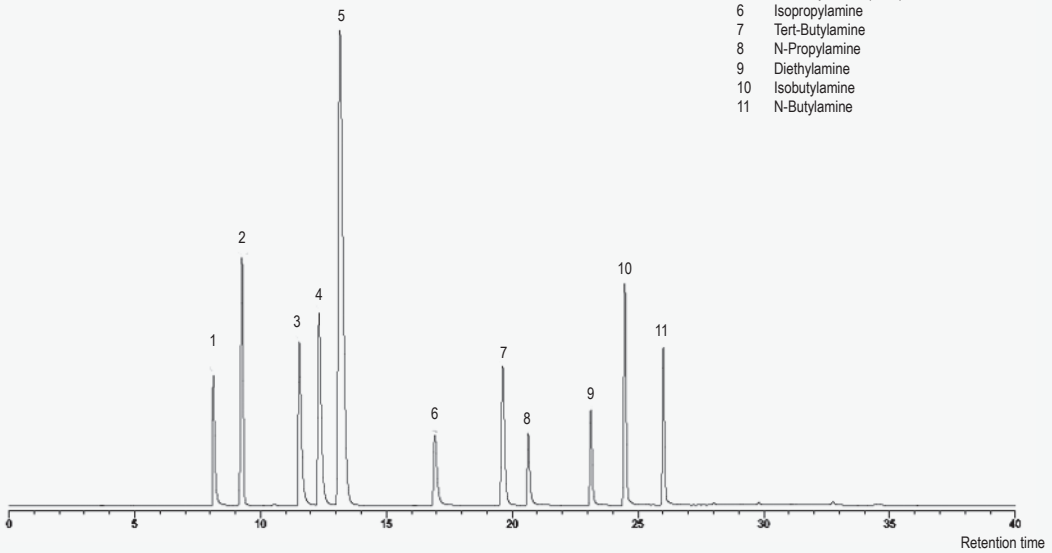
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	15	Optimized	260/280	**TR-635013**
	30	Optimized	260/280	**TR-635033**
	60	Optimized	260/280	**TR-635063**

MetAmine-VOL: Volatile Amines in water

Column: **MetAmine-VOL**, 60 m x 0.32 mm, P/N TR-635063
Injection: 100 µL Head Space 2t, (75°) split 1:15, 180°C
Sample: mix of amines in water
Carrier gas: He, 14 psi (96.5 kPa)
Oven: 40 °C (10 min) to 200 °C @ 10 °C/min
Detector: FID, 225°C

Peak Name

1 Methylamine (MMA)
2 Methanol
3 Dimethylamine (DMA)
4 Ethylamine
5 Trimethylamine (TMA)
6 Isopropylamine
7 Tert-Butylamine
8 N-Propylamine
9 Diethylamine
10 Isobutylamine
11 N-Butylamine

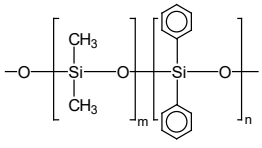


TKG 1256

TRB-5.625

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Column specially manufactured to fulfil the level of inertness required by the EPA methods for the analysis of semivolatile compounds, designed for methods 625, 1625, 8270 and CLP protocols
- Inertness and minimum absorption of acidic, basic and neutral compounds



Structure of Poly (dimethyldiphenyl) siloxane

TRB-5.625 Equivalent Phase

Supelco: PTE-5
Agilent: DB-5.625

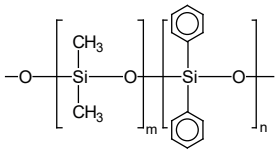
TRB-5.625

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	0,18	-60 to 325/350	**TR-260984**
	20	0,36	-60 to 325/350	**TR-263484**
0,20	12	0,33	-60 to 325/350	**TR-2633B9**
	25	0,33	-60 to 325/350	**TR-263329**
	50	0,33	-60 to 325/350	**TR-263359**
0,25	15	0,10	-60 to 325/350	**TR-260112**
	15	0,25	-60 to 325/350	**TR-260212**
	15	0,50	-60 to 325/350	**TR-260512**
	15	1,00	-60 to 325/350	**TR-261012**
	30	0,10	-60 to 325/350	**TR-260132**
	30	0,25	-60 to 325/350	**TR-260232**
	30	0,50	-60 to 325/350	**TR-260532**
	30	1,00	-60 to 325/350	**TR-261032**
	60	0,10	-60 to 325/350	**TR-260162**
	60	0,25	-60 to 325/350	**TR-260262**
0,32	15	0,10	-60 to 325/350	**TR-260113**
	15	0,25	-60 to 325/350	**TR-260213**
	15	0,50	-60 to 325/350	**TR-260513**
	15	1,00	-60 to 325/350	**TR-261013**
	30	0,10	-60 to 325/350	**TR-260133**
	30	0,25	-60 to 325/350	**TR-260233**
	30	0,50	-60 to 325/350	**TR-260533**
	30	1,00	-60 to 325/350	**TR-261033**
	60	0,10	-60 to 325/350	**TR-260163**
0,53	15	1,50	-60 to 320/340	**TR-261515**
	30	0,50	-60 to 320/340	**TR-260535**
	30	1,00	-60 to 310/330	**TR-261035**
	60	0,25	-60 to 325/350	**TR-260265**

TRB-G27

95% Dimethyl- 5% diphenyl polysiloxane, bonded and crosslinked phase.

- Fulfils the specifications of the American Pharmacopea (USP) for the analysis of organic volatile impurities (OVI) in pharmaceutical products (Methods <USP 467>).



Structure of Poly (dimethyldiphenyl) siloxane

TRB-G27 Equivalent Phase

Restek: Rtx-G27
Supelco: G27

TRB-G27

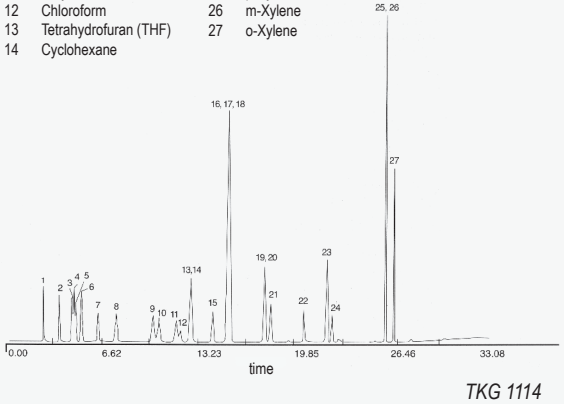
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	30	5,00	-60 to 270/290	**TR-175035**

TRB-G27: Residual solvents in pharmaceutical products

Column: **TRB-G27**, 30 m x 0,53 mm x 5,0 µm, P/N TR-175035
Injection: 220°C, split 1:80, 5 m phenylmethyl deactivated retention gap
Carrier Gas: He, 4.5 psi (31 kPa), 35 cm/s to 35°C
Oven: 35°C (10 min) to 100°C @ 5°C /min to 240°C (5 min) @ 25°C/min
Detector: FID, 250°C
Sample: 0,02 µL solvent mixture

Peak Name

1	Methanol	15	1,2-Dicholoroethane
2	Ethanol	16	Benzene
3	Acetonitrile	17	Carbon tetrachloride
4	Acetone	18	n-Butanol
5	Isopropanol	19	n-Heptane
6	Ethyl ether	20	Trichloroethylene
7	Methylene chloride	21	1,4-Dioxane
8	n-Propanol	22	Pyridine
9	Methyl ethyl ketone (MEK)	23	Toluene
10	n-Hexane	24	Dimethylformamide (DMF)
11	Ethyl acetate	25	p-Xylene
12	Chloroform	26	m-Xylene
13	Tetrahydrofuran (THF)	27	o-Xylene
14	Cyclohexane		

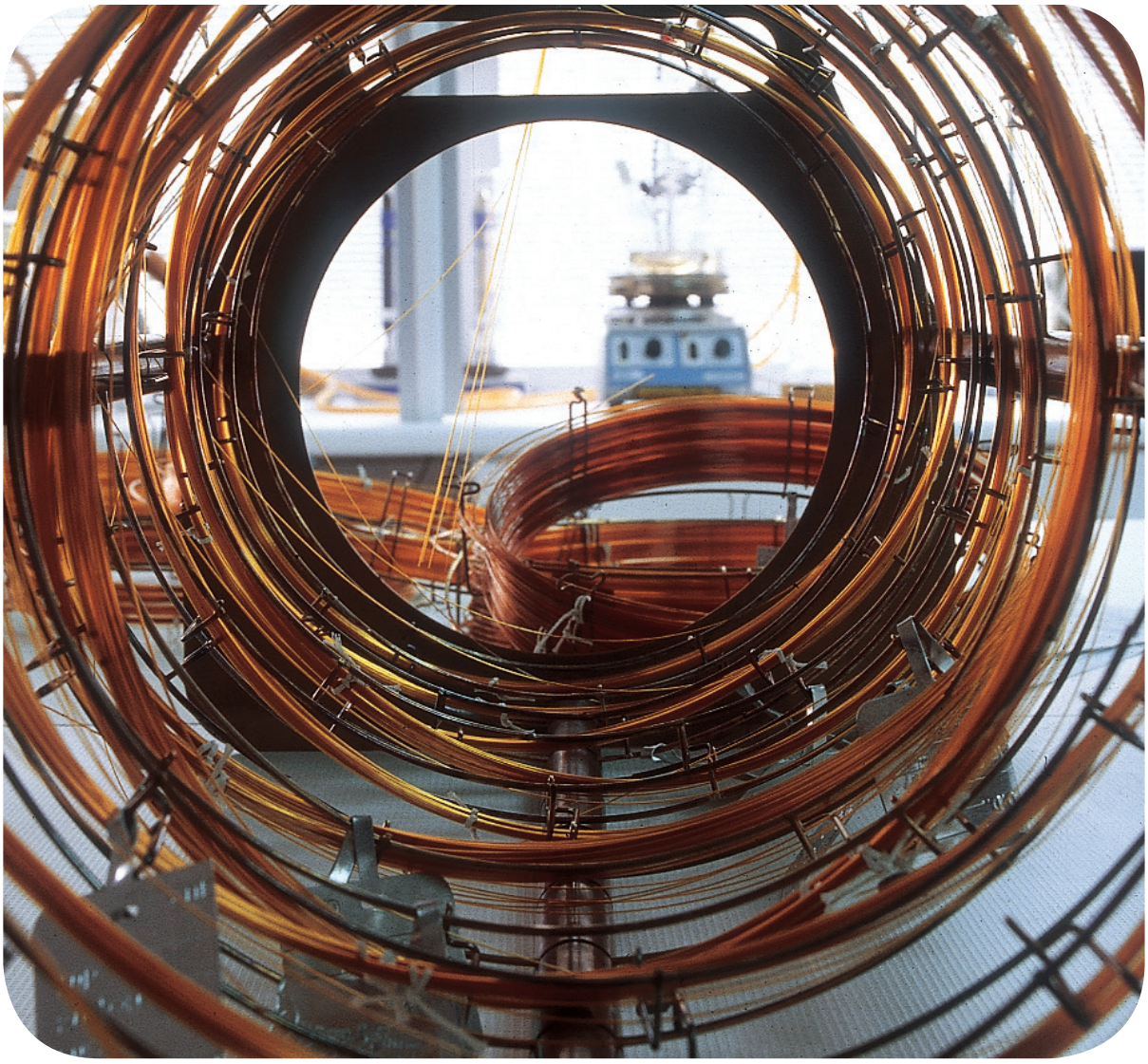


TKG 1114

Teknokroma Capillary Columns

MTI-5

5% Phenyl- 95% methyl polysiloxane, bonded and crosslinked phase.



- Polarity equivalent to Supelco PTE-5 and Agilent HP-5Msi columns
- High inertness and ultra low bleeding
- Column contrasted for analyses of semivolatile contaminant agents (EPA 625, 1625, 8770)
- Maximum thermal stability (360º)

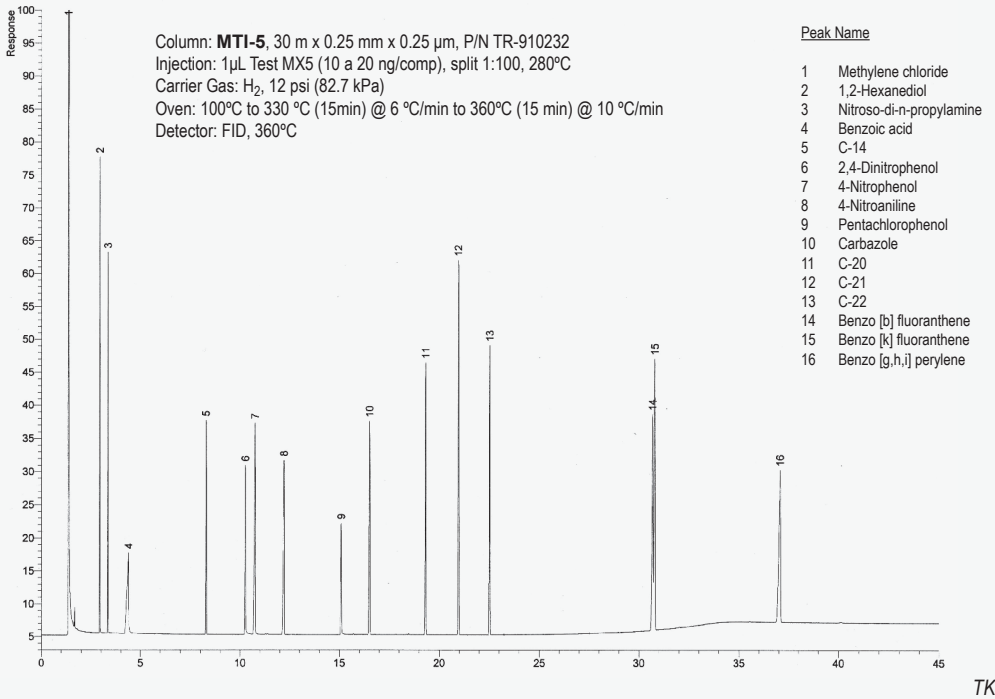
MTI-5 Equivalent Phase

Supelco: PTE-5
Agilent: HP-5Msi

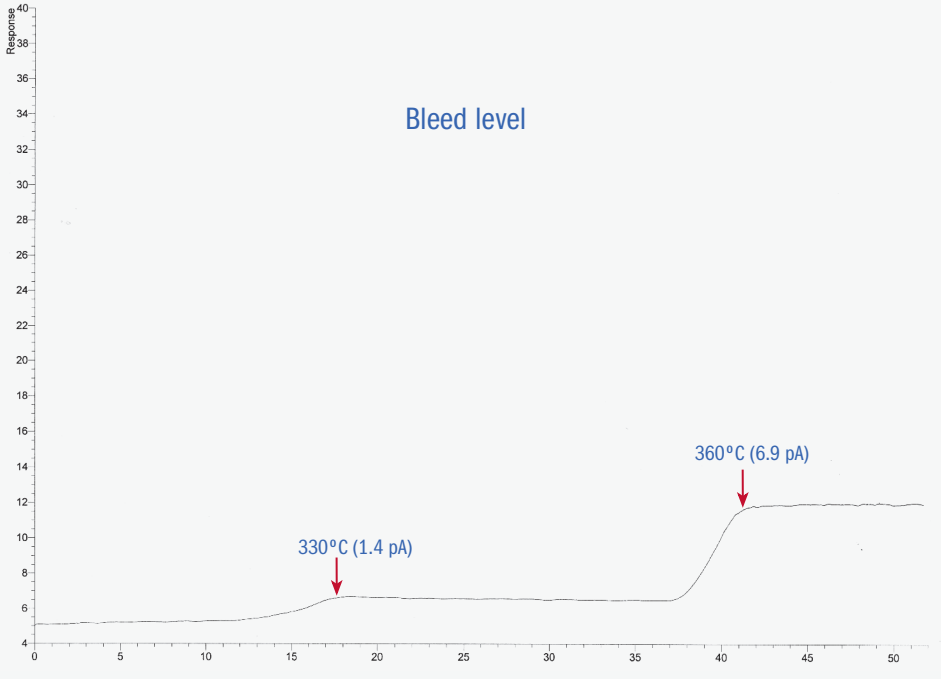
MTI-5

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	30	0,25	-60 to 360	**TR-910232**
0,32	30	0,25	-60 to 360	**TR-910233**
0,53	15	0,50	-60 to 330/360	**TR-910515**

MTI-5: Test



TKG 1207

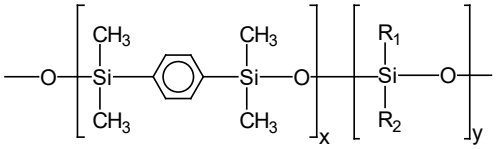


TKG 1208

Meta.X5

Silphenylene phase, selectivity similar to TRB-5, bonded and crosslinked phase.

- Column of choice for the analysis of semivolatile compounds by GC-MS
- Selectivity similar to TRB-5
- New generation of column incorporates arylene groups in the polymer structure, improves thermal stability, reduces bleeding level and provides optimal resolution for aromatic compounds
- Manufacturing procedures guarantees maximal inertness and minimal bleeding level



Structure of Polysiloxane containing p-silphenylene

Meta.X5 Equivalent Phase

Restek: Rtx-5Sil MS
Agilent: DB-5 MS, HP-5TA, CP-SIL8CB Low bleed/MS, VF-5MS
SGE: BPX5, BP5M
Phenomenex: ZB-5MS

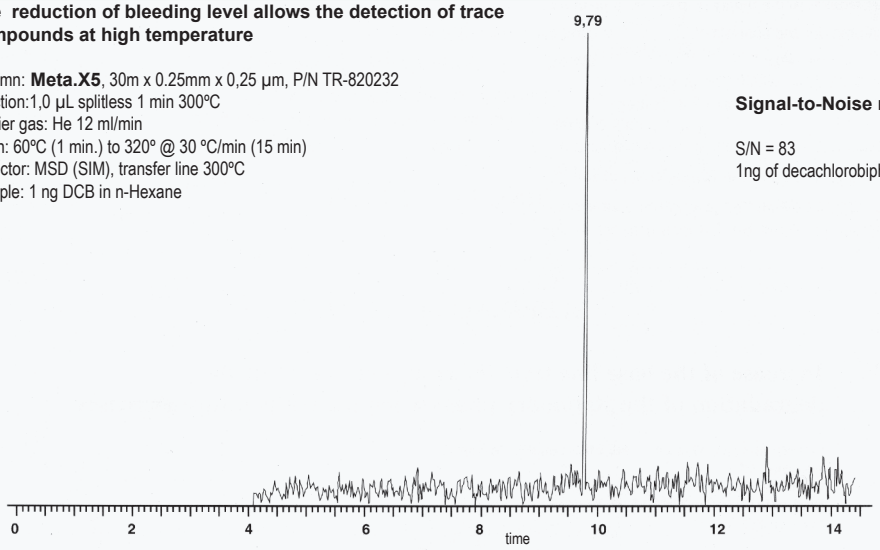
Meta.X5

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	0,18	-60 to 325/350	**TR-820984**
	20	0,36	-60 to 325/350	**TR-823484**
	40	0,18	-60 to 325/350	**TR-8209C4**
0,20	12	0,33	-60 to 325/350	**TR-8233B9**
	25	0,33	-60 to 325/350	**TR-823329**
	50	0,33	-60 to 325/350	**TR-823359**
0,25	15	0,10	-60 to 325/350	**TR-820112**
	15	0,25	-60 to 325/350	**TR-820212**
	15	0,50	-60 to 325/350	**TR-820512**
	15	1,00	-60 to 325/350	**TR-821012**
	30	0,10	-60 to 325/350	**TR-820132**
	30	0,25	-60 to 325/350	**TR-820232**
	30	0,50	-60 to 325/350	**TR-820532**
	30	1,00	-60 to 325/350	**TR-821032**
	60	0,10	-60 to 325/350	**TR-820162**
	60	0,25	-60 to 325/350	**TR-820262**
0,32	15	0,10	-60 to 325/350	**TR-820113**
	15	0,25	-60 to 325/350	**TR-820213**
	15	0,50	-60 to 325/350	**TR-820513**
	15	1,00	-60 to 325/350	**TR-821013**
	30	0,10	-60 to 325/350	**TR-820133**
	30	0,25	-60 to 325/350	**TR-820233**
	30	0,50	-60 to 325/350	**TR-820533**
	30	1,00	-60 to 325/350	**TR-821033**
	60	0,10	-60 to 325/350	**TR-820163**
	60	0,25	-60 to 325/350	**TR-820263**
0,53	15	0,50	-60 to 320/340	**TR-820515**
	15	1,00	-60 to 320/340	**TR-821015**
	15	1,50	-60 to 320/340	**TR-821515**
	30	0,50	-60 to 320/340	**TR-820535**
	30	1,00	-60 to 320/340	**TR-821035**
	30	1,50	-60 to 310/330	**TR-821535**

Meta.X5: Signal-to-Noise ratio

The reduction of bleeding level allows the detection of trace compounds at high temperature

Column: **Meta.X5**, 30m x 0.25mm x 0,25 µm, P/N TR-820232
Injection:1,0 µL splitless 1 min 300ºC
Carrier gas: He 12 ml/min
Oven: 60ºC (1 min.) to 320º @ 30 ºC/min (15 min)
Detector: MSD (SIM), transfer line 300ºC
Sample: 1 ng DCB in n-Hexane

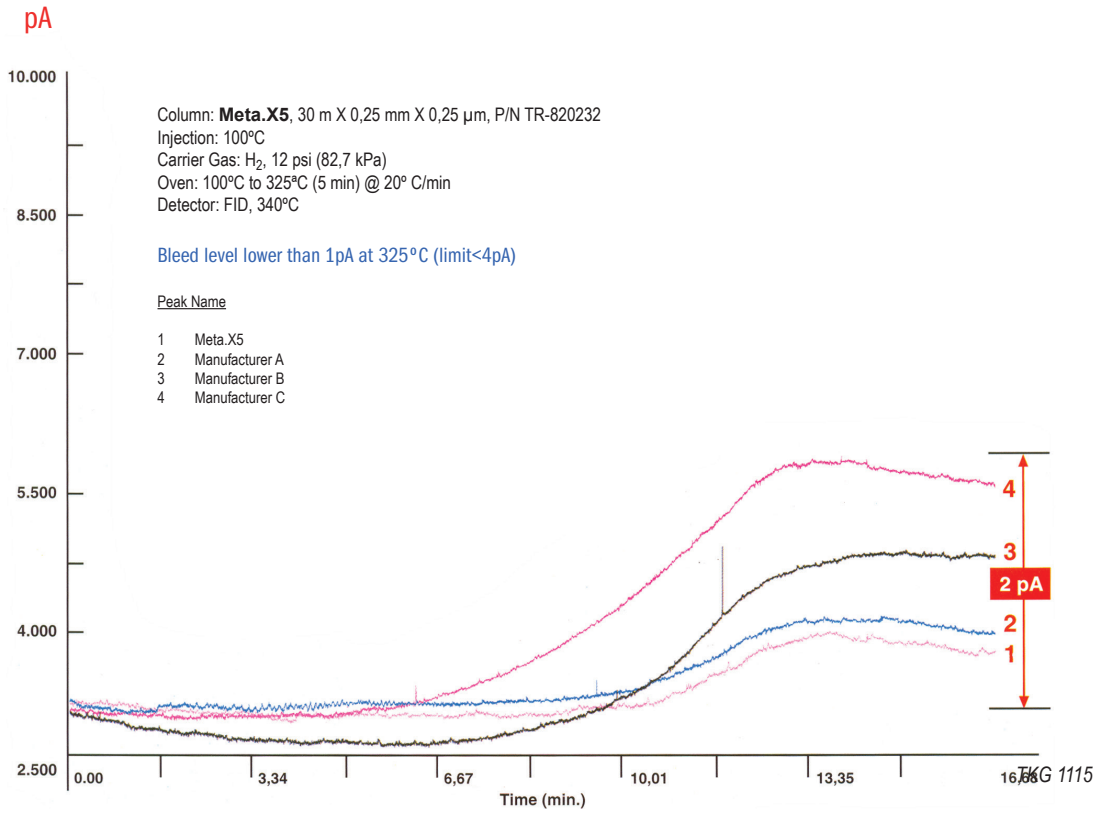


Signal-to-Noise ratio

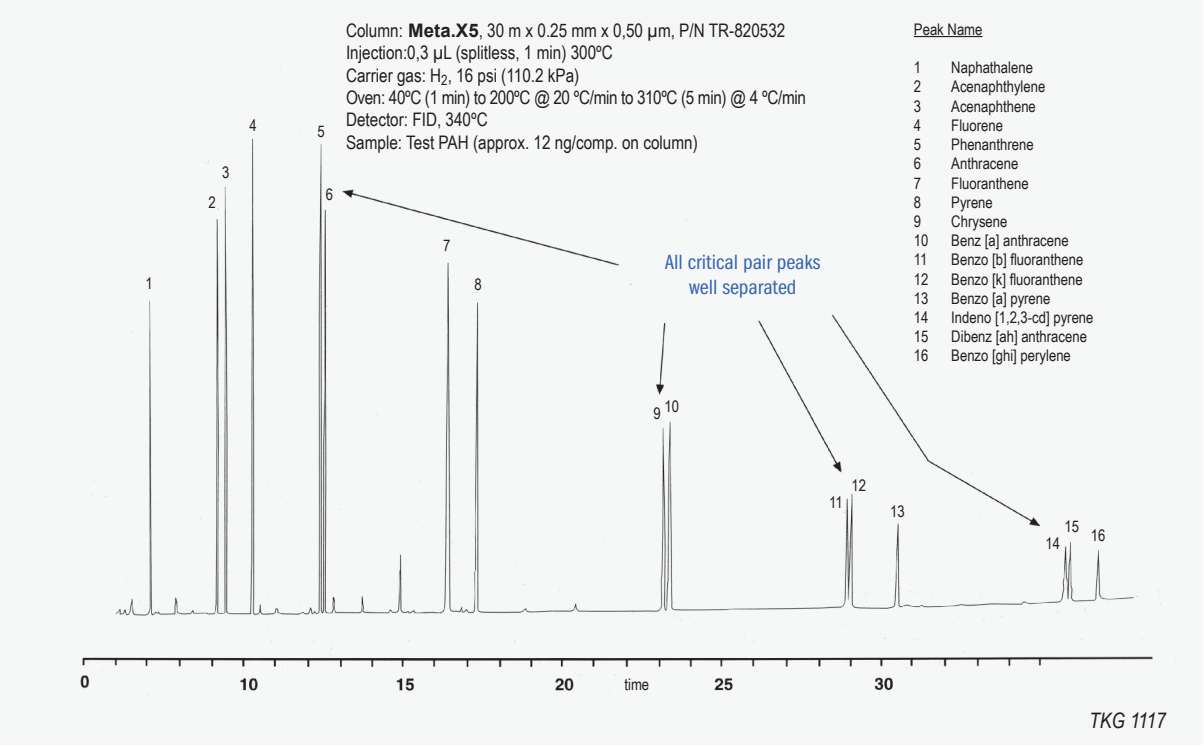
S/N = 83
1ng of decachlorobiphenyl (DCB)

TKG 1116

Meta.X5: Column Bleed comparison



Meta.X5: Polycyclic aromatic hydrocarbons PAHs Method (EPA Method 610)



Meta.X5 TRIAZINE (proprietary phase)

Silphenylene phase, selectivity similar to TRB-5, bonded and crosslinked.

- New formulation of Meta.X5 stationary phase. Ideal for separation of Triazine herbicides from EPA 609 method.
- Low bleed and excelent inertness for the analysis of traces of herbicides by GC/MS.
- General purpose column for pesticides.

Meta.X5 TRIAZINE

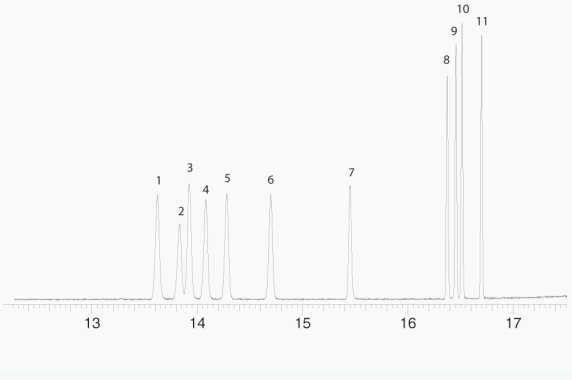
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,30	30	0,25	325/350ºC	**TR-410232**

Meta.X5 TRIAZINE: Triazine Herbicides

Column: **Meta.X5 TRIAZINE**, 30m x 0.25mm x 0,25 µm, P/N TR-410232
Injection: split 1:25, 250 ºC
Carrier gas: He, ct flow 1.0 ml/min
Oven: 80 ºC (0.5 min) to 160 ºC (7 min) @ 30 ºC/min to 195ºC @ 7 ºC/min to 290 ºC (3 min) @ 45 ºC/min
Transfer Line: 290ºC
Ionization mode: EI
Scan range: 50-450 amu
Sample: Triazine herbicides EPA 619 2 ng/compound on column

Peak Name

1 Atraton
2 Simazine
3 Prometon
4 Atrazine
5 Propazine
6 Terbutylazine
7 Secbumeton
8 Simetryn
9 Ametryn
10 Prometryn
11 Terbutryn



TKG 1262

Meta.XLB (proprietary phase)

Silphenylene phase, bonded and crosslinked

- Low polarity phase with Extreme Low Bleed.
- Directly replace for DB-XLB
- General purpose column with extended temperature range (30 to 340/360ºC)
- Ideal column for GC-MS analysis
- Unique selectivity for aromatic compounds (PCBs,PAHs,PBDEs)
- Excellent column for pesticides and herbicides

Meta.XLB Equivalent Phase

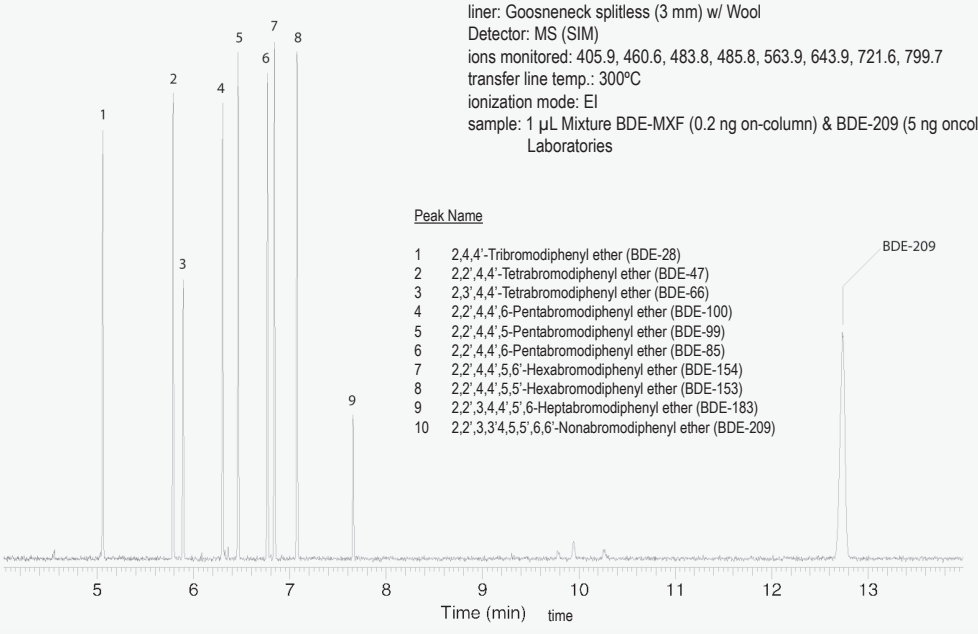
Restek: Rxi-XLB
Agilent: DB-XLB, VF-XMS
Supelco: MDN 12
Phenomenex: ZB-XLB
Macherey-Nagel: OPTIMA XLB

Meta.XLB

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	30 to 340/360ºC	**TR-330141**
0,18	20	0,18	30 to 340/360ºC	**TR-330984**
	30	0,18	30 to 340/360ºC	**TR-330934**
	60	0,18	30 to 340/360ºC	**TR-330964**
0,25	15	0,10	30 to 340/360ºC	**TR-330112**
	15	0,25	30 to 340/360ºC	**TR-330212**
	15	1,00	30 to 340/360ºC	**TR-331012**
	30	0,10	30 to 340/360ºC	**TR-330132**
	30	0,25	30 to 340/360ºC	**TR-330232**
	30	0,50	30 to 340/360ºC	**TR-330532**
	30	1,00	30 to 340/360ºC	**TR-331032**
	60	0,25	30 to 340/360ºC	**TR-330262**
0,32	15	0,25	30 to 340/360ºC	**TR-330213**
	15	1,00	30 to 340/360ºC	**TR-331013**
	30	0,10	30 to 340/360ºC	**TR-330133**
	30	0,25	30 to 340/360ºC	**TR-330233**
	30	0,50	30 to 340/360ºC	**TR-330533**
	30	1,00	30 to 340/360ºC	**TR-331033**
	60	0,25	30 to 340/360ºC	**TR-330263**
0,53	15	1,50	30 to 320/340ºC	**TR-331515**
	30	1,50	30 to 320/340ºC	**TR-331535**

Meta.XLB: Analysis of brominated flame retardants (Polybrominated Diphenyl Ethers, PBDEs)

column: **Meta.XLB**, 15 m x 0.18 mm x 0.072 um, P/N TR-332414
injection: 280ºC, splitless w/ surge: pulse 40 psi @ 0.30 min, 50ml/min @ 0.4 min
oven: 100ºC (0.5 min) to 320ºC (7 min) @ 30ºC/min
carrier gas: Helium, Ct flow 2 ml/min
liner: Goosneneck splitless (3 mm) w/ Wool
Detector: MS (SIM)
ions monitored: 405.9, 460.6, 483.8, 485.8, 563.9, 643.9, 721.6, 799.7
transfer line temp.: 300ºC
ionization mode: EI
sample: 1 µL Mixture BDE-MXF (0.2 ng on-column) & BDE-209 (5 ng oncolumn) from Wellington Laboratories



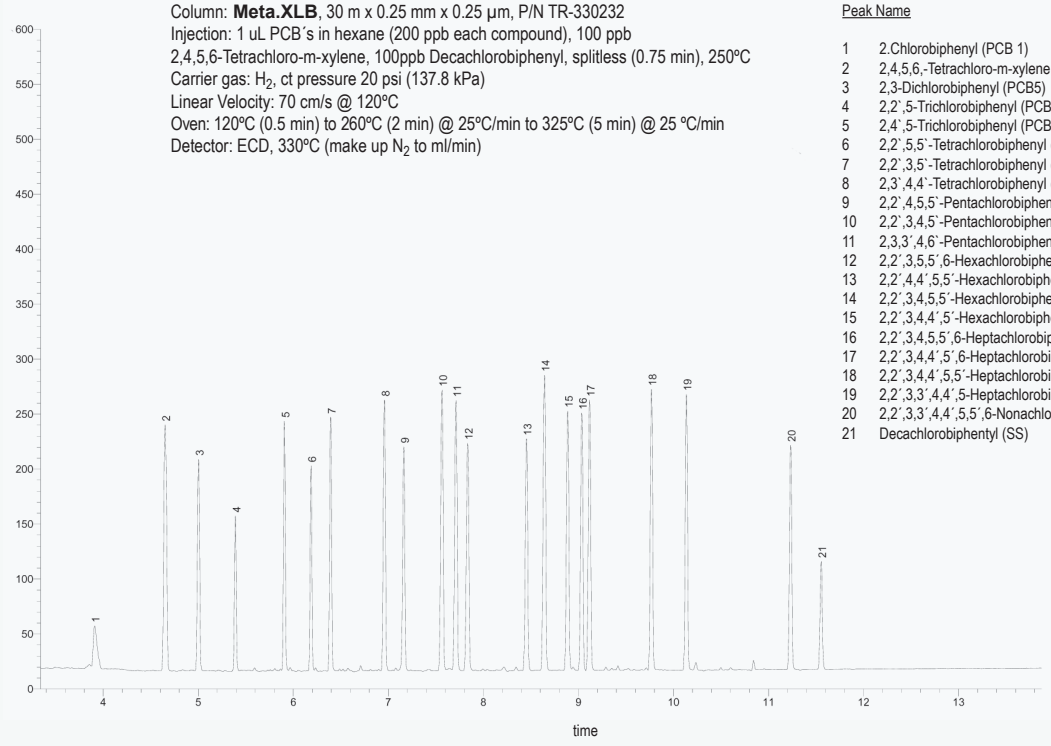
Peak Name

1 2,4,4'-Tribromodiphenyl ether (BDE-28)
2 2,2',4,4'-Tetrabromodiphenyl ether (BDE-47)
3 2,3',4,4'-Tetrabromodiphenyl ether (BDE-66)
4 2,2',4,4',6-Pentabromodiphenyl ether (BDE-100)
5 2,2',4,4',5-Pentabromodiphenyl ether (BDE-99)
6 2,2',4,4',6-Pentabromodiphenyl ether (BDE-85)
7 2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE-154)
8 2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE-153)
9 2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE-183)
10 2,2',3,3'4,5,5',6,6'-Nonabromodiphenyl ether (BDE-209)

TKG 1272

Meta.XLB: Polychlorinaded biphenyl (PCB)

Column: **Meta.XLB**, 30 m x 0.25 mm x 0.25 µm, P/N TR-330232
Injection: 1 uL PCB´s in hexane (200 ppb each compound), 100 ppb 2,4,5,6-Tetrachloro-m-xylene, 100ppb Decachlorobiphenyl, splitless (0.75 min), 250ºC
Carrier gas: H_2, ct pressure 20 psi (137.8 kPa)
Linear Velocity: 70 cm/s @ 120ºC
Oven: 120ºC (0.5 min) to 260ºC (2 min) @ 25ºC/min to 325ºC (5 min) @ 25 ºC/min
Detector: ECD, 330ºC (make up N_2 to ml/min)



Peak Name

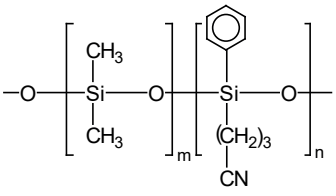
1 2.Chlorobiphenyl (PCB 1)
2 2,4,5,6,-Tetrachloro-m-xylene (SS)
3 2,3-Dichlorobiphenyl (PCB5)
4 2,2`,5-Trichlorobiphenyl (PCB18)
5 2,4`,5-Trichlorobiphenyl (PCB31)
6 2,2`,5,5`-Tetrachlorobiphenyl (PCB52)
7 2,2`,3,5`-Tetrachlorobiphenyl (PCB44)
8 2,3`,4,4`-Tetrachlorobiphenyl (PCB66)
9 2,2`,4,5,5`-Pentachlorobiphenyl (PCB101)
10 2,2`,3,4,5`-Pentachlorobiphenyl (PCB87)
11 2,3,3´,4,6`-Pentachlorobiphenyl (PCB110)
12 2,2´,3,5,5´,6-Hexachlorobiphenyl (PCB151)
13 2,2´,4,4´,5,5´-Hexachlorobiphenyl (PCB153)
14 2,2´,3,4,5,5´-Hexachlorobiphenyl (PCB141)
15 2,2´,3,4,4´,5´-Hexachlorobiphenyl (PCB136)
16 2,2´,3,4,5,5´,6-Heptachlorobiphenyl (PCB187)
17 2,2´,3,4,4´,5´,6-Heptachlorobiphenyl (PCB183)
18 2,2´,3,4,4´,5,5´-Heptachlorobiphenyl (PCB180)
19 2,2´,3,3´,4,4´,5-Heptachlorobiphenyl (PCB170)
20 2,2´,3,3´,4,4´,5,5´,6-Nonachlorobiphenyl (PCB26)
21 Decachlorobiphentyl (SS)

TKG 1265

TRB-1301

94% Dimethyl- 6% cyanopropyl-phenyl polysiloxane, bonded and crosslinked phase.

- Ideal column for analyzing mixtures of acidic and basic compounds with a wide range of polarity
- Intermediate polarity column useful for analyzing pesticides and herbicides



Structure of Poly (dimethylcyanopropylphenyl) siloxane

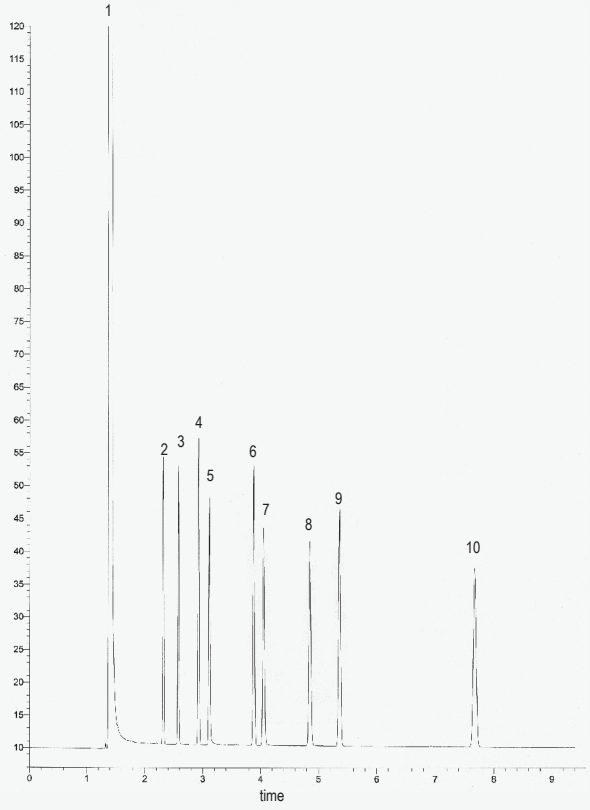
TRB-1301 Equivalent Phase

Agilent: HP-1301, DB-1301, CP-1301
Supelco: SPB-1301,
Restek: Rtx-1301, Rtx-624
SGE: BP624

TRB-1301

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	10	0,40	-20 to 280/300	**TR-640444**
0,25	15	0,25	-20 to 280/300	**TR-640212**
	15	1,00	-20 to 260/280	**TR-641012**
	30	0,25	-20 to 280/300	**TR-640232**
	30	1,00	-20 to 260/280	**TR-641032**
	60	0,25	-20 to 280/300	**TR-640262**
	60	1,00	-20 to 260/280	**TR-641062**
0,32	15	0,25	-20 to 280/300	**TR-640213**
	15	1 00	-20 to 260/280	**TR-641013**
	30	0,25	-20 to 280/300	**TR-640233**
	30	1,00	-20 to 260/280	**TR-641033**
	60	0,25	-20 to 280/300	**TR-640263**
	60	1,00	-20 to 260/280	**TR-641063**
0,53	15	1,00	-20 to 260/280	**TR-641015**
	30	1,00	-20 to 260/280	**TR-641035**
	60	1,00	-20 to 260/280	**TR-641065**

TRB-1301: SP-4-7301 Test



Column: **TRB-1301,** 30 m x 0.25 mm x 1.0 µm, P/N TR-641032
Injection: 0.5 µL standard SP-4-7301 (500 ng/mL), split 1:50, 260 °C
Carrier gas: H_2, ct pressure 12 psi (82.7 kPa)
Oven: 165ºC
Detector: FID, 280 °C

Peak Name

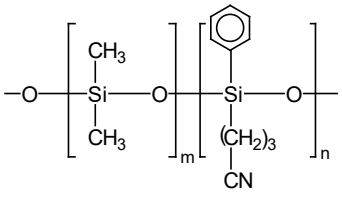
1 Methylene chloride
2 C-10
3 2-Octanone
4 C-11
5 1-Octanol
6 C-12
7 2,6-Dimethylphenol
8 2,6-Dimethylaniline
9 C-13
10 C-14

TKG 1118

TRB-624

94% Dimethyl- 6% cyanopropyl-phenyl polysiloxane, bonded and crosslinked phase.

- Column specially developed for environmental analysis of volatile compounds (Volatile Priority Pollutants)
- Column compatible with EPA methods 501.3, 502.2, 524.2, 601, 602, 8010, 8015, 8020, 8221, 8240 and 8260.
- Excellent inertness.



Structure of Poly (dimethylcyanopropylphenyl) siloxane

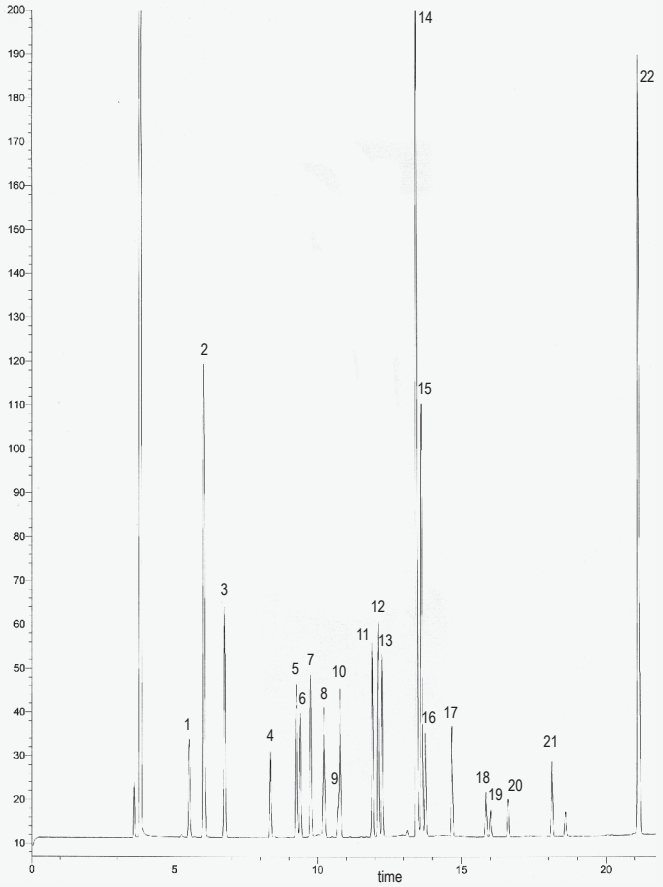
TRB-624 Equivalent Phase

Agilent: HP-624, DB-624, CP- Select 624 CB
Supelco: OVI-G43, SPB-624
Restek: Rtx-1301, Rtx-624
SGE: BP624
Phenomenex: ZB-624

TRB-624

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	1,00	-20 to 240/260	**TR-601084**
0,20	25	1,12	-20 to 240/260	**TR-601129**
0,25	30	1,40	-20 to 240/260	**TR-601432**
	60	1,40	-20 to 240/260	**TR-601462**
0,32	30	1,80	-20 to 240/260	**TR-601833**
	60	1,80	-20 to 240/260	**TR-601863**
0,53	30	3,00	-20 to 240/260	**TR-603035**
	60	3,00	-20 to 240/260	**TR-603065**
	75	3,00	-20 to 240/260	**TR-603075**
	105	3,00	-20 to 240/260	**TR-6030K5**

TRB-624: Solvents



Column: **TRB-624**, 60 m x 0.25mm x 1.4 µm, P/N TR-601462
Injection: 1 µL solvents mixture, split 1:100 (20-600 ng/comp), 260 °C
Carrier gas: H_2, ct pressure 25 psi (172.3 kPa)
Oven: 50 °C (5min) to 220 °C @ 6 °C/min
Detector: FID, 280 °C

Peak Name

1 Diethylether
2 Acetone
3 Methyl acetate
4 Vinyl acetate
5 MEK
6 Ethyl acetate
7 Tetrahydrofuran
8 Cyclohexane
9 Benzene
10 Isopropyl acetate
11 2-Pentanone
12 3-Pentanone
13 Propyl acetate
14 Pyridine
15 Toluene
16 Isobutyl acetate
17 Butyl acetate
18 Ethyl benzene
19 m-Xylene/p-Xylene
20 o-Xylene
21 Diisobutylketone
22 Nitrobenzene

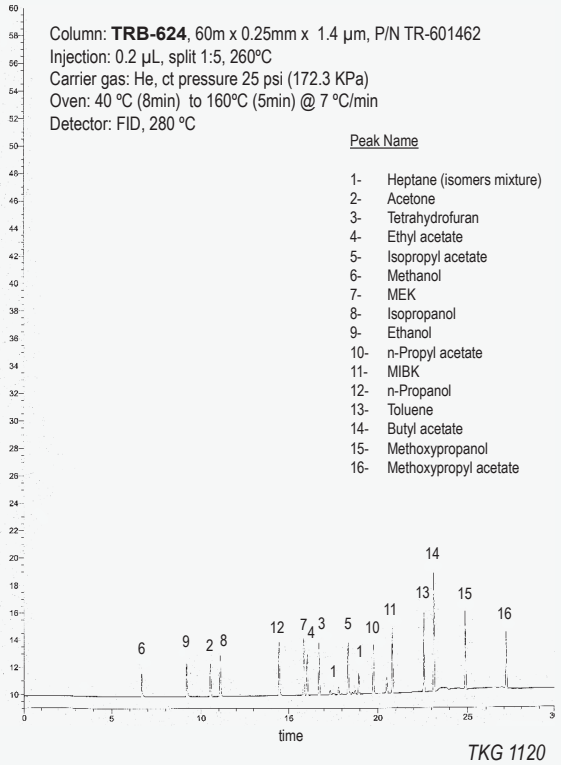
TKG 1119

TRB-624: Solvents

Column: **TRB-624**, 60m x 0.25mm x 1.4 µm, P/N TR-601462
Injection: 0.2 µL, split 1:5, 260ºC
Carrier gas: He, ct pressure 25 psi (172.3 KPa)
Oven: 40 ºC (8min) to 160ºC (5min) @ 7 ºC/min
Detector: FID, 280 ºC

Peak Name

1- Heptane (isomers mixture)
2- Acetone
3- Tetrahydrofuran
4- Ethyl acetate
5- Isopropyl acetate
6- Methanol
7- MEK
8- Isopropanol
9- Ethanol
10- n-Propyl acetate
11- MIBK
12- n-Propanol
13- Toluene
14- Butyl acetate
15- Methoxypropanol
16- Methoxypropyl acetate

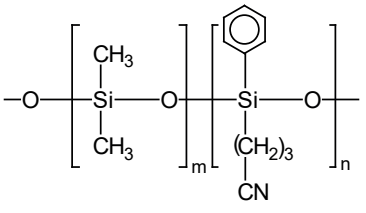


TKG 1120

TRB-G43

94% Dimethyl- 6% cyanopropyl-phenyl polysiloxane, bonded and crosslinked phase.

- USP G43
- Fulfils specifications of the American (USP) and European (EP) pharmacopoeia for the analysis of residual solvents (OVI) in pharmaceutical products, USP method <467> and EP method 2.4.24
- High inertness and low bleed guarenteed.
- Specially tested for complete separation of the five solvents regulated by USP Method 467
- For USP <467>, pharmacopoeia recommends the use of a guard column of 5m (P/N TR-200055) to trap the non-volatile impurities in the sample



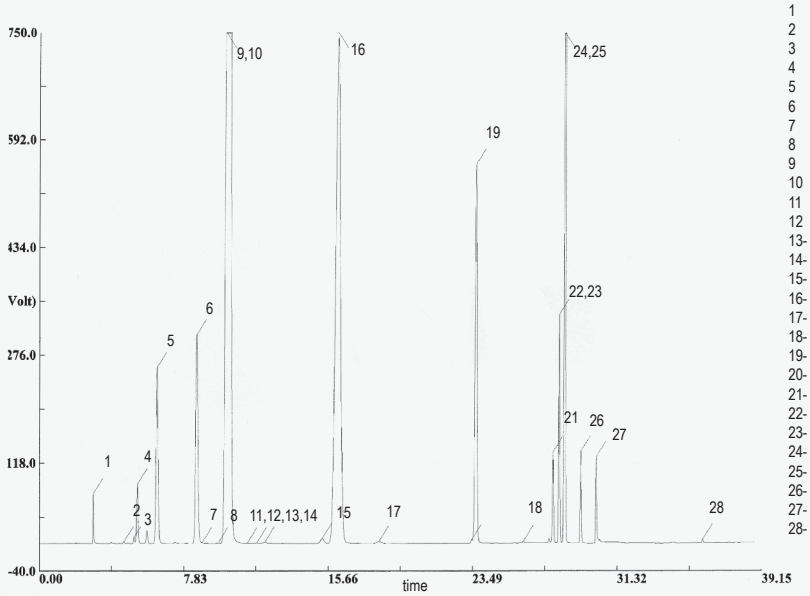
Structure of Poly (dimethylcyanopropylphenyl) siloxane

TRB-G43: Class 1 and Class 2 Residual Solvents

Column: **TRB-G43**, 30 m x 0.53 mm x 3.0 µm, P/N TR-163035
Injection: split 1:2, 250 ºC, 5 m x 0.53 mm intermediate polarity retention gap (TR-200055)
Sample: 0.5 mL headspace 80ºC (2t static head space sampler) 28 Class 1 Mix and Class 2 Mix A, Mix B residual solvents at the regulatory limit concentration
Carrier gas: He, ct pressure 4.8 psi (33.1 kPa), 35 cm/s (40ºC)
Oven: 40 ºC (20 min) to 240 ºC (10 min) @ 10ºC/min
Detector: FID, 250 ºC

Peak Name

1 Methanol
2 1,2-Dichloroethene
3 Acetonitrile
4 Methylene chloride
5 n-Hexane
6 Cis-1,2-Chloroethene
7 Nitromethane
8 Chloroform
9 Cyclohexane
10 1,1,1-Trichloroethane
11 Carbon tetrachloride
12 Benzene
13- 1,2-Dimethoxyethane
14- 1,2-Dichloroethane
15- Trichloroethylene
16- Methylcyclohexane
17- 1,4-Dioxane
18- Pyridine
19- Toluene
20- 2-Hexanone
21- Chlorobenzene
22- Dimethylformamide
23- Ethylbenzene
24- m-Xylene
25- p-Xylene
26- o-Xylene
27- N,N-Dimethylacetamide
28- 1,2,3,4-Tetrahydronaphthalene



TKG 1121

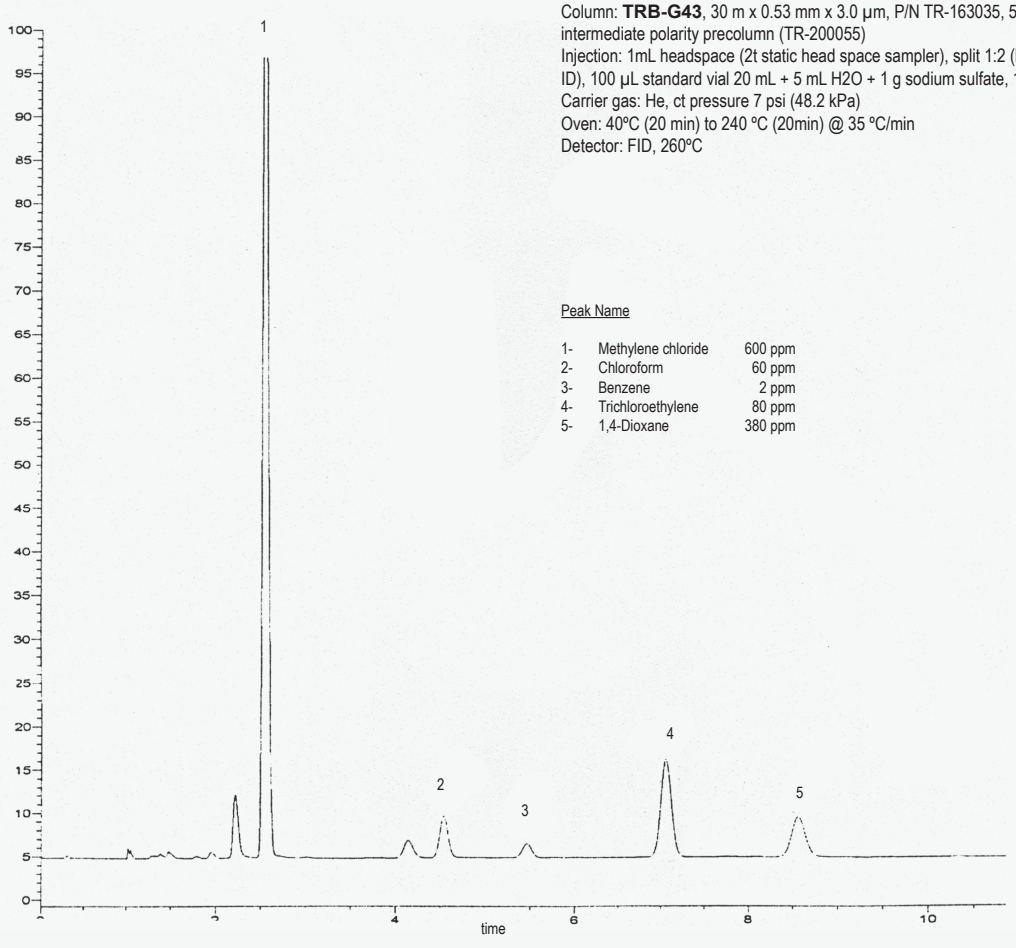
TRB-G43

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	30	3,00	-20 to 240/260	**TR-163035**

TRB-G43 Equivalent Phase

Agilent: HP-624, DB-624, CP-Select 624 CB, DB-624 UI
Supelco: OVI-G43
Restek: Rtx-G43
SGE: BP624
Phenomenex: ZB-624
USP Nomenclature: G43

TRB-G43: Solvents



Column: **TRB-G43**, 30 m x 0.53 mm x 3.0 µm, P/N TR-163035, 5m x 0.53mm intermediate polarity precolumn (TR-200055)
Injection: 1mL headspace (2t static head space sampler), split 1:2 (liner 1 mm ID), 100 µL standard vial 20 mL + 5 mL H2O + 1 g sodium sulfate, 140ºC
Carrier gas: He, ct pressure 7 psi (48.2 kPa)
Oven: 40ºC (20 min) to 240 ºC (20min) @ 35 ºC/min
Detector: FID, 260ºC

Peak Name

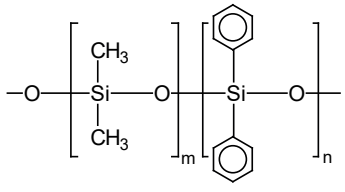
1-	Methylene chloride	600 ppm
2-	Chloroform	60 ppm
3-	Benzene	2 ppm
4-	Trichloroethylene	80 ppm
5-	1,4-Dioxane	380 ppm

TKG 1122

TRB-14

14% Diphenyl - 86% dimethyl polysiloxane, bonded and crosslinked phase.

- Intermediate polarity column with phenyl groups in its structure
- Chemical inertness and low bleed guaranteed
- Confirmation column alongside TRB-1 and TRB-5



Structure of Poly (dimethyldiphenyl) siloxane

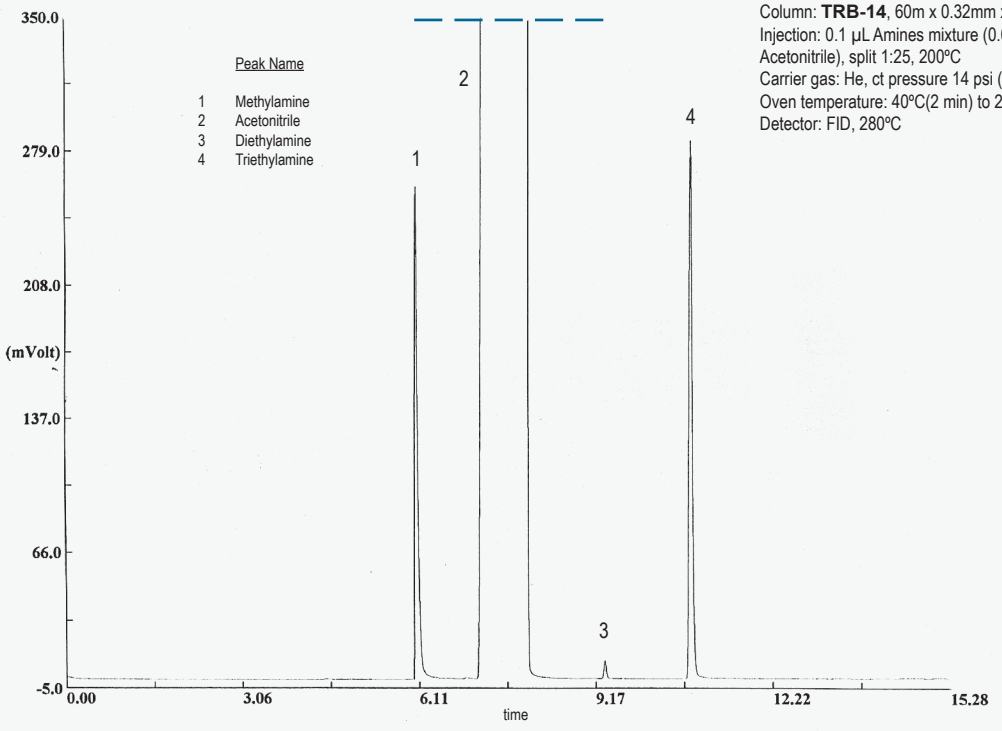
TRB-14 Equivalent Phase

Agilent: CP-SIL 13 CB

TRB-14

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,20	-20 to 300/330	**TR-802112**
	15	0,40	-20 to 300/330	**TR-800412**
	15	1,20	-20 to 300/330	**TR-801212**
	30	0,20	-20 to 300/330	**TR-802132**
	30	0,40	-20 to 300/330	**TR-800432**
	30	1,20	-20 to 300/330	**TR-801232**
	60	0,20	-20 to 300/330	**TR-802162**
	60	0,40	-20 to 300/330	**TR-800462**
	60	1,20	-20 to 300/330	**TR-801262**
0,32	15	0,20	-20 to 300/330	**TR-802113**
	15	0,40	-20 to 300/330	**TR-800413**
	15	1,20	-20 to 300/330	**TR-801213**
	30	0,20	-20 to 300/330	**TR-802133**
	30	0,40	-20 to 300/330	**TR-800433**
	30	1,20	-20 to 300/330	**TR-801233**
	60	0,20	-20 to 300/330	**TR-802163**
	60	0,40	-20 to 300/330	**TR-800463**
	60	1,20	-20 to 300/330	**TR-801263**
0,53	15	1,00	-20 to 300/330	**TR-801015**
	15	2,00	-20 to 300/330	**TR-802015**
	30	1,00	-20 to 300/330	**TR-801035**
	30	2,00	-20 to 300/330	**TR-802035**
	60	1,00	-20 to 300/330	**TR-801065**
	60	2,00	-20 to 300/330	**TR-802065**

TRB-14: Amines



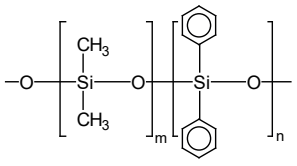
Column: **TRB-14**, 60m x 0.32mm x 1.2 µm, P/N TR-801263
Injection: 0.1 µL Amines mixture (0.02-0.2% in Acetonitrile), split 1:25, 200ºC
Carrier gas: He, ct pressure 14 psi (96.5 kPa)
Oven temperature: 40ºC(2 min) to 250ºC @ 10ºC/min
Detector: FID, 280ºC

TKG 1123

TRB-20

20% Diphenyl - 80% Dimethyl polysilioxane, bonded and crosslinked phase.

- Intermediate polarity column with phenyl groups in its structure
- Excellent confirmation column



Structure of Poly (dimethyldiphenyl) siloxane

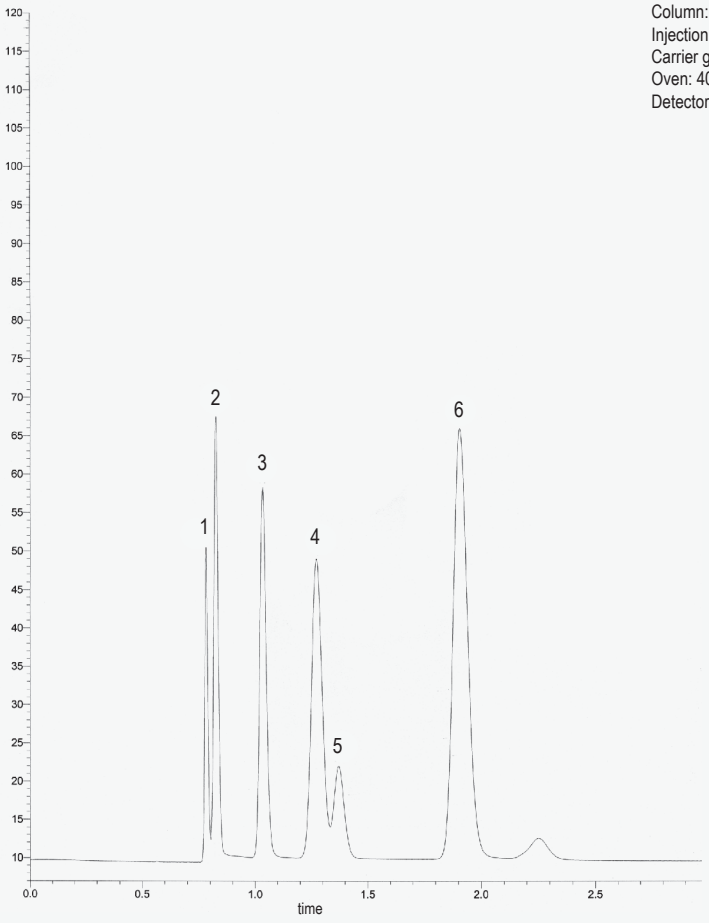
TRB-20 Equivalent Phase

Supelco: SPB-20
Quadrex: 007-502
Restek: Rtx-20

TRB-20

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,25	-20 to 300/320	**TR-200212**
	15	1,00	-20 to 280/300	**TR-201012**
	30	0,25	-20 to 300/320	**TR-200232**
	30	1,00	-20 to 280/300	**TR-201032**
	60	0,25	-20 to 300/320	**TR-200262**
	60	1,00	-20 to 280/300	**TR-201062**
0,32	15	0,25	-20 to 300/320	**TR-200213**
	15	1,00	-20 to 280/300	**TR-201013**
	30	0,25	-20 to 300/320	**TR-200233**
	30	1,00	-20 to 280/300	**TR-201033**
	60	0,25	-20 to 300/320	**TR-200263**
	60	1,00	-20 to 280/300	**TR-201063**
0,53	15	0,50	-20 to 260/280	**TR-200515**
	15	1,00	-20 to 260/280	**TR-201015**
	30	0,50	-20 to 260/280	**TR-200535**
	30	1,00	-20 to 260/280	**TR-201035**
	60	0,50	-20 to 260/280	**TR-200565**
	60	1,00	-20 to 260/280	**TR-201065**

TRB-20: Alcohols in blood



Column: **TRB-20**, 30 m x 0.53 mm x 3.0 µm, P/N TR-203035
Injection: Alcohols in blood, 0.5 µL Head Space, split 5:1, 200 °C
Carrier gas: He, ct pressure 10 psi (69 kPa)
Oven: 40 °C (isothermal)
Detector: FID, 200 °C

Peak Name

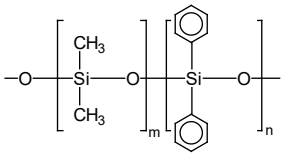
1- Methanol
2- Acetaldehyde
3- Ethanol
4- Isopropanol
5- Acetone
6- n-Propanol

TKG 1124

TRB-35

35% Diphenyl - 65% Dimethyl polysilioxane, bonded and crosslinked phase.

- Intermediate polarity column with phenyl groups in its structure
- Excellent confirmation column



Structure of Poly (dimethyldiphenyl) siloxane

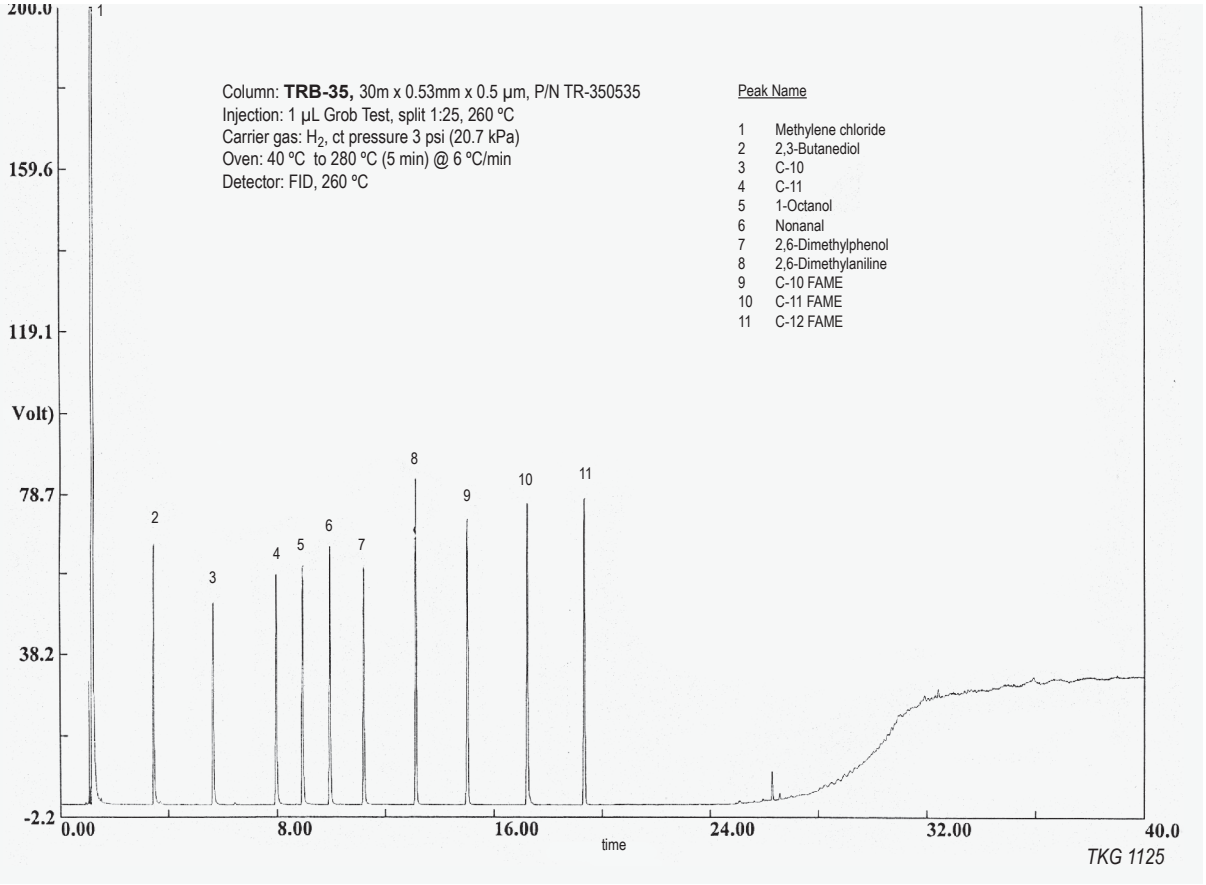
TRB-35 Equivalent Phase

Agilent: HP-35, DB-35
Supelco: SPB-35
Restek: Rtx-35
Quadrex: 007-11
Phenomenex: ZB-35

TRB-35

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,15	-20 to 300/320	**TR-351312**
	15	0,25	-20 to 300/320	**TR-350212**
	30	0,15	-20 to 300/320	**TR-351332**
	30	0,25	-20 to 300/320	**TR-350232**
	60	0,15	-20 to 300/320	**TR-351362**
	60	0,25	-20 to 300/320	**TR-350262**
0,32	15	0,15	-20 to 300/320	**TR-351313**
	15	0,25	-20 to 300/320	**TR-350213**
	15	0,50	-20 to 290/310	**TR-350513**
	30	0,15	-20 to 300/320	**TR-351333**
	30	0,25	-20 to 300/320	**TR-350233**
	30	0,50	-20 to 290/310	**TR-350533**
	60	0,15	-20 to 300/320	**TR-351363**
	60	0,25	-20 to 300/320	**TR-350263**
	60	0,50	-20 to 290/310	**TR-350563**
0,53	15	0,50	-20 to 260/280	**TR-350515**
	15	1,00	-20 to 260/280	**TR-351015**
	30	0,50	-20 to 260/280	**TR-350535**
	30	1,00	-20 to 260/280	**TR-351035**
	60	0,50	-20 to 260/280	**TR-350565**
	60	1,00	-20 to 260/280	**TR-351065**

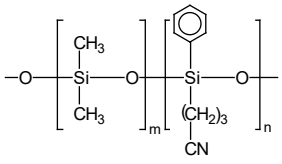
TRB-35: Grob Test



TRB-1701

14% Cyanopropy phenyl - 86% dimethyl polysiloxane, bonded and crosslinked phase.

- Intermediate polarity column of wide use
- Historically used in the analysis of pesticides.

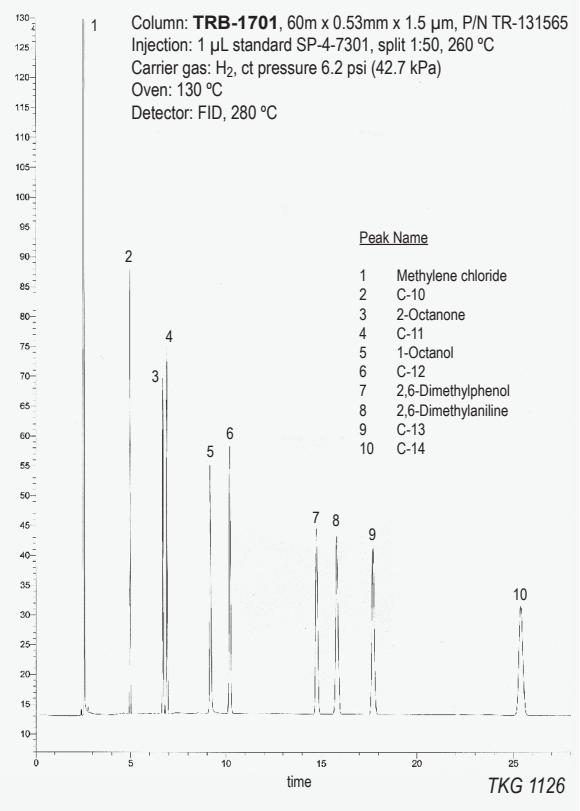


Structure of Poly (dimethylcyanopropylphenyl) siloxane

TRB-1701 Equivalent Phase

Agilent: HP-1701, PAS-1701, DB-1701, CP-SIL 19 CB
Supelco: SPB-1701, Equity 1701
Restek: Rtx-1701
SGE: BP10
Quadrex: 007-1701

TRB-1701: SP-4-7301 Test



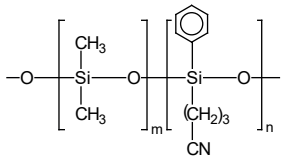
TRB-1701

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	20	0,10	-20 to 280/280	**TR-130181**
	20	0,40	-20 to 280/280	**TR-130481**
0,18	10	0,40	-20 to 280/280	**TR-130444**
	20	0,18	-20 to 280/280	**TR-130984**
0,20	15	0,20	-20 to 280/280	**TR-132119**
	30	0,20	-20 to 280/280	**TR-132139**
	60	0,20	-20 to 280/280	**TR-132169**
0,25	15	0,25	-20 to 280/280	**TR-130212**
	15	0,50	-20 to 270/280	**TR-130512**
	15	1,00	-20 to 260/280	**TR-131012**
	30	0,10	-20 to 280/280	**TR-130132**
	30	0,25	-20 to 280/280	**TR-130232**
	30	0,50	-20 to 270/280	**TR-130532**
	30	1,00	-20 to 260/280	**TR-131032**
	60	0,10	-20 to 280/280	**TR-130162**
	60	0,25	-20 to 280/280	**TR-130262**
	60	0,50	-20 to 270/280	**TR-130562**
	60	1,00	-20 to 260/280	**TR-131062**
0,32	15	0,10	-20 to 280/280	**TR-130113**
	15	0,25	-20 to 280/280	**TR-130213**
	15	0,50	-20 to 270/280	**TR-130513**
	15	1,00	-20 to 260/280	**TR-131013**
	30	0,10	-20 to 280/280	**TR-130133**
	30	0,25	-20 to 280/280	**TR-130233**
	30	0,50	-20 to 270/280	**TR-130533**
	30	1,00	-20 to 260/280	**TR-131033**
	60	0,10	20 to 280/280	**TR-130163**
	60	0,25	-20 to 280/280	**TR-130263**
	60	0,50	-20 to 270/280	**TR-130563**
	60	1,00	-20 to 260/280	**TR-131063**
0,53	15	0,10	-20 to 270/280	**TR-130115**
	15	0,50	-20 to 260/270	**TR-130515**
	15	1,00	-20 to 250/270	**TR-131015**
	15	1,50	-20 to 240/260	**TR-131515**
	30	0,10	-20 to 270/280	**TR-130135**
	30	0,50	-20 to 260/270	**TR-130535**
	30	1,00	-20 to 250/270	**TR-131035**
	30	1,50	-20 to 240/260	**TR-131535**
	60	0,10	-20 to 270/280	**TR-130165**
	60	0,50	-20 to 260/270	**TR-130565**
	60	1,00	-20 to 250/270	**TR-131065**
	60	1,50	-20 to 240/260	**TR-131565**

TRB-225

50% Cyanopropyl phenyl - 50% dimethyl polysiloxane, bonded and crosslinked phase.

- Medium/high polarity column
- Excellent for separating cis-trans isomers of FAMES and sugar derivatives.



Structure of Poly (dimethylcyanopropylphenyl) siloxane

TRB-225 Equivalent Phase

Agilent: HP-225, DB-225, CP-SIL 43 CB
Restek: Rtx-225
SGE: BP225
Quadrex: 007-225
Supelco: SPB-225

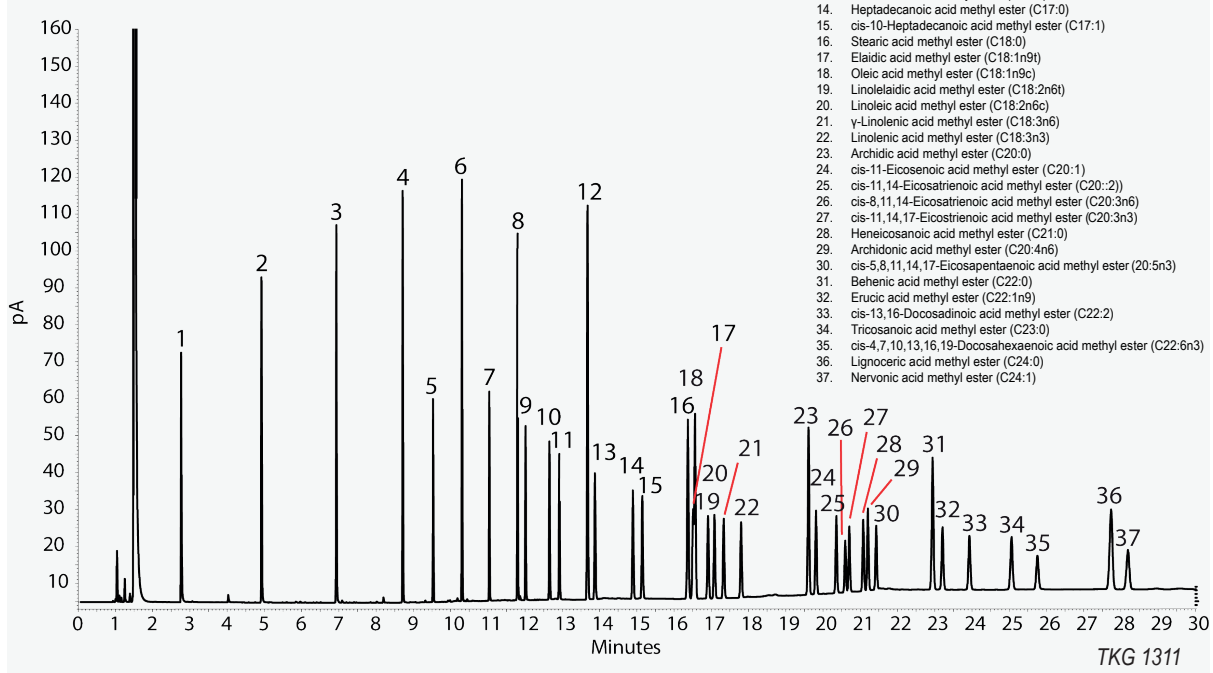
TRB-225

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	20	0,10	40 to 220/240	**TR-250181**
0,18	20	0,18	40 to 220/240	**TR-252184**
0,20	15	0,20	40 to 220/240	**TR-252119**
	30	0,20	40 to 220/240	**TR-252139**
0,25	15	0,15	40 to 220/240	**TR-251312**
	15	0,25	40 to 220/240	**TR-250212**
	30	0,15	40 to 220/240	**TR-251332**
	30	0,25	40 to 220/240	**TR-250232**
0,32	15	0,15	40 to 220/240	**TR-251313**
	15	0,25	40 to 220/240	**TR-250213**
	30	0,15	40 to 220/240	**TR-251333**
	30	0,25	40 to 220/240	**TR-250233**
0,53	15	1,00	40 to 200/220	**TR-251015**
	30	1,00	40 to 200/220	**TR-251035**

TRB-225: Food Industry FAME Mix

Column: **TRB-225,** 30 m x 0.25 mm x 0.25 µm, P/N TR-250232
Injection: 0,7 µL Food Industry FAME MIX (RS-35077) (30 mg/mL), split 1:50, 260 ºC
Carrier gas: H_2, ct pressure, 12 psi
Oven: 35 ºC (1 min) to 195 ºC @ 16 ºC/min to 205ºC @ 1.9 ºC/min to 230 ºC (15 min) @ 5.1 ºC/min
Detector: FID, 260 ºC

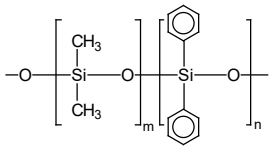
1. Butyric acid methyl ester (C4:0)
2. Caproic acid methyl ester (C6:0)
3. Caprylic acid methyl ester (C8:0)
4. Capric acid methyl ester (C10:0)
5. Undecanoic acid methyl ester (C11:0)
6. Lauric acid methyl ester (C12:0)
7. Tridecanoic acid methyl ester (C13:0)
8. Myristic acid methyl ester (C14:0)
9. Myristoleic acid methyl ester (C14:1)
10. Pentadecanoic acid methyl ester (C15:0)
11. cis-10-Pentadeccenoic acid methyl ester (C15:1)
12. Palmitic acid methyl ester (C16:0)
13. Palmitoleic acid methyl ester (C16:1)
14. Heptadecanoic acid methyl ester (C17:0)
15. cis-10-Heptadecanoic acid methyl ester (C17:1)
16. Stearic acid methyl ester (C18:0)
17. Elaidic acid methyl ester (C18:1n9t)
18. Oleic acid methyl ester (C18:1n9c)
19. Linolelaidic acid methyl ester (C18:2n6t)
20. Linoleic acid methyl ester (C18:2n6c)
21. γ-Linolenic acid methyl ester (C18:3n6)
22. Linolenic acid methyl ester (C18:3n3)
23. Archidic acid methyl ester (C20:0)
24. cis-11-Eicosenoic acid methyl ester (C20:1)
25. cis-11,14-Eicosatrienoic acid methyl ester (C20::2))
26. cis-8,11,14-Eicosatrienoic acid methyl ester (C20:3n6)
27. cis-11,14,17-Eicostrienoic acid methyl ester (C20:3n3)
28. Heneicosanoic acid methyl ester (C21:0)
29. Archidonic acid methyl ester (C20:4n6)
30. cis-5,8,11,14,17-Eicosapentaenoic acid methyl ester (20:5n3)
31. Behenic acid methyl ester (C22:0)
32. Erucic acid methyl ester (C22:1n9)
33. cis-13,16-Docosadinoic acid methyl ester (C22:2)
34. Tricosanoic acid methyl ester (C23:0)
35. cis-4,7,10,13,16,19-Docosahexaenoic acid methyl ester (C22:6n3)
36. Lignoceric acid methyl ester (C24:0)
37. Nervonic acid methyl ester (C24:1)



TRB-50

50% Diphenyl- 50% dimethyl polysiloxane, bonded and crosslinked phase.

- Medium polarity column
- Excellent confirmation column for TRB-5 analyses



Structure of Poly (dimethyldiphenyl) siloxane

TRB-50 Equivalent Phase

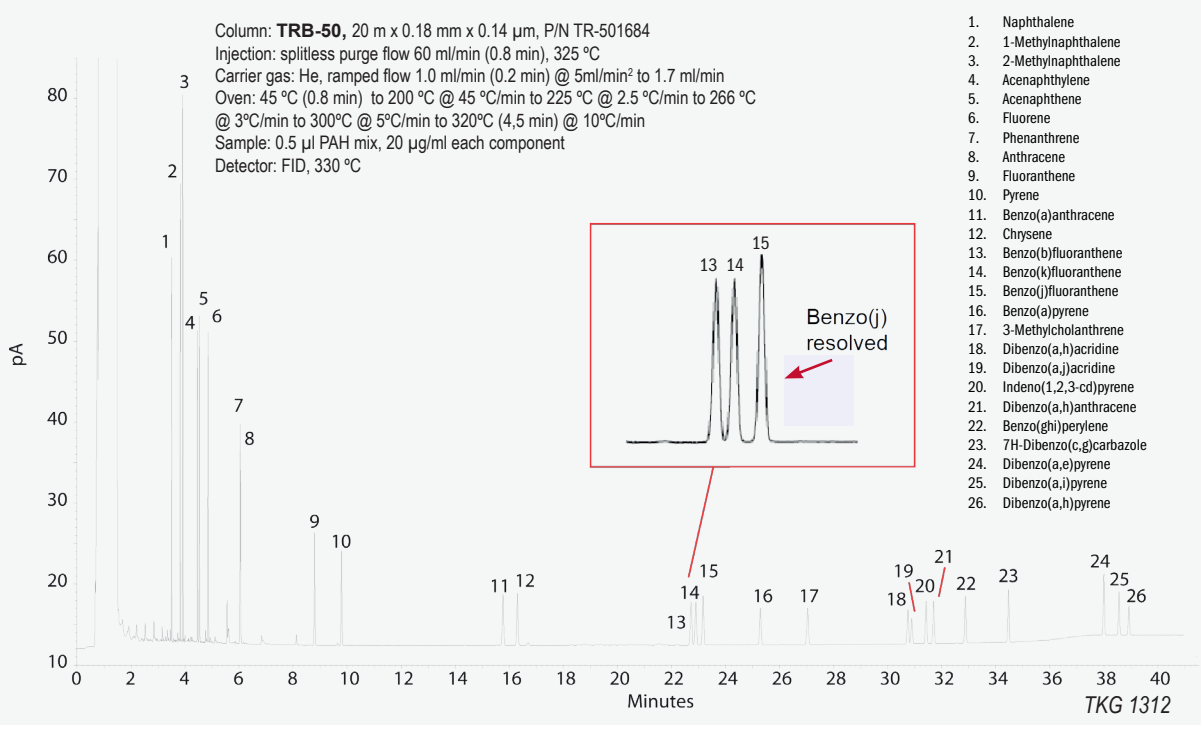
Agilent: HP-50+, DB-17, CP-SIL 24 CB, DB-EuPh
Supelco: SPB-50, SPB-2250
Restek: Rtx-50, Rxi-17
Quadrex: 007-17
Phenomenex: ZB-50

TRB-50

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	40 to 280/300	**TR-500141**
	10	0,20	40 to 280/300	**TR-502141**
	20	0,10	40 to 280/300	**TR-500181**

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	0,18	40 to 280/300	**TR-500984**
	20	0,30	40 to 280/300	**TR-502984**
0,25	15	0,15	40 to 280/300	**TR-501312**
	15	0,25	40 to 280/300	**TR-500212**
	15	0,50	40 to 280/300	**TR-500512**
	30	0,15	40 to 280/300	**TR-501332**
	30	0,25	40 to 280/300	**TR-500232**
	30	0,50	40 to 280/300	**TR-500532**
	60	0,15	40 to 280/300	**TR-501362**
	60	0,25	40 to 280/300	**TR-500262**
	60	0,50	40 to 280/300	**TR-500562**
0,32	15	0,15	40 to 280/300	**TR-501313**
	15	0,25	40 to 280/300	**TR-500213**
	15	0,50	40 to 280/300	**TR-500513**
	30	0,15	40 to 280/300	**TR-501333**
	30	0,25	40 to 280/300	**TR-500233**
	30	0,50	40 to 280/300	**TR-500533**
	60	0,15	40 to 280/300	**TR-501363**
	60	0,25	40 to 280/300	**TR-500263**
	60	0,50	40 to 280/300	**TR-500563**
0,53	15	0,50	40 to 260/280	**TR-500515**
	15	1,00	40 to 260/280	**TR-501015**
	30	0,50	40 to 260/280	**TR-500535**
	30	1,00	40 to 260/280	**TR-501035**
	60	0,50	40 to 260/280	**TR-500565**
	60	1,00	40 to 260/280	**TR-501065**

TRB-50: Polynuclear Aromatic Hydrocarbons (PAHs) Analysis



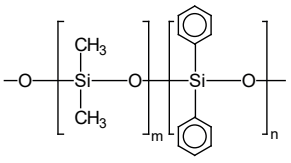
TRB-50HT

50% Diphenyl- 50% dimethylpolysiloxane, bonded and crosslinked phase.

- Medium polarity column with high thermal stability
- Best column for triglycerides analysis

TRB-50HT Equivalent Phase

Agilent: DB-17ht, CP-TAP CB
Restek: Rtx-65TG, MXT-65TG
Quadrex: 007-65HT
SGE: BPX50



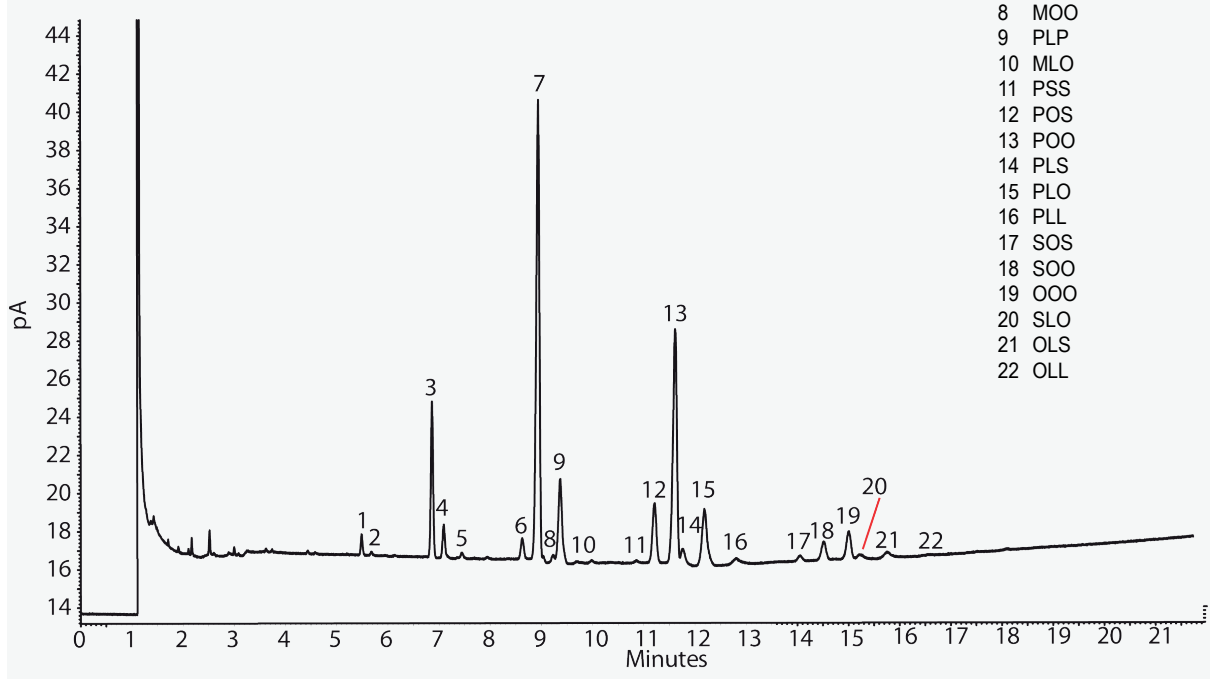
Structure of
Poly (dimethyldiphenyl) siloxane

TRB-50HT

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,10	50 to 370	**TR-530112**
	15	0,15	50 to 370	**TR-531312**
	30	0,10	50 to 370	**TR-530132**
	30	0,15	50 to 370	**TR-531332**

TRB-50HT: Palm oil

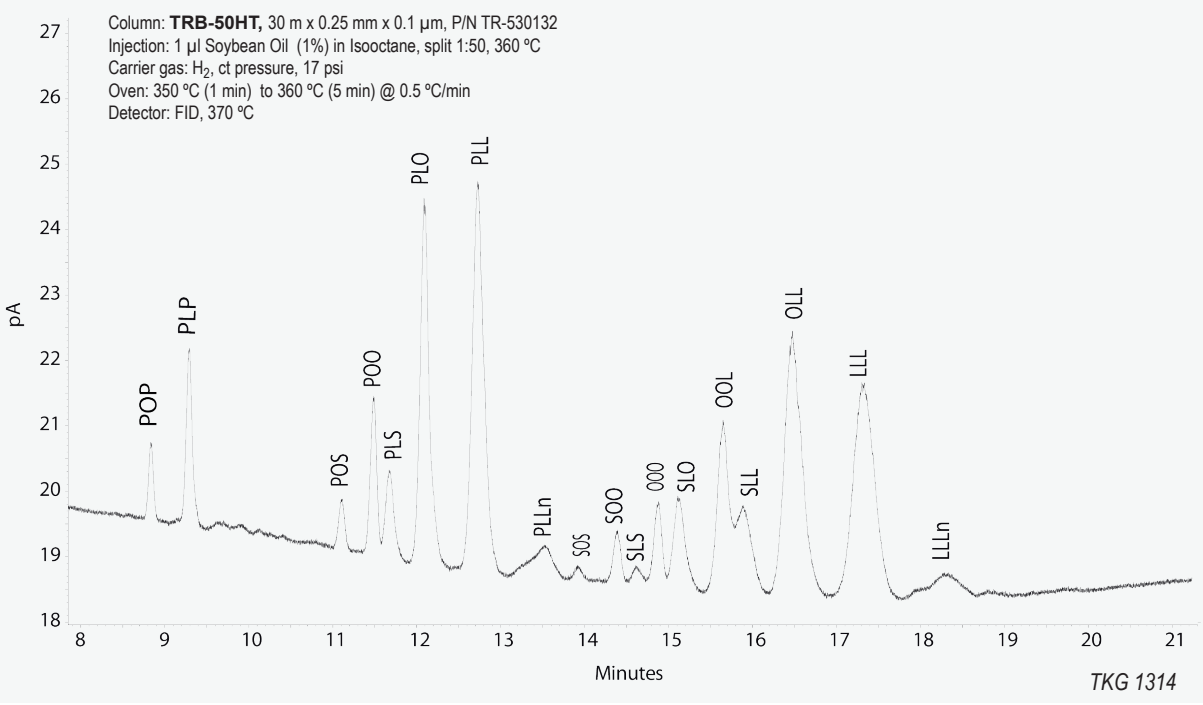
Column: **TRB-50HT,** 30 m x 0.25 mm x 0.1 µm, P/N TR-530132
Injection: 1 µl Palm oil, 10 mg/ml in Isooctane, split 1:50, 360 °C
Liner: Single taper w/wool 4 mm ID
Carrier gas: H_2, ct pressure, 17 psi
Oven: 350 °C (1 min) to 360 °C @ 0.5 °C/min
Detector: FID, 370 °C



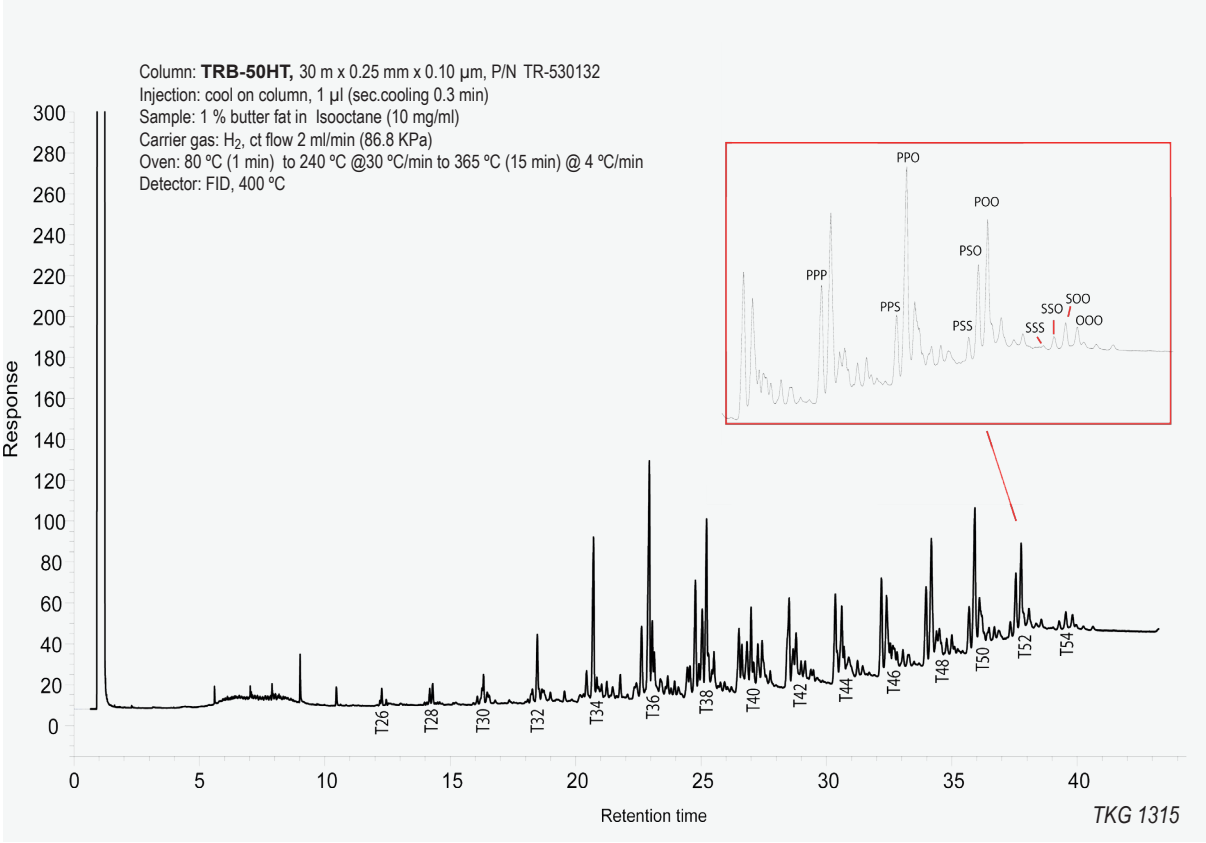
Peak	Name
1	MPP
2	MOM
3	PPP
4	MOP
5	MLP
6	PPS
7	POP
8	MOO
9	PLP
10	MLO
11	PSS
12	POS
13	POO
14	PLS
15	PLO
16	PLL
17	SOS
18	SOO
19	OOO
20	SLO
21	OLS
22	OLL

TKG 1313

TRB-50HT: Soybean Oil



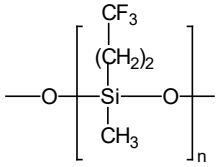
TRB-50HT: Butter Triglycerides



TRB-F50

50% Trifluoropropyl- 50% Methyl polysiloxane, bonded and crosslinked phase.

- High polarity column
- Column designed for the EPA 609 and 8140 methods



Structure of Poly (methyltrifluoroproyl) siloxane

TRB-F50 Equivalent Phase

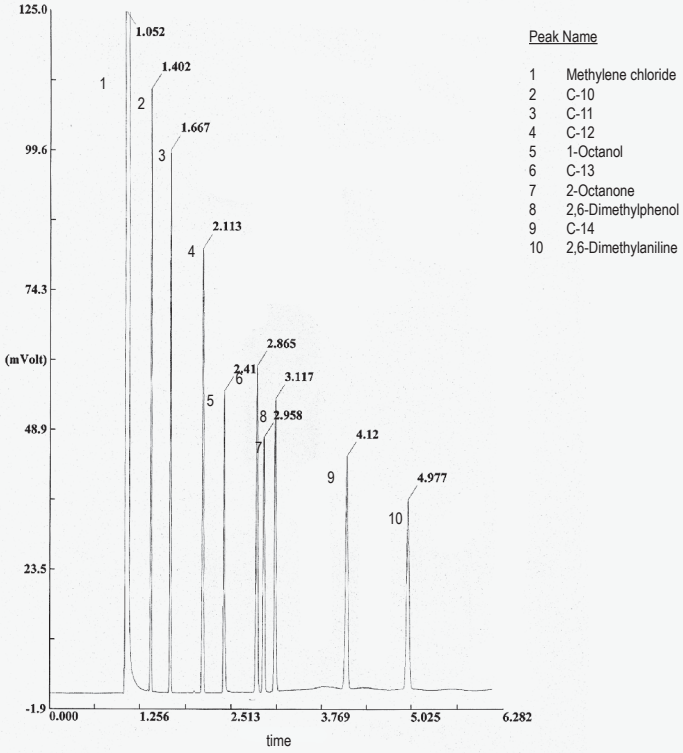
Agilent: DB-210, DB-200
Restek: Rtx-200
Quadrex: 007-210

TRB-F50

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	0,20	45 to 240/260	**TR-572184**
0,25	15	0,15	45 to 240/260	**TR-571312**
	15	0,25	45 to 240/260	**TR-570212**
	15	0,50	45 to 240/260	**TR-570512**
	30	0,15	45 to 240/260	**TR-571332**
	30	0,25	45 to 240/260	**TR-570232**
	30	0,50	45 to 240/260	**TR-570532**
0,32	15	0,15	45 to 240/260	**TR-571313**
	15	0,25	45 to 240/260	**TR-570213**
	15	0,50	45 to 240/260	**TR-570513**
	30	0,15	45 to 240/260	**TR-571333**
	30	0,25	45 to 240/260	**TR-570233**
	30	0,50	45 to 240/260	**TR-570533**
0,53	15	1,00	45 to 220/240	**TR-571015**
	30	1,00	45 to 220/240	**TR-571035**

TRB-F50: SP-4-7301 Test

Column: **TRB-F50**, 30 m x 0.32 mm x 0.5 µm, P/N TR-570533
Injection: 1 µL standard SP-4-7301 (500 ng/mL comp), split 1:50, 260 ºC
Carrier gas: H_2, ct pressure, 7psi (48.2 kPa)
Oven: 100 ºC
Detector: FID, 280ºC



Peak Name

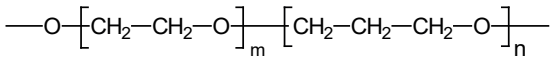
1	Methylene chloride
2	C-10
3	C-11
4	C-12
5	1-Octanol
6	C-13
7	2-Octanone
8	2,6-Dimethylphenol
9	C-14
10	2,6-Dimethylaniline

TKG 1129

TRB-PAG

50% Polyethylene - 50% polypropylene glycol, bonded and crosslinked phase.

- Phase polarity slightly lower than TRB-WAX due to the introduction of propylene oxide groups
- Polarity similar to UCON phase



Structure of Poly (ethylenepropylene) glycol

TRB-PAG Equivalent Phase

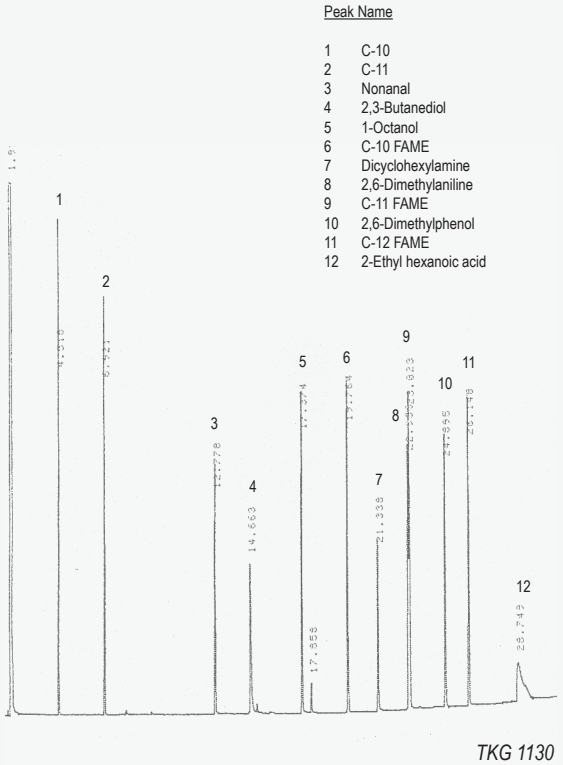
Supelco: PAG

TRB-PAG

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,25	30 to 220/230	**TR-550212**
	30	0,25	30 to 220/230	**TR-550232**
	60	0,25	30 to 220/230	**TR-550262**
0,32	15	0,25	30 to 220/230	**TR-550213**
	30	0,25	30 to 220/230	**TR-550233**
	60	0,25	30 to 220/230	**TR-550263**
0,53	15	0,50	30 to 220/230	**TR-550515**
	30	0,50	30 to 220/230	**TR-550535**
	60	0,50	30 to 220/230	**TR-550565**

TRB-PAG: Grob Test

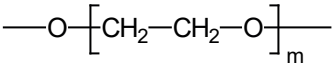
Column: **TRB-PAG**, 30 m x 0.25 mm x 0.25 µm, P/N TR-550232
Injection: 1 µL Test Grob, split 1:25, 260 ºC
Carrier gas: H_2, ct pressure 11 psi (75.8 kPa)
Oven: 40 ºC to 230 ºC (5 min) @ 6 ºC/min
Detector: FID, 260 ºC



SupraWAX-280

Column totally equivalent to the Supelcowax™-10. Based in the popular phase Carbowax 20M.

- 100 % Poliethylene glycol (PEG), bonded and cross-linked phase
- Column of high polarity
- Phase practically equivalent to the USP G16 phase
- Wide range of operating temperatures and high thermal stability (35ºC-280ºC)
- Compatible with water and methanol injections, providing that these solvents must be completely vaporized when they enter into the column.
- Reproducibility among columns guaranteed
- Column used for the analysis of methyl esters of fatty acids (FAMEs) solvents, fragrances, alcohols and aromatic compounds in the alimentary and flavor and fragrance industry.



Structure of Polyethylene glycol

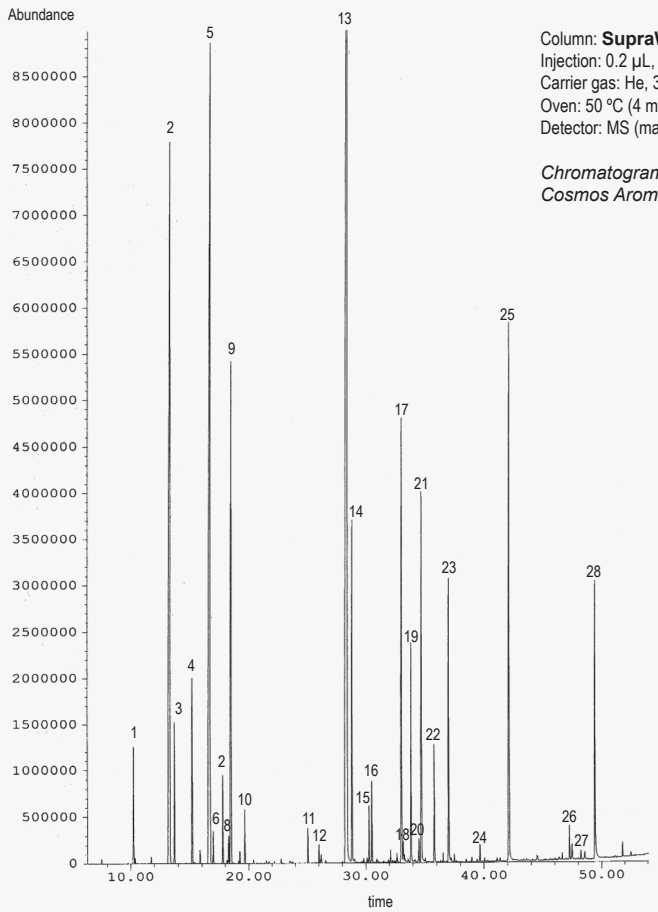
SupraWAX-280 Equivalent Phase

Agilent: DB-WAX etr
Supelco: Supelcowax™ 10
SGE: SolGel-WAX

SupraWAX-280

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	35 to 280	**TR-830141**
	15	0,10	35 to 280	**TR-830111**
	20	0,10	35 to 280	**TR-830181**
	20	0,20	35 to 280	**TR-832181**
	15	0,20	35 to 280	**TR-832111**
0,18	10	0,18	35 to 280	**TR-830944**
	20	0,18	35 to 280	**TR-830984**
	20	0,30	35 to 280	**TR-832984**
	40	0,30	35 to 280	**TR-8329C4**
0,20	30	0,20	35 to 280	**TR-832139**
	60	0,20	35 to 280	**TR-832169**
	60	0,40	35 to 280	**TR-830469**
0,25	15	0,25	35 to 280	**TR-830212**
	15	0,50	35 to 280	**TR-830512**
	30	0,25	35 to 280	**TR-830232**
	30	0,50	35 to 280	**TR-830532**
	60	0,25	35 to 280	**TR-830262**
	60	0,50	35 to 280	**TR-830562**
0,32	15	0,25	35 to 280	**TR-830213**
	15	0,50	35 to 280	**TR-830513**
	30	0,25	35 to 280	**TR-830233**
	30	0,50	35 to 280	**TR-830533**
	30	1,00	35 to 280	**TR-831033**
	60	0,25	35 to 280	**TR-830263**
	60	0,50	35 to 280	**TR-830563**
	60	1,00	35 to 280	**TR-831063**
0,53	15	0.50	35 to 280	**TR-830515**
	15	1,00	35 to 280	**TR-831015**
	30	0.50	35 to 280	**TR-830535**
	30	1,00	35 to 280	**TR-831035**
	30	2,00	35 to 280	**TR-832035**
	60	1,00	35 to 280	**TR-831065**
	60	2,00	35 to 280	**TR-832065**

SupraWAX-280: Essential Oil of Flower of Orange Tree (Neroli)



Column: **SupraWAX-280**, 60 m x 0.20 mm x 0.20 µm, P/N TR-832169
Injection: 0.2 µL, split 1:75, 260 °C
Carrier gas: He, 34.7 psi
Oven: 50 °C (4 min) to 265 °C (10 min) @ 4 °C/min
Detector: MS (mass range 29-350 m/z) 280 °C

Chromatogram proveded by Antonio González from Cosmos Aromatica Internacional

Peak Name

1. α-Pynene
2. β-Pynene
3. Sabynene
4. β-Myrcene
5. Limonene
6. β-Phellandrene
7. Cis-b-ocymene
8. γ-Terpynene
9. Trans-b-ocymene
10. α-Terpynolene
11. Cis-linalool oxide
12. Trans-linalool oxide
13. Linalool
14. Linalyl acetate
15. Terpinen-4-ol
16. Trans-caryophyllene
17. α-Terpyneol
18. α-Terpenyl
19. Neryl acetate
20. Cyclogermacrene
21. Geranyl acetate
22. Cis-geranyol
23. Trans-geranyol
24. Phenyl acetonitrile
25. Nerolydol
26. Methylanthranilate
27. Trans, trans-farnesyl acetate
28. Trans, trans-farnesol

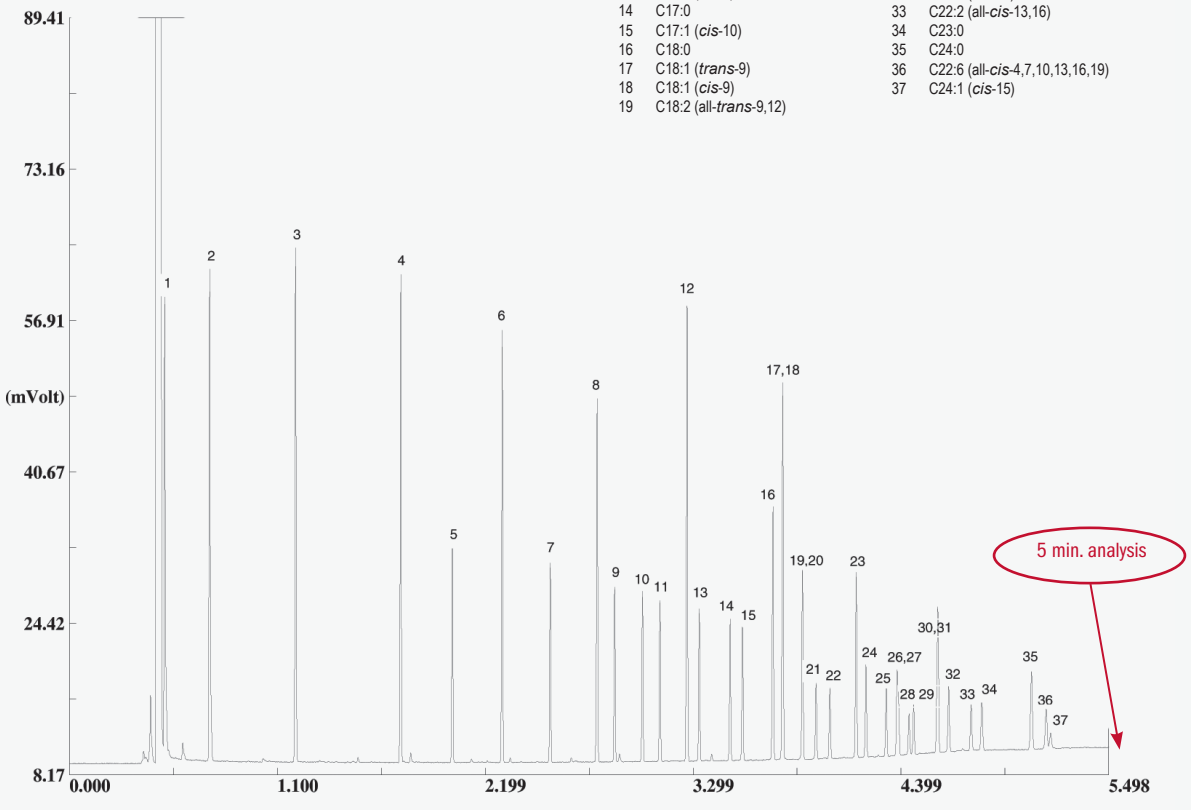
TKG 1202

SupraWAX-280: Food Industry FAME mix (37 compounds)

Column: **SupraWAX-280**, 15 m x 0.10 mm x 0.10 µm, P/N TR-830111
Injection: 0.3 µL Food Industy FAME Mix 10 mg/ml in methylene chloride
280ºC, split 200:1, precission liner
Carrier gas: H_2, 45 psi (310.05 kPa)
Oven: 100 ºC (0.5 min) to 280 ºC (2 min) @ 50 ºC/min
Detector: FID, 280 ºC

Peak Name

1	C4:0
2	C6:0
3	C8:0
4	C10:0
5	C11:0
6	C12:0
7	C13:0
8	C14:0
9	C14:1 (*cis*-9)
10	C15:0
11	C15:1 (*cis*-10)
12	C16:0
13	C16:1 (*cis*-9)
14	C17:0
15	C17:1 (*cis*-10)
16	C18:0
17	C18:1 (*trans*-9)
18	C18:1 (*cis*-9)
19	C18:2 (all-*trans*-9,12)
20	C18:2 (all-*cis*-9,12)
21	C18:3 (all-*cis*-6,9,12)
22	C18:3 (all-*cis*-9,12,15)
23	C20:0
24	C20:1 (*cis*-11)
25	C20:2 (all-*cis*-11,14)
26	C20:3 (all-*cis*-8,11,14)
27	C21:0
28	C20:3 (all-*cis*-11,14,17)
29	C20:4 (all-*cis*-5,8,11,14)
30	C20:5 (all-*cis*-5,8,11,14,17)
31	C22:0
32	C22:1 (*cis*-13)
33	C22:2 (all-*cis*-13,16)
34	C23:0
35	C24:0
36	C22:6 (all-*cis*-4,7,10,13,16,19)
37	C24:1 (*cis*-15)

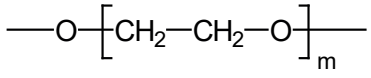


TKG 1247

TRB-WAX

100% polyethylene glycol, bonded and cross-linked phase.

- High polarity column
- Ideal for separating alcohols, aldehydes, ketones and aromatic isomers (BTX)

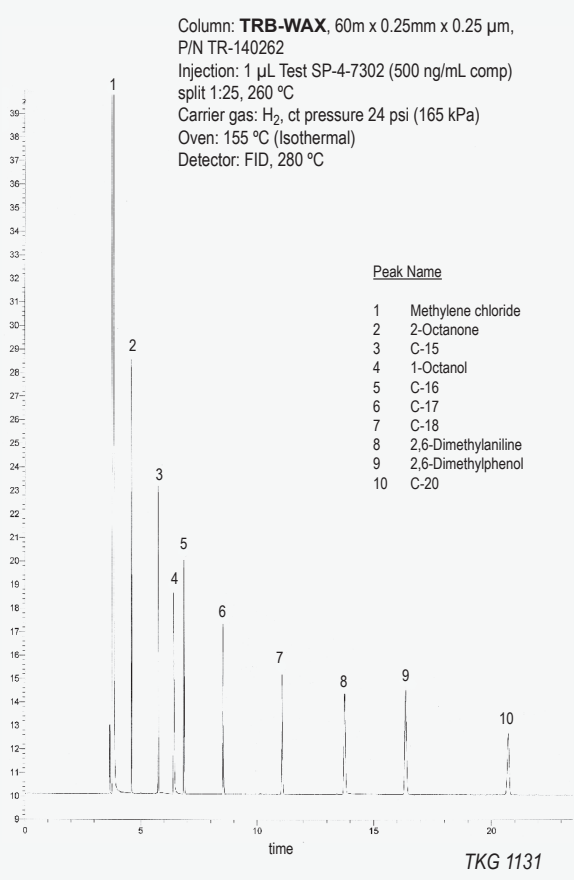


Structure of Polyethylene glycol

TRB-WAX Equivalent Phase

Agilent: HP-INNOWAX, DB-WAX, CP-WAX 52 CB, HP-20M, HP-WAX
Supelco: Carbowax 20M
Restek: STABILWAX, Rtx-WAX
SGE: BP20
Phenomenex: ZB-WAX

TRB-WAX: SP-4-7302 Test



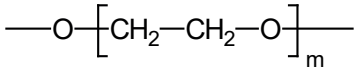
TRB-WAX

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	40 to 260/270	**TR-140141**
	10	0,20	40 to 260/270	**TR-142141**
	20	0,10	40 to 260/270	**TR-140181**
	20	0,20	40 to 260/270	**TR-142181**
0,20	15	0,20	40 to 260/270	**TR-142119**
	15	0,40	40 to 260/270	**TR-140419**
	30	0,20	40 to 260/270	**TR-142139**
	30	0,40	40 to 260/270	**TR-140439**
	60	0,20	40 to 260/270	**TR-142169**
	60	0,40	40 to 260/270	**TR-140469**
0,25	15	0,10	40 to 260/270	**TR-140112**
	15	0,25	40 to 260/270	**TR-140212**
	15	0,50	40 to 260/270	**TR-140512**
	30	0,10	40 to 260/270	**TR-140132**
	30	0,25	40 to 260/270	**TR-140232**
	30	0,50	40 to 260/270	**TR-140532**
	30	1,00	40 to 260/270	**TR-141032**
	60	0,10	40 to 260/270	**TR-140162**
	60	0,25	40 to 260/270	**TR-140262**
	60	0,50	40 to 260/270	**TR-140562**
0,32	15	0,10	40 to 260/270	**TR-140113**
	15	0,25	40 to 260/270	**TR-140213**
	15	0,50	40 to 260/270	**TR-140513**
	30	0,10	40 to 260/270	**TR-140133**
	30	0,25	40 to 260/270	**TR-140233**
	30	0,50	40 to 260/270	**TR-140533**
	50	1,20	40 to 230/240	**TR-141253**
	60	0,10	40 to 260/270	**TR-140163**
	60	0,25	40 to 260/270	**TR-140263**
	60	0,50	40 to 260/270	**TR-140563**
	60	1,00	40 to 230/240	**TR-141063**
	60	1,20	40 to 230/240	**TR-141263**
	100	1,00	40 to 230/240	**TR-141093**
0,53	10	1,00	40 to 240/250	**TR-141045**
	15	1,00	40 to 240/250	**TR-141015**
	30	1,00	40 to 240/250	**TR-141035**
	30	1,33	40 to 240/250	**TR-141735**
	30	2,00	40 to 240/250	**TR-142035**
	60	1,00	40 to 240/250	**TR-141065**
	60	2,00	40 to 240/250	**TR-142065**

TRB-FFAP

Polyethylene glycol esterified with nitroteraphthalic acid, bonded and crosslinked phase.

- Ideal for analysis of free acids (without derivatization), phenols and glycols
- Thermal stability up to (250ºC)

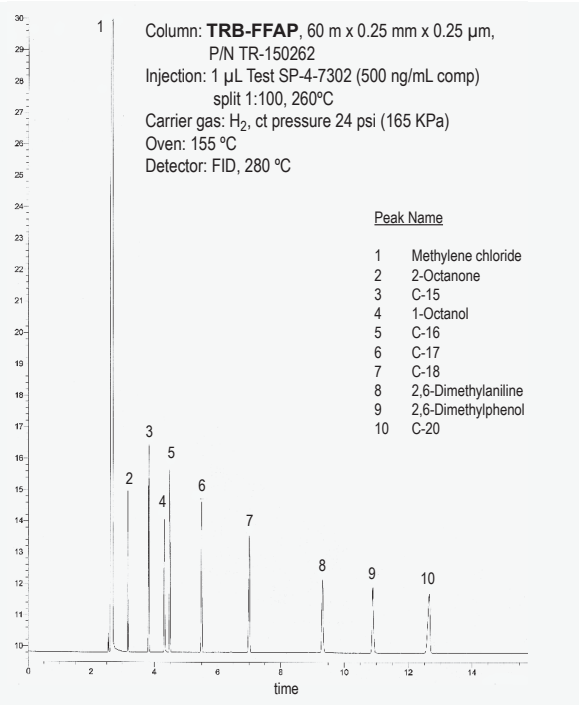


Structure of Polyethylene glycol

TRB-FFAP Equivalent Phase

Agilent: HP-FFAP, DB-FFAP, CP-WAX 58 FFAP CB
Supelco: NUKOL, SPB-1000
Restek: STABILWAX-DA
SGE: BP21
Quadrex: 007-FFAP
Phenomenex: ZB-FFAP

TRB-FFAP: SP-4-7302 Test



TKG 1132

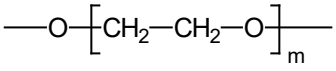
TRB-FFAP

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	40 to 240/250	**TR-150141**
	10	0,20	40 to 240/250	**TR-152141**
	15	0,10	40 to 240/250	**TR-150111**
	20	0,10	40 to 240/250	**TR-150181**
0,20	15	0,30	40 to 240/250	**TR-152119**
	30	0,30	40 to 240/250	**TR-152139**
	60	0,30	40 to 240/250	**TR-152169**
0,25	15	0,25	40 to 240/250	**TR-150212**
	30	0,25	40 to 240/250	**TR-150232**
	60	0,25	40 to 240/250	**TR-150262**
0,32	15	0,25	40 to 240/250	**TR-150213**
	15	0,50	40 to 240/250	**TR-150513**
	30	0,25	40 to 240/250	**TR-150233**
	30	0,50	40 to 240/250	**TR-150533**
	60	0,25	40 to 240/250	**TR-150263**
	60	0,50	40 to 240/250	**TR-150563**
0,53	15	0,50	40 to 240/250	**TR-150515**
	15	1,00	40 to 230/240	**TR-151015**
	30	0,50	40 to 240/250	**TR-150535**
	30	1,00	40 to 230/240	**TR-151035**
	60	0,50	40 to 240/250	**TR-150565**
	60	1,00	40 to 230/240	**TR-151065**

TR-WAX.DB

100% Polyethylene glycol, nonbonded phase.

- Basic deactivated Polyethylene glycol (PEG)
- Excellent for analysing basic nonderivatized compounds
- Ideal for separating amines and nitrosamines



Structure of Polyethylene glycol

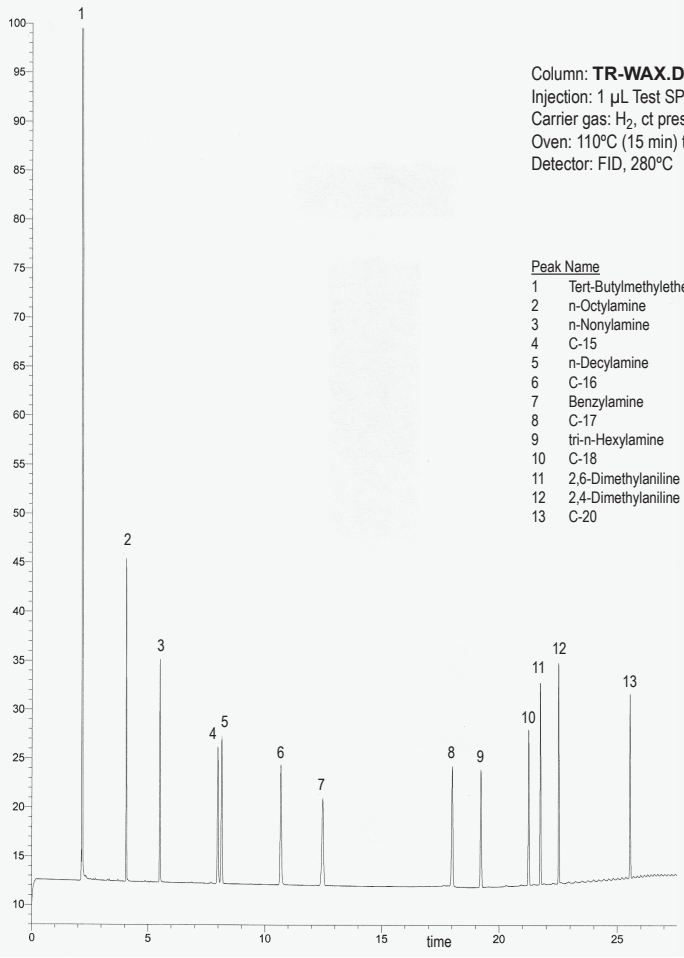
TR-WAX.DB Equivalent Phase

Agilent: CAM, HP-BasicWax, CP-WAX 51 CB for Amines CP-WAX for Volatile Amines
Supelco: Carbowax-Amine
Restek: Stabilwax-DB

TR-WAX.DB

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,20	60 to 210/220	**TR-932112**
	15	0,25	60 to 210/220	**TR-930212**
	30	0,20	60 to 210/220	**TR-932132**
	30	0,25	60 to 210/220	**TR-930232**
	30	0,50	60 to 210/220	**TR-930532**
	60	0,20	60 to 210/220	**TR-932162**
0,32	15	0,25	60 to 210/220	**TR-930213**
	30	0,25	60 to 210/220	**TR-930233**
	30	0,50	60 to 210/220	**TR-930533**
	30	1,00	60 to 210/220	**TR-931033**
	60	1,00	60 to 210/220	**TR-931063**
0,53	15	1,00	60 to 210/220	**TR-931015**
	30	0,50	60 to 210/220	**TR-930535**
	30	1,00	60 to 210/220	**TR-931035**
	30	1,50	60 to 210/220	**TR-931535**
	60	1,00	60 to 210/220	**TR-931065**

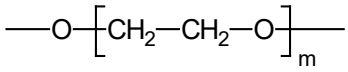
TR-WAX.DB: SP-4-8278 Test



Column: **TR-WAX.DB**, 60m x 0.25mm x 0.20 µm P/N TR-932162
Injection: 1 µL Test SP-4-8278 (500 ng/mL comp), split 1:50, 260ºC
Carrier gas: H_2, ct pressure 24 psi (168 kPa)
Oven: 110ºC (15 min) to 200ºC (10 min) @ 8ºC/min
Detector: FID, 280ºC

Peak	Name
1	Tert-Butylmethylether
2	n-Octylamine
3	n-Nonylamine
4	C-15
5	n-Decylamine
6	C-16
7	Benzylamine
8	C-17
9	tri-n-Hexylamine
10	C-18
11	2,6-Dimethylaniline
12	2,4-Dimethylaniline
13	C-20

TKG 1133



Structure of Polyethylene glycol

TRB-WAXOmega Equivalent Phase

Supelco: Omegawax
Restek: Famewax

TRB-WAXOmega

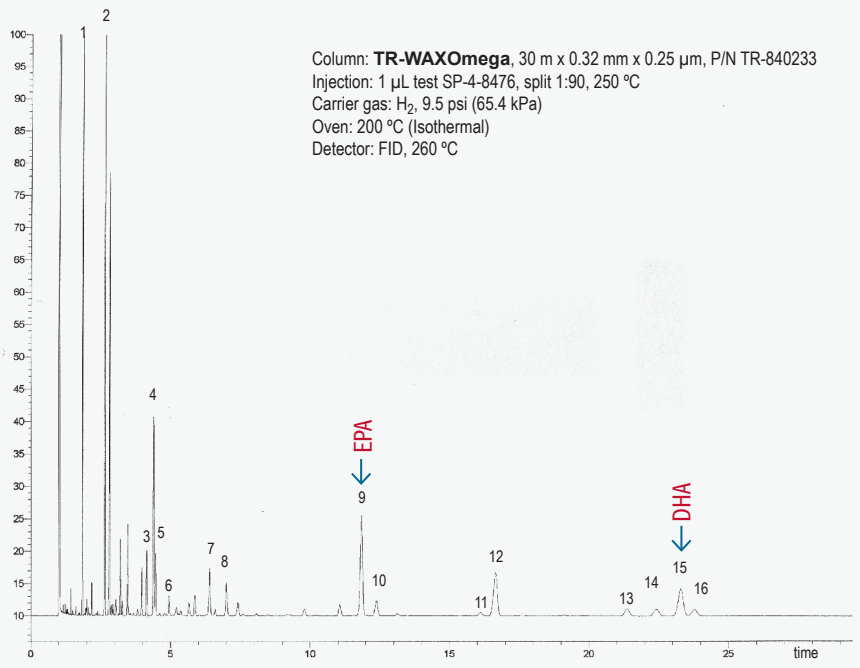
100% Polyethylene glycol, bonded and crosslinked phase.

- High polarity column
- Specially designed for the analysis of Omega-3 and Omega-6 fatty acids methyl esters

TRB-WAXOmega

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	30	0,25	40 to 260/270	**TR-840232**
0,32	30	0,25	40 to 260/270	**TR-840233**
0,53	30	0,50	40 to 260/270	**TR-840535**

TRB-WAXOmega: SP-4-8476 Test



Peak Name

1	C14:0
2	C16:0
3	C18:0
4	C18:1n9
5	C18:1n7
6	C18:2n6
7	C18:4n3
8	C20:0
9	C20:5n3 (EPA)
10	C22:0
11	C21:5n3
12	C23:0
13	C22:5n3
14	C24:0
15	C22:6n3 (DHA)
16	C24:1n9

TKG 1134

Teknokroma Capillary Columns

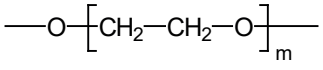
Meta.WAX

100% Polyethylene glycol, bonded and cross-linked phase.

- High polarity column
- Minimum operating temperature 20º C
- Designed for analyzing volatiles in alcoholic beverages
- Excellent symmetry for aldehyde and glycol peaks

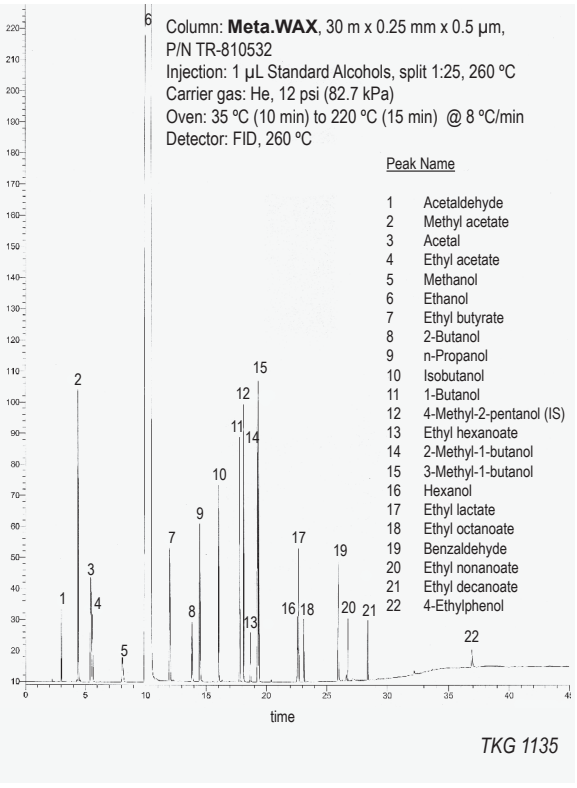
Meta.WAX Equivalent Phase

Agilent: HP-WAX, DB-WAX, CP-WAX 57 CB, DB-WAX FF
Restek: Rtx-WAX
Phenomenex: ZB-WAX
SGE: BP20
Supelco: Nukol



Structure of Polyethylene glycol

Meta.WAX: Alcohols



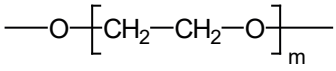
Meta.WAX

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,10	10	0,10	20 to 240/250	**TR-810141**
	10	0,20	20 to 240/250	**TR-812141**
	20	0,10	20 to 240/250	**TR-810181**
	20	0,20	20 to 240/250	**TR-812181**
0,18	10	0,18	20 to 240/250	**TR-810944**
	20	0,18	20 to 240/250	**TR-810984**
	20	0,30	20 to 240/250	**TR-812984**
	40	0,18	20 to 240/250	**TR-8109C4**
	40	0,30	20 to 240/250	**TR-8129C4**
0,25	15	0,10	20 to 240/250	**TR-810112**
	15	0,25	20 to 240/250	**TR-810212**
	15	0,50	20 to 240/250	**TR-810512**
	30	0,10	20 to 240/250	**TR-810132**
	30	0,25	20 to 240/250	**TR-810232**
	30	0,50	20 to 240/250	**TR-810532**
	60	0,20	20 to 240/250	**TR-812162**
	60	0,25	20 to 240/250	**TR-810262**
0,32	15	0,25	20 to 240/250	**TR-810213**
	15	0,50	20 to 240/250	**TR-810513**
	15	1,00	20 to 230/240	**TR-811013**
	30	0,25	20 to 240/250	**TR-810233**
	30	0,50	20 to 240/250	**TR-810533**
	30	1,00	20 to 230/240	**TR-811033**
	60	0,25	20 to 240/250	**TR-810263**
	60	0,50	20 to 240/250	**TR-810563**
	60	0,64	20 to 240/250	**TR-816463**
	60	1,00	20 to 230/240	**TR-811063**
0,53	15	1,00	20 to 230/240	**TR-811215**
	30	1,00	20 to 230/240	**TR-811235**

Meta. WAX 400

100% Polyethylene glycol (PEG), nonbonded phase.

- Column designed for the analysis of volatiles in alcoholic beverages and solvents
- Maximum resolution of amylic alcohols
- High number of plates even at very low temperature (<20ºC)



Structure of Polyethylene glycol

Meta.WAX 400 Equivalent Phase

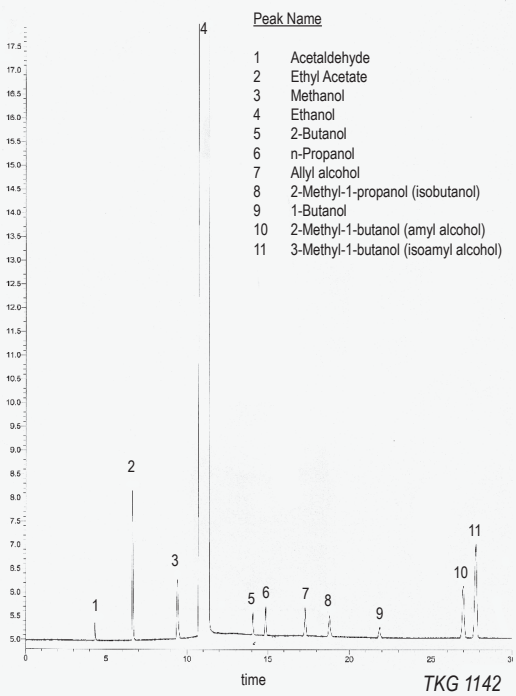
Agilent: CP-Carbowax 400

Meta.WAX 400

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	50	0,20	0 to 60/80	**TR-402153**

Meta.WAX 400: Alcohols

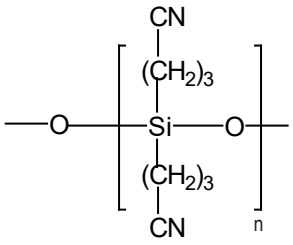
Column: **Meta.WAX 400**, 50 m x 0.32 mm x 0.20 µm, P/N TR-402153
Injection: 1 µL standard (split 1:50), 175 ºC
Carrier gas: He, 11 psi (75.8 kPa)
Oven: 30 ºC (5 min) to 60 ºC (10 min) @ 4 ºC/min
Detector: FID, 175 ºC



TR-CN100

100% Cyanopropyl polysiloxane, nonbonded phase

- Column of maximum polarity
- Designed for separating fatty acids methyl esters (FAME)
- High selectivity towards cis-trans isomers of FAME



Structure of Poly (biscyanopropyl) siloxane

TR-CN100 Equivalent Phase

Agilent: CP-SIL 88, HP-88, Select FAME
Supelco: SP-2340, SP-2380, SP-2560, SP-2330
Restek: Rt-2330, Rt-2560
Phenomenex: ZB-FAME, ZB-88
SGE: BPX70, BPX90

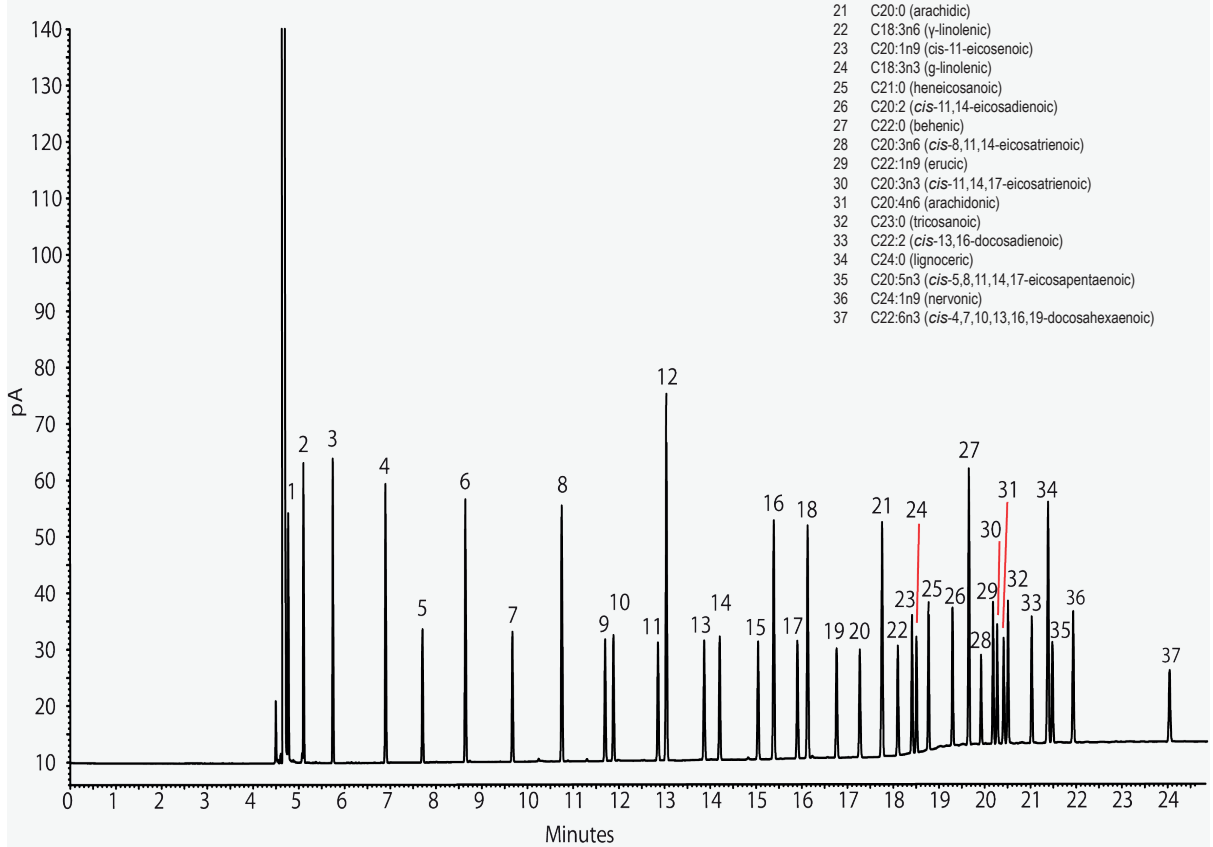
TR-CN100

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	75	0,14	40 to 240/250	**TR-881674**
0,25	15	0,20	40 to 240/250	**TR-882112**
	30	0,20	40 to 240/250	**TR-882132**
	60	0,20	40 to 240/250	**TR-882162**
	100	0,20	40 to 240/250	**TR-882192**
	200	0,20	40 to 240/250	**TR-8821P2**
0,32	15	0,20	40 to 240/250	**TR-882113**
	30	0,20	40 to 240/250	**TR-882133**
	60	0,20	40 to 240/250	**TR-882163**
0,53	15	0,20	40 to 225/250	**TR-882115**
	30	0,20	40 to 225/250	**TR-882135**
	60	0,20	40 to 225/250	**TR-882165**

TR-CN100: SEPARATION OF METHYL ESTERS (FAMES) FAST TEST

Column: **TR-CN100**, 100 m x 0.25 mm x 0.20 µm, P/N TR-882192
Injection: 0.7µL 37 FAMES (RS-35077) (30 mg/mL), split 1:100, 260 ºC
Carrier gas: H_2, ct pressure 42 psi (2,4 ml/min)
Oven: 140 ºC (5 min) to 180 ºC @ 8 ºC/min to 210 ºC @ 4ºC/min to 240 ºC (10 min) @ 20º C/min
Detector: FID, 260 ºC
Liner: 4 mm ID, Single taper w/wool

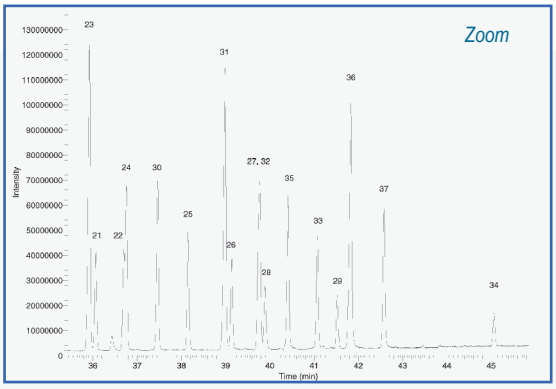
Peak	Name
1	C4:0 (butyric)
2	C6:0 (caproic)
3	C8:0 (caprylic)
4	C10:0 (capric)
5	C11:0 (undecanoic)
6	C12:0 (lauric)
7	C13:0 (tridecanoic)
8	C14:0 (myristic)
9	C14:1 (myristoleic)
10	C15:0 (pentadecanoic)
11	C15:1 (*cis*-10-pentadecanoic)
12	C16:0 (palmitic)
13	C16:1 (palmitoleic)
14	C17:0 (heptadecanoic)
15	C17:1 (*cis*-10-heptadecenoic)
16	C18:0 (stearic)
17	C18:1n9t (elaidic)
18	C18:1n9c (oleic)
19	C18:2n6t (linolelaidic)
20	C18:2n6c (linoleic)
21	C20:0 (arachidic)
22	C18:3n6 (γ-linolenic)
23	C20:1n9 (cis-11-eicosenoic)
24	C18:3n3 (g-linolenic)
25	C21:0 (heneicosanoic)
26	C20:2 (*cis*-11,14-eicosadienoic)
27	C22:0 (behenic)
28	C20:3n6 (*cis*-8,11,14-eicosatrienoic)
29	C22:1n9 (erucic)
30	C20:3n3 (*cis*-11,14,17-eicosatrienoic)
31	C20:4n6 (arachidonic)
32	C23:0 (tricosanoic)
33	C22:2 (*cis*-13,16-docosadienoic)
34	C24:0 (lignoceric)
35	C20:5n3 (*cis*-5,8,11,14,17-eicosapentaenoic)
36	C24:1n9 (nervonic)
37	C22:6n3 (*cis*-4,7,10,13,16,19-docosahexaenoic)

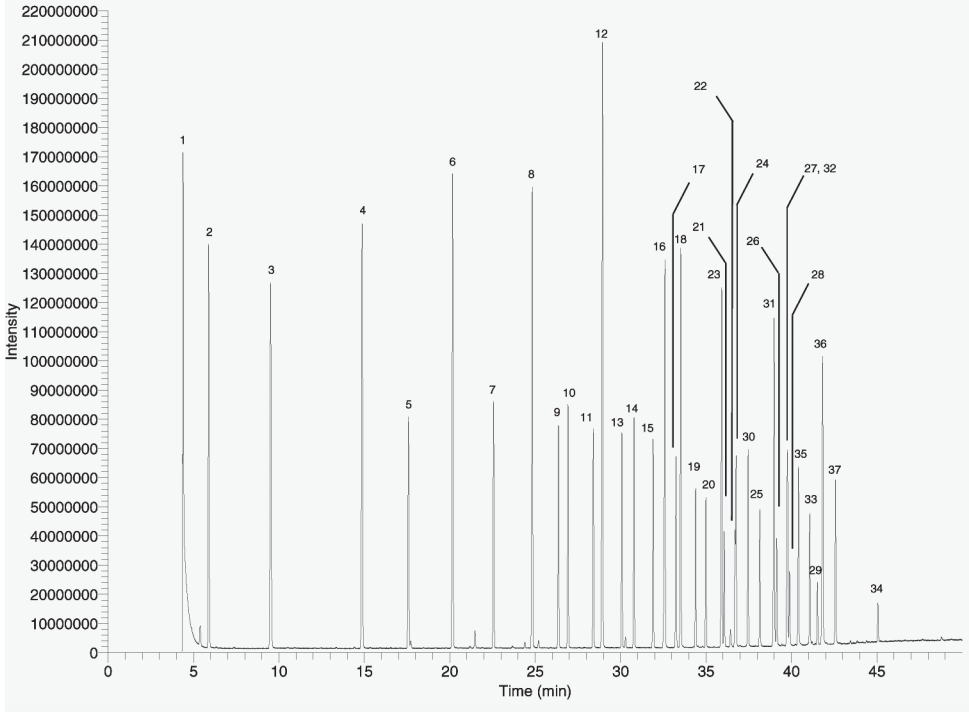


TKG 1316

TR-CN100: Food Industry FAME Mix - 60 m column (MSD)

Column: **TR-CN100**, 60 m x 0.25 mm x 0.20 µm, P/N: TR-882162
Inyection: 280ºC, split 50:1
Carrier gas: He, ct pressure 24 psi (165,6 kPa)
Oven: 90 ºC (7 min) to 240 ºC (3 min) @ 4 ºC/min
Detector: MS
Transfer line: 230 ºC
Ionization mode: EI
Scan range: 40-450 amu
Sample: 0.5µL Food Industry FAME Mix 10 mg/ml in methylene chloride





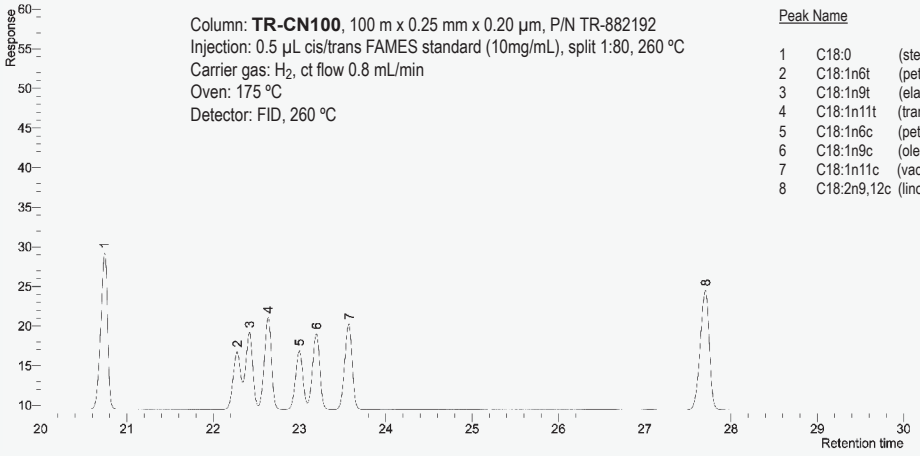
Peak Name

1. C4:0
2. C6:0
3. C8:0
4. C10:0
5. C11:0
6. C12:0
7. C13:0
8. C14:0
9. C14:1(*cis*-9)
10. C15:0
11. C15:1(*cis*-10)
12. C16:0
13. C16:1(*cis*-9)
14. C17:0
15. C17:1(*cis*-10)
16. C18:0
17. C18:1(*trans*-9)
18. C18:1(*cis*-9)
19. C18:2(all-*trans*-9,12)
20. C18:2(all-*cis*-9,12)
21. C18:3(all-*cis*-6,9,12)
22. C18:3(all-*cis*-9,12,15)
23. C20:0
24. C20:1(cis-11)
25. C20:2(all-*cis*-11,14)
26. C20:3(all-*cis*-8,11,14)
27. C20:3(all-*cis*-11,14,17)
28. C20:4(all-*cis*-5,8,11,14)
29. C20:5(all-*cis*-5,8,11,14,17)
30. C21:0
31. C22:0
32. C22:1(*cis*-13)
33. C22:2(all-*cis*-13,16)
34. C22:6 (all-*cis*-4,7,10,13,16,19)
35. C23:0
36. C24:0
37. C24:1(cis-15)

TKG 1251

TR-CN100: MAXIMUM SEPARATION OF CIS-TRANS FAME

Column: **TR-CN100**, 100 m x 0.25 mm x 0.20 µm, P/N TR-882192
Injection: 0.5 µL cis/trans FAMES standard (10mg/mL), split 1:80, 260 ºC
Carrier gas: H_2, ct flow 0.8 mL/min
Oven: 175 ºC
Detector: FID, 260 ºC



Peak Name

1	C18:0	(stearic acid methyl ester)
2	C18:1n6t	(petroselaidic acid methyl ester)
3	C18:1n9t	(elaidic acid methyl ester)
4	C18:1n11t	(transvaccenoic acid methyl ester)
5	C18:1n6c	(petroselinoic acid methyl ester)
6	C18:1n9c	(oleic acid methyl ester)
7	C18:1n11c	(vaccenoic acid methyl ester)
8	C18:2n9,12c	(linoleaic acid methyl ester)

TKG 1255

TR-CRESOL

Proprietary nonbonded phase.

- Column specially designed for the analysis of phenolic compounds (phenols, cresylic acids)
- Derivatization of phenolic compounds is not required to obtain suitable resolution
- Resolves m-cresol/p-cresol and 2,4-xylenol/2,5-xylenol pairs, which are not separated with other columns used for this analysis such as TRB-5 and TRB-WAX

TR-CRESOL Equivalent Phase

Agilent: CP-CRESOL

TR-CRESOL

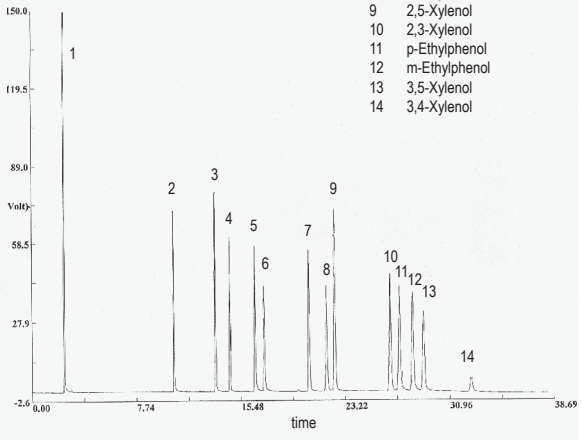
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	30	0,20	130	**TR-702132**
	60	0,20	130	**TR-702162**

TR-CRESOL: Cresols

Column: **TR-CRESOL**, 60 m x 0.25 mm x 0.20 µm, P/N TR-702162
Injection: 1 µL standard Cresols (5000 ng/mL comp), split 1:25, 150ºC
Carrier gas: H_2, ct pressure 24 psi (165 kPa)
Oven: 130 ºC
Detector: FID, 150 ºC

Peak Name

1 Methylene chloride
2 Phenol
3 o-Cresol
4 2,6-Xylenol
5 p-Cresol
6 m-Cresol
7 o-Ethylphenol
8 2,4-Xylenol
9 2,5-Xylenol
10 2,3-Xylenol
11 p-Ethylphenol
12 m-Ethylphenol
13 3,5-Xylenol
14 3,4-Xylenol

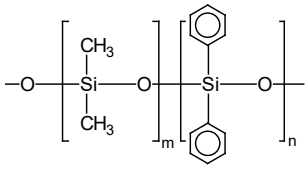


TKG 1137

TR-17

Poly (methylphenylsiloxane)

- Not bonded phase
- Recommended by pharmacopoeia for determining the impurities of sodium saccharin (o-p-Toluenesulfonamides)



Structure of Poly (dimethyldiphenyl) siloxane

TR-17 Equivalent Phase

Agilent: HP-17, DB-17
Restek: Rtx-17

TR-17

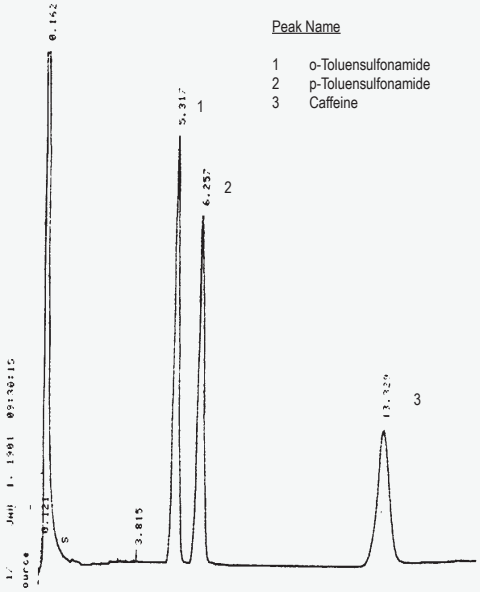
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	10	2,00	40 to 220/240	**TR-712045**

TR-17: Impurities of sodium saccharin

Column: **TR-17,** 10 m x 0,53 mm x 2.0 µm, P/N TR-712045
Injector: 260 ºC
Carrier gas: He, 6.5 psi
Injection: 1ml standard, split 1:4
Oven: 180 ºC
Detector: FID, 280 ºC

Peak Name

1 o-Toluensulfonamide
2 p-Toluensulfonamide
3 Caffeine



TKG 1138

Meta.VOC

Proprietary bonded and crosslinked phase.

- Developed for the analysis of volatile organic compounds (VOC)
- Intermediate polarity column

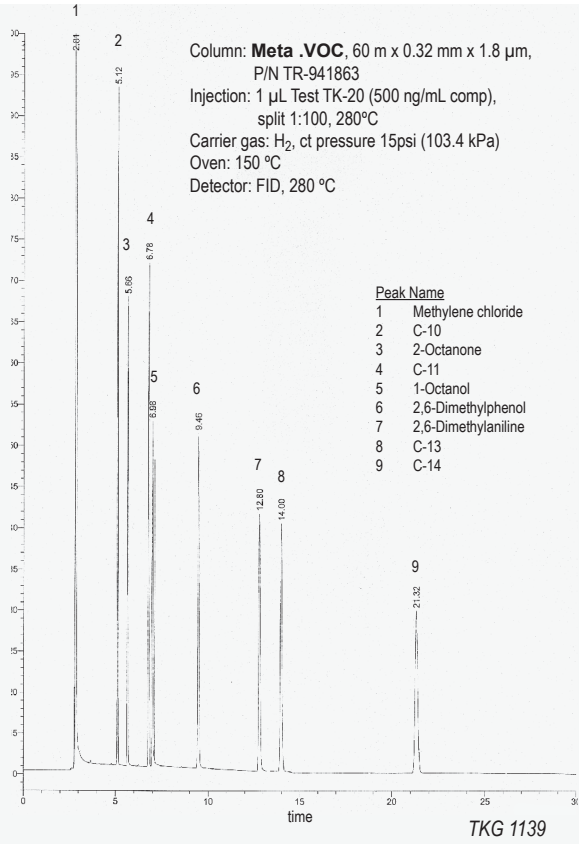
Meta.VOC Equivalent Phase

Agilent: DB-502.2, HP-VOC
Supelco: VOCOL
Restek: Rtx-502.2, Rtx-Volatile

Meta.VOC

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	1,00	-20 to 240/250	**TR-941084**
0,20	10	1,20	-20 to 240/250	**TR-941249**
0,25	30	1,50	-20 to 240/250	**TR-941532**
	60	1,50	-20 to 240/250	**TR-941562**
0,32	60	1,80	-20 to 240/250	**TR-941863**
	60	3,00	-20 to 230/240	**TR-943063**
0,53	30	3,00	-20 to 230/240	**TR-943035**
	60	3,00	-20 to 230/240	**TR-943065**
	105	3,00	-20 to 230/240	**TR-9430K5**

Meta.VOC: TK-20 Test



TKG 1139

TRB-608

Proprietary bonded and crosslinked phase.

- Specifically designed for analysing chlorinated pesticides and PCBs
- Suitable for EPA 508, 608 and 8080 methods.

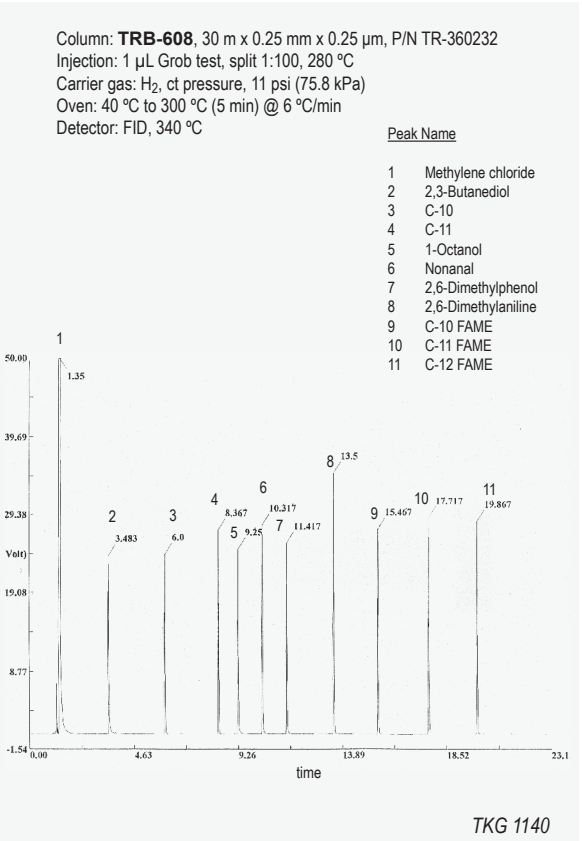
TRB-608 Equivalent Phase

Agilent: HP-608, DB-608
Supelco: SPB-608
SGE: BP608

TRB-608

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,18	20	0,18	-20 to 300/310	**TR-360984**
0,25	30	0,25	-20 to 300/310	**TR-360232**
0,53	15	0,50	-20 to 290/300	**TR-360515**
	30	0,50	-20 to 290/300	**TR-360535**

TRB 608: Grob Test



TKG 1140

TR-TCEP

1, 2, 3-Tris (2-cyanoethoxy) propane, nonbonded phase

- High polarity column
- Column for the analysis of alcohols in gasoline
- Separation of the aliphatic hydrocarbons up to C12 in aromatics

TR-TCEP Equivalent Phase

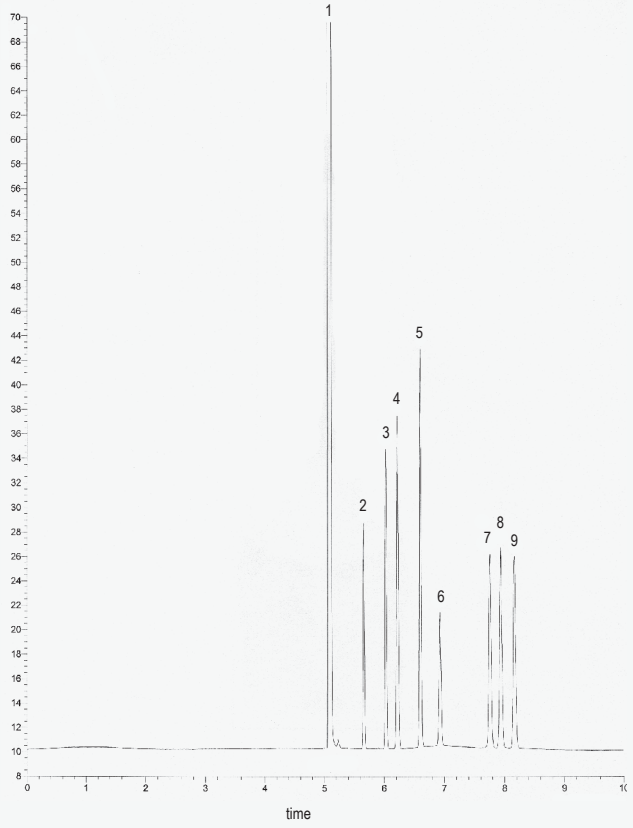
Agilent: CP-TCEP
Supelco: TCEP
Restek: Rt-TCEP

TR-TCEP

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	30	0,40	0 to 135	**TR-960432**
	60	0,40	0 to 135	**TR-960462**

TR-TCEP: TR-TCEP Test

Column: **TR-TCEP**, 60 m x 0.25 mm x 0.40 µm, P/N TR-960462
Injection: 1 µL standard (20 ng/mL comp.), split 1:50, 170 °C
Carrier gas: H_2, ct pressure 24 psi (165 kPa)
Oven: 110 °C
Detector: FID, 170 °C



Peak Name

1 Isooctane
2 C-11
3 C-12
4 Benzene
5 C-13
6 Toluene
7 Ethylbenzene
8 p-Xylene
9 Cumene

TKG 1141

MetaBLOOD 1 & MetaBLOOD 2

Proprietary bonded and crosslinked phases

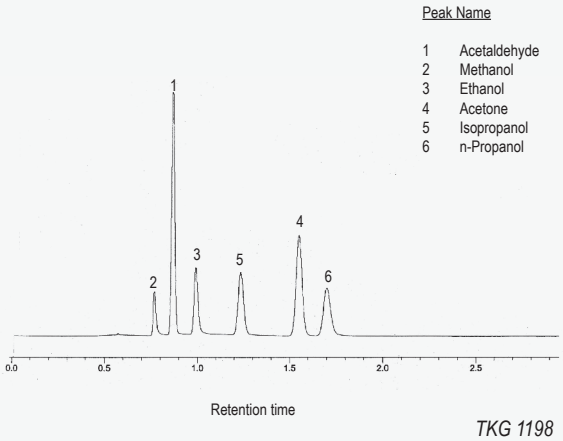
- For analysis of volatile compounds in biological fluids such as blood.
- Extremely low analysis time
- Used as analytical column and confirmation column.
- MetaBLOOD 1 and MetaBLOOD 2 have different elution order for some compounds

MetaBLOOD 1 and MetaBLOOD 2 Equivalent Phases

Agilent: DB-ALC1, DB-ALC2
Restek: Rtx-BAC1, Rtx-BAC2, Rtx-BAC 1 Plus, Rtx-BAC 2 Plus
Phenomenex: ZB-BAC1, ZB-BAC2

MetaBLOOD 1: Alcohols in Blood

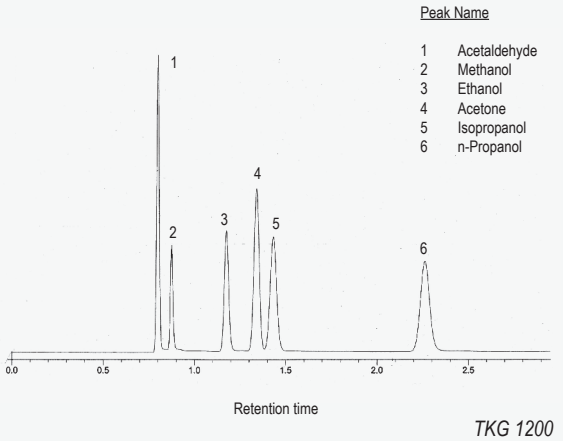
Column: **MetaBLOOD 1**, 30 m x 0.53 mm x 3.0 µm, P/N TR-853035
Injection: 1 mL Head Space 2t, blood alcohols mix, split 1:10, 250 ºC
Carrier gas: He, 80 cm/s (40 ºC)
Oven: 40 ºC (Isothermal)
Detector: FID, 260 ºC



TKG 1198

MetaBLOOD 2: Alcohols in Blood

Column: **MetaBLOOD 2**, 30 m x 0.53 mm x 2.0 µm, P/N TR-862035
Injection: 1 mL Head Space 2t, blood alcohols mix, 250 ºC
Carrier gas: He, 80 cm/s (40 ºC)
Oven: 40 ºC (Isothermal)
Detector: FID, 260 ºC



TKG 1200

MetaBLOOD 1

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	30	1.80	-20 to 240/260	**TR-851833**
0,53	30	3.00	-20 to 240/260	**TR-853035**

MetaBLOOD 2

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	30	1.20	-20 to 240/260	**TR-861233**
0,53	30	2.00	-20 to 240/260	**TR-862035**

TRB-BIODIESEL / TKM-BIODIESEL

- Glycerin and Mono-Di-Triglycerides analysis tested under EN14105/ASTM D6584 methods
- Chemical inertness guaranteed for a good responce for glycerin analysis
- Low column bleed at high temperatures
- Available in fused Silica and metal tubing

TRB-BIODIESEL / TKM-BIODIESEL

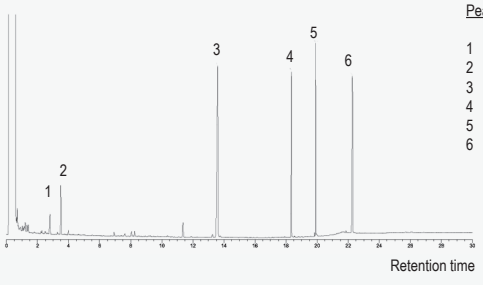
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32 (Fused Silica)	10 + 2 m x 0.53 mm retention gap attached using SS connector	0.10	400	**TR-G780143**
0,32 (Metal)	10 + 2 m x 0.53 mm retention gap attached using SS connector	0.10	400	**TR-G780143M**

Analysis of Glycerin and Glycerides (EN14105/ASTM D6584)
Low Bleed at 370ºC

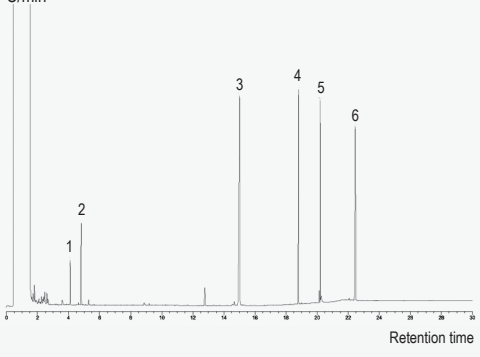
Biodiesel standard, cool on column
Carrier gas: H_2, ct flow 3 mL/min
Oven: 50 ºC (1min) to 180 ºC @ 15 ºC/min to 230 ºC @ 7 ºC/min to 380 ºC (5 min) @ 30 ºC/min
Detector: FID, 380 ºC

Peak Name

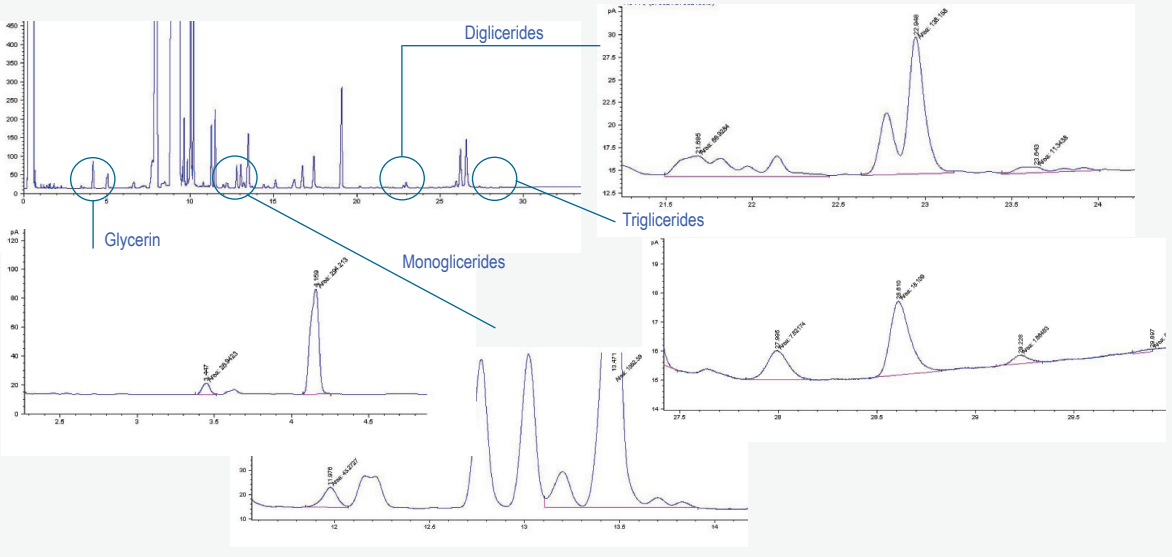
1 Glycerin
2 Buthanetriol (IS1)
3 Monoolein
4 Tricaprin (IS2)
5 Diolein
6 Triolein



Retention Gap (Fused Silica 2 m x 0.53 mmID) + Fused Silica Column
(10 m x 0.32 mm ID x 0.1 µm)



Retention Gap (Metal, 2 m x 0.53 mmID) + Metal Column
(10 m x 0.28 mm ID x 0.1 µm)



Chromatogram obtained from the analysis of Rapesseed oil. Provided by Mercedes H. Muñoz from ACCIONA

Also for Biodiesel analysis

Methanol analysis (EN-14110)
FAMEs and Linolenic acid methyl ester analysis (EN-14103)

TRB-1, 30 m x 0.32 mm x 3.0 µm, TR-113033
SupraWAX-280, 30 m x 0.32 mm x 0.25 µm, TR-830233

Teknokroma Microbore Columns (0.10 mm ID)

- MINIMUM BLEED LEVEL (approximately 10 times less bleed than a conventional column of 0.25 mm ID).
- HIGH ANALYTICAL SPEED (the analysis are approximately 3 times faster than a conventional column of 0.25 mm ID).

0.10 mm internal diameter columns can be connected to a conventional chromatograph fitted with a SPLIT/SPLITLESS injector. Due to its great efficiency (~7,000-10,000 plates/m) and its reduced diameter, the analysis can be undertaken with greater speed compared to standard capillary columns, without loss of peak resolving power. Ideal for complex mixtures, with a large number of components. The standard length is 10 metres (Fig. 8 and Fig. 9).

Fig. 8. TRB-1: Lemon oil in a conventional column

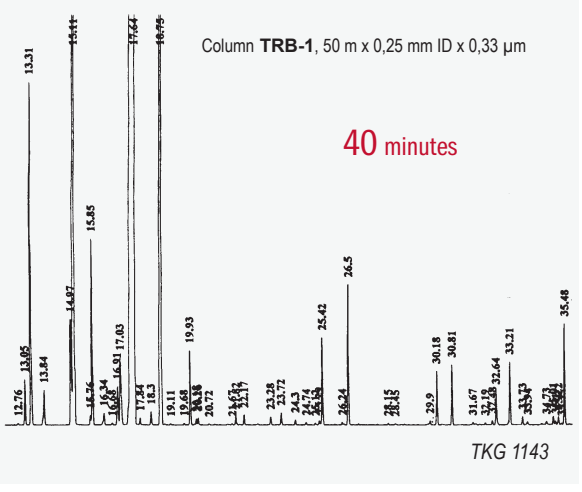
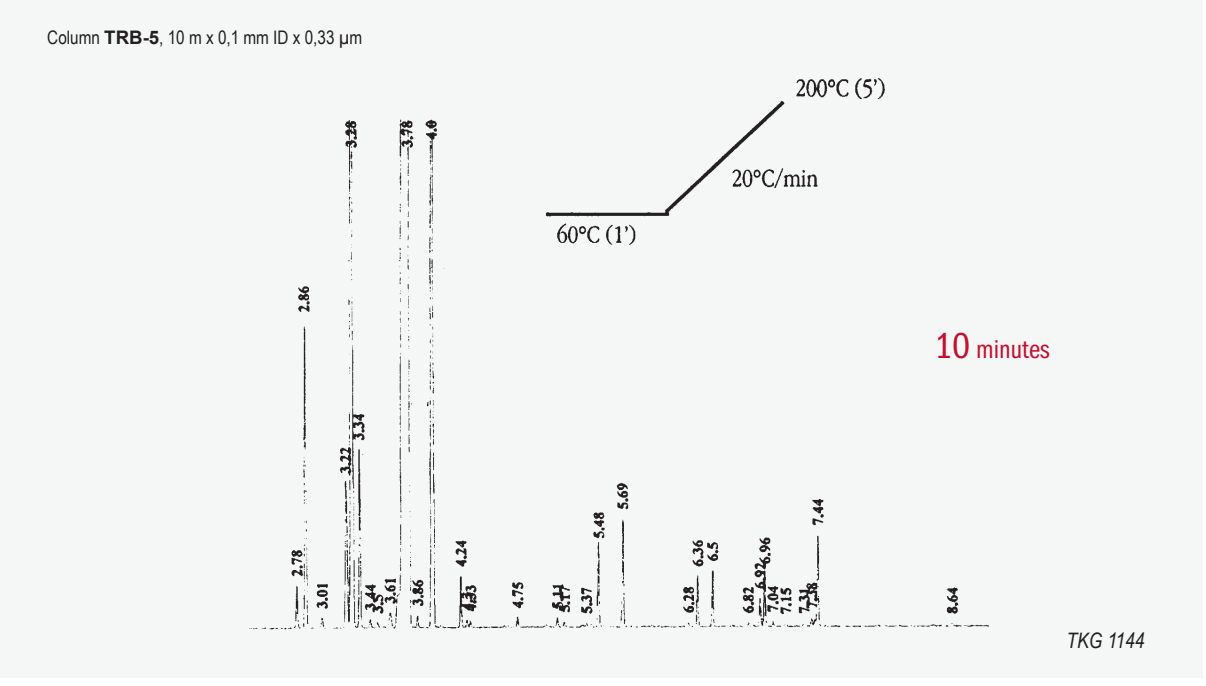


Fig. 9. TRB5: Lemon oil in a 0,10 mm ID column



Teknokroma Microbore Columns (0.10 mm ID)

Limiting factors

1. Working Pressure (Gas Flow)

With microbore columns the working pressures are higher so that more precautions should be taken regarding gas leaks at the injector and connections.
At optimum pressure the carrier gas flow is low (H2~0.2cc/min, He ~0.1cc/min), which is good for working with mass detectors, since it does not exceed its emptying capacity. Not optimizing these parameters may cause losses in peak resolution.

2. Sample Capacity

Narrow bore columns have a very limited sample capacity, approximately 10 times less than that of 0.25 mm ID.

3. Injector

The columns of 0.10 mm ID are compatible with the injection techniques in Split-splitless. It is not recommended to work with direct or on-column injection.
The glass liners, with internal diameters of 2-4 mm, are not the most suitable since, due to their large dead volume, and the fact that one is working with small gas carrying flows, it is difficult for there to be a correct sweep in the injection zone. This transforms into an enlarging of peaks, with the subsequent loss of resolution (especially for liners of 4 mm). It is highly recommended to work with liners of 0.75-1 mm diameter.

Working with this type of small volume liner, along with the microbore columns, means that one must be extremely careful with the purity of the samples that are injected. The samples must be clean and the non-volatile residues must be minimised in order to avoid contaminations that cause absorption of analytes, decompositions, the appearance of ghost peaks, etc.

4. Detector

The gas flows of the detector must be optimised for working with the microbore columns. It is possible that in some detectors the auxiliary gas flow(make up) will have to be increased in order to minimise its dead volume and enable the correct sweep of the compounds that leave the column at very low flow levels.
Since the peaks elute very fast and are very narrow (the peak widths are generally less than 1 s) it is necessary to work at very high speeds on the electrometer and with fast integration so that the quantification of the peaks is correct.
The small volume of these columns means that the stationary phase quantity deposited in them is very small compared to a conventional column. This, along with the low flow levels with which it works, causes the bleed level (proportional to the quantity of the phase and flow) to be minimal, even at high temperatures, thus favouring the signal/noise ratio and contributing to the detectors not getting contaminated.

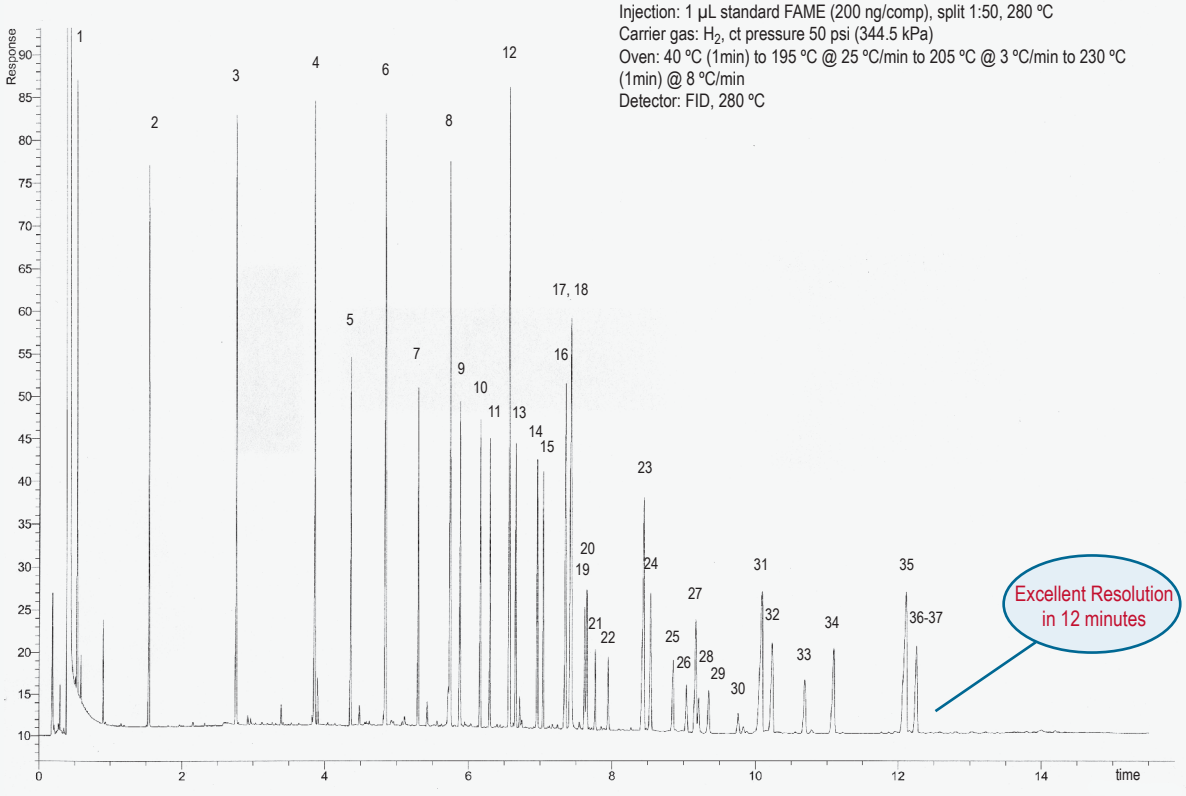
Teknokroma Microbore Columns of 0.10 mm ID

Phase	Length (m)	(df µm)	P/N
TRB-1	5	0.12	**TR-1107A1**
	10	0.10	**TR-110141**
	10	0.40	**TR-110441**
	20	0.10	**TR-110181**
	20	0.40	**TR-110481**
	40	0.20	**TR-1121C1**
	40	0.40	**TR-1104C1**
TRB-1MS	10	0.10	**TR-510141**
	10	0.40	**TR-510441**
	20	0.10	**TR-510181**
	20	0.40	**TR-510481**
TRB-5	10	0.10	**TR-120141**
	10	0.17	**TR-121941**
	10	0.33	**TR-123341**
	10	0.40	**TR-120441**
	20	0.10	**TR-120181**
	20	0.40	**TR-120481**
TRB-5MS	10	0.10	**TR-520141**
	10	0.40	**TR-520441**
	20	0.10	**TR-520181**
	20	0.40	**TR-520481**
TRB-50	10	0.10	**TR-500141**
	10	0.20	**TR-502141**
	20	0.10	**TR-500181**
TRB-225	20	0.10	**TR-250181**
TRB-1701	20	0.10	**TR-130181**
	20	0.40	**TR-130481**
Meta.WAX	10	0.10	**TR-810141**
	10	0.20	**TR-812141**
	20	0.10	**TR-810181**
	20	0.20	**TR-812181**
TRB-WAX	10	0,10	**TR-140141**
	10	0,20	**TR-142141**
	20	0,10	**TR-140181**
	20	0,20	**TR-142181**
SupraWAX-280	10	0.10	**TR-830141**
	15	0.10	**TR-830111**
	20	0.10	**TR-830181**
	20	0.20	**TR-832181**
	15	0.20	**TR-832111**
TRB-FFAP	10	0,10	**TR-150141**
	10	0,20	**TR-152141**
	15	0,10	**TR-150111**
	20	0,10	**TR-150181**

Teknokroma Microbore Columns (0.10 mm ID)

TRB-WAX: 37 FAME mix

Column: **TRB-WAX**, 10 m x 0.10 mm x 0.10 µm, P/N TR-140141
Injection: 1 µL standard FAME (200 ng/comp), split 1:50, 280 ºC
Carrier gas: H_2, ct pressure 50 psi (344.5 kPa)
Oven: 40 ºC (1min) to 195 ºC @ 25 ºC/min to 205 ºC @ 3 ºC/min to 230 ºC (1min) @ 8 ºC/min
Detector: FID, 280 ºC



Peak Name

1	Butyric acid methyl ester (C4:0)
2	Caproic acid methyl ester (C6:0)
3	Caprylic acid methyl ester (C8:0)
4	Capric acid methyl ester (C10:0)
5	Undecanoic acid methyl ester (C11:0)
6	Lauric acid methyl ester (C12:0)
7	Tridecanoic acid methyl ester (C13:0)
8	Myristic acid methyl ester (C14:0)
9	Myristoleic acid methyl ester (C14:1)
10	Pentadecanoic acid methyl ester (C15:0)
11	*cis*-10-Pentadecenoic acid methyl ester (C15:1)
12	Palmitic acid methyl ester (C16:0)
13	Palmitoleic acid methyl ester (C16:1)
14	Heptadecanoic acid methyl ester (C17:0)
15	*cis*-10-Heptadecenoic acid methyl ester (C17:1)
16	Stearic acid methyl ester (C18:0)
17	Oleic acid methyl ester (C18:1n9c)
18	Elaidic acid methyl ester (C18:1n9t)
19	Linoleic acid methyl ester (C18:2n6c)
20	Linolelaidic acid methyl ester (C18:2n6t)
21	γ-Linolenic acid methyl ester (C18:3n6)
22	Linolenic acid methyl ester (C18:3n3)
23	Arachidic acid methyl ester (C20:0)
24	*cis*-11-Eicosenoic acid methyl ester (C20:1)
25	*cis*-11,14-Eicosadienoic acid methyl ester (C20:2)
26	*cis*-8,11,14-Eicosatrienoic acid methyl ester (C20:3n6)
27	Heneicosanoic acid methyl ester (C21:0)
28	*cis*-11,14,17-Eicosatrienoic acid methyl ester (C20:3n3)
29	Arachidonic acid methyl ester (C20:4n6)
30	*cis*-5,8,11,14,17-Eicosapentaenoic acid methyl ester (C20:5n3)
31	Behenic acid methyl ester (C22:0)
32	Erucic acid methyl ester (C22:1n9)
33	*cis*-13,16-Docosadienoic acid methyl ester (C22:2)
34	Tricosanoic acid methyl ester (C23:0)
35	Lignoceric acid methyl ester (C24:0)
36	*cis*-4,7,10,13,16,19-Docosahexaenoic acid methyl ester (C22:6n3)
37	Nervonic acid methyl ester (C24:1)

TKG 1145

Custom Capillary Columns

Teknokroma also provides you with the possibility of working with nonbonded and bonded custom capillary columns, which are still described today in official methods, or which appear in the scientific bibliography. We can supply you with these columns in the size and phase thickness that you require for a similar price as our standard Teknokroma columns. As an example:

TR-101 - 100% polydimethylsiloxane phase (silicone fluid).
TR-SE-30 - 100% polydimethylsiloxane phase.
TR-SE-52 - 5% phenyl-95% dimethylpolysiloxane phase.
TR-SE-54 - 5% phenyl-1% vinyl-94% dimethylpolysiloxane phase.
TR-20M - 100% polyethylene glycol (Carbowax 20M) phase.

We can also supply you with columns for inverse gas chromatography, used for the characterisation of polymers. Teknokroma can coat your polymer in our fused silica column.

For other phases not included in this list contact our technical department

Stainless steel Teknokroma columns (TKM)

- Chemical inertness comparable to that of fused silica
- Ideal for chromatographs in industrial control processes
- Practically unbreakable
- Enables the hightest analysis temperatures

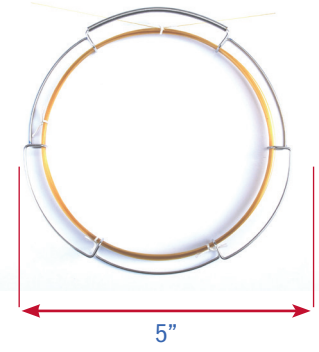
Teknokroma can supply you stainless steel columns with a 0.53 mm internal diameter and an external diameter similar to that of fused silica semi-capillary columns, compatible with standard ferrules of 0.8 mm ID.
These columns are available with our most popular stationary phases.

To order a metallic column:
"simply add the M at the end of the corresponding reference to the column in the catalog."

For instance: TRB-2887 of 10 m x 0.53 mm x 2.65 µm
P/N TR-192645

With stainless steel tube, 10 m x 0.53 mm x 2.65 µm (TKM-2887)
P/N TR-192645M

Columns for the Agilent GC 6850 5-inch column cage



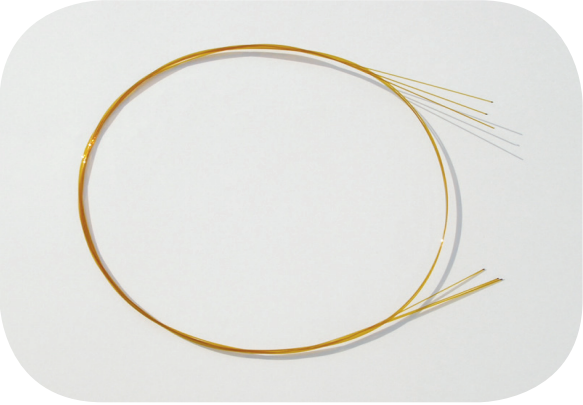
For columns that have to be placed in the oven of the 6850 chromatograph, the column must be rolled up in a 5 inch cage.

To order a column in a 5 inch cage:
you just need to add a 5 to the end of the catalog number of the corresponding column.

For instance: TRB-5, 30m x 0.25 mm x 0.25µm
P/N TR-120232

With 5 inch cage, TRB-5, 30m x 0.25 mm x 0.25µm
P/N TR-1202325

Guard Columns (Retention Gap)



NON POLAR

Methyl deactivated, suitable for pentane/hexane and other non polar solvents.

Internal Diam.(mm)	Length (m)	Part. N°. (P/N)
0,25	3 unit x 1	**TR-100012**
	1 unit x 5	**TR-100052**
	1 unit x 10	**TR-100042**
	1 unit x 20	**TR-100082**
0,32	3 unit x 1	**TR-100013**
	1 unit x 5	**TR-100053**
	1 unit x 10	**TR-100043**
	1 unit x 20	**TR-100083**
0,53	3 unit x 1	**TR-100015**
	1 unit x 5	**TR-100055**
	1 unit x 10	**TR-100045**
	1 unit x 20	**TR-100085**

MEDIUM POLAR (INTERMEDIATE)

Phenyl-methyl deactivated, USP <467> suitable for methylene chloride, hexane, toluene, and a wide range of similar solvents

Internal Diam.(mm)	Length (m)	Part. N°. (P/N)
0,25	3 unit x 1	**TR-200012**
	1 unit x 5	**TR-200052**
	1 unit x 10	**TR-200042**
	1 unit x 20	**TR-200082**
0,32	3 unit x 1	**TR-200013**
	1 unit x 5	**TR-200053**
	1 unit x 10	**TR-200043**
	1 unit x 20	**TR-200083**
0,53	3 unit x 1	**TR-200015**
	1 unit x 5	**TR-200055**
	1 unit x 10	**TR-200045**
	1 unit x 20	**TR-200085**

POLAR

Polyethylene glycol deactivated, suitable for methanol, water and a wide range of similar polar solvents.

Internal Diam.(mm)	Length (m)	Part. N°. (P/N)
0,25	3 unit x 1	**TR-300012**
	1 unit x 5	**TR-300052**
	1 unit x 10	**TR-300042**
	1 unit x 20	**TR-300082**
0,32	3 unit x 1	**TR-300013**
	1 unit x 5	**TR-300053**
	1 unit x 10	**TR-300043**
	1 unit x 20	**TR-300083**
0,53	3 unit x 1	**TR-300015**
	1 unit x 5	**TR-300055**
	1 unit x 10	**TR-300045**
	1 unit x 20	**TR-300085**

Guard Columns (Retention Gap)

AQUASAFE

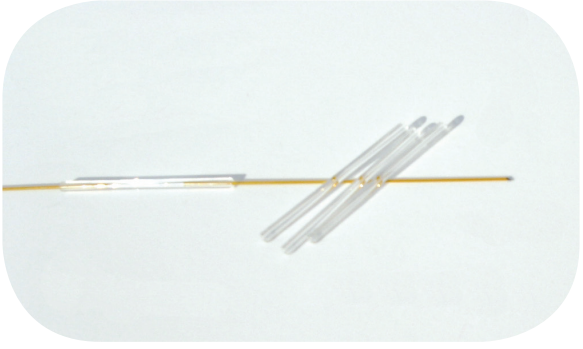
Proprietary deactivation suitable for water direct aqueous injections.

Internal Diam.(mm)	Length (m)	Part. N°. (P/N)
0,25	3 unit x 1	**TR-310012**
	1 unit x 5	**TR-310052**
	1 unit x 10	**TR-310042**
	1 unit x 20	**TR-310082**
0,32	3 unit x 1	**TR-310013**
	1 unit x 5	**TR-310053**
	1 unit x 10	**TR-310043**
	1 unit x 20	**TR-310083**
0,53	3 unit x 1	**TR-310015**
	1 unit x 5	**TR-310055**
	1 unit x 10	**TR-310045**
	1 unit x 20	**TR-310085**

BASE-DEACTIVATED

Proprietary deactivation suitable for the analysis of amines and other basic compounds

Internal Diam.(mm)	Length (m)	Part. N°. (P/N)
0,25	3 unit x 1	**TR-320012**
	1 unit x 5	**TR-320052**
	1 unit x 10	**TR-320042**
	1 unit x 20	**TR-320082**
0,32	3 unit x 1	**TR-320013**
	1 unit x 5	**TR-320053**
	1 unit x 10	**TR-320043**
	1 unit x 20	**TR-320083**
0,53	3 unit x 1	**TR-320015**
	1 unit x 5	**TR-320055**
	1 unit x 10	**TR-320045**
	1 unit x 20	**TR-320085**



UNIVERSAL PRESS FIT CONNECTORS

Deactivated Universal	Description
TR-330001	Universal Press Fit 12pk
TR-330002	Universal Press Fit Angled Y/ 1 unit
TR-330032	Universal Press Fit Angled Y/ 3 units

INTEGRATED GUARD COLUMNS

Some of the most popular Teknokroma capillary columns can be built with an integrated guard column. Built-in guard column is a connection-free solution that protects and preserves the integrity of your column.

Teknokroma also offers the option to build your column with both guard and after column.

to order a column with an integrated guard column use the below formula:

TR-G[P/N Column]-[meters precolumn]-[meters post column]

for instance: Meta XLB 30 m x 0.25 mm x 0.25 µm **P/N TR-330232**
with pre and poscolumn:
Meta XLB 30 m x 0.25 mm x 0.25 µm + 5 meters pre column + 1 meter post column **P/N TR-G330232-5-1**

USP Capillary Column Equivalents

USP CODE	General Description	Teknokroma Recommended Capillary Equivalent
G1	Dimethylpolysiloxane oil	TRB-1, TRB-1ms
G2	Dimethylpolysiloxane gum	TRB-1, TRB-1ms
G3	50% phenyl-50%methylpolysiloxane	TRB-50
G5	3-cyanopropylsiloxane	TR-CN100
G6	Poly(ethylenepropylene)glycol	TRB-F50
G8	90%-3-cyanopropyl-10% phenylmethylsiloxane	TR-CN100
G9	Methylvinylpolysiloxane	TRB-1, TRB-1ms
G14	Polyethylene glycol (MW = 951-1050)	TRB-WAX
G15	Polyethylene glycol (MW = 3000-3070)	TRB-WAX
G16	Polyethylene glycol (MW = 15000)	TRB-WAX
G19	25% phenyl-25%cyanopropylmethylsiloxane	TRB-225
G20	Polyethylene glycol (MW = 400-420)	Meta.WAX 400
G25	Polyethylene glycol TPA	TRB-FFAP
G27	5% phenyl-95%methylpolysiloxane	TRB-5, TRB-5ms, Meta.X5
G28	25% phenyl-75%-dimethylpolysiloxane	TRB-20
G32	20% phenylmethyl-80%-dimethylpolysiloxane	TRB-20
G35	Polyethylene glycol with Nitroterephthalic acid	TRB-FFAP
G36	1%vinyl-5% phenylmethylpolysiloxane	TRB-5, TRB-5ms, Meta.X5
G39	Polyethylene glycol (MW=1500)	TRB-WAX
G42	35% diphenyl-65% dimethylpolysiloxane	TRB-35
G43	6%cyanopropylphenyl-94% dimethylpolysiloxane	TRB-624, TRB-1301, TR-G43
G46	14%cyanopropylphenyl-86% dimethylpolysiloxane	TRB-1701

EPA Drinking Water Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column		Part Number
501.3	Trihalomethanes by GC/MS and SIM	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	75m x 0.53mm x 3.0 µm	TR-603075
		TRB-624	105m x 0.53mm x 3.0 µm	TR-6030K5
		TRB-624	30m x 0.25mm x 1.0 µm	TR-601032
502.2	Volatile halogenated Organics in Water by Purge & Trap GC/PID/ELCD	TRB-624	30m x 0.25mm x 3.0 µm	TR-603035
503.1	Volatile Aromatics & Unsaturated Organics by Purge & Trap GC	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
504.1	1,2-Dibromoethane (EDB), 1,2-Dibromo-3-chloropropane (DBCP), and 1,2,3-Trichloropropane (123TCP) by GC/MS	TRB-1	30m x 0.32mm x 0.25 µm	TR-110233
		TRB-624	30m x 0.32mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
505	Organohalide Pesticides & Aroclors by GC/ECD	TRB-1	30m x 0.32mm x 1.0 µm	TR-111033
		TRB-50	30m x 0.32mm x 0.5 µm	TR-500533
		TRB-50	30m x 0.25mm x 0.25 µm	TR-500232
507	Nitrogen & Phosphorous containing Pesticides in Water by GC/NPD	TRB-5	30m x 0.25mm x 0.25 µm	TR-120232
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
		TRB-1701	30m x 0.25mm x 0.25 µm	TR-130232
508	Chlorinated Pesticides in Water by GC/MS	TRB-5	30m x 0.25mm x 0.25 µm	TR-120232
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
		TRB-1701	30m x 0.25mm x 0.25 µm	TR-130232
513	2,3,7,8-Tetrachlorodibenzo-p-dioxin by GC/MS	TRB-5ms	60m x 0.25mm x 0.10 µm	TR-520162
515.2	Determination of chlorinated acids in water using liquid-solid extraction & GC/ECD	TRB-1	30m x 0.32mm x 0.25 µm	TR-110233
		TRB-5	30m x 0.32mm x 0.25 µm	TR-120233
		TRB-1701	30m x 0.32mm x 0.25 µm	TR-130233
		TRB-5ms	30m x 0.32mm x 0.25 µm	TR-520233
524.2	Measurement of purgeable organic compounds in water by Purge & Trap capillary column GC/MS	TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
		TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	75m x 0.53mm x 3.0 µm	TR-603075
		TRB-624	60m x 0.32mm x 1.8 µm	TR-601863
525	Organic compounds in drinking water by liquid-solid extraction and capillary column GC/MS	TRB-5	30m x 0.32mm x 0.25 µm	TR-120233
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232

EPA Solid Waste Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column		Part Number
8010	Halogenated volatile organics	TRB-624	75m x 0.53mm x 3.0 µm	TR-603075
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
8015	Non- Halogenated volatile organics	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
8020/8021	Aromatic volatile organic	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
8030/8031	Acrolein, acrylonitrile, acetonitrile	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 µm	TR-601432
8040/8041	Phenols	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
8060/8061	Phthalate esters	TRB-1	15m x 0.53mm x 1.5 µm	TR-111515
		TRB-1ms	30m x 0.25mm x 0.4 µm	TR-510432
8080	Organochlorine pesticides and PCBs	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-5ms	30m x 0.25mm x 0.5 µm	TR-520532
8081/8082	Organochlorine pesticides and PCBs as Arochlor	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-1701	30m x 0.53mm x 1.0 µm	TR-131035
8090/8091	Nitroaromatics and cyclics ketones	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-5ms	30m x 0.25mm x 0.5 µm	TR-520532
8100	Polynuclear aromatic hydrocarbons	TRB-5	30m x 0.32mm x 0.25 µm	TR-120233
		TRB-5ms	30m x 0.32mm x 0.25 µm	TR-520233
8120/8121	Chlorinated hydrocarbons	TRB-1	30m x 0.32mm x 1.0 µm	TR-111033
		TRB-1ms	30m x 0.32mm x 1.0 µm	TR-511033
8140	Organophosphorus pesticides	TRB-1	30m x 0.32mm x 1.5 µm	TR-111535
		TRB-1701	30m x 0.53mm x 1.0 µm	TR-131035
		TRB-1	30m x 0.25mm x 0.25 µm	TR-110232
8141	Organophosphorus pesticides	TRB-5	15m x 0.53mm x 1.5 µm	TR-121515
		TRB-5ms	15m x 0.25mm x 0,25 µm	TR-520212
8150/8151	Chlorinated herbicides	TRB-5	25m x 0.53mm x 1.0 µm	TR-121025
		TRB-1701	30m x 0.53mm x 1.0 µm	TR-131035
		TRB-5ms	15m x 0.25mm x 0,25 µm	TR-520232
8240	GC/MS for volatile organics	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	75m x 0.53mm x 3.0 µm	TR-603075
		TRB-624	105m x 0.53mm x 3.0 µm	TR-6030K5
		TRB-624	30m x 0.25mm x 1.0 µm	TR-601032
8250	GC/MS for semi-volatile organics	TRB-5ms	30m x 0.25mm x 0,50mm	TR-520532

EPA Solid Waste Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column		Part Number
8260	GC/MS method for volatile organics capillary techniques	TRB-624	30m x 0.53mm x 3,0 µm	TR-603035
		TRB-624	75m x 0.53mm x 3,0 µm	TR-603075
		TRB-624	105m x 0.53mm x 3,0 µm	TR-6030K5
		TRB-624	30m x 0.25mm x 1,0 µm	TR-601032
8270	GC/MS method for semi-volatile organics capillary techniques	TRB-5	30m x 0.25mm x 1,0 µm	TR-121032
		TRB-5ms	30m x 0.25mm x 1,0 µm	TR-521032
8280	Analysis of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans	TRB-5	30m x 0.25mm x 0,25 µm	TR-120232
		TRB-5ms	60m x 0.25mm x 0,25 µm	TR-520162

EPA Waste Water Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column		Part Number
601	Purgeable halocarbons	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	75m x 0.53mm x 3,0 µm	TR-603075
		TRB-624	105m x 0.53mm x 3,0 µm	TR-6030K5
		TRB-624	30m x 0.25mm x 1,0 µm	TR-601032
602	Purgeable aromatics	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	105m x 0.53mm x 3.0 µm	TR-6030K5
		TRB-624	30m x 0.25mm x 1.0 µm	TR-601032
603	Acrolein and acrylonitrile	TRB-624	30m x 0.53mm x 3.0 µm	TR-603035
		TRB-624	30m x 0.25mm x 1.0 µm	TR-601032
604/605	Phenols and benzidines	TRB-5ms	30m x 0.53mm x 1.4 µm	TR-521435
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
606	Phthalate esters	TRB-5	15m x 0.53mm x 1.5 µm	TR-121515
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
		TRB-5	15m x 0.53mm x 1.5 µm	TR-121515
		TRB-5ms	30m x 0.25mm x 0.25 µm	TR-520232
607	Nitrosamines	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-5ms	30m x 0.25mm x 0.50 µm	TR-520532
608	Organochlorine pesticides and PCBs	TRB-5	50m x 0.53mm x 1.0 µm	TR-121055
		TRB-5ms	50m x 0.25mm x 0.12 µm	TR-520752
609	Nitroaromatics and isophorone	TRB-5	30m x 0.53mm x 1.5 µm	TR-121535
		TRB-5ms	30m x 0.25mm x 0.5 µm	TR-520532

EPA Waste Water Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column		Part Number
610	Polycyclic Aromatic Hydrocarbons	TRB-5	30m x 0.32mm x 0.25 µm	TR-120233
		TRB-5ms	30m x 0.32mm x 0.10 µm	TR-520133
611	Haloethers	TRB-5	15m x 0.53mm x 1.5 mm	TR-121515
		TRB-5ms	30m x 0.25mm x 0.50 mm	TR-520532
612	Chlorinated hydrocarbons	TRB-5	30m x 0.32mm x 1.0 mm	TR-121033
		TRB-5ms	30m x 0.25mm x 1.0 mm	TR-521032
613	2,3,7,8-tetrachlorodibenzo-p-dioxin	TRB-5ms	60m x 0.25mm x 0.10 mm	TR-520162
615	Chlorinated herbicides	TRB-1701	30m x 0.53mm x 1.0 mm	TR-131035
		TRB-1701	30m x 0.25mm x 0.25 mm	TR-130232
619	Triazine herbicides	TRB-50	30m x 0.53mm x 1.0 mm	TR-501035
		TRB-50	30m x 0.25mm x 0.50 mm	TR-500532
624	Purgeables	TRB-624	30m x 0.53mm x 3.0 mm	TR-603035
		TRB-624	75m x 0.53mm x 3.0 mm	TR-603075
		TRB-624	105m x 0.53mm x 3.0 mm	TR-6030K5
		TRB-624	30m x 0.25mm x 1.4 mm	TR-601432
625	Base/neutrals and acids	TRB-5ms	30m x 0.32mm x 0.25 mm	TR-520233
		TRB-1ms	30m x 0.25mm x 0.25 mm	TR-510232
680	Pesticides and PCBs in water and soil/ sediment	TRB-5	30m x 0.32mm x 0.25 mm	TR-120233
		TRB-5ms	30m x 0.32mm x 0.25 mm	TR-520233
1624	Volatile organic compounds by isotope dilution GC/MS	TRB-624	30m x 0.53mm x 3.0 mm	TR-603035
		TRB-624	30m x 0.25mm x 1.4 mm	TR-601432
1625	Semivolatile organic compounds by isotope dilution	TRB-5	30m x 0.25mm x 0.25 mm	TR-120232
		TRB-5ms	30m x 0.25mm x 0.25 mm	TR-520232
1653	Chlorinated phenols in waste water by in-situ MS acylation and GC low bleed/MS	TRB-5	30m x 0.32mm x 0.25 mm	TR-120233
		TRB-5ms	30m x 0.32mm x 0.25 mm	TR-520233

ASTM Methods

Method	Teknokroma P/N	Teknokroma Phase Recommendation	Sample
D1983	TR-882162	**TR-CN100** 60 m x 0.25 mm x 0.2 µm	FAME analysis
D2245	TR-882162	**TR-CN100** 60 m x 0.25 mm x 0.2 µm	Oils and oil acids in solvent-reducible paints
D2267	TR-960462	**TR-TCEP** 60 m x 0.25 mm x 0.40 µm	Aromatics in light naphthas and aviation gasolines
D2306	TR-140262	**TRB-WAX** 60 m x 0.25 mm x 0.25 µm	C8 aromatic hydrocarbons
D2360	TR-140263	**TRB-WAX** 60 m x 0.32 mm x 0.25 µm	Trace impurities in monocyclic aromatic hydrocarbons and total aromatic determination
D2426	TR-111535	**TRB-1** 30 m x 0.53 mm x 1.5 µm	Butadiene dimer and styrene in butadiene concentrates
D2456	TR-141035	**TRB-WAX** 30 m x 0.53 mm x 1.0 µm	Polyhydric alcohols in alkyd resins
D2505	TR-115035	**TRB-1** 30 m x 0.53 mm x 5 µm	Ethylene, other hydrocarbons, and carbon dioxide in dioxide in high-purity ethylene
D2597		30% SE-30 on Chromosorb PAW 80/100 - Molecular Sieve 13X 45/60	Analysis of demethanozed hydrocarbon liquid mixtures containing nitrogen and carbon dioxide
D2580	TR-820423 TR-151035	**Meta.X5** 25 m x 0.32 mm x 0.4 µm **TRB-FFAP** 30 m x 0.53 mm x 1.0 µm	Phenols in water
D2600	TR-960462 TR-141223	**TR-TCEP** 60 m x 0.25 mm x 0.4 µm **TRB-WAX** 25 m x 0.32 mm x 1.2 µm	Aromatic traces in light saturated hydrocarbons
D2743	TR-882162	**TR-CN100** 60 m x 0.25 mm x 0.2 µm	Oil and oil acids
D2800	TR-882162	**TR-CN100** 60 m x 0.25 mm x 0.2 µm	FAME analysis
D2804	TR-141035 TR-571015	**TRB-WAX** 30 m x 0.53 mm x 1.0 µm **TRB-F50** 15 m x 0.53 mm x 1.0 µm	Purity of methyl ethyl ketone
D2887	TR-112645	**TRB-1** 10 m x 0.53 mm x 2.65 µm	Boiling range distribution of petroleum
Extended	TR-1108A5	**TRB-1** 5 m x 0.53 mm x 0.88 µm	
D2908	TR-601833 TR-603035 TR-140533 TR-141035	**TRB-624** 30 m x 0.32 mm x 1.8 µm **TRB-624** 30 m x 0.53 mm x 3.0 µm **TRB-WAX** 30 m x 0.32 mm x 0.5 µm **TRB-WAX** 30 m x 0.53 mm x 1.0 µm	Volatile organics in water
D2998	TR-111033	**TRB-1** 30 m x 0.32 mm x 1.0 µm	Polyhydric alcohols in alkyd resins
D2999	TR-111535	**TRB-1** 30 m x 0.53 mm x 1.5 µm	Monopentaerythritol in commercial pentaerythritol
D3009	TR-140533 TR-141035	**TRB-WAX** 30 m x 0.32 mm x 0.5 µm **TRB-WAX** 30 m x 0.53 mm x 1.0 µm	Composition of turpentine
D3054	TR-110553	**TRB-1** 50 m x 0.32 mm x 0.5 µm	Impurities in cyclohexane
D3086	TR-120752	**TRB-5** 50 m x 0.25 mm x 0.12 µm	Organochlorine pesticides in water
D3168	TR-111033 TR-111535	**TRB-1** 30 m x 0.32 mm x 1.0 µm **TRB-1** 30 m x 0.53 mm x 1.5 µm	Polymers in emulsion paints
D3257		25% bis-(2-cyanoethyl)formamide on Chromosorb PAW	Aromatics in mineral spirits
D3271	TR-141035	**TRB-WAX** 30 m x 0.53 mm x 1.0 µm	Solvent analysis in paints
D3304	TR-120752	**TRB-5** 50 m x 0.25 mm x 0.12 µm	PCBs in environmental materials
D3328	TR-113033 TR-113035	**TRB-1** 30 m x 0.32 mm x 3.0 µm **TRB-1** 30 m x 0.53 mm x 3.0 µm	Comparison of waterborne petroleum oils
D3329	TR-141065	**TRB-WAX** 60 m x 0.53 mm x 1.0 µm	Purity of methyl isobutyl ketonespirits
D3432	TR-111033 TR-111535	**TRB-1** 30 m x 0.32 mm x 1.0 µm **TRB-1** 30 m x 0.53 mm x 1,5 µm	Toluene diisocyanates in urethane prepolymers
D3447	TR-115055	**TRB-1** 50 m x 0.53 mm x 5.0 µm	Purity of trichlorotrifluoroethane (CFC-113)
D3452	TR-111535	**TRB-1** 30 m x 0.53 mm x 1,5 µm	Identification of rubber
D3457	TR-882162	**TR-CN100** 60 m x 0.25 mm x 0.2 µm	FAME analysis
D3465	TR-115223 TR-111535	**TRB-1** 25 m x 0.32 mm x 0.52 µm **TRB-1** 30 m x 0.53 mm x 1.5 µm	Purity of monomeric plasticizers
D3524	TR-110845	**TRB-1** 10 m x 0.53 mm x 0.88 µm 10% OV-101 on Chromosorb WAW 80/100	Diesel fuel diluent used in diesel engine oil
D3525		10% Dexel 300 on Chromosorb WAW 80/100	Gasoline diluent in used gasoline engine oils
D3534	TR-120252	**TRB-5** 50 m x 0.25 mm x 0.25 µm	PCBs in water
D3606	TR-510112 TR-960462	**TRB-1ms** 15 m x 0.25 mm x 0.1 µm **TR-TCEP** 60 m x 0.25 mm x 0.4 µm	Benzene and toluene in gasoline
D3687	TR-140533 TR-141035	**TRB-WAX** 30 m x 0.32 mm x 0.5 µm **TRB-WAX** 30 m x 0.53 mm x 1.0 µm	Volatile organic compounds
D3710	TR-1150J5	**TRB-1** 7.5 m x 0.53 mm x 5.0 µm	Boiling range distribution of gasoline and gasoline fractions
D3725	TR-151035	**TRB-FFAP** 30 m x 0.53 mm x 1.0 µm	Fatty acids in drying oils
D3760	TR-140263 TR-110563	**TRB-WAX** 60m x 0.32 mm x 0.25 µm **TRB-1 60** m x 0.32 mm x 0.5 µm	Analysis of isopropylbenzene (cumene)

ASTM Methods

Method	Teknokroma P/N	Teknokroma Phase Recommendation	Sample
D3797	TR-140563	**TRB-WAX** 60 m x 0.32 mm x 0.5 µm	Analysis of o-Xylene
D3798	TR-140563 TR-140263	**TRB-WAX** 60m x 0.32 mm x 0.5 µm **TRB-WAX** 60 m x 0.32 mm x 0.25 µm	Analysis of p-Xylene
D3876	TR-111033 TR-111535	**TRB-1** 30 m x 0.32 mm x 1.0 µm **TRB-1** 30 m x 0.53 mm x 1.5 µm	Methoxyl and hydroxypropyl substitution in cellulose ether products
D3962	TR-151035	**TRB-FFAP** 30 m x 0.53 mm x 1.0 µm	Impurities in styrene
D4059	TR-120252	**TRB-5** 50 m x 0.25 mm x 0.25 µm	PCBs in insulating liquids
D4275	TR-113033 TR-113035	**TRB-1** 30 m x 0.32 mm x 3.0 µm **TRB-1** 30 m x 0.53 mm x 3.0 µm	Butylated hydroxy toluene in ethylene and ethylenevinylacetate polymers
D4367		10% SE-30 on Chromosorb WAW 80/100 25% TCEP on Chromosorb PAW 80/100	Benzene in hydrocarbon solvents
D4415	TR-150233	**TRB-FFAP** 30 m x 0.32 mm x 0.25 µm	Determination of dimer and acrylic acid
D4420	TR-510112 TR-960462	**TRB-1ms** 15 m x 0.25 mm x 0.1 µm **TR-TCEP** 60 m x 0.25 mm x 0.4 µm	Aromatics in gasoline
D4492	TR-140263	**TRB-WAX** 60 m x 0.32 mm x 0.25 µm	Analysis of benzene
D4534	TR-960462	**TR-TCEP** 60 m x 0.25 mm x 0.4 µm	Benzene content of cyclic products
D4735	TR-151035	**TRB-FFAP** 30 m x 0.53 mm x 1.0 µm	Trace thiophene in refined benzene
D4768	TR-151035	**TRB-FFAP** 30 m x 0.53 mm x 1.0 µm	Phenol and cresol inhibitors in insulating oils
D4815	TR-113035 + TCEP precolumn	**TRB-1** 30 m x 0.53 mm x 5.0 µm + 3 **TCEP precolumn** (56cm)	MTBE, ETBE, TAME, DIPE, tert-amyl alcohol, C1-C4 alcohols in gasoline
D4864	TR-121515	**TRB-5** 15 m x 0.53 mm x 1.5 µm	Traces of methanol in propylene
D5008	TR-115045 TR-140233	**TRB-1** 10 m x 0.53 mm x 5.0 µm **TRB-WAX** 30 m x 0.32 mm x 0.25 µm	Ethyl methyl pentanol content and purity of 2-ethylhexanol
D5060	TR-140563	**TRB-WAX** 60m x 0.32 mm x 0.5 µm	Impurities in high-purity ethylbenzene
D5134	TR-110559	**TRB-50.2PONA** 50 m x 0.20 mm x 0.5 µm	Impurities in high-purity ethylbenzene
D5135	TR-140563	**TRB-WAX** 60m x 0.32 mm x 0.5 µm	Styrene analysis
D5307		10% UCW-982 on Chromosorb PAW 80/100 3% OV-1 on Chromosorb WHP 80/100 10% SE-30 on Chromosorb PAW 80/100	Boiling range distribution of crude oil-simulated distillation of crude oil through 538ºC
D5310	TR-120232 TR-252129	**TRB-5** 30 m x 0.25 mm x 0.25 µm **TRB-225** 25 m x 0.20 mm x 0.20 µm	Tar acid composition
D5399	TR-113045	**TRB-1** 10 m x 0.53 mm x 3.0 µm	Boiling point distribution of hydrocarbon solvents
D5441	TR-110592 TR-110559	**TRB-1** 100m x 0.25 mm x 0.5 µm **TRB-50.2PONA** 50 m x 0.20 mm x 0.5 µm	Analysis of MTBE
D5442	TR-110232 TR-120232	**TRB-1** 30 m x 0.25 mm x 0.25 µm **TRB-5** 15 m x 0.25 mm x 0.25 µm	Analysis of petroleum waxes
D5480	TR-115065	**TRB-1** 60 m x 0.53 mm x 5.0 µm	Engine oil volatility by GC
D5501	TR-110592	**TRB-1** 100m x 0.25 mm x 0.5 µm	Ethanol content of denatured fuel ethanol
D5504	TR-974033	**TRB-SULFUR** 30 m x 0.32 mm x 4.0 µm	Sulfur compounds in natural gas and gaseous fuels by GC and SCD
D5580	TR-115035 + TCEP precolumn	**TRB-1** 30 m x 0.53 mm x 5.0 µm + **TCEP** precolumn (56cm)	Aromatics in gasoline
D5599	TR-111062	**TRB-1** 60m x 0.25 mm x 1.0 µm	Oxygenates in gasoline by GC and oxygen selective flame ionization detector
D5623	TR-114033	**TRB-1** 30m x 0.32 mm x 4.0 µm	Sulfur compounds in light petroleum liquids by GC and sulfur selective detection
D5713	TR-110559	**TRB-50.2PONA** 50 m x 0.20 mm x 0.5 µm	Analysis of high-purity benzene for cyclohexane feedstock by capillary GC
D5769	TR-111062 TR-115063	**TRB-1** 60m x 0.25 mm x 1.0 µm **TRB-1** 60 m x 0.32 mm x 5.0 um	Determination of benzene, toluene and total aromatics in finished gasoline by GC/MS
D5917	TR-140263	**TRB-WAX** 60m x 0.32 mm x 0.25 µm	Trace impurities in monocyclic aromatic hydrocarbons by GC and external calibration
D6144	TR-111062	**TRB-1** 60m x 0.25 mm x 1.0 µm	alpha-Methylstyrene by capillary GC
D6159	TR-115035	**TRB-1** 30 m x 0.53 mm x 5.0 µm	Hydrocarbon impurities in ethylene
E0202	TR-812122	**Meta.WAX** 25 m x 0.25 mm x 0.2 µm	Analysis of glycols
E1100	TR-810535	**Meta.WAX** 30 m x 0.53 mm x 0.50 µm	Analysis of denaturated ethanol

NIOSH Regulatory Methods

Method	Method Name	Teknokroma Phase Recommendation	Teknokroma P/N
1000	Allyl chloride	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1001	Methyl chloride	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1002	Chloroprene	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1003	Halogenated hydrocarbons	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1004	sym-Dichloroethyl ether	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1005	Methylene chloride	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1006	Trichlorofluoromethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1007	Vinyl chloride	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1008	Ethylene dibromide	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1009	Vinyl bromide	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1010	Epichlorohydrin	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1011	Ethyl bromide	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1012	Dibromodifluoromethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1013	1,2-Dichloropropane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1014	Methyl iodide	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1015	Vinylidine chloride	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1016	1,1,1,2-Tetrachloro-2,2-difluoroethane and 1,1,2,2-Tetrachloro-1,2-difluoroethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1017	Bromotrifluoromethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1018	Dichlorodifluoromethane and 1,2-Dichlorotetrafluoroethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1019	1,1,2,2-Tetrachloroethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1020	1,1,2-Trichloro-1,2,2-trifluoroethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1022	Trichloroethylene	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
1300	Ketones 1	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1301	Ketones 2	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1400	Alcohols 1	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1401	Alcohols 2	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1402	Alcohols 3	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1403	Alcohols 4	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1450	Esters 1	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
1500	Hydrocarbons, BP 36-126°C	**TRB-1** 30 m x 0.25 mm ID x 0.25 µm	TR-110232
1501	Hydrocarbons, aromatic	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
1550	Naphthas	**TRB-1** 60 m x 0.25 mm ID x 0.25 µm	TR-110262
1551	Turpentine	**TRB-1** 60 m x 0.25 mm ID x 0.25 µm	TR-110262
1602	Dioxane	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1603	Acetic acid	**TRB-FFAP** 15 m x 0.25 mm ID x 0.25 µm	TR-150212
1604	Acrylonitrile	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1606	Acetonitrile	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1608	Glycidol	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1609	Tetrahydrofuran	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212
1610	Ethyl ether	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1611	Methylal	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1612	Propylene oxide	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1613	Pyridine	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1614	Ethylene oxide	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
1615	Methyl-tert-butyl ether	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2000	Methanol	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2001	Cresol, all isomers	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830232
2002	Amines, aromatic	**Meta.X5** 30 m x 0.25 mm ID x 1.0 µm	TR-821032
2003	1,1,2,2-Tetrabromoethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
2004	Dimethylacetamide and dimethylformamide	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2005	Nitrobenzenes	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2007	Aminoethanol compounds	**TRB-1** 15 m x 0.25 mm ID x 1.0 µm	TR-111012
2500	2-Butanone	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2501	Acrolein	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2503	Acrolein	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
2504	Tetraethyl pyrophosphate	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212

NIOSH Regulatory Methods

Method	Method Name	Teknokroma Phase Recommendation	Teknokroma P/N
2505	Furfuryl alcohol	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2506	Acetone cyanohydrin	**TRB-1** 15 m x 0.25 mm ID x 1.0 µm	TR-111012
2507	Nitroglycerine and ethylene glycol dinitrate	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2508	Isophorone	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212
2510	1-Octanethiol	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
2513	Ethylene chlorohydrin	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2515	Diazomethane	**TRB-1** 15 m x 0.32 mm ID x 0.25 µm	TR-110213
2516	Dichlorofluoromethane	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
2517	Pentachloroethane	**Meta.X5** 30 m x 0.25 mm ID x 0.5 µm	TR-820532
2518	Hexachloro-1,3-cyclopentadiene	**TRB-624** 30 m x 0.25 mm ID x 1.4 µm	TR-601432
2519	Ethyl chloride	**TRB-624** 30 m x 0.25 mm ID x 1.8 µm	TR-601833
2520	Methyl bromide	**TRB-624** 30 m x 0.25 mm ID x 1.8 µm	TR-601833
2521	Methylcyclohexanone	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
2522	Nitrosamines	**Meta.X5** 30 m x 0.25 mm ID x 0.5 µm	TR-820532
2523	1,3-Cyclopentadiene	**TRB-1** 15 m x 0.32 mm ID x 1.0 µm	TR-111013
2524	Dimethylsulfate	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2525	1-Butanethiol	**TRB-1** 15 m x 0.32 mm ID x 1.0 µm	TR-111013
2526	Nitroethane	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2527	Nitromethane	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
2528	2-Nitropropane	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
2529	Furural	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
2530	Biphenyl	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
2531	Gluteraldehyde	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
2533	Tetraethyl lead (as Pb)	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212
2534	Tetramethyl lead (as Pb)	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212
2536	Valeraldehyde	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2537	Methylmethacrylate	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
2538	Acetaldehyde	**TRB-1301** 15 m x 0.32 mm ID x 1.0 µm	TR-601013
2539	Aldehydes, Screening	**TRB-1** 30 m x 0.32 mm ID x 0.25 µm	TR-110232
2541	Formaldehyde	**TRB-1701** 30 m x 0.25 mm ID x 0.25 µm	TR-130232
3502	Phenol	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
3700	Benzene	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
3702	Ethylene oxide	**SupraWAX-280** 30 m x 0.32 mm ID x 0.5 µm	TR-830533
4000	Toluene	**TRB-5** 30 m x 0.25 mm ID x 0.25 µm	TR-120232
5012	EPN, malathion, and parathion	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5014	Chlorinated terphenyl (60% chlorine)	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5017	Dibutyl phosphate	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5019	Azelaic acid	**TRB-1** 15 m x 0.32 mm ID x 0.25 µm	TR-110213
5020	Dibutyl phthalate and Di (2-ethylhexyl) phthalate	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5021	o-Terphenyl	**TRB-1** 30 m x 0.25 mm ID x 0.25 µm	TR-110232
5025	Chlorinated diphenyl ether	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5029	4,4-Dimethylenedianiline	**TRB-5** 15 m x 0.25 mm ID x 0.25 µm	TR-120212
5500	Ethylene glycol	**SupraWAX-280** 15 m x 0.32 mm ID x 0.5 µm	TR-830513
5502	Aldrin and lindane	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5503	Polychlorobiphenyls	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
5506	Polynuclear aromatic hydrocarbons	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
5509	Benzidine and 3,3-dichlorobenzidine	**TRB-5** 15 m x 0.53 mm ID x 1.5 µm	TR-121515
5510	Chlordane	**Meta.X5** 15 m x 0.25 mm ID x 0.25 µm	TR-820212
5514	Demeton	**TRB-5** 15 m x 0.25 mm ID x 0.25 µm	TR-120212
5515	Polynuclear aromatic hydrocarbons (in the presence of isocyanates)	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
5516	2,4- and 2,6-Toluenediamine	**TRB-5** 30 m x 0.25 mm ID x 0.25 µm	TR-120232
5517	Polychlorobenzenes	**TRB-1** 15 m x 0.25 mm ID x 0.25 µm	TR-110212
5518	Naphthylamines	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232
5519	Endrin	**Meta.X5** 30 m x 0.25 mm ID x 0.25 µm	TR-820232

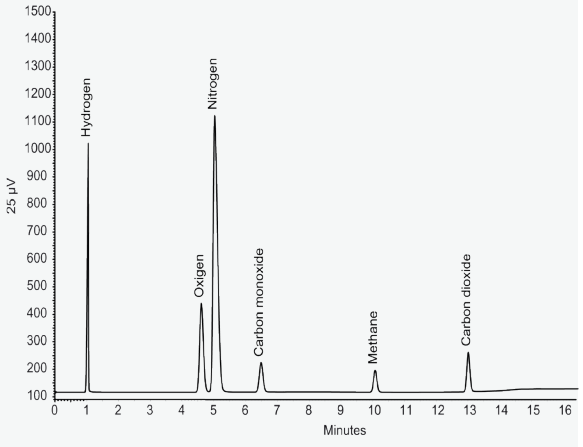
Packed Columns

DESCRIPTION	SOLID SUPPORT	USP CODE
Siliceous earth	Silcoport® Chromosorb® WHP	**S1A**
Siliceous earth, treated as S1A and both acid-and base-washed	Silcoport® WBW	**S1AB**
Crushed firebrick, calcined or burned with a clay binder above 900°C, acid-washed, may be silanized	Chromosorb® PAW or PAW-DMCS	**S1C**
Untreated siliceous earth	Chromosorb® W NAW	**S1NS**
Styrene-divinylbenzene copolymer with nominal surface area of less than 50m2/g an ave. pore diameter of 0.3 - 0.4 mm	Chromosorb® 101	**S2**
Styrene-divinylbenzene copolymer with nominal surface area of 500 to 600m2/g and ave. pore diameter of 0.0075 mm	Hayesep® Q, Porapak® Q	**S3**
Styrene-divinylbenzene copolymer with aromatic -0 and -N groups having a nominal surface area of 400 to 600m2/g and ave. pore diameter of 0.0076 mm	Hayesep® R, Porapak® R	**S4**
High molecular weight tetrafluorethylene polymer, 40-60 mesh	Chromosorb® T	**S5**
Styrene-divinylbenzene copolymer with nominal surface area of 250-350m2/g and ave. pore diameter of 0.0091 mm	Chromosorb® 102, Porapak® P, Hayesp® P	**S6**
Graphitized carbon having a nominal surface area of 12m2/g	CarboBlack® C, Carbopack® C	**S7**
Copolymer of 4-vinyl-pyridine and styrene divinylbenzene	Hayesep® S, Porapak® S	**S8**
Porous polymer based on 2,6-diphenyl-p-phenylene oxide	Tenax® TA	**S9**
Highly cross-linked copolymer of acrylonitrite and divinylbenzene	Hayesep® C	**S10**
Graphitized carbon having a nominal surface area of 100m2/g, modified with small amounts of petrolatum and polyethylene glycol compound	CarboBlack® B 80/120 3% Rt 1500 Carbopack® B 80/120 3% SP-1500	**S11**
Graphitized carbon having a nominal surface area of 100m2/g	CarboBlack® B, Carbopack® B	**S12**

Packed Columns - Solid Supports for USP Methods

PERMANENT GASES ANALYSIS

Column: Permanent Gases 4,6 m x 1/8" x 2,1 mm TR-GC1462010
Carrier Gas: He, 30 ml/min
Injector: 150 ºC
Detector: TCD, 200 ºC
Oven: 35 ºC (5min) to 225 ºC (10 min) @ 20 ºC/min
Sample: 50 µl permanent gases in helium

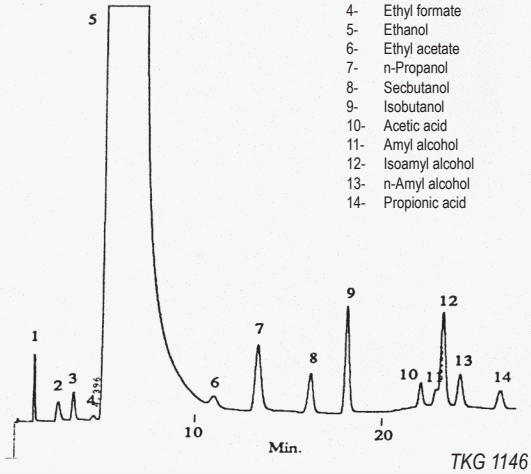


PACKED COLUMNS

Column: 5% Carbowax 20M CarboBlack B/AW, 80/120 mesh
Dimensions: 2m x 1/8" OD X 2mm ID, (Silcosteel)
Injection: 1 µl standard, 175ºC
Carrier Gas: He, 15mL/min
Oven temperature: 60ºC(6min) @ 10ºC/min to 150ºC(7min)
Detector: FID, 175ºC

Peak Name

1- Acetaldehyde
2- Methanol
3- Acetone
4- Ethyl formate
5- Ethanol
6- Ethyl acetate
7- n-Propanol
8- Secbutanol
9- Isobutanol
10- Acetic acid
11- Amyl alcohol
12- Isoamyl alcohol
13- n-Amyl alcohol
14- Propionic acid



These columns have been used for the last 50 years in all kinds of analyses for gas chromatography.

Nowadays packed column use is understandable due to the wide range of solid support packings available and to their high on-column sample capacity. These aspects make packed columns quite versatile for a wide range of applications.

Teknokroma has been manufacturing packed columns since its inception and has always provided a wide range of different packing material and the lasted advances.

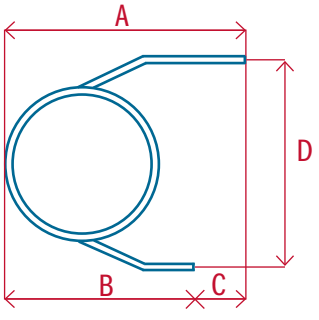
Ask for our micro-packed columns (0,53 mm, 0,75mm and 1,00mm ID) to reduce gas consumption and to increase efficiency.

WE CAN SUPPLY ANY KIND OF COLUMNS... JUST ASK FOR THEM!

Tubing	External Diameter (OD)	Internal Diameter (ID)
Stainless Steel	1/4" and 1/8"	4mm, 3mm and 2mm
Sulfinert	1/4" and 1/8"	5.2mm and 2mm
	1/16"	0.75mm and 1mm
	0.79 mm	0.53 mm
Nickel, Teflon and Copper	1/8"	2 mm

Columns can be delivered pre-conditioned or conditioned and proved at an extra cost (please inquire).

To Order a Packed Column Specify the Following



Physical Dimensions

A: _____
B: _____
C: _____
D: _____

Chromatograph manufacturer:

Model: _____
Tubing material: _____
Length: _____ O.D. _____ I.D. _____

Packing Description

Percentage of coating: _____ Phase: _____
Support: _____
Treatment (WAW,,WHP,,): _____ Mesh size: _____

Comments: _____

Packed Columns

DESCRIPTION	T LIMITS (°C)	USP CODE
Alltech AT™-1000	50/250	G35
Apiezon® L	50/300	-
Apiezon® M	50/300	-
Bentone 34	0/180	-
N,N-bis-(2-Cyanoethyl)formamide (BCEF)	20/125	-
N,N-bis-(p-Methoxybenzylidene)-a,a'-bi-p-toluidine (BMBT)	150	-
Bis-(2-ethoxyethyl) Adipate (BEEA)	150	-
Bis-(2-methoxyethyl) Adipate (BMEA)	150	-
Carbowax® 400	20/100	G20
Carbowax® 540	40/175	G39
Carbowax® 600	20/125	-
Carbowax® 1000	40/150	G14
Carbowax® 1540	50/175	G39
Carbowax® 3350	60/200	G15
Carbowax® 6000	60/200	-
Carbowax® 20M	60/225	G16
Carbowax® 20M-TPA	60/250	G25
DC-200, 350cstk (Methyl)	20/250	-
DC-200, 500cstk (Methyl)	20/250	-
DC-550, (25%-Phehyl)	20/225	G28
Dexsil® 300GC	50/400	G33
Di-n-butyl Maleate	20/50	-
Di-n-decyl phthalate	10/175	-
Di(2-ethylhexyl)sebacate	0/125	G11
Diethyleneglycol Adipate	20/210	-
Diethyleneglycol Succinate	20/200	G4
Diglycerol	20/100	-
2,4-Dimethylsulfonate	0/50	-
Dinonyl Phthalate	20/150	-
Diisodecyl Phthalate	20/150	G24
Ethyleneglycol Adipate	100/210	G40
Ethyleneglycol Succinate	100/210	-
Fluorad FC-431	40/200	-
FFAP	50/250	G35
Halocarbon oil 14-25	150	-
Igepal® CO-630	30/200	-
Igepal® CO-880 (Nonoxynol)	100/200	G31
Igepal® CO-990	100/200	-
Kel-F® Oil No.10	100	-
Neopentylglycol Succinate	50/230	G21
OV™-1 (Methyl gum)	100/350	G2
OV™-17 (50% phenyl)	20/350	G3
OV™-17-Vinyl (50% phenyl)	300+	-

DESCRIPTION	T LIMITS (°C)	USP CODE
OV™-25 (75% phenyl)	300	G17
OV™-101 (Methyl fluid)	20/350	G1
OV™-210 (50% Trifluoropropyl)	20/275+	G6
OV™-225 (25% phenyl, 25% cyanopropyl methyl)	20/250+	G19
OV™-275 (Dicyanoallyl)	250+	-
OV™-1701	0/250	-
b,b-Oxydipropionitrile	0/75	-
Phenyldiethanolamine Succinate	0/230	G12
Polyethylene glycol adipate	0/225	G23
Polyethyleneimine	0/175	-
Polyphenyl ether (5 rings) OS-124	0/200	-
Polyphenyl ether (6 rings) OS-138	0/225	-
Polypropylene glycol	0/150	-
Polypropyleneimine	0/200	-
QF-1 (50% Trifluoropropyl)	20/250	-
SE-30 (Methyl gum)	75/300	-
SE-30 (GC grade)	75/300	G2
SE-52 (5% Phenyl)	50/300	G27
SE-54 (5% Phenyl, 1% Vinyl)	50/300	G36
Sebaconitrile	150	-
Silar® 5CP (50% Cyanopropyl Phenyl Silicone)	50/250	G7
Silar® 9CP (90% Cyanopropyl Phenyl Silicone)	50/250	G8
Silar® 10C (100% Cyanopropyl Silicone)	50/250	G5
Sorbitol	100/150	G13
SP-1200	25/200	-
SP-2100 (Methyl silicone)	0/350	G1
SP-2300 (Polycyanopropylphenylsiloxane)	20/275	G7
SP-2330 (Poly(80%-biscyanopropyl-20%-cyanopropylphenyl)siloxane	25/275	G8
SP-2340 (Polybiscyanopropylsiloxane)	25/275	G5
Squalene	20/150	-
SUPEROX® 4 (4.000.000 MW)	300	-
SUPEROX® 20M (20.000 MW)	60/250	-
Tetracyanoethylated Pentaerythritol (TCEPE)	30/150	-
Tetrahydroxyethylethylene Diamine (THEED)	125	-
1,2,3-Tris-(2-cyanoethoxy)propane (TCEP)	20/180	-
Triton® X-100	0/200	
Triton® X-305 (Octylphenoxy Polyethoxy-ethanol)	20/250	-
UC W-98 (UC-W982)	80/300+	G9
UCON LB-1800-X (Polyalkylene Glycol)	200	G18
Versamid® 900	275	-

For other stationary phases please inquire

The Teknokroma Diskobolus™ Septa

diskobolus septa
by Teknokroma™

Septum is the most general source of contaminants in the injection port. The baseline noise or the appearance of ghost peaks in the chromatogram can be a consequence of the septum bleed or of the samples of former injections that have been adsorbed on the septum surface.

Teknokroma presents the new range of **diskobolus™** septa that have been specially designed and prepared to work at high temperatures, with low bleed, and a better baseline.

General observations to consider in the Septum election:

- Injector temperature
- Column temperature (isothermal or programmed)
- Detector sensitivity

Septa quickly deteriore when the injector temperature increases, and consequently the bleeding may also increase.

These peaks coming from the degradation of the silicone of the septum, can be reduced with the gas flow of the septum purge, with the Split injection or using the lowest possible temperature in the injector.

The existence of rare peaks - called "ghost peaks", generally takes place during the temperature programme where volatile materials of the septum accumulate at the column head during the period of cooling.

When the column warms up again, in the following temperature programme, the accumulated volatile materials elute, ghost peaks and a baseline deviation appears, or a combination of both factors.

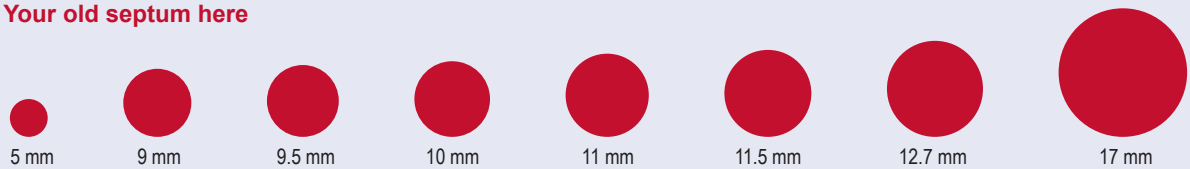
Influence factors in the septum bleeding

- Type of septum - some septa bleed more than others
- Working temperature of the septum -bleed increases with temperature
- Time after septum installation - bleed decreases gradually with the use of the septum
- Column cooling time - with longer cooling time the acumulation of contaminants in the column head increases
- Septum localization -bleed increases when the septum compression through the nut is high
- Column length and stationary phase amount - short columns and small phases thickness keep less bleeding

In the analysis of compounds, septum bleed interferes with the results according to the detector sensitivity. In situations where less sensitivity may be required, septum bleed has less importance.

Measure Guide

Your old septum here



The Teknokroma Diskobolus™ Septa

Performance Recommendations

Do not touch the septum with the fingers, in order to avoid a contamination from the filth of the user fingers.

Put the lid on the septa container once it has been opened, to avoid cross contamination.

Change the septum periodically - at least once a week -, this will avoid the leaks through the septum with the consequent losses of time and possibility to damage the column in an irreversible way.

It is preferable to change the septum at the end of the day, maintaining a high oven temperature to avoid the accumulation of bleed during the night. Alternatively, make a temperature programming for the following day to eliminate contaminant traces of septum volatiles.

Once the septum has been changed, verify the flow at the end of the column or the pressure at the entry, to make sure that the septum has been correctly sealed.

Do not tighten the septum with the nut more than it is necessary.

Use a guide for the needle to prolong the syringe and septum life. The guide helps to inject always at the same place, and avoids random perforations that may cause leaks.

Use needles with narrow outer diameters to avoid the loss of small pieces of septum; this will increase the septum useful life and will avoid the appearance of tails with active compounds.

In case of working with a high sensitivity detector, it is necessary to put the septum in the injection port all the night to obtain the least possible bleed.

Septum Size Chart

Instrument	Septum size (mm)
Agilent (HP)	
5880A, 5890, 6890, 6850, 7890, PTV	11
5700, 5880, 5890, 6890,6900	9.5/10
On-Column Injection	5
CE Instruments (TMQ)	
TRACE GC	17
Finnigan (TQM)	
GC 9001, 9600	9.5
GCQ, 9100	9.5
GCQ w/TRACE	17
QCQ	9.5
TRACE 2000	9.5
Fisons/Carlo Erba (TQM)	
8000 Series	17
PerkinElmer	
Sigma Series	11
900, 990	11
8000 Series	11
Auto SYS	11
Auto SYS XL, Clarus 500	11

Instrument	Septum size (mm)
Pye/Unicam	
All Models	7
Shimadzu	
All Models (14,15A, 16, 17A)	Plug
Varian	
Injector type:	
Varian Packed Column	9.5/10
Split/Splitless:	
Varian 1078/1079	11.5
Varian 1177	9
Varian 1075/1077	11.5
Varian 1040/41/60/61	9.5
Varian 1093/94 SPI	11.5
Thermo	
PTV injector	12.7

Diskobolus™ as (auto-sampler)

- Ideal for autosamplers
- Extremely low bleed
- Long-life injection (more than 200 injections)
- High stability at more than 350 ºC
- Supplied in glass containers for high purity.

diskobolus™ as septum (auto-sampler) has been manufactured by means of a new technology in the silicone field, and with a extraordinary conditioning process achieving an excellent performance in many applications of gas chromatography.

Ideal to work with autosamplers, it has a long useful life and an extremely low bleed.

"the septum with the best quality /price relatio"

Cat.No	Description	Pk
TR-D030500	diskobolus as 9,5 mm D. (3/8")	50
TR-D030600	diskobolus as 11 mm D. (7/16")	50

Economy Diskobolus™ Blue Septa (Blue)

The Economy **diskobolus™** Blue septa are designed for non-demanding, routine applications. They are easy to penetrate. These septa can be used up to 250ºC and are suitable for 90% of all GC analysis. Made from silicone. The package is for 100 pieces.

Cat.No	Description	Pk
TR-D033072	diskobolus Blue 9.5 mm D. (3/8")	100
TR-D033074	diskobolus Blue 11 mm D. (7/16")	100
TR-D033076	diskobolus Blue 12.7 mm. D. (1/2") .	100

The Teknokroma Diskobolus™ Septa

Diskobolus™ BTO
Premium Septa

- Extended Temperature Range , Low Bleed
- Maximum Temperature 400 ºC
- Virtually eliminates injection-port sticking
- Pre-conditioned; packaged in glass to prevent contamination
- Each batch GC-FID tested
- Ideal for use with low bleed “Mass Spec” capillary columns

This septa has an excellent performance. When you need septa to use with high temperature and low bleed these are the septa you should use.

The **diskobolus™** BTO Septa have been optimized to reduce injection port adhesion. Is an ideal septum for trace analysis, high injection port temperature.

The **diskobolus™** BTO Septa are pre-conditioned and packaged in glass to prevent contamination.

Cat.No	Description	Pk
TR-D033006	diskobolus BTO 9.5 mm. D. (3/8”) Low Bleed	50
TR-D033010	diskobolus BTO 11 mm. D. (7/16”) CAD* L. Bleed	50
TR-D033012	diskobolus BTO 11 mm. D. (7/16”) CAD* L. Bleed	100
TR-D033014	diskobolus BTO 11.5 mm. D. CAD* Low Bleed	50
TR-D033018	diskobolus BTO 17 mm. D. CAD* Low Bleed	50
TR-D033020	diskobolus BTO “Plug”, for Shimadzu Low Bleed	50

**** CAD “Center Alignment Depression”***

Teide™ Ferrules for Gas Chromatography

Ferrules teide by Teknokroma™

Ferrules for Gas Chromatography

Ferrules for gas chromatography are used to seal the connections between the column and the injection and detection systems.

The ideal GC column ferrules provide a perfect seal avoiding leaks that would allow the entrance of air and contaminants into the equipment, damage the baseline and increase the background signal.

Ferrules must not stick to the column and must tolerate temperature changes during programming.

Ferrule selection

General considerations in the ferrule selection:

- Injector temperature
- Type and sensitivity of the detector
- Type of material that provides a perfect seal to avoid leaks
- Column OD and type

How to avoid problems with ferrules

- Change the ferrules on installing a new column
- Avoid all type of fingers' grease and other contaminants
- Do not overtighten the ferrules. As a general rule, sealing at ¼ turn past fingertight are enough.
- Observe if the reusable ferrules are damaged before using them again.

When is it necessary to change the ferrules

- When some changes are observed in retention times
- In case of baseline drift caused by the entrance of oxygen and possible reaction with the stationary phase
- When sample loss is observed
- Increase of the detector background signal

Types of Ferrules

Graphite

Graphite is the best material to work at high temperature and at the same time is the softest ferrule. Therefore it fits the capillary column and seals effectively at only ¼ turn past fingertight. As this is a very soft material, thery are easily destroyed or deformed.
Ideal for FID and NPD detectors.
Do not use with MS or other oxygen sensitive detectors.
Upper temperature limit 450ºC.

Vespel/Graphite

Vespel /Graphite ferrules are recommended for applications with GC/MS interface or other oxygen sensitive detectors.
The ferrule composition is 60% polymide and 40% graphite. It is a ferrule for general use in Gas Chromatography.
It is mechanically robust and forms a perfect seal. It is a reusable ferrule. It needs a frequent retightening. Limit temperature 400ºC
85% Polymide (vespel) 15% graphite for Agilent ferrules.

Vespel

The composition of the Vespel ferrule is 100% polyimide.
It is mechanically robust. It can be removed and reused several times. It is an ideal material for glass and metal columns.
It needs a frequent retightening. Limit temperature 350ºC.

"If you don't find ferrules you need please let us know"

Teide™ Ferrules for Gas Chromatography

Graphite Ferrules (100%)

Features:

- Ideal to work with FID and NPD interface applications
- General use to work with capillary columns
- It is the best material to work at high temperatures

Advantages:

- They seal perfectly in fused silica and glass columns
- They resist highest temperature, 450ºC
- Very easy to remove

Limitations:

- They are easily deformed and can only be reused if they are not tighten in excess
- Not recommended to work with GC/MS detectors

Graphite ferrules, (short ferrules) for Agilent 4890, 5890, 6890 except for GC/MS

Cat.No	Description	For Capillary Column	Pk
TR-T031001	teide 1/16" to 0.4 mm	0.18 mm I.D.	10
TR-T031000	teide 1/16" to 0.5 mm	0.25-0.32 mm I.D.	10
TR-T031010	teide 1/16" to 0.8 mm	0.53 mm I.D.	10

Graphite standard ferrules

Cat.No	Description	For Capillary Column	Pk
TR-T031020	teide 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T031030	teide 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T031040	teide 1/16" to 0.8 mm	0.53 mm I.D.	10
TR-T031042	teide 1/16" to 1.0 mm	0.65 mm I.D.	10

Graphite standard ferrules (two holes)

Cat.No	Description	For Capillary Column	Pk
TR-T031102	teide 1/16" 2 holes, 0.5/0.5	0.32 mm I.D.	10

Graphite reducing ferrules

Cat.No	Description	For Capillary Column	Pk
TR-T031104	teide 1/8" to 0.4 mm	0.25 mm I.D.	10
TR-T031106	teide 1/8" to 0.5 mm	0.32 mm I.D.	10
TR-T031108	teide 1/8" to 0.8 mm	0.53 mm I.D.	10
TR-T031110	teide 1/8" to 1/16"	1/16" O.D.	10
TR-T031112	teide 1/4" to 0.5 mm	0.32 mm I.D.	10
TR-T031116	teide 1/4" to 0.8 mm	0.53 mm I.D.	10
TR-T031118	teide 1/4" to 4 mm	4 mm O.D.	10
TR-T031120	teide 1/4" to 6 mm	6 mm O.D.	10
TR-T031122	teide 1/4" to 1/16"	1/16" O.D.	10
TR-T031124	teide 1/4" to 1/8"	1/8" O.D.	10

Special graphite ferrules for Shimadzu

Cat.No	Description	For Capillary Column	Pk
TR-T031128	teide 5 mm for Shimadzu	5 mm O.D.	10

Teide™ Ferrules for Gas Chromatography

Vespel/Graphite Ferrules

Features:
- Ferrules recommended for GC/MS detectors
- More appropriate ferrules for general use in capillary columns
- Perfect seal

Advantages:
- Mechanically robust and long life time ferrules
- Reusable ferrules

Limitations:
- Must be retightened
- Temperature limit 400ºC

Vespel/Graphite ferrules, (short ferrules) for Agilent 4890, 5890, 6890

Cat.No	Description	For Capillary Column	Pk
TR-T031070	teide 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T031080	teide 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T031090	teide 1/16" to 0.8 mm	0.53 mm I.D.	10

Special Vespel/Graphite ferrules (85/15) for Agilent 4890, 5890, 6890

Cat.No	Description	For Capillary Column	Pk
TR-T031071	teide 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T031081	teide 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T031091	teide 1/16" to 0.8 mm	0.53 mm I.D.	10

Vespel/Graphite standard ferrules

Cat.No	Description	For Capillary Column	Pk
TR-T032001	teide 1/16" to 0.3 mm	0.10-0.20 mm I.D.	10
TR-T032000	teide 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T032010	teide 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T032020	teide 1/16" to 0.8 mm	0.53 mm I.D.	10

Vespel/Graphite standard ferrules (two holes)

Cat.No	Description	For Capillary Column	Pk
TR-T031150	teide 1/16" 2 holes, 0.4/0.4	0.25 mm I.D.	10
TR-T031152	teide 1/16" 2 holes, 0.5/0.5	0.32 mm I.D.	10

Vespel Ferrules

Features:
- The composition is 100% polyamide
- Ideal for applications with isotherm temperature
- They can be reused several times
- Upper temperature limit 350ºC

Advantages:
- Mechanically robust
- Reusable for several column changes

Limitations:
- Must be frequently retightened
- Do not resist high temperatures
- Leaks in case of temperture programming

Vespel ferrules, (short ferrules) for Agilent 4890, 5890, 6890

Cat.No	Description	For Capillary Column	Pk
TR-T031210	teide short 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T031212	teide short 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T031214	teide short 1/16" to 0.8 mm	0.53 mm I.D.	10

Vespel standard ferrules

Cat.No	Description	For Capillary Column	Pk
TR-T031216	teide 1/16" to 0.3 mm	0.10-0.18 mm I.D.	10
TR-T031218	teide 1/16" to 0.4 mm	0.25 mm I.D.	10
TR-T031220	teide 1/16" to 0.5 mm	0.32 mm I.D.	10
TR-T031222	teide 1/16" to 0.8 mm	0.53 mm I.D.	10
TR-T031224	teide 1/16" to 1.0 mm	0.65 mm I.D.	10
TR-T031226	teide 1/16" 2- holes 0.4/0.4 mm	0.25 mm I.D.	10
TR-T031228	teide 1/16" 2- holes 0.5/0.5 mm	0.32 mm I.D.	10

Liners for Agilent Capillary GCs

Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
TR-L04010-5	2 mm Splitless	5181-8818	6.5	79	5
TR-L04010-25	2 mm Splitless		6.5	79	25

TR-L04014-5	4 mm Split/Splitless	210-3003	6.3	79	5
TR-L04014-25	4 mm Split/Splitless		6.3	79	25

TR-L04018-5	4 mm Split/Splitless, with Deactivated Glass Wool	19251-60540	6.3	79	5
TR-L04018-25	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	25

TR-L04020-5	Split Liner 4 mm id with Cup	18740-80190	6.3	79	5
TR-L04020-25	Split Liner 4 mm id with Cup		6.3	79	25

TR-L04022-5	Split Cup Liner, 4 mm id with Deactivated Glass Wool	18740-80190	6.3	79	5
TR-L04022-25	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	25

TR-L04024-5	Split Cup Liner, 4 mm with OV-1/Chromosorb W-P 80/100	18740-60840	6.3	79	5
TR-L04024-25	Split Cup Liner, 4 mm id with OV-1/Chromosorb W-P 80/100		6.3	79	25

TR-L04026-5	Single Taper Liner, 2 mm id	5181-3316/2	6.5	79	5
TR-L04026-25	Single Taper Liner, 2 mm id		6.5	79	25

TR-L04028-5	Single Taper Liner, 4 mm id	5181-3316	6.5	79	5
TR-L04028-25	Single Taper Liner, 4 mm id		6.5	79	25

TR-L04030-5	Single Taper Liner, 4 mm id with Deactivated Glass Wool	5062-3587	6.5	79	5
TR-L04030-25	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79	25

TR-L04032-5	Double Taper Liner, 4 mm id	5181-3315	6.5	79	5
TR-L04032-25	Double Taper Liner, 4 mm id		6.5	79	25

Liners for Perkin Elmer Capillary GCs

TR-L04070-5	Split Liner for Autosystem, 4mm id	N610-1052	4	92	5
TR-L04070-25	Split Liner for Autosystem, 4 mm id		4	92	25

TR-L04072-5	Split Liner for Autosystem with Deactivated Glass Wool	N610-1052/mod	4	92	5
TR-L04072-25	Split Liner for Autosystem with Deactivated Glass Wool, 4mm id		4	92	25

TR-L04074-5	Split Liner for Autosystem, 2 mm id	N-612-1372	2	92	5
TR-L04074-25	Split Liner for Autosystem, 2 mm id		2	92	25

Teknokroma Liners

Liners for Varian Capillary GCs for Injector 1177

Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
TR-L05030-5	2 mm Splitless	392611924	6.5	79	5
TR-L05030-25	2 mm Splitless		6.5	79	25
TR-L05034-5	4 mm Split/Splitless		6.3	79	5
TR-L05034-25	4 mm Split/Splitless		6.3	79	25
TR-L05038-5	4 mm Split/Splitless, with Deactivated Glass Wool	392611934	6.3	79	5
TR-L05038-25	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	25
TR-L05046-5	Single Taper Liner, 2 mm id	392611926	6.5	79	5
TR-L05046-25	Single Taper Liner, 2 mm id		6.5	79	25
TR-L05048-5	Single Taper Liner, 4 mm id	392611927	6.5	79	5
TR-L05048-25	Single Taper Liner, 4 mm id		6.5	79	25
TR-L05050-5	Single Taper Liner, 4 mm id with Deactivated Glass Wool	392611936	6.5	79	5
TR-L05050-25	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79	25

Liners for Varian Capillary GCs for Injector 1075/1077

Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
TR-L05054-5	4 mm Open Split Liner	16-000830-00		72	5
TR-L05054-25	4 mm Open Split Liner			72	25
TR-L05056-5	4 mm Open Split Liner with Glass Wool	01-900109-01		72	5
TR-L05056-25	4 mm Open Split Liner with Glass Wool			72	25
TTR-L05058-5	Frit Split Liner	01-900109-3		72	5
TR-L05058-25	Frit Split Liner	16-000830-01		72	25
TR-L05060-5	Splitless, Borosilicate Glass	03-949437-90		74	5
TR-L05060-25	Splitless, Borosilicate Glass	03-949437-00		74	25

525 GC Flowmeter For GC (Gas Chromatography)

Flow Measurement

Acurate and repetable gas flow measurements are a crucial part of obtaining good results from your Gas Chromatograph. The new 525 GC Flowmeter makes gas flow measurement easier and more
accurate, helping to eliminate user errors.

A large OLED display makes reading flows clear and easy, whilst the built in rechargeable battery means the user no longer has to worry about changing dead batteries.

The 525 GC Flowmeter has a 25 point calibration traceable to UKAS standards, to ensure the level of accuracy required in a professional laboratory. Users are able to set the temperature and pressure of their working environment and the 525 GC Flowmeter will automatically compensate for these changes from its calibration
conditions.

Designed for Gas Chromatography

The 525 G C Flowmeter provides as s tandard, measurement of eight gases commonly used in gas chromatography. In addition to the standard flow measurements mode the 525 GC Flowmeter also features:

Linear Velocity

The user is able to select their column diameter in the options menu, the linear velocity can then be calculated and displayed.

Split Flow Calculation

Split flows mode allows the user to measure and store a column flow, the user can then measure the split flow and the 525 GC Flowmeter displays both the flow rate and the split ratio.

Cat.No	Description
TK-525GC	Teknokroma 525 GC Flowmeter

Specifications of 525 GC Flowmeter

Range: 0.1 to 500 ml/min (0.1 to 275 ml/min for Carbon Dioxide)
Resolution: 0.1 ml/min
Accuracy: ±0.4 ml/min or 2.5% of reading
Gases: Air, Argon, Argon/5% Methane, Carbon Dioxide, Helium, Hydrogen, Nitrogen, Oxygen
Size: 68 x 130 x 30 mm
Weight: 150 g
Calibration: Annually
Traceability: Calibration traceable to UKAS standards

Teknokroma 2t Headspace Sampler

Manual Headspace Sampler
The fruit of Experience

Technical Specifications

Heating temperature Range:	up to 140ºC.
Variable injection:	up to 2,5 ml.
Temperature accuracy:	+/- 0,75ºC
Holds up to 6 vials of:	2, 4, 6, 9, 10, 12, 20, 22 and 27 ml.
Sampling time control with accoustic alarm:	1 to 99 seconds
Equilibrium time control with accoustic alarm:	1 to 99 minutes
Stabilization time from 25ºC to 70ºC with 1 ml syringe and 6 empty 20 ml vials:	20 minutes
Safety temperature:	175ºC
Power:	110 / 220 +/- 10% VAC.

It is according the Pharmacopeia test:

European Pharmacopeia 7th. (2011).

USP 35-NFO (2012).

The Teknokroma 2t Headspace Sampler for Headspace technique within your reach with a low cost and high precision level

The 2t sampler is the first manual system for Static Headspace that allows the application of this technique in a quantitative, manner.

Until now it was only possible to use the technique of Static Headspace with automatic equipment. This “equipment” has a high
cost, low versatility and complex operations. For this reason the Static Headspace technique has not been fully used in most laboratories.

The 2t sampler solves these problems making the technique available to all Gas Chromatography users in a economical and simple way.

It complies with all requeriments of the European CE.

Applications

- Volatiles in pharmaceuticals
- Flavours analysis in food and cosmetic products
- Alcohol and other toxic compounds in blood
- Screening of volatiles in all type of environmental samples (soils, waters, plastics, polymers, etc.)

Teknokroma 2t Headpace Sampler

Put the syringe into the black holder.

Insert the closed vials with the sample into the heating block.

a. Insert the syringe holder into the heating block.
b. Set the temperature and the equilibrium time with the keyboard.
c. Press the start.

After the equilibrium time is achieved, move the syringe holder into vial number 1, and aspirate the sample by moving the plunger up until the prefixed volume is reached.

Inject the sample into the GC.
Repeat this sequence for the additional samples.

Teknokroma 2t Headspace Sampler

Performance qualification

To check the Headspace SHS system 0112 proper performance, the following reproductibility test is recommended. In this test, we check not only the equipment performance but we also evaluate:

- The vials are correctly sealed.
- The sampling procedure followed by the analyst is correct
- The Gas Chromatograph works properly
- The data-aquisition system works properly

Sample preparation

Add 2.5 µl of benzene and 2.5 µl of toulene to 100 ml of water (25ppm), stir up until it is completely dissolved.

Adjust head space sample conditions and inject.
Integrate the benzene and toluene peaks of the 6 chromatograms obtained.

The Relative Standard Deviation of the area quotients must be lower than 5%.

Benzene area	Toulene area	Area Ratio
3418.461	5441.008	0.628
3466.125	5449.905	0.625
3359.176	5381.354	0.624
3316.646	5374.388	0.624
3782.404	6035.683	0.627
3794.026	6063.646	0.626
	Mean Value	0.626
	Standard deviation (SD)	0.00163
	Relative standard deviation (RSD)	0.26%

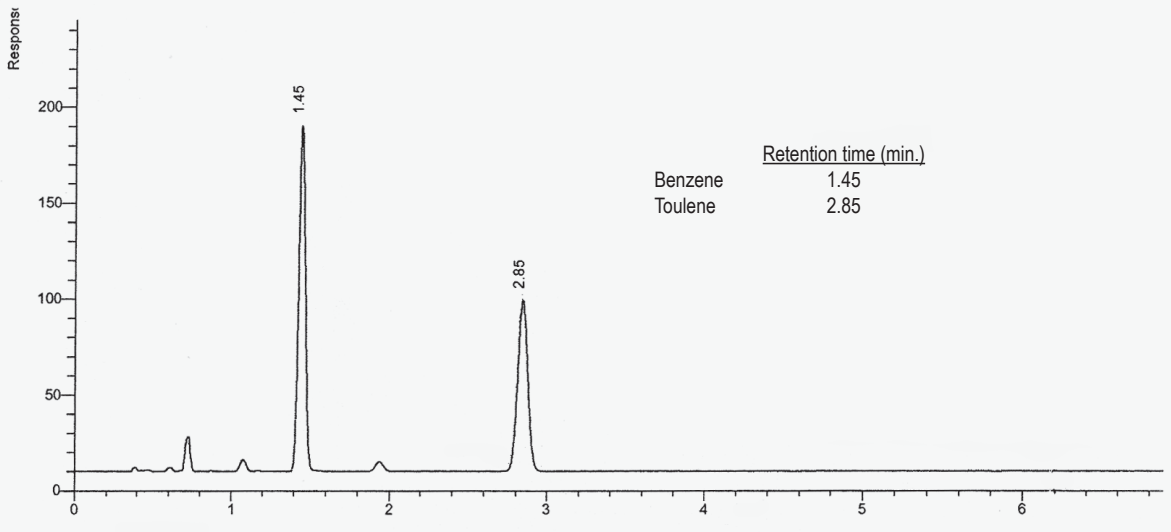
Cat.No	Description
TR-132300	2t Sampler for Static Headspace mod. SHS 0112 (syringe not included)
TR-132113	APE Syringe nod. 1001 HS 1 ml.
TR-132112	APE Syringe nod. 1002 HS 2.5 ml.

Chromatographic Parameters

Column: TRB-1, P/N TR-113015 15m x 0,53mm x 3µm
Injection: 0,7 ml, headspace, split 1:2, 150ºC
5 ml in 10 ml vials (25 ppm benzene/toulene in water)
Carrier gas: He, 4psi (27.6 kPa)
Oven: 60ºC (10 min)
Detector: FID, 250ºC

Headspace conditions

10ml vials, P/N CC-10-CV
Cap with blue silicone/PTFE seal P/N CC-20-ST3
Healting block temperature: 75ºC
Equilibrium time: 30 minutes
Sampling time: 30 seconds
Syringe used: 1ml (1001 LTN, pst 5, P/N HA-81343)
Sampled volume: 0,7ml



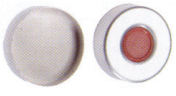
	Retention time (min.)
Benzene	1.45
Toulene	2.85

Headspace Vials

Cat.No	Description	Pk
TR-400085	10 ml Clear Glass,Beveled Edge, Flat bottom, Crimp HS Vial	100
TR-400086	10 ml Clear Glass,Beveled Edge, Rounded-Flat bottom, Crimp HS Vial	100
TR-400037	20 ml Clear Glass,Belveled Edge, Flat bottom, Crimp HS Vial	100
TR-400087	20 ml Clear Glass,Belveled Edge, Rounded-Flat bottom, Crimp HS Vial	100
TR-400088	20 ml Amber Glass,Belveled Edge, Rounded-Flat bottom Crimp HS Vial short neck (PE)	100

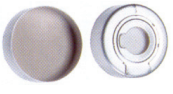
Cat.No	Description	Pk
TR-400030	20 mm Open Top Aluminium Crimp Cap (10 mm Hole) PTFE/Natural Silicone Septa	100
TR-400038	20 mm Open Top Magnetic Crimp Cap (8 mm Hole) Red & Silver PTFE/Silicone Septa	100
TR-400059	20 mm Open Top Magnetic Crimp Cap (8 mm Hole) Blue & Silver PTFE/Silicone Septa	100

20 mm Crimp Seals with Prefited Septa for Headspace Vials



CC-C4020-34A

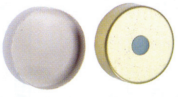
CC-C4020-36AP



CC-C4020-32AP

CC-C4020-37AP

CC-C4020-31



CC-C4020-42-A

Cat.No	Seal Type	Septa	Pk
CC-C4020-34A	Regular	Ivory PTFE/Red Rubber, (-40 to +100°C)	100
CC-C4020-34AP	Pressure Release	Ivory PTFE/Red Rubber, (-40 to +100°C)	100
CC-C4020-39A	Regular	Clear PTFE/Gray Butyl (-40 to +120°C)	100
CC-C4020-43A	Magnetic Steel	Clear PTFE/Gray Butyl (-40 to +120°C)	100
CC-C4020-43AP	Pressure Release	Clear PTFE/Gray Butyl (-40 to +120°C)	100
CC-C4020-36A	Regular	Gray PTFE/Black Molded Butyl (-40 to +125°C)	100
CC-C4020-36AP	Pressure Release	Gray PTFE/Black Molded Butyl (-40 to +125°C)	100
CC-C4020-32A	Regular	Tan PTFE/White Silicone (-60 to +200°C)	100
CC-C4020-32AP	Pressure Release	Tan PTFE/White Silicone (-60 to +200°C)	100
CC-C4020-42A	Magnetic Steel	Clear PTFE/Traslucent Blue Silicone (-60 to +200°C)	100
CC-C4020-42AP	Pressure Release	Clear PTFE/Traslucent Blue Silicone (-60 to +200°C)	100
CC-C4020-37AP	Pressure Release	Aluminium Foil/White High Temp. Silicone (-60 to +220°C)	100
CC-C4020-31	Molded Polypropylene Storage Cap	SepCap Integral Molded Polypropylene	250
CC-C4020-42A	Magnetic Steel	Clear PTFE/Translucent Blue Silicone (-60 to +200°C)	100

Crimpers, Dicrimpers, and Decapping Pliers for 20 mm Top Vials

Cat.No	Description	Use	Pk
CC-C4020-100	Manual Crimper	Attaches 20 mm aluminium crimp seals	1
CC-C4020-101	Decapping Pliers	Removes 20 mm aluminium crimp seals	1
CC-C4020-102	Manual Decrimper	Removes 20 mm aluminium seals without vial damage	1

CC-C4020-102

CC-C4020-100

CC-C4020-101

Super-Clean Gas Filters

A revolution in gas purifying of GC and GC/MS gases

Unique «POINT-OF-USE» and «SEMI IN-LINE» glass/metal, diffusionproof Super-Clean Gas Filters, purify the delicate carrier and burner gases for your GC and GC/MS system for Hydrocarbons, Oxygen (colour indicated) and Moisture (colour indicated) to better-as 6.0 gas (99,9999%) quality, independent of the original gas quality.

Analytical advantages of SGT Super-Clean Gas Filters

- Longer lifetime of analytical columns, avoids bleeding, espec. important for MS and ECD.
- Better sensitivity, decreases baseline noise, eliminates spikes.
- Filter-change during analysis within seconds, system stays online.

Purifier Cartridge Capacity

Type of Purifier	Outlet Gas Quality	Usable for	Indicator Color Change	Capacity			CO_2
				H_2O(gr)	O_2	Hydrocarbons	
Moisture	> 6.0	Inert carrier gas, air hydrogen	Brown to white	7.2			
Oxygen	> 6.0	Inert carrier gas	Green to grey		150 mL		
Hydrocarbon	> 6.0	Inert carrier gas, air hydrogen	No indicator			12 g (as n-butane)	
Carbon Dioxide	> 6.0		No indicator				12g
Combi (moisture/hydrocarbon)	> 6.0	Inert carrier gas, air hydrogen	Brown to white	3.5		6 g (as n-butane)	
Triple (moisture/oxygen/hydrocarbon)	> 6.0		Brown to white Green to grey	1.8	75 mL	4 g (as n-butane)	

Spec´s on GST Super-Clean Gas Filters

- The specified lifetimes are strongly depending of the quality of the incoming gas.
- Effectivity: <0.1 ppm at a flowrate of 2 liters/minute

One position platform

Quick-Fit System

Benefits of the "quick-fit" system:

- Filter replacement within seconds.
  - Eliminates GC downtime.
- Tool-less filter replacement.
  - Easy handling
- Diffusion-proof Baseplate (also during filter replacement).
  - Eliminates analytical disturbance.
- Baseplates can be wall-mounted.
  - Convenient positioning

Different Standard Configurations

GC/MS Carrier Gas Purification System

- Removal of Oxygen, moisture and hydrocarbons for longer column lifetime and cleaner baseline.
- This configuration is excellent for Carrier Gas and ECD, MS applications.

In this configuration, you need to use: 1-position baseplate +
1 Triple Filter

SG-SGT-F0301	Triple Filter (O2/Moisture/Hydrocarbons)
SG-SGT-B0010-B8	1-position baseplate - 1/8" Brass

GC/MS Carrier Gas Helium Specific Purification System

System for Purifying Helium in GC/MS systems

In this configuration, you need to use: 1-position baseplate + 1 Triple filter gas specific Helium

SG-SGT-F0302	Triple Filter; conditioned with Helium (O2/Moisture/Hydrocarbons)
SG-SGT-B0010-B8	1-position baseplate - 1/8" Brass

Carbon Dioxide Filter

Removes carbon dioxide and sulfur from gas streams. To be used in combination with a Moisture Filter

In this configuration, you need to use: 2 units of 1-position baseplate + 1 Carbon dioxide filter

1 x SG-SGT-B0010-B8	1-position baseplate 1/8 " Brass
1 x SG-SGT-F0105	Carbon diaxide Filter

Carrier Gas Purification and FID Gases

The full solution for your GC/FID system
Purifying all gases used in a FID operated GC

In this configuration, you need to use: 3 units of 1-position baseplate + 1 triple filter (O2/Moisture/ Hydrocarbons) for purifying carrier gas + 2 Combi Filter (Hydrcarbons/Moisture) for purifying gases used in a FID.

3 x SG-SGT-B0010-B8	1-position baseplate 1/8 " Brass
1 x SG-SGT-F0301	Triple Filter (O2/Moisture/Hydrocarbons)
2 x SG-SGT-F0201	Combi Filter (Moisture/Hydrocarbons)

High Capacity Purifiers for Carrier a d FID Gases

Recommended for low quality gases
Purifying all gases used in a FID operated GC
Use Ultra Capacity Moisture and Oxygen filters for Carrier and 2 Ultra Capacity Hydrocarbon Filter one for Air & one for Hydrogen.

In this configuration, you need to use: 4 units of 1-position baseplate + 1 Moisture Filter, Standard, Ultra Capacity + 1 Oxygen Filter, Standard, Ultra Capacity + 2 Hydrocarbons Filter, Standard, Ultra Capacity.

4 x SG-SGT-B0010-B8	1-position baseplate 1/8 " Brass
1 x SG-SGT-F0101	Moisture Filter, Standard, Ultra Capacity
1 x SG-SGT-F0102	Oxygen Filter, Standard, Ultra Capacity
2 x SG-SGT-F0103	Hydrocarbons Filter, Standard, Ultra Capacity, pk/1.

LC-MS Gas Purification System High Flow

Unique 2-Position Super Clean System for purifying the nitrogen gas and zero air utilized in LC/MS instruments.

In this configuration, you need to use: 1 unit of 2-position baseplate + 1 Set of Hydrocarbons purifiers for nitrogen gas + particle filter

1 x SG-SGT-B0021-B4	2-position baseplate, 1/4" Brass for 2 High Flow Gas Filters
1 x SG-SGT-F0720	Hydrocarbons Filter, Standard, Ultra capacity, pk/2
1 x SG-SGT-B0060	0.5 micron Particle Filter 1/4", pk/1

Click-On Inline Super-Clean™ Purifiers®

Original Inline Super -Clean™ Purifier

- High-purity output ensures 99.9999% pure gas
- Click-On fittings for easy, leak-tight cartridge changes; brass or stainless steel, ¼" or 1/8"
- Helium-Specific Triple Purifier is ideal for GC/MS

The SGT Click-On Inline Super-Clean™ purifiers are the latest in in-line gas filtration. Click-On adaptor connectors allow purifiers to be exchanged without introducing oxygen. Spring-loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no need for loosening and tightening fittings every time a purifier is changed, and your system will not become contaminated during the process.

The Triple Click-On Purifier is ideal for purifying carrier gas-it contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge.

The Fuel Gas Click-On Purifier is ideal for purifying flame ionization detector (FIC) fuel gases, removing both moisture and hydrocarbons.

The Helium-Specific Triple Click-On Purifier is ideal for purifying helium in GC/MS systems. This Click-On purifier under helium contains oxygen, moisture, and hydrocarbon scrubbers in one cartridge, and is packed and purged.

Click-On purifier replacement depends on the quality of the incoming gas. Use the double connector and install an indicating cartridge after a purifier to indicate when the purifier should be replaced.

Inline Super-Clean™ Specifications

Type	Output Qualtiy	Max Pressure	Max Flow	Used For	Capacity	Estimated Lifetime (years)
Moisture	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H2	21 g H20	>3
Oxygen	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	450 mL	>3
Hydrocarbon	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H2	36 g HCs[3]	>3
Fuel Gas[1]	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier, Helium, Air, H2	10 g H20; 18 g HCs[3]	>2
Triple[2]	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	6 g H20; 12 g HCs[3] 150ml O_2	>2

[1] Removes hydrocarbons, moisture
[2] Removes hydrocarbons, moisture, oxygen
[3] As n-butane.

Note: Super-Clean™ Gas Filters are recommended for purifying non-corrosive gases with low concentration of contaminants. The maximum concentration of 02 in the incoming gas stream for oxygen purifiers is 0.5%.

Click-On Inline Purifier Steel

Cat.No	Description	pK
SG-SGT-CO1005	Click-On Inline Triple Trap (Oxygen/Moisture/Hydrocarbons) Cartridge - Stainless Steel	1 unit
SG-SGT-CO1061	Click-On Inline **Indicatinig** Triple He Trap (Oxygen/Moisture/Hydrocarbons) Cartridge-Glass	1 unit
SG-SGT-CO1001	Click-On Inline Moisture Cartridge - Stainless Steel	1 unit
SG-SGT-CO1002	Click-On Inline Oxygen Cartridge - Stainless Steel	1 unit
SG-SGT-CO1003	Click-On Inline Hydrocarbon Cartridge - Stainless Steel	1 unit
SG-SGT-CO1004	Click-On Inline Combi (Oxygen/Moisture) Cartridge - Stainless Steel	1 unit
SG-SGT-CO1007	Click-On Inline Combi (Hydrocarbons/Moisture) Cartridge - Stainless Steel	1 unit

Click-On Connectors

Cat.No	Description	pK
SGT-CO2001	Click-On Connectors 1/4" Brass	2 units
SGT-CO2002	Click-On Connectors 1/8" Brass	2 units
SGT-CO2010	Click-On Connectors 1/4" SS	2 units
SGT-CO2011	Click-On Connectors 1/8" SS	2 units
SGT-CO2020	Click-On Double Connectors to connect SS Trap with indicating trap	1 unit

SGT Super Big Traps

Click-On Inline Purifier Glass

Cat.No	Description	pK
SG-SGT-CO1041	Click-On Inline Combi Trap (Oxygen/Moisture) Cartridge with indicator - Glass	1 unit
SG-SGT-CO1051	Click-On Inline Triple Trap (Oxygen/Moisture/Hydrocarbons) Cartridge with indicator - Glass	1 unit
SG-SGT-CO1011	Click-On Inline Moisture Cartridge with indicator - Glass	1 unit
SG-SGT-CO1021	Click-On Inline Oxygen Cartridge with indicator - Glass	1 unit
SG-SGT-CO1031	Click-On Inline Hydrocarbon Cartridge with indicator - Glass	1 unit

SGT Super Big Traps with electronic indicator

- Ideal for Central Purifying Solutions
- Largest Big Trap Available
- High-purity output ensures 99.9999% Pure gas
- Click-On fittings for easy, leaktight cartridge changes
- High Pressure Stainless Steel

Click-On Inline Super-CleanTM Big Traps are inline traps designed with Click-On adaptor connectors which allows inline cartridges to be exchanged without introducing oxygen. Spring loaded check valves seal when a filter is removed and open only when a new filter has been locked in place. There is no need for loosening and tightening fittings every time a trap is changed and your system will not become contaminated during the process

Specifications

Material	Stainless Steel
Length	22 inch
Diameter	2,5 inch
Max. Inlet Pressure	1000 psi
Max. Flow (GC/MS)	8 L/min
Max. Flow (LC/MS)	25 L/min
Pressure Drop *	0,30 psi

Virtual Indicator Compatible

Compatible with the Virtual Indicator platform, allows you to monitorthe status with the CLIK device.

Capacity Data

Contaminant		Capacity					
Contaminant	**Gas Purify**	**Triple (Oxy/Moist/Hydr)**	**Moisture**	**Oxygen**	**Hydrocarbons**	**Combi (Hidr/Moist)**	**Combi (Oxy/Moist)**
Oxygen	< 5 ppm	2.0 L	-	4.5 L	-	-	2,25 L
Hydrocarbon	< 5 ppm	120 g	-	-	360 g	180 g	-
Moisture	< 5 ppm	70 g	210 g	-	-	105 g	105 g

Replacement cartridges for Big Traps

Cat.No	Description	Gas Type
SG-COBT1008	Triple H2 (Oxy/Moist/Hydr) Big Trap	Hydrogen
SG-SGT-COBT1006 *1	Triple He (Oxy/Moist/Hydr) Big Trap	Helium
SG-SGT-COBT1005	Triple (Oxy/Moist/Hydr) Big Trap	Nitrogen
SG-SGT-COBT1001	Moisture Big Trap	(He/Ar/Me)
SG-SGT-COBT1002	Oxygen Big Trap	(He/Ar/Me)
SG-SGT-COBT1003 *2	LC/MS Hydrocarbon Big Trap	(He/Ar/Me)
SG-SGT-COBT1007	Combi (Hydr/Moist) Big Trap	(He/Ar/Me)
SG-SGT-COBT1004	Combi (Oxy/Moist) Big Trap	(He/Ar/Me)

*1 : recommended for GC/MS *2 : recommended for LC/MS

Installation Kits (includes re-usable fittings)

Catalog No

Choose any catalog no from the table on the left

Catalog No. Extension	(Re-usable) Fitting
-S8	1/8" Stainless Steel
-S4	1/4" Stainless Steel
-B8	1/8" Brass
-B4	1/4" Brass

For Example: to order a Triple He Big Trap Installation Kit with 1/8" Stainless Steel Click-On Connectors, the part number would be: SGT-COBT1006-S8

Index Vials

Vials

Teknokroma Vials

- Suitable for almost all automatic injectors in the market
- 2 ml Crimp, Snap Top vial and Screw Cap vials
- Crimp Seals, snap caps and Screw Caps (9-425)
- An economical alternative developed by Teknokroma™

Teknokroma 12 x 32 mm Crimp, Snap Top & Screw Cap

VIAL 2 ml	Type	Clear	Amber	Patch	Insert 0,2 ml	Opening Size
TR-400014	Screw	•				9-425
TR-400060	Screw	•		•		9-425
TR-400074	Screw	•			•	9-425
TR-400003	Screw		•	•		9-425
TR-400075	Screw		•			9-425
TR-400013	Crimp	•				11mm
TR-400010	Crimp	•		•		11mm
TR-400076	Crimp	•			•	11mm
TR-400011	Crimp		•	•		11mm
TR-400077	Crimp		•			11mm
TR-400035	Snap	•				11mm
TR-400078	Snap	•		•		11mm
TR-400079	Snap	•			•	11mm
TR-400080	Snap		•	•		11mm
TR-400081	Snap		•			11mm

VIAL CAP	Type	Bonded	Pre-slit	PTFE/Ruber	PTFE/Silicone	Opening Size
TR-400025	Screw				•	9-425
TR-400026	Screw		•		•	9-425
TR-400026W	Screw		•		•	9-425
TR-400020	Screw	•	•		•	9-425
TR-400041	Screw				•	9-425
TR-400055	Screw		•		•	9-425
TR-400058	Screw				•	9-425
TR-400012	Crimp			•		11mm
TR-400021	Crimp				•	11mm
TR-400036	Snap			•		11mm
11-SP4003	Snap		•		•	11mm
11-SP4002	Snap				•	11mm

Teknokroma 6 mm Micro Insert

- Insert vials are economical choice for many routine HPLC applications
- Polyspring inserts are self-centering with a spring to provide a cushion against needle contact.

Cat.No	Description	Pk
TR-400043	Insert, Clear Glass, Flat base 6x31	100
TR-400082	Insert, Clear Glass, Conical base with polyspring 6x29	100
TR-400083	Insert, Clear Glass, Conical Base 6x31	100
TR-400084	PP Insert, Conical base 6x28	100
TR-400082	Insert, Clear Glass, Conical base with polyspring 6x29	100

Teknokroma Crimp Top Headspace Vials & Clousures

- All headspace vials are manufactured to provide uniform glass thickness that ensures even heat distribution for consistent sampling reliabity.

Cat.No	Description	Pk
TR-400085	10 ml Clear Glass,Beveled Edge, Flat bottom, Crimp HS Vial	100
TR-400086	10 ml Clear Glass,Beveled Edge, Rounded-Flat bottom, Crimp HS Vial	100
TR-400037	20 ml Clear Glass,Belveled Edge, Flat bottom, Crimp HS Vial	100
TR-400087	20 ml Clear Glass,Belveled Edge, Rounded-Flat bottom, Crimp HS Vial	100
TR-400088	20 ml Amber Glass,Belveled Edge, Rounded-Flat bottom Crimp HS Vial short neck (PE)	100

Teknokroma Crimp Cap & Septa

Cat.No	Description	Pk
TR-400030	20 mm Open Top Aluminium Crimp Cap (10 mm Hole) PTFE/Natural Silicone Septa	100
TR-400038	20 mm Open Top Magnetic Crimp Cap (8 mm Hole) Red & Silver PTFE/Silicone Septa	100
TR-400059	20 mm Open Top Magnetic Crimp Cap (8 mm Hole) Blue & Silver PTFE/Silicone Septa	100

Teknokroma Headspace Vials

Teknokroma Screw Top Headspace Vials & Clousures

- Screw headspace vials, caps and septa are designed especially for use with Agilent and other rotating or robotic arms samplers.

Teknokroma Screw Top Headspace Vials

Cat.No	Description	Pk
TR-400061	10 ml Clear Glass, Screw Headspace Vial 23 x 47	100
TR-400039	20 ml Clear Glass, Screw Headspace Vial 23 x 75	100

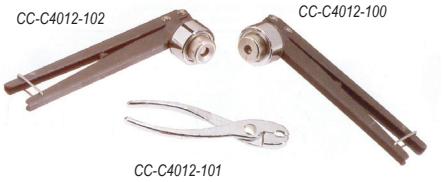
Teknokroma Screw Top Headspace Cap & Septa

Cat.No	Description	Pk
TR-400089	18 mm Silver Open Top metal Cap (8 mm hole) with PTFE / Silicone Septa	100
TR-400090	18 mm Silver Color, Closed Top Metal Cap with PTFE / Silicone Septa	100

Teknokroma Screw Top HeadSpace Vials Pre-assembled with Cap & Septa

Cat.No	Description	Pk
TR-400089	10 ml Clear Glass, Screw Headspace Vial 23 x 47 pre-assembled with 18 mm Silver Open Top metal Cap (8 mm hole) with PTFE / Silicone Septa	100
TR-400090	20 ml Clear Glass, Screw Headspace Vial 23 x 75 18 mm Silver Color, Closed Top Metal Cap with PTFE / Silicone Septa	100

Crimpers, Decrimpers, and Decapping Pliers for 11 mm Top Vials



Cat.No	Description	Use	Pk
CC-C4012-100	Manual Crimper	Attaches 11 mm aluminium crimp seals	1
CC-C4012-101	Decapping Pliers	Removes 11 mm aluminium crimp seals	1
CC-C4012-102	Manual Decrimper	Removes 11 mm aluminium seals without vial damage	1

Crimpers, Decrimpers, and Decapping Pliers for 20 mm Top Vials

Cat.No	Description	Use	Pk
CC-C4020-100	Manual Crimper	Attaches 20 mm aluminium crimp seals	1
CC-C4020-101	Decapping Pliers	Removes 20 mm aluminium crimp seals	1
CC-C4020-102	Manual Decrimper	Removes 20 mm aluminium seals without vial damage	1

Teknokroma EPA VOA Vials

- Available in clear or amber borosilicate glass
- Assembled in Polypropilene caps and PTFE / Silicone Septa
- Compatible with all kinds of autosamplers, such as Shimadzu, Agilent, Waters, etc.

Cat.No	Description	Pk
TR-400050	40 ml Clear Glass, EPA VOA Vial pre-assembled with 24-480 open top PP Screw cap and PTFE / Silicone Septa	100

Cat.No	Description	Pk
TR-400051	40 ml Amber Glass, EPA VOA Vial pre-assembled with 24-480 open top PP 24-400 White Open Top PP Screw Cap	100


MICROLITER® #75
0.025 ml
0.10 ml
0.05 ml
0.25 ml
MICROLITER® #701

Hamilton Syringes

Hamilton™ Syringes

The Measure of Excellence

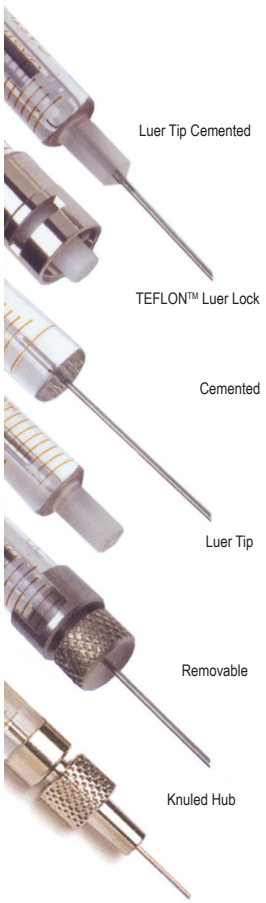
Highest quality materials

From our pioneering efforts in designing and producing the first precision MICROLITER™ syringe, we have crafted our products from the finest materials and have controlled them with the same meticulous care and attention to detail that have become the hallmark of Hamilton products.

Unsurpassed Accurancy and Precision

Every one of our syringes is subjected to extensive quality control procedures and tested to make sure we meet the high expectations of accuracy and precision that you have come to expect from all Hamilton products.

The design of our barrel and plunger dimensions assures high levels of accuracy and precision. Hamilton syringes are manufactured to be accurate within +/- 1% of nominal volume. The Hamilton Quality System is EN ISO 9001 / EN 46001 certified.



Syringe Termination

- **Luer Tip Cemented (LTN)**
  - ground glass tip with a cemented needle: not recommended for use with halogenated solvents, such as $MeCL_2$
- **TEFLON™ Luer Lock (TLL)**
  - can be used with luer (Metal of Kel-F®) hub needles, TEFLON® tubing assemblies and connectors can be used, offer flexibility.
- **Cemented (N)**
  - not recommended for use with halogenated solvents, such as $MeCL_2$
- **Luer Tip (LT)**
  - ground glass tip can be used with most hypodermic needles: Kel-F® hub needles, TEFLON® tubing assemblies and connectors can also be used; offers flexibility
- **Removable (RN)**
  - advantageous for laboratories with multiple users; economical since you can replace the needle without having to purchase a new syringe
- **Knurled Hub (KH)**
  - Replaceable needles; use only with the 7000 Series syringes.

Needle Point Style

- **Point Style AS 1**
  - special conical style needle point designed to withstand the demands of multiple injections; exclusively used on autosampler syringes.
- **Point Style 2**
  - 10 - 12° bevelled non-coring needle point recommended for septum penetration; only needle gauges 26s - 22 are recommended for optimum septum penetration.
- **Point Style 3**
  - blunt needle point for use with HPLC injection valves and for sample pipetting
- **Point Style 4**
  - 10 - 12° bevelled needle point recommended for life science applications; especial point styles such as 12°, and 45° are available on request.
- **Point Style 5**
  - conical needle with side port of penetration of septa, thin-gauged vinyls and plastics without corning; minimizes septum damage.

700 Series MICROLITER™ Syringes

5 µL - 500 µL

- For use with liquids
- Cemented needles (N), removable needles (RN), or luer tip (LT)
- Plungers and syringe barrels are not interchangeable or replaceable
- Tight tolerances between the plumger and the barrel

Hamilton 700 Series Microliter™ Syringes

N (Cemented Needle)

RN (Removable Needle)

LT (Cemented Needle)

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-87900	75 N	5 µL	51 mm	26s	2
HA-80300	701 N	10 µL	51 mm	26s	2
HA-80400	702 N	25 µL	51 mm	22s	2
HA-80500	705 N	50 µL	51 mm	22s	2
HA-80600	710 N	100 µL	51 mm	22s	2
HA-80700	725 N	250 µL	51 mm	22s	2
HA-80800	750 N	500 µL	51 mm	22	2
HA-87930	75 RN	5 µL	51 mm	26s	2
HA-80330	701 RN	10 µL	51 mm	26s	2
HA-80430	702 RN	25 µL	51 mm	22s	2
HA-80530	705 RN	50 µL	51 mm	22s	2
HA-80630	710 RN	100 µL	51 mm	22s	2
HA-80730	725 RN	250 µL	51 mm	22s	2
HA-80830	750 RN	500 µL	51 mm	22	2
HA-80301	701 LT	10 µL	-	26s	-
HA-80401	702 LT	25 µL	-	22s	-
HA-80501	705 LT	50 µL	-	22s	-
HA-80601	710 LT	100 µL	-	22s	-
HA-80701	725 LT	250 µL	-	22s	-
HA-80801	750 LT	500 µL	-	22	-

Hamilton Syringes Six pack

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-80366	701 N, pk/6	10 µL	51 mm	26s	2
HA-80336	701 RN, pk/6	10 µL	51 mm	26s	2

600 Series MICROLITER™ Syringes

2.5 µL- 5 µL

- For use with liquids
- Removable needles (RN)
- Reinforced plungers
- Plungers and syringe barrels are not interchangeable or replaceable

Hamilton 600 Series Microliter™ Syringes

RN (Removable Needle)

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-87942	62 RN	2.5 µL	51 mm	22s	3
HA-87943	65 RN	5 µL	51 mm	22s	3

Hamilton™ Syringes

800 Series MICROLITER™ Syringes

5 µL - 250 µL

- For use with liquids
- Removable needles (RN) or Cemented needles (N)
- Reinforced plungers
- Barrel/plunger assemblies are replaceable
- Plunger stop prevents plunger blowout

N (Cemented Needle)

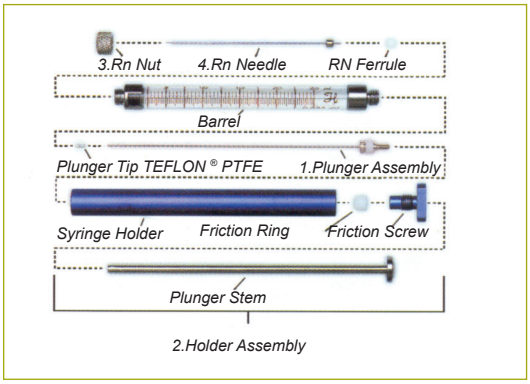
RN (Removable Needle)

Hamilton 800 Series Microliter™ Syringes

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-84850	85 N	5 µL	51 mm	26s	2
HA-84852	801 N	10 µL	51 mm	26s	2
HA-84854	802 N	25 µL	51 mm	22s	2
HA-84856	805 N	50 µL	51 mm	22s	2
HA-84858	810 N	100 µL	51 mm	22s	2
HA-84860	825 N	250 µL	51 mm	22s	2
HA-84851	85 RN	5 µL	51 mm	26s	2
HA-84853	801 RN	10 µL	51 mm	26s	2
HA-84855	802 RN	25 µL	51 mm	22s	2
HA-84857	805 RN	50 µL	51 mm	22s	2
HA-84859	810 RN	100 µL	51 mm	22s	2
HA-84861	825 RN	250 µL	51 mm	22s	2

Operating Parameters

- Maximum temperature for Cemented Needle is 50°C and Removable Needle 115°C.
- Maximum test pressure is 6 bar



Replacement Parts

Description	Volume	5 µL	10 µL	25 µL	50 µL	100 µL	250 µL
	Model	85	801	802	805	810	825
1. Barrel/Plunger Assembly N		**HA-32150**	**HA-32151**	**HA-32152**	**HA-32153**	**HA-32154**	**HA-32155**
Barrel/Plunger Assembly SN [1)]		**HA-32105**	**HA-32158**	**HA-32159**	**HA-32160**	**HA-32161**	**HA-32162**
Barrel/Plunger Assembly RN		**HA-32164**	**HA-32165**	**HA-32166**	**HA-32167**	**HA-32168**	**HA-32169**
B/P Assembly Syringe [2)]		**HA-32134**	**HA-32129**	**HA-32117**	**HA-32120**	**HA-32123**	**HA-32126**
2. Holder Assembly		**HA-32135**	**HA-32135**	**HA-32135**	**HA-32135**	**HA-32135**	**HA-32135**
3. RN Nut		**HA-30902**	**HA-30902**	**HA-30902**	**HA-30902**	**HA-30902**	**HA-30902**
4. RN Needle See specific page							

1) Specify needle gauge, lenght, point style, and wether electro-trapped
2) Needle not included

900 Series MICROLITER™ Syringes

5 µL - 10 µL

- For use with liquids
- Removable needles (RN) or Cemented needles (N)
- Reinforced plungers
- Plungers and syringe barrels are not interchangeable or replaceable

N (Cemented Needle)

RN (Removable Needle)

Hamilton 900 Series Microliter™ Syringes

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-87920	95 N	5 µL	51 mm	26s	2
HA-80360	901 N	10 µL	51 mm	26s	2
HA-87925	95 RN	5 µL	51 mm	26s	2
HA-80370	901 RN	10 µL	51 mm	26s	2

7000 Series MODIFIED MICROLITER™ Syringes

0.5 µL - 5 µL

- For use with liquids
- Removable needles (KH)
- Positive displacement
- Sample contained in the needle
- No dead volume
- Replaceable syringe parts

KH (Knurled Hub)

Hamilton 7000 Series Modified Microliter™ Syringes

Cat.No	Model	Volume	Needle Length	O.D.	Point Style
HA-86257 [1]	7000.5 OC	0.5 µL	100 mm	0.23	3
HA-86259	7000.5 KH	0.5 µL	70 mm	0.50	2
HA-80135	7001 KH	1 µL	70 mm	0.47	2
HA-86211	7101 KH	1 µL	70 mm	0.70	2
HA-88411	7002 KH	2 µL	70 mm	0.50	2
HA-88511	7102 KH	2 µL	70 mm	0.63	2
HA-88011	7105 KH	5 µL	70 mm	0.56	2
HA-86250	7000.5 KH	0.5 µL	70 mm	0.50	3
HA-80100	7001 KH	1 µL	70 mm	0.47	3
HA-86200	7101 KH	1 µL	70 mm	0.70	3
HA-88400	7002 KH	2 µL	70 mm	0.50	3
HA-88500	7102 KH	2 µL	70 mm	0.63	3
HA-88000	7105 KH	5 µL	70 mm	0.56	3

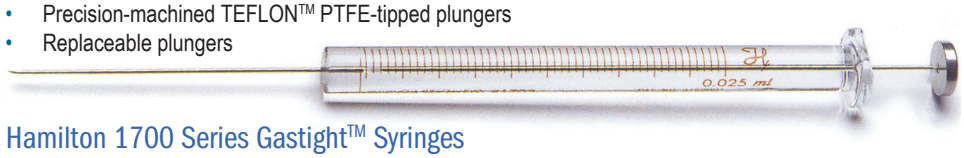
1) Needle lenght is 100 mm

Hamilton™ Syringes

1700 Series GASTIGHT™ Syringes

10 µL - 500 µL

- For use with gases and liquids
- Precision-machined TEFLON™ PTFE-tipped plungers
- Replaceable plungers



N (Cemented Needle)

RN (Removable Needle)

Hamilton 1700 Series Gastight™ Syringes

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-80000	1701 N	10 µL	51 mm	26s	2
HA-80200	1702 N	25 µL	51 mm	22s	2
HA-80900	1705 N	50 µL	51 mm	22s	2
HA-81000	1710 N	100 µL	51 mm	22s	2
HA-81100	1725 N	250 µL	51 mm	22s	2
HA-81217	1750 N	500 µL	51 mm	22	2
HA-80030	1701 RN	10 µL	51 mm	26s	2
HA-80230	1702 RN	25 µL	51 mm	22s	2
HA-80930	1705 RN	50 µL	51 mm	22s	2
HA-81030	1710 RN	100 µL	51 mm	22s	2
HA-81130	1725 RN	250 µL	51 mm	22s	2
HA-81230	1750 RN	500 µL	51 mm	22	2

1000 Series GASTIGHT™ Syringes

1 mL - 100 mL

- For use with gases and lliquids
- Precision-machined TEFLON™ PTFE-tipped plungers
- Replaceable plungers

LTN (Cemented Needle)

RN (Removable Needle)

TLL (TEFLON® Luer Lock w/o slots)

TLL (with slots)

Hamilton 1000 Series Gastight™ Syringes

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style
HA-81317	1001 LTN	1 mL	51 mm	22	2
HA-81330	1001 RN	1 mL	51 mm	22	2
HA-81430	1002 RN	2.5 mL	51 mm	22	2
HA-81530	1005 RN	5 mL	51 mm	22	2
HA-81630	1010 RN	10 mL	51 mm	22	2
HA-81320	1001 TLL w/o slots	1 mL			Needle not Included
HA-81420	1002 TLL w/o slots	2.5 mL			Needle not included
HA-81520	1005 TLL w/o slots	5 mL			Needle not included
HA-81620	1010 TLL w/o slots	10 mL			Needle not included
HA-82520 [1]	1025 TLL w/o slots	25 mL			Needle not included
HA-85020 [1]	1050 TLL w/o slots	50 mL			Needle not included
HA-86020	1100 TLL w/o slots	100 mL			Needle not included
HA-81327	1001 TLL with slots	1 mL			Needle not included
HA-81427	1002 TLL with slots	2.5 mL			Needle not included
HA-81527	1005 TLL with slots	5 mL			Needle not included
HA-81627	1010 TLL with slots	10 mL			Needle not included
HA-82527 [1]	1025 TLL with slots	25 mL			Needle not included
HA-85027 [1]	1050 TLL with slots	50 mL			Needle not included

1) TLL male luer fitting is made of Kel-F ® (CTFE) material instead of TEFLON ® PTFE

HPLC Manual Injection Syringes

Hamilton RNR Microliter™ Serie 600 for Rheodyne Injection Valves

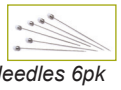
Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style	Repl. Needles pK/6
HA-87942	62 RNR	2.5 µL	51 mm	22s	3	**HA-7770-01**
HA-87943	65 RNR	5 µL	51 mm	22s	3	**HA-7770-01**

Hamilton NR Microliter™ Serie 700 for Rheodyne Injection Valves

NR (Cemented Needle)

RNR (Removable Needle)

RNCP (GASTIGHT ®)



Needles 6pk

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style	Repl. Needles pK/6
HA-80365	701 NR	10 µL	51 mm	22s	3	**HA-7770-01**
HA-80465	702 NR	25 µL	51 mm	22s	3	**HA-7770-01**
HA-80565	705 NR	50 µL	51 mm	22s	3	**HA-7770-01**
HA-80665	710 NR	100 µL	51 mm	22s	3	**HA-7770-01**
HA-80765	725 NR	250 µL	51 mm	22	3	**HA-7780-04**
HA-80865	750 NR	500 µL	51 mm	22	3	**HA-7780-04**

Hamilton N/RNR Microliter™ Serie 1.700 for Rheodyne Injection Valves

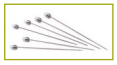
Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style	Repl. Needles pK/6
HA-80275	1702 NR	25 µL	51 mm	22s	3	---
HA-80975	1705 NR	50 µL	51 mm	22s	3	---
HA-81075	1710 NR	100 µL	51 mm	22s	3	---
HA-81175	1725 NR	250 µL	51 mm	22	3	---
HA-81216	1750 NR	500 µL	51 mm	22	3	---
HA-80065	1701 RNR	10 mL	51 mm	22s	3	**HA-7770-01**
HA-80265	1702 RNR	25 mL	51 mm	22s	3	**HA-7770-01**
HA-80965	1705 RNR	50 mL	51 mm	22s	3	**HA-7770-01**
HA-81065	1710 RNR	100 µL	51 mm	22s	3	**HA-7770-01**
HA-81165	1725 RNR	250 µL	51 mm	22	3	**HA-7780-04**
HA-81265	1750 RNR	500 µL	51 mm	22	3	**HA-7780-04**
HA-81365	1001 RNR	1 mL	51 mm	22	3	**HA-7780-04**

Hamilton RNCP Gastight™ Serie 1.700 and 1.000 only for Valco VSF-1 Injection Valves

Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style	Repl. Needles pK/6
HA-80231	1702 RNCP	25 µL	19 mm	22s	3	**HA-7787-01**
HA-80931	1705 RNCP	50 µL	19 mm	22s	3	**HA-7787-01**
HA-81031	1710 RNCP	100 µL	19 mm	22s	3	**HA-7787-01**
HA-81131	1725 RNCP	250 µL	19 mm	22s	3	---
HA-81231	1750 RNCP	500 µL	19 mm	22	3	**HA-7787-02**
HA-81331	1001 RNCP	1 mL	19 mm	22	3	**HA-7787-02**
HA-81431	1002 RNCP	2.5 mL	19 mm	22	3	**HA-7787-02**
HA-81531	1005 RNCP	5 mL	19 mm	22	3	**HA-7787-02**
HA-81631	1010 RNCP	10 mL	19 mm	22	3	**HA-7787-02**

HPLC Manual Injection Syringes

RNW (Removable Needle)



Needles 6pk

RNW Microliter™ Series 800, 1.700 and 1.800 for Waters™ U6K Injection Valve

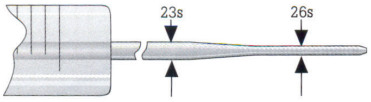
Cat.No	Model	Volume	Needle Length	Needle Gauge	Point Style	Repl. Needles pK/6
HA-84815	801 RNW	10 µL	50 mm	25s	3	**HA-8647-01**
HA-84816	802 RNW	25 µL	50 mm	25s	3	**HA-8647-01**
HA-84817	805 RNW	50 µL	50 mm	25s	3	**HA-8647-01**
HA-84818	810 RNW	100 µL	50 mm	25s	3	**HA-8647-01**
HA-84819	825 RNW	250 µL	50 mm	25s	3	**HA-8648-01**
HA-80038	1701 RNW	10 mL	50 mm	25s	3	**HA-8647-01**
HA-80238	1702 RNW	25 mL	50 mm	25s	3	**HA-8647-01**
HA-80938	1705 RNW	50 mL	50 mm	25s	3	**HA-8647-01**
HA-81038	1710 RNW	100 mL	50 mm	25s	3	**HA-8647-01**
HA-81138	1725 RNW	250 mL	50 mm	25s	3	**HA-8648-01**
HA-84977	1801 RNW	10 mL	50 mm	25s	3	**HA-8647-01**
HA-84980	1802 RNW	25 mL	50 mm	25s	3	**HA-8647-01**
HA-84983	1805 RNW	50 mL	50 mm	25s	3	**HA-8647-01**
HA-84986	1810 RNW	100 mL	50 mm	25s	3	**HA-8647-01**
HA-84989	1825 RNW	250 mL	50 mm	25s	3	**HA-8648-01**

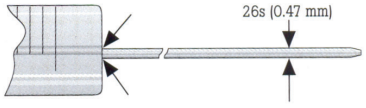
Syringe for Waters™ Pumps

Cat.No	Model	Volume	Use
HA-81610	1010 W	10 µL	Manual Priming Syringe for Waters Pumps

GC Autosampler Syringes

Syringes for Agilent GC Autosamplers





23s-26s Dual Gauge Tapered Needle

- Most popular needle
- Split/splitless or on-column injections
- Versatility without sacrificing durability

23s Gauge Needle

- Most durable needle
- Merlin Microseal™ and standard septum injections
- Packed column injections
- Split/splitless injections

26s Gauge Needle

- Fine Gauge offers versatility
- On-column injections
- Split/splitless injections

Syringes for Agilent GC Autosamplers 7683, 7673 ALS

Cat.No	Volume	Syringe Type	Termination	Gauge	Point style
HA-80000	10 µL	Gastight	N	26s	2
HA-80011	10 µL	Gastight	RN	26s	2
HA-80300	10 µL	Microliter	N	26s	2
HA-80338	10 µL	Microliter	RN	26s	2
HA-87900	5 µL	Microliter	N	26s	2

Syringes for Agilent 7693A, 7673, 7683, and 6850 ALS

Cat.No	Volume	Syringe Type	Termination	Gauge	Point style
HA-86274	0,5 µL	Microliter	Special	26s	AS
HA-86276	0,5 µL	Microliter	Special	23s	AS
HA-80175	1 µL	Microliter	Special	26s	AS
HA-80176	1 µL	Microliter	Special	23s	AS
HA-87957	5 µL	Microliter	RN	23s	AS
HA-87958	5 µL	Microliter	RN	26s	AS
HA-87959	5 µL	Microliter	RN	23s-26s	AS
HA-87987	5 µL	Microliter	N	23s	AS
HA-87988	5 µL	Microliter	N	26s	AS
HA-87991	5 µL	Microliter	N	23s	2
HA-87992	5 µL	Microliter	N	26s	2
HA-87993	5 µL	Microliter	N	23s-26s	AS
HA-80079	10 µL	Gastight	N	23s-26s	AS
HA-80080	10 µL	Gastight	N	23s	AS
HA-80087	10 µL	Gastight	RN	23s	AS
HA-80088	10 µL	Gastight	RN	26s	AS
HA-80089	10 µL	Gastight	RN	23s-26s	AS
HA-80357	10 µL	Microliter	RN	23s	AS
HA-80358	10 µL	Microliter	RN	26s	AS
HA-80359	10 µL	Microliter	RN	23s-26s	AS
HA-80387	10 µL	Microliter	N	23s	AS
HA-80388	10 µL	Microliter	N	26s	AS
HA-80393	10 µL	Microliter	N	23s-26s	AS
HA-80398	10 µL	Microliter	N	23s	2
HA-80399	10 µL	Microliter	N	26s	2

GC Autosampler Syringes

Equivalent Guide Table for Agilent Autosampler 6850 ALS for equipments series 6890 and 6850

Syringes	Volume	G/L/PST/	Ref. Agilent	Ref. Hamilton	Ref. SGE
Syringe	5 µL	23/32/HP	9301-0892	**HA-87987**	001810
Syringe	5 µL	23-26s/42/HP	5182-0835	**HA-87959**	001825
Syringe	10 µL	26s/42/HP	9301-0714	**HA-80388**	002800
Syringe	10 µL	23-26s/42/HP	5181-1267	**HA-80393**	002821
Syringe	10 µL	23-26s/42/HP	5181-3321	**HA-80359**	002825
Syringe	10 µL	23/42/HP	5181-8806	**HA-80357**	002815
Syringe	5 µL	26s/42/HP	9301-0891	**HA-87988**	001800
Syringe	5 µL	23/42/HP	5182-0834	**HA-87957**	001815
Syringe	5 µL	23-26s/42/HP	5181-1273	**HA-87993**	001821
Syringe, PTFE-tipped plunger	10 µL	23-26s/42/HP	5181-3354	**HA-80079**	002826
Syringe, On-column (barrel only)	5 µL		5182-0836	**HA-7634-01**	
Syringe, PTFE-tipped plunger	100 µL	23-26s/42/HP	5183-2042		005668
Syringe, PTFE-tipped plunger	10 µL	23/42/HP	5181-8809	**HA-80080**	002812
Syringe, PTFE-tipped plunger	10 µL	23/42/HP	5181-8613	**HA-80087**	002818
Syringe, PTFE-tipped plunger	10 µL	23-26s/42/HP	5181-3356	**HA-80089**	002829
Syringe, PTFE-tipped plunger	25 µL	23/42/HP	5183-0316		
Syringe, PTFE-tipped plunger	50 µL	23-26s/42/HP	5183-0314		004668
Syringe, PTFE-tipped plunger	100 µL	23/42/HP	5183-2058		
Syringe, PTFE-tipped plunger	50 µL	23/42/HP	5183-0318		
Syringe, PTFE-tipped plunger, 6/pk	10 µL	23-26s/42/HP	5181-3361	**HA-90096**	00286
Syringe, standard plunger	10 µL	23/42/HP	9301-0713	**HA-80387**	002810
1000 µL Replacement Syringe, for G2250A		G2250-24500			
100 µL Replacement Syringe, for G2250A		G2250-24501			

Bruker Varian 8100 and 8200 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202903 (pk/6)	-	-	-	RN	(26s/57/5)
HA-202880	10 µL	Microliter	700	RN	(26s/57/5)

Chrompack CP-8400 CP-8410 CP-9010 and CP-9050 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-80300	10 µL	Microliter	701	N	(26s/51/2)
HA-80330	10 µL	Microliter	701	RN	(26s/51/2)
HA-80339	10 µL	Microliter	701	N	(26s/51/5)
HA-80342	10 µL	Microliter	701	N	(23s/51/AS)

Bruker Varian CP-9020 and CP-9025 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202660	2,5 µL	Gastight	1002	LTN	(22/56/5)

Shimadzu AOC-5000 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-203082	1 mL	Gastight	1001	LTN	(23/5)
HA-203141	1 mL	Gastight	1001	LTN	(26/5)
HA-209681	1 mL	Gastight, Headspace	1001	Glue-Free (GF)	(23/5)
HA-209682	1 mL	Gastight, Headspace	1001	Glue-Free (GF)	(26/5)
HA-203084	2.5 mL	Gastight	1002	LTN	(23/5)
HA-203181	2.5 mL	Gastight	1002	LTN	(26/5)
HA-209683	2.5 mL	Gastight, Headspace	1002	GF	(23/5)
HA-209684	2.5 mL	Gastight, Headspace	1002	GF	(26/5)
HA-203086	5 mL	Gastight	1005	LTN	(23/5)
HA-203182	5 mL	Gastight	1005	LTN	(26/5)
HA-209685	5 mL	Gastight	1005	GF	(23/5)
HA-209686	5 mL	Gastight	1005	GF	(26/5)

Shimadzu AOC-14 AOC-17 and AOC-20 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202630	5 µL	Microliter	75	RN	(22s/43/2)
HA-93898-01	10 µL	Microliter	701	N	(23/43/AS)
HA-202640	10 µL	Microliter	701	RN	(22s/43/2)
HA-202643	10 µL	Microliter	701	N	(23/43/AS)

Shimadzu AOC-9 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-87930	5 µL	Microliter	75	RN	(26s/51/2)
HA-80330	10 µL	Microliter	701	RN	(26s/51/2)

GC Autosampler Syringes

Syringes for ThermoFinnigan GC Autosamplers

HS 250, HS 500, and HS 850 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202660	2.5 mL	Gastight	1002	LTN	(22/56/5)

AS 800 and AS 2000 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-80318	10 µL	Microliter	701	N	(26s/80/AS)

AI 3000 and AS 3000 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-204000	5 µL	Microliter	75	N	(26s/50/2)
HA-204051	5 µL	Microliter	75	N	(26s/50/AS)
HA-204001	10 µL	Microliter	701	N	(26s/50/2)
HA-204052	10 µL	Microliter	701	N	(26s/50/AS)

Syringes for CTC Combi PAL and GC PAL GC Autosamplers

GC S-Line Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-67436-01	5 µL	Microliter	75	N	(26s/51/AS)
HA-67438-01	10 µL	Microliter	701	N	(26s/51/AS)
HA-67440-01	10 µL	Microliter	701	N	(23s/51/AS)
HA-67454-01	10 µL	Microliter	1701	N	(23s/51/AS)
HA-67430-01	25 µL	Gastight	1702	N	(23s/51/AS)
HA-67434-01	100 µL	Gastight	1710	N	(23s/51/AS)

GC C-Line Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-203185	1.2 µL	Microliter	7701.2	KN	(26/51/AS)
HA-203189	5 µL	Microliter	7701.2	FN	(26s/51/AS)
HA-203189	5 µL	Microliter	7701.2	SFN	(C/51/C)
HA-200740	10 µL	Microliter	701	N	(32/85/45°)
HA-200742	10 µL	Microliter	701	N	(32/85/45°)
HA-203072	10 µL	Microliter	701	FN	(26s/51/2)
HA-203198	10 µL	Microliter	701	SFN	(C/51/C)
HA-203205	10 µL	Microliter	701	FN	(26s/51/AS)
HA-203206	10 µL	Gastight	701	FN	(C/51/C)
HA-203361	10 µL	Microliter	701	FN	(23s/51/AS)
HA-203362	10 µL	Microliter	701	FN	(23-26s/51/AS)
HA-203363	10 µL	Microliter	701	FN	(23s/51/2)
HA-203043*	25 µL	Gastight	1702 (7.9mm)	FN	(26s/51/AS)
HA-203074	25 µL	Gastight	1702	FN	(26s/51/AS)
HA-203209	25 µL	Gastight	1702	SFN	(C/51/C)
HA-203076	100 µL	Gastight	1710	FN	(26s/51/AS)
HA-203226	100 µL	Gastight	1710	SFN	(C/51/C)
HA-203078	250 µL	Gastight	1725	FN	(26/51/AS)
HA-203219	250 µL	Gastight	1725	SFN	(C/51/C)
HA-203080	500 µL	Gastight	1725	FN	(26/51/AS)
HA-203225	500 µL	Gastight	1750	SFN	(C/51/C)

CTC LEAP CombiPAL HDHT Headspace Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-209681	1 mL	Gastight, Headspace	1001	GF	(23/51/5)
HA-209682	1 mL	Gastight, Headspace	1001	GF	(26/51/5)
HA-209683	2.5 mL	Gastight, Headspace	1001	GF	(23/51/5)
HA-209684	2.5 mL	Gastight, Headspace	1001	GF	(26/51/5)
HA-209685	5 mL	Gastight, Headspace	1005	GF	(23/51/5)
HA-209686	5 mL	Gastight, Headspace	1005	GF	(26/51/5)

CTC LEAP CombiPAL HD Headspace Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-203082	1 mL	Gastight	1001	LTN	(23/51/5)
HA-203141	1 mL	Gastight	1001	LTN	(26/51/5)
HA-203141	2.5 mL	Gastight	1002	LTN	(23/51/5)
HA-203181	2.5 mL	Gastight	1002	LTN	(26/51/5)
HA-203086	5 mL	Gastight	1005	LTN	(23/51/5)
HA-203086	5 mL	Gastight	1005	LTN	(26/51/5)

Perkin Elmer GC Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-88040	5 µL	Microliter	75	N	(26/70/3)
HA-88035	5 µL	Microliter	75	N	(23/70/3)

HPLC Autosampler Syringes

Agilent 1090A Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-80230	25 µL	Gastight	1700	RN	(22s/51/2)
HA-81130	250 µL	Gastight	1725	RN	(22s/51/2)

Agilent 1290 Infinity LC Injector HTC HTS Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-67444-01	10 µL	Gastight	1701	N	(22s/51/3)
HA-203073	10 µL	Microliter	701	FN	(22s/51/3)
HA-203194	10 µL	Gastight	1701	FN	(22s/51/3)
HA-67446-01	25 µL	Gastight	1702	N	(22s/51/3)
HA-203075	25 µL	Gastight	1702 (7.9 mm)	FN (no Glue)	(22s/51/3)
HA-203274	25 µL	Gastight	1702 (6.6 mm)	FN	(22s/51/3)
HA-204475	25 µL	Gastight	1702 (7.9 mm)	FN (no Glue)	(22s/51/3)
HA-67450-01	50 µL	Gastight	1705	N	(22s/51/3)
HA-204379	50 µL	Gastight	1705	FN	(22s/51/3)
HA-67452-01	100 µL	Gastight	1710 (6.6 mm)	N	(22s/51/3)
HA-202668	100 µL	Gastight	1710	RN	NN
HA-203077	100 µL	Gastight	1710	FN (no Glue)	(22s/51/3)
HA-203235	100 µL	Gastight	1710	FN	(22/51/3)
HA-204400	100 µL	Gastight	1710	FN (no Glue)	(22/51/3)
HA-204452	100 µL	Gastight	1710	FN (no Glue)	(22s/51/3)
HA-67442-01	250 µL	Gastight	1725	N	(22/51/3)
HA-203079	250 µL	Gastight	1725	FN	(22/51/3)
HA-67448-01	500 µL	Gastight	1750	N	(22/51/3)
HA-203349	500 µL	Gastight	1750	FN	(22/51/3)
HA-203081	1 mL	Gastight	1001	LTN	(22/51/3)
HA-203083	2.5 mL	Gastight	1002	LTN	(22/51/3)
HA-203085	5 mL	Gastight	1002	LTN	(22/51/3)

Agilent ProStar 410 Autosampler Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN

CTC/LEAP PAL HPLC Autosampler Syringes

CTC LEAP A200S Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-203560	10 µL	Gastight	1701	N	(22s/51/3)
HA-203566	100 µL	Gastight	1710	N	(22s/51/3)

PAL LC HTC, HTS, and HTX Autosamplers: S-Line Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-67444-01	10 µL	Gastight	1701	N	(22s/51/3)
HA-67446-01	25 µL	Gastight	1702	N	(22s/51/3)
HA-67450-01	50 µL	Gastight	1705	N	(22/51/3)
HA-67452-01	100 µL	Gastight	1705	N	(22s/51/3)
HA-67442-01	250 µL	Gastight	1705	N	(22/51/3)
HA-67448-01	500 µL	Gastight	1750	N	(22/51/3)

PAL LC HTC, HTS, and HTX Autosamplers: C-Line Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-203073	10 µL	Microliter	701	FN	(22s/51/3)
HA-203194	10 µL	Gastight	1701	FN (no Glue)	(22s/51/3)
HA-203075	25 µL	Gastight	1702	FN (no Glue)	(22s/51/3)
HA-203274	25 µL	Gastight	1702	N	(22s/51/3)
HA-202668	100 µL	Gastight	1710	RN	NN
HA-203077	100 µL	Gastight	1710	FN (no Glue)	(22s/51/3)
HA-203235	100 µL	Gastight	1710	N	(22/51/3)
HA-203079	250 µL	Gastight	1725	FN (no Glue)	(22/51/3)
HA-203349	500 µL	Gastight	1750	FN (no Glue)	(22/51/3)
HA-203081	1 mL	Gastight	1001	N	(22/51/3)
HA-203083	2.5 mL	Gastight	1002	N	(22/51/3)
HA-203085	5 mL	Gastight	1005	N	(22/51/3)

PAL LC HTC, HTS, and HTX Autosamplers: X-Type Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-204475	25 µL	Gastight	1702	FN (no Glue)	(22s/51/3)
HA-204379	50 µL	Gastight	1705	FN (no Glue)	(22s/51/3)
HA-204400	100 µL	Gastight	1710	FN (no Glue)	(22/51/3)
HA-204452	100 µL	Gastight	1710	FN (no Glue)	(22s/51/3)

Syringes for Spark Holland HPLC Autosamplers

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Shimadzu HPLC Autosamplers

Shimadzu SIL-6A Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-7656-01	100 µL	Gastight	1710	RN	NN

HPLC Autosampler Syringes

Shimadzu SIL 10-AF and SIL 10-AP Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-81260	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-81460	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Antec HPLC Autosamplers

AS 100 Syringes & AS 110 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Spectra Physics ThermoFinnigan HPLC Autosamplers

ThermoFinnigan SP8780, SP8875, and SP8880 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202192	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-81460	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

ThermoFinnigan AS100, AS1000, AS3000, and AS3500 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-202145	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-202192	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-81360	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-81460	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Beckman Coulter HPLC Autosamplers

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Hitachi HPLC Autosamplers

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-0160310	500 µL	Gastight	1750	Special	NN

Syringes for Waters HPLC Autosamplers

Waters 2777 Sample Manager

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-67444-01	10 µL	Gastight	1701	N	(22s/51/3)
HA-203073	10 µL	Microliter	701	FN	(22s/51/3)
HA-203194	10 µL	Gastight	1701	FN	(22s/51/3)
HA-67446-01	25 µL	Gastight	1702	N	(22s/51/3)
HA-203075	25 µL	Gastight	1702	FN	(22s/51/3)
HA-203274	25 µL	Gastight	1702	FN	(22s/51/3)
HA-204475	25 µL	Gastight	1702	FN (no Glue)	(22s/51/3)
HA-67450-01	50 µL	Gastight	1705	N	(22/51/3)
HA-204379	50 µL	Gastight	1705	FN	(22s/51/3)
HA-67452-01	100 µL	Gastight	1710	N	(22s/51/3)
HA-202668	100 µL	Gastight	1710	RN	NN
HA-203077	100 µL	Gastight	1710	FN	(22s/51/3)
HA-203235	100 µL	Gastight	1710	FN	(22/51/3)
HA-204400	100 µL	Gastight	1710	FN (no Glue)	(22/51/3)
HA-204452	100 µL	Gastight	1710	FN (no Glue)	(22s/51/3)
HA-67442-01	250 µL	Gastight	1725	N	(22/51/3)
HA-203079	250 µL	Gastight	1725	FN	(22/51/3)
HA-67448-01	500 µL	Gastight	1750	N	(22/51/3)
HA-203349	500 µL	Gastight	1750	FN	(22/51/3)
HA-203081	1 mL	Gastight	1001	LTN	(22/51/3)
HA-203083	2.5 mL	Gastight	1002	LTN	(22/51/3)
HA-203085	5 mL	Gastight	1005	LTN	(22/51/3)

Waters 2707 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702SH	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Waters 717 plus and WISP Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-80020	25 µL	Gastight	1702CX	ChemSeal (C, 1/4"-28)	NN
HA-80024	250 µL	Gastight	1725CX	ChemSeal (C, 1/4"-28)	NN

HPLC Autosampler Syringes

Syringes for Dionex HPLC Autosamplers

UltiMate 3000 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-67444-01	10 µL	Gastight	1701	N	(22s/51/3)
HA-203073	10 µL	Microliter	701	FN	(22s/51/3)
HA-203194	10 µL	Gastight	1701	FN	(22s/51/3)
HA-67446-01	25 µL	Gastight	1702	N	(22s/51/3)
HA-203075	25 µL	Gastight	1702	FN	(22s/51/3)
HA-203274	25 µL	Gastight	1702	FN	(22s/51/3)
HA-204475	25 µL	Gastight	1702	FN (no Glue)	(22s/51/3)
HA-67450-01	50 µL	Gastight	1705	N	(22/51/3)
HA-204379	50 µL	Gastight	1705	FN	(22s/51/3)
HA-67452-01	100 µL	Gastight	1710	N	(22s/51/3)
HA-202668	100 µL	Gastight	1710	RN	NN
HA-203077	100 µL	Gastight	1710	FN	(22s/51/3)
HA-203235	100 µL	Gastight	1710	FN	(22/51/3)
HA-204400	100 µL	Gastight	1710	FN	(22/51/3)
HA-204452	100 µL	Gastight	1710	FN	(22s/51/3)
HA-67442-01	250 µL	Gastight	1725	N	(22/51/3)
HA-203079	250 µL	Gastight	1725	FN (no Glue)	(22/51/3)
HA-67448-01	500 µL	Gastight	1750	N	(22/51/3)
HA-203349	500 µL	Gastight	1750	FN	(22/51/3)
HA-203081	1 mL	Gastight	1001	LTN	(22/51/3)
HA-203083	2.5 mL	Gastight	1002	LTN	(22/51/3)
HA-203085	5 mL	Gastight	1005	LTN	(22/51/3)

Dionex Gina ASI 100 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-7654-01	25 µL	Gastight	1702	RN	NN
HA-7657-01	250 µL	Gastight	1725	RN	NN

ESA Model 542, 540 & ESA Model 540 MT Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1701	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

HPLC Autosampler Syringes

Syringes for Bruker Varian HPLC Autosamplers

ProStar 410, 420, 430 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1701	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Varian 9100 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-0159902	100 µL	Gastight	1710	ChemSeal (C, 1/4"-28)	NN

Syringes for Grace Alltech HPLC Autosamplers

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1701	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringes for Kontron HPLC Autosamplers

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-201050	100 µL	Gastight	1710	AccuDil® (AD)	NN

Syringes for Perkin Elmer HPLC Autosamplers

Series 225, Flexar FX 10 & FX 15 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-62161-01	25 µL	Gastight	1702	ChemSeal (C, 1/4"-28)	NN
HA-54658-01	100 µL	Gastight	1701	ChemSeal (C, 1/4"-28)	NN
HA-54659-01	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-54660-01	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-54661-01	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-54662-01	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Series 200 Syringes

Cat.No	Volume	Syringe Type	Syringe Series	Termination	Needle
HA-80962	50 µL	Gastight	1705	ChemSeal (C, 1/4"-28)	NN
HA-81162	250 µL	Gastight	1725	ChemSeal (C, 1/4"-28)	NN
HA-81262	500 µL	Gastight	1750	ChemSeal (C, 1/4"-28)	NN
HA-81360	1 mL	Gastight	1001	ChemSeal (C, 1/4"-28)	NN
HA-81460	2.5 mL	Gastight	1002	ChemSeal (C, 1/4"-28)	NN

Syringe Needles

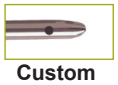
Removable Needles

- Convenient SIX PACKS
- For use with RN-style syringes and connectors
- 304 stainless steel (sst.) needle
- Standard needle lenght: 51 mm

Small Gauge Needles
27 - 33

Small Gauge Needles (27-33) for 2.5 - 100 µL Syringes

All needles sold in 6 packs.

Gauge	 Point Style 2	 Point Style 3	 Point Style 5	 Custom Needles [1]	Custom [2] Point Styles 2, 3, 4, AS
33	-	**HA-7762-06**	-	-	**HA-2074-30**
32	-	**HA-7762-05**	-	-	**HA-7803-04**
31	-	**HA-7762-04**	-	-	**HA-7803-03**
30	-	**HA-7762-03**	-	-	**HA-7803-07**
28	-	**HA-7762-02**	-	-	**HA-7803-02**
27	-	**HA-7762-01**	-	-	**HA-7803-01**

Large Gauge Needles
26s - 22

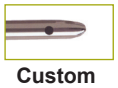
Large Gauge Needles (26s-22) for 2.5 - 100 µL Syringes

All needles sold in 6 packs.

Gauge	 Point Style 2	 Point Style 3	 Point Style 5	 Custom Needles [1]	Custom [2] Point Styles 2, 3, 4, AS
26s	**HA-7758-02**	**HA-7768-01**	**HA-7784-07**	**HA-7731-02**	**HA-7804-04**
26	**HA-7758-04**	**HA-7768-02**	**HA-7784-08**	**HA-7731-01**	**HA-7804-03**
22s	**HA-7758-03**	**HA-7770-01**	**HA-7784-05**	**HA-7731-04**	**HA-7804-02**
22	**HA-7758-01**	**HA-7770-02**	**HA-7784-06**	**HA-7731-03**	**HA-7804-01**

Large Gauge Needles (26s-22) for 250 µL - 10 mL Syringes

All needles sold in 6 packs.

Gauge	 Point Style 2	 Point Style 3	 Point Style 5	 Custom Needles [1]	Custom [2] Point Styles 2, 3, 4, AS
26s	**HA-7779-02**	**HA-7780-01**	**HA-7784-03**	**HA-7732-04**	**HA-7806-04**
26	**HA-7779-04**	**HA-7780-02**	**HA-7784-04**	**HA-7732-03**	**HA-7806-03**
22s	**HA-7779-03**	**HA-7780-03**	**HA-7784-01**	**HA-7732-02**	**HA-7806-02**
22	**HA-7779-01**	**HA-7780-04**	**HA-7784-02**	**HA-7732-01**	**HA-7806-01**

1) Please specify lenght, and wether electro-tapered (Point style 5) or not
2) Please specify lenght, point style, and wether electro-tapered or not

PEEK RN and Kel-F™
Needles

PEEK RN and Kel-F™ Hub Needles

- When contact with stainless steel must be avoided
- Standard 51 mm long needle, O.D. 1.52 mm, I.D. 0.76 mm

Reference	Description	Used with syringe
HA-8650-01	Removable (RN) needle, pk/6	250 µL RN Syringes
HA-8649-01	Kel-F™ (KF) hub needle, pk/6	All LT and TLL Syringes

Hub Needles

- Metal hub (N) or Kel-F™ (KF)needles in convenient SIX PACKS, SST tubing (no hub) IN SINGLE PACKS.
- Metal hub (nickel plated brass) for use with TLL syringes and LT or TLL connectors, Kel-F™ hub for use with LT and TLL syringes and connectors.
- 304 stainless steel (stt.) needle
- Standard needle lenght: 51 mm

Metal Hub Needles

Metal Hub (N)

All needles sold in 6 packs.

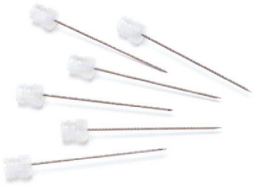
Gauge	Tubing No Hub	Point Style 2	Point Style 3	Point Style 5	Custom Needles [1]	Custom N. [2] Point Styles 2, 3, 4, AS
33	**HA-21033**	**HA-90033**	**HA-91033**	-	-	**HA-7747-01**
32	**HA-21032**	**HA-90032**	-	-	-	-
31	**HA-21031**	**HA-90031**	**HA-91031**	-	-	**HA-7748-17**
30	**HA-21030**	**HA-90030**	**HA-91030**	-	-	**HA-7748-16**
29	**HA-21029**	**HA-90029**	-	-	-	-
28	**HA-21028**	**HA-90028**	**HA-91028**	-	-	**HA-7748-14**
27	**HA-21027**	**HA-90027**	**HA-91027**	-	-	**HA-7748-13**
26s	**HA-21039**	**HA-90039**	**HA-91039**	**HA-7729-01**	**HA-7751-19**	**HA-7748-19**
26	**HA-21026**	**HA-90026**	**HA-91026**	**HA-7729-03**	**HA-7751-17**	**HA-7748-12**
25	**HA-21025**	**HA-90025**	**HA-91025**	**HA-7729-04**	**HA-7751-16**	**HA-7748-11**
24	**HA-21024**	**HA-90024**	**HA-91024**	**HA-7729-05**	**HA-7751-15**	**HA-7748-10**
23	**HA-21023**	**HA-90023**	**HA-91023**	**HA-7729-06**	**HA-7751-14**	**HA-7748-09**
22s	**HA-21038**	**HA-90038**	**HA-91038**	**HA-7729-02**	**HA-7751-18**	**HA-7748-18**
22	**HA-21022**	**HA-90022**	**HA-91022**	**HA-7729-07**	**HA-7751-13**	**HA-7748-08**
21	**HA-21021**	**HA-90021**	**HA-91021**	**HA-7729-08**	**HA-7751-12**	**HA-7748-07**
20	**HA-21020**	**HA-90020**	**HA-91020**	**HA-7729-09**	**HA-7751-11**	**HA-7748-06**
19	**HA-21019**	**HA-90019**	-	-	-	**HA-90319**
18	**HA-21018**	**HA-90018**	**HA-91018**	**HA-7729-10**	**HA-7751-09**	**HA-7748-04**
17	**HA-21017**	**HA-90017**	**HA-91017**	**HA-7729-11**	**HA-7751-08**	**HA-7748-03**
16	**HA-21016**	**HA-90016**	**HA-91016**	**HA-7729-12**	**HA-7751-07**	**HA-7748-02**
15	**HA-21015**	**HA-90015**	-	-	-	**HA-90315**
14	**HA-21014**	**HA-90014**	**HA-91014**	-	-	**HA-7749-05**
13	**HA-21013**	**HA-90013**	**HA-91013**	-	-	**HA-7749-04**
12	**HA-21012**	**HA-90012**	**HA-91012**	-	-	**HA-7749-03**
11	**HA-21011**	**HA-90011**	**HA-91011**	-	-	**HA-7749-02**
10	**HA-21010**	**HA-90010**	**HA-91010**	-	-	**HA-7749-01**

1) Please specify lenght, and wether electro-tapered (Point style 5) or not
2) Please specify lenght, point style, and wether electro-tapered or not

Syringe Needles

Hel-F™ Hub (KF)

All needles sold in 6 packs.



Hel-F™ Hub (KF)

Gauge	 Point Style 2	 Point Style 3	 Point Style 5	 Custom Needles [1]	Custom [2] Needles. 2, 3, 4, AS
31	HA-90131	HA-90531	-	-	HA-7750-22
30	HA-90130	HA-90530	-	-	HA-7750-21
29	HA-90129	-	-	-	-
28	HA-90128	HA-90528	-	-	HA-7750-19
27	HA-90127	HA-90532	-	-	HA-7750-18
26s	HA-90139	HA-90539	HA-7746-12	HA-7752-19	HA-7750-24
26	HA-90126	HA-90533	HA-7746-10	HA-7752-17	HA-7750-17
25	HA-90125	HA-90525	HA-7746-09	HA-7752-16	HA-7750-16
24	HA-90124	HA-90524	HA-7746-08	HA-7752-15	HA-7750-15
23	HA-90123	HA-90523	HA-7746-07	HA-7752-14	HA-7750-14
22s	HA-90138	HA-90534	HA-7746-11	HA-7752-18	HA-7750-23
22	HA-90122	HA-90134	HA-7746-06	HA-7752-13	HA-7750-13
21	HA-90121	HA-90521	HA-7746-05	HA-7752-12	HA-7750-12
20	HA-90120	HA-90520	HA-7746-04	HA-7752-11	HA-7750-11
19	HA-90119	-	-	-	HA-90369
18	HA-90118	HA-90535	HA-7746-03	HA-7752-09	HA-7750-09
17	HA-90117	HA-90517	HA-7746-02	HA-7752-08	HA-7750-08
16	HA-90116	HA-90516	HA-7746-01	HA-7752-07	HA-7750-07
15	HA-90115	-	-	-	-
14	HA-90114	-	-	HA-7752-05	HA-7750-05
13	HA-90113	-	-	HA-7752-04	HA-7750-04
12	HA-90112	-	-	HA-7752-03	HA-7750-03
11	HA-90111	-	-	HA-7752-02	HA-7750-02
10	HA-90110	-	-	HA-7752-01	HA-7750-01

1) Please specify lenght, and wether electro-tapered (Point style 5) or not
2) Please specify lenght, point style, and wether electro-tapered or not

Needle Gauge Index

Gauge	I.D. (mm)	I.D Tolerance (mm)	O.D. (mm)	O.D. Tolerance (mm)	Wall Thickness (mm)	Volume (mm)
34	0.06	0.02	0.16	0.01	0.05	0.03
33	0.11	0.02	0.21	0.01	0.05	0.10
32	0.11	0.02	0.24	0.01	0.07	0.10
31	0.13	0.02	0.26	0.01	0.07	0.13
30	0.16	0.02	0.31	0.01	0.08	0.20
29	0.18	0.02	0.34	0.01	0.08	0.25
28	0.18	0.02	0.36	0.01	0.09	0.25
27	0.21	0.02	0.41	0.01	0.10	0.35
26s	0.13	0.015	0.47	0.01	0.17	0.13
26	0.26	0.02	0.46	0.01	0.10	0.53
25s	0.15	0.015	0.52	0.01	0.19	0.18
25	0.26	0.02	0.52	0.01	0.13	0.53
24	0.31	0.02	0.57	0.01	0.13	0.75
23s	0.09	0.02	0.64	0.03	0.28	0.06
23	0.34	0.02	0.64	0.01	0.15	0.91
22s	0.15	0.015	0.72	0.01	0.29	0.18
22	0.41	0.02	0.72	0.01	0.16	1.32
21	0.51	0.02	0.83	0.01	0.16	2.04
20	0.60	0.02	0.91	0.01	0.16	2.83
19	0.69	0.04	1.17	0.015	0.19	3.74
18	0.84	0.04	1.27	0.015	0.22	5.54
17	1.07	0.04	1.47	0.015	0.20	8.99
16	1.19	0.04	1.65	0.015	0.23	11.12
15	1.37	0.04	1.83	0.015	0.23	14.74
14	1.60	0.05	2.11	0.025	0.26	20.11
13	1.80	0.05	2.41	0.025	0.31	5.45
12	2.16	0.05	2.77	0.025	0.31	36.64
11	2.39	0.05	3.05	0.025	0.33	44.86
10	2.69	0.05	3.40	0.025	0.36	56.83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Index Filters & Extraction

Filters & Extraction

Certified Olimpeak™ Syringe Filters

OlimPeak®
Certified Filters by Teknokroma

Introduction

Filtering samples prior to injection will prolong column, frits and valves life, and reduce down time due to less instrument maintenance.

The quality of the filtrate from any sample is dependent on a number of variables, such as, the membrane, the membrane support(if used), the resin used to mold the filter housing, and last but not least, the analyst.
In any laboratory filtration where the purity of the filtrate is important, the analyst must remember three very important words, slower is better. Filtration improves when the sample passes through the filter slowly. Attention should be payed when using a high volume syringe (more than 10 ml), in order to avoid the maximum operating presure.

Integrity of the Membrane

The best method to guarantee the integrity of the membrane is the control of the bubble point.
The bubble point is the minimum pressure required to create a steady flow of bubbles from a fully wetted membrane (water for hydrophilic materials and alcohols for hydrophobics). Microporous membranes in contact with the wetting liquid, fill their pores following principles associated with the capillary forces. To vent the filled pores requires a differential pressure to be applied across them.

Principal factors affecting bubble point test are: surface tension of the liquid, surface free energy of the membrane, size of pores, temperature and wetting procedure.

In a simplified math-form, the required pressure to vent a liquid filled pore **P**, has a inverse relationship to the pore diameter, **d** as described by this bubble point equation:

$$P = \frac{K4\sigma \cos\theta}{d}$$

P: Bubble point pressure
σ: Surface tension of wetting fluid
θ: Contact angle of liquid-solid
K: Pore shape factor constant (since pores are not simple cylinders in the real filter membranes).
d: pore diameter.

Syringe Filter Membrane Compatibility Chart

Use this information to determine the ability of a specific syringe filter membrane to whistand exposure to solvent.
All concentrations are 100% unless noted.

Chemical	Nylon	PTFE PTFEH	PVDF	PES	CA	RC	PP	GMF
ACIDS								
Acetic, Glacial	LC	C	C	C	IC	C	C	C
Acetic, 25%	C	C	C	C	CA	C	C	C
Hydrochloric, Concentrated	IC	C	C	C	IC	IC	C	C
Hydrochloric, 25%	IC	C	C	C	IC	IC	C	C
Sulfuric, Concentrated	IC	C	IC	IC	IC	IC	C	C
Sulfuric, 25%	IC	C	C	C	IC	IC	C	LC
Nitric, Concentrated	IC	C	C	IC	IC	IC	C	LC
Nitric, 25%	IC	C	C	C	IC	IC	C	LC
Phosphoric, 25%	IC	C	ND	ND	CA	LC	C	C
Formic, 25%	IC	C	ND	ND	LC	C	C	C
Trichloroacetic, 10%	IC	C	ND	ND	CA	C	C	ND
ALCOHOLS								
Methanol, 98%	C	C	C	C	C	C	C	C
Ethanol, 98%	C	C	C	C	C	C	C	C
Ethanol, 70%	LC	C	C	C	C	C	C	C
Isopropanol	C	C	C	C	C	C	C	C
n-Propanol	C	C	C	C	C	C	C	C
Amyl Alcohol (Butanol)	C	C	C	C	C	C	C	C
Benzyl Alcohol	C	C	C	ND	LC	C	C	IC
Ethylene Glycol	C	C	C	C	C	C	C	C
Propylene Glycol	C	C	C	C	LC	C	C	C
Glycerol	C	C	C	C	C	C	C	C
ALKALIES								
Ammonium Hydroxide, 25%	C	C	LC	C	C	LC	C	C
Sodium Hydroxide, 3N	C	C	C	C	IC	LC	C	IC
AMINES AND AMIDES								
Dimethyl Formamide	LC	C	IC	IC	IC	LC	C	C
Diethylacetamide	C	C	ND	ND	IC	C	ND	C
Triethanolamine	C	C	ND	ND	C	C	ND	ND
Aniline	ND	C	ND	ND	IC	C	ND	ND
Pyridine	C	C	IC	IC	IC	C	IC	C
Acetronile	C	C	C	LC	IC	C	C	C
ESTERS								
Ethyl Acetate/Methyl Acetate	C	C	C	IC	IC	C	LC	C
Amyl Acetate/Butyl Acetate	C	C	IC	IC	LC	C	LC	C
Propyl Acetate	C	C	IC	IC	LC	C	LC	ND
Propylene Glycol Acetate	ND	C	ND	IC	IC	C	C	ND
2-Ethoxyethyl Acetate	ND	C	ND	IC	LC	C	ND	ND
Methyl Cellusolve	ND	C	ND	IC	IC	C	C	C

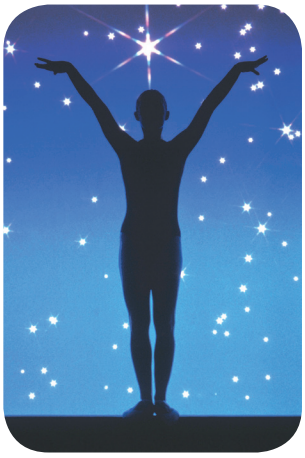
Chemical	Nylon	PTFE PTFEH	PVDF	PES	CA	RC	PP	GMF
Benzyl Benzoate	C	C	ND	IC	C	C	ND	ND
Isoporopyl Muristate	C	C	ND	IC	C	C	ND	ND
Tricresyl Phosphate	ND	C	ND	IC	C	C	ND	ND
HALOGENATED HYDROCARBONS								
Methylene Chloride	LC	C	C	IC	IC	C	LC	C
Chloroform	C	C	C	IC	IC	C	LC	C
Trichloroethylene	C	C	C	IC	C	C	C	C
Chlorobenzene	C	C	C	LC	C	C	C	C
Freon	C	C	C	LC	C	C	C	C
Carbon Tetrachloride	C	C	C	IC	LC	C	LC	C
HYDROCARBONS								
Hexane/Xylene	C	C	C	IC	C	C	IC	C
Toulene/Benzene	C	C	C	IC	C	C	IC	C
Keroesene/Gasoline	C	C	C	LC	C	C	IC	C
Tetralin/Decalin	ND	C	C	ND	C	C	ND	ND
KETONES								
Acetone	C	C	IC	IC	IC	C	C	C
Cyclohexanone	C	C	IC	IC	IC	C	C	C
Methyl Ethyl Ketone	C	C	LC	IC	LC	C	LC	C
Isoporpylacetone	C	C	IC	IC	C	C	ND	C
Methyl Isobutyl Ketone	ND	C	LC	IC	ND	C	LC	C
ORGANIC OXIDES								
Ethyl Ether	C	C	C	C	C	LC	LC	ND
Dioxane	C	C	LC	IC	C	C	C	C
Tetrahydrofuran	C	C	LC	IC	C	C	C	C
Triethanolamine	C	C	ND	C	C	ND	ND	ND
Dimethylsulfoxide (DSMO)	C	C	IC	IC	C	C	C	C
Isopropyl Ether	ND	C	C	C	C	C	C	ND
MISCELANEOUS								
Phenol, Aqueous Sol., 10%	ND	C	LC	IC	IC	IC	C	C
Formaldehyde, Aqueous Sol. 30%	C	C	C	C	C	LC	C	C
Hydrogen Peroxide, 30%	C	C	ND	ND	C	C	ND	ND
Silicone Oil/Mineral Oil	ND	C	C	C	C	C	C	C

Legend

C Compatible
LC Limited Compatibility (membrane may swell and shrink)
IC Incompatible (not recommended)
ND No compatibility data currently available

PTFE Polytetrafluorotehylene (Teflon®)
PTFEH Hydrophilic Polytetrafluorotehylene (Teflon®)
PVDF Polyvinylidene
PES Polyethersulfone
CA Cellulose Acetate
RC Regenerated Cellulose
PP Polypropylene
GMF Glass MicroFiber

Certified Olimpeak™ Syringe Filters



Membrane Selection

To select the right membrane for sample and solvent filtration for chromatography, there are several important considerations:

- The membrane and housing must be highly solvent resistant, since most chromatography solvents are aggresive and sometimes corrosive.
- It should not have extractables because they can interfere with analytical results.
- It should present a low protein binding for biological samples.
- Size and amount of particulates in the sample
- Special considerations if you need pre-filter
- Special membrane for filtration of inorganic ions

Guidelines to choose your syringe filter

Sample matrix with organic or/and water solvents:
You can use: Nylon, Polypropylene, PVDF, PTFE, Hydrophilic PTFE, Regenerated Cellulose

Sample matrix with aqueous solutions:
You can use:
Cellulose Acetate, M.E. Cellulose, PES, Nitrocellulose

Sample matrix with peptides and proteins:
You can use:
Regenerated Cellulose, Acetate Cellulose, Polypropilene, PVDF, PES

Tissue Culture media Filtration:
You can use:
Regenerated Cellulose,Cellulose Acetate, PES, M.E Cellulose

Ion Chromatography Filtration:
You can use:
Certified Polyethersulfone

Samples matrix with excessive amount of particulates:
You can use: Syringe filter with Glass Prefilter.

General Overview

Filter Housing: High density polypropylene (PP) medical grade:
Excellent chemical compatibility with acids, alcohols, bases, ethers, glycols, ketones and oils.
Limited resistence for acids > 1N, ethers, aromatics and halogenated hydrocarbons
Maximum operating temperature 135 ºC

Standard Connections: Female Luer Lock inlet, male Luer slip outlet as a standard in compliance with ISO 594-1

Minitip Connections: Female Luer Lock inlet, male MiniTip oulet

Robotic Connections: Female Luer Lock inlet, male Minispike outlet

Filter type: Non sterile / Sterile

Membranes Selection: PP (Polypropylene), Nylon, PTFE, Hydrophilic PTFE, M.E. Cellulose, Regenerated Cellulose, PVDF, Nitrocellulose, Cellulose Acetate, Polyethersulfone, and Glass Microfiber

Pore size: 0.2 - 0.45 µm for all filters

Pore size: 1, 2 and 5 µm for Glass microfiber

Pore size 0.45 µm: Most of HPLC application.

Pore size 0.20 µm: we use them in 2 cases:
1- In order to eliminate all bacterial contamination.
2- When we use < 5 µm HPLC column.

Max. Operating pressure: 4 mm D 650 KPa, 13 mm D. 650 KPa, 25 mm D 650 KPa and 50 mm D. 650 KPa.

Retention volumes: 4 mm < 10 µL, 13 mm < 100 µL, 25 mmD. < 150 µL and 50 mm D. <500 µL

Sample Volume Size: 4 mm D. <1 mL,13 mm D. 1-10 ml, 25 mm D > 10 ml and 50 mm D. >100 mL

Filtration area: 4 mm D. 0.07 cm2, 13 mm D. 0.95 cm2 and 25 mm D. 3.55 cm2 and 50 mm D. 16.33 cm2

For samples with a high amount of particulates it is recommended to use the filters with a glass-fiber pre-filter. This combination eliminates the need for a pre-filtration step.

(*) For critical applications using UV detection at < 210 nm is recommended to reject the first 0.1 mL filtrated (for 4mmØ), the first 0.3mL filtrated (for 13mmØ), the first 1 mL filtrated (for 25mmØ), and the first 3mL filtrated (for 50mmØ)

Certified Olimpeak™ Syringe Filters

OlimPeak®
Certified Filters by Teknokroma

Introduction of the New line of Olimpeak™ syringe filters

Teknokroma introduces into the market the new range of Certified Syringe Filters **Olimpeak™.**

This new line of Olimpeak™ Certified Filters offers a step further in traceability, method validation and GLP.

Certified Olimpeak™ syringe filters are made using polypropilene medical grade housing with Luer Lock and Luer slip fittings in compliance with ISO 594-1. Each filter is sealed using an external ring insert to maintain the membrane integrity and best performance. Olimpeak™ syringe filters are color coded for an easy identification.

All syringe filters are manufactured in compliance with ISO 9001 and technical procedures and tested according international standards of ISO 17025. Our manufacturing methods eliminate variable results through controlled manufacturing consistency batch to batch, and filter to filter.Samples and raw data of all syringe filter batches and membranes are stored during 5 years from production for reference.

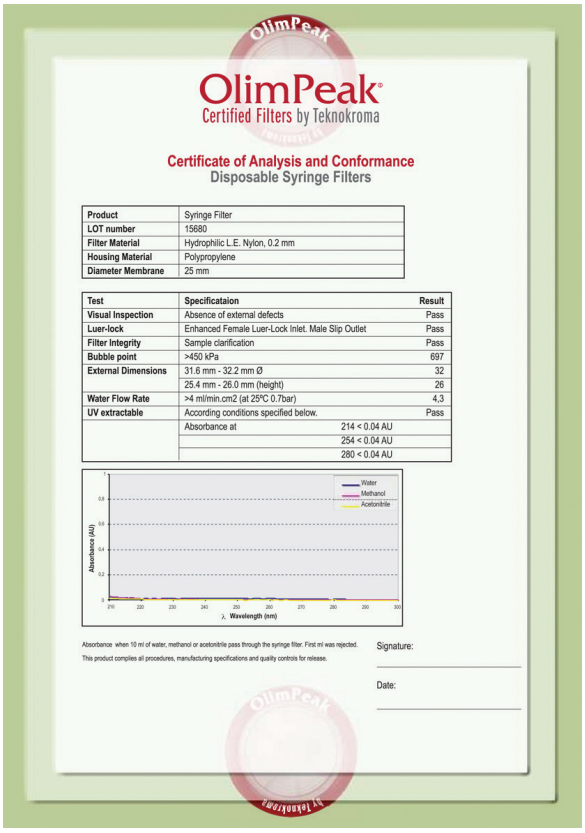
Our new **Certified Syringe Filter Olimpeak™** offer the best value. All filters are supplied with a Certificate of Quality batch to batch as guarantee of product performance and quality.

Each lot is quality monitored for:

- 100 % of the syringe filters are visually inspected following quality specifications
- Each batch of filters is tested for external dimensions
- Bubble Point
- Burst Pressure
- Filter Integrity
- Water Flow Rate
- UV Extractables and compliance with all technical procedures.
- Manufacturing specifications and quality controls for release

Test are carried out by an independent laboratory

(*) For critical applications using chromatography detection at < 210 nm it is recommended to reject the first filtrate ml.


OlimPeak®
Certified Filters by Teknokroma

Certificate of Analysis and Conformance
Disposable Syringe Filters

Product	Syringe Filter
LOT number	15680
Filter Material	Hydrophilic L.E. Nylon, 0.2 mm
Housing Material	Polypropylene
Diameter Membrane	25 mm

Test	Specificataion	Result
Visual Inspection	Absence of external defects	Pass
Luer-lock	Enhanced Female Luer-Lock Inlet. Male Slip Outlet	Pass
Filter Integrity	Sample clarification	Pass
Bubble point	>450 kPa	697
External Dimensions	31.6 mm - 32.2 mm Ø	32
	25.4 mm - 26.0 mm (height)	26
Water Flow Rate	>4 ml/min.cm2 (at 25ºC 0.7bar)	4,3
UV extractable	According conditions specified below.	Pass
	Absorbance at 214 < 0.04 AU	
	254 < 0.04 AU	
	280 < 0.04 AU	

Absorbance when 10 ml of water, methanol or acetonitrile pass through the syringe filter. First ml was rejected.
This product complies all procedures, manufacturing specifications and quality controls for release.

Signature:

Date:

Olimpeak™ Certificate

Teknokroma´s Syringes filters are of high quality and their level of extractables is very low. The encapsulating process forces the sample to pass only through the membrane .

They chemically resist a wide range of chemical products and solvents.

Teknokroma´s filters avoid any leak or any contamination due to the use of high quality materials.

Easy Identification for Method Validation

In addition to the color code, every single unit of Olimpeak™ Certified Syringe Filter is printed with the membrane type, pore size and batch number. This information makes them uniques for traceability, GLP's and validation purposes.

Certified Olimpeak™ Syringe Filters

Nylon Olimpeak™ Certified Syringe Filter with Polypropylene Housing

- Hydrophilic membrane.
- Excellent for HPLC samples, can be used for general filtration.
- Nylon is compatible with organic or aqueous solutions
- High bubble point.
- Nylon has high protein retention.
- Maximum operating temperature 100 ºC
- Nylon Low Extractables

Don´t use with strong acids, or bases, halogenated hydrocarbons, and protein.

Reference	Description	Pk
TR-200100	Nylon Filter, green 0.45 µm, 25 mm D	100
TR-200101	Nylon Filter, light green 0.20 µm, 25 mm D	100
TR-200500	Nylon Filter, green 0.45 µm, 13 mm D	100
TR-200501	Nylon Filter, light green 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

PTFE Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- The PTFE (polytetrafluoroethylene) is an hydrophobic membrane resistant to strong acids, aggresive solvents, alcohols, bases and aromatics.
- This membrane is ideal for filtration and degassing of chromatography solvents and also for extremely basic mobile phase solutions
- Very low extractables
- This membane is mechanically strong
- For sterile venting use 0.2 µm pore size, and for trasducer protection or air/gas filtration use 1 or 0.45 µm.
- Excellent thermal stability
- Aqueous solutions require pre-wetting with an alcohol
- Maximum operating temperature 100 ºC

Reference	Description	Pk
TR-200102	PTFE Filter, blue , 0.45 µm, 25 mm D	100
TR-200103	PTFE Filter, light blue, 0.20 µm, 25 mm D	100
TR-200502	PTFE Filter, blue , 0.45 µm, 13 mm D	100
TR-200503	PTFE Filter, light blue , 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

Hydrophilic PTFE Certified Olimpeak™Syringe Filter with Polypropylene Housing

The PTFE (polytetrafluoroethylene) is an hydrophilic membrane resistant to strong acids, aggresive solvents, alcohols, bases and aromatics.

- This membrane is ideal for filtration and degassing of chromatography solvents and also for extremely basic mobile phase solutions
- Very low extractables
- This membane is mechanically strong
- For sterile venting use 0.2 µm pore size, and for trasducer protection or air/gas filtration use 1 or 0.45 µm.
- Excellent thermal stability
- Aqueous solutions can be directly filtrated
- Maximum operating temperature 100 ºC
- Alternative to PP membrane filters

Reference	Description	Pk
TR-200102H	PTFE H Filter, blue , 0.45 µm, 25 mm D	100
TR-200103H	PTFE H Filter, light blue, 0.20 µm, 25 mm D	100
TR-200502H	PTFE H Filter, blue , 0.45 µm, 13 mm D	100
TR-200503H	PTFE H Filter, light blue , 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

Certified Olimpeak™ Syringe Filters

Polypropilene Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- Polypropylene is a hydrophilic membrane, highly resistant to solvents
- Exhibits a wide range of chemical compatibility to organic solvents
- It is ideal for biological sample filtration due to the low protein binding
- Good choice for chromatography protein analysis and biological sample filtration
- Can be used with acids and bases, and general HPLC analysis
- Maximum operating temperature 110 ºC
- Limited resistance to chloroform and MeCl

Reference	Description	Pk
TR-200111	Polypropylene Filter, white 0.45 µm, 25 mm D	100
TR-200112	Polypropylene Filter, natural , 0.20 µm, 25 mm D	100
TR-200509	Polypropylene Filter, white , 0.45 µm, 13 mm D	100
TR-200508	Polypropylene Filter, natural , 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

PVDF Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- PVDF is Polyvinylidene difluoride and is a hydrophilic membrane
- This membrane is solvent resistant and exhibits low levels of extractables
- PVDF is a low protein binding membrane, and can be used with proteins and peptides
- Can be used for sample filtration of aqueous and organic solvents
- Ideal for all the applications for HPLC and general biological filtration
- Maximum operating temperature 110 ºC

Don´t use it with strong acids, bases or ketones.

Reference	Description	Pk
TR-200106	PVDF Filter, red 0.45 µm, 25 mm D	100
TR-200107	PVDF Filter, rose 0.20 µm, 25 mm D	100
TR-200506	PVDF Filter, red 0.45 µm, 13 mm D	100
TR-200507	PVDF Filter, rose, 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

Regenerated Cellulose Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- Regenerated Cellulose, is a hydrophilic solvent resistant and very low protein binding membrane
- It is also compatible with nearly all common HPLC solvents
- The Regenerated Cellulose is compatible with aqueous samples in a pH from 3 to 12
- These membranes, can used for biological samples filtration and are important for the protein recuperation
- The Regenerated Cellulose is the membrane of choice for low nonspecific binding applications, tissue culture media filtration and biological sample filtration. To improve the filtration use it with Glass pre-filte membrane
- Maximum operating temperature 110 ºC

Don´t use with strong acids, chloroform, THF.

Reference	Description	Pk
TR-200445	Regenerated Cellulose Filter, brown, 0.45 µm, 25 mm D	100
TR-200440	Regenerated Cellulose Filter, light brown, 0.20 µm, 25 mm D	100
TR-200435	Regenerated Cellulose Filter, brown 0.45 µm, 13 mm D	100
TR-200430	Regenerated Cellulose Filter, light brown, 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

Certified Olimpeak™ Syringe Filters

Polyethersulfone Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- Hydrophilic membrane, very low protein and nucleotic acid binding and can be used with high temperature liquids
- This membrane provides high flow rates and good throughput volume
- PES is the filter of choice for tissue culture work, having very low extractables
- The PES is a mechanically strong membrane, and can be used with strong bases, alcohols and resistive proteins
- Good to excellent flow rates
- Maximum operating temperature 100 ºC

Don´t use it with acids, ketones, ethers, halogenated or aromatic hydrocarbons.

Reference	Description	Pk
TR-200401	Polyethersulfone, violet 0,45 µm, 25 mm D	100
TR-200402	Polyethersulfone, light violet 0,20 µm, 25 mm D	100
TR-200403	Polyethersulfone, violet 0,45 µm, 13 mm D	100
TR-200404	Polyethersulfone, light violet 0,20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

Cellulose Acetate Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- Hydrophilic membrane
- Ideal for aqueous based samples and for tissue cultura media filtration and sensitive biological simples
- Very low protein binding membrane, even less than either PVDF or PES membranes
- This membrane has a lower chemical resistance than Regenerated Cellulose
- Maximum operating temperature 110 ºC

Don´t use it with organic solvents.

Reference	Description	Pk
TR-200406	Cellulose Acetate, orange 0.45 µm, 25 mm D	100
TR-200407	Cellulose Acetate, light orange 0.20 µm, 25 mm D	100
TR-200408	Cellulose Acetate, orange 0.45 µm, 13 mm D	100
TR-200409	Cellulose Acetate, light orange 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

M.E. Cellulose Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- The M.E Cellulose membrane is hydrophilic
- They are used to clean or to sterilize many aqueous solutions
- It is ideal for biological samples or culture media filtration

Reference	Description	Pk
TR-200104	M.E Cellulose Filter, yellow, 0.45 µm, 25 mm D	100
TR-200105	M.E Cellulose Filter, light yellow, 0.20 µm, 25 mm D	100
TR-200504	M.E Cellulose Filter, yellow, 0.45 µm, 13 mm D	100
TR-200505	M.E Cellulose Filter, light yellow, 0.20 µm, 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

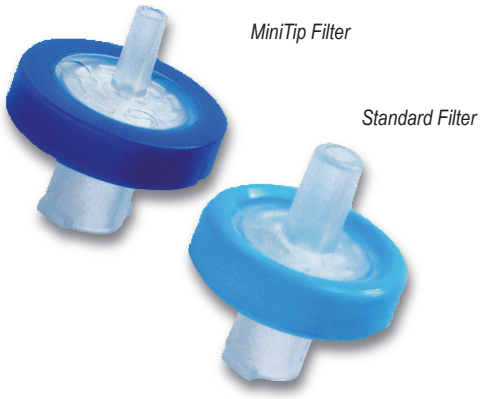
Certified Olimpeak™ Syringe Filters

Glass Microfibre GMF Certified Olimpeak™ Syringe Filter with Polypropylene Housing

- GMF membranes are commonly used as pre-filters to remove large particulates to extend the loading capacity of the filter membrane
- Membrane of choice for dissolution test
- Maximum operating temperature 110 ºC

Reference	Description	Pk
TR-200000G	Glass Microfiber GMF, Grey, 1,0 µm 25 mm D	100
TR-200006G	Glass Microfiber GMF, Grey, 2,0 µm 25 mm D	100
TR-200007G	Glass Microfiber GMF, Grey, 5,0 µm 25 mm D	100
TR-200003G	Glass Microfiber GMF, Grey, 1,0 µm 13 mm D	100
TR-200008G	Glass Microfiber GMF, Grey, 2,0 µm 13 mm D	100
TR-200009G	Glass Microfiber GMF, Grey, 5,0 µm 13 mm D	100
*	4mm Filters available at pg 160	
**	Sterile Filters available at pg: 161	

MiniTip Certified Olimpeak™ Syringe Filters

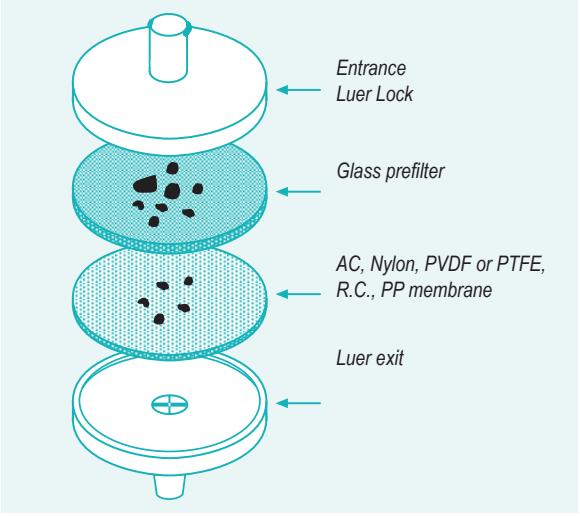


- Teknokroma has designed a new 13 mm syringe filter with a thin outlet called MiniTip, for direct filling of microvials.
- High quality MiniTip syringe filters are available with these membranes: Nylon, PES, PTFE, PVDF, RC, CN, CA, M.E.C and PP.
- Pore size can be 0.45 or 0.20 µm and the lot number of each filter is printed on the PP housing.

Reference	Description	Pk
TR-200500MT5	Mini Tip Nylon 0.45 µm x 13 mm PP, Green	500
TR-200501MT5	Mini Tip Nylon 0.2 µm x 13 mm PP, Light Green	500
TR-200502MT5	Mini Tip PTFE 0.45 µm x 13 mm PP, Blue	500
TR-200503MT5	Mini Tip PTFE 0.2 µm x 13 mm PP, Light Blue	500
TR-200502MT5H	Mini Tip PTFE H.*0.45 µm x 13 mm PP, Blue	500
TR-200503MT5H	Mini Tip PTFE H.*0.2 µm x 13 mm PP, Light Blue	500
TR-200504MT5	Mini Tip M.E.Cellulose 0.45 µm x 13 mm PP, Yellow	500
TR-200505MT5	Mini Tip M.E.Cellulose 0.2 µm x 13 mm PP, Light Yellow	500
TR-200506MT5	Mini Tip PVDF 0.45 µm x 13 mm PP, Red	500
TR-200507MT5	Mini Tip PVDF 0.2 µm x 13 mm PP, Light Red	500
TR-200508MT5	Mini Tip Polypropylene 0.2 µm x 13 mm PP, White	500
TR-200509MT5	Mini Tip Polypropylene 0.45 µm x 13 mm PP, White	500
TR-200430MT5	Mini Tip Regenerated Cellulose 0.2 µm x 13 mm PP, Light Brown	500
TR-200435MT5	Mini Tip Regenerated Cellulose 0.45 µm x 13 mm PP, Brown	500
TR-200408MT5	Mini Tip Cellulose Acetate 0.45 µm x 13 mm.D, Orange	500
TR-200409MT5	Mini Tip Cellulose Acetate 0.2 µm x 13 mm.D, Light Orange	500
TR-200403MT5	Mini Tip Polyethersulfone 0.45 µm x 13 mm.D, Violet	500
TR-200404MT5	Mini Tip Polyethersulfone 0.2 µm x 13 mm.D, Light Violet	500
TR-200500GMT5	Mini Tip GMF 1.0 µm x 13 mm, Grey	500
TR-200506GMT5	Mini Tip GMF 2.0 µm x 13 mm, Grey	500
TR-200507GMT5	Mini Tip GMF 5.0 µm x 13 mm, Grey	500
*	Hydrophilic	
**	Sterile Filters available at pg: 161	

Target Syringe Filters

Filter with Glass prefilter Certified Olimpeak™ Syringe and Polypropylene Housing



- Teknokroma offers a wide range of syringe filters with a Glass Microfiber membrane used as pre-filter.
- The Glass pre-filter is mounted before the microporous filter membrane. This combination eliminates the need for a pre-filtration step, minimizes sample loss, and prolongs the life of membrane.
- Flow rates are increased and filtrate volume is significantly greater when compared to filters with no pre-filter.
- Regenerated Cellulose membrane with the GMF membrane as a prefilter, is especially useful for tissue culture media filtration, as well as for general biological sample filtration.
- These filters are ideal for general laboratory filtration of samples that contain an excessive amount of particulates.
- The glass pre-filter removes the larger particulates and prevents premature clogging of the filter membrane.

Reference	Pore	Description	Housing	Pk
TR-200100G	0.45 µm	Nylon/Glass fibre 1 µm, 25mm	PP	100
TR-200101G	0.2 µm	Nylon/Gass fibre 1 µm, 25mm	PP	100
TR-200102G	0.45 µm	PTFE/Glass fibre 1 µm, 25mm	PP	100
TR-200103G	0.2 µm	PTFE/Glass fibre 1 µm, 25mm	PP	100
TR-200102GH	0.45 µm	PTFE H/Glass fibre 1 µm, 25mm	PP	100
TR-200103GH	0.2 µm	PTFE H/Glass fibre 1 µm, 25mm	PP	100
TR-200111G	0.45 µm	PP/Glass fibre 1 µm, 25mm	PP	100
TR-200112G	0.2 µm	PP/Glass fibre 1 µm, 25mm	PP	100
TR-200445G	0.45 µm	RC/Glass fibre 1 µm, 25mm	PP	100
TR-200440G	0.2 µm	RC/Glass fibre 1 µm, 25mm	PP	100
TR-200104G	0.45 µm	M.E.C/Glass fibre 1 µm, 25mm	PP	100
TR-200105G	0.2 µm	M.E.C/Glass fibre 1 µm, 25mm	PP	100
TR-200106G	0.45 µm	PVDF/Glass fibre 1 µm, 25mm	PP	100
TR-200107G	0.2 µm	PVDF/Glass fibre 1 µm, 25mm	PP	100
TR-200406G	0,45 µm	CA/Glass fibre 1 µm, 25mm	PP	100
TR-200407G	0,20 µm	CA/Glass fibre 1 µm, 25mm	PP	100
TR-200401G	0,45 µm	PES/Glass fibre 1 µm, 25mm	PP	100
TR-200402G	0,20 µm	PES/Glass fibre 1 µm, 25mm	PP	100
TR-200500G	0.45 µm	Nylon/Glass fibre 1 µm, 13mm	PP	100
TR-200501G	0.2 µm	Nylon/Gass fibre 1 µm, 13mm	PP	100
TR-200502G	0.45 µm	PTFE/Glass fibre 1 µm, 13mm	PP	100
TR-200503G	0.2 µm	PTFE/Glass fibre 1 µm, 13mm	PP	100
TR-200502HG	0.45 µm	PTFE H/Glass fibre 1 µm, 13mm	PP	100
TR-200503HG	0.2 µm	PTFE H/Glass fibre 1 µm, 13mm	PP	100
TR-200509G	0.45 µm	PP/Glass fibre 1 µm, 13mm	PP	100
TR-200508G	0.2 µm	PP/Glass fibre 1 µm, 13mm	PP	100
TR-200435G	0.45 µm	RC/Glass fibre 1 µm, 13mm	PP	100
TR-200430G	0.2 µm	RC/Glass fibre 1 µm, 13mm	PP	100
TR-200504G	0.45 µm	M.E.C/Glass fibre 1 µm, 13mm	PP	100
TR-200505G	0.2 µm	M.E.C/Glass fibre 1 µm, 13mm	PP	100
TR-200506G	0.45 µm	PVDF/Glass fibre 1 µm, 13mm	PP	100
TR-200507G	0.2 µm	PVDF/Glass fibre 1 µm, 13mm	PP	100
TR-200408G	0,45 µm	CA/Glass fibre 1 µm, 13mm	PP	100
TR-200409G	0,20 µm	CA/Glass fibre 1 µm, 13mm	PP	100
TR-200403G	0,45 µm	PES/Glass fibre 1 µm, 13mm	PP	100
TR-200404G	0,20 µm	PES/Glass fibre 1 µm, 13mm	PP	100

** Sterile Filters available at pg: 161

*4 mm Certified Olimpeak™ Syringe Filters

- GIdeal for sample volumes < 2 ml
- Available in 10 different membranes
- Dead volume < 10 µL
- Double connection: Luer + Mini Tip
- Certified for low level extractables

Order Information

Reference	Description	Pore	Pk
TR-200610	Cellulose Esters filters, 4 mm	0.20 µm	100
TR-200615	Cellulose Esters filters, 4 mm	0.45 µm	100
TR-200620	PVDF filters, 4 mm	0.20 µm	100
TR-200625	PVDF filters, 4 mm	0.45 µm	100
TR-200630	Nylon filters, 4 mm	0.20 µm	100
TR-200635	Nylon filters, 4 mm	0.45 µm	100
TR-200640	PTFE filters, 4 mm	0.20 µm	100
TR-200645	PTFE filters, 4 mm	0.45 µm	100
TR-200640H	PTFE Hydrophilic filters, 4 mm	0.20 µm	100
TR-200645H	PTFE Hydrophilic filters, 4 mm	0.45 µm	100
TR-200650	PP filters, 4 mm	0.20 µm	100
TR-200655	PP filters, 4 mm	0.45 µm	100
TR-200660	Regenerated Cellulose, 4 mm	0.20 µm	100
TR-200665	Regenerated Cellulose, 4 mm	0.45 µm	100

Sterile Syringe Filters

Reference	Description	Pore	Pk
TR-200670	Cellulose Acetate filters, 4 mm	0.20 µm	100
TR-200675	Cellulose Acetate filters, 4 mm	0.45 µm	100
TR-200680	PES (polyethersulfone), 4 mm	0.20 µm	100
TR-200685	PES (polyethersulfone), 4 mm	0.45 µm	100
TR-200691	Glass Microfiber GMF, 4 mm	1.00 µm	100
TR-200692	Glass Microfiber GMF, 4 mm	2.00 µm	100
TR-200695	Glass Microfiber GMF, 4 mm	5.00 µm	100
**	Sterile Filters available at following secction		

** Sterile Syringe Filter

- Teknokroma offers a wide range of Sterile syringe filters
- Ideal for :
  medical aplications
  biotech aplications
  microbiological aplications
- Each filter is packed individually to guarantee a proper sterilitzation
- An indicator shows the filter its sterilizated
- Each filter is sterilizated with etilene oxide

"to order a sterile filter it's as simple as choose any configuration you want and add an "E" at the end of the P/N, like the below example:"

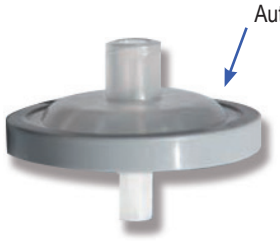
TR-200640E Sterile PTFE filters 4 mm

On-Line 50 mm Certified Olimpeak™ Filter for Gas/Liquid Aplications

Reference	Membrane	Pore	Housing	Pk
TR-200808	Cellulose Esters filters, 50 mm	0.20 µm		10
TR-200810	Cellulose Esters filters, 50 mm	0.45 µm		10
TR-200812	PVDF filters, 50 mm	0.20 µm		10
TR-200814	PVDF filters, 50 mm	0.45 µm		10
TR-200800	Nylon filters, 50 mm	0.20 µm		10
TR-200802	Nylon filters, 50 mm	0.45 µm		10
TR-200804	PTFE filters, 50 mm	0.20 µm		10
TR-200806	PTFE filters, 50 mm	0.45 µm		10
TR-200804H	PTFE Hydrophilic filters, 50 mm	0.20 µm		10
TR-200806H	PTFE Hydrophilic filters, 50 mm	0.45 µm		10
TR-200816	PP filters, 50 mm	0.20 µm		10
TR-200818	PP filters, 50 mm	0.45 µm		10
TR-200820	Regenerated Cellulose, 50 mm	0.20 µm		10
TR-200822	Regenerated Cellulose, 50 mm	0.45 µm		10
TR-800824	Cellulose Acetate filters, 50 mm	0.20 µm		10
TR-200826	Cellulose Acetate filters, 50 mm	0.45 µm		10
TR-200828	PES (polyethersulfone), 50 mm	0.20 µm		10
TR-200830	PES (polyethersulfone), 50 mm	0.45 µm		10
TR-200840	Glass fibre, 50 mm 1 µm			10
TR-200842	Glass fibre, 50 mm 2 µm			10
TR-200844	Glass fibre, 50 mm 5 µm			10
**	Sterile Filters available at previous secction			

Certified Olimpeak™ AUTOMATIC Syringe Filters

Certified AUTOMATIC OlimPeak Filter for Sotax Filter Stations

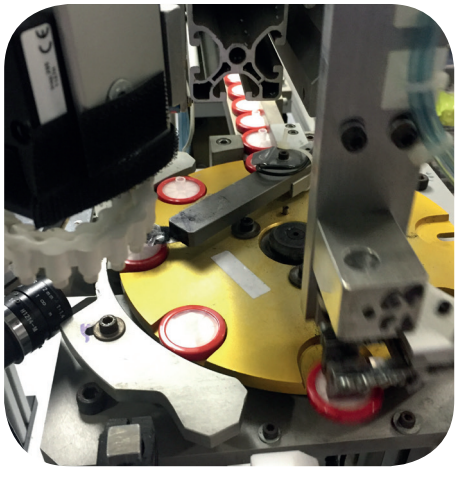


- This filter units are the newest development of Teknokroma filter for automatic equipments.
- The design of this filter is the same than the Robotic Filter except that the upper side is vault shaped.
- The inlet is a female luer Screw ant the outlet is a male luer Minispike.

Certified Olimpeak™ Filters for Automatic Equipments

Reference	Membrane	Pore	Housing	Pk
TR-200000A	Fiber Glass	1,00 µm	PP	1000
TR-200006A	Fiber Glass	2,00 µm	PP	1000
TR-200007A	Fiber Glass	5,00 µm	PP	1000
TR-200100A	Nylon	0,45 µm	PP	1000
TR-200101A	Nylon	0,20 µm	PP	1000
TR-200102A	PTFE	0,45 µm	PP	1000
TR-200103A	PTFE	0,20 µm	PP	1000
TR-200102AH	PTFE Hydrophilic	0,45 µm	PP	1000
TR-200103AH	PTFE Hydrophilic	0,20 µm	PP	1000
TR-200104A	M.E.Cellulose	0,45 µm	PP	1000
TR-200105A	M.E.Cellulose	0,20 µm	PP	1000
TR-200106A	PVDF	0,45 µm	PP	1000
TR-200107A	PVDF	0,20 µm	PP	1000
TR-200111A	Polypropylene	0,45 µm	PP	1000
TR-200112A	Polypropylene	0,20 µm	PP	1000
TR-200445A	Regenerated Cellulose	0,45 µm	PP	1000
TR-200440A	Regenerated Cellulose	0,20 µm	PP	1000
TR-200406A	Cellulose Acetate	0,45 µm	PP	1000
TR-200407A	Cellulose Acetate	0,20 µm	PP	1000
TR-200401A	Polyethersulfone	0,45 µm	PP	1000
TR-200402A	Polyethersulfone	0,20 µm	PP	1000
TR-200100GA	Nylon/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200102GA	PTFE/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200103GA	PTFE/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200102GAH	PTFE H/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200103GAH	PTFE H/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200111GA	PP/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200112GA	PP/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200445GA	RC/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200440GA	RC/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200104GA	M.E.C/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200105GA	M.E.C/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200106GA	PVDF/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200107GA	PVDF/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200406GA	CA/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200407GA	CA/Glass fibre 1 µm	0,20 µm	PP	1000
TR-200401GA	PES/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200402GA	PES/Glass fibre 1 µm	0,20 µm	PP	1000

Filter Station Sotax

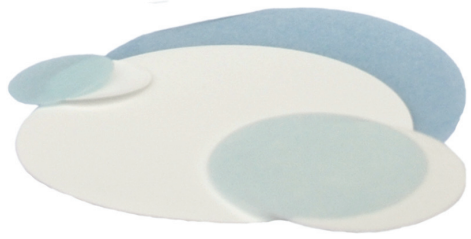


Olimpeak™ Membrane Filters for Mobile Phase

Membrane Filters

- Protect your instruments and columns eliminating particulates and gases from mobile phase
- Nylon and PVDF membrane filters are resistant to a wide range of organic and aqueous solvents.
- M.E. Cellulose membranes are used for filtration of aqueous mobile phase
- PTFE membrane filters are ideal for organic solvent

Membrane filters for mobile phase filtration 47 mm D.



Reference	Membrane	Pore Size µm	Diameter mm	Pk
TR-200140	Nylon	0.45	47	50
TR-200150	Nylon	0.20	47	50
TR-200200	PTFE	0.45	47	50
TR-200210	PTFE	0.20	47	50
TR-200200H	PTFE Hydrophilic	0.45	47	50
TR-200210H	PTFE Hydrophilic	0.20	47	50
TR-200260	M.E. Cellulose	0.45	47	50
TR-200270	M.E. Cellulose	0.20	47	50
TR-200320	PVDF	0.45	47	50
TR-200330	PVDF	0.20	47	50
TR-200380	Polipropylene	0.45	47	50
TR-200390	Polipropylene	0.20	47	50
TR-200420	Regenerated cellulose	0.45	47	50
TR-200425	Regenerated cellulose	0.20	47	50
TR-200457G	Glass Microfiber	1.00	47	25
TR-200457G2	Glass Microfiber	2.00	47	25
TR-200457G5	Glass Microfiber	5.00	47	25
TR-200458	Cellulose Acetate	0.45	47	50
TR-200457	Cellulose Acetate	0.20	47	50
TR-200486	PES	0.45	47	50
TR-200487	PES	0.20	47	50

Filtering Equipment

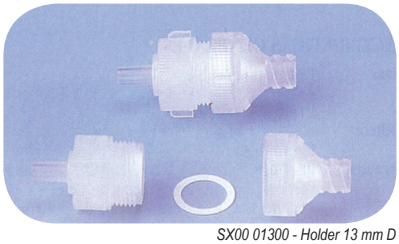
- 47 mm filtration apparatus is recommended for filtration of mobile phase and removal of particles from HPLC solvents.
- Manufactured with first quality glass, tube of DURAN galss from Schott.
- The porosity of the filtration plate is of number 3, which means a nominal pore size of 16-40 micrometers.

Reference	Description
TR-F1000	Complete Filtering Equipment 1.000 ml vessel and 250 ml funnel.
TR-F1002	Complete Filtering Equipment 2.000 ml vessel and 250 ml funnel.
TR-F1010	Filtration vessel, frosted glass and 1.000 ml capacity
TR-F1012	Filtration vessel, frosted glass and 2.000 ml capacity
TR-F1022	Fritted glass support, with screw fitting.
TR-F1016	Aluminium plier for the filtering equiment.
TR-F1018	Galss Funnel with 250 ml capacity for the filtering equipment.

Olimpeak™ Membrane Filters for Sample Filtration

Membrane filters for sample filtration (need the holder 13/25 mm D.)

Reference	Membrane	Pore Size mm	Diameter mm	Pk
TR-200109	Nylon	0.45	13	100
TR-200110	Nylon	0.20	13	100
TR-200220	M.E. Cellulose	0.45	13	100
TR-200230	M.E. Cellulose	0.20	13	100
TR-200160	PTFE	0.45	13	100
TR-200170	PTFE	0.20	13	100
TR-200160H	PTFE Hydrophilic	0.45	13	100
TR-200170H	PTFE Hydrophilic	0.20	13	100
TR-200280	PVDF	0.45	13	100
TR-200290	PVDF	0.20	13	100
TR-200340	Polipropylene	0.45	13	100
TR-200350	Polipropylene	0.20	13	100
TR-200400	Regenerated cellulose	0.45	13	100
TR-200405	Regenerated cellulose	0.20	13	100
TR-200453G	Glass microfibre	1.00	13	100
TR-200453G2	Glass microfibre	2.00	13	100
TR-200453G5	Glass microfibre	5.00	13	100
TR-200304	Cellulose Acetate	0.45	13	100
TR-200305	Cellulose Acetate	0.20	13	100
TR-200432	PES	0.45	13	100
TR-200433	PES	0.20	13	100
TR-200120	Nylon	0.45	25	50
TR-200130	Nylon	0.20	25	50
TR-200240	M.E. Cellulose	0.45	25	50
TR-200250	M.E. Cellulose	0.20	25	50
TR-200180	PTFE	0.45	25	50
TR-200190	PTFE	0.20	25	50
TR-200180H	PTFE Hydrophilic	0.45	25	50
TR-200190H	PTFE Hydrophilic	0.20	25	50
TR-200300	PVDF	0.45	25	50
TR-200310	PVDF	0.20	25	50
TR-200360	Poliyropylene	0.45	25	50
TR-200370	Polypropylene	0.20	25	50
TR-200410	Regenerated cellulose	0.45	25	50
TR-200415	Regenerated cellulose	0.20	25	50
TR-200002G	Glass microfibre	1.00	25	50
TR-200005G	Glass microfibre	2.00	25	50
TR-200008G	Glass microfibre	5.00	25	50
TR-200306	Cellulose Acetate	0.45	25	50
TR-200307	Cellulose Acetate	0.20	25	50
TR-200411	PES	0.45	25	50
TR-200412	PES	0.20	25	50



SX00 01300 - Holder 13 mm D

Holder for 13 mm. D Membrane

Reference	Description	Pk
SX00 01300	Milipore Swinex Holder 13 mm. D	10

Membrane filters 90 mm D.

Reference	Membrane	Pore Size µm	Diameter mm	Pk
TR-200140-90	Nylon	0.45	90	50
TR-200150-90	Nylon	0.20	90	50
TR-200200-90	PTFE	0.45	90	50
TR-200210-90	PTFE	0.20	90	50
TR-200200-90H	PTFE Hydrophilic	0.45	90	50
TR-200210-90H	PTFE Hydrophilic	0.20	90	50
TR-200260-90	M.E. Cellulose	0.45	90	50
TR-200270-90	M.E. Cellulose	0.20	90	50
TR-200320-90	PVDF	0.45	90	50
TR-200330-90	PVDF	0.20	90	50
TR-200380-90	Polipropylene	0.45	90	50
TR-200390-90	Polipropylene	0.20	90	50
TR-200420-90	Regenerated cellulose	0.45	90	50
TR-200425-90	Regenerated cellulose	0.20	90	50
TR-200457G-90	Glass Microfiber	1.00	90	50
TR-200457G2-90	Glass Microfiber	2.00	90	25
TR-200457G5-90	Glass Microfiber	5.00	90	25
TR-200458-90	Cellulose Acetate	0.45	90	50
TR-200457-90	Cellulose Acetate	0.20	90	50
TR-200486-90	PES	0.45	90	50
TR-200487-90	PES	0.20	90	50

Finisterre
by Teknokroma™

Technical Information of Finisterre™ SPE Cartridges

Teknokroma introduces in the market the line of Finisterre™ Solid Phase Extraction columns for a fast and efficient sample clean-up and concentration prior to analysis through GC, HPLC, and/or other instrumental methods.
SPE method concentrates and purifies analytes from solution by sorption onto a disposable solid phase cartridge, followed by elution of the analyte with an appropriate solvent for instrumental analysis.
The Finisterre™ SPE columns improve sample purity, quantification, and HPLC column life.

Our unic packing process **Filling PRIM™** guarantees unsurpassed accuracy by strictly monitoring the amount of packing in each individual column.
The dosification control by weight, column by column, using an automated specially designed machine, permits to assure results with high accuracy and less variability.

The irregular silica shape with an average particle size of 50 µm and no fines, avoid silica contamination in your final product. The pore diameter used in the Finisterre™ packing is 60Å .
The very tight particle size distribution used to manufacture SPE Finisterre™ packing provides a very good separation, as the sample and solvent flow uniformly through the sorbent bed, incrementing the contact with the packing.

Finisterre™ SPE columns consist of molded high purity polypropylene bodies with two 20 µm polyethylene frits that contain the packing material.
Finisterre™ SPE columns are equipped with male Luer-tips and designed for elution using either a syringe, a filter flask or a vacuum manifold.

Finisterre™ SPE products are manufactured in compliance with ISO 9001 and technical procedures and tested according international standards ISO 17025.

Teknokroma Finisterre™ SPE cartridges are available in four sizes (1, 3, 6 and 12 mL) and different packing materials (C18, C8, C4, C2, PH, SI, CN, NH_2, DIOL, Florisil™, SAX, SCX).
Sorbent weights ranged from 100 mg to 1 g.

Samples and raw data of all Finisterre™ SPE cartridges batches are stored during 5 years from production for reference.

Product Presentation

Finisterre™ SPE Columns

Finisterre™ C18 SPE Columns

Is the traditional matrix for reversed-phase chromatography. The high loading provides the highest degree of hydrophobicity

Retention Mechanism: Reverse phase, one of the most hydrophobic phases
Functional Group: Polymerically bonded octadecyl C18 endcapped. High Capacity C18
Endcapped: yes
Carbon Load: 17.0 %
Sílica Base: Irregular Shape
Average Particle Size: 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polyethylene 20 µm porosity

Applications

Isolation of hydrophobic species from solution
Compounds retained are Non- polar to moderately polar in a polar matrix.

- Drugs in serum, plasma and urine
- Desalting of peptides
- Organic acids in wine
- Pesticides in water by trace enrichment.

Finisterre™ C18 High Capacity C18 are Equivalent to:

Baker C18, Macherey –Nagel C18–ec, Macherey –Nagel C18–ecf, Phenomenex C 18-E,Supelco DSC-18, Supelco ENVI-18, Varian C 18, Waters C18, Whatman ODS-5

Cat.No	Description	pk
TR-F034000	Finisterre SPE Columns C18/17% 100mg/1ml	100
TR-F034002	Finisterre SPE Columns C18/17% 200mg/3ml	50
TR-F034004	Finisterre SPE Columns C18/17% 500mg/3ml	50
TR-F034006	Finisterre SPE Columns C18/17% 500mg/6ml	30
TR-F034008	Finisterre SPE Columns C18/17% 1000mg/6ml	30
TR-F034010	Finisterre SPE Columns C18/17% 1000mg/12ml	20
TR-F034012	Finisterre SPE Columns C18/17% 2000mg/12ml	20

Finisterre™ C8 SPE Columns

Retention Mechanism: Reverse phase.
Functional Group: Octyl (C8)
Endcapped: yes
Carbon Load: 8.5 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polyethylene 20 µm porosity

Applications

For compounds retained too strongly on C18

Cat.No	Description	pk
TR-F034020	Finisterre SPE Columns C8 100mg/1ml	100
TR-F034022	Finisterre SPE Columns C8 200mg/3ml	50
TR-F034024	Finisterre SPE Columns C8 500mg/3ml	50
TR-F034026	Finisterre SPE Columns C8 500mg/6ml	30
TR-F034028	Finisterre SPE Columns C8 1000mg/6ml	30
TR-F034030	Finisterre SPE Columns C8 1000mg/12ml	20
TR-F034032	Finisterre SPE Columns C8 2000mg/12ml	20

Finisterre™ C2 SPE Columns

Retention Mechanism: Reverse phase.
Functional Group: Ethyl (C2)
Endcapped: yes
Carbon Load: 5.5 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polyethylene 20 µm porosity

Applications

Antiepileptics from plasma

Cat.No	Description	pk
TR-F034060	Finisterre SPE Columns C2 100mg/1ml	100
TR-F034062	Finisterre SPE Columns C2 200mg/3ml	50
TR-F034064	Finisterre SPE Columns C2 500mg/3ml	50
TR-F034066	Finisterre SPE Columns C2 500mg/6ml	30
TR-F034068	Finisterre SPE Columns C2 1000mg/6ml	30
TR-F034070	Finisterre SPE Columns C2 1000mg/12ml	20
TR-F034072	Finisterre SPE Columns C2 2000mg/12ml	20

Finisterre™ PH SPE Columns

Retention Mechanism: Reverse phase.
Functional Group: Phenyl (PH)
Endcapped: yes
Carbon Load: 3.8 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene

Finisterre™ SPE Columns

Applications
Choose for highly aromatic compounds.

Cat.No	Description		pk
TR-F034080	Finisterre SPE Columns PH	100mg/1ml	100
TR-F034082	Finisterre SPE Columns PH	200mg/3ml	50
TR-F034084	Finisterre SPE Columns PH	500mg/3ml	50
TR-F034086	Finisterre SPE Columns PH	500mg/6ml	30
TR-F034088	Finisterre SPE Columns PH	1000mg/6ml	30
TR-F034090	Finisterre SPE Columns PH	1000mg/12ml	20
TR-F034092	Finisterre SPE Columns PH	2000mg/12ml	20

Finisterre™ CN SPE Columns

Retention Mechanism: Normal phase -weak/moderate non-polar with aqueous matrix, or polar with non polar organic matrix
Functional Group: Cyanopropyl (CN)
Endcapped: yes
Carbon Load: 4.0 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications
Compounds retained are polar compounds in a non-polar matrix
- Analytes in aqueous or organic solvents
- Drugs and metabolites in physiological fluids.

Cat.No	Description		pk
TR-F034100	Finisterre CN SPE Columns	100mg/1ml	100
TR-F034102	Finisterre CN SPE Columns	200mg/3ml	50
TR-F034104	Finisterre CN SPE Columns	500mg/3ml	50
TR-F034106	Finisterre CN SPE Columns	500mg/6ml	30
TR-F034108	Finisterre CN SPE Columns	1000mg/6ml	30
TR-F034110	Finisterre CN SPE Columns	1000mg/12ml	20
TR-F034112	Finisterre CN SPE Columns	2000mg/12ml	20

Finisterre™ NH_2 SPE Columns

Retention Mechanism: Weak anion exchange with aqueous matrix, normal phase with non-polar organic matrix.
Functional Group: Aminopropyl (NH_2)
Endcapped: no
Carbon Load: 5.0 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications
Compounds retained are polar compounds in a non-polar matrix

Cat.No	Description		pk
TR-F034140	Finisterre SPE Columns NH2	100mg/1ml	100
TR-F034142	Finisterre SPE Columns NH2	200mg/3ml	50
TR-F034144	Finisterre SPE Columns NH2	500mg/3ml	50
TR-F034146	Finisterre SPE Columns NH2	500mg/6ml	30
TR-F034148	Finisterre SPE Columns NH2	1000mg/6ml	30
TR-F034150	Finisterre SPE Columns NH2	1000mg/12ml	20
TR-F034152	Finisterre SPE Columns NH2	2000mg/12ml	20

Finisterre™ DIOL SPE Columns

Retention Mechanism: Normal phase
Functional Group: DIOL (2OH)
Endcapped: no
Carbon Load: 6.0 %
Sílica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å

Applications
Compounds retained are polar compounds in a non-polar matrix
- Analytes in aqueous or organic solvents
- Drugs and metabolites in physiological fluids

Cat.No	Description		pk
TR-F034180	Finisterre Diol SPE Columns	100mg/1ml	100
TR-F034182	Finisterre Diol SPE Columns	200mg/3ml	50
TR-F034184	Finisterre Diol SPE Columns	500mg/3ml	50
TR-F034186	Finisterre Diol SPE Columns	500mg/6ml	30
TR-F034188	Finisterre Diol SPE Columns	1000mg/6ml	30
TR-F034190	Finisterre Diol SPE Columns	1000mg/12ml	20
TR-F034192	Finisterre Diol SPE Columns	2000mg/12ml	20

Finisterre™ SPE Columns

Finisterre™ Florisil SPE Columns

Retention Mechanism: Normal phase
Functional Group: Florisil ® (FLO)
Base: Magnesium Silicate
Average Particle Size 75-100 µm
Pore Diameter: 85 Å
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications

Compounds retained are polar compounds in a non-polar matrix
Isolation of low to moderate polarity species from non-aqueous solution

- Pesticides in food and feeds
- Polychlorinated biphenyls in transformer oil
- Clean up of pesticides from soil extraction and food residue

Cat.No	Description		pk
TR-F034160	Finisterre Frorisil SPE Column	100mg/1ml	100
TR-F034162	Finisterre Frorisil SPE Column	200mg/3ml	50
TR-F034164	Finisterre Frorisil SPE Column	500mg/3ml	50
TR-F034166	Finisterre Frorisil SPE Column	500mg/6ml	30
TR-F034168	Finisterre Frorisil SPE Column	1000mg/6ml	30
TR-F034170	Finisterre Frorisil SPE Column	1000mWg/12ml	20
TR-F034172	Finisterre Frorisil SPE Column	2000mWg/12ml	20

Finisterre™ Florisil/P SPE Columns

Retention Mechanism: Normal phase
Functional Group: Florisil ® (FLO)
Base: Magnesium Silicate
Average Particle Size 100-200 µm
Pore Diameter: 85 Å
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications

Compounds retained are polar compounds in a non-polar matrix
Isolation of low to moderate polarity species from non-aqueous solution

- Pesticides in food and feeds
- Polychlorinated biphenyls in transformer oil
- Clean up of pesticides from soil extraction and food residue

Cat.No	Description		pk
TR-F034161	Finisterre Frorisil/P SPE Column	100mg/1ml	100
TR-F034163	Finisterre Frorisil/P SPE Column	200mg/3ml	50
TR-F034165	Finisterre Frorisil/P SPE Column	500mg/3ml	50
TR-F034167	Finisterre Frorisil/P SPE Column	500mg/6ml	30
TR-F034169	Finisterre Frorisil/P SPE Column	1000mg/6ml	30
TR-F034171	Finisterre Frorisil/P SPE Column	1000mWg/12ml	20
TR-F034173	Finisterre Frorisil/P SPE Column	2000mWg/12ml	20

Finisterre™ Si SPE Columns

Retention Mechanism: Normal phase, polar neutral phase
Functional Group: Silica (Si)
Base: Silica
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications

Isolation of low to moderate polarity species from non-aqueous solution.
Compounds retained are Polar compounds in a non-polar matrix

- Lipid classification
- Separation of plant pigments
- Removal of fat soluble vitamins
- Clean up of pesticides from soil extraction and food residue

Cat.No	Description		pk
TR-F034120	Finisterre SPE Columns Silica	100mg/1ml	100
TR-F034122	Finisterre SPE Columns Silica	200mg/3ml	50
TR-F034124	Finisterre SPE Columns Silica	500mg/3ml	50
TR-F034126	Finisterre SPE Columns Silica	500mg/6ml	30
TR-F034128	Finisterre SPE Columns Silica	1000mg/6ml	30
TR-F034130	Finisterre SPE Columns Silica	1000mg/12ml	20
TR-F034132	Finisterre SPE Columns Silica	2000mg/12ml	20

Finisterre™ SAX SPE Columns

Retention Mechanism: Anion exchange
Functional Group: Tetramethyl ammonium
Base: Silica
Counter Ion: Acetate
Average Particle Size 50 µm
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Finisterre™ SPE Columns

Applications

Retains (-) charged compounds

Cat.No	Description		pk
TR-F034200	Finisterre SAX SPE Columns	100mg/1ml	100
TR-F034202	Finisterre SAX SPE Columns	200mg/3ml	50
TR-F034204	Finisterre SAX SPE Columns	500mg/3ml	50
TR-F034206	Finisterre SAX SPE Columns	500mg/6ml	30
TR-F034208	Finisterre SAX SPE Columns	1000mg/6ml	30
TR-F034210	Finisterre SAX SPE Columns	1000mg/12ml	20
TR-F034212	Finisterre SAX SPE Columns	2000mg/12ml	20

Finisterre™ SCX SPE Columns

Retention Mechanism: Cation exchange
Functional Group: Benzene sulfonic acid
Base: Silica
Counter Ion: Hydrogen
Exchange Capacity: 0.24 meq/100 mg
Average Particle Size 50 µm
Hardware: Polypropylene
Frit: Polypropylene 20 µm porosity

Applications

Retains (+) charged compounds

Cat.No	Description		pk
TR-F034220	Finisterre SCX SPE Columns	100mg/1ml	100
TR-F034222	Finisterre SCX SPE Columns	200mg/3ml	50
TR-F034224	Finisterre SCX SPE Columns	500mg/3ml	50
TR-F034226	Finisterre SCX SPE Columns	500mg/6ml	30
TR-F034228	Finisterre SCX SPE Columns	1000mg/6ml	30
TR-F034230	Finisterre SCX SPE Columns	1000mg/12ml	20
TR-F034232	Finisterre SCX SPE Columns	2000mg/12ml	20

Note: Customs configurations about Finisterre SPE columns are aviable, contact with us for further information

Finisterre™ SPE columns are simple to use and alow four-steps sample preparation

1. **Conditioning**
2. **Sample Application**
3. **Washing**
4. **Elution**

The capacity of SPE columns are defined as the amount of analyte that a packing bed will retain from a sample matrix.
There are some variables that affect capacity, basicaly: sample matrix, analyte, structure and other compound than compete with the analyte. But in general, with 60 Å bonded silica phases will retain approximately 1 % of their bed weigth.

For example, a 200 mg bed will retain approximately 2 mg of all compounds in a sample that have an affinity for the sorbent.
But the best system to determine the capacity for an SPE column is experimentally.

1. Conditioning

The conditioning wets the packing surface, making the packing functional group fully accesible to the sample. In general for 100 mg of packing you can pass 2 ml of two solvent, generaly metanol followed of water in reverse phase. In normal phase are usually conditioned with the solvent that is weaker than the sample matrix.

It is important that the tube should not be dried before adding the sample.

2. Sample application

A general rule use a sample volume equal to half the tube volume, for example 1 ml for 200 mg tubes.
The flow rate of elution of sample about 1 ml/min. for 100 mg tubes, 2 ml /min. for 200 mg tubes, and 3 ml/min. for 500 mg tubes.

3. Washing

Select a wash solvent that has the same, or slightly greater, elution strength as the sample matrix.

Wash solvents should remove weakly retained interferences without being strong enough to elute the analyte.

4. Elution

Select a solvent with more elution strength than the sample matrix.

As standard use 250 µl of solvent for 100 mg of packing, in general the solvents use for elution should be strong enough to completely elute an analyte in a small volume 1 or 2 ml.
Attention should be paid to solvent strength relative to the packing material.

Finisterre OA™ Polymeric SPE Columns

Finisterre OA™ HLB

Description:

Finisterre OA™ HLB is a wettable copolymer presenting a Hydrophobic-Lipophilic Balance (HLB) permitting a strong retention for neutral, acidic and basic compounds and a high stability in organic silvents.

Particle Size: 40 µm
Pore Diameter: 110 Å
Surface Area: 850 m²/g
pH Stability: 0 to 14

Applications

- Drugs & metabolites in biological fluids
- API from tablets, creams, in waste water & drinking water
- Environmental analysis: trace of PAHs, pesticides, herbicides, phenols & PCB in water
- Antibiotics and pesticides in food & beverage

Cat.No	Description	pk
TR-FB034300	Finisterre OA™ HLB SPE Columns 30mg/1ml	100
TR-FB034302	Finisterre OA™ HLB SPE Columns 60mg/3ml	50
TR-FB034304	Finisterre OA™ HLB SPE Columns 100mg/6ml	30
TR-FB034306	Finisterre OA™ HLB SPE Columns 200mg/6ml	30
TR-FB034308	Finisterre OA™ HLB SPE Columns 500mg/6ml	30

Finisterre OA™ SCX

Description:

Finisterre OA™ SCX is a polystyrene-divinylbenzene copolymer functionalized by a strong cation exchanger presenting a high selectivity for acids (pK_a 2 - 10). It is highly stable in organic solvents.

Particle Size: 85 µm
Pore Diameter: 60 Å
Surface Area: 800 m²/g
pH Stability: 0 to 14
Ionic Capacity: 0,85 meq/g

Applications

- Basic Drugs & metabolites in biological fluids
- API from tablets, creams, in waste water & drinking water
- Pesticides, herbicides, fongicides & melamine from food & beverage

Cat.No	Description	pk
TR-FB034320	Finisterre OA™ SCX SPE Columns 30mg/1ml	100
TR-FB034322	Finisterre OA™ SCX SPE Columns 60mg/3ml	50
TR-FB034324	Finisterre OA™ SCX SPE Columns 100mg/6ml	30
TR-FB034326	Finisterre OA™ SCX SPE Columns 200mg/6ml	30
TR-FB034328	Finisterre OA™ SCX SPE Columns 500mg/6ml	30

Finisterre OA™ DVB

Description:

Finisterre OA™ DVB is a polystyrene-divinylbenzene copolymer presenting a high hydrophobicity used as reversed-phase for extraction of neutral, acidic and basic compounds in viscous matrices.

Particle Size: 85 µm
Pore Diameter: 60 Å
Surface Area: 1000 m²/g
pH Stability: 0 to 14

Applications

- Drugs & metabolites in biological fluids
- API from tablets, creams, in waste water & drinking water
- Environmental analysis: trace of PAHs, pesticides, herbicides, phenols & PCB in water

Cat.No	Description	pk
TR-FB034310	Finisterre OA™ DVB SPE Columns 30mg/1ml	100
TR-FB034312	Finisterre OA™ DVB SPE Columns 60mg/3ml	50
TR-FB034314	Finisterre OA™ DVB SPE Columns 100mg/6ml	30
TR-FB034317	Finisterre OA™ DVB SPE Columns 200mg/6ml	30
TR-FB034318	Finisterre OA™ DVB SPE Columns 500mg/6ml	30

Finisterre OA™ SAX

Description:

Finisterre OA™ SAX is a polystyrene-divinylbenzene copolomer functionalized by a strong anion exchanger presenting a high selectivity (pK_a 2 - 8). It is highly stable in organic solvents.

Particle Size: 85 µm
Pore Diameter: 60 Å
Surface Area: 900 m²/g
pH Stability: 1 to 14
Ionic Capacity: 0,25 meq/g

Applications

- Acidic compounds & metabolites from biological fluids & tissues
- Food additives & contaminants
- Acidic phenols
- Acidic herbicides

Cat.No	Description	pk
TR-FB034330	Finisterre OA™ SAX SPE Columns 30mg/1ml	100
TR-FB034332	Finisterre OA™ SAX SPE Columns 60mg/3ml	50
TR-FB034334	Finisterre OA™ SAX SPE Columns 100mg/6ml	30
TR-FB034336	Finisterre OA™ SAX SPE Columns 200mg/6ml	30
TR-FB034338	Finisterre OA™ SAX SPE Columns 500mg/6ml	30

Finisterre OA™ Polymeric SPE Columns

Finisterre OA™ WCX

Description:

Finisterre OA™ WCX is a polystyrene-divinylbenzene copolymer functionalized by a weak cation exchanger used to catch and release strong basic compounds (pK_a >10). It is highly stable in organic solvents.

Particle Size: 85 µm
Pore Diameter: 60 Å
Surface Area: 800 m²/g
pH Stability: 0 to 14
Ionic Capacity: 0,70 meq/g

Applications

- Strong basic compounds from biological fluids & tissues
- Streptomycin from food

Cat.No	Description	pk
TR-FB034340	Finisterre OA™ WCX SPE Columns 30mg/1ml	100
TR-FB034342	Finisterre OA™ WCX SPE Columns 60mg/3ml	50
TR-FB034344	Finisterre OA™ WCX SPE Columns 100mg/6ml	30
TR-FB034346	Finisterre OA™ WCX SPE Columns 200mg/6ml	30
TR-FB034348	Finisterre OA™ WCX SPE Columns 500mg/6ml	30

Finisterre OA™ HLB

Description:

Finisterre OA™ WAX is a polystyrene-divinylbenzene copolymer functionalized by a weak anion exchanger used to catch and release strong acidic compounds (pKa <2). It is highly stable in organic solvents.

Particle Size: 85 µm
Pore Diameter: 60 Å
Surface Area: 800 m²/g
pH Stability: 1 to 14
Ionic Capacity: 0,50 meq/g

Applications

- Drugs & metabolites in biological fluids
- API from tablets, creams, in waste water & drinking water
- Environmental analysis: trace of PAHs, pesticides, herbicides, phenols & PCB in water
- Antibiotics and pesticides in food & beverage

Cat.No	Description	pk
TR-FB034350	Finisterre OA™ WAX SPE Columns 30mg/1ml	100
TR-FB034352	Finisterre OA™ WAX SPE Columns 60mg/3ml	50
TR-FB034354	Finisterre OA™ WAX SPE Columns 100mg/6ml	30
TR-FB034356	Finisterre OA™ WAX SPE Columns 200mg/6ml	30
TR-FB034358	Finisterre OA™ WAX SPE Columns 500mg/6ml	30

Equivalences

Teknokorma	Waters	Phenomenex	Agilent	Biotage
Finisterre OA™ HLB	Waters Oasis® HLB	Phenomenex Strata™- X	Agilent Bond Elut Plexa / Agilent Nexus	Biotage Evolute® ABN
Finisterre OA™ DVB	Waters Oasis® HLB	Phenomenex Strata™- X	Agilent Bond Elut PPL / Agilent SimpliQ DVB	Biotage Evolute® ABN
Finisterre OA™ SCX	Waters Oasis® MCX	Phenomenex Strata™-X-C	Agilent Bond Elut Plexa PCX / Agilent SimpliQ SCX	Biotage Evolute® CX
Finisterre OA™ SAX	Waters Oasis® MAX		Agilent SimpliQ SAX	Biotage Evolute® AX
Finisterre OA™ WCX	Waters Oasis® WCX	Phenomenex Strata™-X-CW	Agilent SimpliQ WCX	Biotage Evolute® WCX
Finisterre OA™ WAX	Waters Oasis® WAX	Phenomenex Strata™-X-AW	Agilent SimpliQ WAX	Biotage Evolute® WAX

Finisterre™ C18 SPE 96 well plate

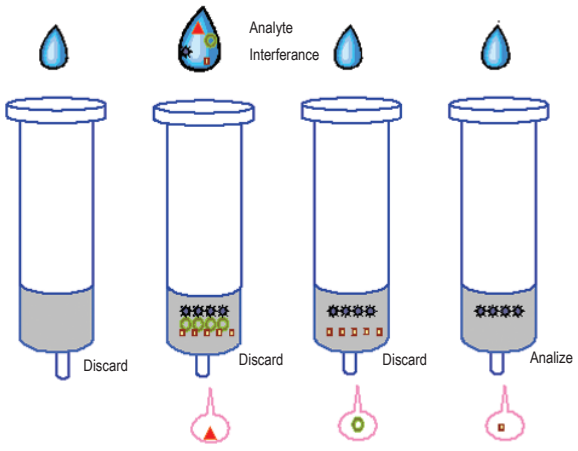
Retention Mechanism: Reverse phase, one of the most hydrophobic phases
Functional Group: Polymerically bonded octadecyl C18 endcapped. High Capacity C18

Endcapped: yes
Higher Carbon Load: 17.0 %
Sílica Base: Irregular Shape
Average Particle Size: 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polyethylene 20 µm porosity

96 well plate format

Cat.No	Description	pk
TR-F034500	Finisterre SPE 96 w/plate C18/17% 10mg/2ml	1
TR-F034502	Finisterre SPE 96 w/plate C18/17% 20mg/2ml	1
TR-F034504	Finisterre SPE 96 w/plate C18/17% 30mg/2ml	1
TR-F034506	Finisterre SPE 96 w/plate C18/17% 60mg/2ml	1
TR-F034508	Finisterre SPE 96 w/plate C18/17% 1000mg/2ml	1

Finisterre™ Use & Extraction Procedures



Select the different Extraction Procedures Methods:

Extraction Prodecures for Reversed Phases

Packings of Reverse Phase are composed of a silica backbone bonded with hydrocarbon chains.
Packings of Reverse Phase are used to isolate relatively non-polar compounds from a polar matrix.
Reverse Phase packings require conditioning with an organic solvent followed by an aqueous solvent prior to use.
Elution of no non polar compounds require less polar solvents, and moderataly polar compounds is accomplished with middle polarity solvents.

1. Conditioning:
Rinse packing bed with 3-5 ml of methanol followed by 3-5 ml of water or buffer (don't let packing bed dry before adding sample).

2. Sample application:
Apply sample solution to the top of the packing bed. Push or draw the sample through the bed at a flow rate of 1-5 ml/min. Collect sample for analysis if desired compound has passed through the packing bed without being retained.

3. Wash:
If the desired compound was retained, wash off any weakly retained interfering compound(s) with a polar solvent.

4. Elution:
Elute desired compound with 1-2 ml of a non-polar solvent and collect for analysis.

Extraction Prodecures for Normal Phases

Normal-phase packings are composed of a silica backbone bonded with carbon chains containing polar functional groups.
Packings of Normal Phase are used to isolate polar compounds from a non-polar matrix.
Normal Phase packings require conditioning with non polar solvents
Elution is accomplished with more polar solvents.

1. Conditioning:
Rinse packing bed with 3-5 ml of non-polar solvent (don't let packing bed dry before adding sample).

2. Sample application:
Apply sample solution to the top of the packing bed. Push or draw the sample through the bed at a flow rate of 1-5 ml/min. Collect sample for analysis if desired compound has passed through the packing bed without being retained.

3. Wash:
If the desired compound was retained, wash off any weakly retained interfering compound(s) with a non-polar solvent.

4. Elution:
Elute desired compound with 1-2 ml of a polar solvent and collect for analysis.

Extraction Prodecures for Ion-Exchange

Packings of Ion Exchange are composed of different materials backbone bonded with carbon chains terminated by a negatively or positively charged functional groups.
Packings of Ion Exchange are used to isolate charged or potentially charged compounds.
Anions and cations are retained on the corresponding resin by exchanging the anion or cation in the sample with the anion or cation on the resin.

1. Conditioning:
Rinse packing bed with 3-5 ml of de-ionized water or low ionic strength buffer (e.g. 0.0001M-0.01M).

2. Sample application:
Apply sample to the top of the packing bed. Push or draw the sample through the bed at a flow rate of 1-2 ml/min. Collect sample for analysis if desired compound has passed through the packing bed without being retained.

3. Wash:
If the desired compound was retained, wash off any weakly retained interfering compound(s) with de-ionized water or low strength buffer.

4. Elution:
Elute desired compound with 1-5 ml of a high salt concentration solution (e.g. 0.1M- 0.5M) or change elution buffer pH such that the sample compound is no longer ionized and collect for analysis

Finisterre™ SPE Applications

Extraction of Catecholamines from Urine

SPE column: **TR-F034000** Finisterre™ C18/17% 100 mg/1mL column
Sample preparation: Urine, pH 8.5 with 2 M ammonium hydroxide
Conditioning: 2 x 1mL of methanol, followed by 2 x 1mL of ammonium chloride/0.5% EDTA, pH 8.5
Sample application: Addition of 1 mL of sample
Wash: 2 x 1mL of 0.2 M ammonium chloride, pH 8.5, followed by 1mL of ammonium chloride / methanol (80:20), pH 8.5
Elution: Air dry for 2 min and elute with 2 x 1mL of 0.08 M acetic acid

Extraction of Vitamin D from Serum

SPE column: **TR-F034124** Finisterre™ Si 500 mg/3mL column
Sample preparation: Serum, 2 mL extracted with 7.5 mL of methylene chloride/methanol (33:67). Add 2.5mL of methylene chloride and shake. Allow phases to separate and collect the lower methylene-chloride layer
Conditioning: 3mL of anhydrous ether/hexane (1:9)
Sample application: Addition of extracted sample
Wash: 10mL of anhydrous ether/hexane (1:9)
Elution: 7.5mL of anhydrous ether/hexane (33:67)

Organochlorine Pesticides in Water

SPE column: **TR-F034106** Finisterre™ CN 500 mg/6mL column
Sample preparation: River water 100 mL
Conditioning: 2.5mL methanol
2.5mL ethyl acetate
2.5mL methanol
2.5mL distilled water
Sample application: Addition of sample
Wash: Force residual water out of sorbent with air.
Elution: 2.5mL ethyl acetate

Extraction of Pyridonecarboxylic-Acid Antibacterials (PCAs) from Fish Tissue

SPE column: **TR-F034146** Finisterre™ NH2 500 mg/6mL column
Sample preparation: Blend 5 g of sample is extracted with hexane/ethyl acetate 1:3 and 10 g of sodium sulfate. High speed blend and decant. Repeat and combine extracts
Conditioning: 10mL methanol, followed by 5mL of hexane/ethyl acetate 1:3
Sample application: Addition of the sample
Wash: 5mL of hexane/ethyl acetate 1:3
Elution: 10mL of acetonitrile/methanol/0.01M aqueous oxalic acid pH=3 with NaOH

Extraction of Antibiotics from Ointment

SPE column: **TR-F034184** Finisterre™ Diol 500 mg/3mL column
Sample preparation: 50 mg of ointment is extracted with 2 mL of hexane. The sample forms an insoluble suspension.
Conditioning: 3mL of hexane.
Sample application: Addition of the suspension.
Wash: 2 x 1mL of hexane. Air dry the column.
Elution: 2 x 1mL of methanol/0.1 N HCl 1:1

Extraction of Polychlorinated Biphenyls (PCBs) from transformer Oil

SPE column: **TR-F034168** Finisterre™ Florisil 1000 mg/6mL column
Sample preparation: 200 mg of transformer oil
Conditioning: 2 x 2mL of hexane.
Sample application: Addition of the transformer oil directly into the column.
Wash: No wash steps are needed.
Elution: 25mL of hexane and evaporate for GC/MS analysis.

Vacuum Manifolds for SPE

Vacuum Manifold

Teknokroma vacuum manifolds simplify SPE sample processing. These manifolds permit consistent extraction and filtration results. Analyst can save time, since these manifolds allow simultaneous multiple sample processing.

The manifolds yield consistent extraction, elution and filtration results for up to 24 columns, cartridges or 25 mm syringe filters. Filters should not be attached to the vacuum manifold port prior to elution. Filters will air-lock and prevent fluid passage if used during column conditioning, sample application, or column wash. Using filters during the final elution step will ensure a clean sample for injection. Parallel processing of this kind greatly reduces the time required to prep multiple samples.

The manifolds consist of a clear glass chamber to which vacuum is applied to draw a sample through on SPE column, cartridge, or disk.
Adjustable racks placed in the glass vacuum chamber will accommodate a variety of sample collection vessels, including test tubes, autosamplers, vials, volumetric flasks, and Erlenmeyer flasks.
Eluants are deposited directly into the collection vessel of choice via polypropylene, optional stainless steel, or Teflon needles.

Vacuum manifolds for SPE sample preparation, filtration, and elution are available in 12, 16, and 24 port configurations.

Port Vacuum Manifold complete set include: Glass chamber, cover gasket & 12 stopcocks, vacuum valve and gauge, colections racks plates (13 mm, 16 mm tubes, volumetric flask, plate base, plate dimple, lid legs, propilene needles, retaining clips for collections racks.

Cat.No	Description
TR-004012	12 Port Vacuum Manifold, Complete Set
TR-004416	16 Port Vacuum Manifold, Complete Set
TR-004824	24 Port Vacuum Manifold, Complete Set

Vacuum Pump R-300

Vacuum Pump impulsed by serving dish, without oil, declaring the innovative silent technology and mechanics.

The R-300 is adaptable to many requirements of laboratory:

- **Slow vibration and silent**
  Motor directly conducted without the mechanism of transmission and rubber feet of quality that mantain the noise level only upon approximately 50 dB.
- **Weigh compact and light**
  The aluminum mold and its precise construction make the R-300 so little and compact, with a weight of only 4,1 kg.
- **Cleanliness and maintenance**
  The design without oil makes the R-300 clean and free of maintenance, we guarantee the free supply of spare parts during two years of 3000 working hours (except humidity filter).

Cat.No	Description
BOVT 0300	Vacuum Pump R-300

	Specifications	
	Maximum vacuum	650 mm. Hg
	Vacuum Velocity	(2.5 L tank):
	0 mmHg:	17/min = 9.6 CFM
	100 mmHg:	14 l/min = 0.49 CFM
	200 mmHg:	12 l/min = 0.42 CFM
	300 mmHg:	9.5 l/min = 0.34 CFM
	400 mmHg:	7 l/min = 0.25 CFM
	500 mmHg:	4.5 l/min = 0.16 CFM
	600 mmHg:	1.5 l/min = 0.05 CFM
	Maximum flow:	13 l/min
	Motive rotation:	1450 rpm
	Potency:	1/8 CV/HP
	Poles Nbr.:	4 P
	Gross weight:	5.1 kg
	Net weight:	4.1 kg
	Entrance screw:	1/8 PS
	Noise level:	50 dB

Vacuum Manifolds Accesories

Description	12 Positions	Pk	16 Positions	Pk	24 Positions	Pk
Glass Chamber	TR-004013	1	TR-004417	1	TR-004825	1
Cover, gasket & stopcocks	TR-004014	1	TR-004418	1	TR-004826	1
Gaskets	TR-004015	2	TR-004419	2	TR-004827	1
Vacuum gauge, valve & glass chamber	TR-004016	1	TR-004420	1	TR-004828	1
Needles - Polypropylene	TR-004017	12	TR-004421	16	TR-004829	24
Needles - Stainless Steel	TR-004018	12	TR-004422	16	TR-004830	24
Collection Rack-shelves, legs, chips & posts	TR-004019	1	TR-004423	1	TR-004831	1
Plate - 13 mm	TR-004020	1	TR-004424	1	TR-004832	1
Plate - volumetric flask	TR-004021	1	---		---	
Plate - 16 mm test tube	TR-004022	1	TR-004426	1	TR-004834	1
Plate - autosampler vial	TR-004023	1	---		---	
Plate - dimple	TR-004024	1	TR-004428	1	TR-004836	1
Plate - base	TR-004025	1	TR-004429	1	TR-004837	1
Stopcoks	TR-004026	12	TR-004430	16	TR-004838	24

Drying Attachments

Drying attachments are available for the 12 and 24 port manifolds, which will direct the flow of air or nitrogen into the collection vessels to concentrate eluants, prior to further analysis.

Drying attachments can be connected, via adapters, to SPE columns or cartridges in order to dry the column or cartridge prior to final elution.

Cat.No	Description
TR-004027	12 Positions Drying Attachment
TR-004431	16 Positions Drying Attachment
TR-004839	24 Positions Drying Attachment

Disposable polypropylene waste container

The disposable polypropylene waste container simplifies clean-up of the vacuum chamber in 12 port manifolds. The disposable waste liner is a molded solvent resistant polypropylene liner that fits into the vacuum chamber of the 12 port manifolds. The liner is designed to contain all liquids used in SPE sample preparation. To use the liner, remove the manifold lid and take out the rack and shelf set. Place the disposable liner into the glass vacuum chamber, and replace
the manifold lid. Proceed with all conditioning and sample preparation steps. Just prior to final elution, the liner, containing the waste solvents, is removed from the vacuum chamber.

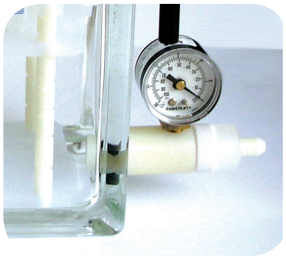
There are small handles at each end of the waste liner to facilitate its removal.

Replace the lid, and proceed with the final elutionof the analyze. Waste solvents should be properly discarded from the liner. The liner can be cleaned and re-used a number of times, prior to discarding.

Cat.No	Description	Pk
TR-004028	12 Positions PP Vacuum Waste Container	10

Vacuum Manifolds Accesories

Accesories

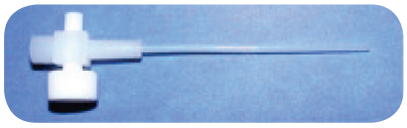


Cat.No	Description	Pk
TR-004102	Female Luer Fittings	2
TR-004103	Male Luer Fittings	2
TR-004104	Support post for rack	3
TR-004105	Legs for cover- black	4
TR-004106	Vacuum gauge & valve assembly	1
TR-004107	Valve assembly only	1
TR-004108	Vacuum gauge	1
TR-004109	Retaining clips	12
TR-004110	Vacuum manifolds plugs	50
AP-2402	Adapters for columns SPE 1, 3 and 6 ml	10

Disposable Teflon Needles

Teflon needles

Teflon control valves



Disposable teflon needles and teflon needles with flow control valves are designed to fit through the manifolds lid via the luer fitting. These needles deliver the eluant directly from the SPE extraction columns or cartridge into the collection vessel in the vacuum chamber. These needles, when used in conjunction with teflon columns
and teflon frits ensure zero extractables from the column, frits, and fluid path. This combination is especially useful for critical sample analysis, such as environmental samples.

Excellent solvent resistant and direct flow into the sample chambers are the key benefits.

Cat.No	Description	Pk
TR-004210	Teflon Needles	100
TR-004212	Teflon Needles	500
TR-004202	Teflon Control Valve	25
TR-004204	Teflon Control Valve	50

QuEChERS Finisterre by Teknokroma™

QuEChERS (Quick, Easy, Cheap, Effective, Rugged & Safe) offer a convenient and effective approach for determining pesticide residues in fruit, vegetables and other foods.

The Teknokroma Finisterre QuEChERS Extraction and Dispersive SPE kits permit to work with the specific methods, including:

1. Method **EN 15662** Foods and Plant Origin. Determination of Pesticide Residues using GC-MS and/or LC-MS/MS Following Acetonitrile Extraction/Partitioning and Clean-up by Dispersive SPE- QuEChERS.
2. Method **AOAC 2007.01.** Pesticide Residues in Food by Acetonitrile Extraction and partitioning with Magnesium sulfate.
3. Method **Mini-multiresidue QuEChERS**. Method for the Analysis of Pesticide Residues in Low-Fat Products. www.quechers.com. (2008)

These products make simple to prepare your food samples for analysis with:

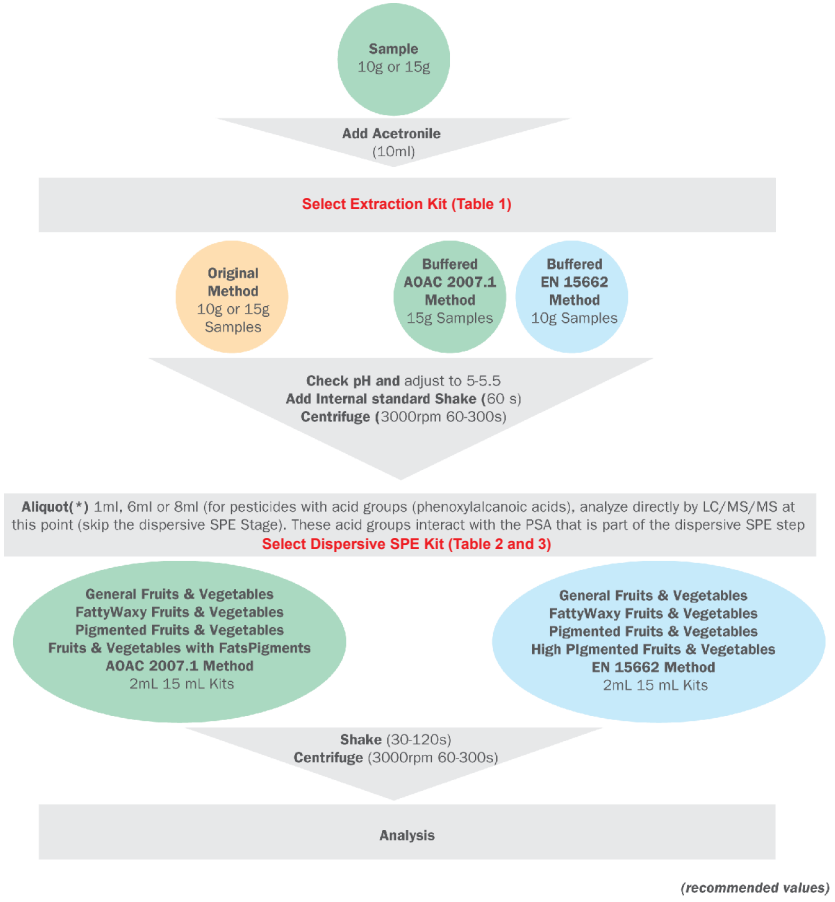
- High recoveries
- Accurate results
- High sample throughput
- Minimal solvent use
- Less labor
- Lower costs
- Simple glassware

We offer QuEChERS extraction and dispersive SPE products in a variety of standard size and formats.

Extraction kits contain preweighed salt, so you can add them after the acetonitrile step, protecting the integrity of your sample.

Dispersive SPE kits are assembled in 2 mL and 15 mL sizes, preweighed are premixed with just the right mixture of salts and sorbents for your aliquot volume.

Quechers Finisterre™



(recommended values)

PHASE 1: Extraction

Adding solvent and salts to a small (10 or 15 g) fruit or vegetable sample enables to extract the pesticides into the organic layer.

PHASE 1 Extraction KIT - Table 1
50mL Centrifuge Tubes for Sample Extraction

P/N	Description	Qty.	Recommended Application
TR-Q5010	4g MgSO4, 1g NaCl, 1g trisodium citrate dihydrate, 0,5g disodium hydrogencitrate sesquihydrate	50	European EN-15662
TR-Q5040	6g MgSO4, 1,5g NaOAc	50	AOAC 2007.01
TR-Q5020	4g MgSO4, 1g NaCl	50	Mini-Multiresidue (10 g sample)
TR-Q5045	6g MgSO4, 1,5g NaCl	50	Mini-Multiresidue (15 g sample)
TR-Q5030	6g MgSO4, 1,5g NaCl, 1,5g sodium citrate dibasic, 750mg disodium citrate dibasic sesquihydrate	50	
TR-Q5050	6g MgSO4, 1,5g NaOAc, 750mg disodium citrate sesquihydrate	50	

PHASE 2: Dispersive SPE Clean-up

Select the dispersive SPE kit according to the type of food being analyzed and the method that you want to use. One aliquot (*) of the sample extract from Phase 1 is added to 2 mL or 15 mL centrifuge tubes (Table 2 or Table 3) containing a small quantity of SPE sorbent and MgS04.

PHASE 2 Dispersive SPE KIT Clean-Up - Table 2

2 mL Micro-centrifuge tubes

P/N	Description	Qty.	Aliquot (mL) (*)	Recommended Application
TR-Q2015	150mg MgSO4, 25mg PSA	100	1	European EN-15662 Mini-Multiresidue
TR-Q2025	150mg MgSO4, 25mg PSA, 25mg C18	100	1	European EN-15662 Mini-Multiresidue
TR-Q2035	150mg $MgSO_4$, 25mg PSA, 2,5mg GCB	100	1	European EN-15662 Mini-Multiresidue
TR-Q2045	150mg $MgSO_4$, 25mg PSA, 7,5mg GCB	100	1	European EN-15662 Mini-Multiresidue
TR-Q2055	150mg $MgSO_4$, 50mg PSA	100	1	AOAC 2007.01
TR-Q2065	150mg $MgSO_4$, 50mg PSA, 50mg C18	100	1	AOAC 2007.01
TR-Q2075	150mg $MgSO_4$, 50mg PSA, 50mg GCB	100	1	AOAC 2007.01
TR-Q2085	150mg $MgSO_4$, 50mg PSA, 50mg C18, 50mg GCB	100	1	AOAC 2007.01
TR-Q2090	150mg MgSO4, 25mg C18	100	1	AOAC 2007.01
TR-Q2095	150mg MgSO4, 50mg PSA, 50mg C18, 7,5mg GCB	100	1	

15 mL Centrifuge tubes - Table 3

P/N	Description	Qty.	Aliquot (mL) (*)	Recommended Application
TR-Q1590	900mg $MgSO_4$, 150mg PSA	50	6	European EN-15662
TR-Q1593	900mg $MgSO_4$, 150mg PSA, 150mg C18	50	6	European EN-15662
TR-Q1591	900mg $MgSO_4$, 150mg PSA, 15mg GCB	50	6	European EN-15662
TR-Q1592	900mg $MgSO_4$, 150mg PSA, 45mg GCB	50	6	European EN-15662
TR-Q1510	1200mg $MgSO_4$, 400mg PSA	50	8	AOAC 2007.01
TR-Q1525	1200mg MgSO4, 400mg PSA, 400mg C18, 60mg GCB	50	8	AOAC 2007.01
TR-Q1515	1200mg $MgSO_4$, 400mg PSA, 400mg C18	50	8	AOAC 2007.01
TR-Q1516	1200mg $MgSO_4$, 400mg PSA, 400mg GCB	50	8	AOAC 2007.01
TR-Q1520	1200mg $MgSO_4$, 400mg PSA, 400mg C18, 400mg GCB	50	8	AOAC 2007.01
TR-Q1596	900mg $MgSO_4$, 150mg C18	50	6	AOAC 2007.01
TR-Q1594	900mg $MgSO_4$, 300mg PSA, 150mg GCB	50	6	---
TR-Q1593	900mg $MgSO_4$, 150mg PSA, 150mg C18	50	6	---
TR-Q1595	900mg $MgSO_4$, 300mg PSA, 150mg C18	50	6	---
TR-Q1600	750mg $MgSO_4$, 250mg PSA, 250mg C18, 250 mg GCB	50	6	---
TR-Q501015	4g MgSo4, 1g NaCl, 1g Trisodium Citrate dhydrate, 0,5g disodium hydrogencitrate sesquihydrate	50	6	---
TR-Q1700	900 mg Na_2SO_4, 1000mg PSA, 1000mg C18	50	6	

PSA= Primary and secondary exchange material

GCB= Graphitized carbon blank

Quechers Finisterre™

2 mL Easy lock Micro-centrifuge tubes

P/N	Description	Qty.	Aliquot (mL) (*)	Recommended Application
TR-Q2015C	150mg MgSO4, 25mg PSA	100	1	European EN-15662 Mini-Multiresidue
TR-Q2025C	150mg MgSO4, 25mg PSA, 25mg C18	100	1	European EN-15662 Mini-Multiresidue
TR-Q2035C	150mg $MgSO_4$, 25mg PSA, 2,5mg GCB	100	1	European EN-15662 Mini-Multiresidue
TR-Q2045C	150mg $MgSO_4$, 25mg PSA, 7,5mg GCB	100	1	European EN-15662 Mini-Multiresidue
TR-Q2055C	150mg $MgSO_4$, 50mg PSA	100	1	AOAC 2007.01
TR-Q2065C	150mg $MgSO_4$, 50mg PSA, 50mg C18	100	1	AOAC 2007.01
TR-Q2075C	150mg $MgSO_4$, 50mg PSA, 50mg GCB	100	1	AOAC 2007.01
TR-Q2085C	150mg $MgSO_4$, 50mg PSA, 50mg C18, 50mg GCB	100	1	AOAC 2007.01
TR-Q2090C	150mg MgSO4, 25mg C18	100	1	AOAC 2007.01
TR-Q2095C	150mg MgSO4, 50mg PSA, 50mg C18, 7,5mg GCB	100	1	

Selection Guide for Dispersive Kits. Phase 2

		Methods			
Types	**Qt Pack**	**EN 15662**	**AOAC 2007.1**	**Mini Multiresidue**	**Others**
General Fruits and Vegetables: **Removes polar organic acids, some sugars and lipids**					
	100 tubes 2 mL	25 mg PSA 150 mg MgSO4 **Part Nº TR-Q2015**	50 mg PSA 150 mg MgSO4 **Part No. TR-Q2055**	25 mg PSA 150 mg MgSO4 **Part No. TR-Q2015**	
	50 tubes 15 mL	150 mg PSA 900 mg MgSO4 **Part No. TR-Q1590**	400 mg PSA 1200 mg MgSO4 **Part No. TR-Q1510**		
Fruits and Vegetables with Fats and Waxes: **Removes polar organic acids, some sugars, more lipids and sterols**					
	100 tubes 2 mL	25 mg PSA 25 mg C18 150 mg MgSO4 **Part No.TR-Q2025**	50 mg PSA 50 mg C18 150 mg MgSO4 **Part No. TR-Q2065**	25 mg PSA 25 mg C18 150 mg MgSO4 **Part No. TR-Q2025**	
	50 tubes 15 mL	150 mg PSA 150 mg C18 900 mg MgSO4 **Part No. TR-Q1593**	400 mg PSA 400 mg C18 1200 mg MgSO4 **Part No. TR-Q1515**		150 mg PSA 150 mg C18 900 mg MgSO4 **TR-Q1593**

Selection Guide for Dispersive Kits. Phase 2

Pigmented Fruits and Vegetables:
Removes polar organic acids, some sugars and lipids, and carotinoides and chlorophyll; not for use with planar pesticides

		Methods			
Types	**Qt Pack**	**EN 15662**	**AOAC 2007.1**	**Mini Multiresidue**	**Others**
	100 tubes 2 mL	25 mg PSA 2.5 mg GCB 150 mg MgSO4 **Part No.TR-Q2035**	50 mg PSA 50 mg GCB 150 mg MgSO4 **Part No. TR-Q2075**	25 mg PSA 2,5 mg GCB 150 mg MgSO4 **Part No. TR-Q2035**	50 mg PSA 50 mg GCB 150 mg MgSO4 **TR-Q2075**
	50 tubes 15 mL	150 mg PSA 400 mg GCB 900 mg MgSO4 **Part No. TR-Q1591**	400 mg PSA 400 mg C18 1200 mg MgSO4 **Part No. TR-Q1516**		
	50 tubes 15 mL	150 mg PSA 45 mg GCB 900 mg MgSO4 **Part No. TR-Q1592**			300 mg PSA 150 mg GCB 900 mg MgSO4 **TR-Q1594**

Fruits and Vegetables with Pigments and Fats:
Removes polar organic acids, some sugars and lipids, plus carotinoides and chlorophyll; not for use with planar pesticides

	100 tubes 2 mL	50 mg PSA 50 mg C18 50 mg GCB 150 Mg MgSO4 **Part No. TR-Q2085**	25 mg PSA 7,5 mg GCB 150 mg MgSO4 **Part No. TR-Q2045**	
	50 tubes 15 mL	400 mg PSA 400 mg C18 400 mg GCB 1200 Mg MgSO4 **Part No. TR-Q1520**		

QuEChERS Finisterre by Teknokroma™

15 mL Centrifuge tubes

2 mL Micro-centrifuge tubes

2 mL Easy lock Micro-centrifuge tubes

Quechers Finisterre™

PHASE 1: Extraction

Adding solvent and salts to a small (10 or 15 g) fruit or vegetable sample enables to extract the pesticides into the organic layer.

PHASE 1 Extraction Pouches - Table 1
QuEChERS Salt/Sorbent Pouches for Sample Extraction

P/N	Description	Qty.	Recommended Application
TR-Q5010K	4g $MgSO_4$, 1g NaCl, 1g trisodium citrate dihydrate, 0,5g disodium hydrogencitrate sesquihydrate	50	European EN-15662
TR-Q5040K	6g $MgSO_4$, 1,5g NaOAc	50	AOAC 2007.01
TR-Q5020K	4g $MgSO_4$, 1g NaCl	50	Mini-Multiresidue (10 g sample)
TR-Q5045K	6g $MgSO_4$, 1,5g NaCl	50	Mini-Multiresidue (15 g sample)
TR-Q5030K	6g $MgSO_4$, 1,5g NaCl, 1,5g sodium citrate dibasic, 750mg disodium citrate dibasic sesquihydrate	50	
TR-Q5050K	6g $MgSO_4$, 1,5g NaOAc, 750mg disodium citrate sesquihydrate	50	

PHASE 2: Dispersive SPE Clean-up Pouches for 2 or 15ml tubes

Select the dispersive SPE kit according to the type of food being analyzed and the method that you want to use. One aliquot (*) of the sample extract from Phase 1 is added to 2 mL or 15 mL centrifuge tubes (Table 2 or Table 3) containing a small quantity of SPE sorbent and MgS04.

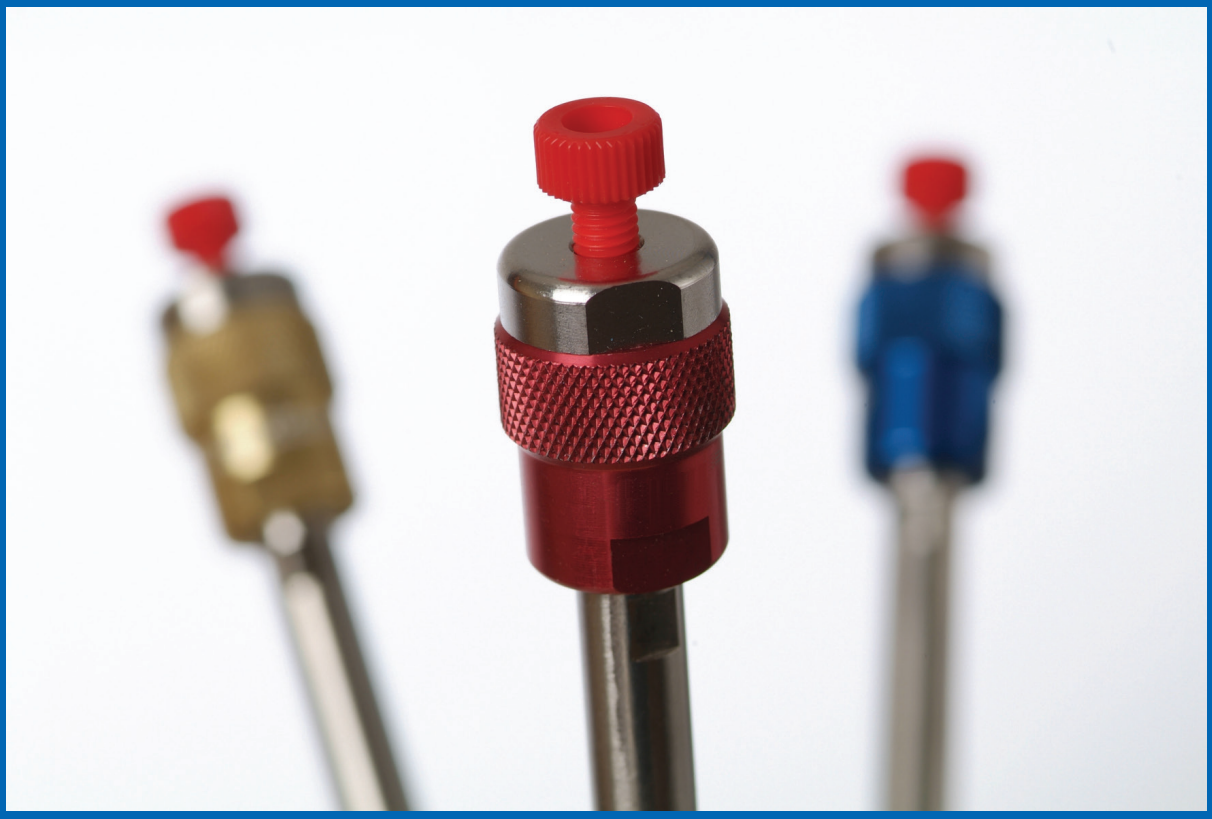
Table 1 Pouches for 2ml tubes

P/N	Description	Qty.	Aliquot (mL) (*)	Recommended Application
TR-Q2015K	150mg $MgSO_4$, 25mg PSA	50	1	European EN-15662 Mini-Multiresidue
TR-Q2025K	150mg $MgSO_4$, 25mg PSA, 25mg C18	50	1	European EN-15662 Mini-Multiresidue
TR-Q2035K	150mg $MgSO_4$, 25mg PSA, 2,5mg GCB	50	1	European EN-15662 Mini-Multiresidue
TR-Q2045K	150mg $MgSO_4$, 25mg PSA, 7,5mg GCB	50	1	European EN-15662 Mini-Multiresidue
TR-Q2055K	150mg $MgSO_4$, 50mg PSA	50	1	AOAC 2007.01
TR-Q2065K	150mg $MgSO_4$, 50mg PSA, 50mg C18	50	1	AOAC 2007.01
TR-Q2075K	150mg $MgSO_4$, 50mg PSA, 50mg GCB	50	1	AOAC 2007.01
TR-Q2085K	150mg $MgSO_4$, 50mg PSA, 50mg C18, 50mg GCB	50	1	AOAC 2007.01
TR-Q2090K	150mg $MgSO_4$, 25mg C18	50	1	AOAC 2007.01
TR-Q2095K	150mg $MgSO_4$, 50mg PSA, 50mg C18, 7,5mg GCB	50	1	AOAC 2007.01

Table 2 Pouches for 15ml tubes

P/N	Description	Qty.	Aliquot (mL) (*)	Recommended Application
TR-Q1590K	900mg $MgSO_4$, 150mg PSA	50	6	European EN-15662
TR-Q1593K	900mg $MgSO_4$, 150mg PSA, 150mg C18	50	6	European EN-15662
TR-Q1591K	900mg $MgSO_4$, 150mg PSA, 15mg GCB	50	6	European EN-15662
TR-Q1592K	900mg $MgSO_4$, 150mg PSA, 45mg GCB	50	6	European EN-15662
TR-Q1510K	1200mg $MgSO_4$, 400mg PSA	50	8	AOAC 2007.01
TR-Q1525K	1200mg MgSO4, 400mg PSA, 400mg C18, 60mg GCB	50	8	AOAC 2007.01
TR-Q1515K	1200mg $MgSO_4$, 400mg PSA, 400mg C18	50	8	AOAC 2007.01
TR-Q1516K	1200mg $MgSO_4$, 400mg PSA, 400mg GCB	50	8	AOAC 2007.01
TR-Q1520K	1200mg $MgSO_4$, 400mg PSA, 400mg C18, 400mg GCB	50	8	AOAC 2007.01
TR-Q1596K	900mg $MgSO_4$, 150mg C18	50	6	AOAC 2007.01
TR-Q1594K	900mg $MgSO_4$, 300mg PSA, 150mg GCB	50	6	---
TR-Q1593K	900mg $MgSO_4$, 150mg PSA, 150mg C18	50	6	---
TR-Q1595K	900mg $MgSO_4$, 300mg PSA, 150mg C18	50	6	---
TR-Q1600K	750mg $MgSO_4$, 250mg PSA, 250mg C18, 250 mg GCB	50	6	---
TR-Q501015K	4g MgSo4, 1g NaCl, 1g Trisodium Citrate dhydrate, 0,5g disodium hydrogencitrate sesquihydrate	50	6	---
TR-Q1700K	900 mg Na_2SO_4, 1000mg PSA, 1000mg C18	50	6	---

***NOTE:** If you want the pouches plus the tubes just add a **"T"** to the P/N like the below example
TR-Q1590KT: 900mg $MgSO_4$, 150 mg PSA in pouches plus 15 ml Tubes ***




200 µL
100 µL
20 µL
Tecnokroma
LOAD
INJECT

HPLC Chromatography

USP Column Listing

L1	Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 3 to 10 µm in diameter.	MEDITERRANEA SEA18 TRACER EXCEL 120 ODS A TRACER EXCEL 120 ODS B Brisa 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

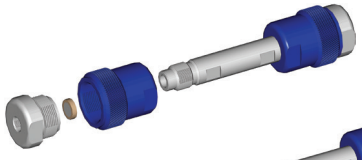
Column	Efficiency (N/m)	AS (10%)
mediterranea sea18 Column 3 µm 5 x 0,46 cm Ultrafit™ System	134904	1,11
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Prefilter Ultrafilter™	135042	1,05
mediterranea sea18 Column 3 µm 5 x 0,46 cm with Precolumn Ultraguard™	137819	1,07

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

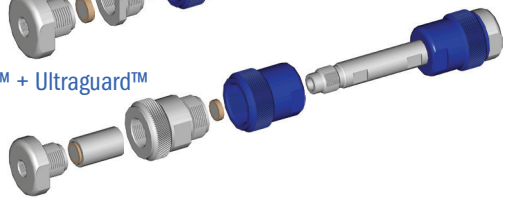
Ultrafit™ System Configuration

Ultrafit™

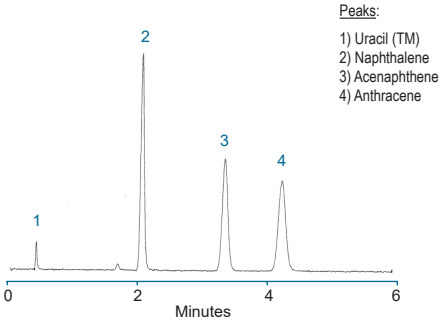


Ultrafit™ + Ultrafiter™

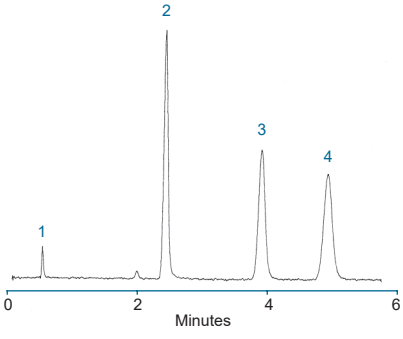
UltrafitT™ + Ultraguard™



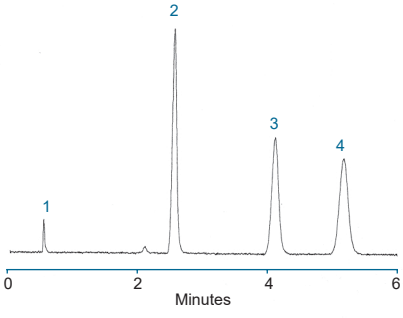
Our Columns Mediterranea™, Europa Peptides, Europa Proteins & Tracer Excel are built with the new Ultrafit ™ System



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

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.

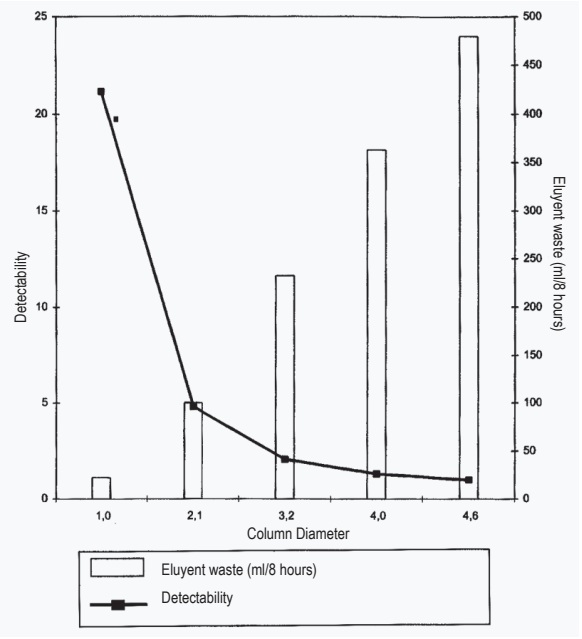
Instrumentation

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.

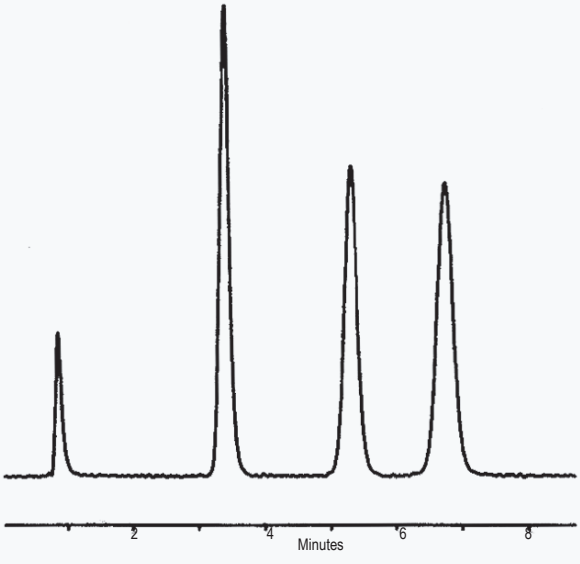
Economy

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.

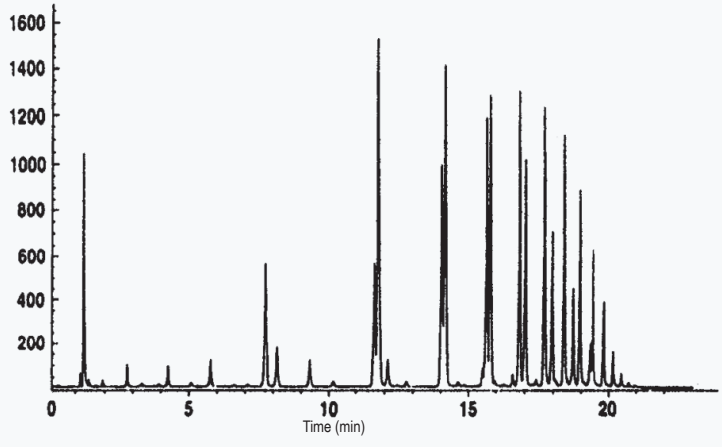


Sample:
1. Uracil
2. Naphtalene
3. Acenaphthene
4. Anthracene

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

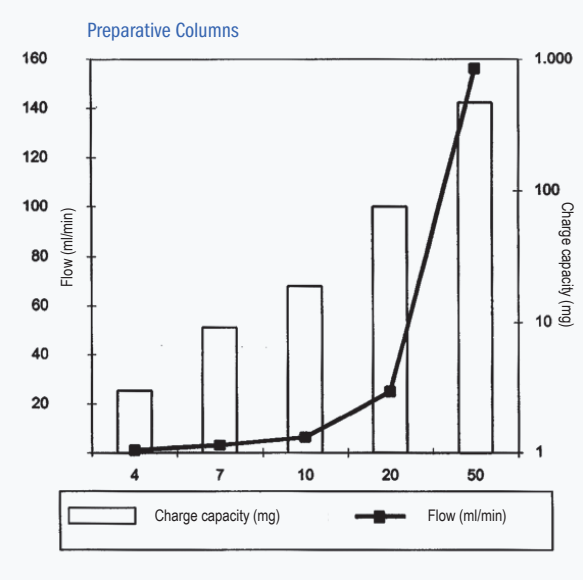
Column: Tracer Extrasil ODS2 3µ 3,5 x 0,46 cm

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
TR-C-460	Holder for 2 cm guard columns
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

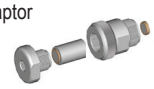
Product	Description	Cat.Nbr.
Ultrafilter™	Ultrafit prefilter adaptor *(frit not included)*	**TR-010067**
	Frits of 0.5 µm pore (10 units)	**TR-010069**
	Frits of 2.0 µm pore (10 units)	**TR-010070**
Ultraguard™	Ultrafit Guardcolumn adaptor *(guard column not included)*	**TR-010068**
Guard Column	ODS 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

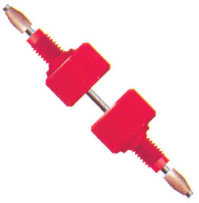
Ultraguard™, Ultrafit Guardcolumn adaptor **TR-010068**
(guard column not included)



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.



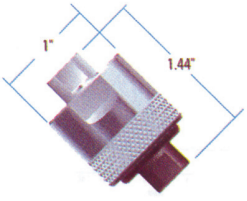
U-284 Union Column-Precolumn

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

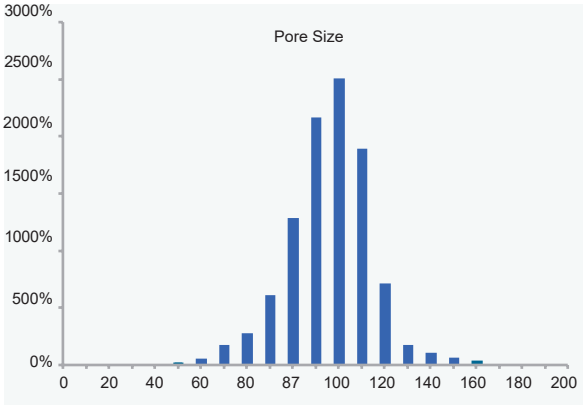
After evaluating many materials as a base for the global-best reverse phase chromatographic packing, the clear consensus is that the special characteristics of silica packings classify them as unsurpassable. No other packing material, apart from ultra-pure silica, achieves the perfect balance of physical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

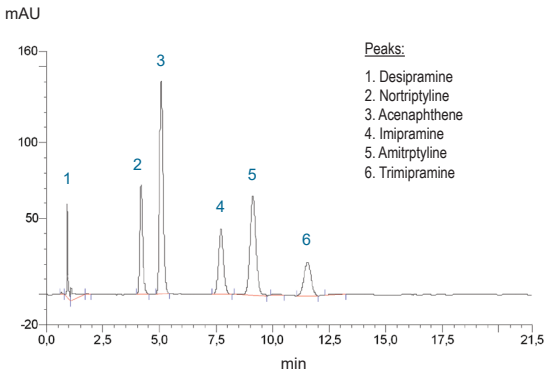
The endcapping process is a critical step in obtaining a perfectly deactivated mediterranea™ sea18 column. Our proprietary Multifunctional Endcapping Deactivation (MED) technology maximizes surface-bonding, blocking practically all the active centres that may have remained on the surface of the silica 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.

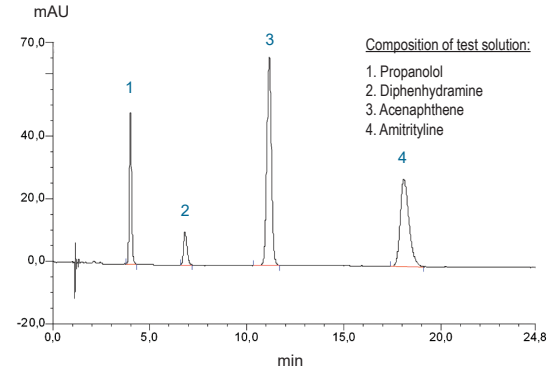
Column	As Acenaphtene	Ncol Acenaphtene	As Amitryptiline	Ncol Amitriptilyne
mediterranea™ sea18 5 µm 15 x 0,46	1,06	11031	1,21	8119
Xterra MSC18 5 µm 15 x 0,39	1,36	6476	1,32	4619
Gemini C18 5 µm 15 x 0,46	1,22	9524	1,23	7490
Nucleosil 100 C18 5 µm 15 x 0,46	1,07	7815	na	na

Tricyclic Anti-depressants

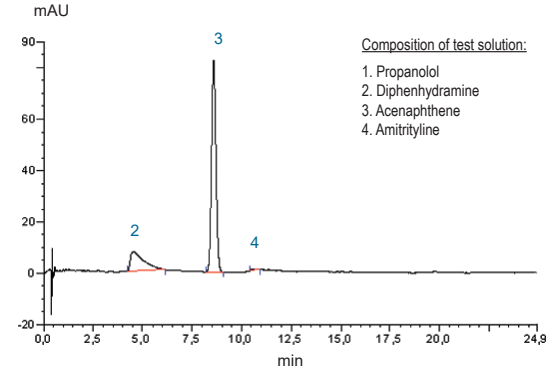


Column: **mediterranea sea 18**, 5 µm 15 x 0,46 cm
Eluent: Methanol/20mM K2HPO4 (pH 7.0) 70:30
Flow: 1ml/min
Room Temperature
Detection: UV 254 nm

Basic Compounds



Column A - mediterranea™ sea 18



Column B - The Competition

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

Aqueous Environments

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

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

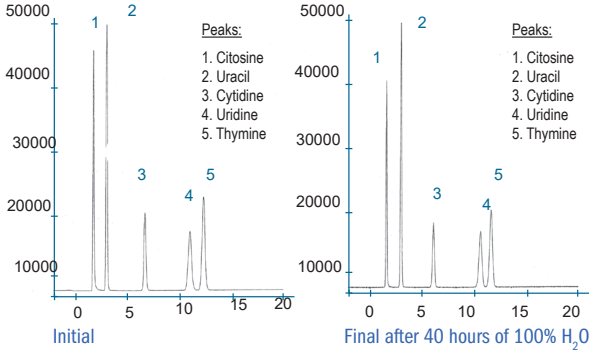
Nevertheless, these advantages are achieved at the expense of less retention for polar compounds, and poor column stability. Polar-embedded packings exhibit chromatographic behavior that cannot be considered as 100% reverse phase, since secondary interaction mechanisms may co-exist due to the nature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

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

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

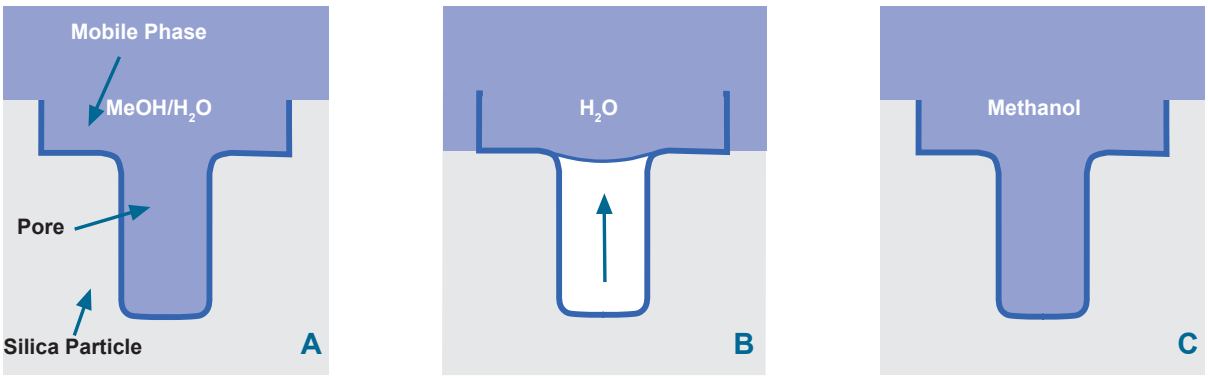
The mediterranea™ sea18 column also widely surpasses the stop flow test, designed to be able to show up the dewetting phenomenon that usually occurs in highly deactivated ODS-type columns, causing irreversible expulsion of water included in the packing pores. As can be seen in the data of five successive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

Aqueous Environments



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

mediterranea™ Sea HPLC Column



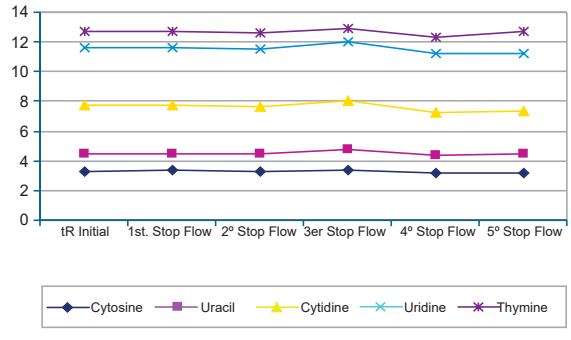
The phenomenon of "Dewetting"

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



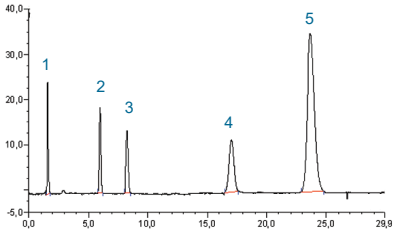
Compound	tR initial	1st stop flow	2nd stop flow	3rd stop flow	4th stop flow	5th stop flow
Cytosine	3,32	3,33	3,3	3,35	3,16	3,21
Uracil	4,45	4,45	4,44	4,75	4,36	4,44
Cytidine	7,73	7,73	7,63	8,00	7,24	7,34
Uridine	11,57	11,57	11,53	12,02	11,25	11,24
Thymine	12,70	12,7	12,62	12,87	12,35	12,70

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.

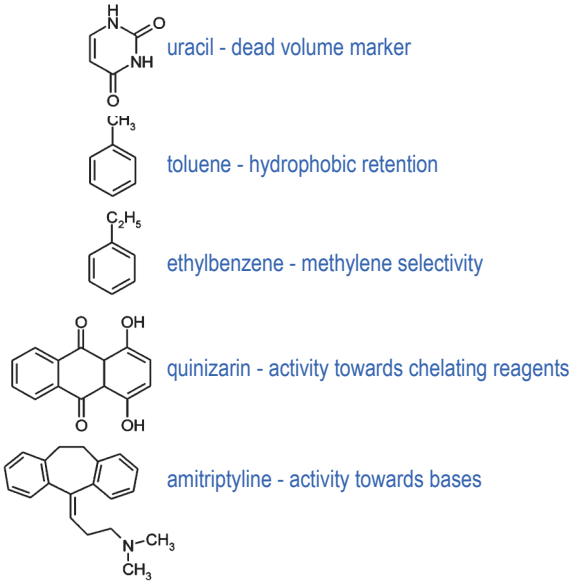
The high number of HPLC reverse phase packings available in the market and the big differences in their chromatographic behaviour has led to the need to design a characterisation and classification method for these packings.
This procedure uses a mixture of five organic components (uracil, toluene, ethylbenzene, 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

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

Toluene/Ethylbenzene

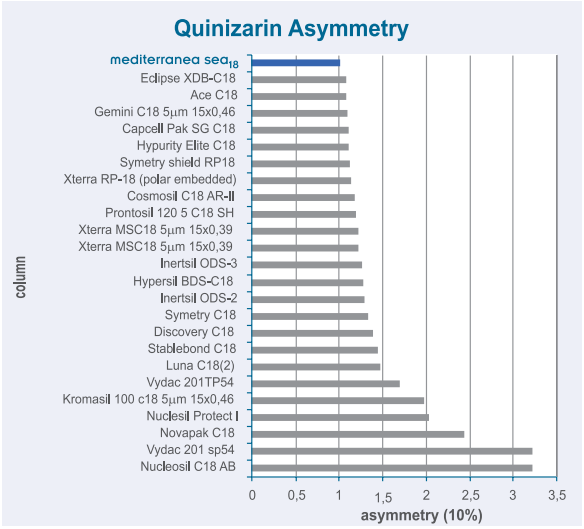
The selectivity factor between these two compounds can be used to characterise the differences between packings primarily due to solvophobic interactions. The absolute retention times of these compounds give an idea of the column reverse-phase strength.
Both compounds can also be used to measure the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

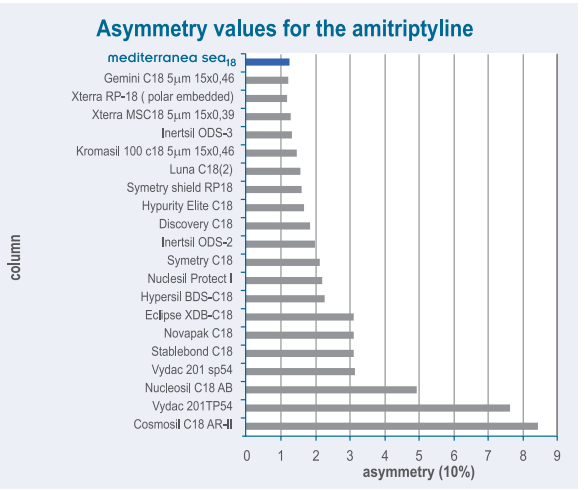
Quinizarin (1,4-dihydroanthraquinone)

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

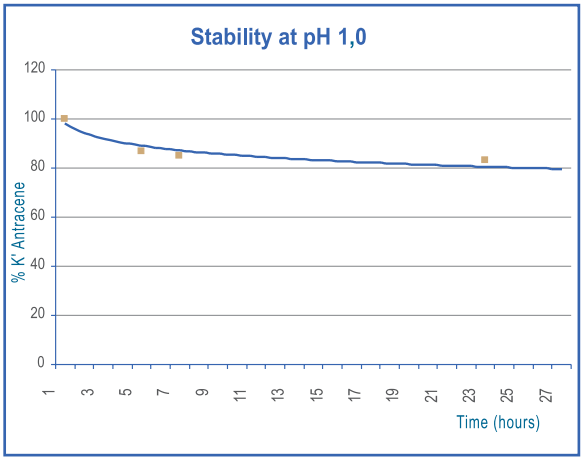
A perfectly spherical particle, a totally controlled pore design, a total lack of metallic traces, a well-studied process of phase bonding and final endcapping, all combine in achieving a packing with a resistance to extreme pH values not previously reached.

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.

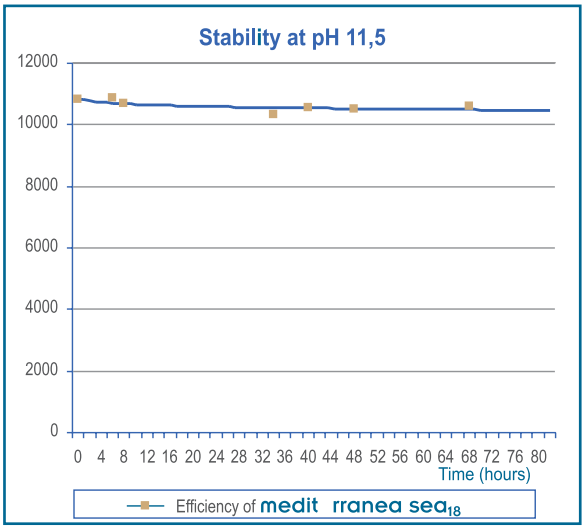
Using mediterranea™ sea18 packing makes it is possible to work with eluents from pH 1 to pH 12. Such unusual pH-resistance values have been secured as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield that impedes acidic and basic eluents from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

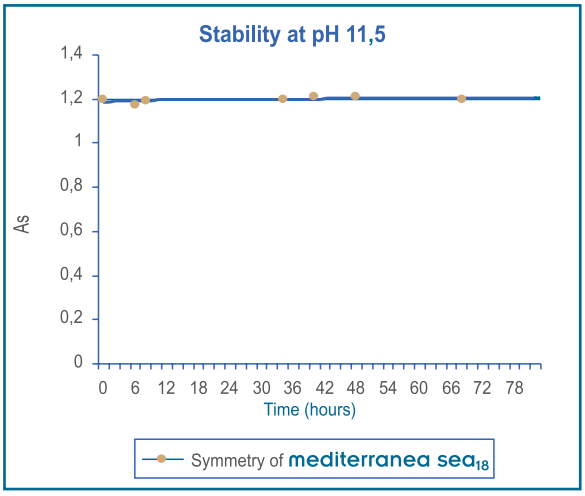
Eluting the mediterranea™ sea18 column for 78 hours at pH 11.5, showed no significant deterioration in terms of both efficiency and peak symmetry for diphenhydramine..

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 made of the last anthracene peak.



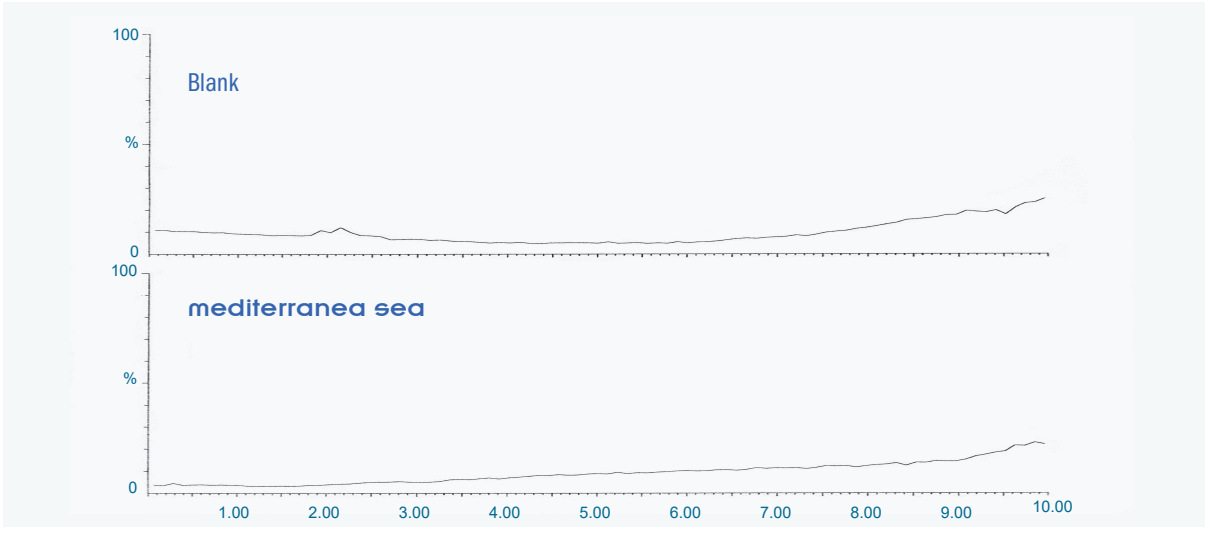


An eluent of ACN//1- methylpyrrolidine 50mM pH 11,5 50:50, 1ml/min 25ºC is passed through the column. With the same eluent 10 ml of diphenhydramine (1mg/ml dissolved in water) is injected and the efficiency and symmetry of the peak is tested.

LC-MS Mediterranea™ Sea 18 Columns

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

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

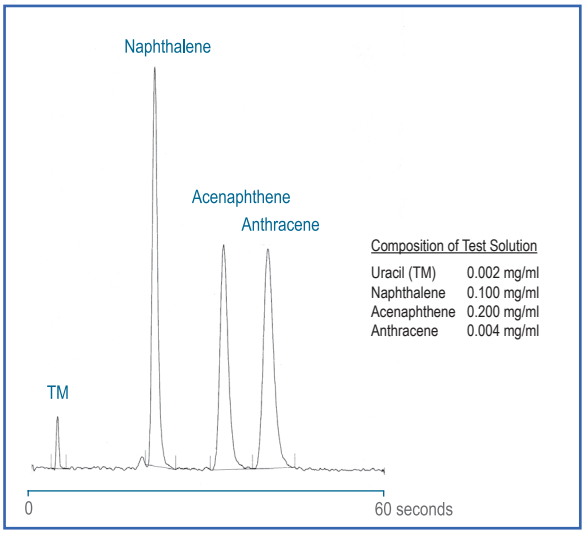
MS Instrument: Waters ZMD
Capillary Voltage: 3kV (ESI positive)
Cone Voltage: 20V
Source block Temp: 100ºC
Desolvation Temp: 350ºC
Gas: 500l/h
Gas of cone: 35 l/h
Mass Range: 60 to100 amu

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.

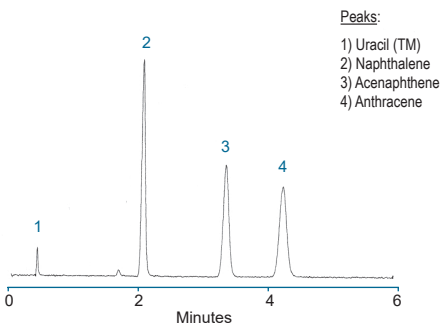
New Hardware Design for Mediterranea™ Column: Ultrafit™ System

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.

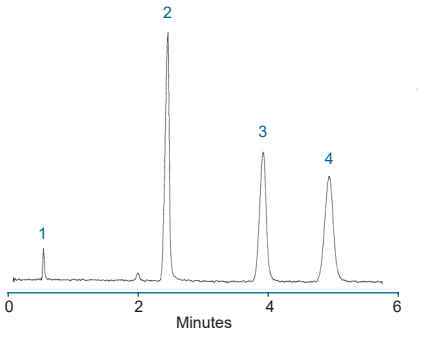
Ultrafit™ System Efficiency

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

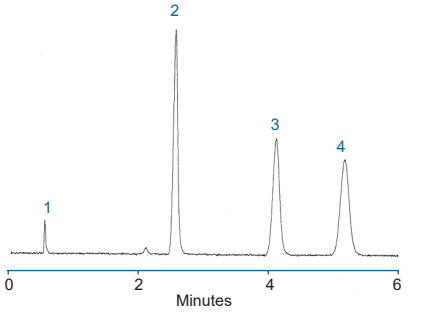
Chromatographic Conditions:
Column: mediterranea™ sea18 3 mm 5 x 0,46 cm
Eluant: Acetonitryle/Water 65:35
Flow: 0,9 ml/min
Det.: UV 254 nm
Temp.: Room
Sample: Acenaphthene 0.2 mg/ml



Column with Ultrafit™ System

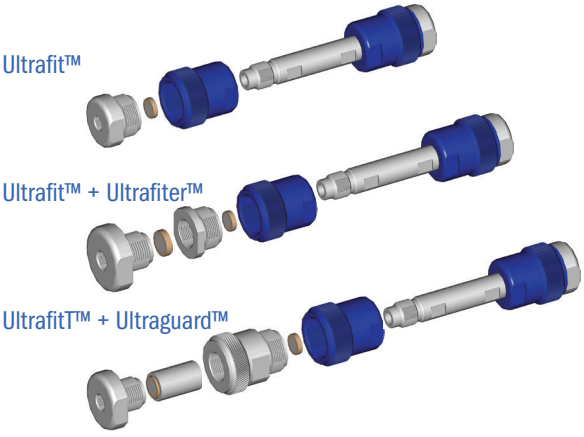


Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Ultrafit™ System Configuration



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

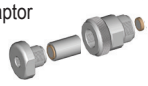
Microbore Columns 0.21 cm ID
mediterranea™ sea 3 µm

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**

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

			Length	Diameter	
Packing	Funct.	µm	cm	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**

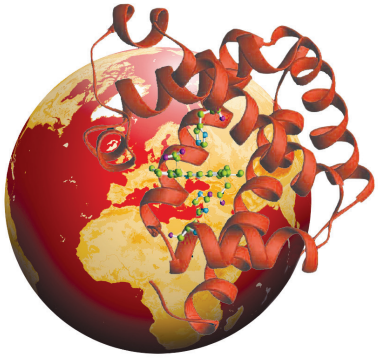
UHPLC Columns
Brisa LC² C18-MS 5 µm

			Length	Diameter	
Packing	Funct.	µm	cm	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

			Length	Diameter	
Packing	Funct.	µm	cm	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

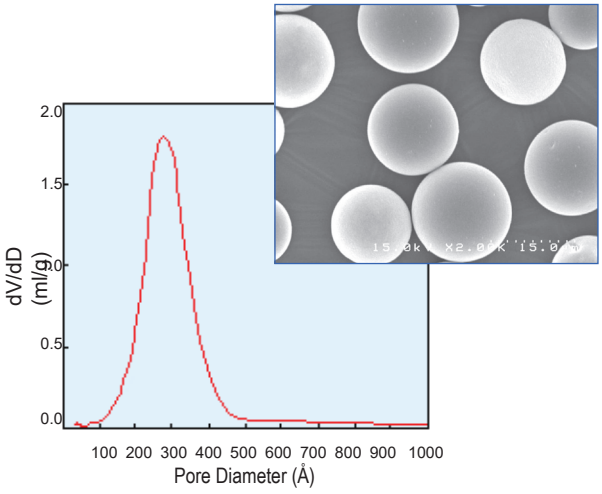
The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

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.

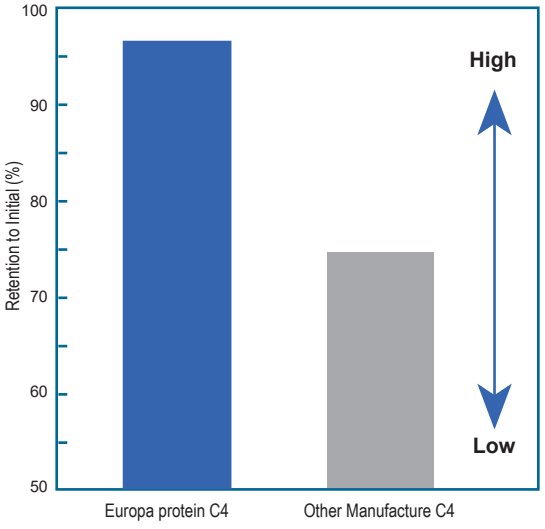
Wide pH Range

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.

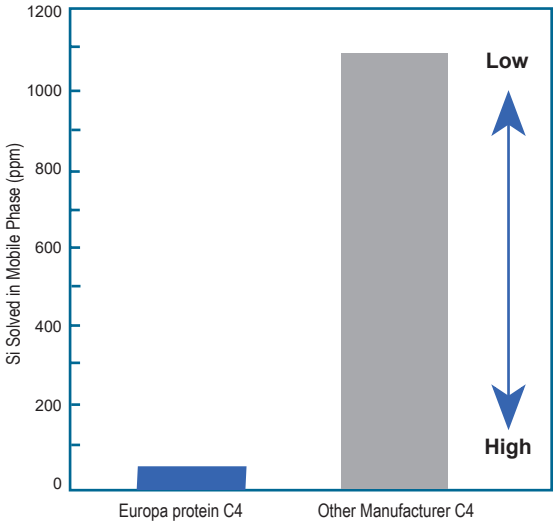
Europa Protein C4 Phase Stability

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

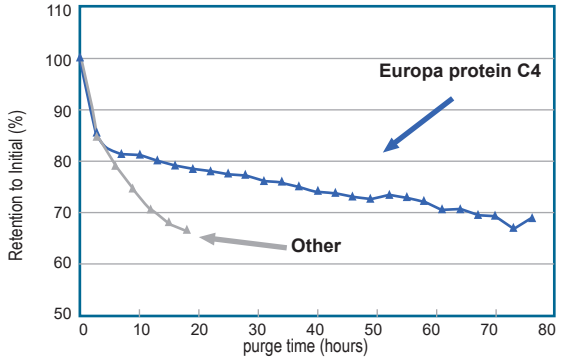


Europa HPLC Column for Peptides and Proteins

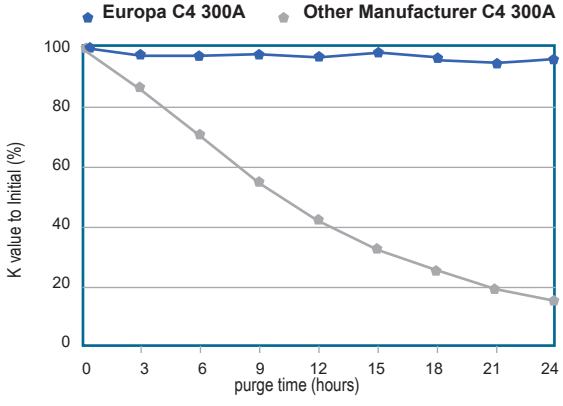
Durability comparison in Alkaline Medium/RT

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.

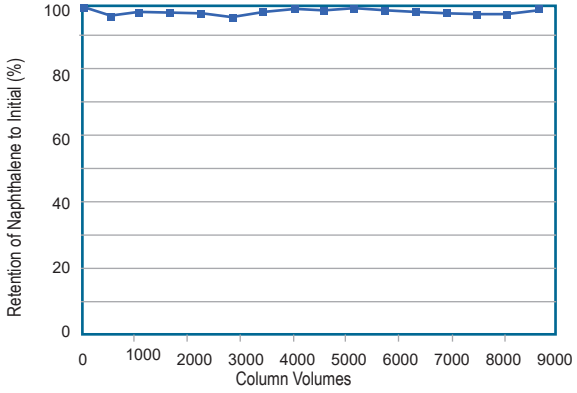


Durability comparison in Acidic Medium / K value



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.

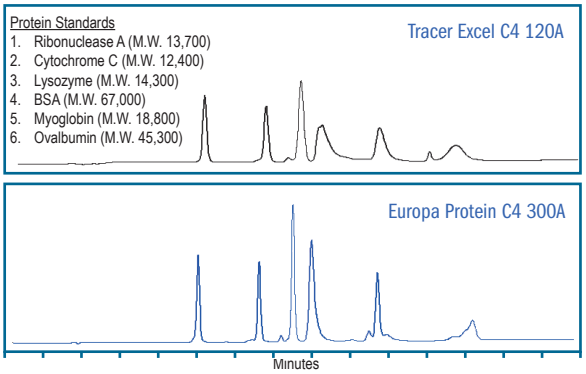
Our **"Ultra-Fast"** columns are made in 3-5 cm length in order to get quick analytical results, whereas the **"High Efficiency"** columns are normally in 15-25cm lengths to obtain the best resolution.

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

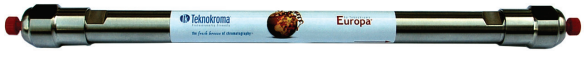
Columns are particularly designed for LC/MS applications.
The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

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

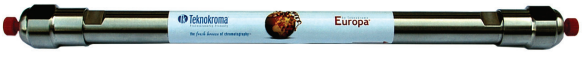
Columns are particularly designed for LC/MS applications. The high detection sensitivity of these columns allows the use of smaller quantities of samples and also decreases the required volume of solvents.

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

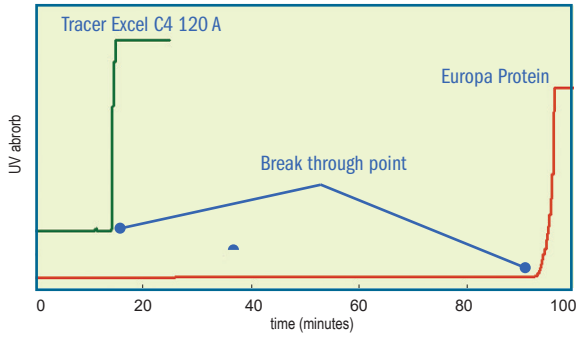
For Guard Columns please refer to pages 193-196

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

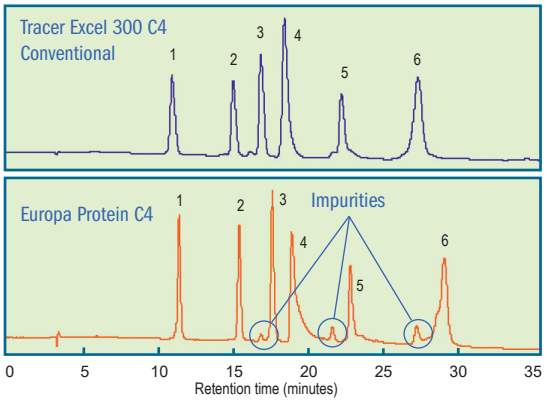


Column: 7 mm I.D. x 250 mm Length; Temperature: 35ºC; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

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

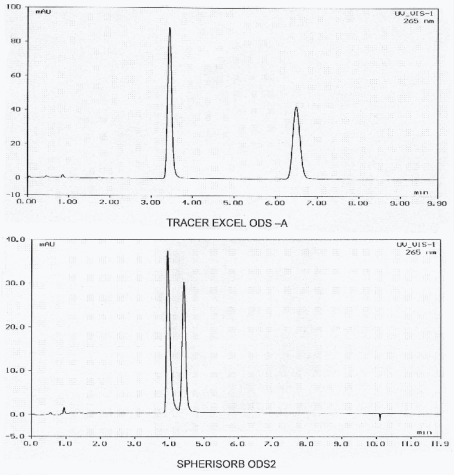
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

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:

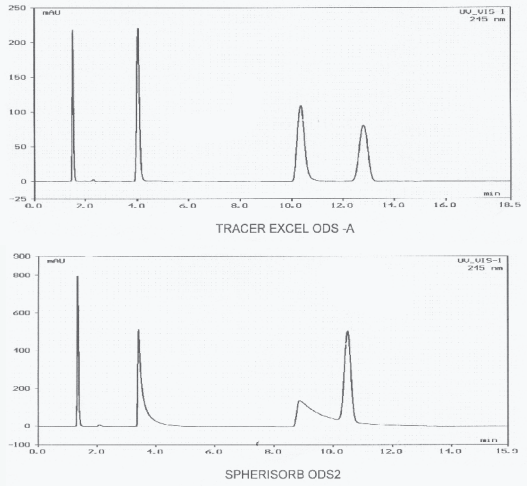
Pyridine 2.1µl/ml
Phenol:14 mg/m

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



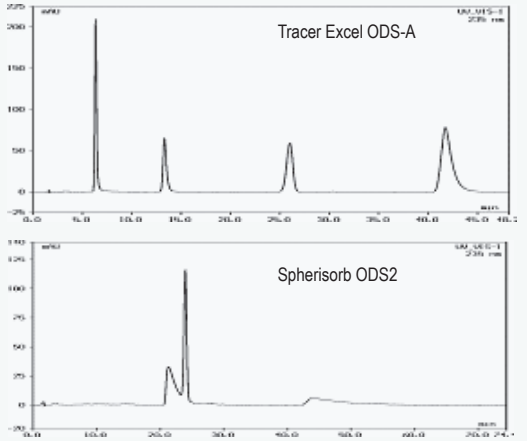
Conditions of test

Eluant : 20 mM KH2PO4pH3.2/CH3CN 65:35
1 ml/min. Temp 40°C 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 25°C UV 235nm

Composition:

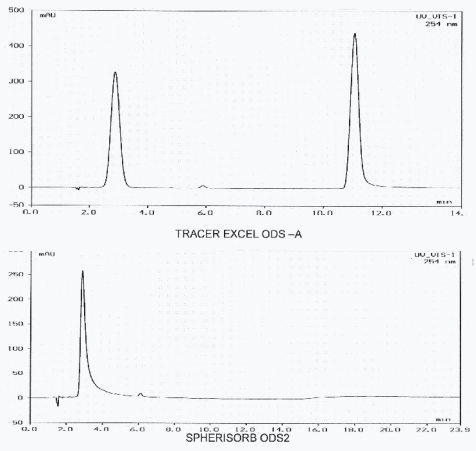
Propanolol: 0.08mg/ml
Diphenidramine :1.28 mg/ml
Acetonaphthalene: 0.2 mg/ml
Amyltryptilene: 0.3 mg/ml

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 30°C 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.

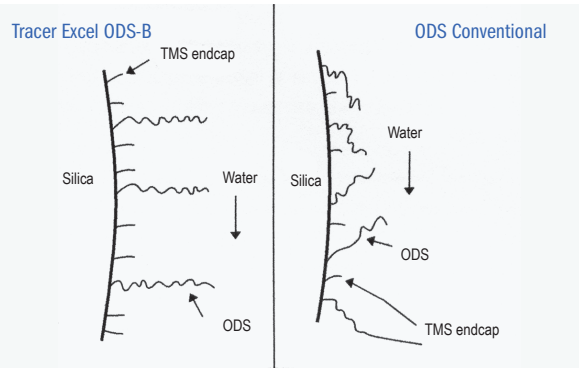
Based on the same principles as the TRACER EXCEL ODS-A columns, the TRACER EXCEL ODS-B column presents a high selectivity for hydrophilic and polar compounds, which are poorly retained on conventional ODS columns.

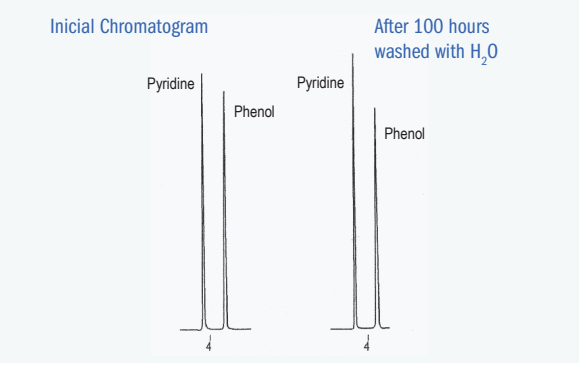
A special modification in the process of functionalizing the pure silica particle prevents the collapsing effect of the C18 chains when working with mainly aqueous eluants. So you can work with excellent chromatographic performance even when the percentage of the aqueous phase is 100%.

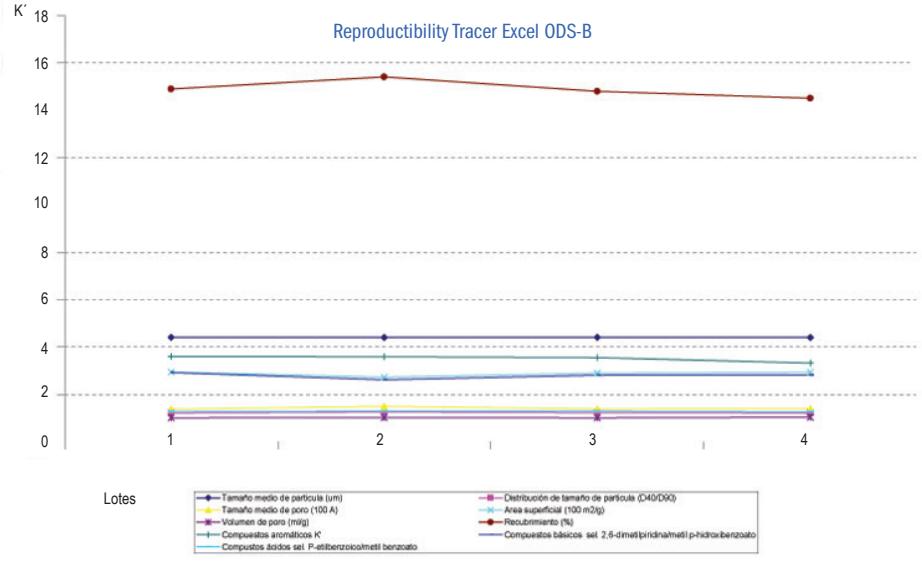
Generally, its field of application is the same as that of the TRACER EXCEL ODS-A, but its field of application is extended for samples which are especially difficult for conventional reversed phases, as is the case in separating oligosaccharides, amino acids, nucleotides and organic acids.

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.





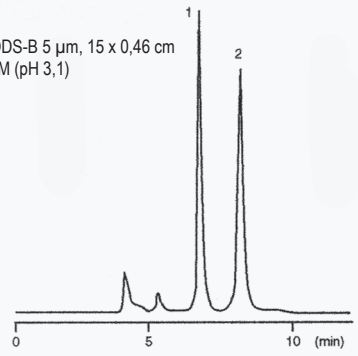


Tracer Excel ODS-B

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

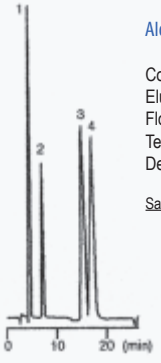
Sample: 1 Calcium Pantothenate
2 Pyridoxine hydrochloride (B_6)
3 Nicotinamide

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

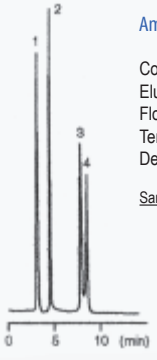
Alcohols



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



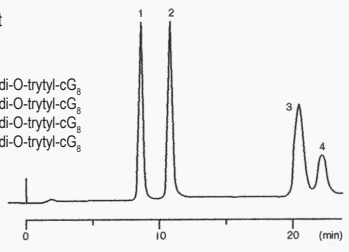
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: H_2O
Flow: 0.6 ml/min.
Temperature: 40ºC
Detector: RID

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

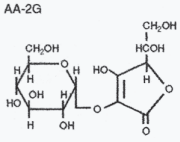
Sample: 1 6^1, 6^5 -di-O-trytyl-cG_8
2 6^1, 6^4 -di-O-trytyl-cG_8
3 6^1, 6^3 -di-O-trytyl-cG_8
4 6^1, 6^2 -di-O-trytyl-cG_8

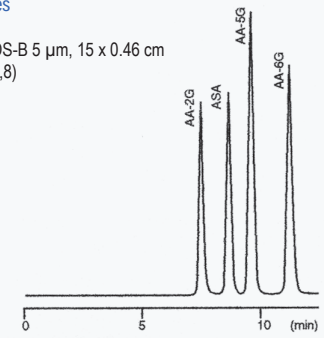


Ascorbic Acid and Glycosides

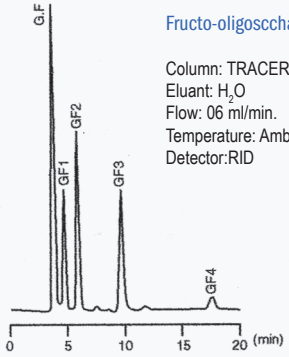
Column: TRACER EXCEL ODS-B 5 µm, 15 x 0.46 cm
Eluant: Phosphate Plug (pH 3,8)
Flow: 04 ml/min.
Temperature: Ambient
Detector:UV240 nm

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

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.

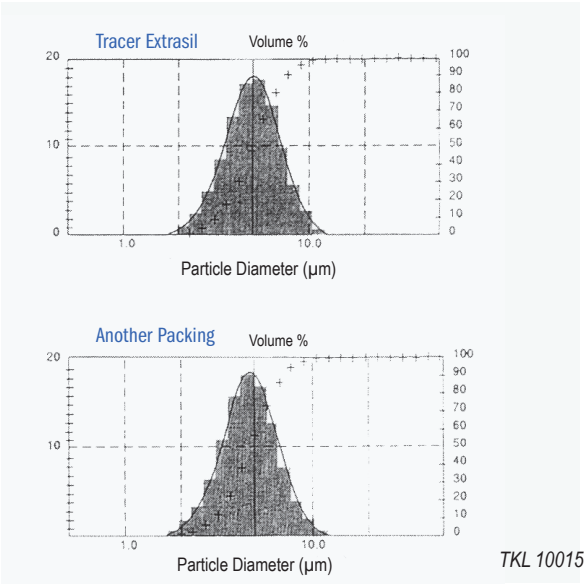
Characteristics

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.

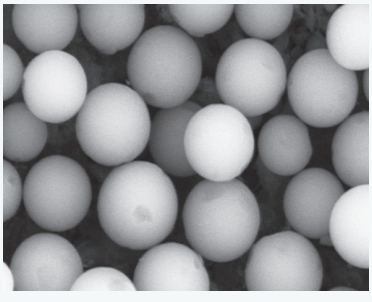


TKL 10015

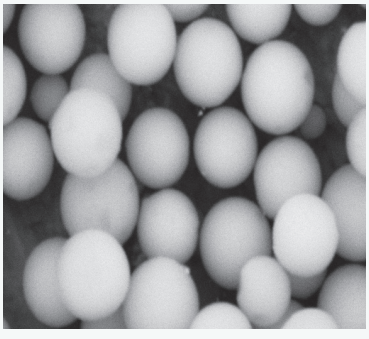
S.E.M. of the silica particle

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

Tracer EXTRASIL



Another Packing

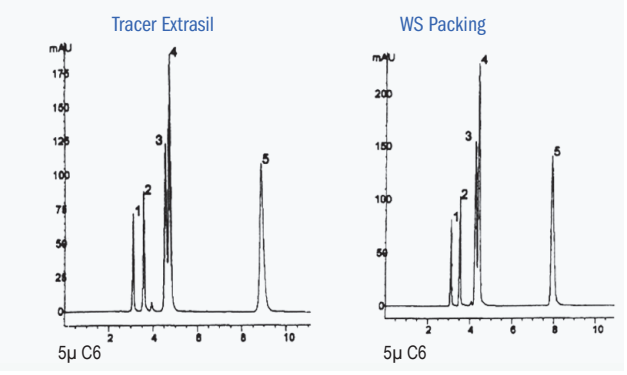


Applications

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.

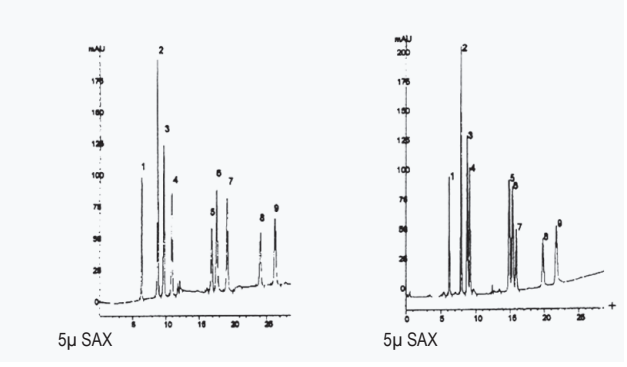
Catecholamines

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



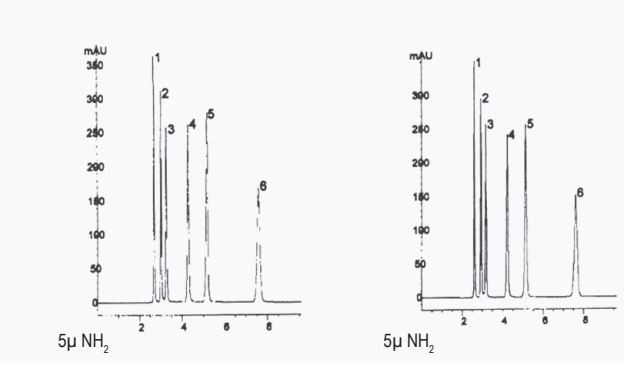
Nucleotides

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



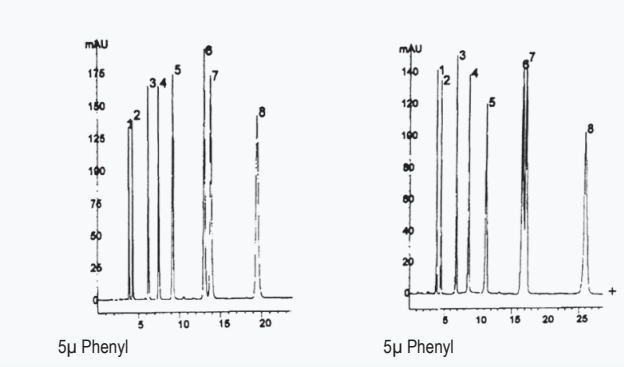
Corticosteroids

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

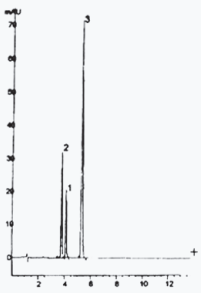
SRM 869

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

Tracer Extrasil

5µ ODS(1)

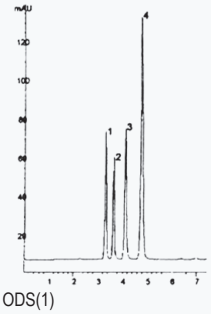
WS Packing



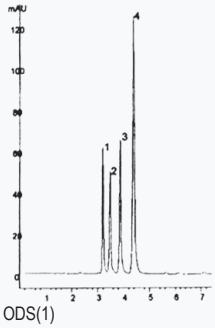
5µ ODS(1)

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



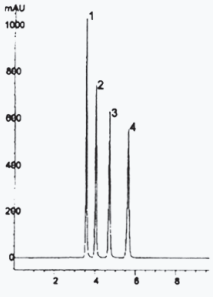
5µ ODS(1)



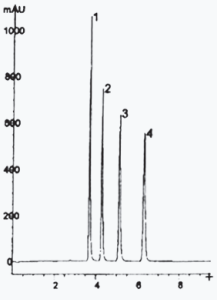
5µ ODS(1)

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



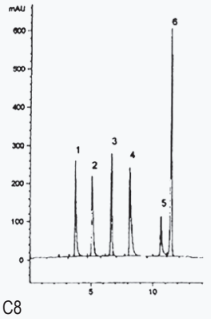
5µ C8



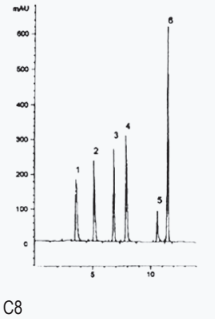
5µ C8

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



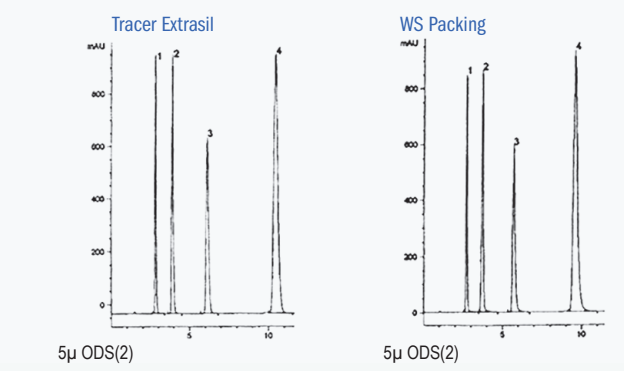
5µ C8



5µ C8

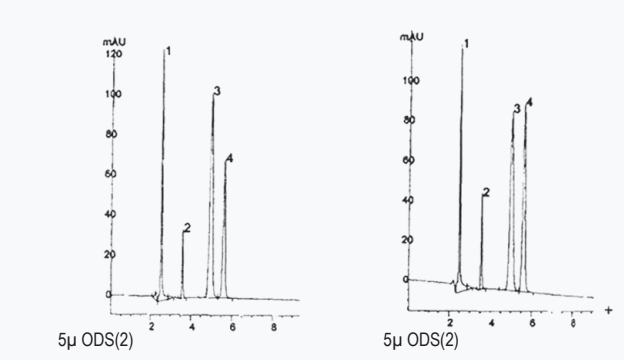
4-Hydroxybenzoat

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



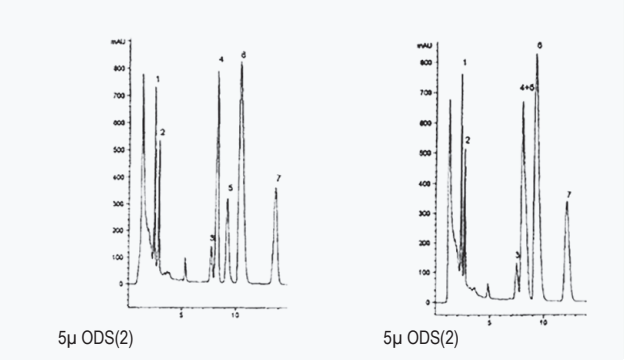
Polar Compounds

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



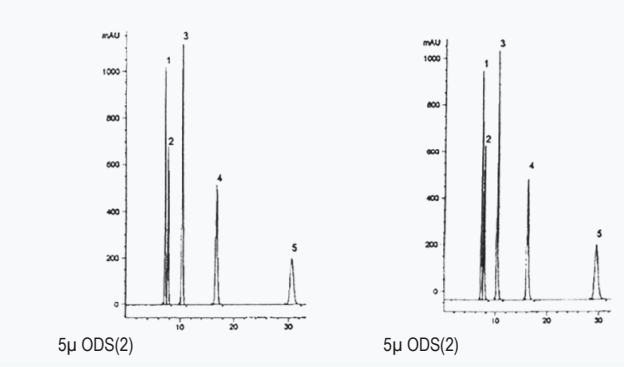
Liposoluble Vitamines

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 Packing
Microbore columns 0.21 cm i.d. HYPERPACK

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

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

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

5 Microns Packing
Semi-preparative columns HYPERPACK

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

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

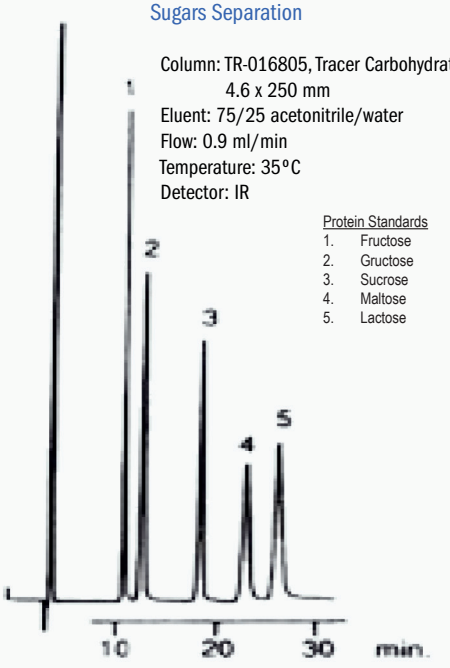
Designed for Carbohydrates Analisys

Reference	Description	Particle Size	Dimensions
		µm	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

Sugars Separation

Column: TR-016805, Tracer Carbohydrates, 4.6 x 250 mm
Eluent: 75/25 acetonitrile/water
Flow: 0.9 ml/min
Temperature: 35°C
Detector: IR

Protein Standards
1. Fructose
2. Gructose
3. Sucrose
4. Maltose
5. Lactose



Tracer Excel PFP & PAH

Tracer Excel PFP

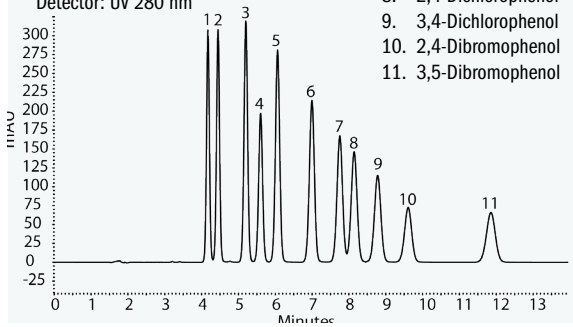
Excel PFP is a endcapped stationary phase with unique selectivity that can be useful for separating halogen-containing compounds, polar analytes, and compounds that contain minor structural differences. Excel PFP can be used at high temperatures (50ºC) over a pH range of 2-8.

- 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.

Column: TR-021520 Tracer Excel PFP, 5 µ 4.6 x 250 mm
Eluent: acetonitrile, 0.1% formic acid 35 water, 0.1% formic acid 65
Flow: 1 ml/min
Temperature: 35°C
Detector: UV 280 nm

1. o-Cresol
2. m-Cresol
3. 3,4-Dimethylphenol
4. 3,5-Dimethylphenol
5. 2,5-Dimethylphenol
6. 2,6-Dichlorophenol
7. 2,3-Dichlorophenol
8. 2,4-Dichlorophenol
9. 3,4-Dichlorophenol
10. 2,4-Dibromophenol
11. 3,5-Dibromophenol



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.

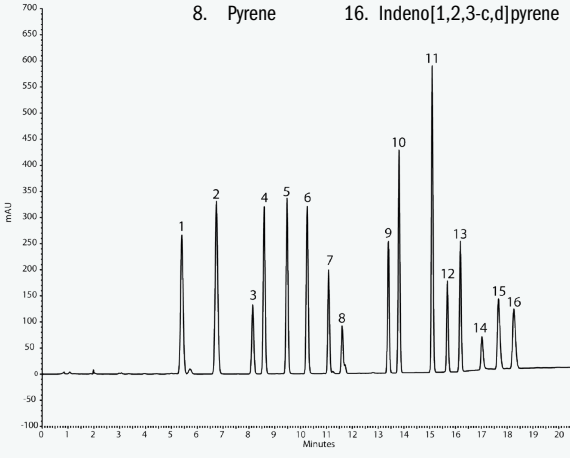
Excel PAH provides a base-line resolution of 16 PAHs priority pollutants in EPA Method 610.

- 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

Column: TR-021615 Tracer Excel PAH, 5u 15 x 0.46 cm Eluent: ACN (A) H_2O (B); Flow rate: 1,5 ml/min; Temperature: 35°C; Detector: UV, 254 nm

t	ACN	H_2O
0	50	50
5	50	50
15	100	100
20	100	100

1. Naphtalene
2. Acenaphtylene
3. Acenaptheno
4. Fluorene
5. Phenatrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benz[a]anthracene
10. Chrysene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Dibenz[a,h]anthracene
15. Benzo[g,h,i]perylene
16. Indeno[1,2,3-c,d]pyrene



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**

Fingertight Fittings

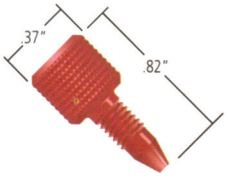
High Pressure Fingertight Fittings

One Piece or Two?

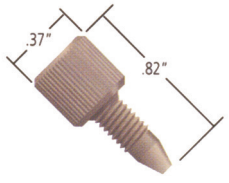
A one-piece fitting is more convenient and less cumbersome, since the ferrule cannot stick in a receiving port and the fitting is more easily found if dropped. With two-Piece Fingertight, you only replace the ferrule instead of the entire unit, making these Fingertights more economical than the one-piece version.

One Piece Fingertight Fittings

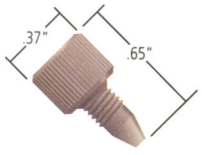
All of our One-Piece Fingertight Fittings are designed to be used with 1/16´´ OD tubing, except the M-645 (1/32´´) and P-100 (1/8´´).



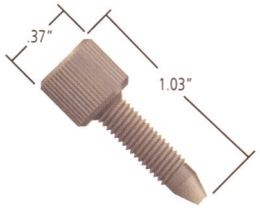
UP-F-100
10-32 Kel-F™ Fiting
Max Pressure 276 bar



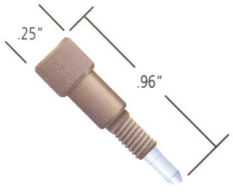
UP-F-120
10-32 PEEK™ Fiting
Max Pressure 414 bar



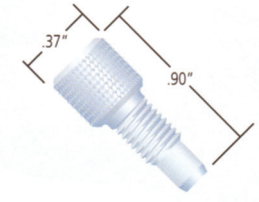
UP-F-127
10-32 PEEK™ Fiting
Max Pressure 414 bar



UP-F-130
10-32 PEEK™ Fiting
Max Pressure 414 bar



UP-M-645
6-40 PEEK/Kel-F™ Fiting
for 1/32´´ OD tubing
Max Pressure 121-224 bar



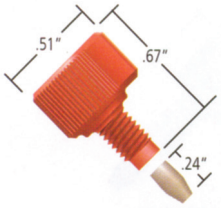
UP-P-100
1/14-28 Kel-F™ Fiting
for 1/8´´ OD tubing
Max Pressure 69 bar

One-Piece Fingertight Fittings[1,2]

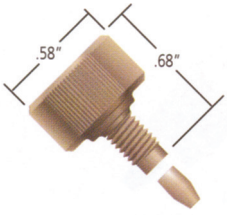
Cat.No.	Description	Qty.
UP-F-100x	Kel-F, Red, 10-32 for 1/16" OD tubing	10-pk
UP-F-120x	PEEK, Natural, 10-32 1/16" OD tubing	10-pk
UP-F-127x	PEEK, Natural, 10-32 Short 1/16" OD tubing	10-pk
UP-F-130x	PEEK, Natural, 10-32 Long 1/16" OD tubing	10-pk
UP-M-645x	PEEK/Kel-F, Natural, 6-40, for 1/32" OD tubing	10-pk
UP-P-100	Kel-F, Natural, 1/4-28, for 1/8" OD tubing	ea.

Two-Piece Fingertight Fittings

Our original Two-Piece Fingertight Fittings were designed exclusively for 1/16" OD tubing. We now offer optional ferrules for connecting 1/32"OD and 190 µm OD tubing with any Fingertight nut on last page. Our M-215 Conductive Perfluorelastomer Ferrule is designed for mass spectrometer electrospray applications.

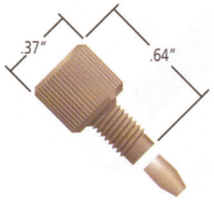


UP-F-200
10-32 Delrin™ Winged Nut
with F-142 PEEK™ Ferrule

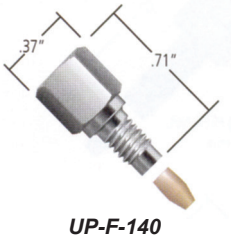


UP-F-300
10-32 PEEK™ Double Winged Nut
with F-142 PEEK™ Ferrule

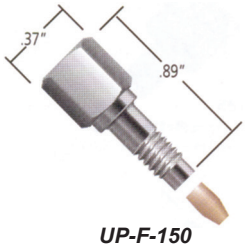
UP-F-330
10-32 PEEK™ Nut
with F-142 PEEK™ Ferrule



UP-F-331
10-32 PEEK™ Nut
with F-142 PEEK™ Ferrule



UP-F-140
10-32 Stainless Steel Nut
with F-142 PEEK™ Ferrule



UP-F-150
10-32 Stainless Steel Nut
with F-142 PEEK™ Ferrule

To order please follow these guidelines:

1/16" OD tubing
Select the desired nut, which comes complete with the appropriate ferrule. Or order the optional UP-F-142N Ferrule, along with the desired nut by replacing the "x" at the end of its product number with "-01". For instance, if you want an UP-F-113 Ferrule Nut, order UP-F-200-01, not UP-F-200x.
Please note: "-0.1" denotes a single nut without the ferrule.

1/32" OD tubing
Select the UP-F-113 Ferrule. Order the desired nut by replacing the "x" at the end of its product number with "-0.1", as described above.

190 µm OD tubing
Select the UP-F-148 Ferrule. Order the desired nut by replacing the "x" at the end of its product number with "-0.1", as described above.

Fingertight Fittings - Stainless Steel Tubing

360-510 µm OD tubing
For electrospray applications, chose the UP-M-215 Conductive Ferrule. Order the desired nut by replacing the "x" at the end of its product number with "-0.1", as described at previous page.

Two-Piece Polymer Fingertight Fittings

Cat.No.	Description	Qty.
UP-F-200x	Delrin Nuts, Red, with UP-F-142 Ferrules, 10-32	10-pk
UP-F-300x	PEEK Nuts, Natural, with UP-F-142 Ferrules, 10-32	10-pk
UP-F-330x	Long PEEK Nuts, Natural, with UP-F-142 Ferrules, 10-32	10-pk
UP-F-331x	Short PEEK Nuts,Natural, with UP-F-142 Ferrules,10-32	10-pk
Two-Piece Stainless Steel Fingertight Fittings		
UP-F-140x	Stainless Steel Nuts, with UP-F-142 Ferrules, 10-32	10-pk
UP-F-150x	Long Stainless Steel Nuts, with UP-F-142 Ferrules, 10-32	10-pk

UP-F-113
Optional PEEK Ferrule for 1/32" OD tubing

UP-F-142N
Optional Tefzel™ Ferrule for 1/16" OD tubing

UP-F-148
Optional Kel-F™ Ferrule for 190µm OD tubing

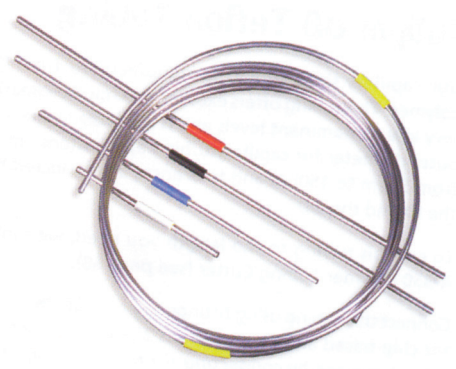
UP-M-215
Optional Perfluoroelastometer Ferrule for 360-510µm OD tubing (conductive)

Replacement Ferrules

Cat.No.	Description	Qty.
For 1/16" OD Tubing		
UP-F-142x	PEEK Ferrules, Natural	10-pk
UP-F-142Nx	Tefzel Ferrules, Natural	10-pk
For 1/32" OD Tubing		
UP-F-113	PEEK Ferrules, Natural	ea.
For 360-510 µm OD Tubing		
UP-F-151	Kel-F Ferrule, Natural	ea.
UP-M-215	Conductive Perfluoroelastomer Ferrules, Black	ea.
For 190 µm OD Tubing		
UP-F-148	Kel-F Ferrule, Natural	ea.

Stainless Steel Tubing

- Precut 316 Stainless Steel*
- The Cleanest, Best Finish available
- Color-Coded Banding for easy identification



Stainless Steel, .005" (125µm) ID x 1/16" OD (Red Colour Band)

Reference	Length
UP-U-152	5 cm
UP-U-153	10 cm
UP-U-154	20 cm
UP-U-155	30 cm
UP-U-156	0.5 m
UP-U-157	1 m**
UP-U-158	1.5 m**
UP-U-160	7.5 m**

Stainless Steel, .010" (.25mm) ID x 1/16" OD (Blue Colour Band)

Reference	Length
UP-U-111	5 cm
UP-U-112	10 cm
UP-U-113	20 cm
UP-U-114	30 cm
UP-U-132	0.5 m
UP-U-133	1 m**
UP-U-106	1.5 m**
UP-U-162	7.5 m**

Stainless Steel, .007" (175µm) ID x 1/16" OD (Black Colour Band)

Reference	Length
UP-U-126	5 cm
UP-U-127	10 cm
UP-U-128	20 cm
UP-U-129	30 cm
UP-U-130	0.5 m
UP-U-131	1 m**
UP-U-108	1.5 m**
UP-U-161	7.5 m**

Stainless Steel, .020" (.50mm) ID x 1/16" OD (Yellow Colour Band)

Reference	Length
UP-U-101	5 cm
UP-U-102	10 cm
UP-U-103	20 cm
UP-U-104	30 cm
UP-U-134	0.5 m
UP-U-135	1 m**
UP-U-105	1.5 m**
UP-U-163	7.5 m**

** *All Stainless Steel tubing of longer than 1m is coiled.*

PEEK™ tubing

PEEK™ Tubing

- 1/16", 1/8" and 1.8mm ODs Available
- Biocompatible, Inert and Easily Cut
- Great for High Pressure Applications

PEEK (polyetheretherketone) polymer tubing is biocompatible, chemically inert to most solvents, and can be used to replace stainless steel tubing in most liquid analytical systems. Unlike stainless steel and titanium tubing, PEEK tubing is flexible and can be easily cut to desired lengths. PEEK tubing can be used with stainless steel or polymer fittings.

The benefits of PEEK polymer tubing include a high pressure rating (up to 7,000 psi in most cases) and a high temperature rating (maximum continuous use temperature of 100ºC). Additionally, PEEK tubing has a very smooth internal surface, which causes less turbulance than similar sized metal tubing. Turbulence can cause remixing of separated sample bands and dilution of bands by the mobile phase. Of all our polymer tubing materials, PEEK is the least permeable to gas.

PEEK tubing 1/16" OD X 5'

Reference	Description	Colour	psi	bar
UP-1560	.0025" (65 µm)ID	Natural	7,000 psi	(483 bar)*
UP-1561	.004" (100 µm)ID	Black	7,000 psi	(483 bar)*
UP-1535	.005" (125 µm) ID	Red	7,000 psi	(483 bar)*
UP-1562	.006" (150 µm)ID	Purple	7,000 psi	(483 bar)*
UP-1536	.007" (175 µm) ID	Yellow	7,000 psi	(483 bar)*
UP-1531	.010" (.25 mm) ID	Natural	7,000 psi	(483 bar)*
UP-1531B	.010" (.25 mm) ID	Blue	7,000 psi	(483 bar)*
UP-1565	.015" (.40 mm) ID	Gray	7,000 psi	(483 bar)*
UP-1532	.020" (.50 mm) ID	Orange	7,000 psi	(483 bar)*
UP-1533	.030" (.75 mm) ID	Green	7,000 psi	(483 bar)*
UP-1538	.040" (1.00 mm) ID	Natural	5,000 psi	(345 bar)*
UP-1537	.055" (1.40 mm) ID	Natural	500 psi	(345 bar)*

PEEK tubing 1/8" OD X 5'

Reference	Description	Colour	psi	bar
UP-1534	.062" (1.60 mm) ID	Natural	4,000 psi	(276 bar)*
UP-1544	.080" (2.00 mm) ID	Natural	3,000 psi	(207 bar)*

PEEK tubing 1.8 mm OD X 5'

Reference	Description	Colour	psi	bar
UP-1545	.010" (.25 mm) ID	Natural	7,000 psi	(483 bar)*
UP-1546	.020" (.50 mm) ID	Natural	7,000 psi	(483 bar)*
UP-1547	.030" (.75 mm) ID	Natural	7,000 psi	(483 bar)*
UP-1540	.042" (1.05 mm) ID	Natural	5,000 psi	(345 bar)*
UP-1539	.055" (1.40 mm) ID	Natural	500 psi	(34 bar)*

Polymer Tubing Cutters

for 1/16", 1/8", 3/16", 1/4" and 5/16 OD tubing

Polymer tubing cutters

Reference	Description
UP-A-327	Standard Polymer Tubing Cutter* for 1/16" and 1/8" OD tubing
UP-A-329	Large Bore Polymer Tubing Cutter* for 3/16" - 5/16" OD tubing
UP-A-328	Replacement Blades for A-327 and A-329 - 5 pk.

General Use Inlet Solvent Filters

- Large Surface Areas
- Disposable
- 2 µm, 10 µm and 20 µm Filters Available
- General use and Prep Filters for Higher Flow Applications

It is good practice to filter your solvents to prevent pump damage. These 316 stainless steel filters provide that protection. Their large surface areas also mean longer life without pump cavitation.

Because filters should be changed periodically, we make it easy to replace them, without tools. For those filters using a plastic nut, thread the nut into the filter and finger tighten. Our other filters have stems, allowing easy insertion directly into your inlet tubing.
Please Note: The internal design of the UP-A-309 and the UP-A-230A Filters allows solvent to be drawn to within 1/8" (3.2mm) of the bottom of your solvent bottle, with Bottom-of-the-Bottle™. designs similar to the stainless steel and UHMWPE filters.

General Use Inlet Filters

For Analytical HPLC

Reference	Description
UP-A-220	10µm Inlet Solvent Filter, for 1/8" OD tubing[1]
UP-A-221	UP-A-220, 5-pack, for 1/8" OD tubing[1]
UP-A-222	2µm Inlet Solvent Filter, for 1/8" OD tubing[1]
UP-A-223	UP-A-222, 5-pack, for 1/8" OD tubing[1]
UP-A-228	2µm Inlet Solvent Filter with stem, for 1/8" ID tubing
UP-A-302	10µm Inlet Solvent Filter with stem, for 1/16" ID tubing
UP-A-302A	10µm Inlet Solvent Filter with Flangeless Fittings, for 1/8" OD tubing[2]
UP-A-309	10µm Inlet Solvent Filter with stem, for 1/16" ID tubing

For Waters'™ Analytical HPLC Systems

UP-A-231A	20µm Inlet Solvent Filter for 3/16" OD tubing[3]
UP-A-310	10µm Inlet Solvent Filter with stem, for 1/8" tubing

For Preparative HPLC Systems

UP-A-225	20µm Inlet Solvent Filter with stem, for 1/16" ID tubing
UP-A-225A	20µm Inlet Solvent Filter with Flangeless Fittings, for 1/8 OD tubing[4]
UP-A-226A	10µm Inlet Solvent Filter, for 5/16" OD tubing[5]
UP-A-227A	10µm Inlet Solvent Filter, for 1/4" OD tubing[6]
UP-A-230A	20µm Inlet Solvent Filter, for 1/4" OD tubing[6]
UP-A-231A	20µm Inlet Solvent Filter, for 3/16" OD tubing[6]
UP-A-311	10µm Inlet Solvent Filter with stem, for 1/16" ID tubing
UP-A-311A	10µm Inlet Solvent Filter with Flangeless Fittings, for 1/8" OD tubing[2]

[1] Requires a UP-P-100 Fitting (not included). Order the UP-A-210 Kit above, or purchase the UP-P100 alone.
[2] Includes a UP-P-315 Tefzel™ (ETFE) Nut and a UP-P-300 ETFE Ferrule.
[3] Includes a UP-P-132 PEEK™ Nut and a UP-P-133 ETFE Ferrule.
[4] Includes a UP-P-315 ETFE Nut and a UP-P-300N ETFE Ferrule.
[5] Includes a UP-U-622 PEEK Nut and a UP-U-660 ETFE Ferrule.
[6] Includes a UP-U-655 PEEK Nut and a UP-U-650 ETFE Ferrule.

Maximum Suggested Flow Rates

Flow Rates are determined by porosity surface area

Reference	Porosity	Max. Flow Rate
UP-A-222	2 µm	10 mL/min.
UP-A-220	10 µm	40 mL/min.
UP-A-302	10 µm	40 mL/min.
UP-A-302A	10 µm	40 mL/min.
UP-A-309	10 µm	40 mL/min.
UP-A-310	10 µm	40 mL/min.
UP-A-225	20 µm	100 mL/min.
UP-A-225A	20 µm	100 mL/min.
UP-A-226A	10 µm	100 mL/min.
UP-A-227A	10 µm	100 mL/min.
UP-A-230A	20 µm	100 mL/min.
UP-A-231A	20 µm	100 mL/min.
UP-A-311	10 µm	100 mL/min.
UP-A-311A	10 µm	100 mL/min.

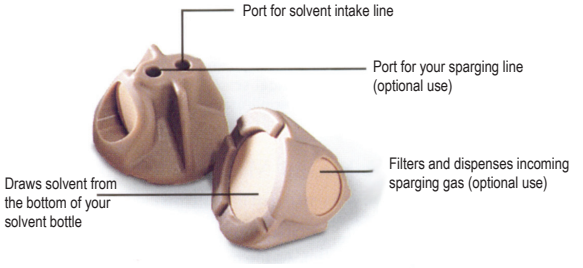
Bottle Caps - PEEK Bottom-of-the-Bottle Solvent Filters

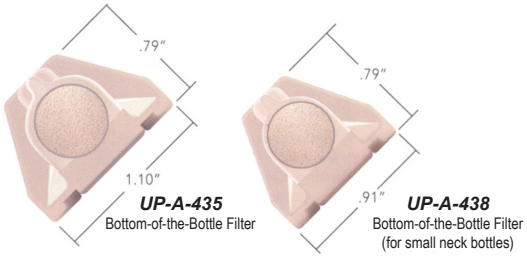
PEEK Bottom-of-the-Bottle Solvent Filters

- Our Most Recommended Filtering Unit!
- 100% PEEK Polymer Construction
- Easy Operation - No fittings required!

These Upchurch Scientific biocompatible filters are made from 100% PEEK polymer. Each has two PEEK frits. The bottom frit (2µm or 10µm) will draw solvents from within 0.28" (2mm) of the bottom of the solvent bottle. The 2µm frit on the side may be used for a 1/8" OD helium sparging line.

To use, simply press fit your appropriately sized Teflon® tubing firmly into the top holes. That´s It!.





UP-A-435
Bottom-of-the-Bottle Filter

UP-A-438
Bottom-of-the-Bottle Filter (for small neck bottles)

UHMWPE Bottom-of-the-Bottle Solvent Filters

Reference	Description
UP-A-445	10µm UHMWPE Filter Assembly for 1/16" OD tubing[1]
UP-A-446	10µm UHMWPE Filter Assembly for 1/8" OD tubing[2]
UP-A-427	10µm UHMWPE Replacement Solvent Filter Cups, 5pk

PEEK Bottom-of-the-Bottle Solvent Filters

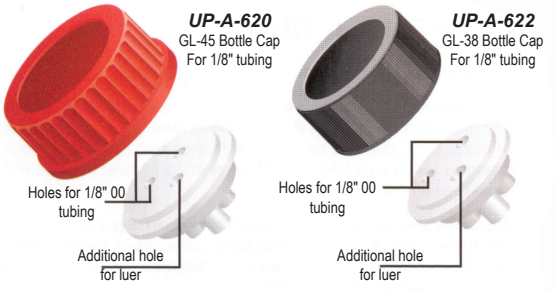
Reference	Description
UP-A-435	2µm PEEK Filter for 1/8" OD tubing
UP-A-436	2µm PEEK Filter for 3/16" OD tubing[3]
UP-A-437	2µm PEEK Filter for 1/8" OD tubing for small-neck (GL-38) bottles
UP-A-438	10µm PEEK Filter for 1/8" OD tubing for small-neck (GL-38) bottles
UP-A-440	10µm PEEK Filter for 1/8" OD tubing
UP-A-441	10µm PEEK Filter for 3/16" OD tubing[3]
UP-A-450	2µm PEEK Filter for 1/16" OD tubing
UP-A-451	10µm PEEK Filter for 1/16" OD tubing
UP-A-452	2µm PEEK Filter for 1/16" OD tubing for small-neck (GL-38) bottles
UP-A-453	10µm PEEK Filter for 1/16" OD tubing for small-neck (GL-38) bottles

[1] Includes a UP-P-200 Tefzel™ Ferrule and a UP-P-245 Teflon™ PFA Nut
[2] Includes a UP-P-300 Tefzel™ Ferrule and a UP-P-345 Teflon™ PFA Nut
[3] Typically for Waters® systems.

Bottle Caps

- Inexpensive
- Extremely Simple - No Threaded Ports or Fittings!

If you are looking for a bottle cap that is quick and easy, but still allows many options, we have just what you need!
These injection-molded caps are manufactured of inert Tefzel™ and polypropylene. They fit standard GL-45 or smaller-neck GL-38 bottles.
Three holes are provided in each insert. With two of the holes you simply push your tubing straight through. The third hole, with a luer taper, can be used for a number of 0ptions. Any male luer will fit snugly in this hole, or you can use our UP-A-626 or UP-A-627 Plug. The exceptions are the UP-A-610 and UP-A-610B Bottle Caps. Please see the note to the right.

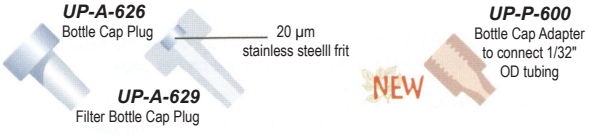


Bottle Caps for UP-GL-45, 1L Bottles

Reference	Description
UP-A-610	for 3/16" OD tubing, red
UP-A-610B	for 3/16" OD tubing, blue
UP-A-620	for 1/8" OD tubing, red
UP-A-620B	for 1/8" OD tubing, blue
UP-A-630	for 1/16" OD tubing, red
UP-A-630B	for 1/16" OD tubing, blue

Bottle Caps for UP-GL-38, 4L Bottles

Reference	Description
UP-A-622	for 1/8" OD tubing, black or white[1]
UP-A-632	for 1/16" OD tubing, black or white[1]



Bottle Cap Plugs and Adapter

Reference	Description
UP-A-626	Bottle Cap Plug for luer hole, UHMWPE
UP-A-627	Filter Bottle Cap Plug for luer hole, UHMWPE
	with 20 µm stainless steel Irit
UP-A-628	Bottle Cap Plug for 1/16" or 1/8" hole, UHMWPE
UP-A-629	Filter Bottle Cap Plug for 1/16" or 1/8" hole,
	UHMWPE with 20 µm stainless steel Irit
UP-P-600	Bottle Cap Adapter for 1/8" hole[2], PEEK to
	connect 1/32" OD tubing

[1] Designed for use with The UP-A-622 and UP-A-632 Bottle Cap rings now come in black or white, depending on availability

Precolumn and Inline Filters

Increase the Life of your Column

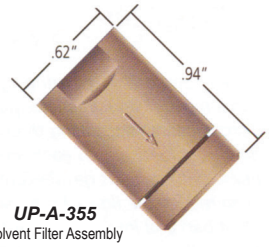
A precolumn filter placed between the sample injection valve and the HPLC column protects the column from particles originating in the sample and from pump/valve seal wear. Why use a precolumn filter when there is a frit at the head of the column itself? Because changing the column frit risks ruining the column by disturbing the column packing. A precolumn filter provides relatively inexpensive insurance against column damage, and changing its frit is easy.

Precolumn Filters

- 0.5 µm or 2 µm Frits Available
- Great Column Protection
- Stainless Steel and Biocompatible PEEK™ Polymer Versions Available

These Precolumn Filters have .020" diameter thru-holes and 8° distribution cones for minimal band spreading and mixing. They are available in stainless steel (UP-A-315/UP-A-316), pressure rated to 9,000 psi (620 bar) and biocompatible PEEK polymer versions (UP-A-355/UP-A-356), pressure rated to 5,000 psi (345 bar). Choose either the 0.5 µm or 2 µm version to filter particulates from your flow path.

UP-A-315
Solvent Filter Assembly



UP-A-355
Solvent Filter Assembly

Precolumn Filters

Reference	Description	Swept Volume*
UP-A-315	2µm Solvent Filter Assembly, with UP-A-101 Frit	1.4 µL
UP-A-316	0.5µm Solvent Filter Assembly, with UP-A-102 Frit	1.3 µL
UP-A-355	2µm Solvent Filter Assembly, with UP-A-700 ID PEEK Frit, Biocompatible	1.4 µL
UP-A-356	0.5µm Solvent Filter Assembly, with UP-A-701 ID PEEK Frit, Biocompatible	1.3 µL
UP-A-101x	2µm Replacement Frits, Stainless Steel, 10-pk	0.74 µL
UP-A-102x	0.5µm Replacement Frits, Stainless Steel, 10-pk	0.61 µL
UP-A-700	2µm Replacement Frit, PEEK Polymer	0.74 µL
UP-A-701	0.5µm Replacement Frit, PEEK Polymer	0.61 µL

Ultra-Low Volume Precolumn Filter

- Our Lowest Swept Volume Precolumn Filter for 1/16" OD Tubing

With a .010" diameter thru-hole, our UP-A-318 Filter has one of the lowest swept volumes (0.61\µL*) of any HPLC filter available, ensuring maximum protection with no band broadening. Pressure rated to 9,000 psi (620 bar).

UP-A-318
Precolumn Filter

UP-A-102
0.5 µm stainless steel frit

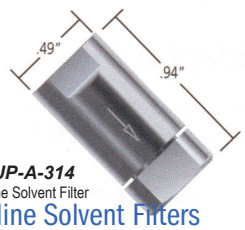
Ultra-Low Volume Precolumn Filters

Reference	Description	Swept Volume*
UP-A-318	0.5µm Solvent Filter Assembly, with UP-A-102 Frit	0.84 µL
UP-A-102x	0.5µm Replacement Frits, Stainless Steel, 10-pk	0.61 µL

Inline Solvent Filter

- Excellent for General Purpose In line Use

Placed between the pump and sample injection valve, our Inline Solvent Filter traps particles released through normal piston seal wear. Without an inline filter, these particles can be flushed through your system's tubing to the sample injection valve, resulting in valve damage and further system contamination.
This filter is pressure rated to 8,500 psi (586 bar) and uses a 2µm stainless steel frit with a PEEK ring. An 8° distribution cone spreads the flow of the mobile phase over the entire surface of the frit, while the .050" diameter thru-hole allows proper solvent flow.



UP-A-314
Inline Solvent Filter

UP-A-100
2 µm stainless steel frit

Inline Solvent Filters

Reference	Description	Swept Volume*
UP-A-314	2.0µm Solvent Filter Assembly, with UP-A-I 00 Frit	4.0 µL
UP-A-100x	2.0µm Replacement Frits, Stainless Steel, 10-pk	1.4 µL

** Swept volumes include/reflect theoretical frit volume values.*

Deuterium Lamps for a Detector

Agilent Deuterium Lamps

Cat.No	Model	Description	Ref. Agilent
TR-G1103-60001	Agilent 1100, 1200 Tungsten Lamp	Visible Light Bulb	G1103-60001
TR-LD-AGI-101	Agilent 1050 C 1050 DAD 1090, 1040	D2 Lamp	79883-60002
TR-LD-AGI-104LL	Agilent 1100 VWD	**Longlife** D2 Lamp	2140-0585
TR-LD-AGI-105	Agilent 1100 DAD 8453	D2 Lamp	2140-0590
TR-LD-AGI-105LL	Agilent 1100, 1200 G1315/G1365 A & B Series DAD	**Longlife** D2 Lamp	5182-1530
TR-LD-AGI-106	Agilent 8452	D2 Lamp	08452-60104
TR-LD-AGI-107LL	Agilent 1100, 1200 G1315/G1365 C & D Series DAD	**Longlife** D2 Lamp	2140-0585
TR-LD-AGI-108LL	Agilent 1290 G4212 A/B DAD (8-Pin)	Longlife D2 Lamp	5190-0917

Waters Deuterium Lamps

Cat.No	Model	Description	Ref. Waters
TR-LD-WAT-102LL	Waters 486	D2 Lamp	WAT080678
TR-LD-WAT-104LL	Waters 996, 2996 PDA	**Longlife** D2 Lamp	WAT052586
TR-LD-WAT-105LL	Waters 2487 DAD Alliance	**Longlife** D2 Lamp	WAS081142
TR-LD-WAT-108LL	Waters Acquity 2998 HB	**Longlife** D2 Lamp	201000281
TR-LX-WAT-150MO	Waters 470 474 2475	Xe Lamp	WAT052665

Shimadzu Deuterium Lamps

Cat.No	Model	Description	Ref. Shimadzu
TR-LD-SHI-100	Shimadzu LC4A LC6A SPD2A SPD6A SPD6AV SP4	D2 lamp	062-65056-03
TR-LD-SHI-101LL	Shimadzu SPD10A, 10A3, 10AV, 10AVP, 20A, 20AV	**Longlife** D2 Lamp	228-34016-02
TR-LD-SHI-102SLL	Shimadzu UV series Spectrophotometer,BioSpec-mini	**Longlife** D2 Lamp	200-75503-01
TR-LD-SHI-103LL	Shimadzu LC2010	**Longlife** D2 Lamp	228-37401
TR-LD-SHI-104LL	Shimadzu SPD-M10A, M10AV	D2 Lamp	670-14604-00
TR-LD-SHI-105	Shimadzu Prominence 2030, Nexera 2040	D2 Lamp	228-55626-01
TR-LX-SHI-150MO	Shimadzu RF1501.5301 5000	Xe Lamp	200-81500
TR-LX-SHI-150S	Shim. RF540 RF535 RF551 RF500 RF10A RF10AXL	Xe Lamp	228-45147
TR-LX-SHI-75XE	Shimadzu RF530 RF510	Xe Lamp	N/A
TR-LX-SHI-150SK	Shimadzu RF5000U (w/Ozone)	Xe Lamp	UXL155
TR-LX-SHI-101	Shimadzu SPD-10AV,AVP,AVVP,20AV	Tungsten Lamp	670-14602-00
TR-LX-SHI-104	Shimadzu M10AVP/M20A	Tungsten Lamp	228-34410-91
TR-LX-SHI-062-65005AT	Shimadzu Spectrophotometer	Tungsten Lamp	062-65005AT

Varian Deuterium Lamps

Cat.No	Model	Description	Ref. Varian
TR-LD-VAR-100LL	Varian 2050 2550 5500	D2 Lamp	03-915503-99
TR-LD-VAR-103LL	Varian UV50/100/200 9050 Prostar 310, Vista 5000, 5500	**Longlife** D2 Lamp	0391615691
TR-LD-VAR-104	Varian Prostar 330 DAD	D2 Lamp	393570502
TR-LD-VAR-105LL	Varian Prostar 325 335	**Longlife** D2 Lamp	110715400
TR-LD-VAR-106	Varian Prostar 340 345	D2 Lamp	R000088515
TR-LX-VAR-152H	Varian Prostar 363	Xe Lamp	392613103

Deuterium Lamps for a Detector

Merck Hitachi Deuterium Lamps

Cat.No	Model	Description	Ref. Hitachi
TR-LD-MEH-100S	Hitachi L & U Series Nosed	D2 Lamp	HITA 890-2430
TR-LD-MEH-101	Hitachi 100-10, 124, 100-40, 100-50, 100-60	D2 Lamp	982-1035
TR-LX-MEH-152H	Hitachi Fluorescence Detector	Xe Lamp	5000330
TR-LD-MEH-103	Hitachi U-1800, 2810, 1900, 2900, 2910, 3900,3900H	D2 Lamp	2J1-1500
TR-LT-MEH-100	Hitachi U Series	Vis. Lamp	855-1200
TR-LT-MEH-101	Hitachi L2400, 2420, 2450, 2455	Tungsten Lamp	890-2527

Dionex Deuterium Lamps

Cat.No	Model	Description	Ref. Dionex
TR-LD-DIO-101	Dionex DSA-1 VDM-1	D2 Lamp	N/A
TR-LD-DIO-102LL	Dionex PDA-100, PDA-3000, AD-25	**Longlife** D2 Lamp	939016T
TR-LD-DIO-104	Ultimate Dionex UVD 3000 Nano LC	D2 Lamp	6074.2070
TR-LD-DIO-105LL	Dionex Ultimate DAD,MWD 3000/RS VWD3000/3400	D2 Lamp	6074.1110
TR-LX-DIO-150S	Dionex Fluoresence Detector	Xe Lamp	5057-1000
TR-LT-DIO-105	Dionex 3000 VWD DAD	Tungsten Lamp	6074.2000

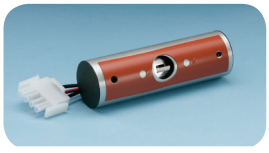
Gilson Deuterium Lamps

Cat.No	Model	Description	Ref. Gilson
TR-LD-GIL-101	Gilson115/116/117/118/119/151/152/155/156	D2 Lamp	100326
TR-LD-GIL-105LL	Gilson 170 D.A.D.	**Longlife** D2 Lamp	18011003
TR-LX-GIL-150MO	Gilson 122	Xe Lamp	N/A

TSP Deuterium Lamps

Cat.No	Model	Description	Ref. TSP
TR-LD-TSP-102S	TSP UV100/1000/2000/3000, Focus, CE Series	D2 Lamp	9551-0023
TR-LD-TSP-106	TSP UV6000DAD,UV6000LP, Accela PDA, Surveyor	D2 Lamp	108052
TR-LD-TSP-103	TSP SA6510,SP770,SP970,SP8480XR,SP8773XR	D2 Lamp	N/A
TR-LD-TSP-104	TSP Thermosolaar M Series	D2 Lamp	942342020004
TR-LD-TSP-107	TSP ICE3300 AAS, S Series, SOLAAR S4	D2 Lamp	942342030004
TR-LT-TSP-106	TSP UV6000	Tungsten Lamp	60257-60006

ABI Deuterium Lamps



Cat.No	Model	Description	Ref. ABI
TR-LD-ABI-100	ABI 757 759 783A 785A 1000S FS980 120A 130A	D2 Lamp	N2920149

Deuterium Lamps for a Detector

Perkin Elmer Deuterium Lamps

Cat.No	Model	Description	Ref. Perkin Elmer
TR-LD-PER-100	Perkin Elmer Series 200	D2 Lamp	N2920149
TR-LD-PER-102	Perkin Elmer Series 200 DAD	D2 Lamp	N2922046
TR-LD-PER-103	PE LC235,1335,LC55,65,75,85,95,135 Lambda 1.3 Integral	D2 Lamp	N2351285
TR-LD-PER-160	PE Lambda 2 to 45 800 900 Bio, 55X series	D2 Lamp	B016-0917
TR-LT-PER-160	PE Lambda 2 to 45 800 900 Bio, 55X series	W Lamp	B011-4620
TR-LX-PER-150MO	PE 203 204 650 MPF2A MPF3 MPF4	Xe Lamp	3501646

Jasco Deuterium Lamps

Cat.No	Model	Description	Ref. Jasco
TR-LD-JAS-101SLL	Jasco UV970 975 (B & C)1570,1575,2075,3075, MD	D2 Lamp	5330-0091
TR-LD-JAS-102LL	Jasco V-530, 550, 560 570,600,700 & 7800	D2 Lamp	5330-0094B
TR-LT-JAS-102	Jasco V-530, 550, 560 570,600,700	Tungsten Lamp	5530-0099
TR-LX-JAS-150MO	Jasco 820 821	Xe Lamp	5330-0052
TR-LX-JAS-274	Jasco 920 921 1520 2020	Xe Lamp	6715-H310H

Kontron Deuterium Lamps

Cat.No	Model	Description	Ref. Kontron
TR-LD-KON-102LL	Kontron 535DAD, 332/335/430/432/433/770	**Longlife** D2 Lamp	91-91494
TR-LD-KON-103LL	Kontron 540DAD 540+ 545V	**Longlife** D2 Lamp	54-02007
TR-LD-KON-104	Kontron Uvikon 922, 923, 943, 930, 932, 933, 940	D2 Lamp	90-007825T
TR-LX-KON-150MO	Kontron SFM25	Xe Lamp	N/A
TR-LD-KON-108	Kontron 720LC	D2 Lamp	54-02003

Biorad Deuterium Lamps

Cat.No	Model	Description	Ref. Biorad
TR-LD-BIO-101	Biorad 206, 300, 1790, BioDimensions,	D2 Lamp	930-6106
TR-LD-BIO-103LL	Biorad 1503	D2 Lamp	N/A

Beckman Deuterium Lamps

Cat.No	Model	Description	Ref. Beckman
TR-LD-BEC-102	Beckman DU600 620 630 640 650 6000 7000 7500	D2 Lamp	514366
TR-LD-BEC-103	Beckman 166	D2 Lamp (prealigned)	239372
TR-LD-BEC-105	Beckman 168	D2 Lamp (prealigned)	538711
TR-LD-BEC-110	Beckman P/ACE MDQ	D2 Lamp	144667
TR-LT-BEC-100	Beckman 166, DU6/70/600/800	Tungsten Lamp	945672

Philips and Unicam Deuterium Lamps

Cat.No	Model	Description	Ref. Philips/Unican
TR-LD-PHU-100	Unicam 4225	D2 Lamp	9551-0023
TR-LD-PHU-101	Unicam UV & Helios series	D2 Lamp	9423U/9004B
TR-LD-PHU-105	Unicam 929 939 959 AA Spectrometers	D2 Lamp	942339346251
TR-LT-PHU-102	Unicam 5625 6575 8600 8700 8800 Series	Tungsten Lamp	942318503021
TR-LT-PHU-103	Unicam Helios Aquamate, Biomate 5, a,b,g,d	Tungsten Lamp	9423UV90004E

LKB-Pharmacia Deuterium Lamps

Cat.No	Model	Description	Ref. LKB
TR-LD-LKB-100	LKB Pharmacia 2141 4050 4054 Ultraspec	D2 Lamp	N/A
TR-LD-LKB-101	LKB Productor 2140	D2 Lamp	8010-3135

ECOM Deuterium Lamps

Cat.No	Model	Description	Ref. LKB
TR-LD-ECO-100	Ecom LCD 2083 & 2084 Series	D2 Lamp	22590000
TR-LD-ECO-101	Ecom Flash Series Opal, Sapphire, Topaz & LCD 2073A	D2 Lamp	22590001

Interchim Deuterium Lamps

Cat.No	Model	Description	Ref. LKB
TR-LD-INT-100	I.Puriflash215 430 450 800 4100 4250-40 4250-250 PF1SP2	D2 Lamp	PFS970

PG Instruments Deuterium Lamps

Cat.No	Model	Description	Ref. LKB
TR-LD-PGI-100	PG Inst. T70 T80 T92 990 AAS	**Longlife** D2 Lamp	N/A

Deuterium Lamps for a Detector

Cecil Deuterium Lamps

Cat.No	Model	Description	Ref. Cecil
TR-LD-CEC-111	Cecil Series 2 1000 to 9000 CE	D2 Lamp	2202-0142
TR-LT-CEC-111	Cecil Series 2 1000 to 9000 CE	Tungsten Lamp	2303-0140

Knauer Deuterium Lamps

Cat.No	Model	Description	Ref. Knauer
TR-LD-KNA-101	Knauer Wellchrom K2000 K2500 K2501 K2600 K2700	**Longlife** D2 Lamp	A4071
TR-LD-KNA-102	Knauer 8700, 9700, 2151	**Longlife** D2 Lamp	N/A
TR-LD-KNA-103LL	Knauer Smartline PDA 2800 2850 K-2800	**Longlife** D2 Lamp	A4447
TR-A5193	Knauer S2250/A5190, S2520	**Longlife** D2 Lamp	A5193
TR-A4073	Knauer K2501	**Tungsten** Lamp	A4073
TR-228-51511-95	Knauer 59200 59201	**Xe** D2 Lamp	A59210

LDC Deuterium Lamps

Cat.No	Model	Description	Ref. LDC
TR-LD-LDC-100	LDC 3000 & 4000 Series Spectromonitor I II III D	D2 Lamp	108035
TR-LD-LDC-102	LDC 5000 D.A.D.	D2 Lamp	N/A
TR-LX-LDC-150MO	LDC FM4100	Xe Lamp	

ACS Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-ACS-100	ACS LC 750 11E 12	D2 Lamp	N/A

Analytic Jena Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-ANJ-100	A.Jena Spekol 1100,1200 Spekord S100/200/50	D2 Lamp	820-60021-0
TR-LD-ANJ-101	A.Jena Spekol 1300/ 1500/200	D2 Lamp	820-60238-0

Biotage Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-BTG-100	Biotage Isolera SP1/4 VWL	D2 Lamp	09830

GE AKTA Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LH-GE-101	GE AKTA UPC-900	Mercury Lamp	28-4042-25
TR-LH-GE-102	GE AKTA UV-900 (Monochromator cpl)	Xe Lamp	19-1029-35
TR-LH-GE-103	GE AKTA UV-900 (Refurb Exchange)	Xe Lamp	19-1029-35

Gynkotek Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-GYN-100LL	Gynkotek (Dionex) UVD 320 340U 340S 160 170S 170U	D2 Lamp	5053.1204

Hach Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-HAC-100	Hach Lange DR5000, DR6000	D2 Lamp	A23792

Jenway Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-I/605016	Jenway 6051	Tungsten Lamp	I/605016
TR-012146	Jenway 6270, 6280 & 6285	Xe Lamp	012146
TR-012075	Jenway 6300,6310,6320D,6500,6505,6700,7310	Tungsten Lamp	012075
TR-012094	Jenway 6305 & 6315	Xe Lamp	012094
TR-640508	Jenway 6400 6500 &6505	**Longlife** D2 Lamp	640508
TR-6705/LA	Jenway 6705 & 6715	Xe Lamp	6705/LA
TR-685024	Jenway 6800 & 6850	Tungsten Lamp	685024
TR-12050	Jenway 7200	Tungsten Lamp	12050
TR-7205/SER/LAMP	Jenway 7205 & Geneva Bio	Xe Lamp	7205/SER/LAMP
TR-I/730545	Jenway 7305 7315 7415/nano, Geneva plus & nano	Xe Lamp	I/730545
TR-740018	Jenway 7410 & 7600	Tungsten Lamp	740018

Young Lin Deuterium Lamps

Cat.No	Model	Description	Ref. ACS
TR-LD-YNG-101	Young Lin 820	**Longlife** D2 Lamp	N/A

HPLC Safety Caps

Dangers and hazards in many laboratories

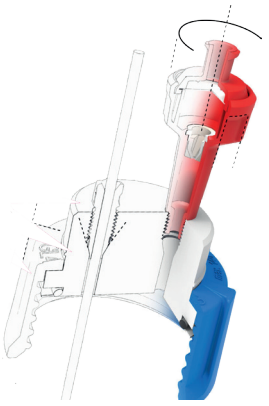
Safety for HPLC users

Vapours and gases of dangerous liquids can cause damage to your health and to your environment. Bottles and containers with unsafe contents always have to be sealed reliably to avoid health hazards and environment pollution.

Many directives are already regulated by law - in addition, you should always take care of your health and integrity yourself.

Troubleshooting by SCAT Safety Caps

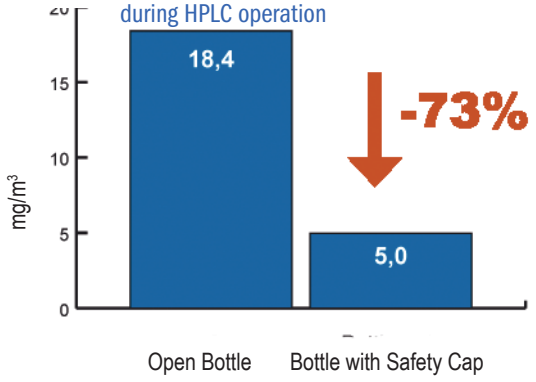
- **No escape of hazardous vapours**
  Integrated air valve and exhaust filters keep your containers sealed safely.
- **No pollution**
  Containers always remain shut, even during extraction or filling of liquids.
- **No shift of tubing**
  Tubes remain fixed - no air intake into sensitive equipment like chromatography systems
- **Easy container exchange**
  Safety Caps are freely turnable without twisting tubes.
- **No air intake**
  No interruption of chromatography processes.



Reduce pollution

Ecological and sanitary damage can be reduced intensely by SCAT Safety Caps. Officially accredited testing laboratories verify a reduction of toxic concentrations in the air amounting to 73%.

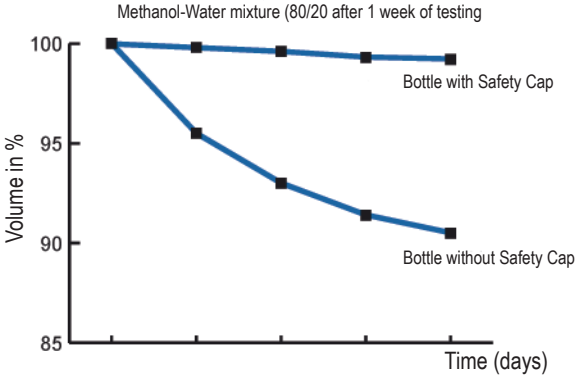
Emissions of Acetronile in a test laboratory during HPLC operation



Avoid shrinkage

Spend less money on chemicals - SCAT Safety Caps avoid decrease of expensive solvents which otherwise evaporate into extraction hoods or into the environmental air.

Solvent shrinkage
Methanol-Water mixture (80/20 after 1 week of testing



SafetyCaps 2.0
The next Level!

THE System for Solvent Safety

NEW: Luer Lock Adapter
Useful for many applications

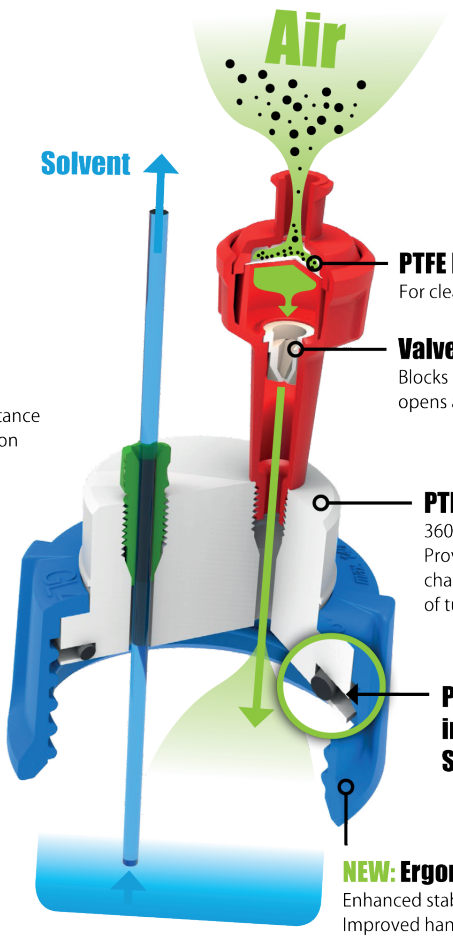
NEW: Air valve
for analytical **and** preparative applications

NEW: PFA Fittings
Improved design for easy tubing connection
Excellent chemical resistance
Flammability classification V-0 (UL-94)

NEW: Medical Grade PTFE
Excellent resistance
Food safe
FDA conform
Flammability classification V-0 (UL-94)

NEW: Insertion Label
Mark your bottles with individual descriptions

NEW: PPS Screw Cap
Autoclavable / sterilisable up to 200 °C
Flammability classification V-0 (UL-94)



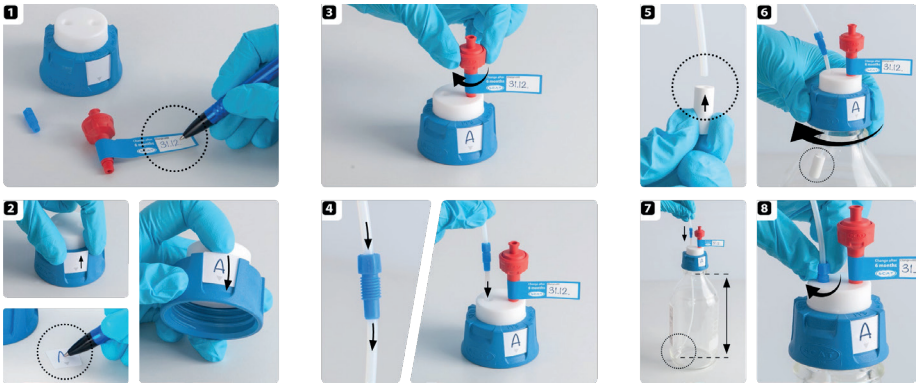
PTFE Filter
For clean solvents

Valve membrane
Blocks solvent vapours, opens at underpressure

PTFE-Body
360° freely rotatable.
Provides easy container change without distortion of tubing

PTFE Body with integrated FKM Seal

NEW: Ergonomic Design
Enhanced stability and construction
Improved handling
Easy installation
Smart exchange



HPLC Safety Caps

Safety Caps GL 45 - Safe Fluid Supply

Safe venting for pressure equalization during the solvent supply by integrated air valve. Protection against dangerous solvent vapours.

Available connectors for tubing:

- 1.6mm (1/16“) OD

- 2.3mm OD

- 3.2mm (1/8“) OD

Cat.No	Description
TR-S1-00712	Safety Cap I, (V2.0) GL 45 1 port for 3.2mm (1/8“) OD tubing
TR-S1-00713	Safety Cap II, (V2.0) GL 45 2 ports for 3.2mm (1/8“) OD tubing 1x Blind plug
TR-S1-00714	Safety Cap III, (V2.0) GL 45 3 ports for 3.2mm (1/8”) OD Tubing 2 x Blind Plug
TR-S1-00715	Safety Cap IV, (V2.0) GL 45 4 ports for 3.2mm (1/8”) OD Tubing 2 x Blind Plug
TR-S1-00716	Safety Cap V, (V2.0) GL 45 5 ports for 3.2mm (1/8”) OD Tubing 2 x Blind Plug
TR-S1-00715	Safety Cap VI, (V2.0) GL 45 6 ports for 3.2mm (1/8”) OD Tubing 2 x Blind Plug
TR-S1-00717	Air valve for SafetyCaps service life 6 months (Box of 1)
TR-S1-00718	Air valve for SafetyCaps service life 6 months (Box of 10)

TR-S1-00720

1 Blind plug included (to lock unused connections)

TR-S1-00721

4 Blind plugs included (to lock unused connections)

Starter Kits

Cat.No	Description
TR-S1-00720	Starter Kit Supply S1 content: SafetyCapl 3 u GL45 1 connector 3,2mm OD Safetycap II 1 unit GL45 2 connectors 3,2 mm OD Blind plug for tubing connection 1/4”
TR-S1-00721	Starter Kit Supply S2 content: SafetyCapl 3 u GL45 1 connector 3,2mm OD Safetycap II 1 unit GL45 2 connectors 3,2 mm OD Blind plug for tubing connection 1/4”
TR-S1-00255	HPLC Safety Set Content: 4 x Safety Cap III TR-S1-00714; 1x safetywaste Cap TR-S1-00728 4 connectors 1 x Filter Exhaust with indicatoir TR-S1-00724 2x Tube connector 6-8 mm TR-S1-00587 1 x tube connector 9.5-10 Angled TR-S1-00580

PFA fittings for capillaries

Cat.No	Description
TR-S1-00157	5x Fitting for 3.2 mm OD Blue
TR-S1-00156	5x Fitting for 3.2 mm OD Red
TR-S1-00159	5x Fitting for 3.2 mm OD Yellow
TR-S1-00151	5x Fitting for 1.6 mm OD Green
TR-S1-00154	5x Fitting for 2.3 mm OD Violet
TR-S1-00082	10 x Blind plug

Thread adapters for SafetyCaps

Cat.No	Description
TR-S1-00233	Adapter GL 38 (f) to GL 45 (m)
TR-S1-00235	Adapter GL 40 (f) to GL 45 (m)

TR-S1-00255

HPLC Safety Caps

Bottles (Clear Glass) - GL 45 Thread

Round bottles with scale (ml) and screw cap.

Also available with protective covering!

Cat.No	Volume	Cat.No. with protective Covering
TR-S1-00321	250 ml	**TR-S1-00322**
TR-S1-00325	500 ml	**TR-S1-00326**
TR-S1-00315	1000 ml	**TR-S1-00313**
TR-S1-00319	2000 ml	**TR-S1-00318**
TR-S1-00328	5000 ml	**TR-S1-00329**

Bottles (Brown Glass) - GL 45 Thread

Round bottles (brown glass) with scale (ml) and screw cap.

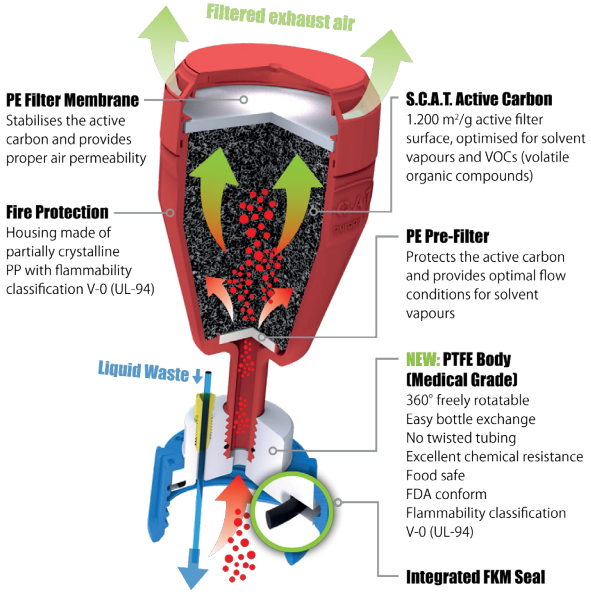
Cat.No	Volume
TR-S1-00320	250 ml
TR-S1-00324	500 ml
TR-S1-00314	1000 ml

Square Bottles (Clear Glass) - GL 45 Thread

Four-cornered bottles for space saving placement. Each bottle with scale (ml) and screw cap.

Cat.No	Volume
TR-S1-00323	250 ml
TR-S1-00327	500 ml
TR-S1-00316	1000 ml

Safe Liquid Waste Collection



TR-S1-00722

TR-S1-00723

TR-S1-00724

TR-S1-00725

HPLC Safety Waste Caps

SafetyWaste Caps

our exhaust filter system absorbs 99% of all volatile substances evaporating from solvent disposal containers.

Available connectors for tubing:
- 1.6mm (1/16“) OD
- 2.3mm OD
- 3.2mm (1/8“) OD

Cat.No	Description
TR-S1-00726	SafetyWaste Cap, GL 45 3 port for 3.2mm (1/8“) OD tubing
TR-S1-00727	SafetyWaste Cap , GL 45 2 ports for 3.2mm (1/8“) OD tubing 1 port for 6-8 mm
TR-S1-00728	SafetyWaste Cap , GL 45 4 ports for 3.2mm (1/8“) OD tubing 1 port for 6-8 mm
TR-S1-00487	SafetyWaste Cap, S 60/61 3 port for 3.2mm (1/8“) OD tubing
TR-S1-00486	SafetyWaste Cap, S 60/61 2 ports for 3.2mm (1/8“) OD tubing 1 port for 6-8 mm
TR-S1-00544	SafetyWaste Cap, S 90/91 4 ports for 3.2mm (1/8“) OD tubing 1 port for 6-8 mm
TR-S1-00722	Exhaust Filter, size M with splash protection and label
TR-S1-00723	2x Exhaust Filter, size M with splash protection and label
TR-S1-00724	Exhaust Filter, size M with splash protection andchange indicator
TR-S1-00725	2x Exhaust Filter, size M with splash protection and change indicator

Cat.No	Description
TR-S1-00149	Exhaust Filter, size S with splash protection and label
TR-S1-00070	4x Exhaust Filter, size S with splash protection and label

SafetyWaste Caps with Safety Funnel

For safe disposal of solvent and sample leftovers. simply open the safety funnel by pressing the locking mechanism.

Cat.No	Description
TR-S1-00460	SafetyWaste Cap, S 50 2 port for 3.2mm (1/8“) OD tubing with funnel
TR-S1-00483	SafetyWaste Cap, S 55 2 port for 3.2mm (1/8“) OD tubing with funnel
TR-S1-00504	SafetyWaste Cap, S 60/61 2 port for 3.2mm (1/8“) OD tubing with funnel
TR-S1-00500	SafetyWasteCap S60/61, safety funnel with shut-off, 2 port 2,3/3,2 mm OD

Sample Injection Rheodyne™ Valves

Complet range of HPLC sample injectors, from nanoscale to preparative applications.

Rheodyne Injecion Valves for Microscale Applications

Model 8125

Manufactured in stainless steel and designed for 1.0 and 2.0 mm microbore columns. This sample injector can also be used for analytical columns between 3.0 and 5.0 mm ID.
Maximum recommended injection volume is 200 µl.

Cat.No	Description
RH-8125	Microscale sample injector, dual mode, stainless steel

Cat.No	Description	Stator Material
RH-7725	Dual Mode Analytical Injector	Stainless Steel
RH-7725i	Dual Mode Analytical Injector with switch	Stainless Steel
RH-9725	Dual Mode Analytical Injector	PEEK
RH-9725i	Dual Mode Analytical Injector wiyh switch	PEEK

Rheodyne Injecton Valves for Analytical Applications

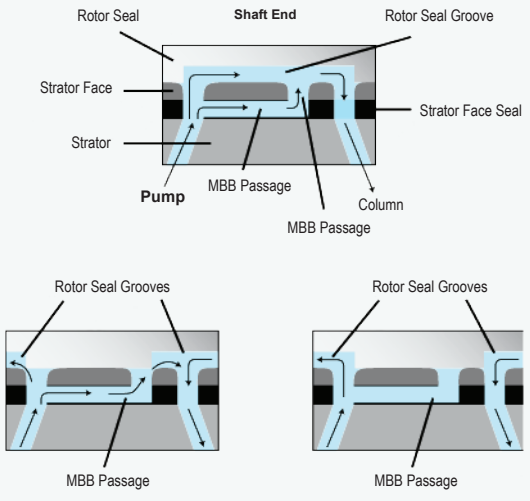
Models 7725, 7725i, 9725 and 9725i

All these well recognized valves are manufactured in 316 stainless steel. Some specialized features include :

- The Rheodyne patented Make-Before-Break (MBB™) architecture allows continuous flow between LOAD and INJECT positions wich greatly reduces transient pressure shocks that disrupt your system.
- Wide 30° portangles offer easier access to fittings using the Rheodyne wrench (**P/N RH-6810**).
- Front-end pressure screw makes easy to adjust and maintain pressure.
- A built-in position sensor switch (“i” versions) provides a “start” signal to the instrument
- Small diameter internal flow paths assure minimal dispersion.

Patented Rheodyne MBB Design:

Flow paths of Model 7725 and 9725 with patented Rheodyne MBB design



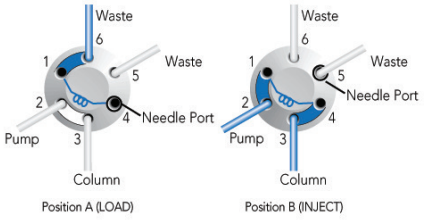
Sample Injection Rheodyne™ Valves

Rheodyne Injection Valves for Preparative Applications

Models 3725-038, 3725i-038, 3725 and 3725i

These valves have been designed for high injection volumes and flow rates up to 100 ml/min. 1/8" or 1/16" tubing can be attached usind the right fitting adapter.
MBB™ patented Rheodyne architecture allows continuous and stable flow when switching from LOAD to INJECT.

Cat.No	Description
RH-3725-038	Preparative Scale Injector, Dual Mode, Stainless Steel
RH-3725i-038	Preparative Scale Injector with switch, Dual Mode, Stainless Steel
RH-3725	Preparative Scale Injector, Dual Mode, PEEK
RH-3725i	Preparative Scale Injector with switch, Dual Mode, PEEK



Rheodyne Rotor Seals and Stators

- Genuine Rheodyne Parts
- For Popular Rheodyne Valves

A rotor seal is a polymeric disc that makes a high pressure seal against the stator in a valve. The seal wears with use and is one of the few valve parts that may need to be replaced routinely. Stators need replacement only if the threated ports are damaged or the sealing surface is scored.
Vespel™ blend Rotor Seals have an operating pH range of 0-10. Tefzel™ are usable at a pH range from 0 to 14. Some stators can also be manufactured in stainless steel.

Rotors Vespel

Cat.No	Valve	Material
RH-7010-039	7010,7000,7040	Vespel
RH-7030-003	7030	Vespel
RH-7060-070	7060,7066	Vespel
RH-7125-047	7125,7725	Vespel
RH-7410-038	7410	Vespel
RH-7413-013	7413	Vespel
RH-8125-038	8125	Vespel

Rotors Tefzel

Cat.No	Valve	Material
RH-7010-071	7010,7010-087,7000,7040	Tefzel
RH-7030-015	7030	Tefzel
RH-7060-074	7060,7066,9060	Tefzel
RH-7125-079	7125,7125-081,7725	Tefzel
RH-7410-075	7410	Tefzel
RH-8125-097	8125	Tefzel
RH-9010-051	9010	Tefzel
RH-9125-082	9125,9725	Tefzel

Rotors Peek

Cat.No	Valve	Material
RH-3030-005	3030,3030-038	Peek
RH-3060-001	3060,3060-038	Peek
RH-3710-008	3000,3000-038,3710,3710-038	Peek
RH-3725-018	3725,3725-038	Peek
RH-7610-011	7610-400,7610-600	Peek

Stators

Cat.No	Valve
RH-3060-009	3060
RH-3725-006	3725,3710-038,3000-038
RH-3725-085	3725-038,3710-038,3000-038,3030-038
RH-7010-040	7010,7125,7000,7030,7040
RH-7010-066	7125-081,7010-087
RH-7060-039	7060,7066
RH-7410-041	7410,7413
RH-7610-048	7610-600
RH-7725-010	7725
RH-8125-098	8125
RH-9060-016	9060
RH-9125-043	9125,9010,9030,9725

Sample Injection Rheodyne™ Valves

Rheodyne RheBuild™ Kits

Included in each individualized RheBuild Kit are genuine Rheodyne parts, tools and instructions to maintain the precision and performance of your Rheodyne valve. Rheodyne kits eliminate individual part ordering at a very convenient price.

RheBuild Kit	Model
RH-3725-999	3725, 3725i, 3725-038, 3735i-038
RH-7010-996	Conversion Kit with strator for 7010 model
RH-7010-997	7010 strator included
RH-7010-999	7010 and 7010 models
RH-7125-999	7125,7126
RH-7410-999	7410
RH-7520-999	7520,7526
RH-7725-999	7725,7725i
RH-8125-999	8125,8126
RH-9010-999	9010
RH-9125-999	9125,9126
RH-9725-999	9725,9725i

Sampling Loops for Rheodyne Injection Valves

Available in stainless steel and PEEK. Please note that stainless steel loops are not interchangeable between valve types 7125, 7010 and 7725.

Stainless Steel Sampling Loops for 7125 and 7010 Valves (Not to be used in 7725 Valves)

Cat.No.	Volume	Tubing
RH-7020	5 µL Loop	0,18 mm (0,007")ID x 1/16" OD
RH-7021	10 µL Loop	0,30 mm (0,012")ID x 1/16" OD
RH-7022	20 µL Loop	0,51mm (0,020")ID x 1/16" OD
RH-7023	50 µL Loop	0,51 mm (0,020")ID x 1/16" OD
RH-7024	100 µL Loop	0,51 mm (0,020")ID x 1/16" OD
RH-7025	200 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7026	500 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7027	1000 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7028	2000 µL Loop	1 mm (0,040")ID x 1/16" OD
RH-7029	5000 µL Loop	1 mm (0,040")ID x 1/16" OD
RH-1876	10000 µL Loop	2 mm (0,080")ID x 1/8" OD
RH-1877	20000 µL Loop	2 mm (0,080")ID x 1/8" OD

Stainless Steel Sampling Loops for 3725-038 and 3725i-038 valves

Cat.No.	Volume	Tubing
RH-3065-018	2000 µL Loop	2 mm (0,080")ID x 1/8" OD
RH-3065-019	5000 µL Loop	2 mm (0,080")ID x 1/8" OD
RH-3065-023	10000 µL Loop	2 mm (0,080")ID x 1/8" OD
RH-3065-025	20000 µL Loop	2 mm (0,080")ID x 1/8" OD

Stainless Steel Sampling Loops for 7725 and 7725i (Not to be used in 7125 valves)

Cat.No.	Volume	Tubing
RH-7755-020	5 µL Loop	0,18 mm (0,007")ID x 1/16" OD
RH-7755-021	10 µL Loop	0,30 mm (0,012")ID x 1/16" OD
RH-7755-022	20 µL Loop	0,30mm (0,012")ID x 1/16" OD
RH-7755-023	50 µL Loop	0,51 mm (0,020")ID x 1/16" OD
RH-7755-024	100 µL Loop	0,51 mm (0,020")ID x 1/16" OD
RH-7755-025	200 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7755-026	500 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7755-027	1000 µL Loop	0,76 mm (0,030")ID x 1/16" OD
RH-7755-028	2000 µL Loop	1 mm (0,040")ID x 1/16" OD
RH-7755-029	5000 µL Loop	1 mm (0,040")ID x 1/16" OD
RH-1876	10000 µL Loop	2 mm (0,080")ID x 1/8" OD
RH-1877	20000 µL Loop	2 mm (0,080")ID x 1/8" OD

Stainless Steel Sampling Loops for 8125 and 7010 Valves (Please use RH-7755-029 for vol. >50 µl)

Cat.No.	Volume	Tubing
RH-8020	5 µL Loop	0,2 mm (0,008")ID x 1/16" OD
RH-8021	10 µL Loop	0,2 mm (0,008")ID x 1/16" OD
RH-8022	20 µL Loop	0,25 mm (0,010")ID x 0,020" OD
RH-8023	50 µL Loop	0,3 mm (0,012")ID x 1/16" OD

Sample Injection Rheodyne™ Valves

PEEK Sampling Loops for 3725 and 3725i Valves

Cat.No.	Volume	Tubing
RH-3055-018	2000 µL Loop	1,6 mm(0,062")ID x 1/8" OD
RH-3055-019	5000 µL Loop	1,6 mm(0,062")ID x 1/8" OD
RH-3055-023	10000 µL Loop	2 mm(0,080")ID x 1/8" OD
RH-3055-025	20000 µL Loop	2 mm(0,080")ID x 1/8" OD

PEEK Sampling Loops for 9725 and 9010

Cat.No.	Volume	Tubing
RH-7755-015	2 µl Loop	Internal Loop
RH-9055-020	5 µL Loop	0,18 mm(0,007")ID x 1/16" OD
RH-9055-021	10 µL Loop	0,25 mm(0,010")ID x 1/16" OD
RH-9055-022	20 µL Loop	0,25 mm(0,010")ID x 1/16" OD
RH-9055-023	50 µL Loop	0,51 mm(0,020")ID x 1/16" OD
RH-9055-024	100 µL Loop	0,51 mm(0,020")ID x 1/16" OD
RH-9055-025	200 µL Loop	0,51 mm(0,020")ID x 1/16" OD
RH-9055-026	500 µL Loop	0,76 mm(0,030")ID x 1/16" OD
RH-9055-027	1000 µL Loop	0,76 mm(0,030")ID x 1/16" OD
RH-9055-028	2000 µL Loop	0,76 mm(0,030")ID x 1/16" OD
RH-9055-029	5000 µL Loop	0,76 mm(0,030")ID x 1/16" OD
RH-9055-033	10000 µL Loop	0,76 mm(0,030")ID x 1/16" OD

PEEK Sampling Loops for 7725 and 7725i

Cat.No.	Volume	Tubing
RH-7755-015	2 µl Loop	Internal Loop

RHEFLEX Fittings

Cat.No.	Description
RH-6000-083	Nut and Ferrule for 1/8" Loop, 5u.
RH-6000-210	Ferrules for 1/8" loops, 10u.
RH-6000-211	Nuts and ferrules for 1/16" Loops, 10u.
UP-P-331	Super Flangeless Nut for RH-1876 and RH-1877 1/8" Loops, 1u.
UP-P-350X	Super Flangeless Ferrule for RH-1876 and RH-1877 Loops, 10u.
UP-P-654	PEEK adapter for RH-1876 and RH-1877 1/8" Loops, 1u.

RHEFLEX Fittings for PEEK Loops

Cat.No.	Description
RH-6000-251	PEEK Ferrules for 1/16" Loops, 10u
RH-6000-254	PEEK Nuts and ferrules for 1/16" Loops, 10u
RH-6000-078	PEEK Nuts and Ferrules for 1/8" Loops, 1u
RH-6000-079	PEEK Ferrules for 1/8" Loops, 5u

Rheodyne Accessories

Accessories for the Injection Port

Cat.No.	Description
RH-7012	Stainless Steel Loop Filler Point
RH-9012	PEEK Loop Filler Point
RH-9013	PEEK Needle Port
RH-7125-054	Needle Port Cleaner
RH-9125-076	Suction Needle Adapter (for Model 9725)

Mounting Brackets

Rheodyne mounting brackets and panels of different shapes and sizes organize and provide a sturdy support for Rheodyne valves. The Ring Stand Mounting Bracket now allows the valves to mount onto common laboratory equipment.

Cat.No.	Description
RH-7160	Mounting Panel
RH-7160-010	Valve Angle Bracket
RH-7160-029	Ring Stand Mounting Bracket

RH-7160-10

RH-7160

RH-7160-029

Other Accessories

Cat.No.	Description
RH-7161-020	Position Sensor Switch for 7125
RH-7161-016	Pos. Sensor Switch for 7010, 7410, 7000, 7030, and 7040
RH-7165	Pos. Sensor Switch for 7250
RH-6810	Rheodyne Wrench

RH-6810

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