



Chromatography Products Catalogue

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Tk Corporate Information



It is a pleasure to introduce you our Chromatography Products Catalogue, fruit of our clear objective to be closer to you in a professional and also friendly manner.

Just a few words to explain the basis of our relationship objectives

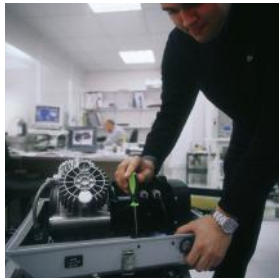
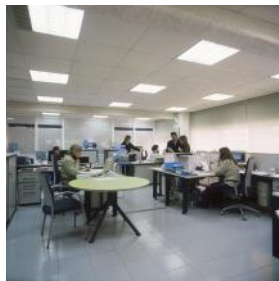
The confidence shown in us by our clients over more than 30 years is explained by our constant policy of surpassing their expectations.

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 enabled 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, expressed over so many years. It is this confidence that strenghtens our convictions, and helps us each day to be closer to you.

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



Teknokroma Headquarters

Jaume Costa i Balcells
Sales & Marketing Director

Camí de Can Calders, 14
08173 Sant Cugat del Vallés (Barcelona) Spain
Tel: +34 936 748 800. Fax: +34 936 752 405

E-mail: export@teknokroma.es
www.teknokroma.com



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

Teknokroma™ Products



Our technical analysis products catalogue, with more than 4.000 references, is continuously growing with new own research developments and external collaborations with companies and institutions such as “Consejo Superior de Investigaciones Científicas (CSIC)”, “Institut Químic de Sarrià (IQS)” and with world-renown chromatographer, Cole Woolley, PhD.

- Packed Columns
- Capillary Columns
- HPLC Columns
- Syringe Filters
- Membrane Filters
- Syringes
- Robot Filters
- Static Head Space Sampler
- SPE
- Vials and Septa for Autosampler
- Consumables GC
- Consumables HPLC





Capillary Columns

Sapiens-1ms	See page XI
Sapiens-5ms	See page XIII
Sapiens-X5ms	See page XVII
Sapiens-Wax.ms	See page XXII
Sapiens-Wax.ht	See page XXIV
MetAmine-VOL	See page 37
MTI-5	See pages 39-40
Meta.X5 Triazine	See page 43
Meta.XLB	See pages 43-44
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Meta.VOC	See page 68
Meta.BLOOD 1	See page 70
Meta.BLOOD 2	See page 70
TRB-BIODIESEL	See pages 71-72

Ferrules
teide by Teknokroma™



TEIDE™ Ferrules

See pages 93-96

New Teknokroma Liners



New Teknokroma Liners

See pages 97-101

OlimPeak[®]
Certified Filters by Teknokroma



Certified Olimpeak™ Syringe Filters

See pages 160-168

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

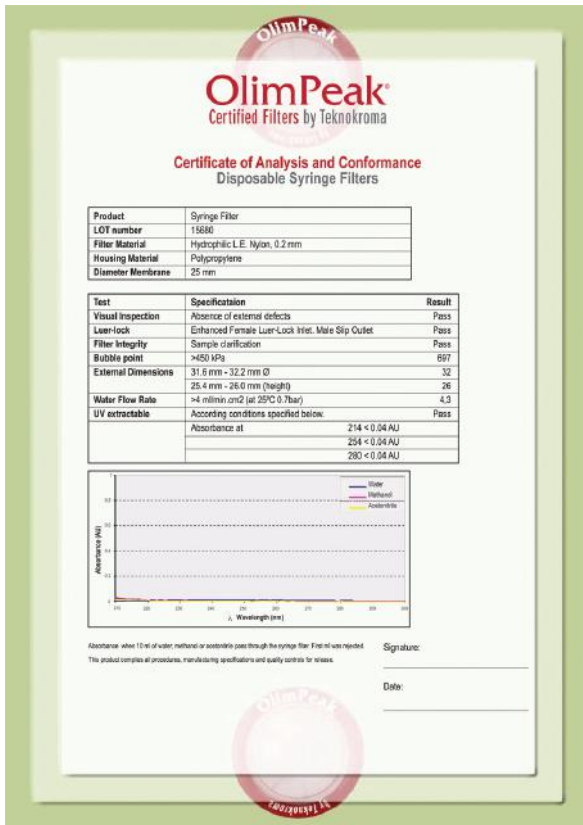
diskobolus septa
by Teknokroma™



Diskobolus™ Septa

See pages 88-92





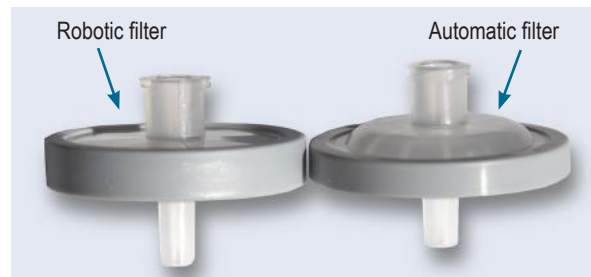
MiniTip Certified Olimpeak™ Syringe Filters



MiniTip Olimpeak™ Syringe Filters See page 167

- 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.

New Certified AUTOMATIC OlimPeak Filter



New Certified AUTOMATIC OlimPeak Filter for Automatic Equipments See page 170

- 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 leuer Screw ant the outlet is a male luer Minispike.

Micro-Centrifugal Filters - Nonsterile



New Micro-Centrifugal Filters - Nontersile See page 169

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 uniuques for traceability, GLP's and validation purposes.

Certified Olimpeak™ Membrane Filters



Certified Olimpeak™ Membrane Filters See pages 171-172

- 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

Filtering Equipment



Filtering Equipment See page 172

- 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 glass DURAN from Schott.
- The porosity of the filtration plate is of number 3, which means a nominal pore size of 16-40 micrometers.

Finisterre

by Teknokroma™



Finisterre™ SPE Columns See pages 173-179

Teknokroma introduces in the market the new 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.

HPLC Columns



New Hardware Design column: Ultrafit™ System

New Hardware Design column:
Ultrafit™ System See page 190

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.

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:

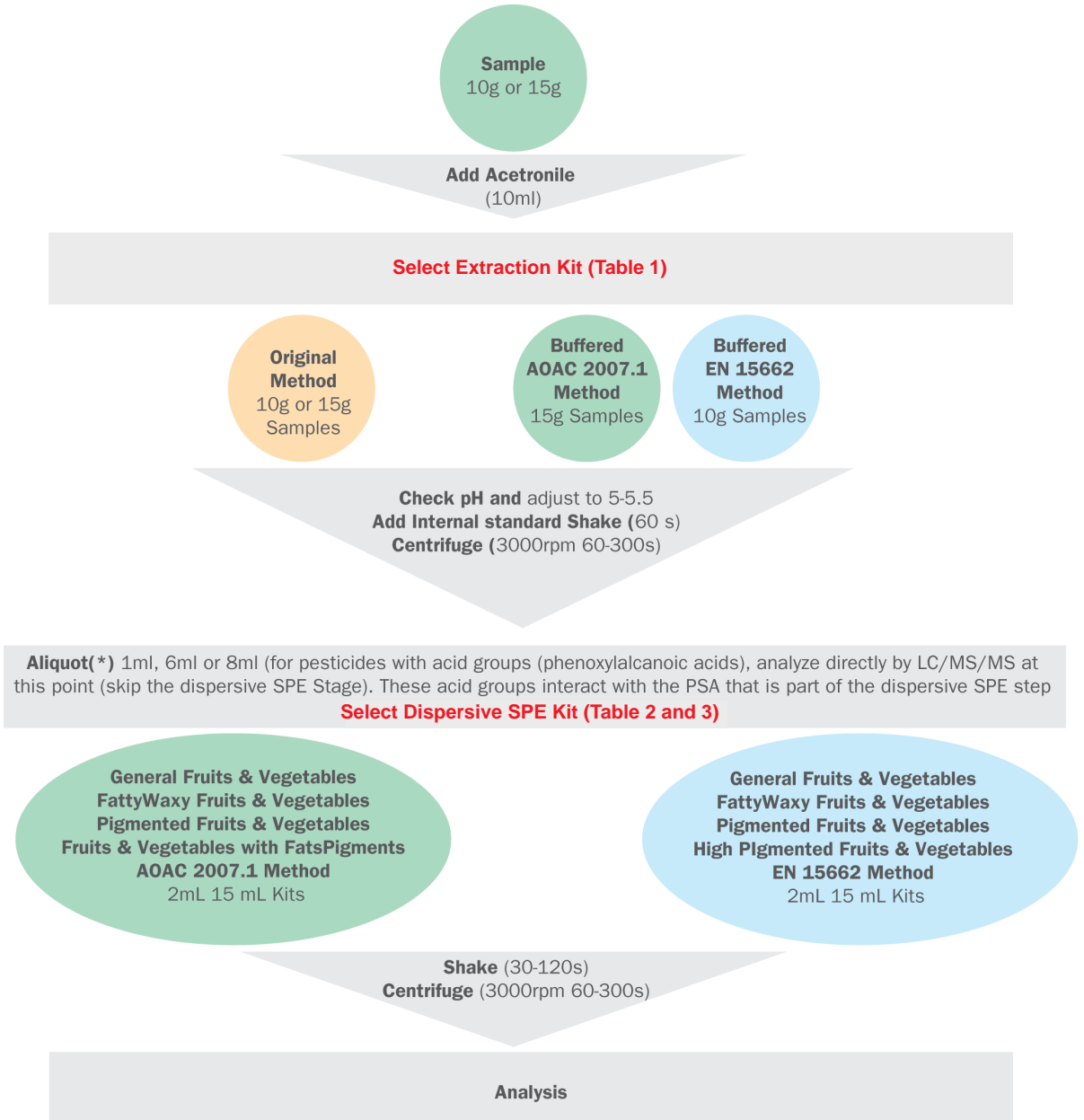
- √ High recoveries
- √ Accurate results
- √ High sample throughput
- √ Minimal solvent use
- √ Less labor
- √ Lower costs
- √ Simple glassware

Tk What's New

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.



(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 MgSO ₄ , 1g NaCl, 1g trisodium citrate dihydrate, 0.5g disodium hydrogencitrate sesquihydrate	50	European EN-15662
TR-Q5040	6g MgSO ₄ , 1.5g NaOAc	50	AOAC 2007.01
TR-Q5020	4g MgSO ₄ , 1g NaCl	50	Mini-Multiresidue (10 g sample)
TR-Q5045	6g MgSO ₄ , 1.5g NaCl	50	Mini-Multiresidue (15 g sample)
TR-Q5030	6g MgSO ₄ , 1.5g NaCl, 1.5g sodium citrate dibasic, 750mg disodium citrate dibasic sesquihydrate	50	
TR-Q5050	6g MgSO ₄ , 1.5g NaOAc, 750mg disodium citrate sesquihydrate	50	
TR-Q5000	Empty 50mL tube	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 MgSO₄.

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 MgSO ₄ , 25mg PSA	100	1	European EN-15662 Mini-Multiresidue
TR-Q2025	150mg MgSO ₄ , 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 MgSO ₄ , 25mg C18	100	1	AOAC 2007.01
TR-Q2000	Empty 2mL Centrifuge Tube	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-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-Q1595	900mg MgSO ₄ , 300mg PSA, 150mg C18	50	6	---
TR-Q1600	750mg MgSO ₄ , 250mg PSA, 250mg C18, 250 mg GCB	50	6	---

PSA= Primary and secondary exchange material

GCB= Graphitized carbon blank



Selection Guide for Dispersive Kits. Phase 2




Types	Qt Pack	Methods			
		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 MgSO ₄ Part N° TR-Q2015	50 mg PSA 150 mg MgSO ₄ Part No. TR-Q2055	25 mg PSA 150 mg MgSO ₄ Part No. TR-Q2015	
	50 tubes 15 mL	150 mg PSA 900 mg MgSO ₄ Part No. TR-Q1590	400 mg PSA 1200 mg MgSO ₄ 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 MgSO ₄ Part No. TR-Q2025	50 mg PSA 50 mg C18 150 mg MgSO ₄ Part No. TR-Q2065	25 mg PSA 25 mg C18 150 mg MgSO ₄ Part No. TR-Q2025	
	50 tubes 15 mL	150 mg PSA 150 mg C18 900 mg MgSO ₄ Part No. TR-Q1593	400 mg PSA 400 mg C18 1200 mg MgSO ₄ Part No. TR-Q1515		150 mg PSA 150 mg C18 900 mg MgSO ₄ 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		





Mediterranea™ Sea 18, 8 & 4

See pages 200-210

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.

by Teknokroma Europa®



Europa™ for Peptides & Proteins

See pages 211-217

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

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

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

As a result of these, we launch into the market the Line of Europa HPLC columns, one of the best columns in the field of analysis of biomolecules.

The Europa HPLC columns for peptides and proteins, provide the best performance and unsurpassed efficiency, reliability and reproducibility.

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

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

mediterranea hplc



New 2,2 µm Mediterranea by Teknokroma

Reduces analysis costs with no resolution loss
Can work at high flow rates with no efficiency loss
Less backpressure than 1,8 µm columns
Reduces solvent consumption
Ideal for LC-MS applications

Mediterranea UHPLC column

Mediterranea is a transitional column fully compatible with cutting-edge HPLC and UPLC systems, radically improving analysis performance and reducing retention times.

The material used for the development of Mediterranea 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 100 Å.

Mediterranea C18 uses the latest technology in functionalization and endcapping of silica particles. Is compatible with a 100% aqueous mobile phase and it stands extreme pH conditions (1,5 to 11).

Mediterranea has been developed to offer the highest quality and reproducibility

Mediterranea UPLC columns C18 2,2 µm

TR-010900	Mediterranea C18	5 x 0,21 cm	2,2 µm
TR-010901	Mediterranea C18	10 x 0,21 cm	2,2 µm

Teknokroma checks rigorously both each packing batch and every single column.

Brisa "LC2"

Latest technology Ultrapure Silica

Optimizes your analysis costs

Immediate delivery

New column Brisa LC2

"Limited Cost x Liquid Chromatography"

The material used for this column development is an ultrapure and metal free silica packing. The pore size is 120 Å and it's available in 3 & 5 µm 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

C18 (3 & 5 µm)

TR-010481	Brisa LC2 C18	25 x 0,46 cm.	5 µm
TR-010480	Brisa LC2 C18	15 x 0,46 cm.	5 µm
TR-010498	Brisa LC2 C18	15 x 0,46 cm.	3 µm
TR-010499	Brisa LC2 C18	10 x 0,46 cm.	3 µm

LC-MS Columns Brisa LC2

C18-MS (3 µm)

TR-010496	Brisa LC2 C18-MS	5 x 0,21 cm.	3 µm
TR-010497	Brisa LC2 C18-MS	10 x 0,21 cm.	3 µm

Advantix ODS



Advantix ODS

See pages 235-236

New packing made of spherical ultra-pure silica particles, with extremely low metals content, functionalized with groups octadecylsilyl of polar embedded type. This polar group included in the base of hydrocarbonades chains confers to the packing a high deactivation in front of basic compounds, being able to chromatograph with perfectly symmetric peaks all kind of bases, including the most difficult ones. Working with acid pH's are able to easily cromatograph acid compounds, basic and quelants.

Also, the polar group included in the functionalization of the packing provides an especial selectivity very useful in the resolution of mixtures separated in conventional C18 packings.

Hyper-Pack ODS



Hyper-Pack ODS

See pages 237-237

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.

Hyper-Pack Basic



Hyper-Pack Basic

See pages 239-240

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.

Deuterium Lamps for a Detector



Deuterium Lamps for a Detector

See pages 279-282

HPLC Safety Caps



HPLC Safety Caps

See pages 283-287

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.



HPLC Safety Waste Caps
 HPLC Safety Caps - With Safety Funnel
 Exhaust Filters for Safety Caps
 HPLC Safety Funnels
 Accessories & Consumables

Safety Caps

See pages 288-297

Hamilton SoftGrip™ 2nd. Generation Pipettes



Hamilton SoftGrip™
 2nd. Generation Pipettes

See pages 299-301

- Wide Selection of Ergonomic Pipettes
- Completely Autoclavable
- Guaranteed Accuracy and Precision

Universal AdvanTip™ LT and Precision Pipette Tips



Universal AdvanTip™ LT
 and Precision Pipette Tips

See pages 302-303

GLP Laboratory Electrodes



GLP Laboratory Electrodes

See pages 304-307

- All electrodes are printed with an indelible serial number
- Individual test certificates with measured values
- Indelible marking means long-term readability
- Ergonomic electrode head
- Proven electrolyte sealing system
- High-quality seal between electrode head and cable (IP 68)
- Integrated, captive seal at the electrode plug head
- Blue interior buffer gives visual indication of contact with the pH diaphragm

HPLC Column Heaters



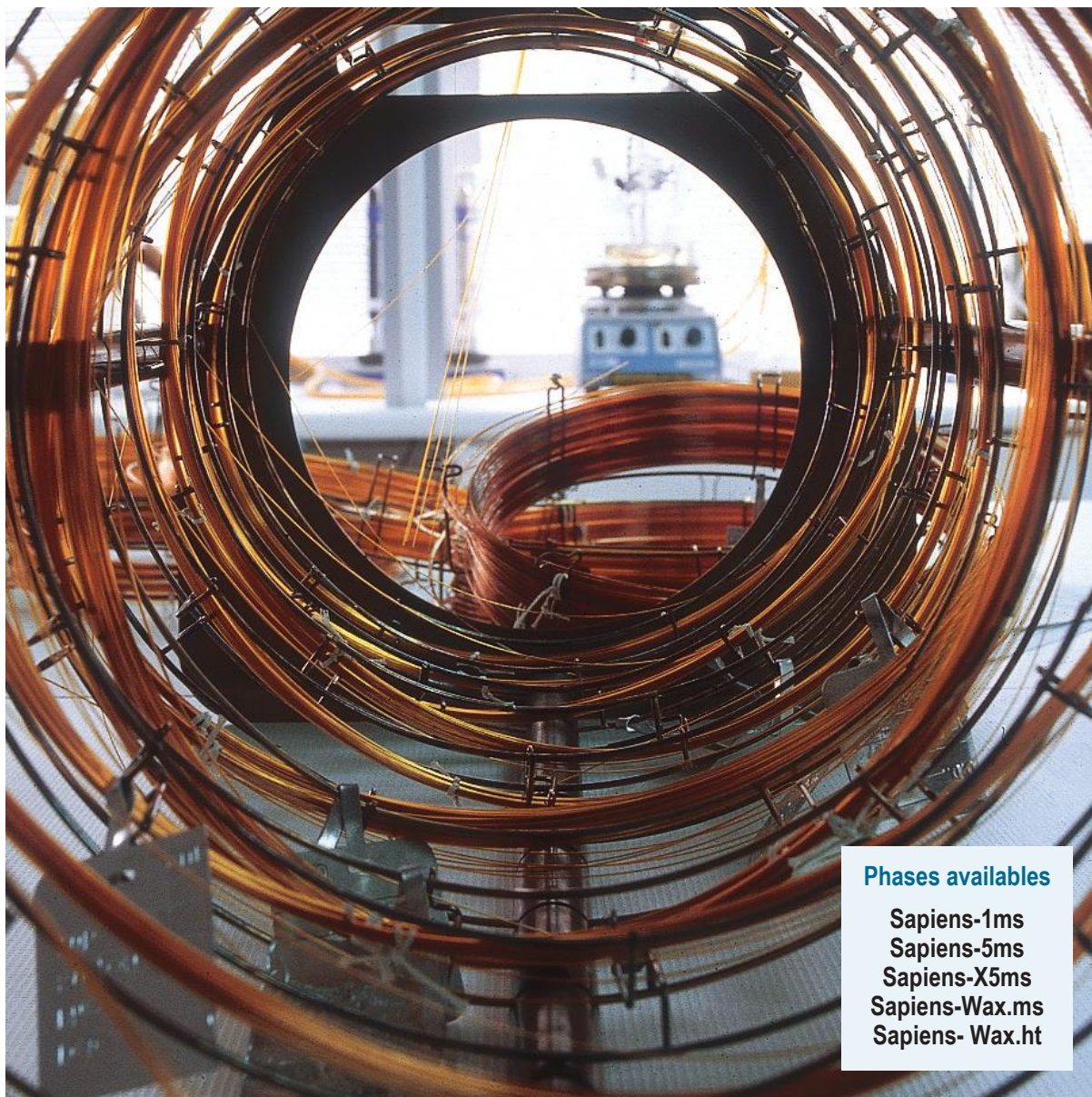
HPLC Column Heaters

See pages 308-309

- **Functional and Compact**
 Can be used with any instrument and any column
 Remote control
 Rheodyne or Vici valves can be installed internally
 Mobile phase preheating (optional)
- **Accurate**
 The opposite metal mesh beds guarantee uniform temperature spread as the metal acts as an ideal heat conductor while, at the same time, allowing air to circulate freely (patented).
 Electronic temperature regulation produces reproducible retention times (CV < 1%)
- **Safe**
 Mobile phase leaks easily detectable (leak detector)

Line of Sapiens Capillary Columns

We are pleased to introduce a superb new generation of capillary columns



Phases availables

Sapiens-1ms
Sapiens-5ms
Sapiens-X5ms
Sapiens-Wax.ms
Sapiens- Wax.ht

- Ultra low bleed and high inertness with respect to active, acid and basic compounds
- Developed with integral technology
- Molecular Stabilization Process incorporated (MSP)

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.
- Developed with new integral technology
- Molecular Stabilization Process incorporated (MSP)
- Highest inertness for polar, acid and basic compounds
- Extreme low bleed (improve trace level analysis)
- Warranted reproducibility between batches
- Perfect for use with Retention Time Locking (RTL) software

Sapiens-1ms

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

- General purpose column, non polar
- Ultralow bleed, improved signal to noise ratio for GC-MS
- Solvent rinsable

Sapiens-1ms Equivalent Phase

Agilent: DB1-MS UI, HP-1 MS UI, VF-1MS

Restek: Rxi-1MS

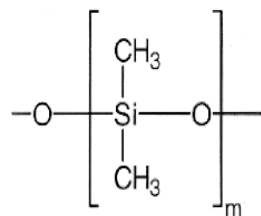
Phenomenex: ZB-1MS

GL Sciences: InertCap 1MS

Sigma-Aldrich: Equity-1

SGE: SOL-GEL-1MS, BPX-1

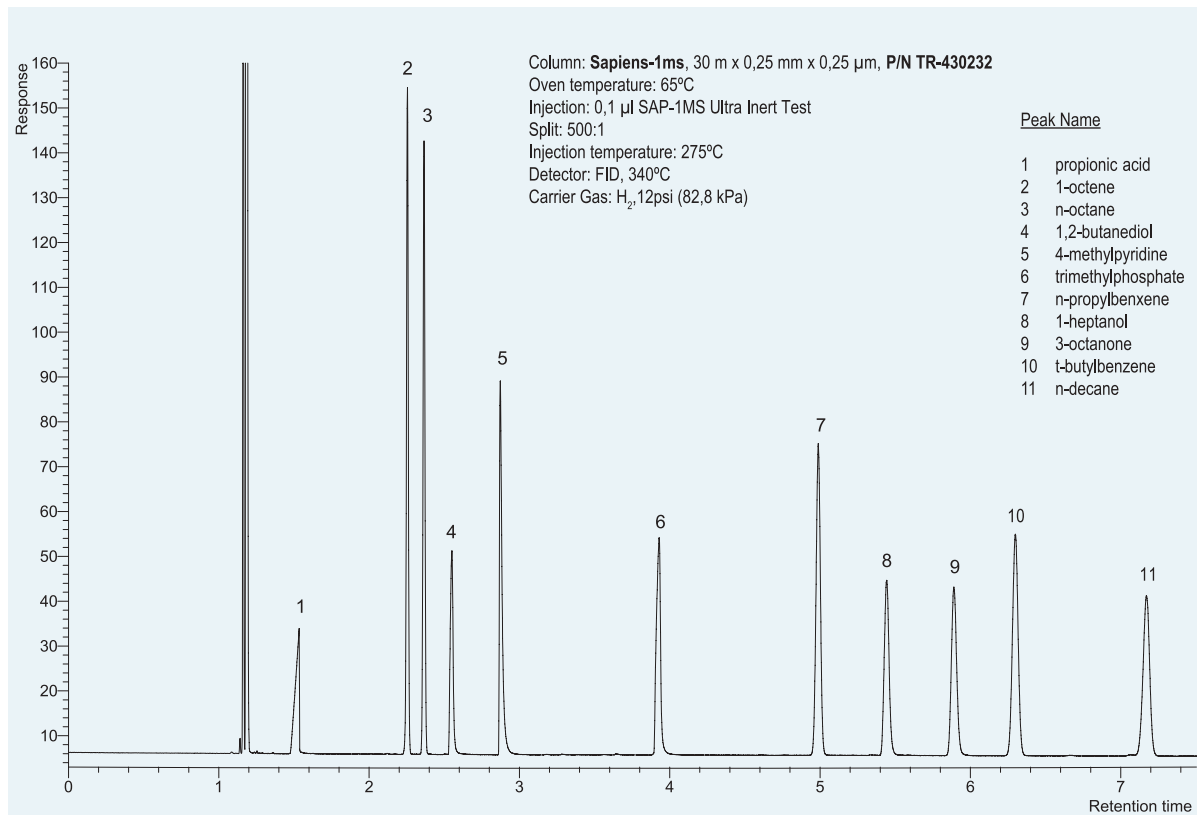
Macherey-Nagel: OPTIMA-1MS Accent



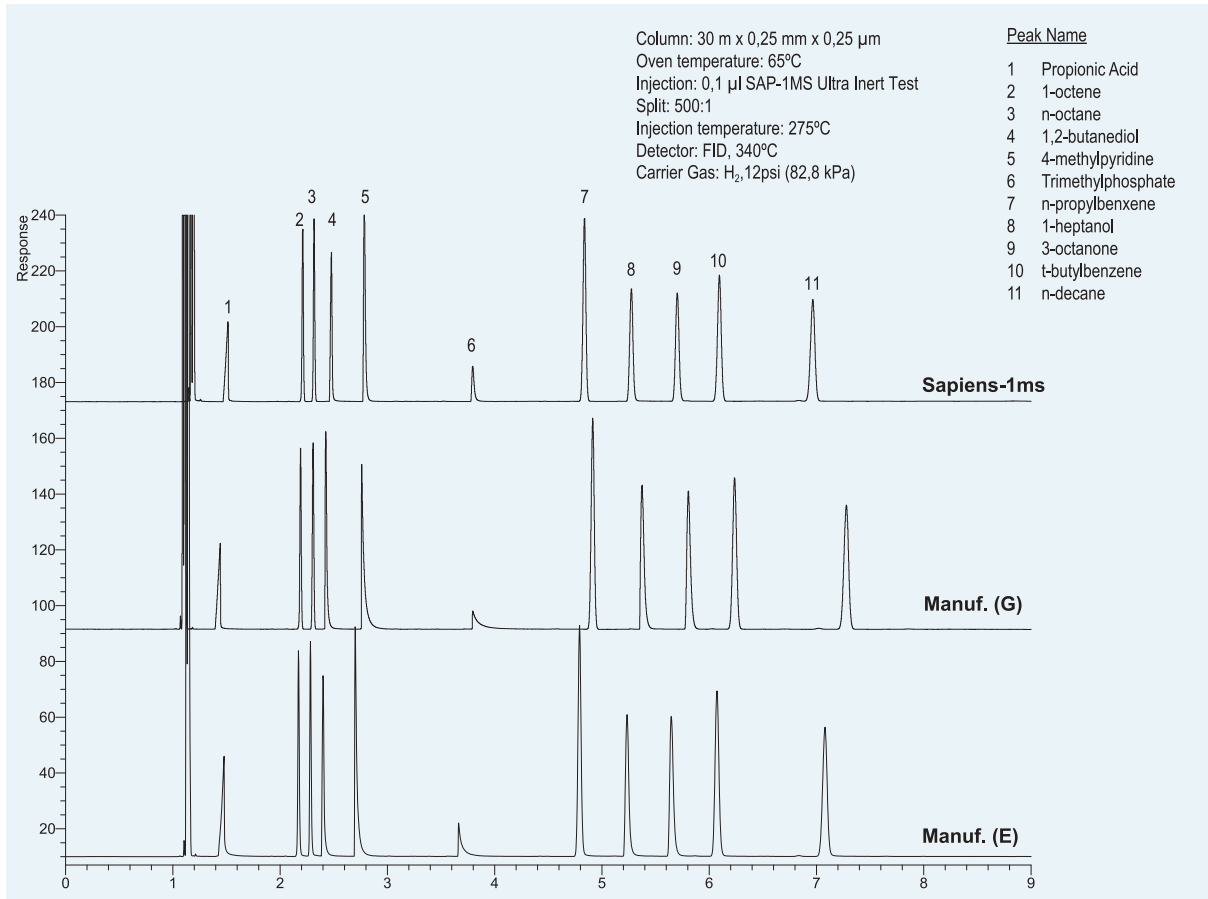
Structure of Poly(dimethyl)siloxane

Sapiens-1ms: Ultra Inert Test (SAP-1MS)

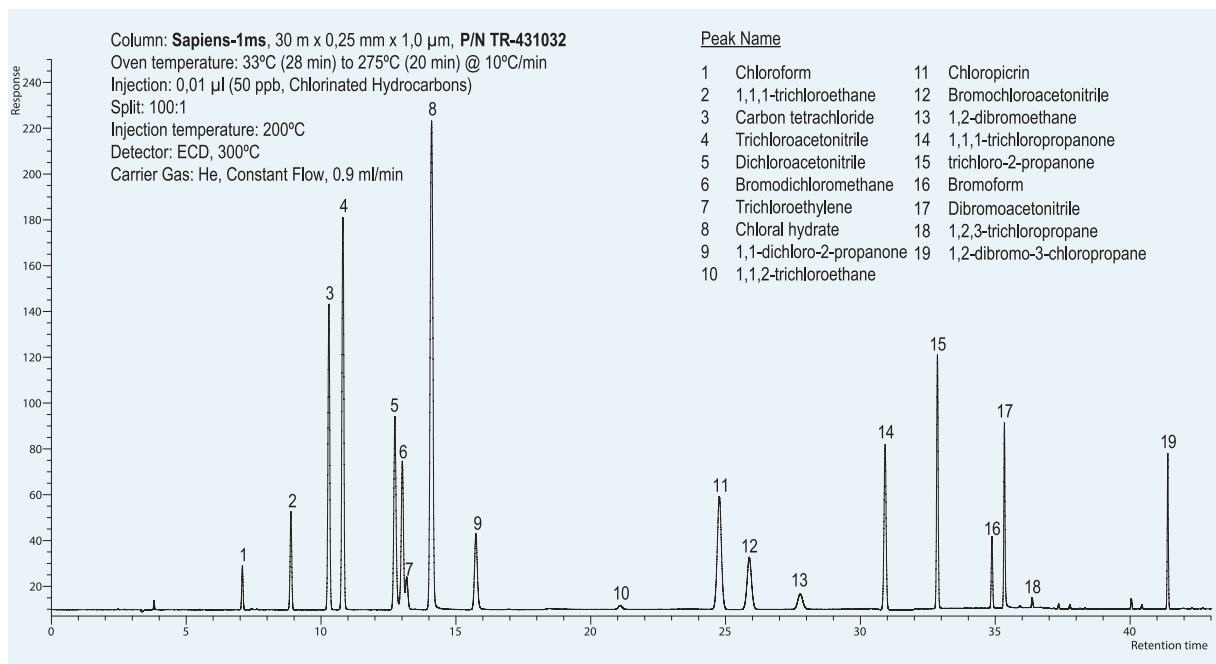
Good peak shape and response for all active compounds



Sapiens-1ms, Ultra Inert Comparative Test (SAP-1MS) vs principal competitors



Application: Sapiens-1ms, 30m x 0,25mm x 1,0 μ m, P/N TR-431032 Analysis chlorinated solvents and disinfection by-products (EPA 551.1)



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
0,32	60	0,25	-60 to 325/350	TR-430262
	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

Sapiens-5ms Equivalent Phase

Agilent: HP-5 MS UI

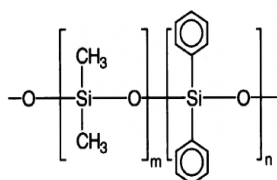
Restek: Rxi-5MS

Phenomenex: ZB-5MSi

Sigma-Aldrich: Equity®-5

SGE: BP-5

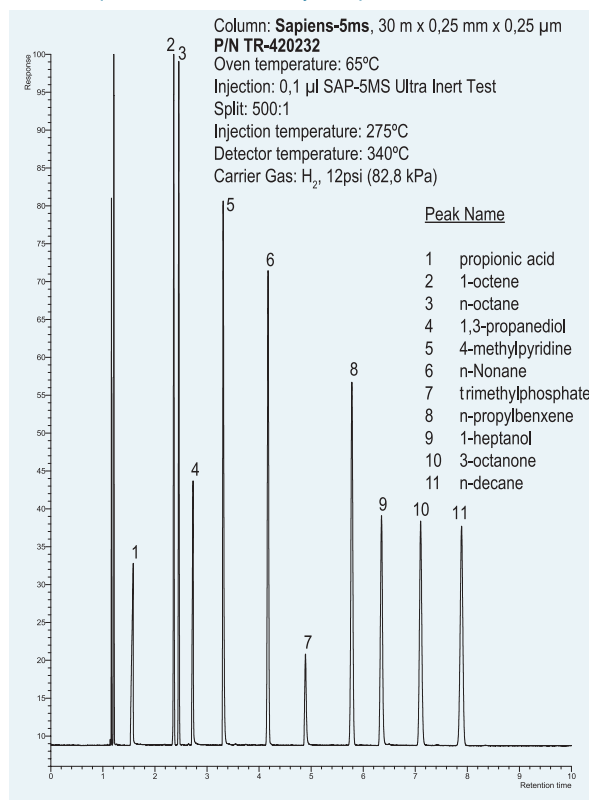
Macherey-Nagel: OPTIMA-5MS



Structure of Poly (dimethyl-diphenylsiloxane)

Sapiens-5ms: Ultra Inert Test (SAP-5MS)

Excellent performance for all key compounds

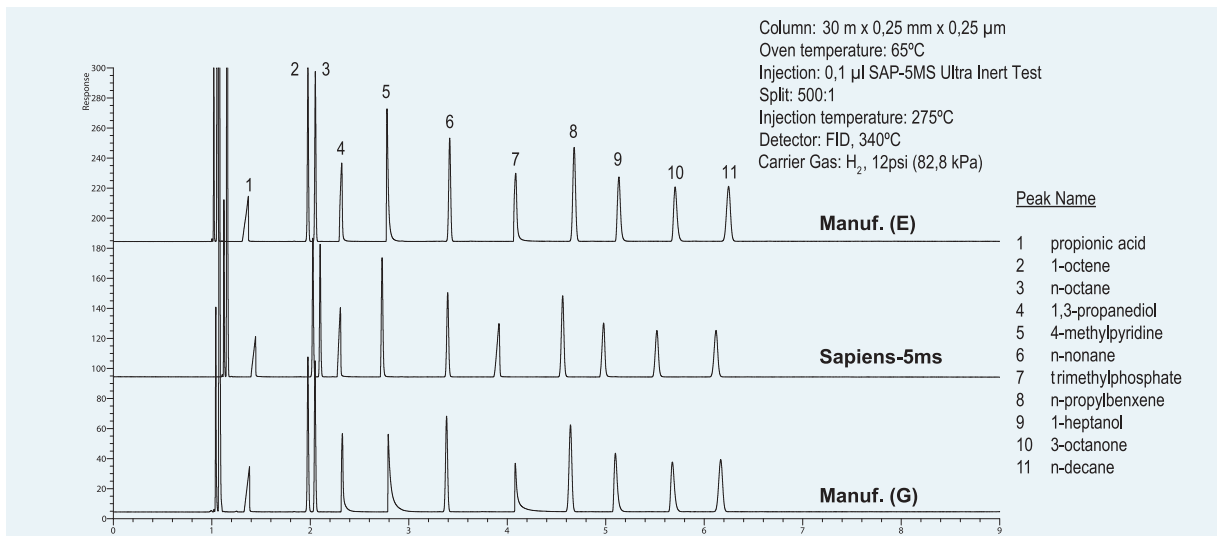


SAP-5MS: Ultra Inert Test (composition)

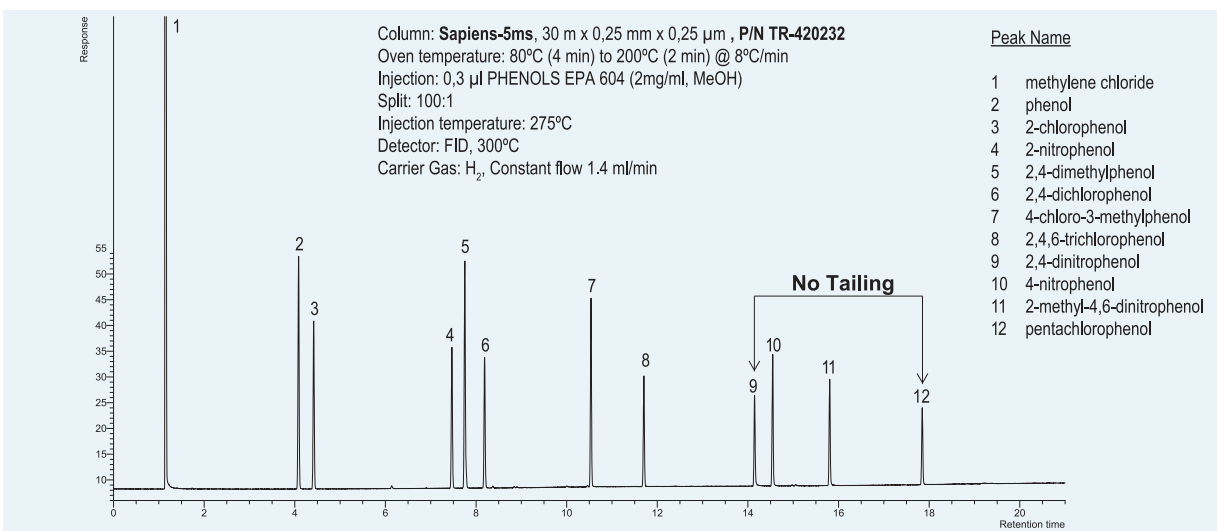
Elution	Compound	Key Control Parameter
1	Propionic acid	Basicity
2	1-Octene	Polarity
3	n-Octane	Hydrocarbon
4	1,3-Propanediol	Silanol
5	4-Methylpyridine	Acidity
6	n-Nonane	Hydrocarbon
7	Trimethylphosphate	Acidity
8	n-Propylbenzene	Hydrocarbon
9	1-Heptanol	Silanol
10	3-Octanone	Polarity
11	n-Decane	Hydrocarbon

Comparison Sapiens-5ms

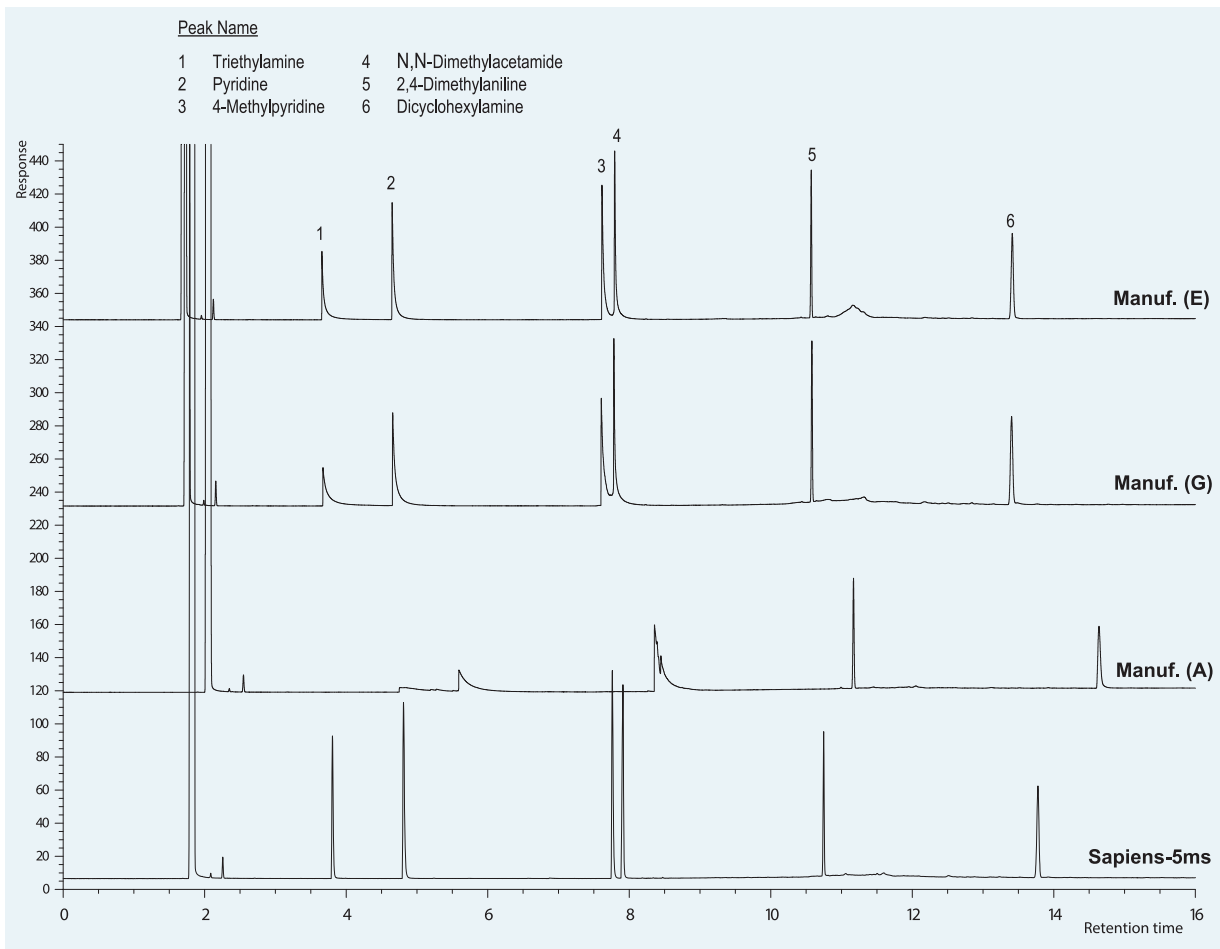
Sapiens-5ms: Inertness comp. test (SAP-5MS) vs principal competitors



Sapiens-5ms: Acidity Test - Perfect Peak shapes

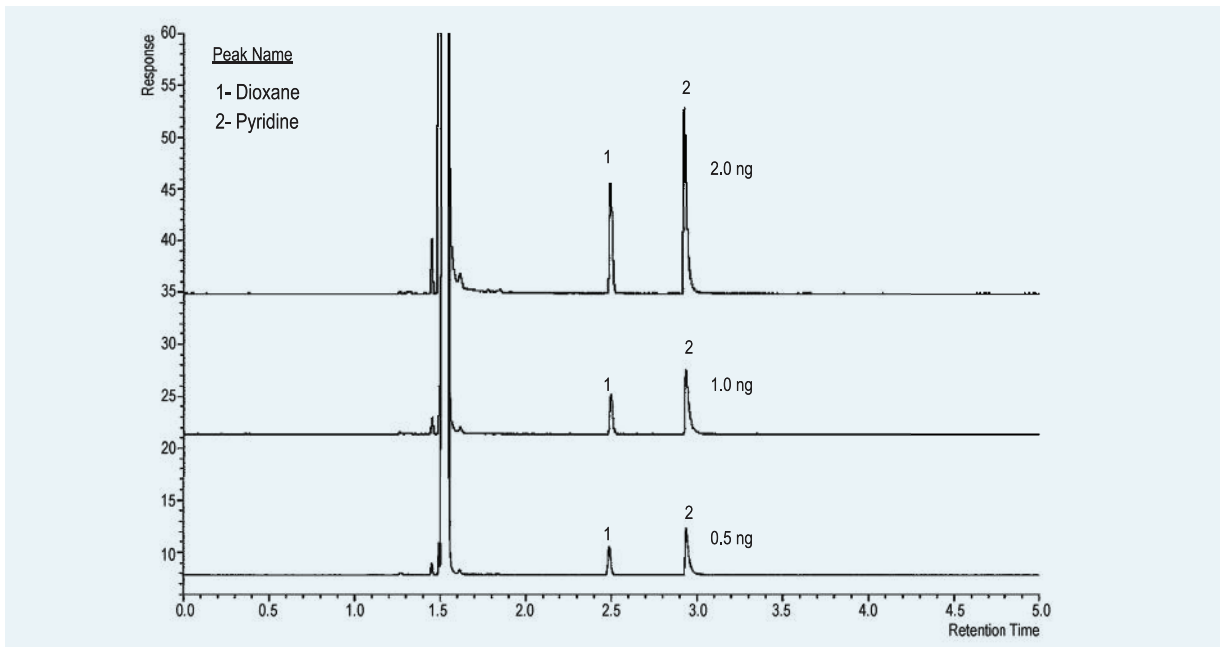


Sapiens-5ms: Basicity comp. test vs principal competitors

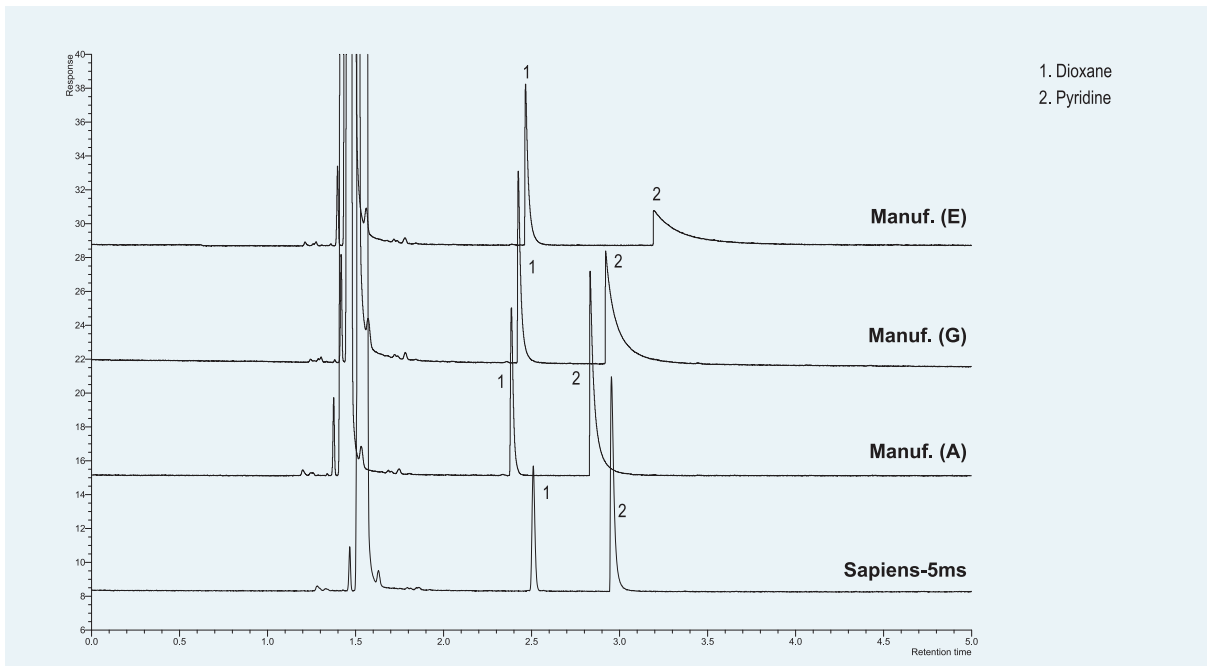


Sapiens-5ms: High inertness, Dioxane, Pyridine

No retention time shifts with pyridine at low concentration (no surface activity)

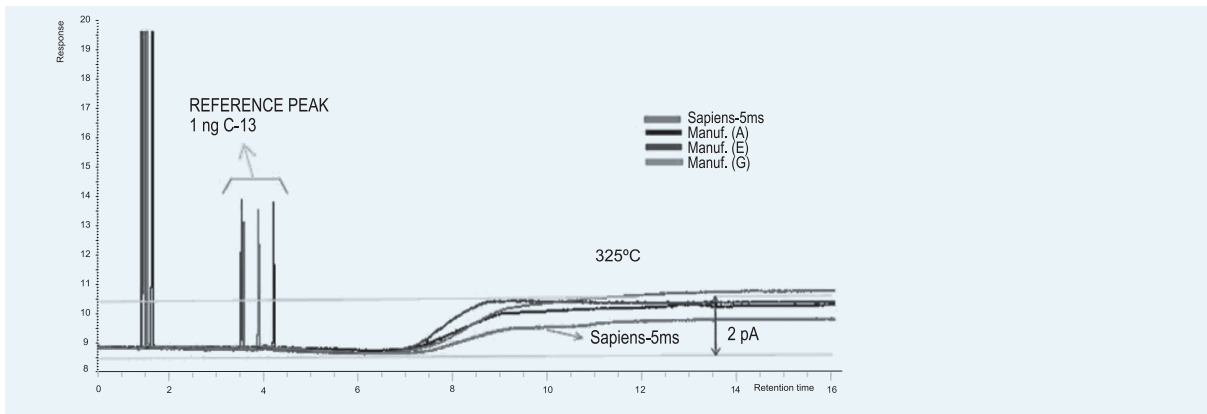


Sapiens-5ms: 1,4-dioxane and pyridine comparison test vs principal competitors



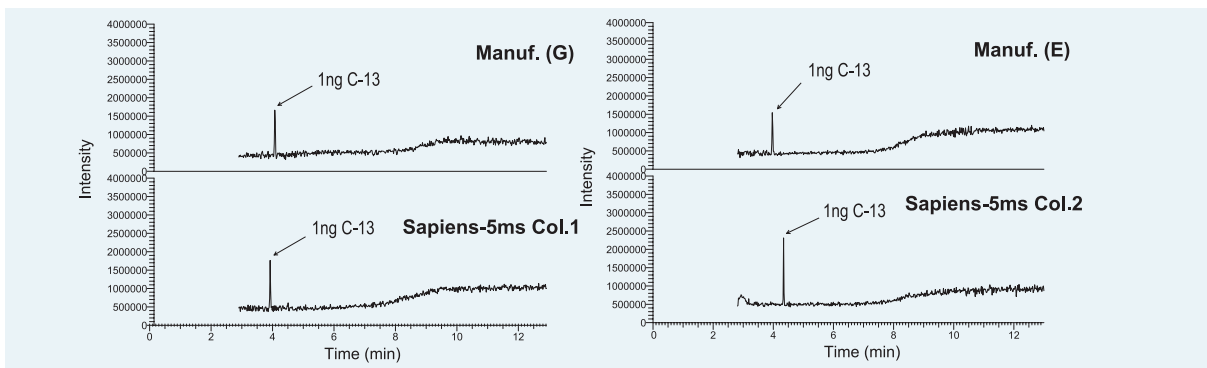
Sapiens-5ms: Bleed (FID) comparison test vs principal competitors

Bleed curves related to 1ng of tridecane in FID detector



Sapiens-5ms: Bleed (GC-MS) comparison test

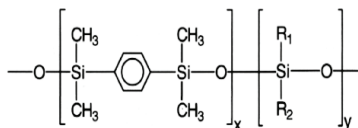
Bleed curves related to 1ng of tridecane in MS detector



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
0,32	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
	30	0,25	-60 to 325/350	TR-420233
0,32	30	0,25	-60 to 325/350	TR-420233
	30	1,00	-60 to 325/350	TR-421033

Sapiens-X5ms (Silphenylene phase)



Structure of Polysiloxane containing p-silphenylene

Sapiens-X5ms Equivalent Phase

Agilent: DB-5MS UI, VF-5MS

Restek: Rxi-5Sil MS

Phenomenex: ZB-5MS

SGE: BPX-5, BP-5MS

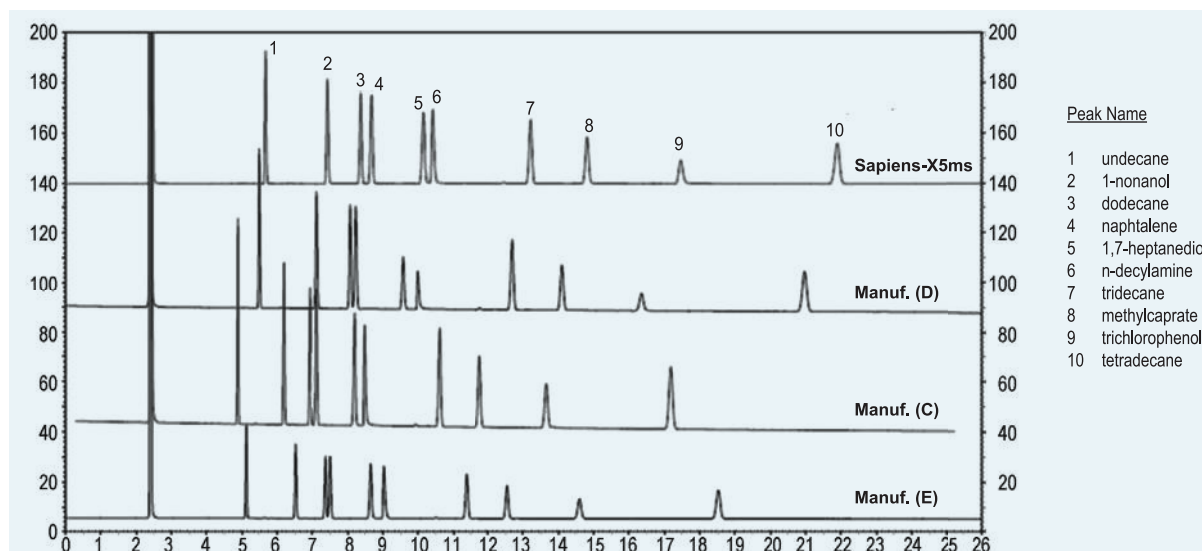
Sigma-Aldrich: SLB-5MS

Macherey-Nagel: OPTIMA-5MS Accent

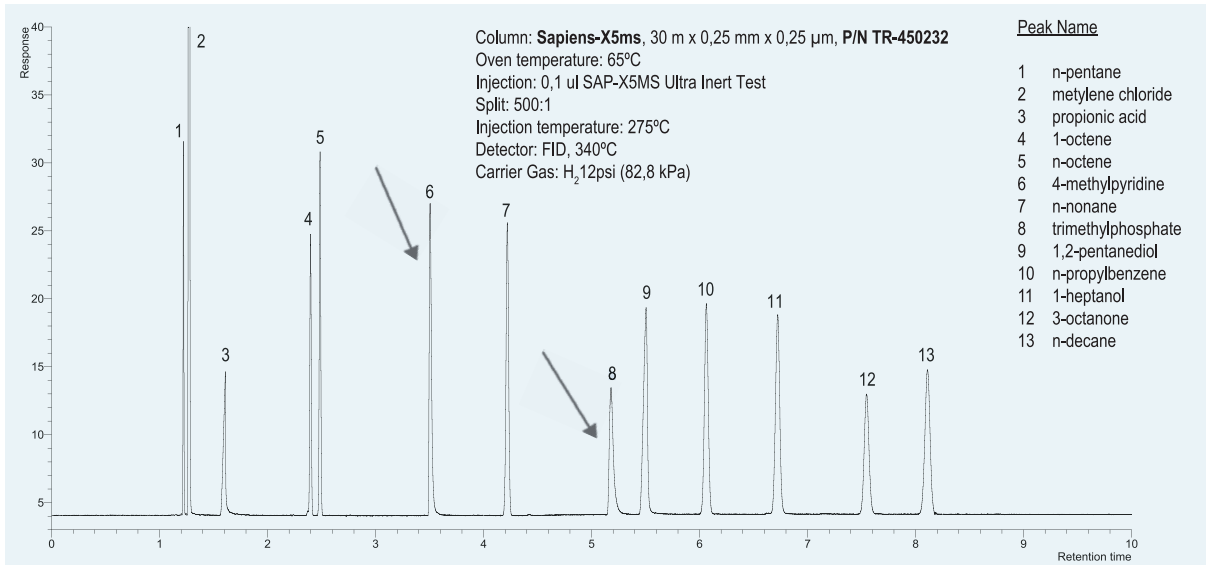
SAP-X5MS: Ultra Inert test (composition)

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

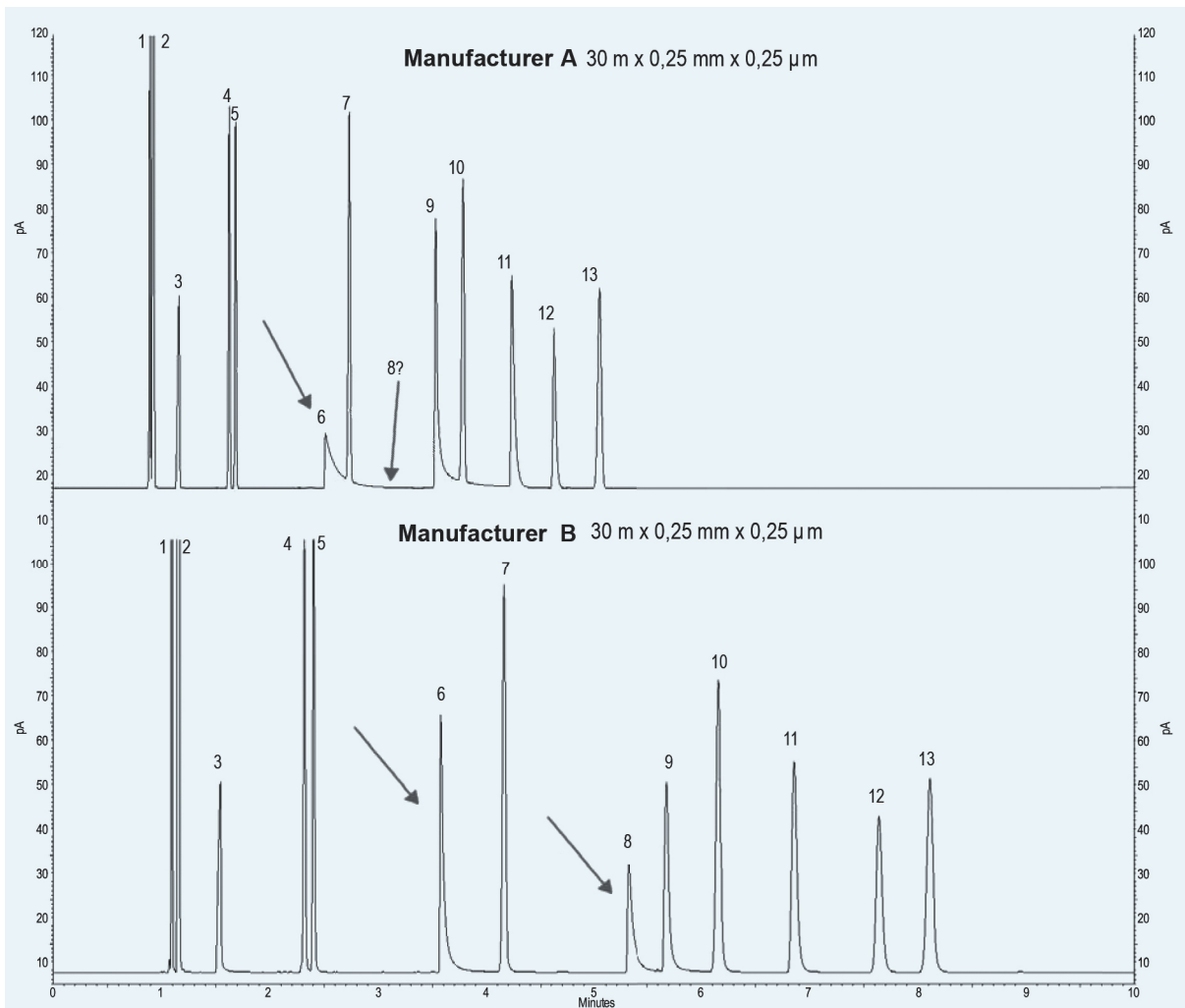
Sapiens-X5ms: Classical Inertness Test (comparison) - All columns are good

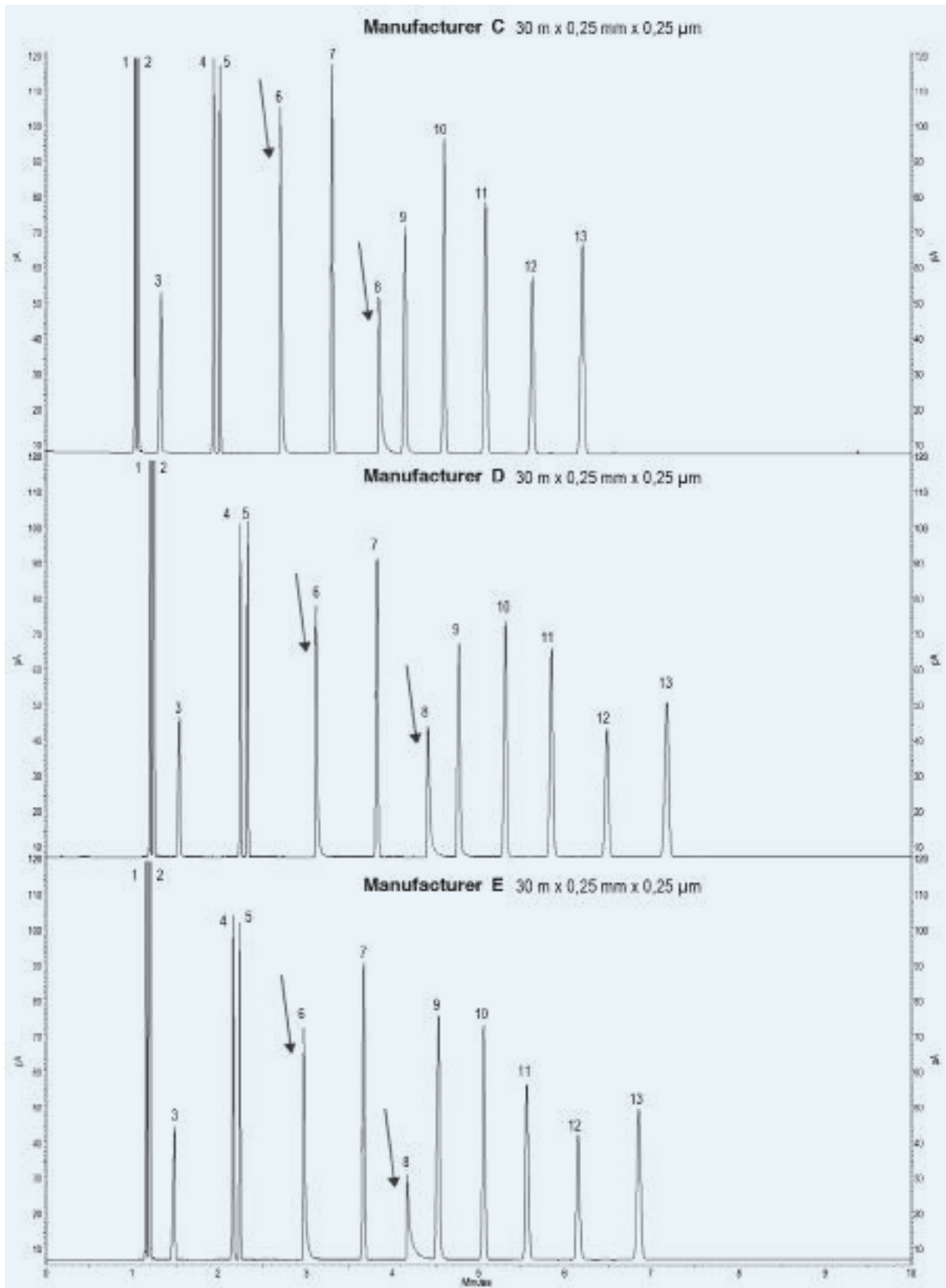


Sapiens-X5ms: Ultra Inert Test (J.Luong et al. J.Sep.Sci. 2007)
 Superior quality and peak shape for all active compounds



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





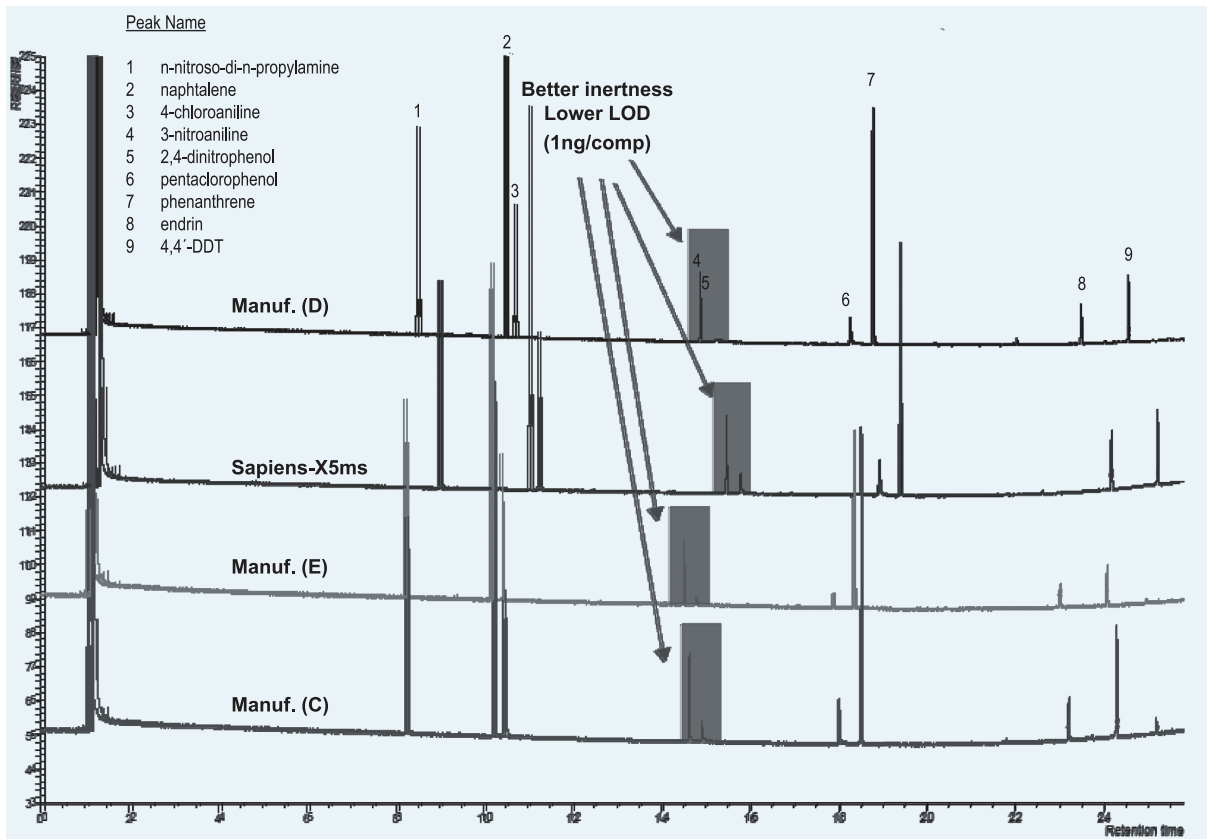
* To perform previous chromatograms shown, it have been used columns from: Agilent, Phenomenex, Supelco, SGE, Restek, (listed in random order).



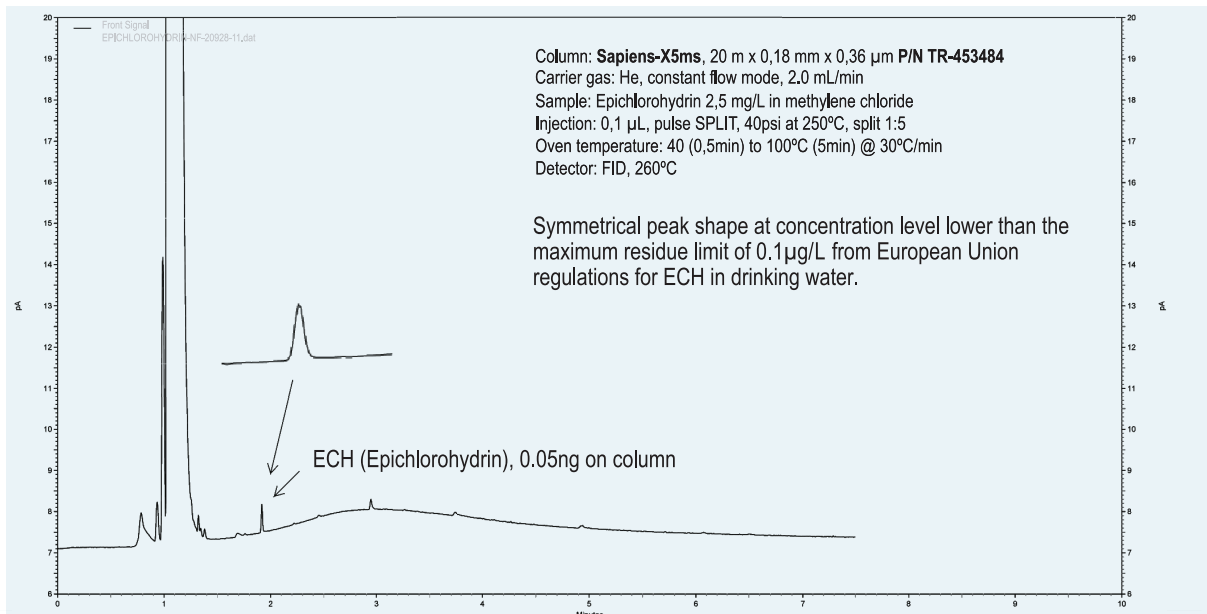
TEST ANILINES-PHENOLS-PESTICIDES:

Sapiens-X5ms vs principal manufacturers

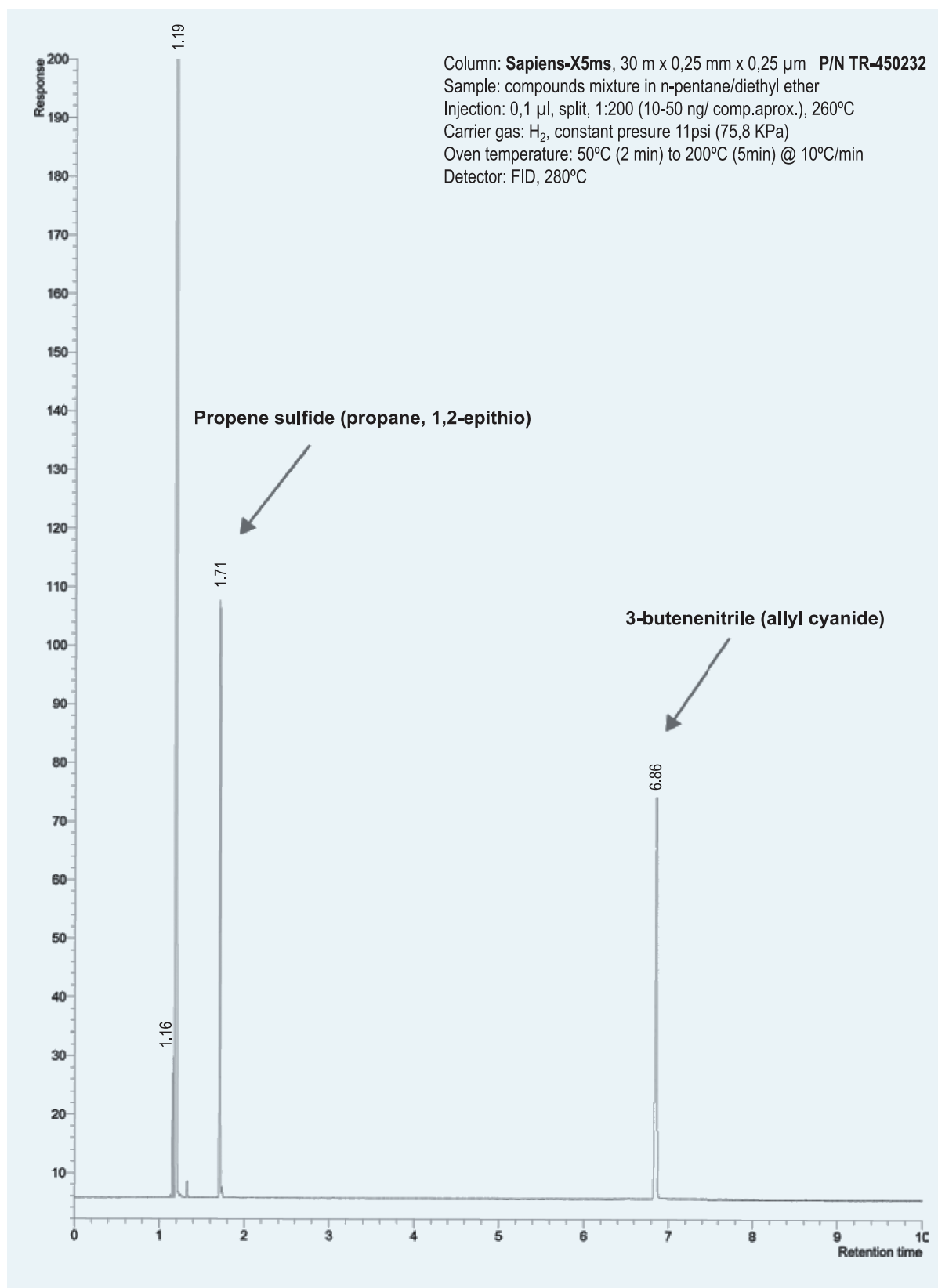
Sapiens-X5ms - Improved performance for active compounds



Application : Sapiens-X5ms - Epichlorohydrin GC analysis in drinking whater with Sapiens-X5ms column



- Application : Sapiens-X5ms - Two components from whole garlic



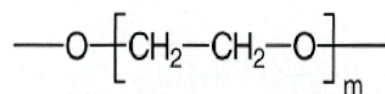
Sapiens-X5ms

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
0,32	60	1,00	-60 to 325/350	TR-451062
	30	0,25	-60 to 325/350	TR-450233
	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 and G39 phases

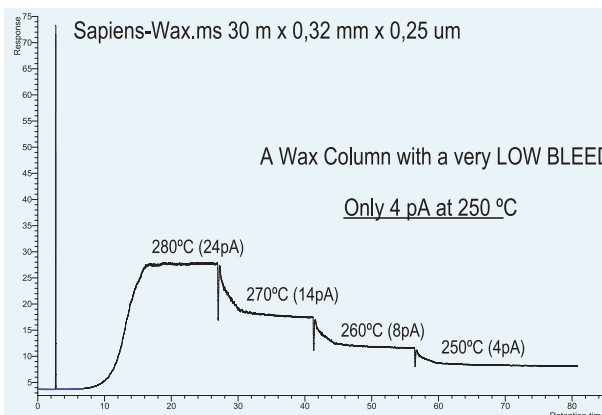


Structure of Polyethylene glycol

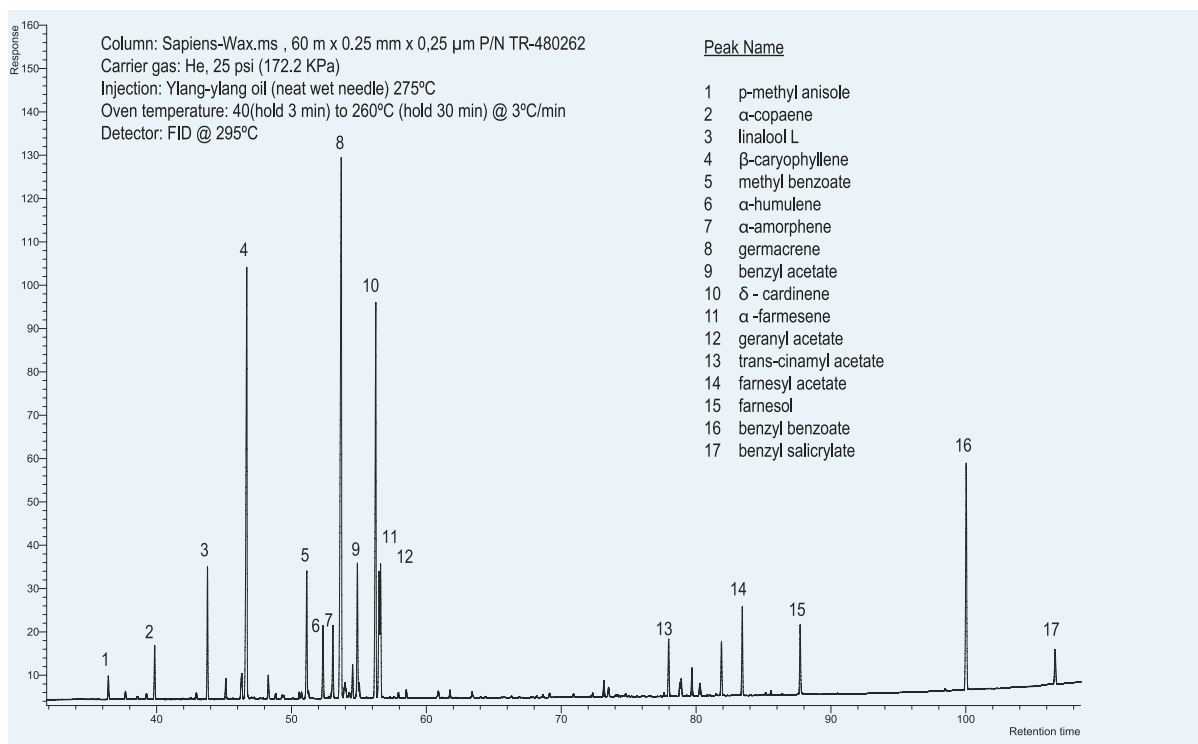
Sapiens-Wax.ms: Bleed vs Temperature

Sapiens-Wax.ms Equivalent Phase

Varian: VF-WAXms
Restek: STABILWAX MS,
Phenomenex: ZB-WAX,
Supelco: Supelcowax 10
SGE: SolGel-WAX
Macherey-Nagel: Optima-WAX



Aplicación : Sapiens-Wax.ms-essential oil: HIGH-CLASS PERFUMES GC-FID Ylang-Ylang Oil



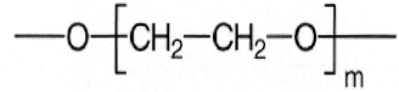
Sapiens-Wax.ms

Internal Diam(mm)	Length (m)	Film thickness(μ m)	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
0,32	60	0,25	35 to 280	TR-480262
	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

Polyethylen glycol that can withstand up to 300 ° C

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

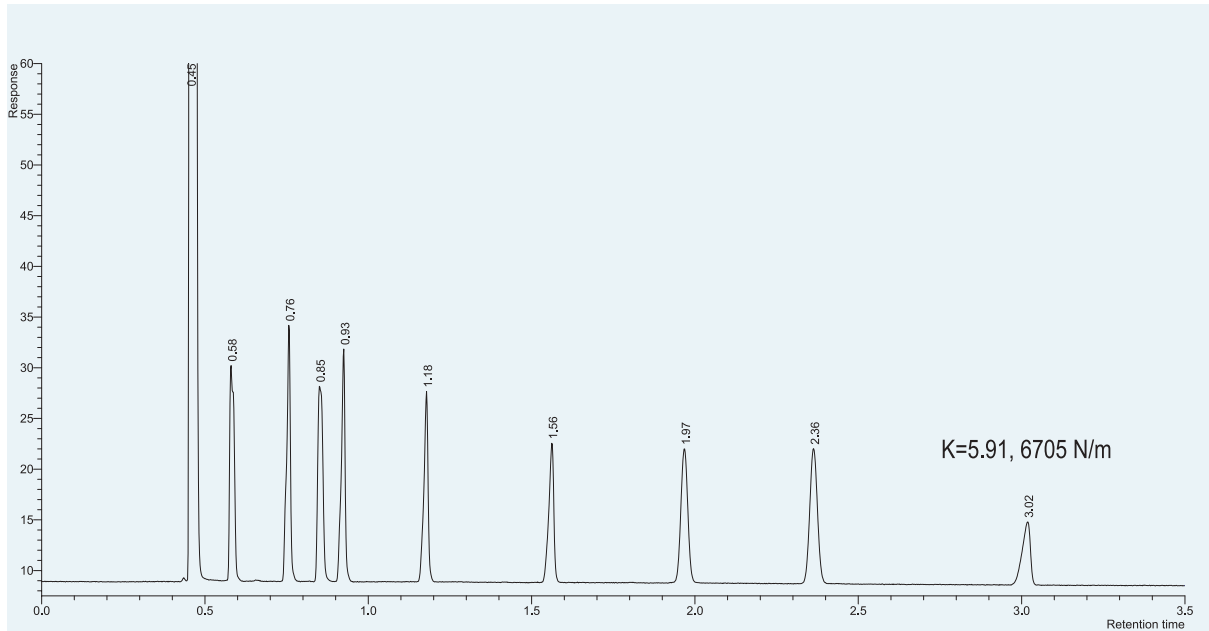


Structure of Polyethylene glycol

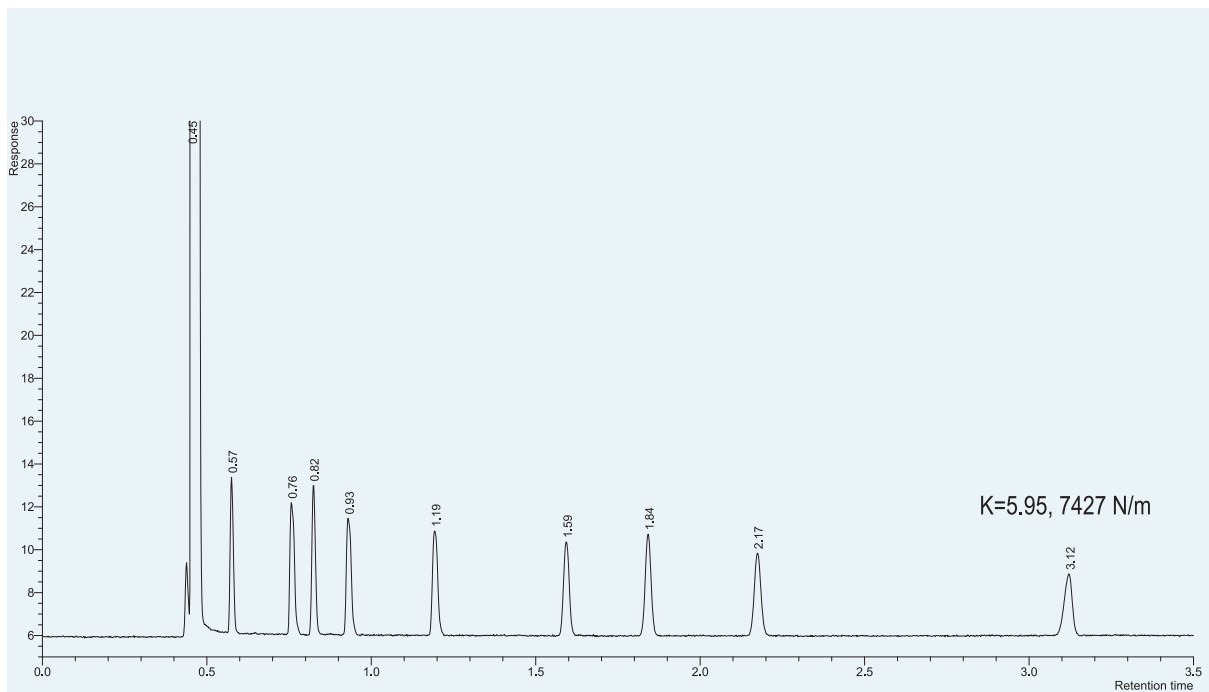
Sapiens-Wax.ht: 10 m x 0,10 mm x 0,10 μm

After 5hrs continuously at 300°C no degradation of the stationary phase is detected

Initial time

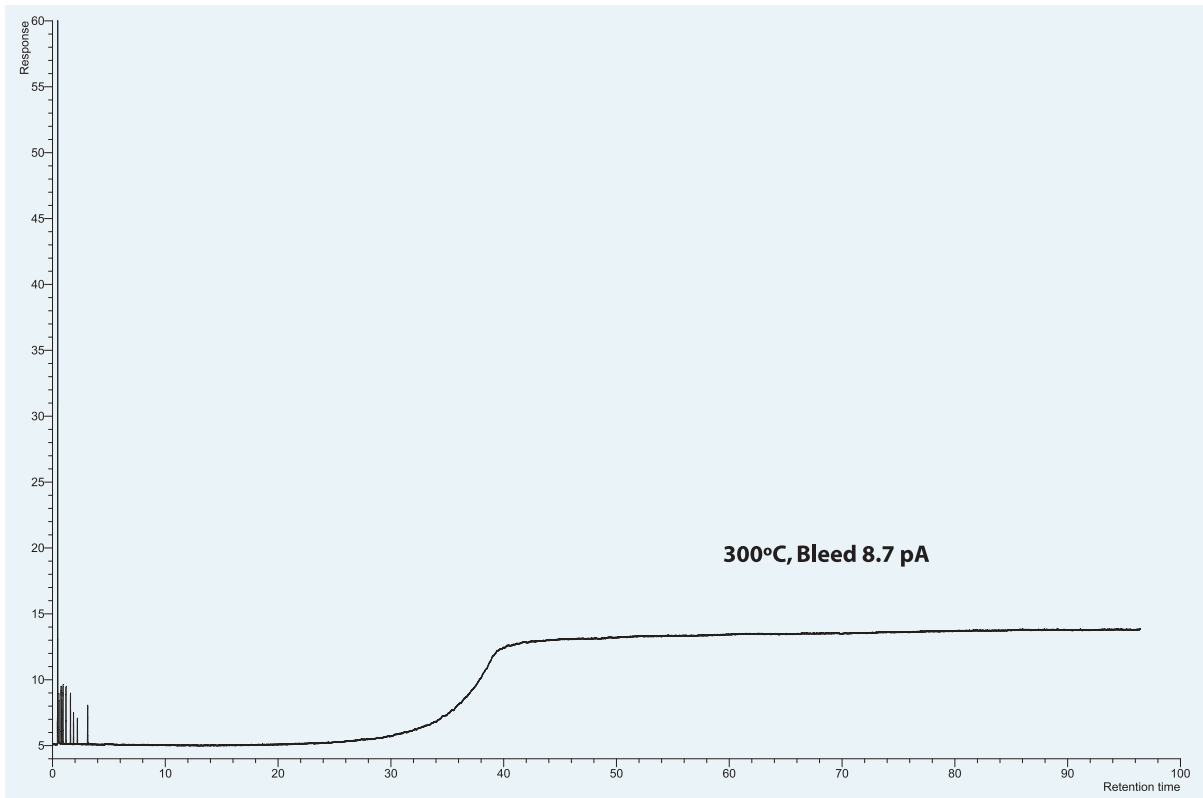


After 5 hours at 300°C



Sapiens-Wax.ht: 10 m x 0,10 mm x 0,10 μ m

Bleed at 300°C



Sapiens-Wax.ht

Internal Diam(mm)	Length (m)	Film thickness(μ m)	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



Gas Chromatography

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Gas Chromatography Applications

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Teknokroma has been at the forefront of chromatographic developments in Spain. From its beginnings at 1979, 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.

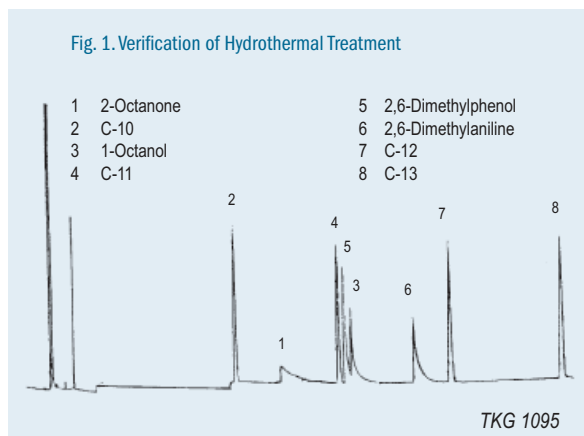
- Stage 1:** Hydrothermal treatment
- Stage 2:** Deactivation process
- Stage 3:** Wetting, bonding and crosslinking
- Stage 4:** Quality control

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 (~2000°C).

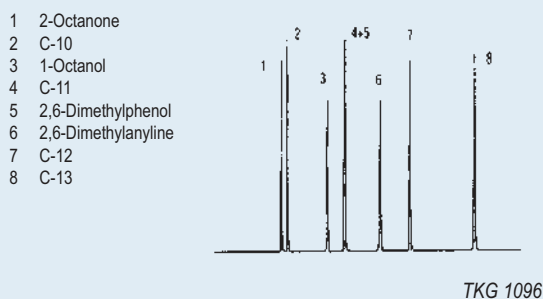
Fig. 1. Verification of Hydrothermal Treatment



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)



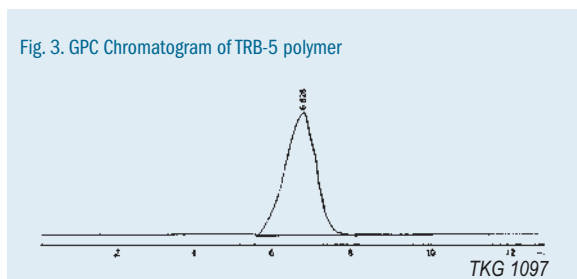
Stage 3: Wetting, bonding and crosslinking

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.

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.

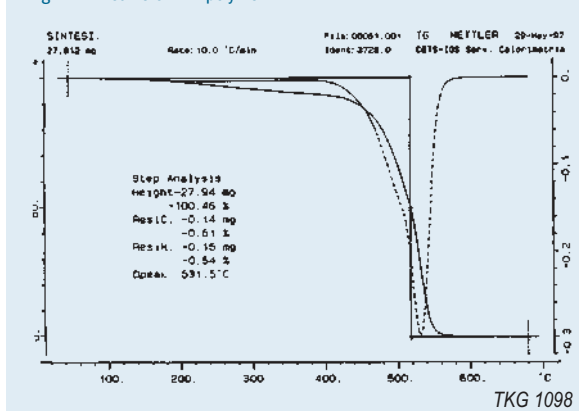
In general, non polar phases are more thermally stable than the polar phases. In other words, the higher the column polarity, the lower its thermal stability. Most of the Teknokroma columns are cross-linked, which results in high thermal stability.

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 TEKOKROMA 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. 4. DTA Curve of TRB-polymer



Stage 4. Quality Control

SELECT PROVEN QUALITY

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. (1:100:250°C)
Concentration: Approx. 5ng of each compound on column
Detector: FID, 250°C

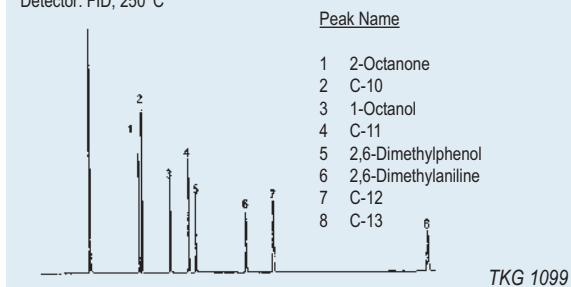
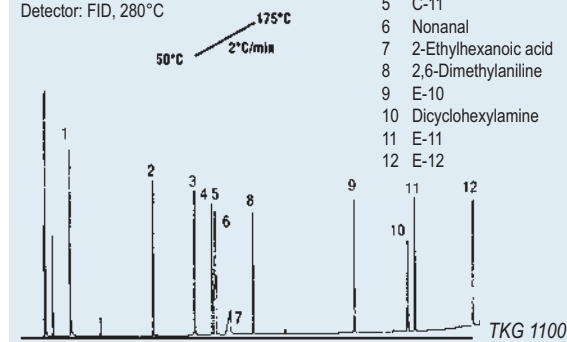


Fig. 6. GROB test

Column: **TRB-5**, 30m x 0.25 mm ID x 0.25 µm.
Carrier gas: He, 12 psi.
Injection: 1µl, split. (1:100), 260°C
Detector: FID, 280°C



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.

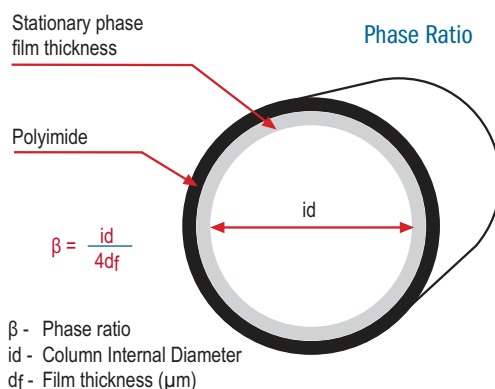
Thick films increase retention of the most volatile components whereas thin films provide faster elution at lower temperatures. As a general rule, thin films (0.1 μm) must be used for compounds with a high molecular weight such as triglycerides, antioxidants,

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).



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.

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.

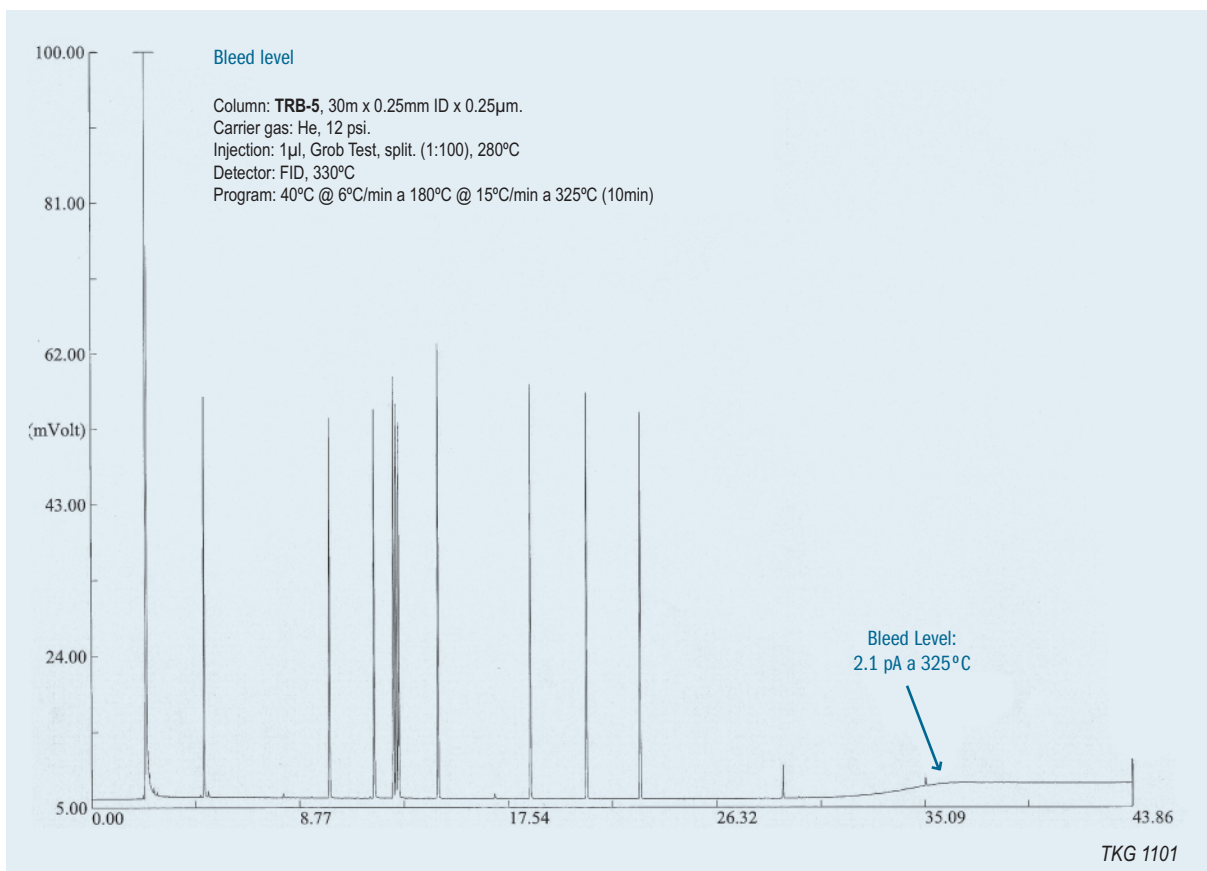
Wide Stationary Phase Selection

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



Stationary Phase Cross Reference (Table 1)

TEKNOKROMA	PHASE COMPOSITION	AGILENT	SUPELCO	RESTEK	VARIAN	SGE	ALLTECH	QUADREX	PHENOMENEX	MACHEREY-NAGEL	USP CODE
TRB-1	100% dimethyl polysiloxane	HP-1, HP101, Ultra-1, DB-1	SPB-1, Equity-1	Rtx-1	CP-Sil 5 CB	BP-1	AT-1	007-1	ZB-1	Optima-1	G1,G2,G38
TRB-1ht		DB-1ht		Stx-1HT			AT-1 ht		ZB-1ht		
TRB-1ht SimDist		DB-1ht SimDist		IMXT-1 SimDist	CP-SimDist						
TRB-1MS		HP-1MS, DB-1MS	EQUITY-1	Rtx-1ms, Rtx-1ms	VF-1ms, CP-Sil 5 CB MS		AT-1 ms		ZB-1ms	Optima-1ms	
TRB-SULFUR			SPB-1Sulfur		CP-Select CB for Sulfur						
TRB-2887		DB-2887	Petrocol-2887	Rtx-2887							
TRB-502PONA		HP-PONA	Petrocol DH 50.2	Rtx-1 PONA	CP-SIL PONA CB	BP-1 PONA					
TRB-PETROL		DB-PETRO	Petrocol DH	Rtx-1 PONA							
TRB-PETRO.150			Petrocol DH 150								
TRB-5	95% dimethyl-5% diphenyl polysiloxane	HP-5, Ultra-2, DB-5	SPB-5, Equity-5	Rtx-5	CP-Sil 8 CB	BP-5	AT-5	007-2	ZB-5	Optima-5	G27,G36
TRB-5ht		DB-5ht							ZB-5ht		
TRB-5MS		HP-5MS, PAS-5	Equity-5	Rtx-5 MS, Rtx-5ms	VF-5ms, CP-Sil 8 CB MS				ZB-5ms	Optima-5ms	
TRB-STEROL			SAC-5								
TRB-5 AMINE			PTA-5	Rtx-5Amine	CP-Sil 8 CB MS					Optima-5 Amine	
TRB-G27			G27	Rtx-G27							
MTI-5		HP-5msi	PTE-5	Rtx-5ms							
Meta .X5	95% dimethyl-5% polysilphenylene	HP-5TA, DB-5MS	MDN-5, SLB-5ms	Rtx-5SII MS	CP-Sil 8 CB Low Bleed/MS VF-5ms	BPX-5	AT-5ms	007-5 MS	ZB-5ms	Optima-5 Accent	
Meta.XLB	Proprietary Bonded Phase	DB-XLB	MDN 12		VF-Xms				ZB-XLB	OPTIMA.XLB	
TRB-1301, TRB-624,		HP-1301, HP-624	SPB-1301, OVI/L43	Rtx-1301, Rtx-624	CP-Select 624 CB	BPX-624	AT-624		ZB-624	Optima-1301	G43
TRB-G43		DB-1301, DB-624								Optima-624	
TRB-14	14% diphenyl-86% dimethyl polysiloxane				CP-Sil 13 CB						
TRB-20	20% diphenyl-80% dimethyl polysiloxane		SPB-20, VOCCOL	Rtx-20			AT-20	007-7			G28, G32
TRB-35	35% diphenyl-65% dimethyl polysiloxane	HP-35, DB-35	SPB-35	Rtx-35		BPX-35, BPX-608	AT-35	007-11	ZB-35		G42

Stationary Phase Cross Reference (Table 1) - Page 2.

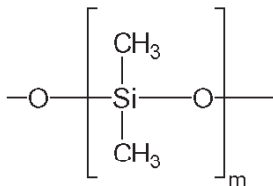
TEKNOKROMA	PHASE COMPOSITION	AGILENT	SUPELCO	RESTEK	VARIAN	SGE	ALLTECH	QUADREX	PHENOMENEX	MACHEREY-NAGEL	USP CODE
TRB-1701	14% cyanopropylphenyl-86% dimethyl polysiloxane	HP-1701, PAS-1701 DB-1701	SPB-1701	Rtx-1701	CP-SII 19 CB	BP-10	AT-1701	007-1701	ZB-1701	Optima-1701	G46
TRB-225	50% cyanopropylphenyl-50% dimethyl polysiloxane	HP-225, DB-225		Rtx-225	CP-SII 43 CB	BP-225	AT-225	007-225		Optima-225	G7, G19
TRB-PAG	50% polyethylene-50% poly propylenglycol		PAG								
TRB-FFAP	treated polyethyleneglycol for acidic compounds	HP-FFAP, DB-FFAP	Nukol, SP-1000	Stabilwax-DA	CP-wax 56 CB	BP-21	AT-1000, FFAP	007-FFAP		Permabond FFAP	G25, G35
TRB-50	50% diphenyl-50% dimethyl polysiloxane	HP-50+, DB-17, DB-608	SPB-50, SPB-2250	Rtx-50, Rtx-17	CP-SII 24 CB		AT-50	007-17	ZB-50	Optima-17	G3
TRB-50ht	50% diphenyl-50% dimethyl polysiloxane	DB17ht		Rtx-65	TAB-CB			007-65HT			G17
TRB-F50	50% trifluoropropylmethyl polysiloxane	DB-210, DB-200		Rtx-200			AT-210	007-210		Optima-210	G6
TRB-WAX	100% polyethyleneglycol	HP-20M, HP-innowax DB-wax, DB-waxetr	Supelcowax-10, Carbowax 20M	Stabilwax	CP-wax 52 CB	BP-20	AT-wax	007-CW	ZB-wax	Permabond CW 20M	G14, G15, G16
SupraWax-280	100% polyethyleneglycol		Supelcowax-10								
TRB-WAX-DB	treated polyethyleneglycol for basic compounds	CAM, HP-Basicwax	Carbowax-Amine	Stabilwax-DB	CP-wax 51 CB						
Meta.Wax	100% polyethyleneglycol	HP-wax, DB-wax			CP-wax 57 CB						
TRB-Wax-Omega	100% polyethyleneglycol		Omegawax	Famewax							
TR-CM100	100% bis(ciano propyl) polysiloxane	HP-17	SP-2340	Rtx-2340	CP-SII 88	BPX-70, BPX-90					G48
TR-Cresol	not bonded phase				CP-Cresol						
TRB-17	50% diphenyl-50% dimethyl polysiloxane	HP-17									G3
Meta.VOC	proprietary bonded phase	DB-502.2, HP-VOC	Voccl	Rtx-502.2							
Meta.Blood 1	proprietary bonded phase	DB -ALC1		Rtx-BAC1							
Meta.Blood 2	proprietary bonded phase	DB-ALC2		Rtx-BAC2							
TRB-608	proprietary bonded phase	HP-608	SPB-608			BP-608					
TR-TCEP	1,2,3-tris(cyanoethoxy)propane		TCEP	Rt-TCEP	CP-TCEP						
MetaAmine-VOL	proprietary bonded phase				CP-Volamine						
TRB-BIODIESEL	proprietary bonded phase	DB-5ht		Rtx-Biodiesel	Select Biodiesel			400-5ht	ZB-5ht		

TRB-1

100% Dimethyl polysiloxane, bonded and crosslinked phase

- 100% Dimethylpolysiloxane
- 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, HP101, ULTRA-1, DB-1

Supelco: SPB-1, EQUITY-1

Restek: Rtx-1, Rtx-2887

Varian: CP-SIL 5 CB

SGE: BP-1.

Alltech: AT-1

Macherey-Nagel: OPTIMA-1

TRB-1

Column: **TRB-1**, P/N TR-111226

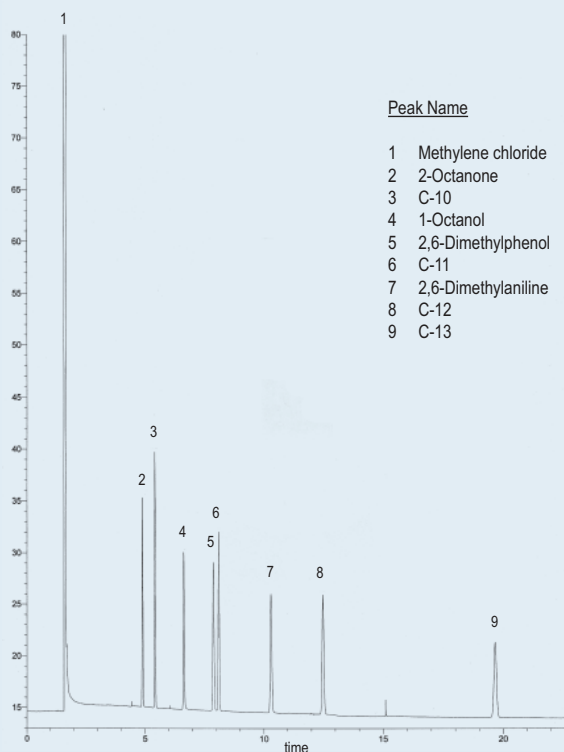
Dimensions: 25m x 0.15mm x 1.2µm

Injection: 1 µL Test SP-4-7300, split 1:100, 280°C

Carrier gas: H₂, constant pressure 22 psi (151.6 KPa).

Oven program: 145°C (isothermal)

Detector: FID, 300°C



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

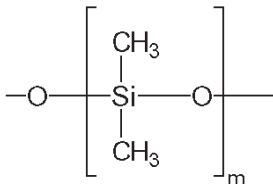
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)	
0,20	12	0,33	-60 to 325/350	TR-1133B9	
	15	0,15	-60 to 325/350	TR-111319	
	15	0,35	-60 to 325/350	TR-110319	
	15	0,50	-60 to 325/350	TR-110519	
	25	0,15	-60 to 325/350	TR-111329	
	25	0,33	-60 to 325/350	TR-113329	
	25	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	

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)	
	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

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- Non-polar phase
- Produced specially for high temperature analyses (Max.temp. 400°C).
- Fused silica tubing with polyimide coating for high temperatures.
- Uses: analysis of compounds with high boiling point, triglycerides, waxes, etc.



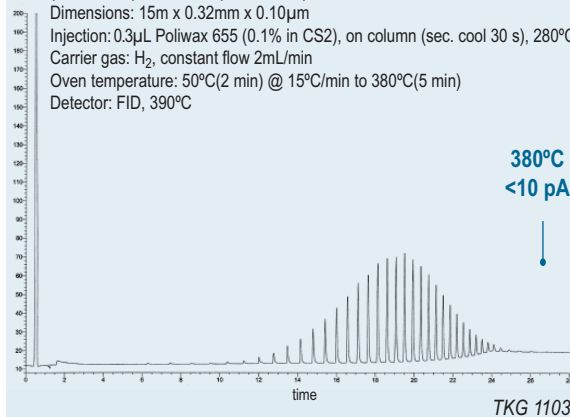
Structure of Poly(dimethyl)siloxane

TRB-1ht Equivalent Phase

Agilent: DB-1ht
Restek: Stx-1HT
Alltech: AT-1 ht

TRB-1ht

Column: Retention Gap (intermediate polarity) 5m x 0.53mm (TR-200055) + **TRB-1ht** (TR-610113)
 Dimensions: 15m x 0.32mm x 0.10µm
 Injection: 0.3µL Poliwax 655 (0.1% in CS₂), on column (sec. cool 30 s), 280°C
 Carrier gas: H₂, constant flow 2mL/min
 Oven temperature: 50°C(2 min) @ 15°C/min to 380°C(5 min)
 Detector: FID, 390°C



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

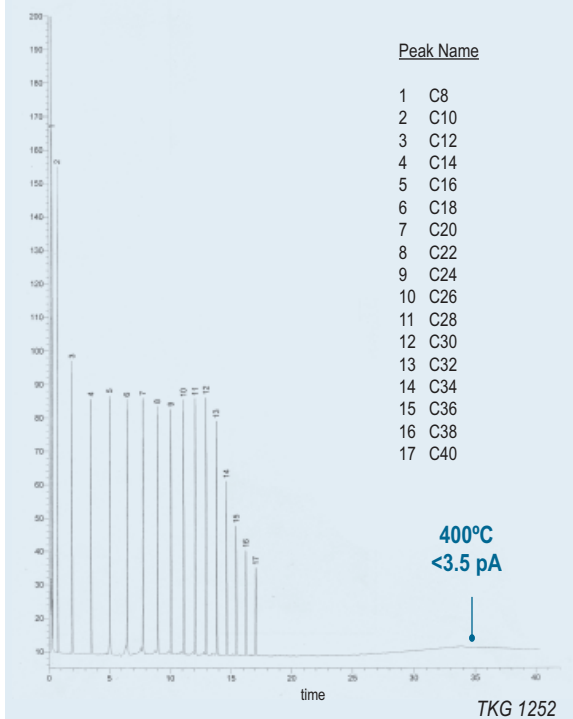
TRB-1ht SimDist

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethyl polysiloxane, bonded and crosslinked phase
- True methyl silicone polarity
- Unbreakable, specially treated stainless steel
- Maximum temperature 430°C
- Low bleed at 400°C (Typical values of 4-6pA)
- Distillation range C6 to C120

TRB-1ht SimDist

Column: **TRB-1ht SimDist**, P/N TR-2301A5 INOX
 Dimensions: 5m x 0.53mm x 0.10µm
 Injection: 0.4µL Hydrocarbons C8-C40 (500ng/µL), 300°C, split 1:20 (3mm ID liner)
 Carrier gas: H₂, 60 cm/s (40°C)
 Oven temperature: Temperature: 40°C @ 15°C/min a 400°C(15 min)
 Detector: FID, 430°C



TRB-1ht SimDist

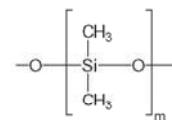
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	5	0,10	-60 to 400/430	TR-2301A5INOX
	5	0,15	-60 to 400/430	TR-2313A5INOX

TRB-1ms

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- These columns, with a selectivity identical 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 325 °C
- Great chemical inertness towards active constituents and excellent thermal stability.
- Improved signal/noise ratio, which enables greater sensitivity to be obtained with the MS, ECD, NPD, SCD, etc. detectors and provides greater precision in quantitative analysis at trace levels
- Less column bleed means less detectors contamination and greater speed in conditioning columns

Structure of Poly(dimethyl)siloxane



TRB-1ms Equivalent Phase

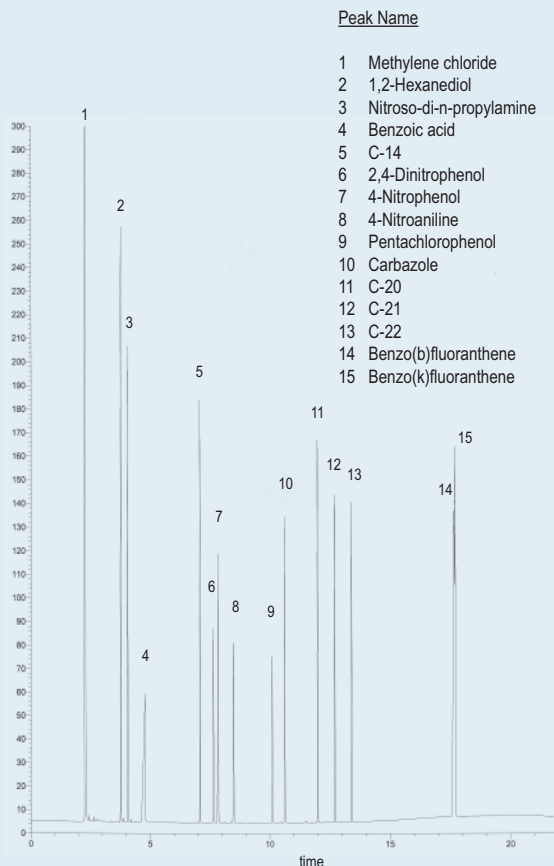
Agilent: HP-1MS, DB-1MS
Restek: Rtx-1ms, Rxi-1ms
Varian: CP-SIL 5 CB MS, VF-1MS
Alltech: AT-1 MS

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-1ms

Column: **TRB-1ms**, P/N TR-510262
 Dimensions: 60m x 0.25mm x 0.25µm
 Injection: 1 µL Test MX5 (10 to 20 ng/comp. on column), split 1:100, 280°C
 Carrier gas: H₂, constant pressure 25 psi (172 KPa).
 Oven temperature: 100°C @ 6°C/min to 325°C(5 min)
 Detector: FID, 340°C

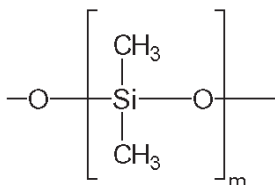


TKG 1104

TRB-Sulfur

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- Column specially designed for the analysis of sulphurous compounds (in natural gas, petrol derivatives, wines, beer, etc.)
- Guaranteed thermal stability, with low column bleed



Structure of Poly(dimethyl)siloxane

TRB-Sulfur Equivalent Phase

Supelco: SPB-1 SULFUR

TRB-Sulfur

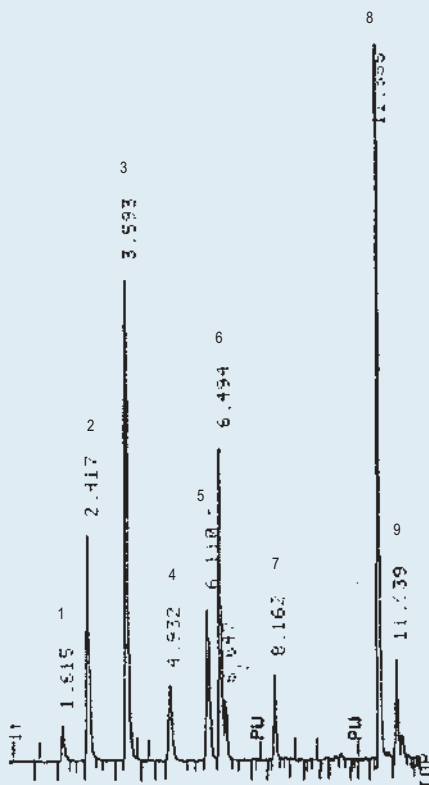
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,32	30	4,00	-60 to 270/290	TR-974033

TRB- SULFUR

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

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.

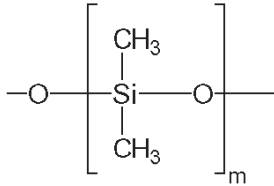


TKG 1105

TRB-Petrol

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- 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

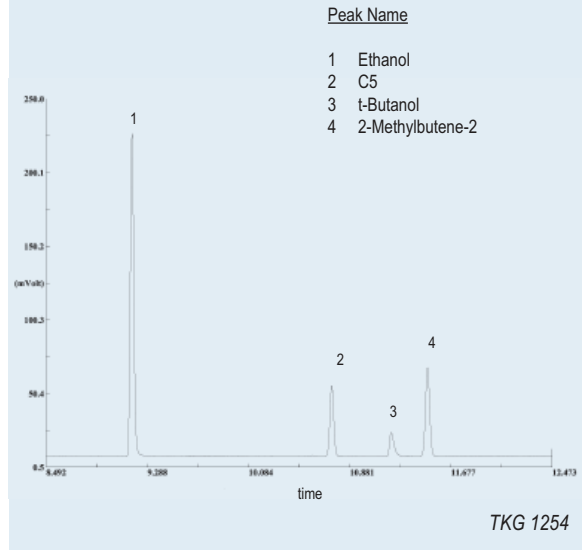
Agilent: DB-Petro
Supelco: Petrocol DH

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

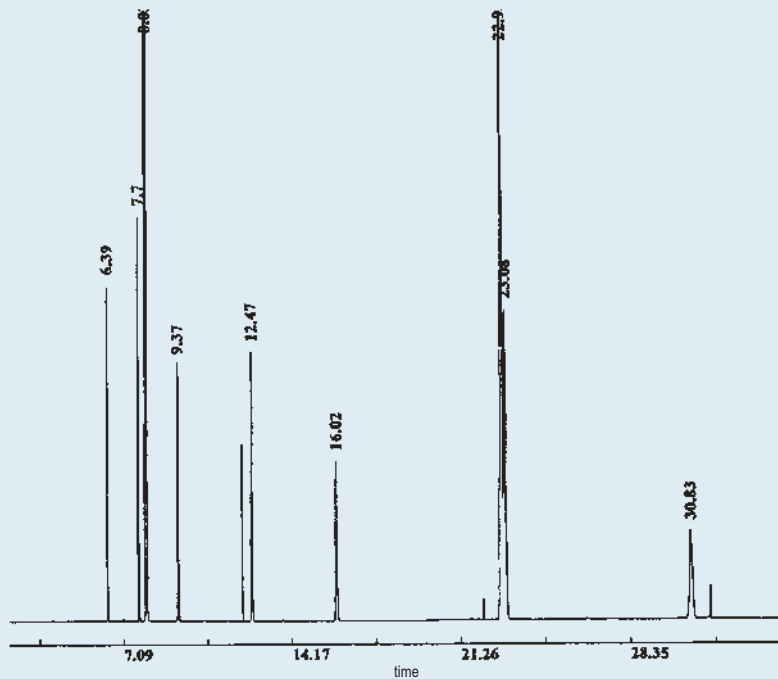
ASTM D-6730 Specifications	
C5 efficiency (total theoretical plates) : 618.503	450.000-550.000
K(C5) : 0.47	0.45-0.50
t-Butanol skewness : 1.62	>1.00 - < 5.00
Resolution t-Butanol/2-Methylbutene-2 : 4.41	3.25-5.25



TRB-PETROL

Column: **TRB-PETROL**, 100m x 0.25mm x 0.50µm P/N TR 110592
 Temperature: 60°C (isothermal)
 Injector: 260°C
 Carrier gas: H₂, 34 psi
 Injection: Test for hydrocarbons, split (1:100)
 Detector: FID, 260°

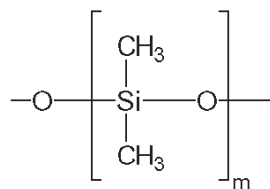
tr (min.)	Compound
6.39	n-Hexane
7.70	Benzene
8.03	Cyclohexane
9.37	n-Heptane
12.47	Toluene
16.02	n-Octane
22.93	m-Xylene
23.08	p-Xylene
30.83	n-Nonane



TRB-Petro.150

100% Dimethyl polysiloxane, bonded and crosslinked phase.

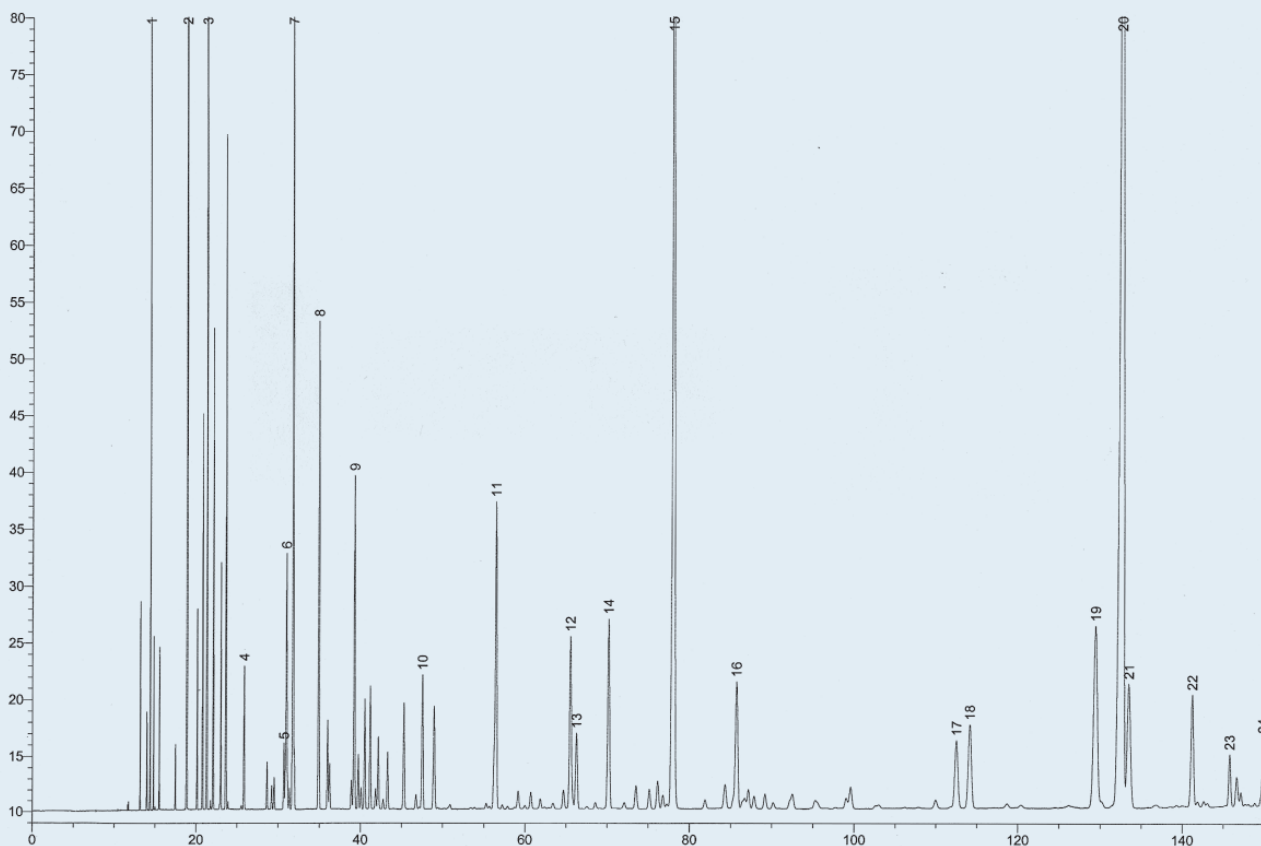
- 100% Dimethylpolysiloxane
- Maximum resolution for hydrocarbon analysis



Structure of Poly(dimethyl)siloxane

TRB-PETRO.150

Column: **TRB-PETRO.150**, P/N TR-1110G2
 Dimensions: 150m x 0.25mm x 1.0µm
 Injection: 0.1µl unleaded gasoline, split 100:1 @ 280°C
 Carrier gas: He, 75psi (517 kPa) @ 35°C
 Oven program: 35°C(hold 135 min.) to 200°C @ 2°C/min. (hold 20 min)
 Detector: FID @ 280°C



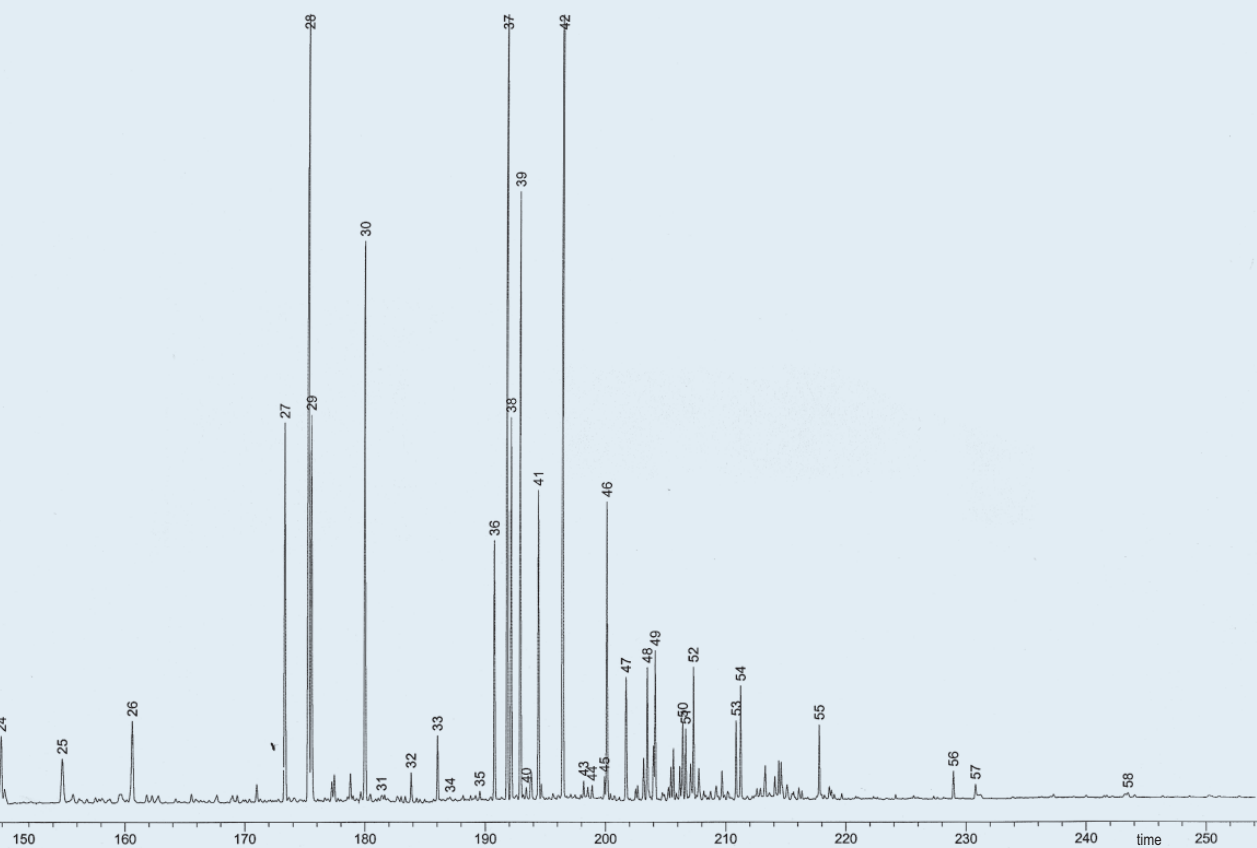
- | | | |
|------------------------|----------------------------|----------------------------|
| 1 n-Butane | 11 Benzene | 21 2,3,3- Trimethylpentane |
| 2 Isopentane | 12 2-Methylhexane | 22 2,3-Dimethylhexane |
| 3 n-Pentane | 13 2,3-Dimethylpentane | 23 2-Methylheptane |
| 4 2,2-Dimethylbutane | 14 3-Methylhexane | 24 3-Methylheptane |
| 5 Cyclopentane | 15 2,2,4- Trimethylpentane | 25 2-Methyl-1-heptane |
| 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

Supelco: Petrocol DH 150.

TRB-Petro.150

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	150	1,00	-60 to 300/320	TR-1110G2



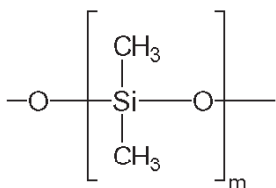
- | | | |
|----------------------------|--------------------------------|---------------------------------|
| 31 1-Nonene | 41 1-Methyl-2-ethylbenzene | 51 1,3- Dimethyl-4-ethylbenzene |
| 32 n-Nonane | 42 1,2,4- Trimethylbenzene | 52 1,2-Dimethyl-4-ethylbenzene |
| 33 Isopropylbenzene | 43 Isobutylbenzene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

TKG 1107

TRB-50.2PONA

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- Column designed for the complete analysis of PONA hydrocarbons (P-Paraffins, O-Olefins, N-Naphthenes and A-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
Supelco: Petrocol DH 50.2
Restek: Rtx-1 PONA
Varian: CP-SIL PONA CB
SGE: BP-1 PONA

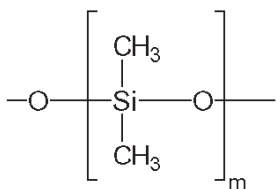
TRB-50.2PONA

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

100% Dimethyl polysiloxane, bonded and crosslinked phase.

- 100% Dimethylpolysiloxane
- Designed specifically for simulated distillation according to the ASTM method D2887



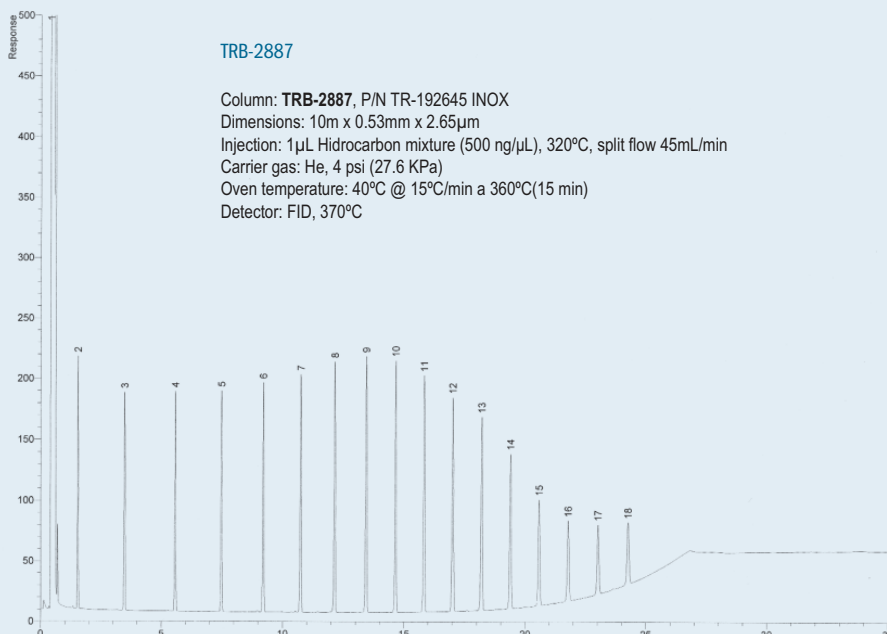
Structure of Poly(dimethyl)siloxane

TRB-2887 Equivalent Phase

Agilent: DB-2887
Supelco: PETROCOL-2887
Restek: Rtx-2887

TRB-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



Peak Name

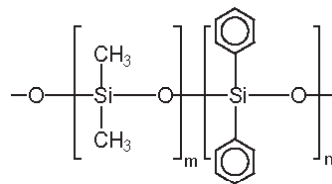
- 1 n-hexane
- 2 C-8
- 3 C-10
- 4 C-12
- 5 C-14
- 6 C-16
- 7 C-18
- 8 C-20
- 9 C-22
- 10 C-24
- 11 C-26
- 12 C-28
- 13 C-30
- 14 C-32
- 15 C-34
- 16 C-36
- 17 C-38
- 18 C-40

TKG 1108

TRB-5

(95%) Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

- It is the most versatile and universal stationary phase in the gas chromatography analysis field
- The low percentage of phenyl in the polymer structure gives it a characteristic affinity towards the compounds with aromatic rings. This phase, the most popular one, due to its great thermal stability and chemical inertness is the stationary phase of choice for any type of analysis
- It allows the analysis of acidic and basic compounds
- It is ideal for the analysis in the environmental field. Analysis of 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/JW: HP-5, Ultra-2, DB-5, DB-5.625

Supelco: SPB-5, PTE-5, SAC-5, Equity-5

Chromapack/Varian: CP-SIL8CB

Alltech: AT-5

Macherey-Nagel: OPTIMA-5

Quadrex: 007-2

SGE: BP-5

TRB-5

Column: **TRB-5**, P/N TR-120232

Dimensions: 30m x 0.25mm x 0.25µm

Injection: 1µL chlorinated pesticides mixture, splitless @230°C (25-270 ppb on column)

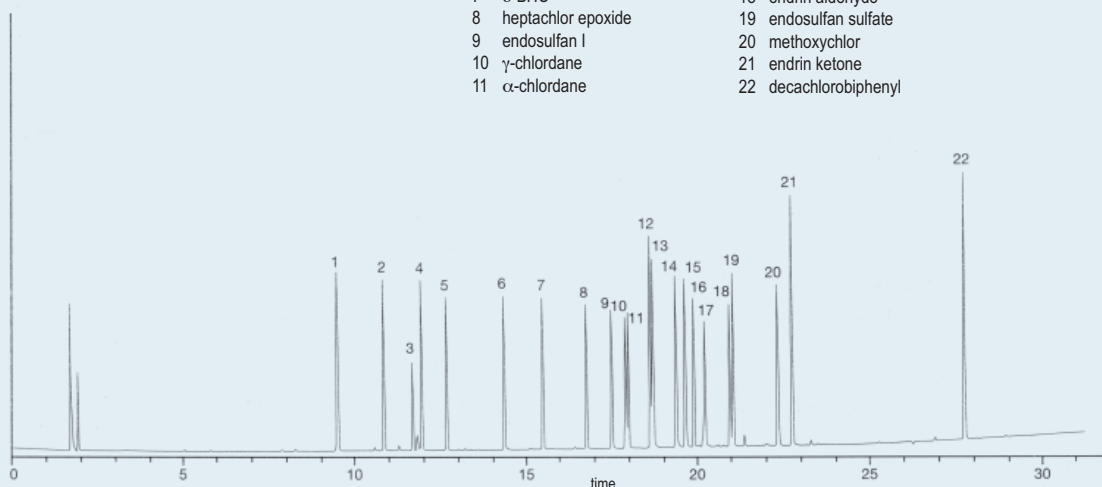
Carrier gas: H₂, constant pressure 12 psi (87.7 KPa) 150°C

Oven temperature: 150°C to 225°C@ 2°C/min (10 min.)

Detector: ECD, 310°C

Peak Name

1	2,4,5,6-tetrachloro- <i>m</i> -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

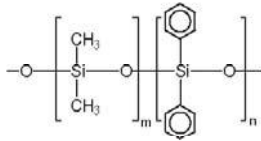
TRB-5

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

TRB-5ht

(95%) Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

- Produced specially for analysis at high temperature up to 400°C
- Fused silica tube covered with polyimide, resistant to high temperatures, or stainless steel tube (specially deactivated)
- Excellent symmetry for compounds with high boiling points
- Preferably used for the analysis of waxes, triglycerides, sterol esters, polyoxyethylenated alcohols, etc.



Structure of Poly(dimethyldiphenyl)siloxane

TRB-5ht Equivalent Phase

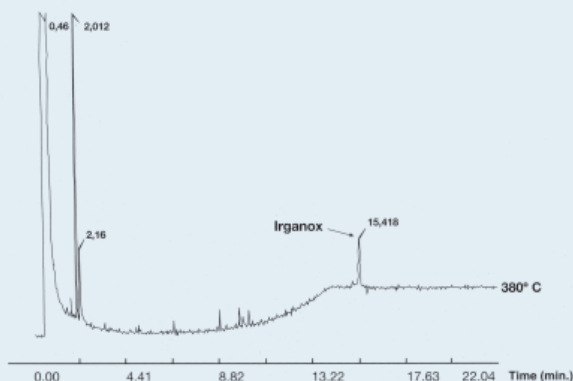
Agilent: DB-5t
Phenomenex: ZB-5ht

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

IRGANOX 1010

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

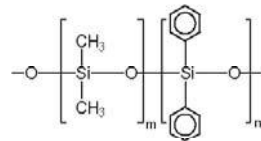


TKG 1110

TRB-Sterol

(95%) Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

- Column specifically designed for the analysis of complex mixtures of sterols, from either animal or plant origin
- Deactivation method of the capillary tube wall, developed by Teknokroma, that guarantees a high chemical inertness a low bleeding level and allows the analysis of sterols without derivatization
- The column is specifically tested for sterols



Structure of Poly(dimethyldiphenyl)siloxane

TRB-Sterol Equivalent Phase

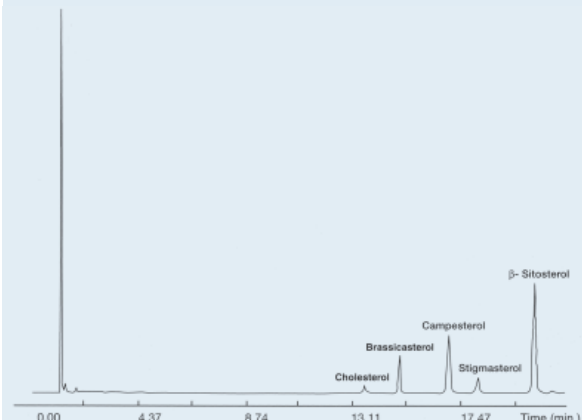
Supelco: SAC-5

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

Sterols

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



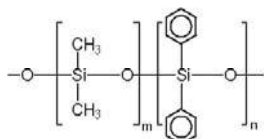
TKG 1111



TRB-5ms

(95%) Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

- The TRB-5ms Column uses the same stationary phase as TRB-5, but the polymer synthesis process, the capillary deactivation technique and the bonding and crosslinking procedures have been optimized to obtain the minimum possible bleeding level and an exceptional chemical inertness
- The bleeding specifications for a column of 30m x 0,25 mm x 0,25 μm (P/N 520232) indicate that it is lower than 4 pA at 325°C
- Column recommended to work with any selective detector
- Ideal column to connect with a mass detector. Its ultra-low bleeding joined to its high chemical inertness allows for a better signal/noise ratio (higher sensitivity level), and therefore better detection and quantification of sample components at low concentrations.



Structure of Poly(dimethyldiphenyl)siloxane

TRB-5ms Equivalent Phase

Restek: Rtx 5ms, Rxi-5ms
Agilent/JW: HP-5MS
Supelco: PTE-5, Equity-5
Macherey-Nagel: OPTIMA-5ms
Varian: CP-Sil8-MS

TRB-5ms

Internal Diam.(mm)	Length (m)	Film Thickness (μm)	Temp limits ($^{\circ}\text{C}$)	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
	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
	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
	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
	30	1,50	-60 to 310-330	TR-521535
	30	1,50	-60 to 310-330	TR-521535

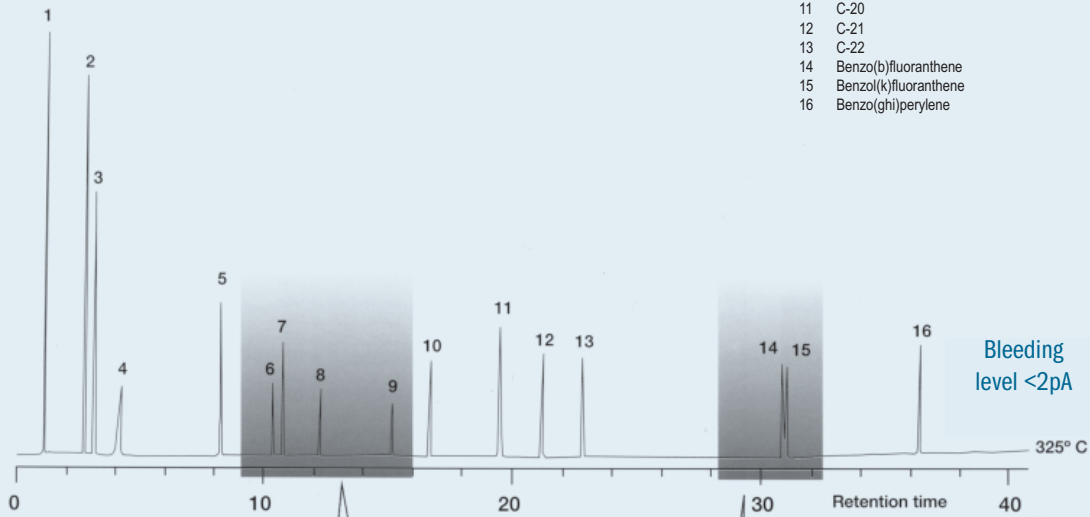
The TRB-5MS column has an excellent resolution and symmetry in all its polarity range, for neutral, acid and basic compounds. All these substances that appear in the analysis of semivolatle traces (for example, EPA official methods) can be analyzed in only one column.

Test MX5

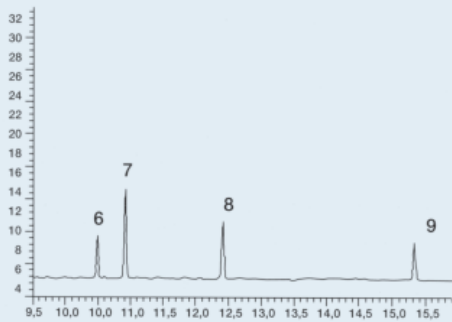
Column: **TRB-5ms**, P/N TR-520232
 Dimensions: 30 m x 0,25 mm x 0,25 μ m
 Injection: 1 μ l, split (1:100), 5 to 10 ng/comp. on column, 280°C
 Carrier gas: H₂, 12 psi (87,7 kPa)
 Oven temp.: 100°C to 325°C (5 min.) @ 6°C/min.
 Detector: FID to 300°C
 Sample: Test MX5

Peak Name

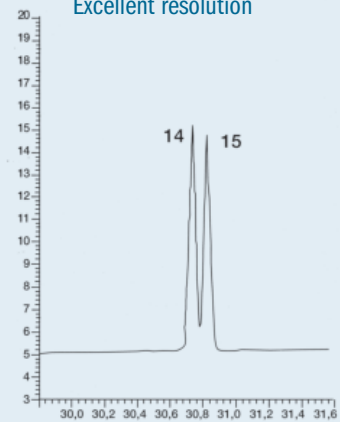
- 1 Methylene chloride
- 2 1,2-Hexanediol
- 3 Nitroso-di-n-propylamine
- 4 Benzoic acid
- 5 C-14
- 6 2,4-Dinitrophenol
- 7 4-Nitrophenol
- 8 4-Nitroaniline
- 9 Pentachlorophenol
- 10 Carbazole
- 11 C-20
- 12 C-21
- 13 C-22
- 14 Benzo(b)fluoranthene
- 15 Benzo(k)fluoranthene
- 16 Benzo(ghi)perylene



Injection of 1ng/peak on column
 Exceptional symmetry



Excellent resolution

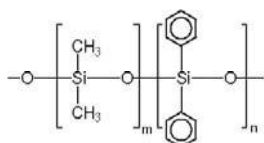


TKG 1112

TRB-5Amine

95% Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

- Column specially designed for the analysis of amines
- Basic deactivation of the column surface with reagents synthesized in our laboratories, that jointly with the crosslinking method have permitted the minimization of the absorption level and tailing of basic compounds, like the 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

Restek: Rtx-5Amine

Supelco: PTA-5

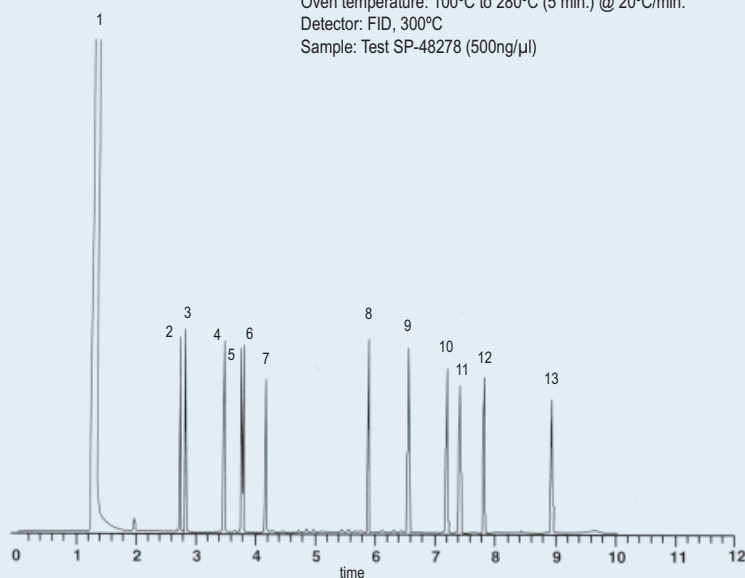
Macherey-Nagel: OPTIMA-5A

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
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

Amines Test

Column: **TRB-5Amine**, P/N TR-210532
 Dimensions: 30 m x 0.25 mm x 0.50 µm
 Injection: 1 µL (split 1:50), 280°C
 Carrier gas: H₂, 12 psi (87.7 kPa).
 Oven temperature: 100°C to 280°C (5 min.) @ 20°C/min.
 Detector: FID, 300°C
 Sample: Test SP-48278 (500ng/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)
- Fully compatible with water samples
- High temperature stability
- Good peak shape for volatile alcohols

This column is one of the best options for separation of volatile amines and alcohols. High retention, selectivity and inertness to amines (optimal peak shape).

Base line separation of Mono-Methylamine (MMA), di-Methylamine (DMA) and tri-Methylamine (TMA)

MetAmine-VOL Equivalent Phase

Varian: CP-Volamine

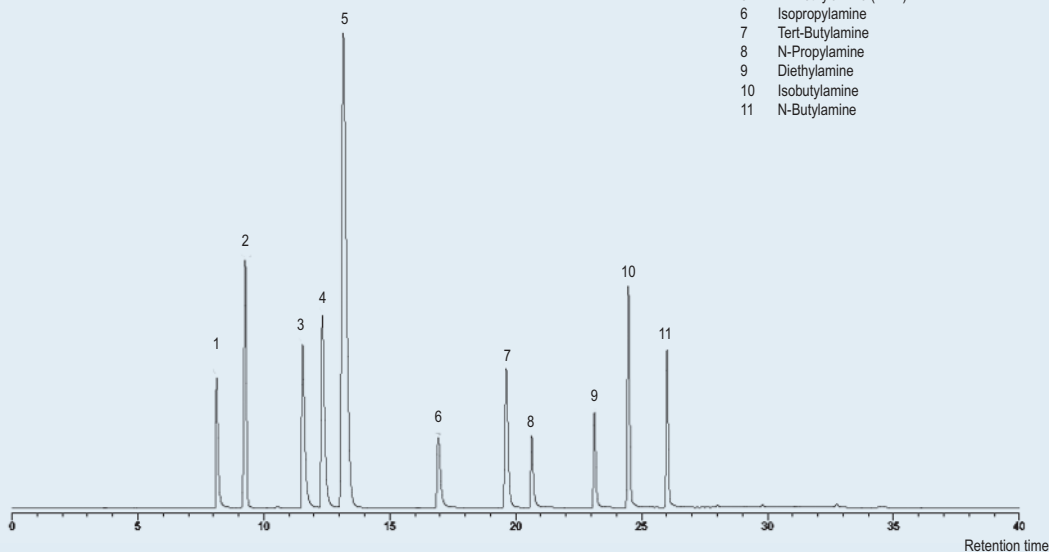
MetAmine-VOL

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

Column: **MetAmine-VOL**, P/N TR-635063
 Dimensions: 60 m x 0.32 mm
 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).
 Program temperature: 40°C (10 min) @ 10°C/min. to 200°C
 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

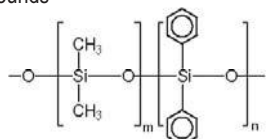


TKG 1256

TRB-5.625

95% Dimethyl-(5%) diphenylpolysiloxane, bonded and crosslinked phase.

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



Structure of Poly(dimethyldiphenyl)siloxane

TRB-5.625 Equivalent Phase

Supelco: PTE-5
Agilent: DB.5.625

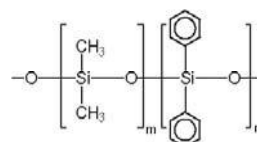
TRB-5.625

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	
	0,25	-60 to 325/350	TR-260232	
	0,50	-60 to 325/350	TR-260532	
	1,00	-60 to 325/350	TR-261032	
60	0,10	-60 to 325/350	TR-260162	
	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	
	0,25	-60 to 325/350	TR-260233	
	0,50	-60 to 325/350	TR-260533	
	1,00	-60 to 325/350	TR-261033	
60	0,10	-60 to 325/350	TR-260163	
	0,25	-60 to 325/350	TR-260263	
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%) diphenylpolysiloxane, bonded and crosslinked phase.

- Column which fulfils the specifications of the American Pharmacopeia (USP), for the test 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

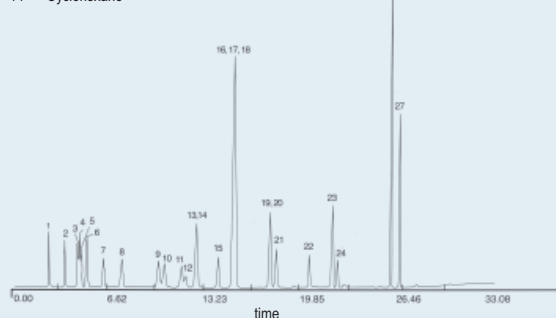
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,53	30	5,00	-60 to 270/290	TR-175035

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 (31kPa), 35 cm/s. to 35°C
Oven Temp: 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

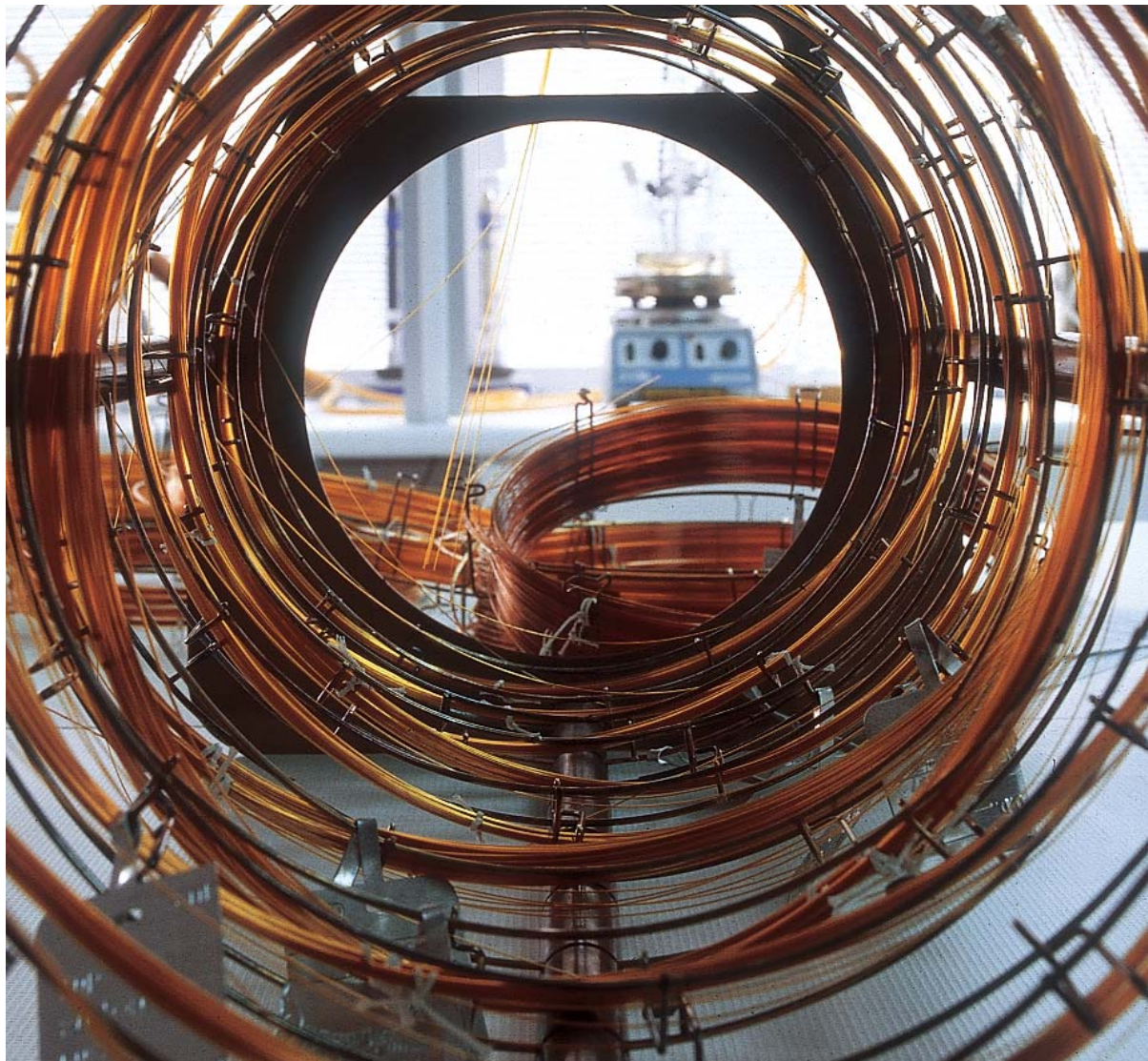
1	Methanol	15	1,2-Dichloroethane
2	Ethanol	16	Benzene
3	Acetonitrile	17	Carbon tetrachloride
4	Acetone	18	n-Butanol
5	Isopropanol	19	n-Heptane
6	Ethyl ether	20	Trichloroethylene
7	Methylene chloride	21	1,4-Dioxane
8	n-Propanol	22	Pyridine
9	Methyl ethyl ketone (MEK)	23	Toluene
10	n-Hexane	24	Dimethylformamide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



TKG 1114

MTI-5

5% Phenyl-(95%) methylpolysiloxane, bonded and crosslinked phase.



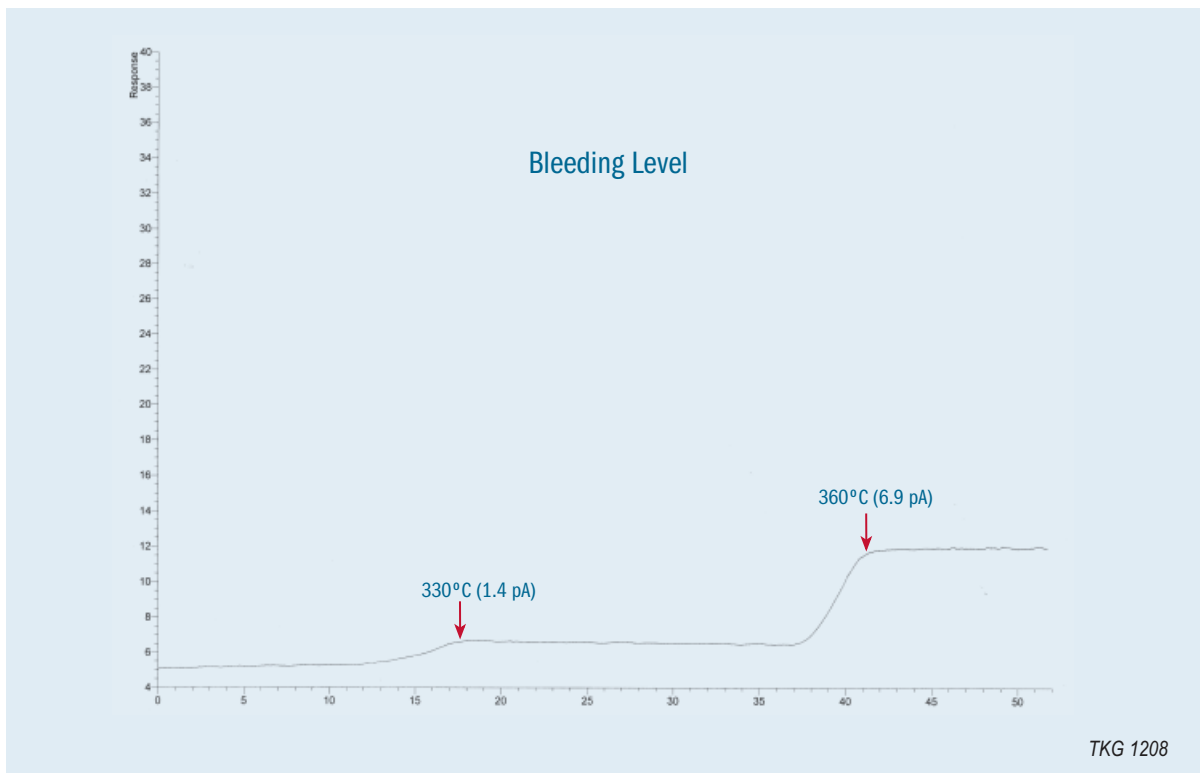
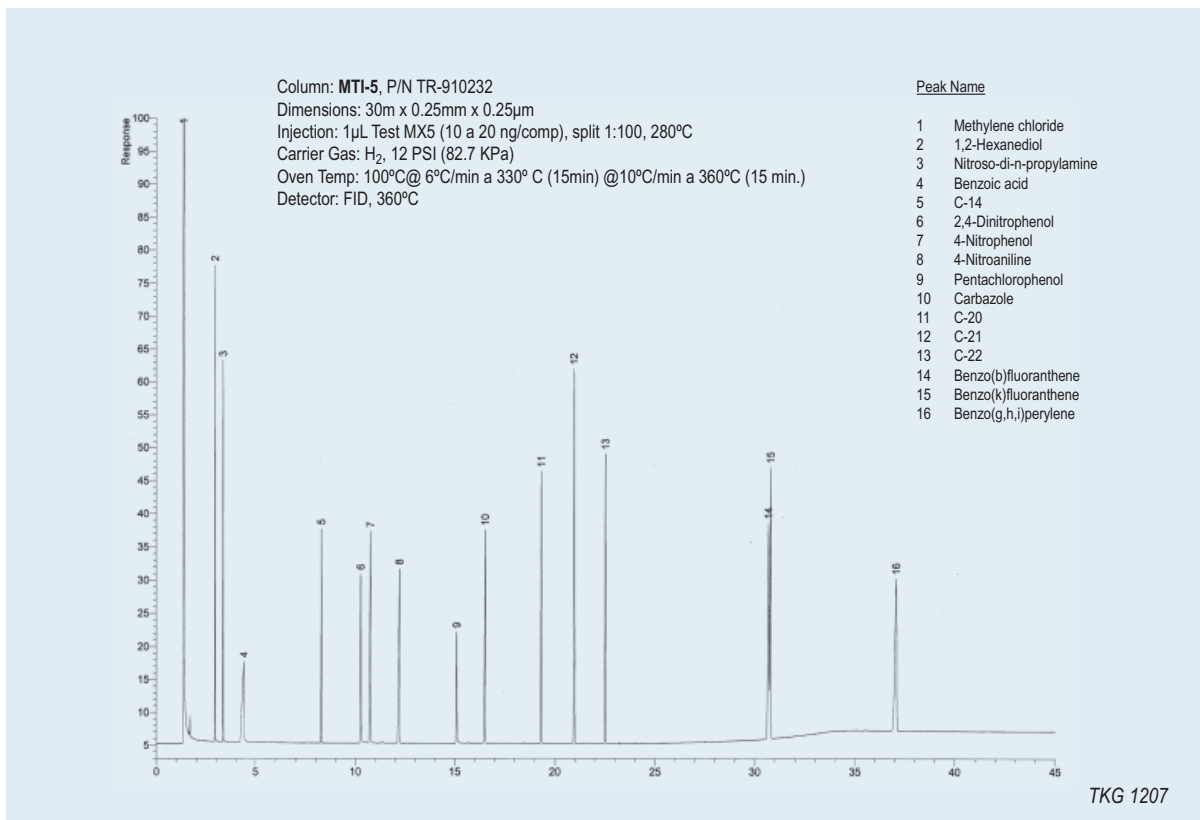
- Polarity equivalent to Supelco PTE-5 and Agilent HP-5Msi columns
- Non polar column maximum inertness and ultra low bleeding.
- Column contrasted for analyses of semivolatil contaminant agents (EPA 625, 1625, 8770)
- Maximum thermal stability (360°)

MTI-5 Equivalent Phase

Supelco: PTE-5
Agilent: HP-5Msi

MTI-5

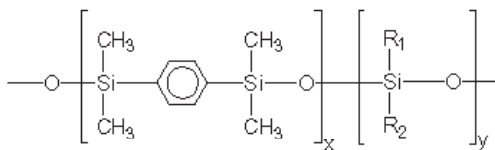
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N° (P/N)
0,25	30	0,25	-60 to 360	TR-910232
0,32	30	0,25	-60 to 360	TR-910233
0,53	15	0,50	-60 to 330/360	TR-910515



Meta.X5

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

- Choice column for the analysis of semivolatile compounds with GC-MS
- Polymer synthesis designed and developed by scientists at Teknokroma
- Selectivity similar to TRB-5
- New generation of column incorporates arylene groups in the polymer structure, and this improves the thermal stability, reduces the bleeding level and provides optimal resolution for aromatic compounds
- Manufacturing procedures of this Teknokroma column guarantees maximal inertness and minimal bleeding level
- Quality control test (MX5) that guarantees total inertness and optimal signal/noise ratio (S/N) for the more active compounds that normally suffer adsorption problems, like 2,4-dinitrophenol, 4 nitroaniline and pentachlorophenol



Structure of Polysiloxane containing p-silphenylene

Meta.X5 Equivalent Phase

Restek: Rxi-5Sil MS

Agilent/JW: DB.5 MS, HP-5TA

Supelco: MDN-5, SLB-5MS

Chromopack/Varian: CP-SIL8CB MS, VF-5MS

Alltech: AT-5ms

Quadrex: 007-5MS

SGE: BPX-5

Phenomenex: ZB-5MS

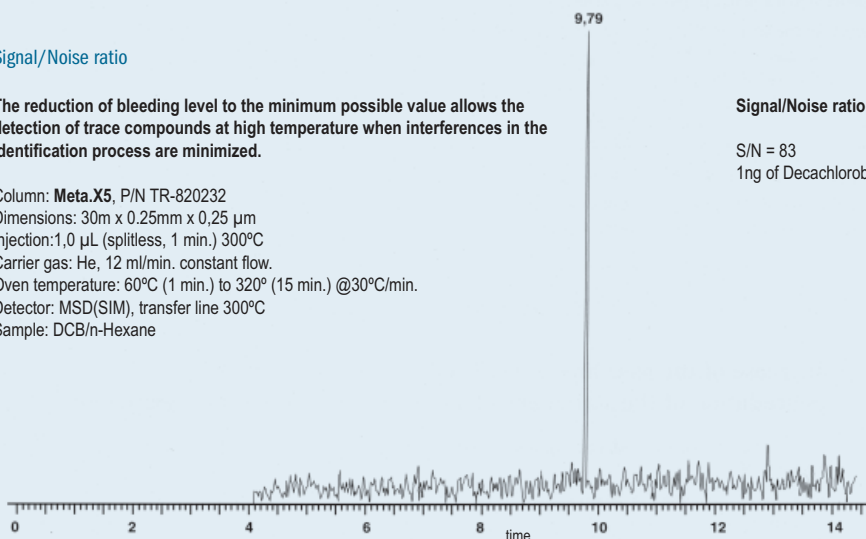
Meta.X5

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

Signal/Noise ratio

The reduction of bleeding level to the minimum possible value allows the detection of trace compounds at high temperature when interferences in the identification process are minimized.

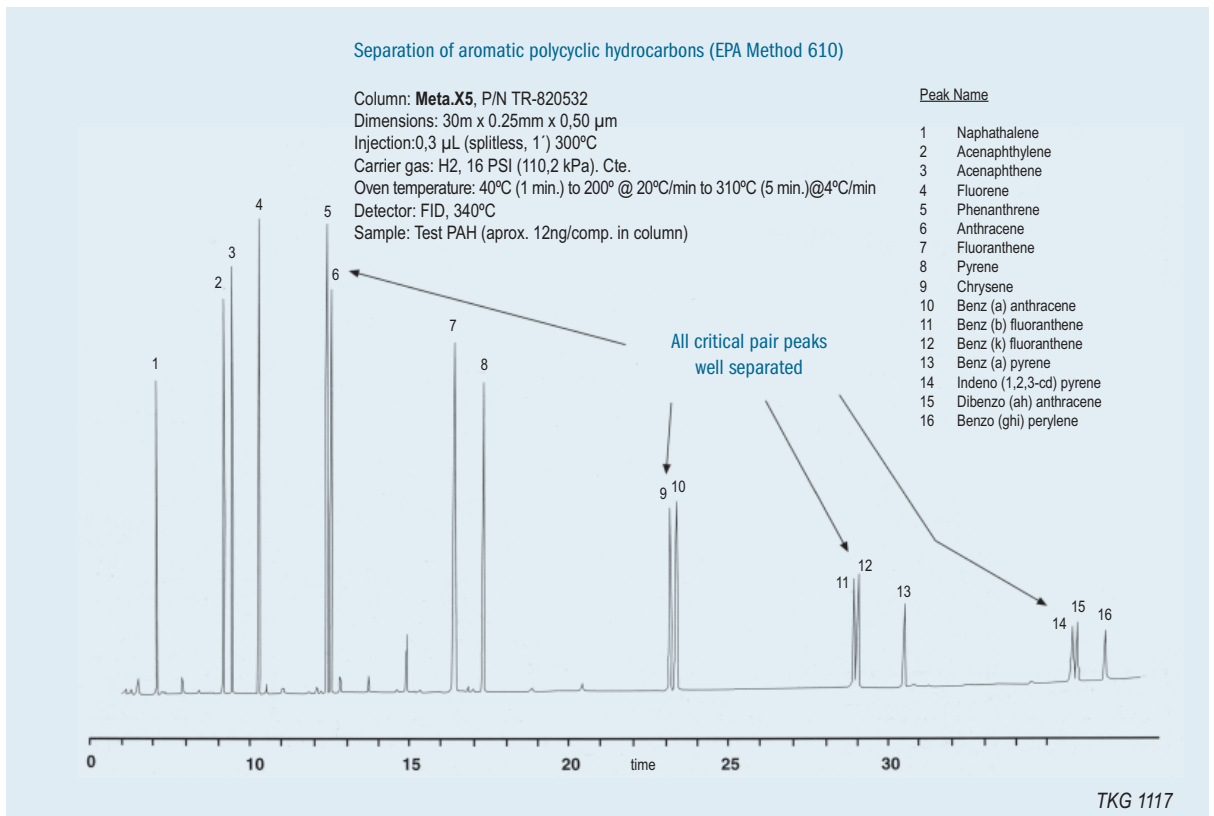
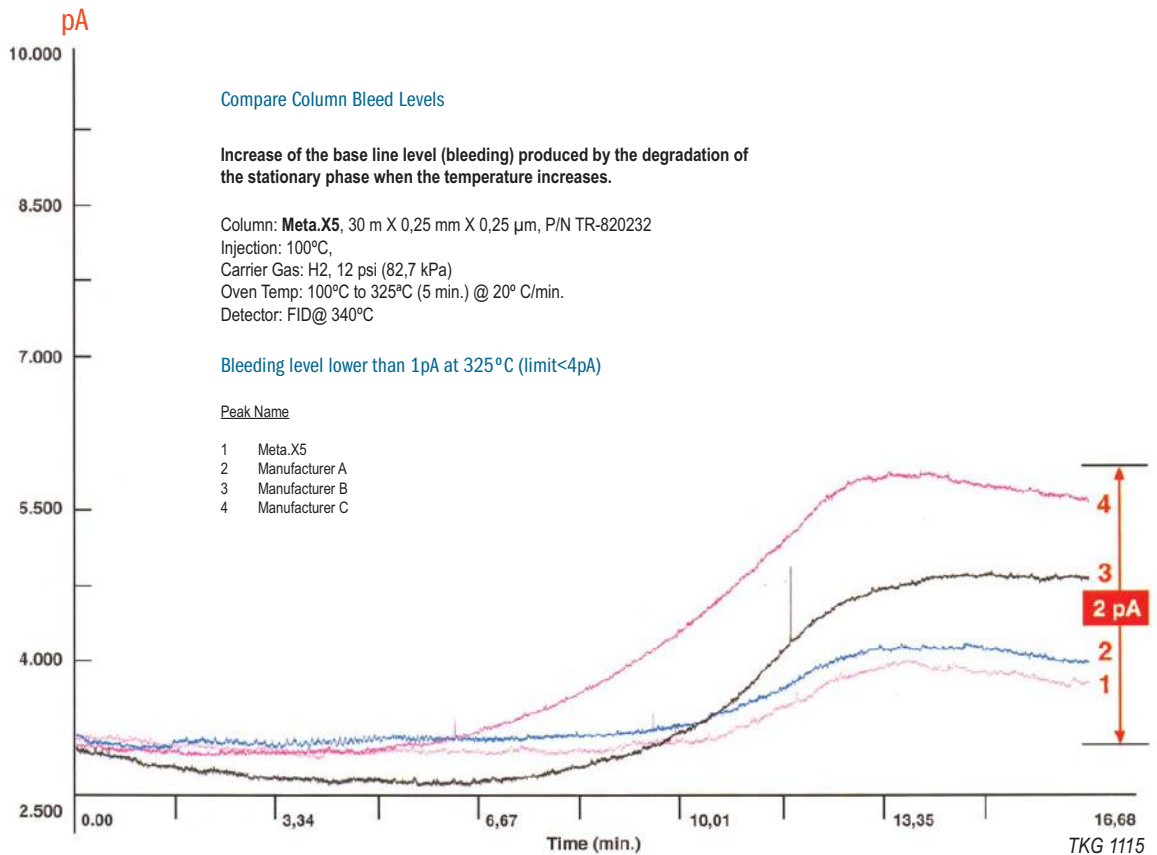
Column: **Meta.X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1.0 µL (splitless, 1 min.) 300°C
 Carrier gas: He, 12 ml/min. constant flow.
 Oven temperature: 60°C (1 min.) to 320° (15 min.) @30°C/min.
 Detector: MSD(SIM), transfer line 300°C
 Sample: DCB/n-Hexane



Signal/Noise ratio

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

TKG 1116



Meta.X5 Triazine (proprietary phase)

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

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

Meta.X5 Triazine

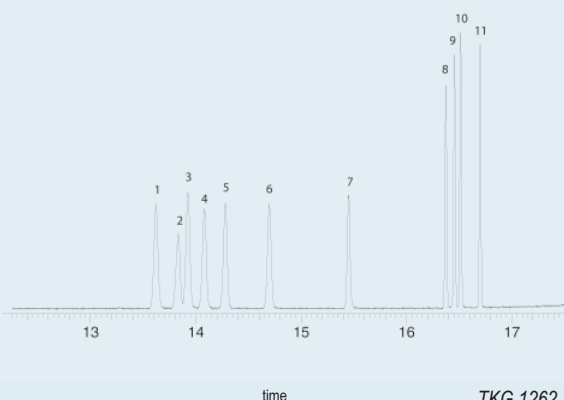
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,30	30	0,25	325 to 350°C	TR-410232

Triazine Herbicides

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

Peak Name

- Atraton
- Simazine
- Prometon
- Atrazine
- Propazine
- Terbutylazine
- Secbumeton
- Simetryn
- Ametryn
- Prometryn
- Terbutryn



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 340/360°C)
- Ideal column for GC-MS analysis
- Unique selectivity for aromatic compounds (PCBs, PAHs, PBDEs)
- Excellent column for pesticides and herbicides

Meta.XLB Equivalent Phase

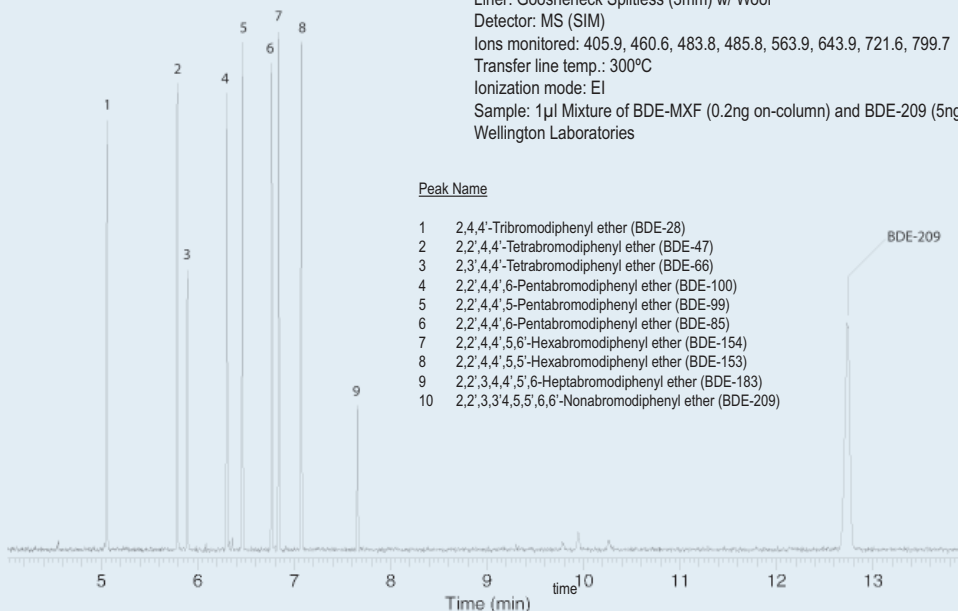
Restek: Rxi-XLB
Agilent/JW: DB-XLB
Supelco: MDN 12
Varian: VF-Xms
Phenomenex: ZB-XLB
Macherey-Nagel: OPTIMA XLB

Meta.XLB

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

ANALYSIS OF BROMINATED FLAME RETARDANTS (POLYBROMINATED DIPHENYL ETHERS, PBDEs)

Column: **Meta.XLB**, 15m x 0.18mm x 0.072µm (P/N: TR-332414)
 Injection: 280°C, Splitless w/ Surge: Pulse 40psi @ 0.30min, 50ml/min @ 0.4min
 Oven temperature: 100°C (0.5min) to 320°C (7min) @ 30°C/min
 Carrier gas: Helium, Constant flow @ 2ml/min
 Liner: Gooseneck Splitless (3mm) 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.: 300°C
 Ionization mode: EI
 Sample: 1µl Mixture of BDE-MXF (0.2ng on-column) and BDE-209 (5ng on-column) from Wellington Laboratories



Peak	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',4,4',5,5',6,6'-Nonabromodiphenyl ether (BDE-209)

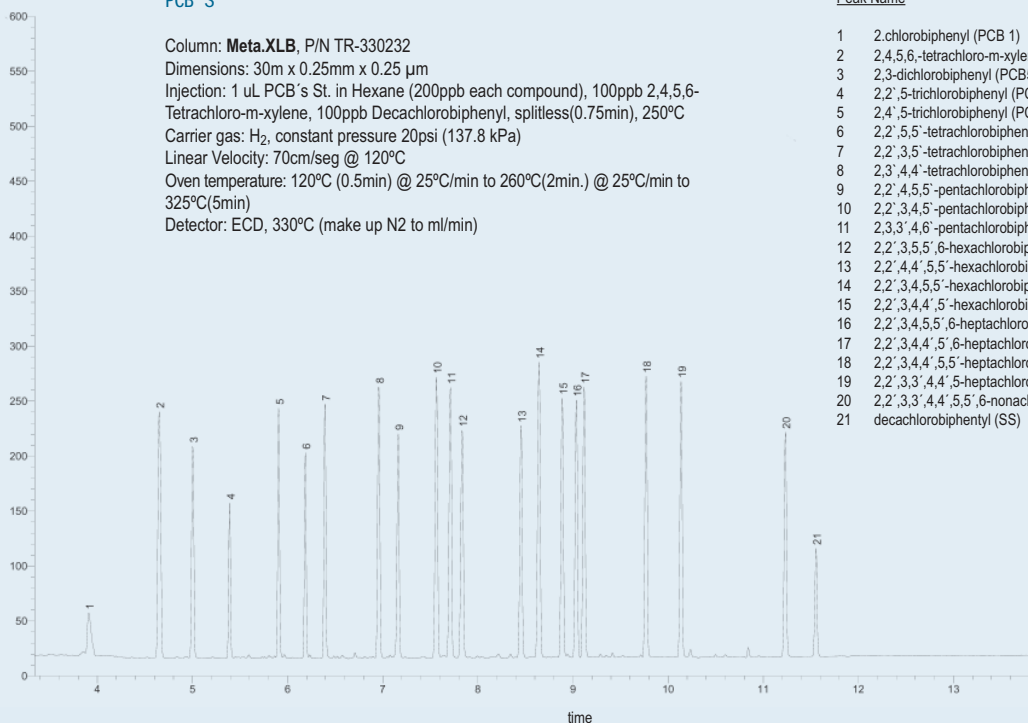
TKG 1272

PCB'S

Column: **Meta.XLB**, P/N TR-330232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL PCB's St. in Hexane (200ppb each compound), 100ppb 2,4,5,6-Tetrachloro-m-xylene, 100ppb Decachlorobiphenyl, splitless(0.75min), 250°C
 Carrier gas: H₂, constant pressure 20psi (137.8 kPa)
 Linear Velocity: 70cm/seg @ 120°C
 Oven temperature: 120°C (0.5min) @ 25°C/min to 260°C(2min.) @ 25°C/min to 325°C(5min)
 Detector: ECD, 330°C (make up N₂ 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 (PCB286)
21	decachlorobiphenyl (SS)

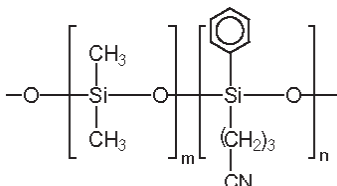


TKG 1265

TRB-1301

94% Dimethyl-(6%) cyanopropylphenyl polysiloxane, bonded and crosslinked phase.

- (6%)Cyanopropyl-phenyl-(94%)dimethylpolysiloxane
- Ideal column for analyzing mixtures of acidic and basic compounds with a wide range of polarity
- This column of intermediate polarity is very useful for analyzing pesticides and herbicides



Structure of Poly(dimethylcyanopropylphenyl)siloxane

TRB-1301 Equivalent Phase

Agilent: HP-1301, HP-624, DB-1301, DB-624

Supelco: SPB-1301, OVI-G43

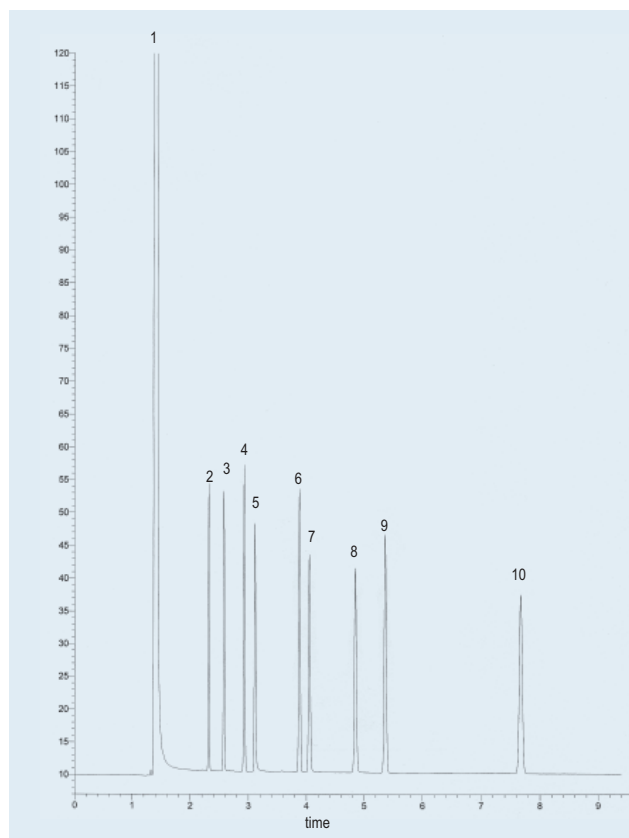
Restek: Rtx-1301, Rtx-624

SGE: BPX-624

Alltech: AT-624

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
0,25	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

Column: **TRB-1301**, P/N TR-641032

Dimensions: 30m x 0.25mm x 1.0 µm

Injection: 0.5 µL standard SP-4-7301 (500 ng/mL), split 1:50, 260°C

Carrier gas: H₂, constant pressure 12 psi (82.7 kPa).

Oven temperature: 165°C

Detector: FID, 280°C

Peak Name

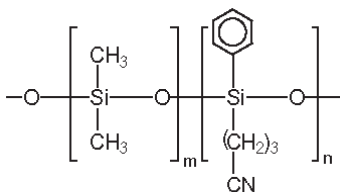
- 1 Methylene chloride
- 2 C-10
- 3 2-Octanone
- 4 C-11
- 5 1-Octanol
- 6 C-12
- 7 2,6-Dimethylphenol
- 8 2,6-Dimethylaniline
- 9 C-13
- 10 C-14

TKG 1118

TRB-624

94% Dimethyl-(6%) cyanopropylphenyl polysiloxane, bonded and crosslinked phase.

- (6%) Cyanopropyl-phenyl - (94%) dimethylpolysiloxane
- Column developed specially for environmental analysis of volatile compounds ("Volatile Priority Pollutants")
- Column perfectly compatible with EPA methods 501.3, 502.2, 524.2, 601, 602, 8010, 8015, 8020, 8221, 8240 and 8260.
- Excellent inertness against active compounds



Structure of Poly(dimethylcyanopropylphenyl)siloxane

TRB-624 Equivalent Phase

Agilent: HP-1301, HP-624, DB-1301, DB-624

Supelco: SPB-1301, OVI-G43

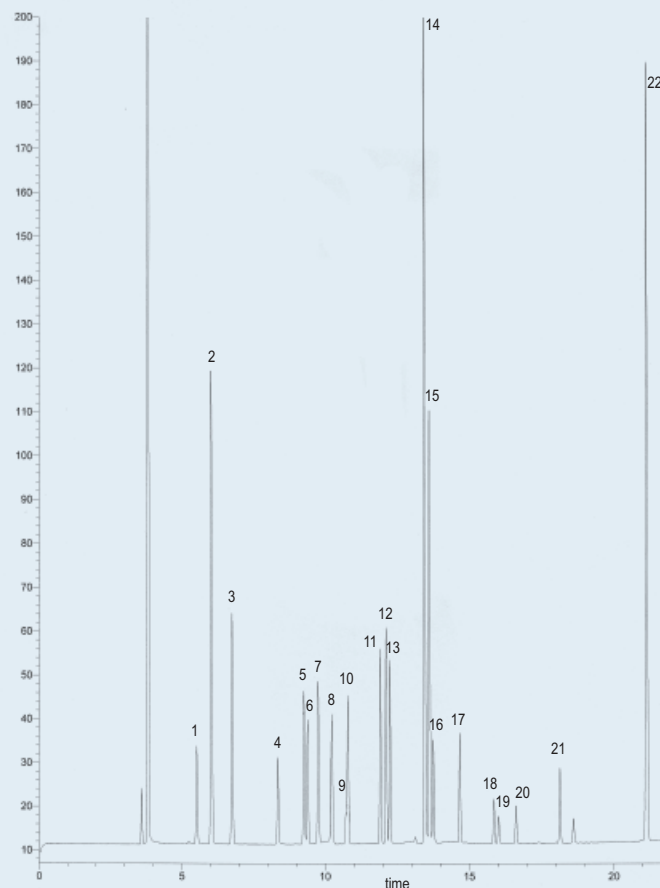
Restek: Rtx-1301, Rtx-624

SGE: BPX-624

Alltech: AT-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

Column: **TRB-624**, P/N TR-601462

Dimensions: 60m x 0.25mm x 1.4 µm

Injection: 1 µL solvents mixture, split 1:100 (20-600 ng/comp.), 260°C

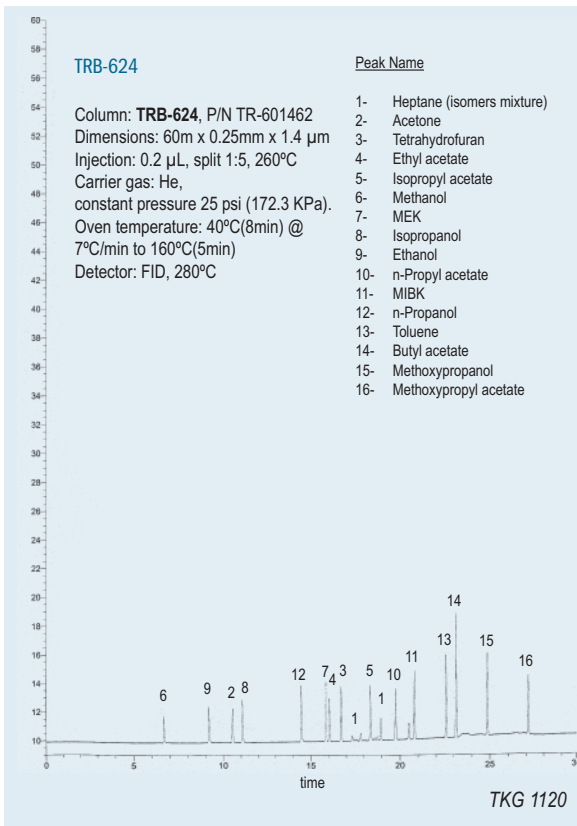
Carrier gas: H₂, constant pressure 25 psi (172.3 KPa).

Oven temperature: 50°C(5min) @ 6°C/min to 220°C

Detector: FID, 280°C

Peak Name

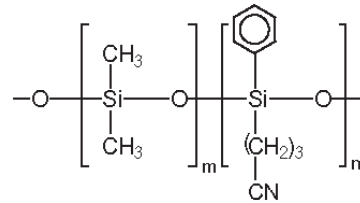
- Diethylether
- Acetone
- Methyl acetate
- Vinyl acetate
- MEK
- Ethyl acetate
- Tetrahydrofuran
- Cyclohexane
- Benzene
- Isopropyl acetate
- 2-Pentanone
- 3-Pentanone
- Propyl acetate
- Pyridine
- Toluene
- Isobutyl acetate
- Butyl acetate
- Ethyl benzene
- m-Xylene/p-Xylene
- o-Xylene
- Diisobutylketone
- Nitrobenzene



TRB-G43

94% Dimethyl-(6%) cyanopropylphenyl polysiloxane, bonded and crosslinked phase.

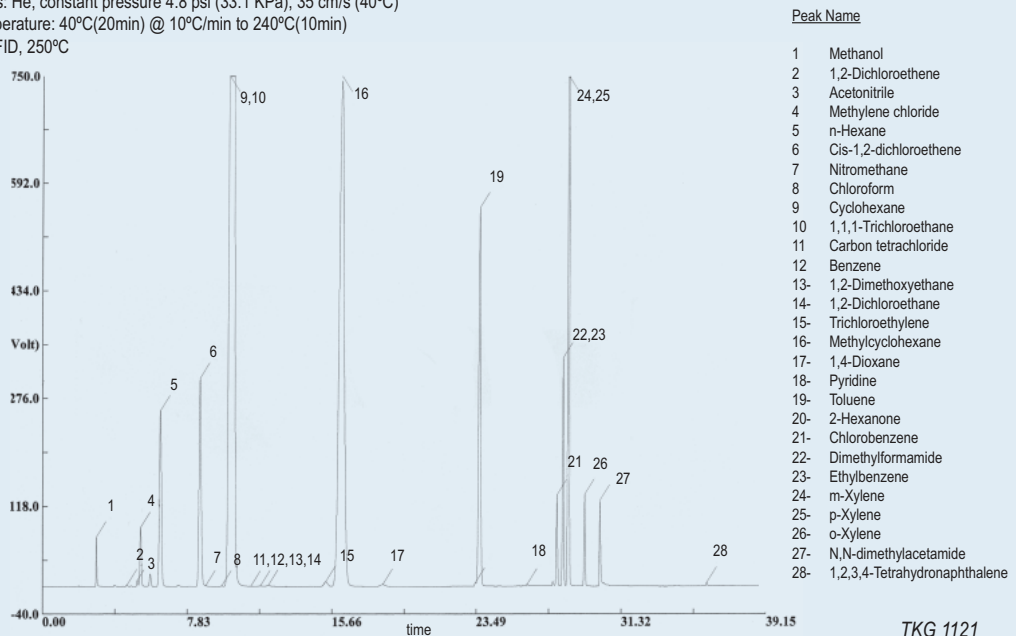
- (6%) Cyanopropyl-phenyl - (94%) dimethylpolysiloxane (USP G43)
- Fulfills the specifications of the American (USP) and European (EP) pharmacopoeia for the analysis of residual solvents (OVI) in pharmaceutical products, USP method <467> and EP method 2.4.24
- Column with chemical inertness and low bleed guaranteed
- Specially tested for complete separation of the five solvents regulated by USP Method 467
- For this analysis, 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

Column: **TRB-G43**, P/N TR-163035
 Dimensions: 30m x 0.53mm x 3.0 μm
 Injection: split 1:2, 250°C, 5m x 0.53mm intermediate polarity column (TR-200055)
 Sample: 0.5 mL headspace 80°C (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, constant pressure 4.8 psi (33.1 KPa), 35 cm/s (40°C)
 Oven temperature: 40°C(20min) @ 10°C/min to 240°C(10min)
 Detector: FID, 250°C





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-1301, HP-624, DB-1301, DB-624

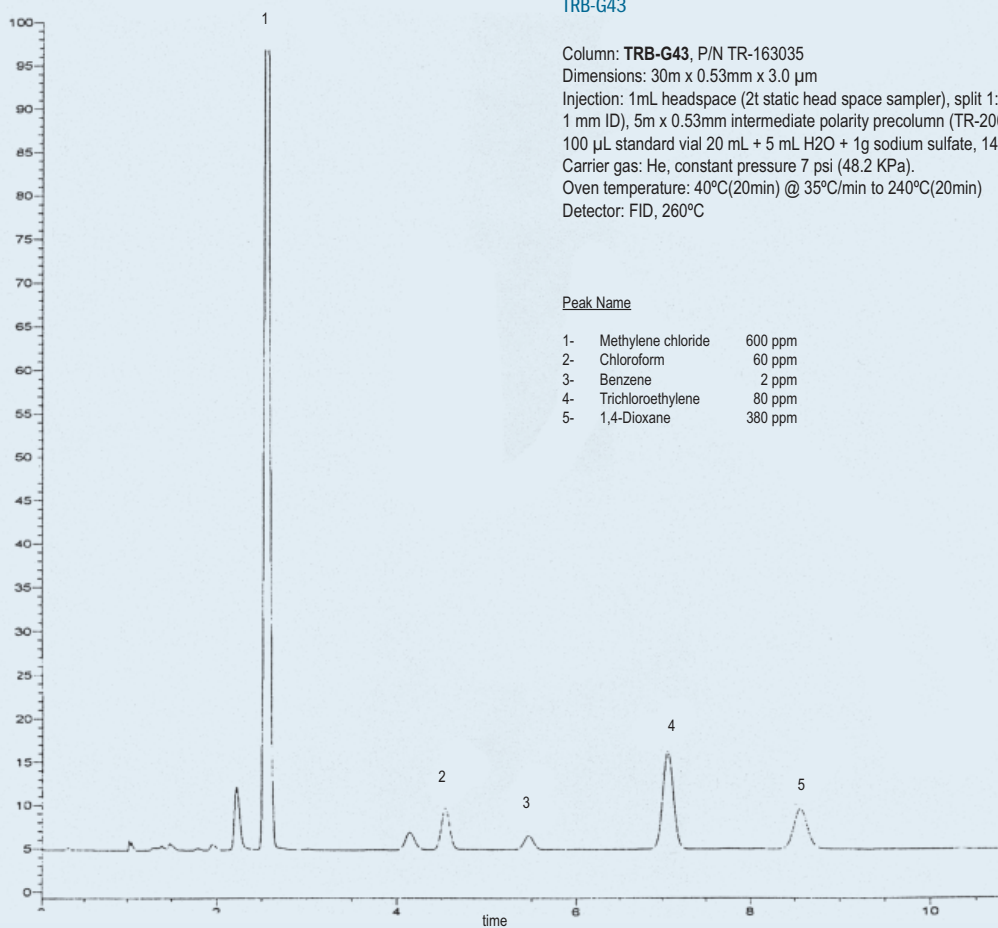
Supelco: SPB-1301, OVI-G43

Restek: Rtx-1301, Rtx-624

SGE: BPX-624

Alltech: AT-624

USP Nomenclature: G43



TRB-G43

Column: **TRB-G43**, P/N TR-163035

Dimensions: 30m x 0.53mm x 3.0 µm

Injection: 1mL headspace (2t static head space sampler), split 1:2 (liner 1 mm ID), 5m x 0.53mm intermediate polarity precolumn (TR-200055), 100 µL standard vial 20 mL + 5 mL H₂O + 1g sodium sulfate, 140°C

Carrier gas: He, constant pressure 7 psi (48.2 KPa).

Oven temperature: 40°C(20min) @ 35°C/min to 240°C(20min)

Detector: FID, 260°C

Peak Name

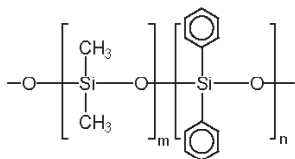
1-	Methylene chloride	600 ppm
2-	Chloroform	60 ppm
3-	Benzene	2 ppm
4-	Trichloroethylene	80 ppm
5-	1,4-Dioxane	380 ppm

TKG 1122

TRB-14

(14%) Diphenyl- (86%) dimethylpolysiloxane, bonded and crosslinked phase.

- (14%) Diphenyl- (86%) dimethylpolysiloxane
- Column of intermediate polarity without cyanopropyl groups in its structure
- Chemical inertness and low bleed guaranteed
- Confirmation column alongside TRB-1 and TRB-5



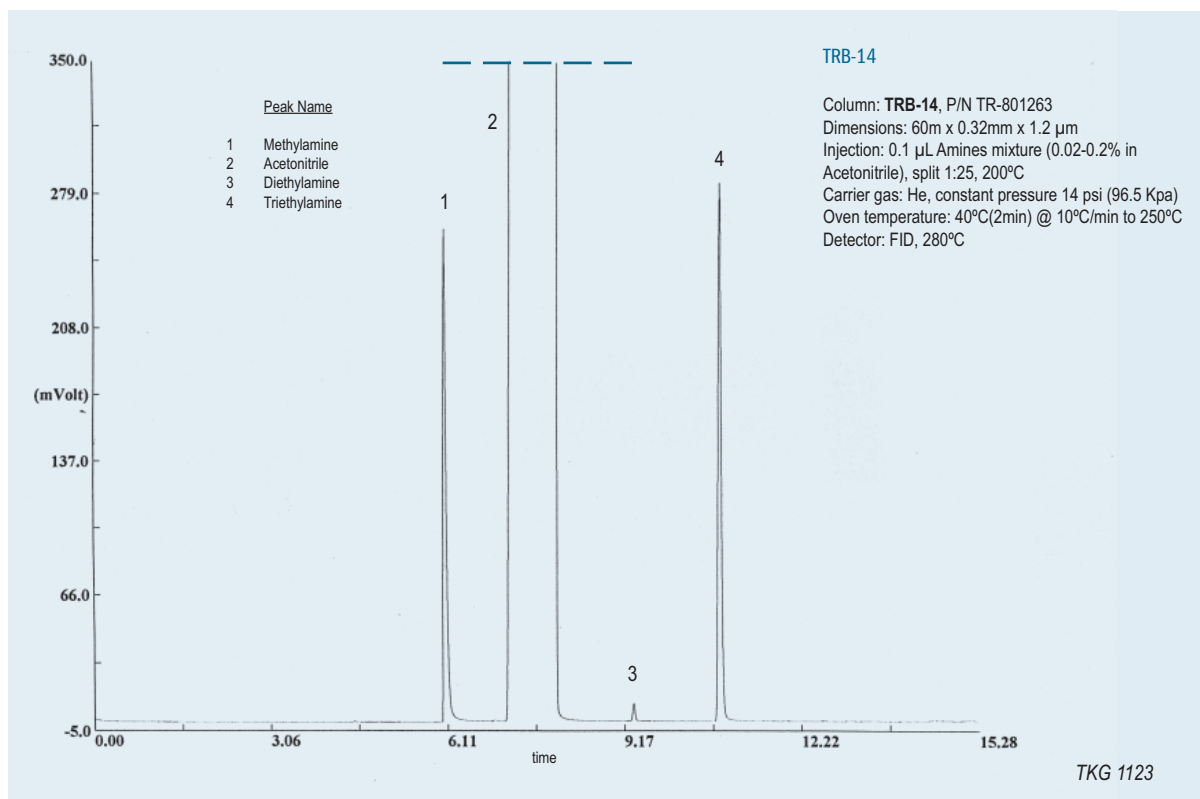
Structure of Poly(dimethyldiphenyl)siloxane

TRB-14 Equivalent Phase

Varian: CP-SIL 13 CB

TRB-14

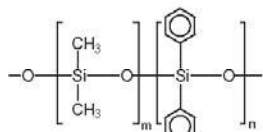
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,20	-20 to 300/330	TR-802112
	15	0,40	-20 to 300/330	TR-800412
	15	1,20	-20 to 300/330	TR-801212
	30	0,20	-20 to 300/330	TR-802132
	30	0,40	-20 to 300/330	TR-800432
	30	1,20	-20 to 300/330	TR-801232
	60	0,20	-20 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-20

(20%) Diphenyl-(80%) Dimethylpolysiloxane, bonded and crosslinked phase.

- (20%) Diphenyl-(80%) dimethylpolysiloxane
- Column of intermediate polarity without cyanopropyl groups in its structure
- Excellent confirmation column



Structure of Poly(dimethyldiphenyl)siloxane

TRB-20 Equivalent Phase

Varian: CP-SIL 13 CB

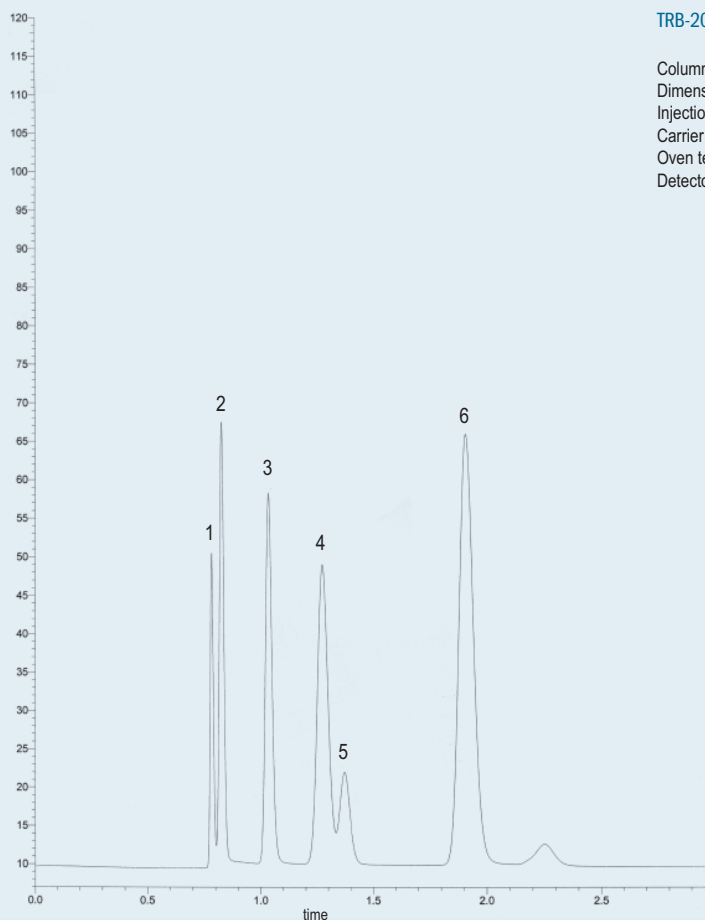
Supelco: SPB-20

Alltech: AT-20

Quadrex: 007-502

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

Column: **TRB-20**, P/N TR-203035

Dimensions: 30m x 0.53mm x 3.0 µm

Injection: Alcohols in blood, 0.5 µL Head Space, split 5:1, 200°C

Carrier gas: He, constant pressure 10 psi (69Kpa)

Oven temperature: 40°C (isothermal)

Detector: FID, 200°C

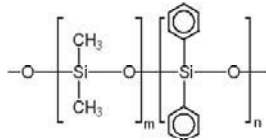
Peak Name

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

TRB-35

(35%) Diphenyl (65%) Dimethylpolysiloxane, bonded and crosslinked phase.

- (35%) Diphenyl-(65%) dimethylpolysiloxane
- Column of intermediate polarity without cyanopropyl 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

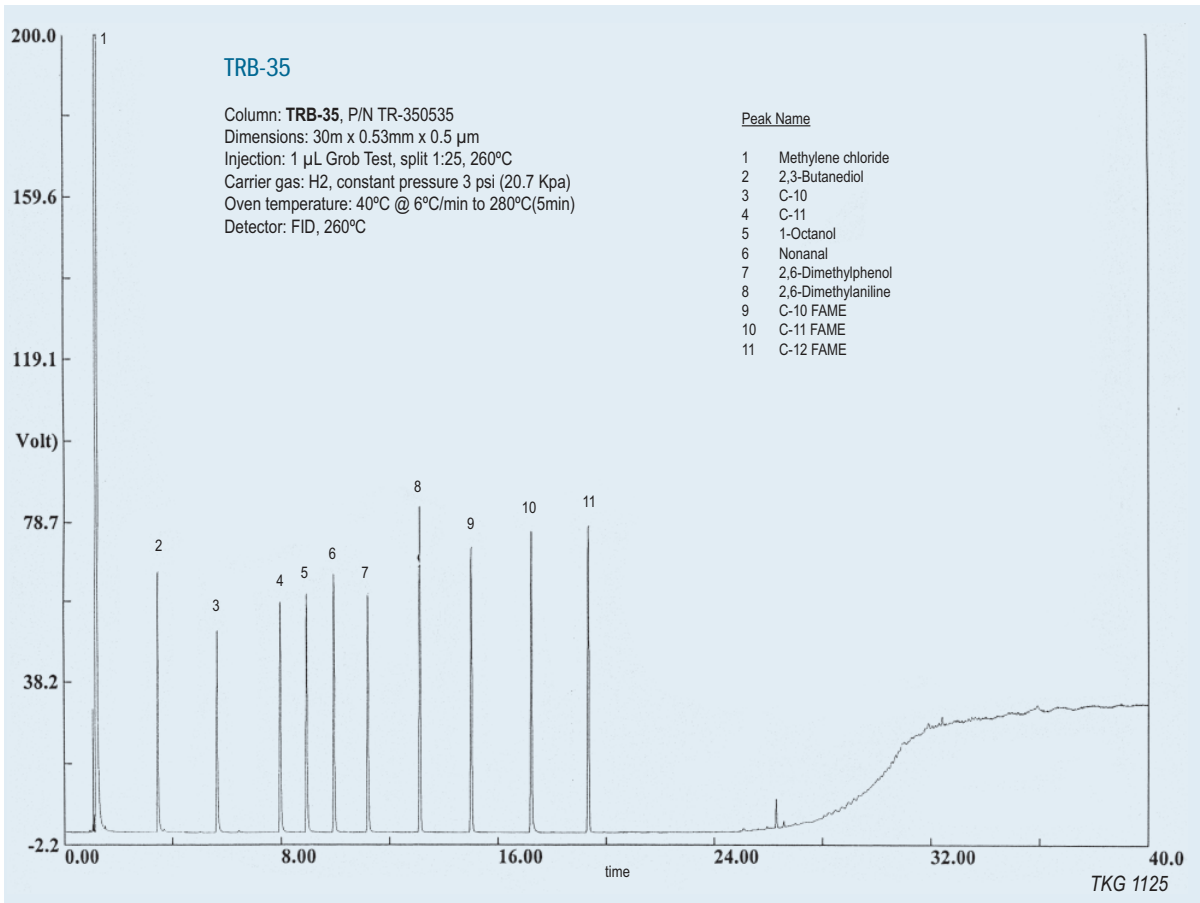
SGE: BPX-35

Alltech: AT-35

Quadrex: 007-11

TRB-35

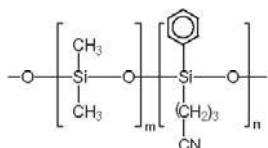
Internal Diam. (mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,15	-20 to 300/320	TR-351312
	15	0,25	-20 to 300/320	TR-350212
	30	0,15	-20 to 300/320	TR-351332
	30	0,25	-20 to 300/320	TR-350232
	60	0,15	-20 to 300/320	TR-351362
	60	0,25	-20 to 300/320	TR-350262
0,32	15	0,15	-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-1701

(14%) Cyanopropylphenyl-(86%) dimethyl polysiloxane, bonded and crosslinked phase.

- (14%) Cyanopropyl-phenyl- (86%)dimethylpolysiloxane
- 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

Supelco: SPB-1701

Restek: Rtx-1701

Varian: CP-SIL 19 CB

SGE: BP-10

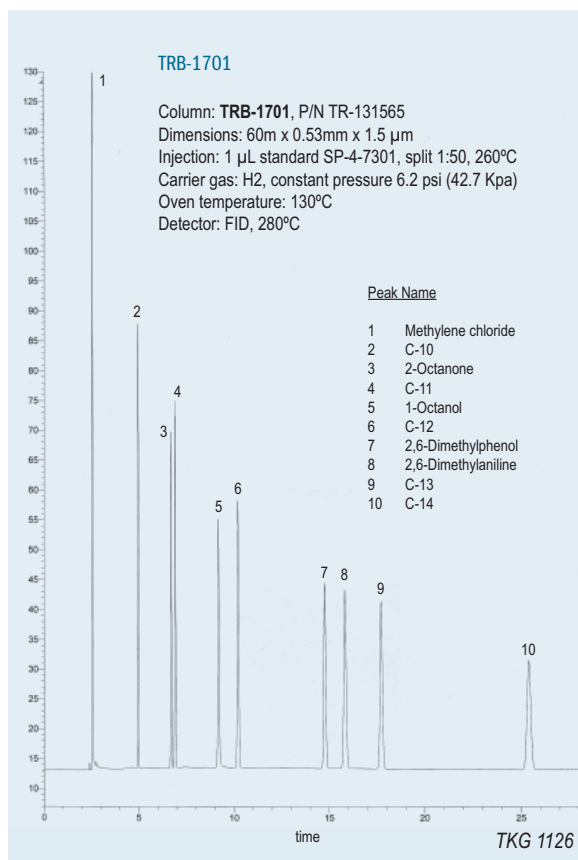
Alltech: AT-1701

Quadrex: 007-1701



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
0,32	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
	0,53	15	0,10	-20 to 280/280
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
0,53	60	0,50	-20 to 270/280	TR-130563
	60	1,00	-20 to 260/280	TR-131063
	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
0,53	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%) Cyanopropylphenyl - (50%) dimethyl polysiloxane, bonded and crosslinked phase.

- (50%) Cyanopropylphenyl - (50%) dimethyl polysiloxane
- Medium/high polarity column
- Excellent for separating cis-trans isomers of FAMES and sugar derivatives.

TRB-225 Equivalent Phase

Agilent: HP-225, DB-225

Restek: Rtx-225

Varian: CP-SIL 43 CB

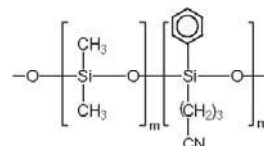
SGE: BP-225

Alltech: AT-225

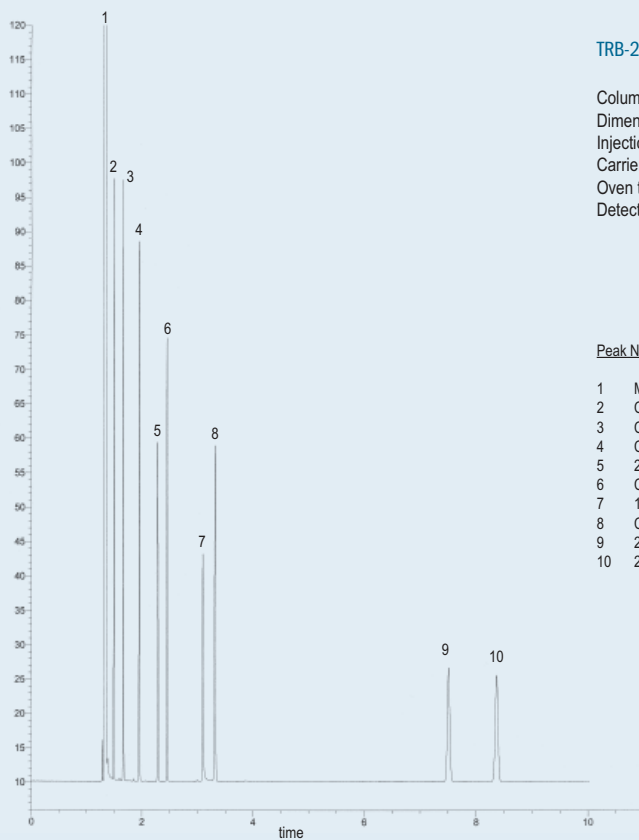
Quadrex: 007-225

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
0,32	30	0,25	40 to 220/240	TR-250232
	15	0,15	40 to 220/240	TR-251313
0,53	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



Structure of Poly(dimethylcyanopropylphenyl)siloxane



TRB-225

Column: **TRB-225**, P/N TR-251332

Dimensions: 30m x 0.25mm x 0.15 µm

Injection: 1 µL standard SP-4-7301, split 1:50, 260°C

Carrier gas: H₂, constant pressure 12 psi (82.7 Kpa)

Oven temperature: 110°C

Detector: FID, 280°C

Peak Name

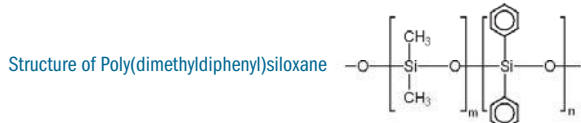
- 1 Methylene chloride
- 2 C-10
- 3 C-11
- 4 C-12
- 5 2-Octanone
- 6 C-13
- 7 1-Octanol
- 8 C-14
- 9 2,6-Dimethylphenol
- 10 2,6-Dimethylaniline

TKG 1127

TRB-50

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

- (50%) Diphenyl-(50%) dimethyl polysiloxane
- Medium polarity column
- Excellent column for confirmation of TRB-5 analyses



TRB-50 Equivalent Phase

Agilent: HP-50, +DB-17, DB-608
Supelco: SPB-50, SPB-2250
Restek: Rtx-50, Rxi-17
Varian: CP-SIL 24 CB
Alltech: AT-50
Quadrex: 007-17

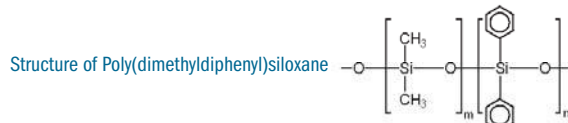
TRB-50

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
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
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
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-50ht

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

- (50%) Diphenyl-(50%) dimethylpolysiloxane
- Medium polarity column with high thermal stability
- Best column for triglycerides analysis



TRB-50ht Equivalent Phase

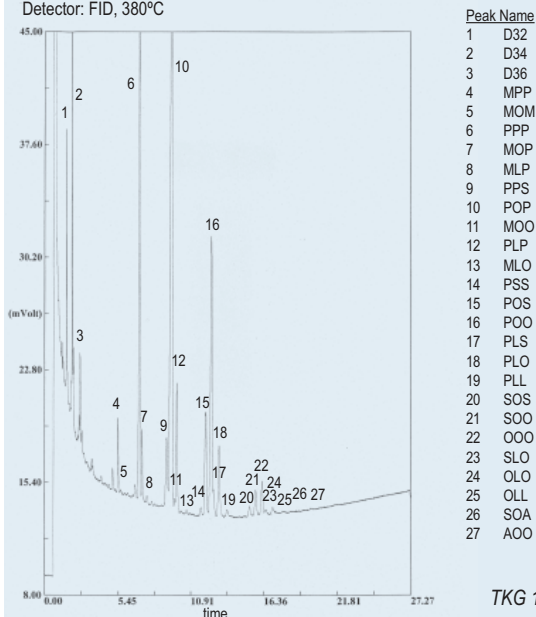
Agilent: DB17ht
Restek: Rtx-65
Varian: TAB-CB
Quadrex: 007-65HT

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

Column: **TRB-50ht**, P/N TR-531312
 Dimensions: 15m x 0.25mm x 0.15 µm
 Injection: 0.2mL Triglycerides Palm Oil in Isooctane(50 mg/mL), split 1:12
 Carrier gas: H₂, constant pressure, 9psi (56 KPa)
 Oven temperature: 340°C(1min)@0.5°C/min to 355°C(5min)
 Injector: 380°C (high temperature septum)
 Detector: FID, 380°C



Peak Name
1 D32
2 D34
3 D36
4 MPP
5 MOM
6 PPP
7 MOP
8 MLP
9 PPS
10 POP
11 MOO
12 PLP
13 MLO
14 PSS
15 POS
16 POO
17 PLS
18 PLO
19 PLL
20 SOS
21 SOO
22 OOO
23 SLO
24 OLO
25 OLL
26 SOA
27 AOO

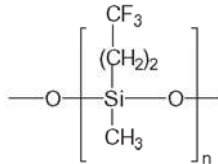
TKG 1128

TRB-F50

(50%) Trifluoropropyl-(50%) Methylpolysiloxane, bonded and crosslinked phase.

- (50%) Trifluoropropyl-(50%) Methylpolysiloxane
- High polarity column
- Column designed for the EPA 609 and 8140 methods

Structure of Poly(methyltrifluoropropyl)siloxane



TRB-F50 Equivalent Phase

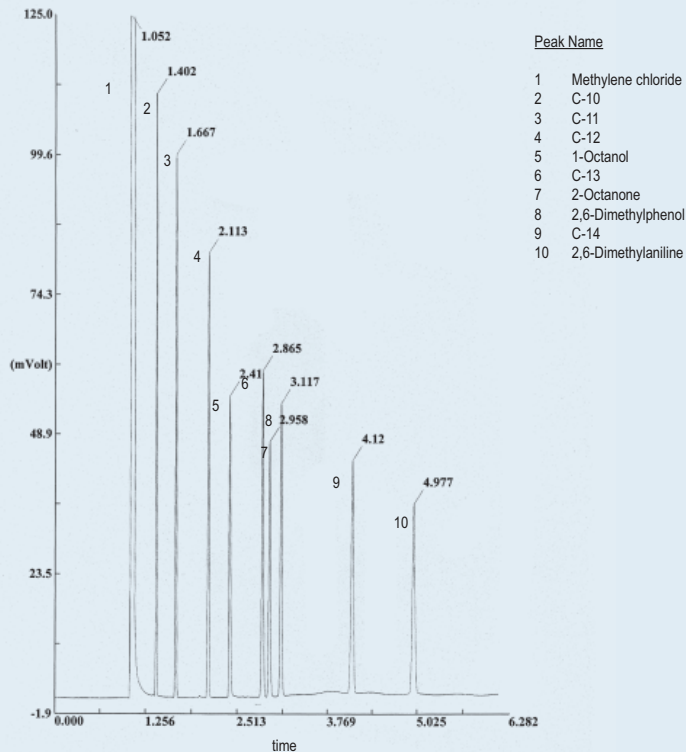
Agilent: DB-210, DB-200
Restek: Rtx-200
Alltech: AT-210
Quadrex: 007-210

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
		15	0,25	45 to 240/260
		15	0,50	45 to 240/260
		30	0,15	45 to 240/260
		30	0,25	45 to 240/260
		30	0,50	45 to 240/260
	0,32	15	0,15	45 to 240/260
		15	0,25	45 to 240/260
		15	0,50	45 to 240/260
		30	0,15	45 to 240/260
		30	0,25	45 to 240/260
		30	0,50	45 to 240/260
	0,53	15	1,00	45 to 220/240
30		1,00	45 to 220/240	TR-571035

TRB-F50

Column: **TRB-F50**, P/N TR-570533
 Dimensions: 30m x 0.32mm x 0.5 µm
 Injection: 1 µL standard SP-4-7301 (500 ng/mL comp), split 1:50, 260°C
 Carrier gas: H2, constant pressure, 7psi (48.2 KPa)
 Oven temperature: 100°C
 Detector: FID, 280°C

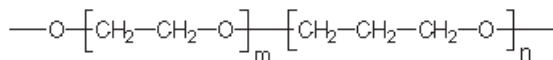


TKG 1129

TRB-PAG

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

- (50%) Polyethylene-(50%) polypropylene glycol
- Phase polarity slightly lower than TRB-WAX due to the inclusion of groups of propylene oxide
- Polarity similar to UCON phase



Structure of Poly(ethylenepropylene)glycol

TRB-PAG Equivalent Phase

Supelco: PAG

TRB-PAG

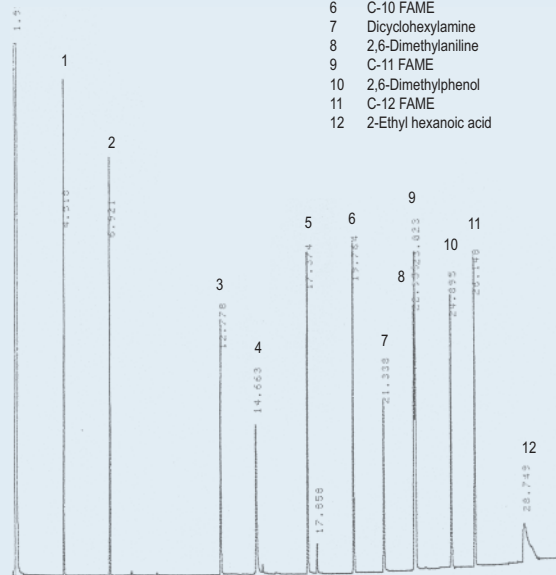
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
0,25	15	0,25	30 to 220/230	TR-550212
	30	0,25	30 to 220/230	TR-550232
	60	0,25	30 to 220/230	TR-550262
0,32	15	0,25	30 to 220/230	TR-550213
	30	0,25	30 to 220/230	TR-550233
	60	0,25	30 to 220/230	TR-550263
0,53	15	0,50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

Column: **TRB-PAG**, P/N TR-550232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL Test Grob, split 1:25, 260°C
 Carrier gas: H₂, constant pressure 11 psi (75.8 Kpa)
 Oven temperature: 40°C @ 6°C/min to 230°C(5min)
 Detector: FID, 260°C

Peak Name

- C-10
- C-11
- Nonanal
- 2,3-Butanediol
- 1-Octanol
- C-10 FAME
- Dicyclohexylamine
- 2,6-Dimethylaniline
- C-11 FAME
- 2,6-Dimethylphenol
- C-12 FAME
- 2-Ethyl hexanoic acid



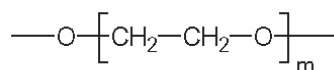
TKG 1130

SupraWax-280

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

Extended use for the analysis of methyl esters of fatty acids (FAMES) and analysis of solvents, fragrances, alcohols and aromatic compounds in the alimentary and flavor and fragrance industry.

- 100 % Poliethyleneglycol (PEG), bonded cross-linked phase
- Column of high polarity
- Phase practically equivalent to the USP G16 phase
- Ample range of operating temperatures and high thermal stability (35°C-280°C)
- Compatible with water and methanol injections, providing that these solvents be completely vaporized when they enter into the column.
- Reproducibility among columns guaranteed



Structure of Polyethyleneglycol

SupraWax-280 Equivalent Phase

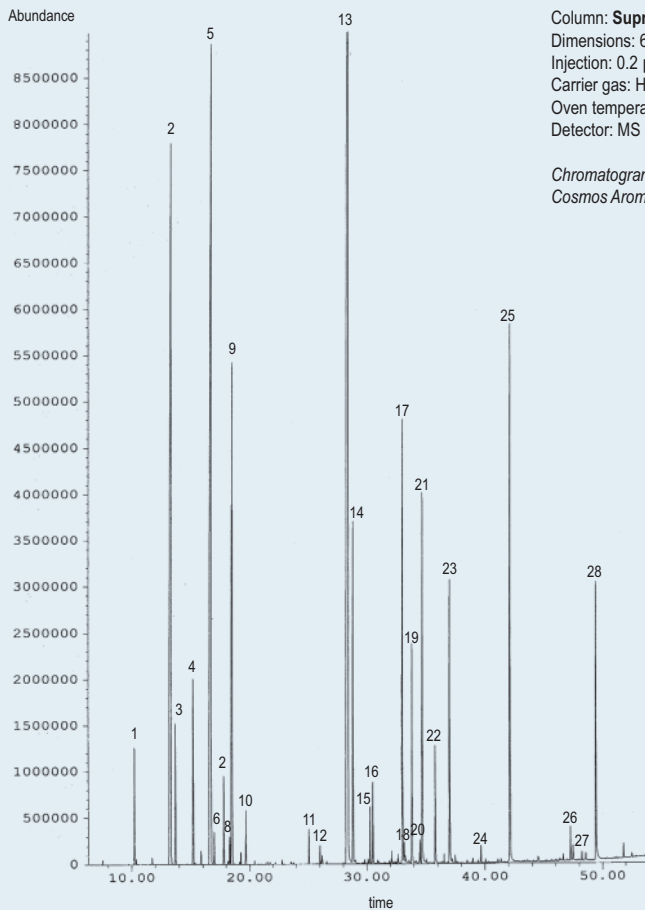
Supelco: Supelcowax™ 10.

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

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N°. (P/N)
60	60	0,25	35 to 280	TR-830262
		0,50	35 to 280	TR-830562
0,32	15	0,25	35 to 280	TR-830213
		0,50	35 to 280	TR-830513
30	30	0,25	35 to 280	TR-830233
		0,50	35 to 280	TR-830533
60	60	0,25	35 to 280	TR-830263
		0,50	35 to 280	TR-830563
0,53	15	0,50	35 to 280	TR-830515
		1,00	35 to 280	TR-831015
30	30	0,50	35 to 280	TR-830535
		1,00	35 to 280	TR-831035
60	60	1,00	35 to 280	TR-831063
		2,00	35 to 280	TR-832035
60	60	1,00	35 to 280	TR-831065
		2,00	35 to 280	TR-832065

Essential Oil of Flower of Orange Tree (Neroli)



Column: **SupraWax-280**, P/N TR-832169

Dimensions: 60m x 0.20mm x 0.20 µm

Injection: 0.2 µL, split 1:75, 260°C

Carrier gas: He, 34.7 psi

Oven temperature: 50°C(4min) @ 4°C/min to 265°C(10min)

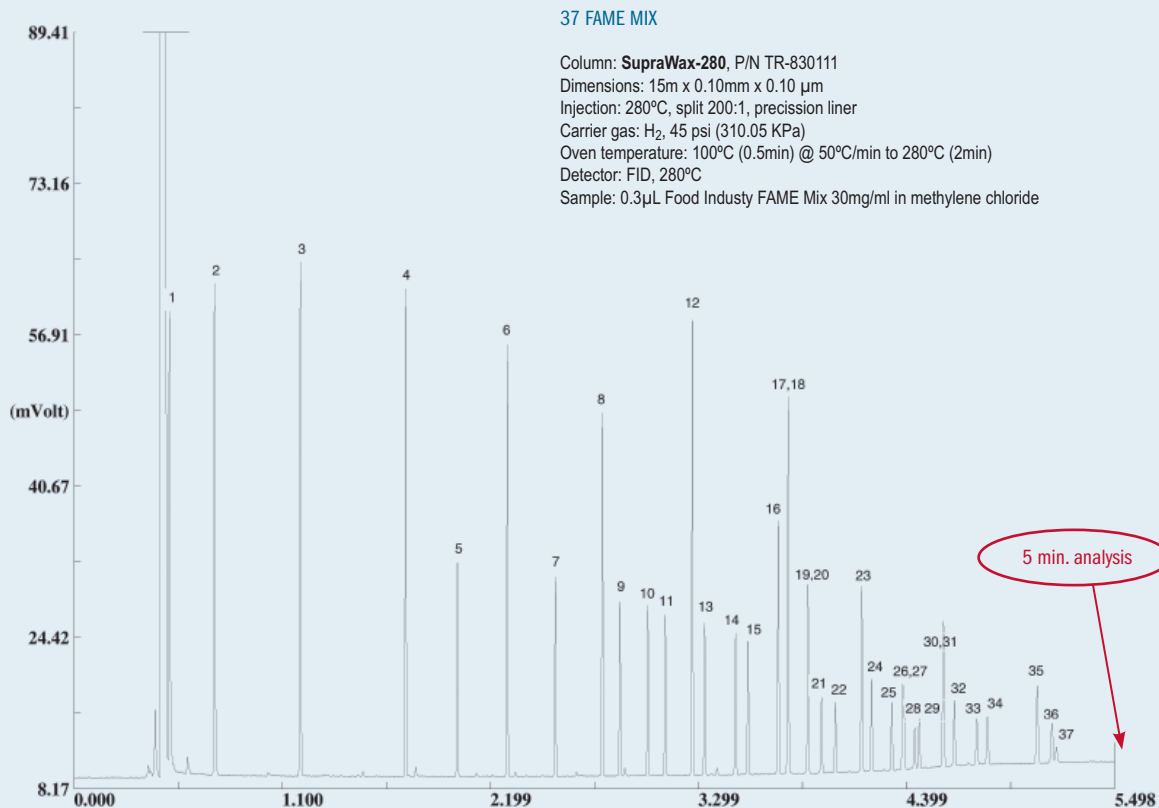
Detector: MS (Solvent delay, mass range 29:350 m/z) 280°C

Chromatogram provided by Antonio González from Cosmos Aromatica Internacional

Peak Name

1. α-Pynene
2. β-Pynene
3. Sabinene
4. β-Myrcene
5. Limonene
6. β-Phellandrene
7. Cis-b-ocymene
8. γ-Terpinene
9. Trans-b-ocymene
10. α-Terpinolene
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-geranylol
23. Trans-geranylol
24. Phenyl acetonitrile
25. Nerolydol
26. Methylantranilate
27. Trans, trans-farnesyl acetate
28. Trans, trans-farnesol

TKG 1202



Peak Name

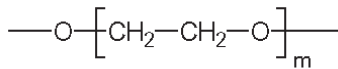
1	C4:0	20	C18:2 (all- <i>cis</i> -9,12)
2	C6:0	21	C18:3 C18:2 (all- <i>cis</i> -6,9,12)
3	C8:0	22	C18:3 (all- <i>cis</i> -9,12,15)
4	C10:0	23	C20:0
5	C11:0	24	C20:1(<i>cis</i> -11)
6	C12:0	25	C20:2 (all- <i>cis</i> -11,14)
7	C13:0	26	C20:3 (all- <i>cis</i> -8,11,14)
8	C14:0	27	C21:0
9	C14:1 (<i>cis</i>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

TKG 1247

TRB-WAX

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

- 100% Polyethylene glycol (PEG)
- High polarity column
- Wide range of working temperatures and high thermal stability (270° C)
- Ideal for separating alcohols, aldehydes, ketones and aromatic isomers (BTX)



Structure of Polyethylene glycol

TRB-WAX Equivalent Phase

Agilent: HP-20M, INNOWAX, DB-WAX, DBWAXetr

Supelco: SUPELCOWAX-10, Carbowax 20M

Restek: STABILWAX

Varian: CP-WAX 52CB

SGE: BP-20

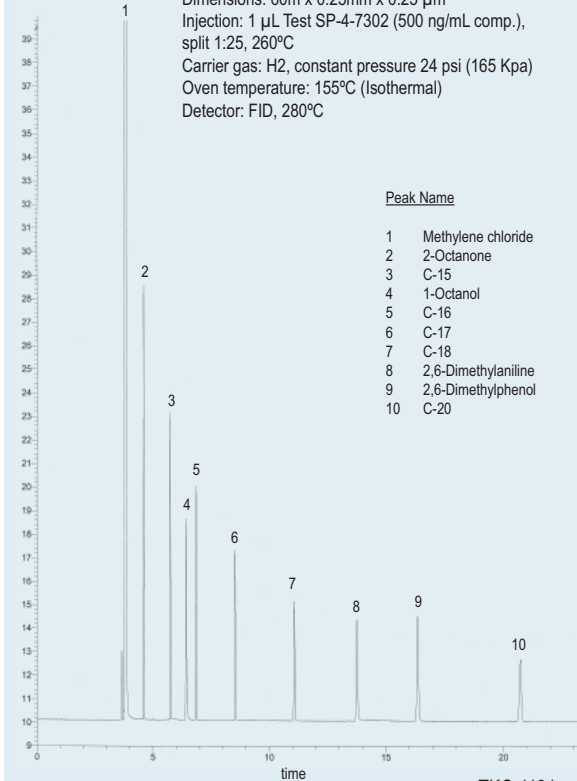
Alltech: AT-WAX

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	
0,53	100	1,00	40 to 230/240	TR-141093	
	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-WAX

Column: **TRB-WAX**, P/N TR-140262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: 1 µL Test SP-4-7302 (500 ng/mL comp.), split 1:25, 260°C
 Carrier gas: H2, constant pressure 24 psi (165 Kpa)
 Oven temperature: 155°C (Isothermal)
 Detector: FID, 280°C

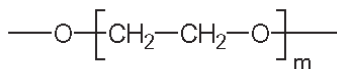




TRB-FFAP

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

- 100% Polyethylene glycol (PEG) esterified with nitroterephthalic acid
- Ideal for analysis of free acids (without derivatization), phenols and glycols
- High thermal stability (250°C)



Structure of Polyethylene glycol

TRB-FFAP Equivalent Phase

Agilent: HP-FFAP, DB-FFAP

Supelco: NUKOL, SP-1000

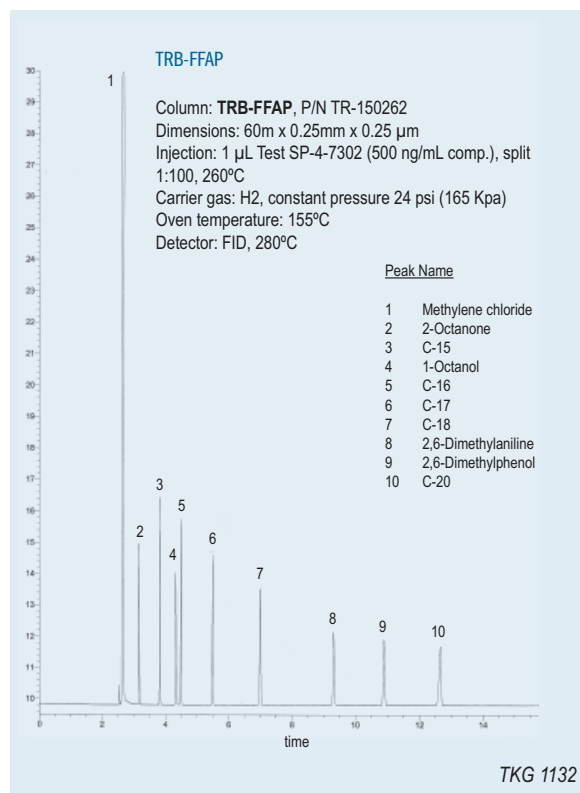
Restek: STABILWAX-DA

Varian: CP-WAX 58 CB

SGE: BP-21

Alltech: AT-1000, FFAP

Quadrex: 007-FFAP



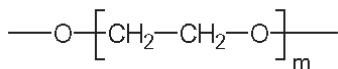
TRB-FFAP

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

TR-WAX.DB

(100%) Polyethylene glycol, nonbonded phase.

- 100% 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

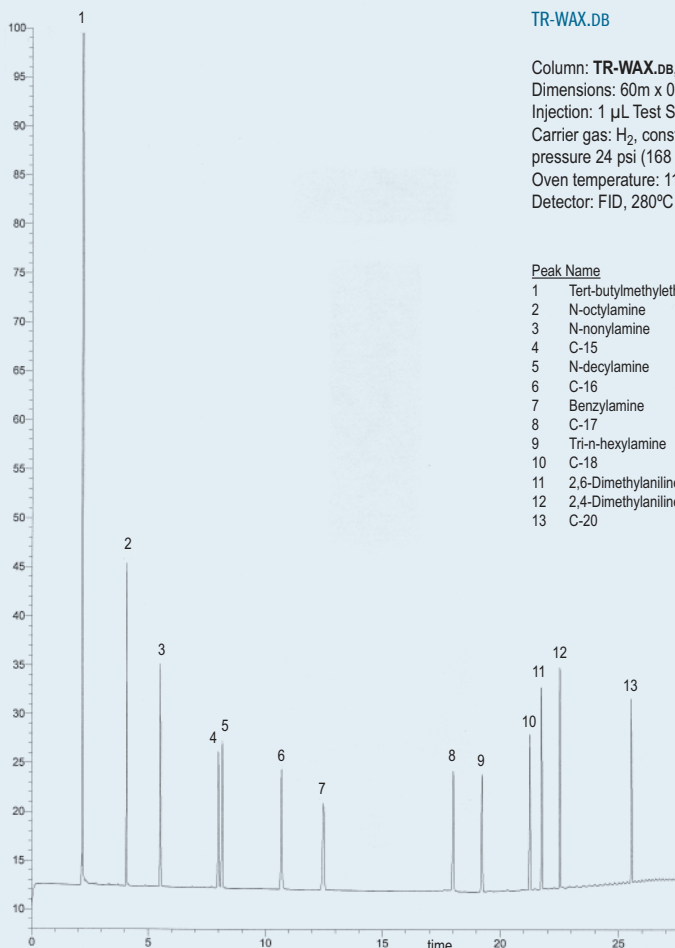
Varian: CP-WAX 51

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
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

Column: **TR-WAX.DB**, P/N TR-932162

Dimensions: 60m x 0.25mm x 0.20 µm

Injection: 1 µL Test SP-4-8278 (500 ng/mL comp.), split 1:50, 260°C

Carrier gas: H₂, constant

pressure 24 psi (168 Kpa)

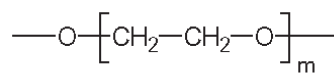
Oven temperature: 110°C(15') @ 8°C/min to 200°C (10')

Detector: FID, 280°C

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

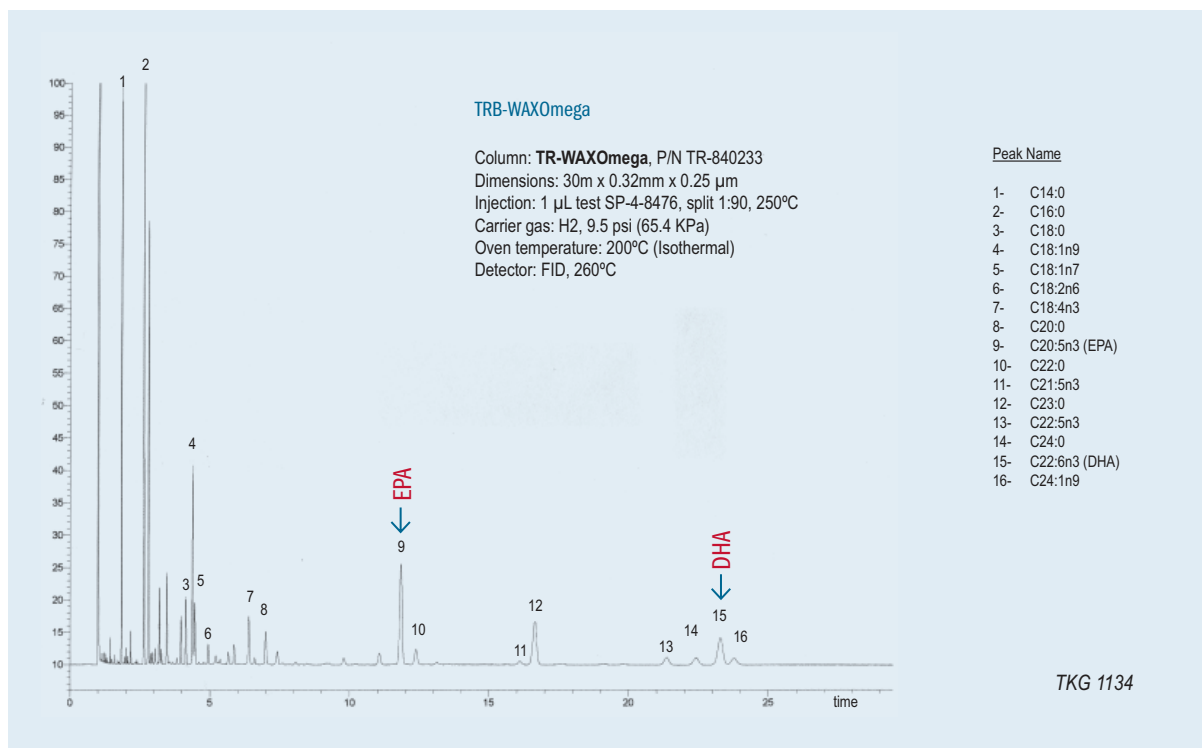
TRB-WAXOmega

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

(100%) Polyethylene glycol, bonded and crosslinked phase.

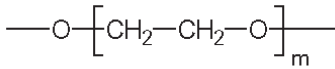
- 100% Polyethylene glycol (PEG)
- High polarity column
- Specially designed for analysis of Omega 3 and Omega 6 fatty acids methyl esters



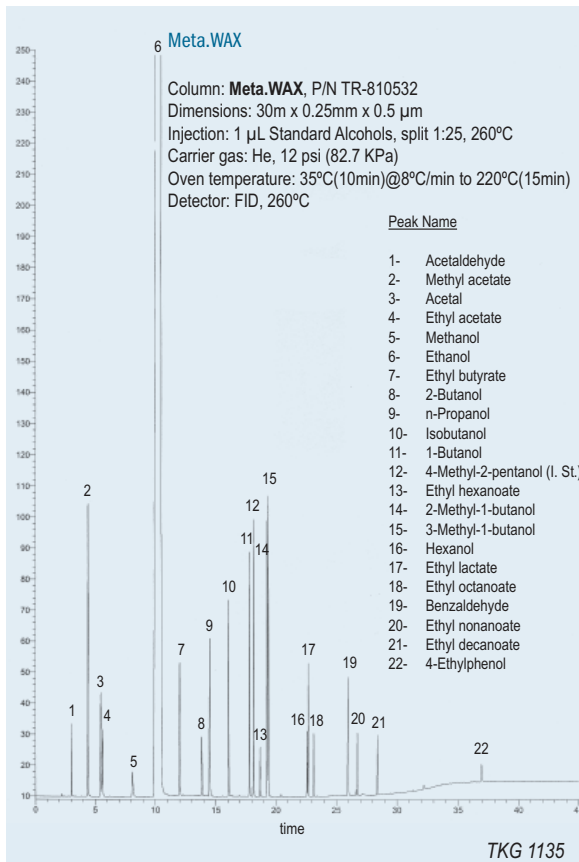
Meta.WAX

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

- 100% Polyethylene glycol (PEG)
- High polarity column
- Minimum operating temperature 20° C
- Designed for analyzing volatiles in alcoholic beverages
- Excellent symmetry for aldehyde and glycol peaks



Structure of Polyethylene glycol



Meta.WAX Equivalent Phase

Agilent: HP-WAX, DB-WAX
Varian: CP-WAX 57 CB
Restek: Rtx-WAX

Meta.WAX

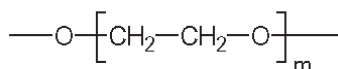
Internal Diam. (mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N° (P/N)
0,10	10	0,10	20 to 240/250	TR-810141
		0,20	20 to 240/250	TR-812141
	20	0,10	20 to 240/250	TR-810181
		0,20	20 to 240/250	TR-812181
0,18	10	0,18	20 to 240/250	TR-810944
		0,18	20 to 240/250	TR-810984
	20	0,30	20 to 240/250	TR-812984
		0,18	20 to 240/250	TR-8109C4
0,25	15	0,10	20 to 240/250	TR-810112
		0,25	20 to 240/250	TR-810212
	15	0,50	20 to 240/250	TR-810512
		0,10	20 to 240/250	TR-810132
0,32	15	0,25	20 to 240/250	TR-810213
		0,50	20 to 240/250	TR-810513
	15	1,00	20 to 230/240	TR-811013
		0,25	20 to 240/250	TR-810233
0,53	15	1,20	20 to 230/240	TR-811215
		1,20	20 to 230/240	TR-811235

Meta. WAX 400

100% Polyethylene glycol (PEG), nonbonded phase.

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

Structure of Polyethyleneglycol



Meta.WAX 400 Equivalent Phase

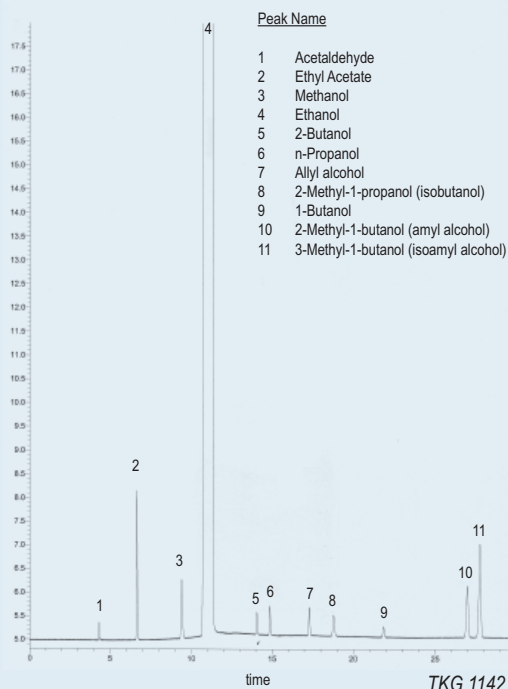
Varian: CP Carbowax 400

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

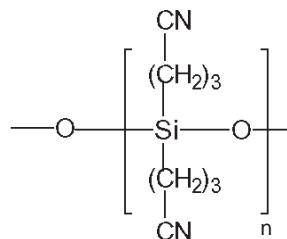
Column: **Meta.WAX 400**, P/N TR-402153
 Dimensions: 50m x 0.32mm x 0.20 µm
 Injection: 1 µL standard (split 1:50), 175°C
 Carrier gas: He, 11 psi (75.8 Kpa)
 Oven Temperature: 30°C(5 min.) @ 4°C/min to 60°C(10 min.)
 Detector Temperature: FID, 175°C



TR-CN100

(100%) Cyanopropyl polysiloxane, nonbonded phase

- 100% Cyanopropyl polysiloxane
- Column of maximum polarity
- Designed for separating fatty acids methyl esters (FAMES)
- High selectivity towards cis-trans isomers of FAMES



Structure of Poly(biscyanopropyl)siloxane

TR-CN100 Equivalent Phase

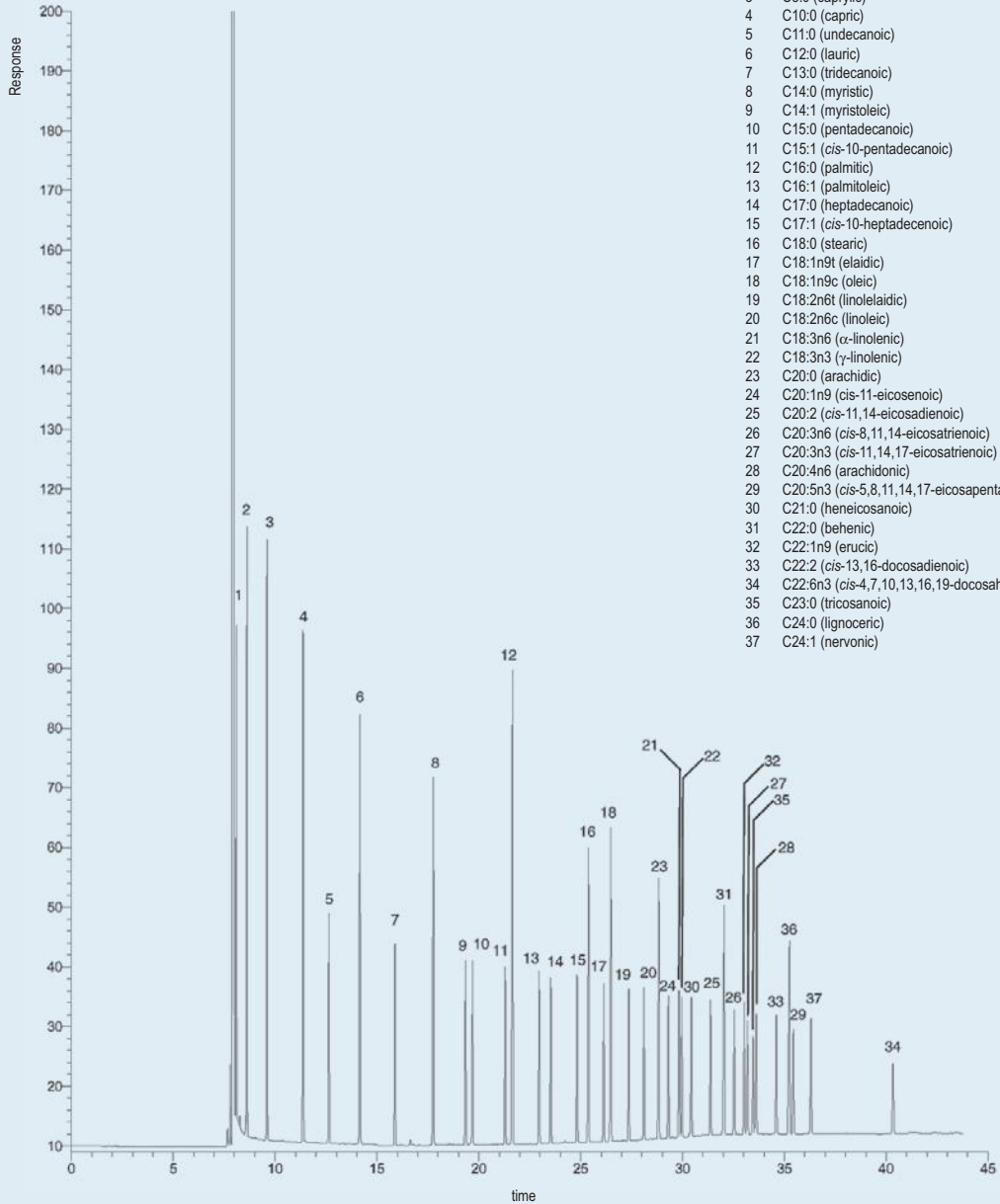
Supelco: SP-2340, SP-2380
 Restek: Rt-2330, Rt-2580
 Varian: CP-SIL 88

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
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)

Column: **TR-CN100**, P/N TR-882192
 Size: 100m x 0.25 mm x 0.20µm
 Injection: 1µL Total FAMES en CH₂Cl₂ (30 mg/mL), split 1:100, 260°C
 Carrier gas: He 45 psi, 21 cm/s (140°C)
 Program temperature: 140°C(6min) @ 4°C/min to 240°C(10min)
 Detector: FID, 260°C

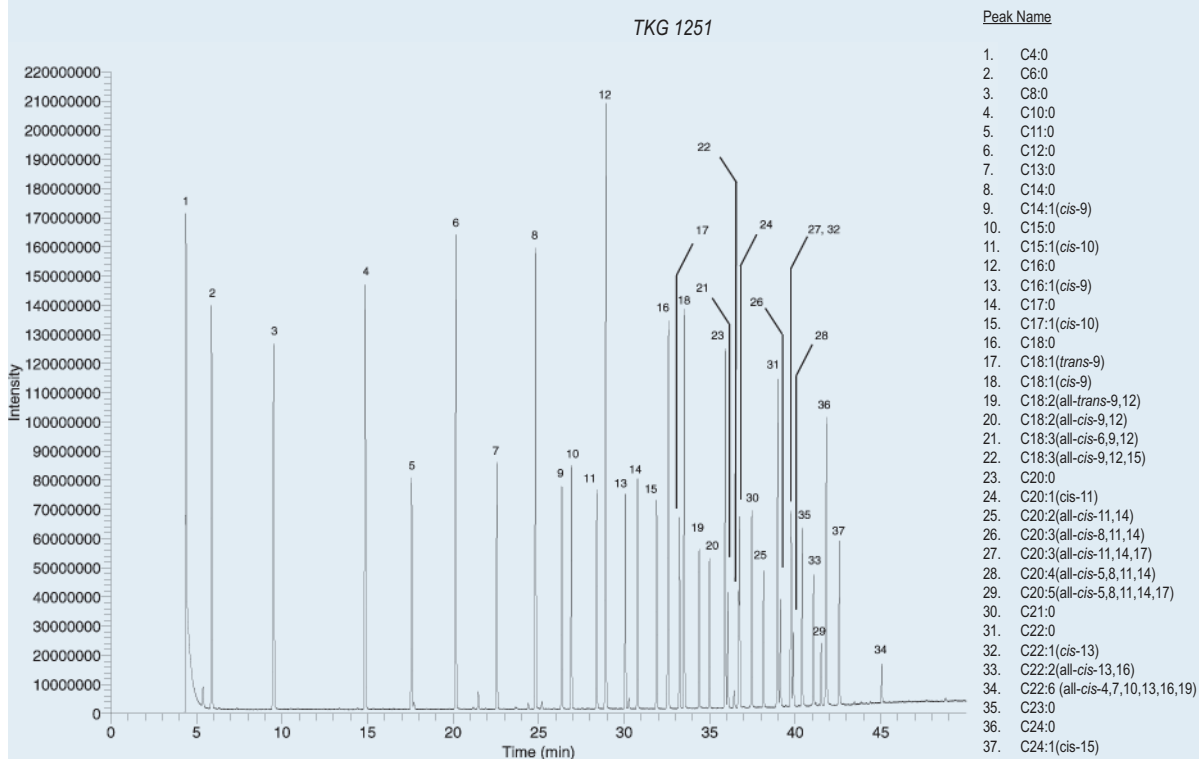
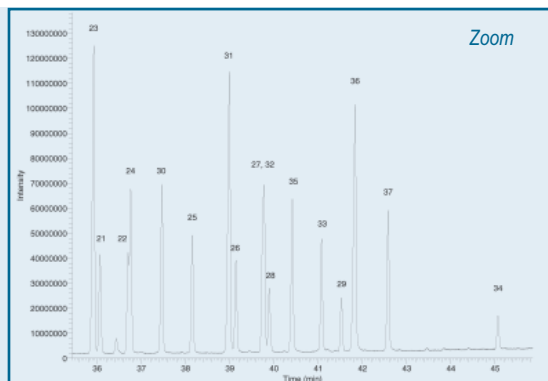


Peak Name
1 C4:0 (butyric)
2 C6:0 (caproic)
3 C8:0 (caprylic)
4 C10:0 (capric)
5 C11:0 (undecanoic)
6 C12:0 (lauric)
7 C13:0 (tridecanoic)
8 C14:0 (myristic)
9 C14:1 (myristoleic)
10 C15:0 (pentadecanoic)
11 C15:1 (cis-10-pentadecanoic)
12 C16:0 (palmitic)
13 C16:1 (palmitoleic)
14 C17:0 (heptadecanoic)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

TKG 1229

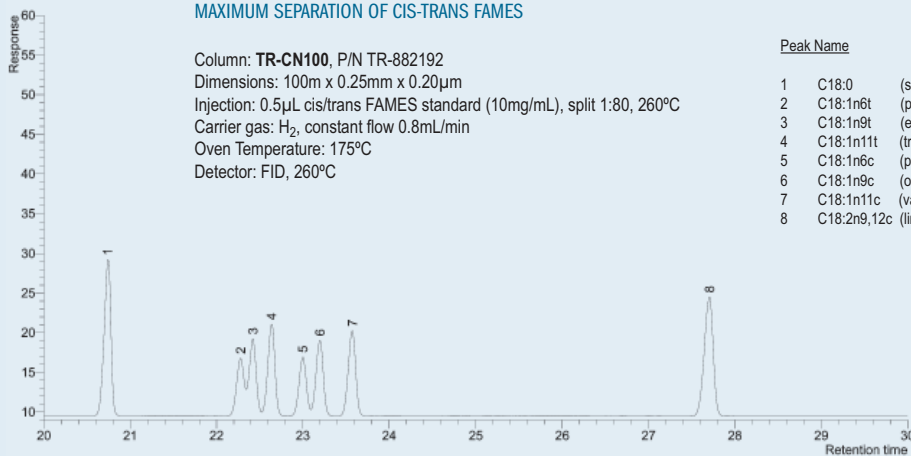
37 FAME MIX- MS DETECTOR

Column: **TR-CN100**, P/N: TR-882162
 Dimensions: 60m x 0.25mm x 0.20µm
 Injection: 280°C, split 50:1
 Carrier gas: Helium, constant pressure @ 24psi
 Oven temperature: 90°C (7min) to 240°C @ 4°C/min (3min)
 Detector: MS
 Transfer line temp.: 230°C
 Ionization mode: EI
 Scan range: 40-450amu
 Sample: 0.5µL Food Industry FAME Mix 30mg/ml in methylene chloride



MAXIMUM SEPARATION OF CIS-TRANS FAMES

Column: **TR-CN100**, P/N TR-882192
 Dimensions: 100m x 0.25mm x 0.20µm
 Injection: 0.5µL cis/trans FAMES standard (10mg/mL), split 1:80, 260°C
 Carrier gas: H₂, constant flow 0.8mL/min
 Oven Temperature: 175°C
 Detector: FID, 260°C



TKG 1255

TR-CRESOL

Proprietary nonbonded phase.

- Stationary phase of perfectly defined purity
- Column specially designed for 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

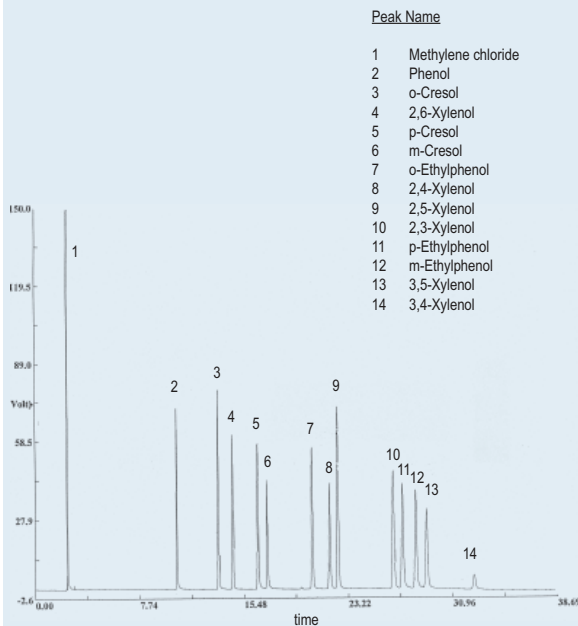
Varian: CP-CRESOL

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

Column: **TR-CRESOL**, P/N TR-702162
 Dimensions: 60m x 0.25mm x 0.20 µm
 Injection: 1 µL standard Cresols (5000 ng/mL comp.), split 1:25, 150°C
 Carrier gas: H₂, constant pressure 24 psi (165 Kpa)
 Oven temperature: 130°C
 Detector: FID, 150°C

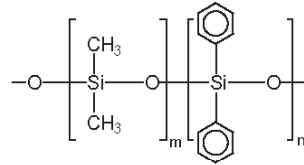


TKG 1137

TR-17

Polymethylphenylsiloxane

- Polymethylphenylsiloxane
- Recommended by pharmacopoeia for determining the impurities of sodium saccharin (o-p-toluenesulphonamides)



Structure of Poly(dimethyldiphenyl)siloxane

TR-17 Equivalent Phase

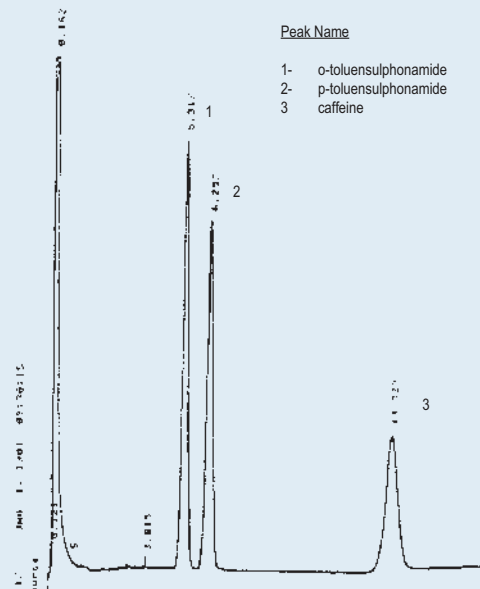
Agilent: HP-17

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

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



TKG 1138

Meta.VOC

Proprietary bonded and crosslinked phase.

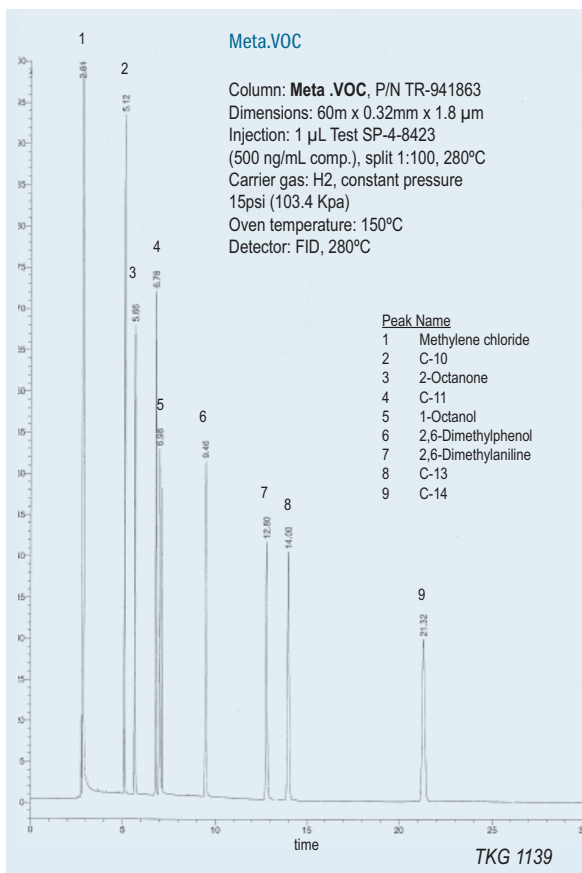
- Developed for analysis of volatile organic compounds (VOC)
- Intermediate polarity column

Meta.VOC Equivalent Phase

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

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



TRB-608

Proprietary bonded and crosslinked phase.

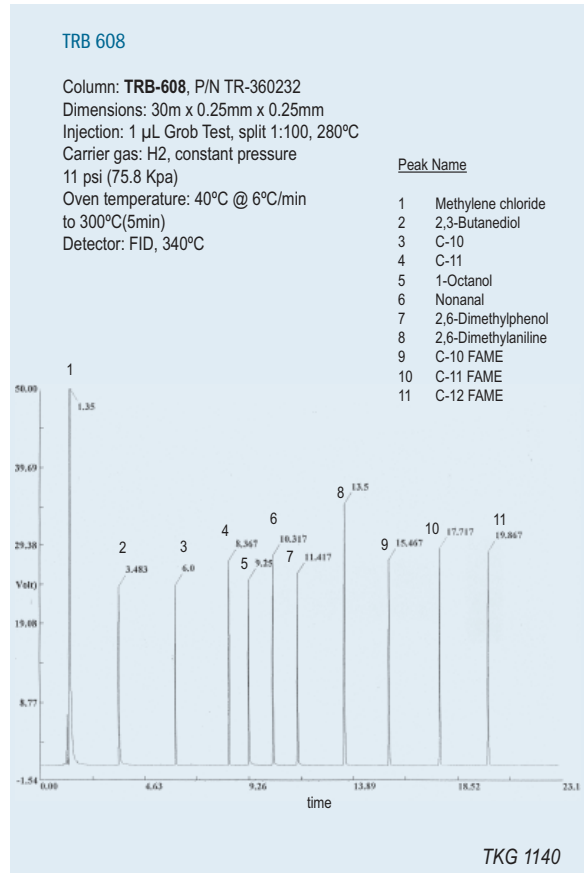
- Specifically designed for analysing chlorinated pesticides and PCBs
- Designed for the EPA 508, 608 and 8080 methods.

TRB-608 Equivalent Phase

Agilent: HP-608
Supelco: SPB-608
SGE: BP-608

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



TR-TCEP

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

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

TR-TCEP

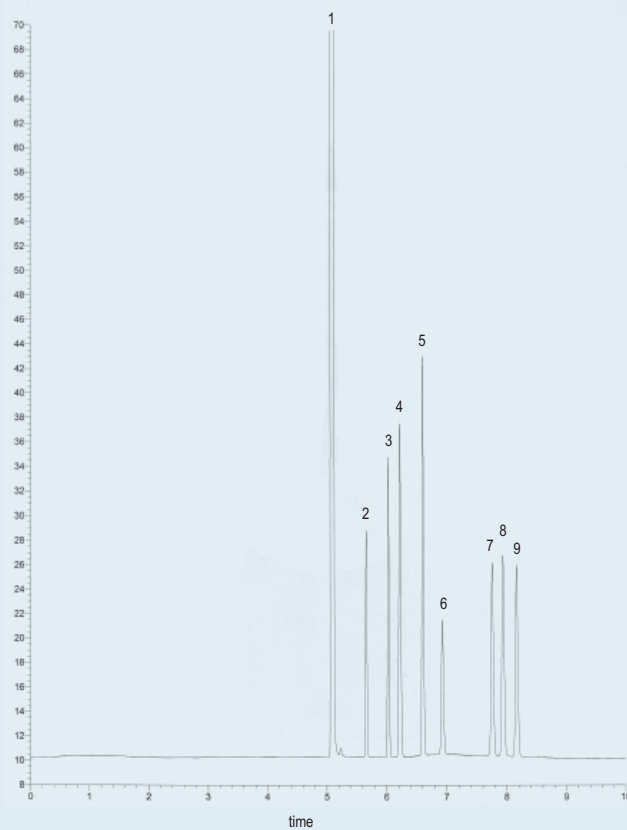
Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N° (P/N)
0,25	30	0,40	0 to 135	TR-960432
	60	0,40	0 to 135	TR-960462

TR-TCEP Equivalent Phase

Supelco: TCEP
 Restek: Rt-TCEP
 Varian: CP-TCEP

TR-TCEP

Column: **TR-TCEP**, P/N TR-960462
 Dimensions: 60m x 0.25mm x 0.40 µm
 Injection: 1 µL standard (20 ng/mL comp.), split 1:50, 170°C
 Carrier gas: H₂, constant pressure 24 psi (165 Kpa)
 Oven temperature: 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

Stationary phases specially designed by Teknokroma for the analyses of volatiles in blood.

- Bonded and Cross linked phases
- For analysis of volatile compounds in biological fluids
- Extremely low analysis time
- Possibility of utilization in dual system, as analytical and as well as confirmation column.
- Order of elution different for some compounds

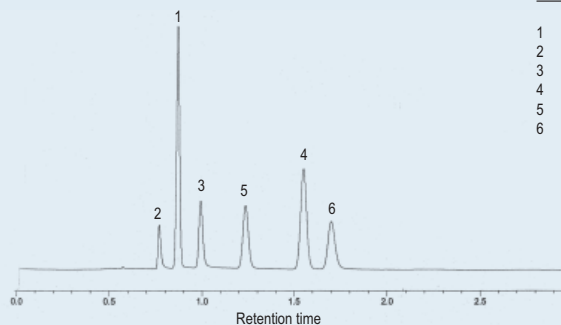
MetaBLOOD 1 and MetaBLOOD 2 Equivalent Phases

Agilent/JW: DB-ALC1, DB-ALC2

Restek: Rtx-BAC1, Rtx-BAC2

Alcohols in Blood

Column: **MetaBLOOD 1**, P/N TR-853035
 Dimensions: 30m x 0.53mm x 3.0 μ m
 Injection: 1 mL Head Space 2t. alcohols standard, split 1:10, 250°C
 Carrier gas: He, 80 cm/s to 40°C
 Oven temperature: 40°C (Isothermal)
 Detector: FID, 260°C



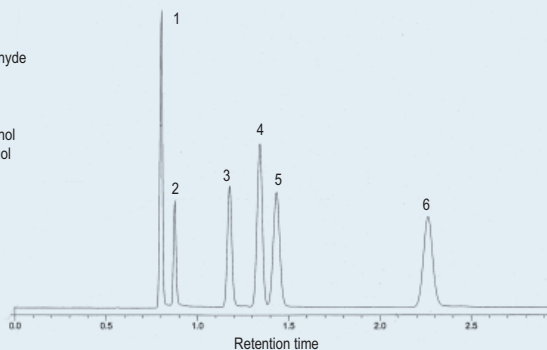
TKG 1198

Alcohols in Blood

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

Peak Name

- Acetaldehyde
- Methanol
- Ethanol
- Acetone
- Isopropanol
- n-Propanol



TKG 1200

MetaBLOOD 1

Internal Diam. (mm)	Length (m)	Film Thickness (μ m)	Temp limits ($^{\circ}$ C)	Part. N $^{\circ}$. (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 (μ m)	Temp limits ($^{\circ}$ C)	Part. N $^{\circ}$. (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

- Glycerin and Mono-,Di,Triglycerides analysis tested under EN14105/ASTM D6584 methods
- Chemical inertness guaranteed for a good response for glycerin analysis
- Low column bleed at high temperatures
- Two columns, silica (High temperature polyimide) and stainless steel (INOX)

TRB-BIODIESEL

Internal Diam.(mm)	Length (m)	Film Thickness (µm)	Temp limits (°C)	Part. N° (P/N)
0,32 (Fused Silica)	10 + 2m x 0.53mm precolumn attached using INOX connector	0.10	400	TR-G780143
0,28 (INOX)	10 + 2m x 0.53mm precolumn attached using INOX connector	0.10	400	TR-G780147INOX

TRB-BIODIESEL COLUMN

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

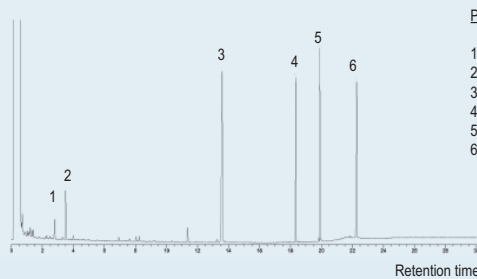
Column: **TRB-BIODIESEL**, with retention gap, 2m x 0.53mm ID

Injection: Biodiesel standard, cool on column

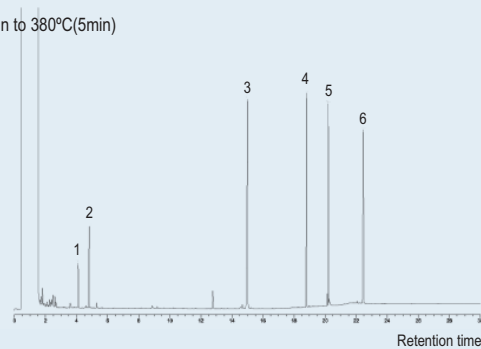
Carrier gas: H₂, constant flow 3 mL/min

Program temperature: 50°C(1min) @ 15°C/min to 180°C @ 7°C/min to 230°C @ 30°C/min to 380°C(5min)

Detector: FID, 380°C (N₂, make up)

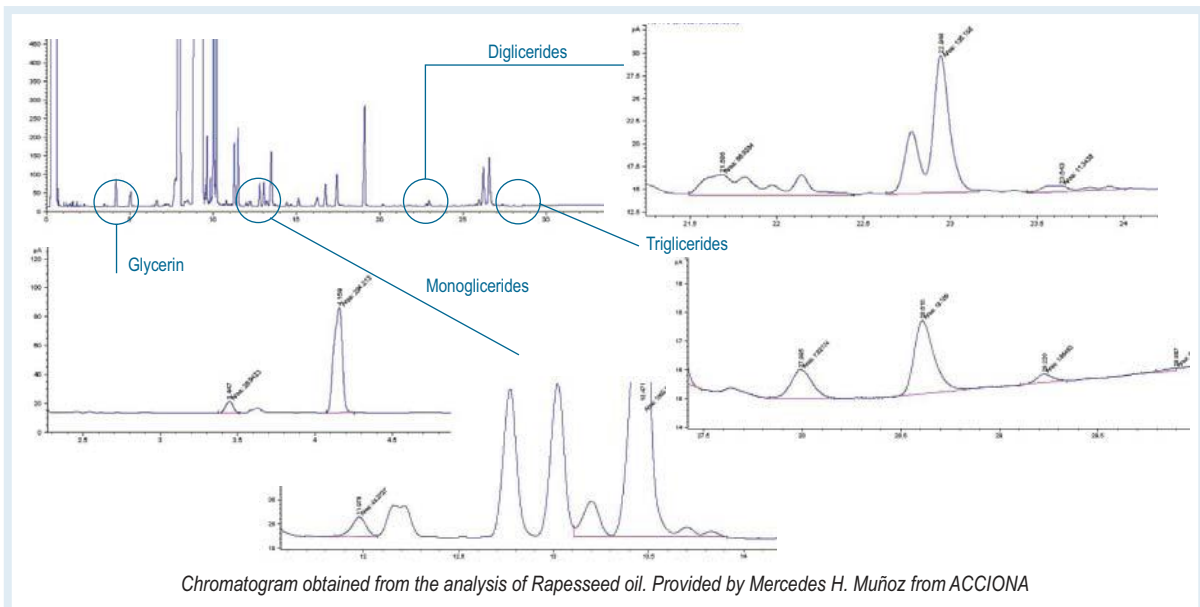


Peak Name	1	2	3	4	5	6
Glycerin						
Buthanetriol (IS1)						
Monoolein						
Tricaprin (IS2)						
Diolein						
Triolein						



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

Retention Gap (Inox, 2m x 0.53mmID) + Innox Column (10m x 0.28mmID x 0.1 µm)



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

Also for Biodiesel analysis

Methanol analysis (EN-14110)

FAMES and Linolenic acid methyl ester analysis analysis (EN-14103)

TRB-1, 30m x 0.32mm x 3.0 µm, P/N TR-113033

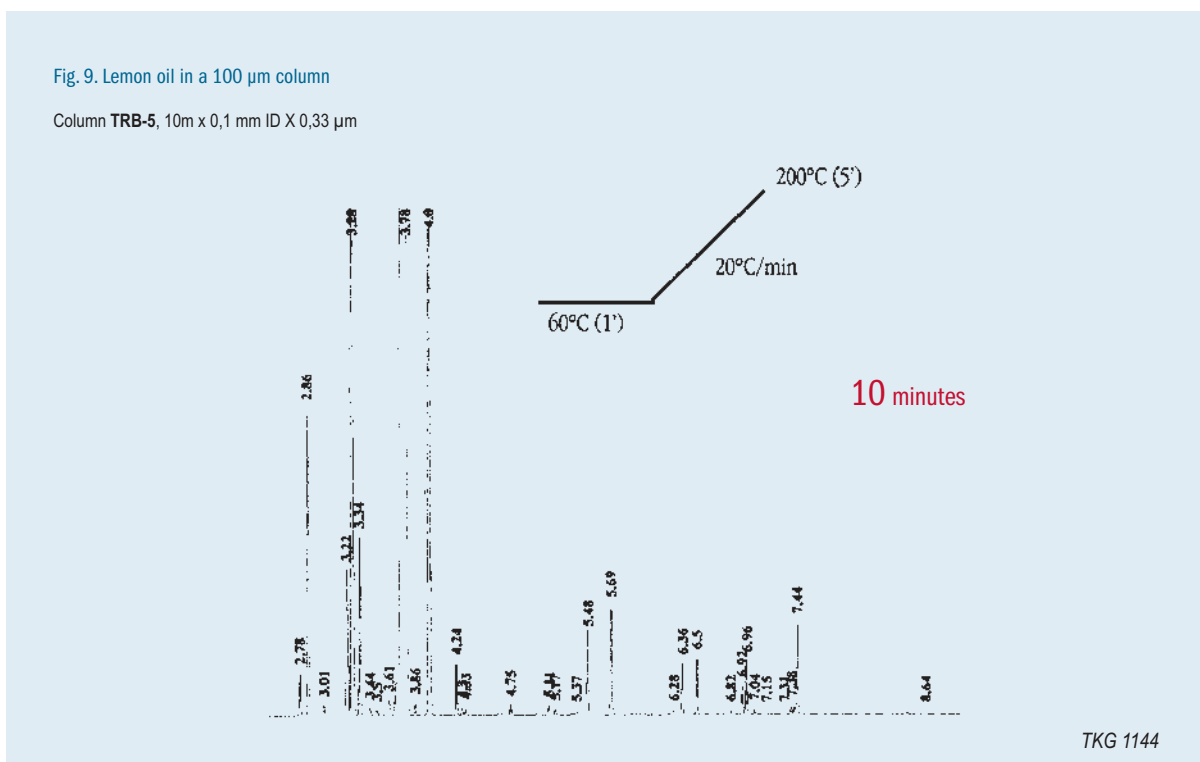
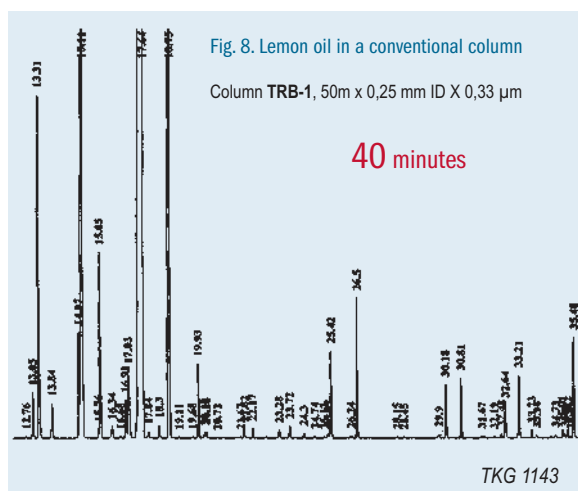
SupraWax-280, 30m x 0.32mm x 0.25 µm, P/N TR-830233

TK Teknokroma Microbore Columns (0.10 mm ID)



- **MINIMUM BLEED LEVEL** (approximately 10 times less than that of 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).

These columns of 100 μm internal diameter also enable them to be connected to a conventional chromatograph fitted with a SPLIT/SPLITLESS injector, and due to its great efficiency ($\sim 7,000\text{-}10,000$ 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. Having such a high level of efficiency enables the analysis of complex mixtures, with a large number of components. The standard length is 10 metres (Fig. 8 and Fig. 9).



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 from the injector cavity or with ferrules.

At optimized 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

In these columns with a small diameter the sample that can be injected is much smaller than with a column with a conventional diameter. Its sample capacity is around ten times less than that of a column of 0.25 mm ID.

3. INJECTOR

The columns of 0.1 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

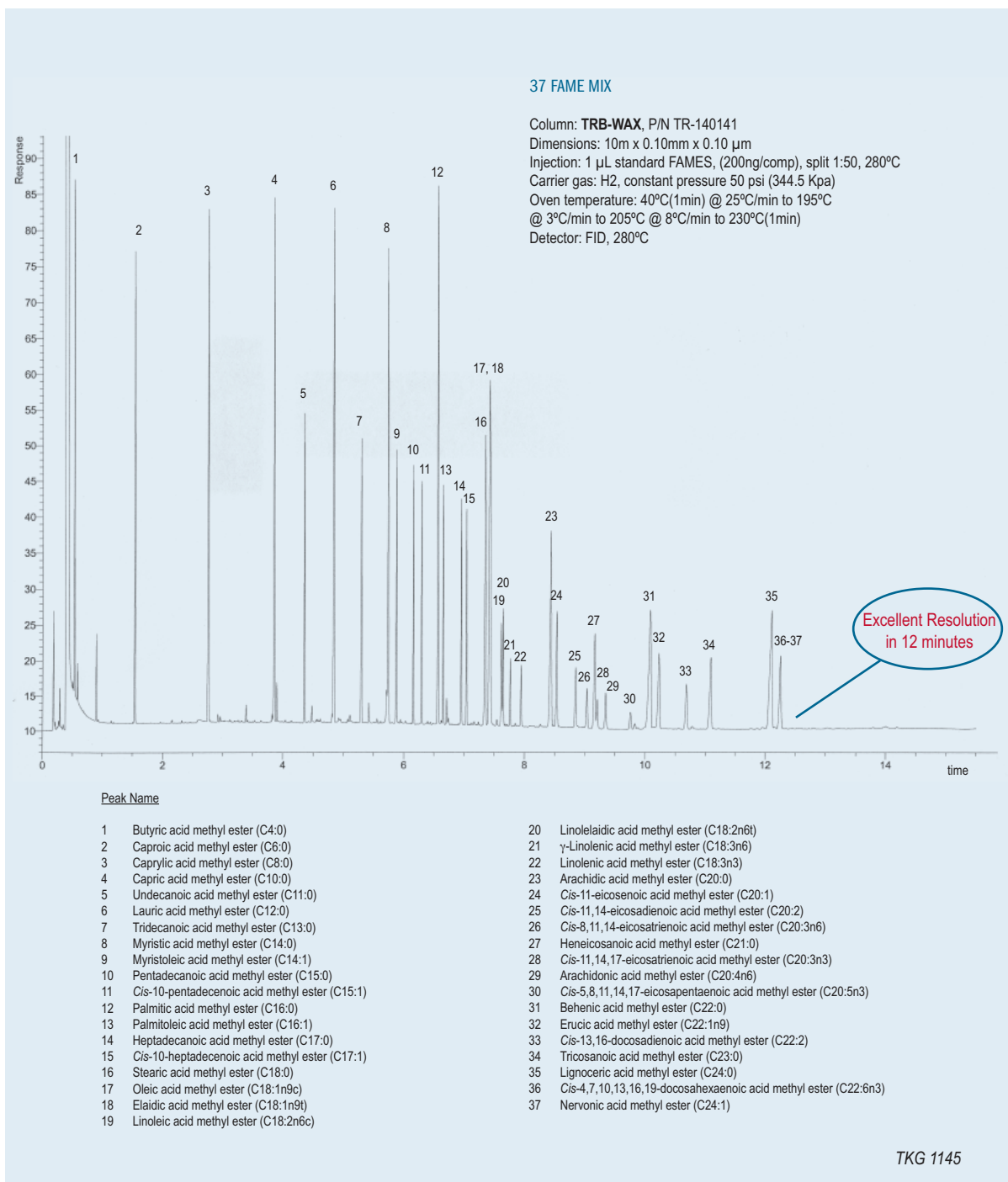
The gas flows of the detector must be optimised for working with the microbore columns. It is possible that in some detectors the auxiliary gas flow (make up) will have to be increased in order to minimise its dead volume and enable the correct sweep of the compounds that leave the column at very low 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 100 µm

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
TRB-1ms	40	0.40	TR-1104C1
	10	0.10	TR-510141
	10	0.40	TR-510441
	20	0.10	TR-510181
TRB-5	20	0.40	TR-510481
	10	0.10	TR-120141
	10	0.17	TR-121941
	10	0.33	TR-123341
TRB-5ms	10	0.40	TR-120441
	20	0.10	TR-120181
	20	0.40	TR-120481
	10	0.10	TR-520141
TRB-50	10	0.40	TR-520441
	20	0.10	TR-520181
	20	0.40	TR-520481
	10	0.10	TR-500141
TRB-225	10	0.20	TR-502141
	20	0.10	TR-500181
	20	0.10	TR-250181
	20	0.10	TR-130181
TRB-1701	20	0.40	TR-130481
	10	0.10	TR-810141
	10	0.20	TR-812141
	20	0.10	TR-810181
Meta.WAX	20	0.20	TR-812181
	10	0,10	TR-140141
	10	0,20	TR-142141
	20	0,10	TR-140181
TRB-WAX	20	0,20	TR-142181
	10	0.10	TR-830141
	15	0.10	TR-830111
	20	0.10	TR-830181
Supra.WAX-280	20	0.20	TR-832181
	15	0.20	TR-832111
	10	0,10	TR-150141
	10	0,20	TR-152141
TRB-FFAP	15	0,10	TR-150111
	20	0,10	TR-150181



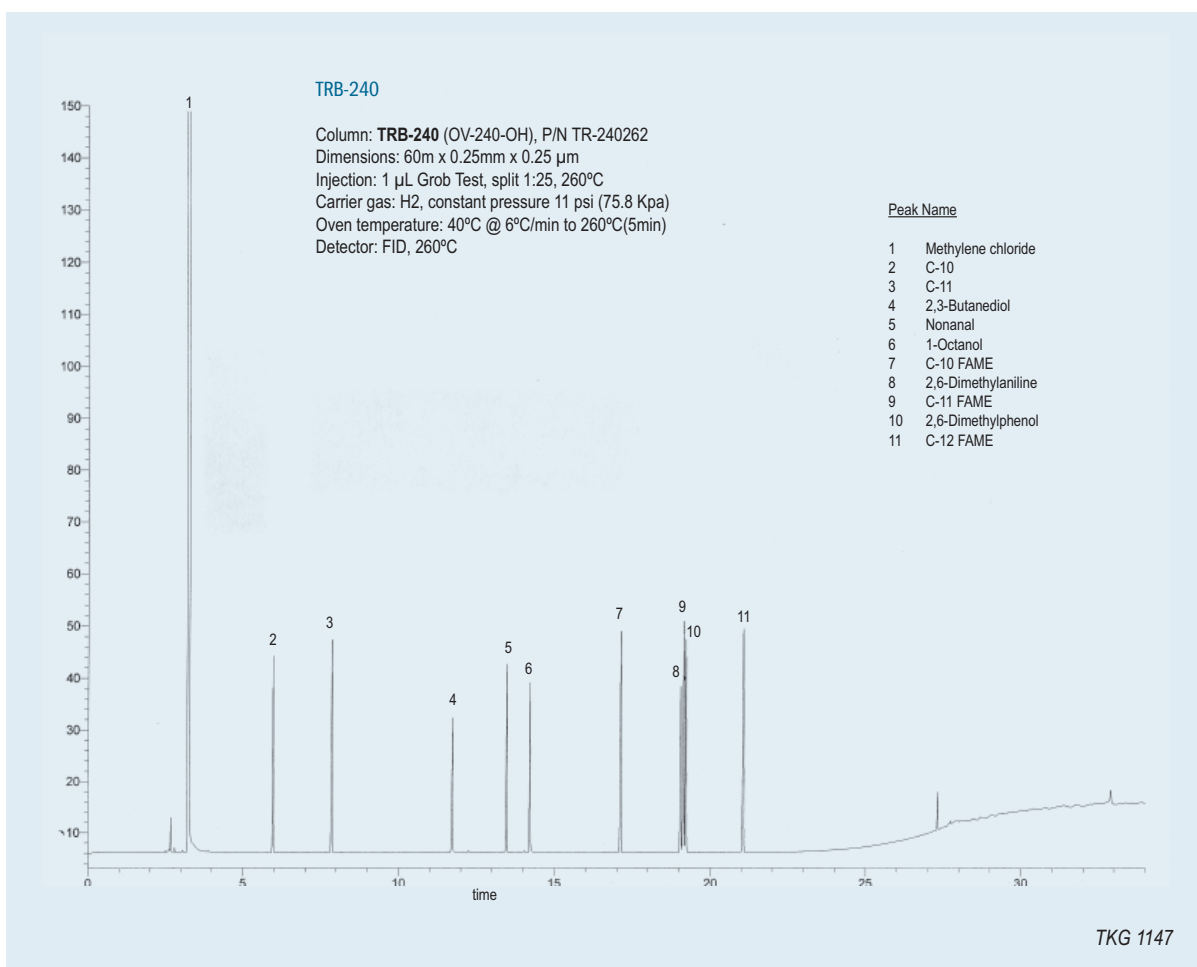


Teknokroma also provides you with the possibility of working with nonbonded and bonded custom capillary columns, which are still described today in official methods, or which appear in the scientific bibliography. We can supply you with these columns in the size and phase thickness that you require for 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 - polyethylene glycol 100% (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**



TK Guard Columns (Retention Gap)



NON POLAR
MEDIUM POLAR (INTERMEDIATE)
POLAR
AQUASAFE
BASE-DEACTIVATED

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 x 1	TR-100012
	1 x 5	TR-100052
	1 x 10	TR-100042
	1 x 20	TR-100082
0,32	3 x 1	TR-100013
	1 x 5	TR-100053
	1 x 10	TR-100043
	1 x 20	TR-100083
0,53	3 x 1	TR-100015
	1 x 5	TR-100055
	1 x 10	TR-100045
	1 x 20	TR-100085

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

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 x 1	TR-200012
	1 x 5	TR-200052
	1 x 10	TR-200042
	1 x 20	TR-200082
0,32	3 x 1	TR-200013
	1 x 5	TR-200053
	1 x 10	TR-200043
	1 x 20	TR-200083
0,53	3 x 1	TR-200015
	1 x 5	TR-200055
	1 x 10	TR-200045
	1 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 x 1	TR-300012
	1 x 5	TR-300052
	1 x 10	TR-300042
0,32	1 x 20	TR-300082
	3 x 1	TR-300013
	1 x 5	TR-300053
	1 x 10	TR-300043
0,53	1 x 20	TR-300083
	3 x 1	TR-300015
	1 x 5	TR-300055
	1 x 10	TR-300045
	1 x 20	TR-300085

AQUASAFE

Proprietary deactivation suitable for water direct aqueous injections.

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

BASE-DEACTIVATED

Proprietary deactivation suitable for analysis of amines and other basic compounds

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

Teknokroma Metal Capillary Columns Stainless steel Teknokroma columns (TR-INOX)



- Chemical inertness comparable to that of fused silica
- Bonded and crosslinked
- Ideal for chromatographs in industrial control processes
- Practically unbreakable
- Enables the use of high analysis temperatures

Teknokroma can supply you with Teknokroma stainless steel columns with a 0.53 mm internal diameter and with an external diameter similar to that of fused silica semi-capillary columns, enabling you to use the same 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 prefix INOX at the end of the corresponding reference to the column in the catalog.

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

With stainless steel tube, 10m x 0.53 mm x 2.65µm
P/N TR-192645INOX

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 example: 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

TK 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	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-6030K5
		TRB-624	TR-601032
502.2	Volatile halogenated Organics in Water by Purge & Trap GC/PID/ECD	TRB-624	TR-603035
503.1	Volatile Aromatics & Unsaturated Organics by Purge & Trap GC	TRB-624	TR-603035
504.1	1,2-Dibromoethane (EDB), 1,2-Dibromo-3-chloropropane (DBCP), and 1,2,3-Trichloropropane (123TCP) by GC/MS	TRB-1	TR-110233
		TRB-624	TR-603035
		TRB-624	TR-601432
		TRB-1	TR-111033
505	Organohalide Pesticides & Aroclors by GC/ECD	TRB-50	TR-500533
507	Nitrogen & Phosphorous containing Pesticides in Water by GC/NPD	TRB-50	TR-500232
		TRB-5	TR-120232
		TRB-5ms	TR-520232
		TRB-1701	TR-130232
508	Chlorinated Pesticides in Water by GC/MS	TRB-5	TR-120232
		TRB-5ms	TR-520232
		TRB-1701	TR-130232
		TRB-5ms	TR-520162
513	2,3,7,8-Tetrachlorodibenzo-p-dioxin by GC/MS	TRB-1	TR-110233
515.2	Determination of chlorinated acids in water using liquid-solid extraction & GC/ECD	TRB-5	TR-120233
		TRB-1701	TR-130233
		TRB-5ms	TR-520233
		TRB-624	TR-601432
524.2	Measurement of purgeable organic compounds in water by Purge & Trap capillary column GC/MS	TRB-624	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-601863
		TRB-5	TR-120233
525	Organic compounds in drinking water by liquid-solid extraction and capillary column GC/MS	TRB-5ms	TR-520232

EPA Solid Waste Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column	Part Number
8010	Halogenated volatile organics	TRB-624	TR-603075
		TRB-624	TR-601432
		TRB-624	TR-603035
		TRB-624	TR-601432
8015	Non- Halogenated volatile organics	TRB-624	TR-603035
		TRB-624	TR-603035
		TRB-624	TR-601432
		TRB-624	TR-603035
8020/8021	Aromatic volatile organic	TRB-624	TR-601432
		TRB-624	TR-603035
8030/8031	Acrolein, acrylonitrile, acetonitrile	TRB-624	TR-603035
		TRB-624	TR-601432
8040/8041	Phenols	TRB-5	TR-121535
		TRB-5ms	TR-520232
8060/8061	Phthalate esters	TRB-1	TR-111515
		TRB-1ms	TR-510432
8080	Organochlorine pesticides and PCBs	TRB-5	TR-121535
		TRB-5ms	TR-520532
		TRB-5	TR-121535
		TRB-1701	TR-131035
8090/8091	Nitroaromatics and cyclic ketones	TRB-5	TR-121535
		TRB-5ms	TR-520532
		TRB-5	TR-120233
		TRB-5ms	TR-520233
8100	Polynuclear aromatic hydrocarbons	TRB-1	TR-111033
		TRB-1ms	TR-511033
8120/8121	Chlorinated hydrocarbons	TRB-1	TR-111535
		TRB-1701	TR-131035
		TRB-1	TR-110232
		TRB-5	TR-121515
8141	Organophosphorus pesticides	TRB-5ms	TR-520212
		TRB-5	TR-121025
		TRB-1701	TR-131035
		TRB-5ms	TR-520232
8240	GC/MS for volatile organics	TRB-624	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-6030K5
		TRB-624	TR-601032
8250	GC/MS for semi-volatile organics	TRB-5ms	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	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-6030K5
		TRB-624	TR-601032
8270	GC/MS method for semi-volatile organics capillary techniques	TRB-5	TR-121032
8280	Analysis of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans	TRB-5ms	TR-521032
		TRB-5	TR-120232
		TRB-5ms	TR-520162

EPA Waste Water Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column	Part Number
601	Purgeable halocarbons	TRB-624	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-6030K5
		TRB-624	TR-601032
602	Purgeable aromatics	TRB-624	TR-603035
		TRB-624	TR-6030K5
		TRB-624	TR-601032
		TRB-624	TR-603035
603	Acrolein and acrylonitrile	TRB-624	TR-601032
		TRB-624	TR-603035
604/605	Phenols and benzidines	TRB-5ms	TR-521435
		TRB-5ms	TR-520232
606	Phthalate esters	TRB-5	TR-121515
		TRB-5ms	TR-520232
		TRB-5	TR-121515
		TRB-5ms	TR-520232
607	Nitrosamines	TRB-5	TR-121535
		TRB-5ms	TR-520532
608	Organochlorine pesticides and PCBs	TRB-5	TR-121055
		TRB-5ms	TR-520752
609	Nitroaromatics and isophorone	TRB-5	TR-121535
		TRB-5ms	TR-520532

EPA Waste Water Test Methods

EPA Method	Application	Recommended Teknokroma Capillary Column	Part Number
610	Polycyclic-Aromatic Hydrocarbons	TRB-5	TR-120233
		TRB-5ms	TR-520133
611	Halocethers	TRB-5	TR-121515
		TRB-5ms	TR-520532
		TRB-5	TR-121033
612	Chlorinated hydrocarbons	TRB-5ms	TR-521032
		TRB-5ms	TR-520162
613	2,3,7,8-tetrachlorodibenzo-p-dioxin	TRB-1701	TR-131035
		TRB-1701	TR-130232
615	Chlorinated herbicides	TRB-50	TR-501035
		TRB-50	TR-500532
619	Triazine herbicides	TRB-624	TR-603035
		TRB-624	TR-603075
		TRB-624	TR-6030K5
		TRB-624	TR-601432
624	Purgeables	TRB-5ms	TR-520233
		TRB-1ms	TR-510232
625	Base/neutral and acids	TRB-5	TR-120233
		TRB-5ms	TR-520233
680	Pesticides and PCBs in water and soil/ sediment	TRB-5	TR-120233
		TRB-5ms	TR-520233
1624	Volatile organic compounds by isotope dilution GC/MS	TRB-624	TR-603035
		TRB-624	TR-601432
1625	Semivolatile organic compounds by isotope dilution	TRB-5	TR-120232
		TRB-5ms	TR-520232
1663	Chlorinated phenols in waste water by in-situ MS acylation and GC low bleed/MS	TRB-5	TR-120233
		TRB-5ms	TR-520233

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 demethanized 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)

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	TRB-WAX 60m x 0.32 mm x 0.5 µm	Analysis of p-Xylene
	TR-140263	TRB-WAX 60 m x 0.32 mm x 0.25 µm	
D3876	TR-111033	TRB-1 30 m x 0.32 mm x 1.0 µm	Methoxyl and hydroxypropyl substitution in cellulose ether products
	TR-111535	TRB-1 30 m x 0.53 mm x 1.5 µm	
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	TRB-1 30 m x 0.32 mm x 3.0 µm	Butylated hydroxy toluene in ethylene and ethylenevinylacetate polymers
	TR-113035	TRB-1 30 m x 0.53 mm x 3.0 µm	
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	TRB-1ms 15 m x 0.25 mm x 0.1 µm	Aromatics in gasoline
	TR-960462	TR-TCEP 60 m x 0.25 mm x 0.4 µm	
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-115035 + TCEP precolumn	TRB-1 30 m x 0.53 mm x 5.0 µm + 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	TRB-1 10 m x 0.53 mm x 5.0 µm	Ethyl methyl pentanol content and purity of 2-ethylhexanol
	TR-140233	TRB-WAX 30 m x 0.32 mm x 0.25 µm	
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 538°C
D5310	TR-120232	TRB-5 30 m x 0.25 mm x 0.25 µm	Tar acid composition
	TR-252129	TRB-225 25 m x 0.20 mm x 0.20 µm	
D5399	TR-113045	TRB-1 10 m x 0.53 mm x 3.0 µm	Boiling point distribution of hydrocarbon solvents
D5441	TR-110592	TRB-1 100m x 0.25 mm x 0.5 µm	Analysis of MTBE
	TR-110559	TRB-50.2PONA 50 m x 0.20 mm x 0.5 µm	
D5442	TR-110232	TRB-1 30 m x 0.25 mm x 0.25 µm	Analysis of petroleum waxes
	TR-120232	TRB-5 15 m x 0.25 mm x 0.25 µm	
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	TRB-1 60m x 0.25 mm x 1.0 µm	Determination of benzene, toluene and total aromatics in finished gasoline by GC/MS
	TR-115063	TRB-1 60 m x 0.32 mm x 5.0 um	
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 denatured ethanol

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

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



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 DMDCS	S1C
Untreated siliceous earth	Chromosorb® W NAW	S1NS
Styrene-divinylbenzene copolymer with nominal surface area of less than 50m ² /g and ave. pore diameter of 0.3 - 0.4 mm	Chromosorb® 101	S2
Styrene-divinylbenzene copolymer with nominal surface area of 500 to 600m ² /g and ave. pore diameter of 0.0075 mm	Hayesep® Q Porapak® Q	S3
Styrene-divinylbenzene copolymer with aromatic -O and -N groups having a nominal surface area of 400 to 600m ² /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 250-350m ² /g and ave. pore diameter of 0.0091 mm	Chromosorb® 102, Porapak®, Hayesep®, CarboBlack®	S6
Graphitized carbon having a nominal surface area of 12m ² /g	CarboBlack®	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 acrylonitrile and divinylbenzene	Hayesep® C	S10
Graphitized carbon having a nominal surface area of 100m ² /g, modified with small amounts of petrolatum and polyethylene glycol compound	CarboBlack® B 80/120 3%Rt 1500	S11
Graphitized carbon having a nominal surface area of 100m ² /g	CarboBlack® B	S12



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

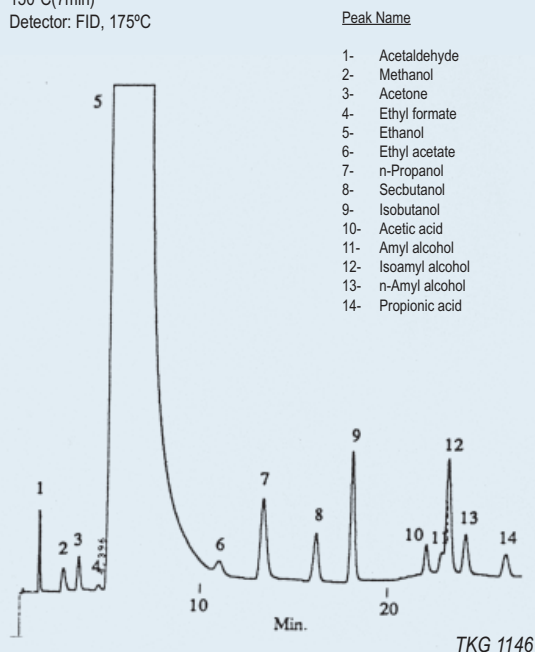
"Packed column use today is understandable due to the wide range of solid support packings available and to their high on-column sample capacity. These aspects make packed columns quite versatile for a wide range of applications".

"Today Packed columns are still demonstrating their utility in the solution of many analytical problems where it is not necessary to use the high resolution of capillary columns".

"Teknokroma has packed columns since its beginnings and have always provided a wide range and latest advantages in this area of gas chromatography. Within these new advances we showcase the latest advance in micro-packed columns (0,75mm and 1,00mm ID) and new bonded phase packings".

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, 175°C
 Carrier Gas: He, 15mL/min
 Oven temperature: 60°C(6min) @ 10°C/min to 150°C(7min)
 Detector: FID, 175°C

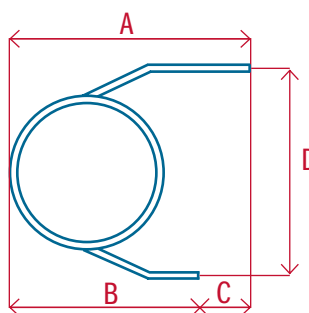


WE CAN SUPPLY YOU ANY KIND OF COLUMNS... JUST ASK FOR THEM!

Tubing	External Diameter (OD)	Internal Diameter (ID)
Glass	1/4"	2mm, 3mm and 4mm
Stainless Steel	1/4" and 1/8"	4mm, 3mm and 2mm
Silcosteel®	1/4" and 1/8"	5.2mm and 2mm
		1/16"
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: _____

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

Tk The Teknokroma New range of 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 deteriorate when the injector temperature increases, and consequently the level of bleed 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.

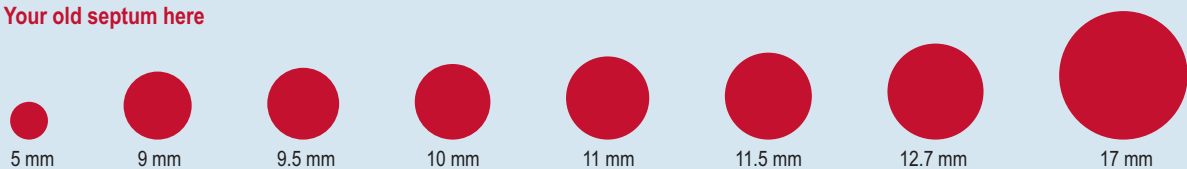
Influence factors in the septum bleeding

- 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 accumulation 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

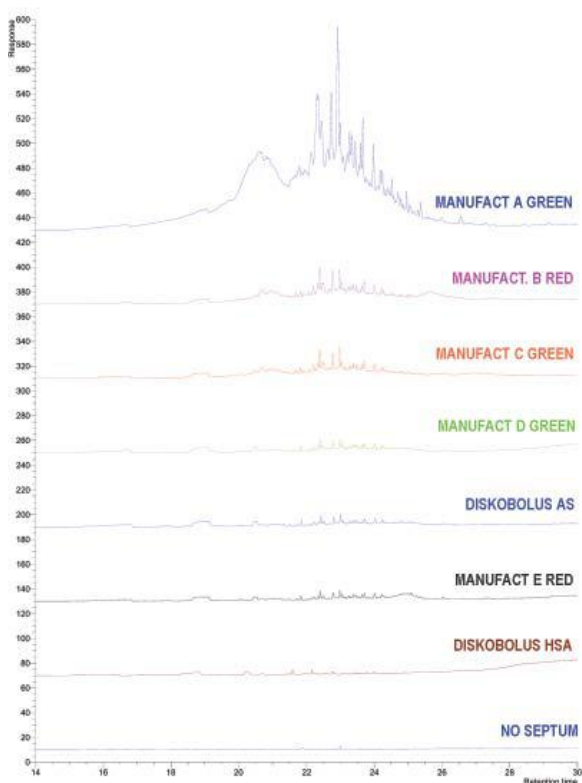


The Teknokroma New range of Diskobolus™ Septa Tk

Septum Comparison



Comparing **diskobolus™ hsa** and **diskobolus™ as** septa from Teknokroma to other manufacturers.



Column: Teknokroma Capillary Column **TRB-5**, P/N TR-121515

Dimensions: 15 m x 0.53 mm x 1.5 µm

Sample: A small piece of each type of septum with similar form and measures is inserted in the splitless liner.

Injection: splitless (10 min), 250°C

Carrier gas: He, constant flow 4 mL/min

Temperature programme: 50°C (15 min) @ 20°C/min at 250°C (15 min)

Detector: FID, 280°C

Performance Recommendations

Avoid touching 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 it sure that the septum has been correctly sealed.

Do not screw up 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 in 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)	Instrument	Septum size (mm)
Agilent (HP)		Pye/Unicam	
5880A, 5890, 6890, 6850	11	All Models	7
5700, 5880	9.5/10	Shimadzu	
On-Column Injection	5	All Models	Plug
CE Instruments (TMQ)		Varian	
TRACE GC	17	<i>Injector type:</i>	
Finnigan (TQM)		Varian Packed Column	9.5/10
GC 9001	9.5	<i>Split/Splitless:</i>	
GCQ	9.5	Varian 1078/1079	11.5
GCQ w/TRACE	17	Varian 1177	9
QCQ	9.5	Varian 1075/1077	11.5
TRACE 2000	9.5	Varian 1040/41/60/61	9.5
Fisons/Carlo Erba (TQM)		Varian 1093/94 SPI	11.5
8000 Series	17	Thermo	
PerkinElmer		PTV injector	12.7
Sigma Series	11		
900, 990	11		
8000 Series	11		
Auto SYS	11		
Auto SYS XL	11		

Tk The Teknokroma New range of Diskobolus™ Septa

Diskobolus™ hsa (high sensitivity analysis)




- Ideal for GC/ MS
- Temperature range: 100 - 350 °C
- Pre-conditioned, ready to be used
- It is supplied in glass containers for high purity

diskobolus™ hsa (high sensitivity analysis) septum has been specially designed and prepared to work at high temperatures, with a low bleed and a good baseline.

Ideal for analysis where high sensitivity is required, like in trace analysis, where low bleed and stability are essential in case of high temperatures.

Teknokroma controls bleeding and the penetration tolerance of each septa batch. Each septum is pre-conditioned and ready to be used.

“If the septum you use has bleed problems, try our diskobolus™ hsa septa”

Cat.No	Description	Pk
TR-D030000	diskobolus hsa 9.5 mm (3/8")	50
TR-D030100	diskobolus hsa 11 mm D. (7/16")	50
TR-D030200	diskobolus hsa 17 mm D.	50
TR-D030300	diskobolus hsa "Shimadzu Plug" 	50

Diskobolus™ as (auto-sampler)



- Ideal for autosamplers
- Extremely low bleed
- Long-life injection (more than 200 injections)
- High stability at more than 350 °C
- 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 an 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 relationship”

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

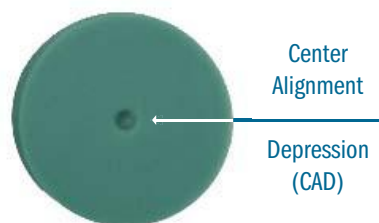
Economy Diskobolus™ Blue Septa (Blue)



The Economy **diskobolus™** Blue septa are designed for non-demanding, routine applications. They are easy to penetrate, with a durometer rating of 40-45. These septa can be used up to 200-250°C and are suitable for 90% of all GC analysis. Made from silicone. The package is for 100 pieces.

Cat.No	Description	Pk
TR-D033070	diskobolus Blue 6.4 mm D. (1/4")	100
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

Diskobolus™ Septa Center Alignment Depression (CAD) for Improved Performance



- Center Alignment Depression guides the needle for easy penetration
- Reduce needle bending
- Precision molding assures accurate fit
- Available in selected sizes of our premium septa
- Increase septa life

The Teknokroma New range of Diskobolus™ Septa Tk

Diskobolus™ BTO Premium Septa




- Extended Temperature Range , Low Bleed
- Maximum Temperature 400 °C
- 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.

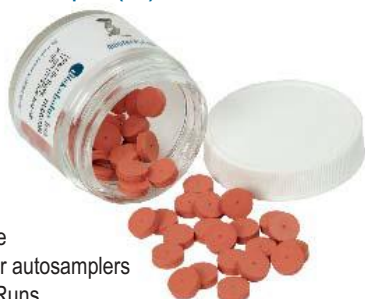
The **diskobolus™** BTO Septa have been optimized to reduce injection port adhesion. Is an ideal septum for trace analysis, high injection port temperature.

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

Cat.No	Description	Pk
TR-D033000	diskobolus BTO 5 mm D. CAD*	50
TR-D033002	diskobolus BTO 6.4 mm D. (1/4")	50
TR-D033004	diskobolus BTO 9 mm D. CAD*	50
TR-D033006	diskobolus BTO 9.5 mm. D. (3/8")	50
TR-D033008	diskobolus BTO 10 mm. D.	50
TR-D033010	diskobolus BTO 11 mm. D. (7/16") CAD*	50
TR-D033012	diskobolus BTO 11 mm. D. (7/16") CAD*	100
TR-D033014	diskobolus BTO 11.5 mm. D. CAD*	50
TR-D033016	diskobolus BTO 12.7 mm. D. (1/2") CAD*	50
TR-D033018	diskobolus BTO 17 mm. D. CAD*	50
TR-D033020	diskobolus BTO "Plug", for Shimadzu 	50

* CAD "Center Alignment Depression"


Diskobolus™ Long Life Septa (LL)



- Outstanding Lifetime
- Premium Septum for autosamplers
- Ideal for Overnight Runs
- Up to 400 injections per Septum
- Maximum Temperature 400 °C
- Soft, 45 Durometer, Easy On Autosampler Needles

The **diskobolus™** Long Life Septum , has been developed as an advanced GC septum for autosampler use, with significantly longer life. **diskobolus™** Long Life septum typically achieves 400 injections.

without failure, when used with a rounded-tip (HP-style) needles and autosampler or needle guide. Now you can make extended autosampler runs without fear of sample loss, caused by blow-back of leaking carrier gas. **diskobolus™** Long Life septum is also ideal for standard manual-injection GC and GC/MS. They are packaged in glass vials.

Cat.No	Description	Pk
TR-D033050	diskobolus Long Life 5 mm D. CAD*	50
TR-D033052	diskobolus Long Life 9 mm D. CAD*	50
TR-D033054	diskobolus Long Life 9.5 mm D. (3/8")	50
TR-D033056	diskobolus Long Life 11 mm. D. (7/16") CAD*	50
TR-D033058	diskobolus Long Life 11 mm. D. (7/16") CAD*	100
TR-D033060	diskobolus Long Life 11.5 mm. D. CAD*	50
TR-D033062	diskobolus Long Life 12.7 mm. D. (1/2") CAD*	50
TR-D033064	diskobolus Long Life 17 mm. D.	50
TR-D033066	diskobolus Long Life "Plug", for Shimadzu 	50


* CAD "Center Alignment Depression"

Diskobolus™ Green Septa



- True Long-Life, High Temperature Green Septum
- More injections per Septum
- Reduced Injection Port Sticking
- Maximum Temperature 400 °C

The **diskobolus™** Green Septum was specifically created to combine significantly longer injection life, low bleed and low injection port adhesion. The result is a green septum good for general purpose use. The septa are packaged in glass vials for high purity.

Cat.No	Description	Pk
TR-D033030	diskobolus Green 5 mm D. CAD*	50
TR-D033032	diskobolus Green 9 mm D. CAD*	50
TR-D033034	diskobolus Green 9.5 mm D. (3/8")	50
TR-D033036	diskobolus Green 11 mm. D. (7/16") CAD*	50
TR-D033038	diskobolus Green 11 mm. D. (7/16") CAD*	100
TR-D033040	diskobolus Green 11.5 mm. D. CAD*	50
TR-D033042	diskobolus Green 12.7 mm. D. (1/2") CAD*	50
TR-D033044	diskobolus Green 17 mm. D.	50
TR-D033046	diskobolus Green "Plug", for Shimadzu 	50

* CAD "Center Alignment Depression"

Tk The Teknokroma New range of Diskobolus™ Septa

Accessories

Septum needle Guide



Attaches to most conventional chromatograph inlets. The conical needle guide entrance is located about one inch away from the hot septum. It remains cool to the touch, eliminating premature flashing. It helps prevent bent needles when using harder septa. The Needle Guide also lengthens septum life. The needle guide fits into a 3/16" diameter hole in the septumcap; the cap can be drilled out if it has a narrower opening.

Cat.No	Description	Pk
TR-K450050	Septum Needle Guide for 3/16" hole	2

Injection Port Cleaning Kit



It is designed for cleaning all GC injection ports, including those in Shimadzu instruments. Included are three stainless steel brushes, 5 mm (for Shimadzu), 1/4" and 3/8", and one scraper for removing septum residue.

Cat.No	Description	Pk
TR-K206211	Injection Port Cleaning Kit	1

Septa Pick



The Septa Pick is useful for removing small pieces of septa lodged in the threads and corners of the septum cap or injection port. It can also be used to remove small bits of graphite ferrule from the cap and fittings of column connectors; other small cleaning jobs.

Cat.No	Description	Pk
TR-K205465	Septa Pick	1

Micro Hook



This is a multi-purpose hook used for pulling O-rings, springs, or septum fragments.

Cat.No	Description	Pk
TR-K205678	Micro Hook	1



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 let 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

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, seals 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, there are easily destroyed or deformed. Ideal for FID and NPD detectors.

Do not use with MS or other oxygen sensitive detectors. Upper temperature limit 450°C.

Vespel/Graphite

Vespel /Graphite ferrules are recommended for applications with GC/MS interface or other oxygen sensitive detectors.

The ferrule composition is 60% polyimide 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 400°C

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 350°C.

Teflon

These ferrules have been manufactured with 100% Teflon. It is totally inert and very soft. It is used for glass columns. Limit temperature 250°C.

TK New 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, 450°C
- 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
TR-T031012	teide 1/16" to 1.0 mm	0.53-0.65 mm I.D.	10
TR-T031014	teide 1/16" to 1/16"	1/16" O.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-T031100	teide 1/16" 2 holes, 0.4/0.4	0.25 mm I.D.	10
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

TR-T031126	teide 1/8" two holes 0.5/0.5 mm	0.32 mm I.D.	10
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Special graphite ferrules for Shimadzu



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

Special graphite ferrules for ThermoFinnigan M4 Nut and M8 Nut



M4 Nut



M8 Nut

Cat.No	Description	For Capillary Column	Pk
TR-T031130	teide 0.5 mm ID (M8 nut) for ThermoFinnigan (CE)		10
TR-T031132	teide 0.8 mm ID (M8 nut) for ThermoFinnigan (CE)		10

TR-T031134	teide Cup Ferrule for Thermo 0.25 mm I.D. (M4 nut)	10
TR-T031136	teide Cup Ferrule for Thermo 0.35 mm I.D. (M4 nut)	10
TR-T031138	teide Cup Ferrule for Thermo 0.45 mm I.D. (M4 nut)	10
TR-T031140	teide Cup Ferrule for Thermo 0.80 mm I.D. (M4 nut)	10

Liner Seals for ThermoFinnigan Trace



8 mm graphite linear seal for ThermoFinnigan Trace TR-T032050

Cat.No	Description	For Capillary Column	Pk
TR-T032050	teide Graphite Liner Seal 8mm for ThermoFi., Trace GC 1		

Liner Seals for Agilent



O-Ring TR-T032056

Cat.No	Description	For Capillary Column	Pk
TR-T032052	teide Graphite Liner Seal 6.35 mm ID for Agilent		10
TR-T032054	teide Graphite Liner Seal 6.52 mm ID for Agilent		10
TR-T032056	teide O-Ring made of Viton for Agilent		12

New Teide™ Ferrules for Gas Chromatography **Tk**

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 400°C

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



Cat.No	Description	For Capillary Column	Pk
TR-T031060	teide 1/16" to 0.3 mm	0.10 mm I.D.	10
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

Vespel/Graphite standard ferrules



Cat.No	Description	For Capillary Column	Pk
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
TR-T032022	teide 1/16" to 1.0 mm	0.65 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/Graphite reducing ferrules



Cat.No	Description	For Capillary Column	Pk
TR-T031160	teide 1/8" to 0.4 mm	0.25 mm I.D.	10
TR-T031162	teide 1/8" to 0.5 mm	0.32 mm I.D.	10
TR-T031164	teide 1/8" to 0.8 mm	0.53 mm I.D.	10
TR-T031170	teide 1/8" to 1/16"	1/16" O.D.	10
TR-T031172	teide 1/4" to 0.4 mm	0.25 mm I.D.	10
TR-T031174	teide 1/4" to 0.5 mm	0.32 mm I.D.	10
TR-T031176	teide 1/4" to 0.8 mm	0.53 mm I.D.	10
TR-T031178	teide 1/4" to 1/16"	1/16" O.D.	10
TR-T031180	teide 1/4" to 6 mm	6 mm O.D.	10
TR-T031182	teide 1/4" to 1/8"	1/8" O.D.	10

Teide™ Vespel/Graphite reducing ferrules Two Holes

Cat.No	Description	For Capillary Column	Pk
TR-T031166	teide 1/8", two holes 0.5/0.5 mm	0.32 mm I.D.	10
TR-T031168	teide 1/8", two holes 0.8/0.8 mm	0.53 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 350°C

Advantages:

- Mechanically robust
- Reusable for several column changes

Limitations:

- Must be frequently retightened
- Do not resist high temperatures
- Leaks in case of temperature 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

Vespel reducing ferrules

Cat.No	Description	For Capillary Column	Pk
TR-T031232	teide 1/8" to 0.4 mm	0.25 mm I.D.	10
TR-T031234	teide 1/8" to 0.5 mm	0.32 mm I.D.	10
TR-T031236	teide 1/8" to 0.8 mm	0.53 mm I.D.	10
TR-T031238	teide 1/8" 2-hole 0.5/0.5 mm	0.32 mm I.D.	10
TR-T031239	teide 1/8" 2-hole 0.8/0.8 mm	0.53 mm I.D.	10
TR-T031242	teide 1/8" to 1/16"	1/16" O.D.	10
TR-T031244	teide 1/4" to 1/16"	1/16" O.D.	10
TR-T031246	teide 1/4" to 1/8"	1/8" O.D.	10

TK New Teide™ Ferrules for Gas Chromatography

Straight Ferrules

Graphite Straight Ferrules



Cat.No	Description	Pk
TR-T031157	teide Straight ferrule for tube 1/16" O.D.	10
TR-T031158	teide Straight ferrule for tube 1/8" O.D.	10
TR-T031159	teide Straight ferrule for tube 1/4" O.D.	10

Vespal/Graphite Straight Ferrules



Cat.No	Description	Pk
TR-T031190	teide Straight ferrule for tube 1/16" O.D.	10
TR-T031192	teide Straight ferrule for tube 1/8" O.D.	10
TR-T031194	teide Straight ferrule for tube 1/4" O.D.	10

Vespal Straight Ferrules



Cat.No	Description	Pk
TR-T031280	teide Straight ferrule for tube 1/16" O.D.	10
TR-T031282	teide Straight ferrule for tube 1/8" O.D.	10
TR-T031284	teide Straight ferrule for tube 1/4" O.D.	10

PTFE Straight Ferrules



Cat.No	Description	Pk
TR-T031250	teide Straight ferrule for tube 1/16" O.D.	10
TR-T031260	teide Straight ferrule for tube 1/8" O.D.	10
TR-T031270	teide Straight ferrule for tube 1/4" O.D.	10

Accessories

Ferrule Remover

Two tools are supplied for capillary ferrules from 0.4 mm to 0.8 mm id. The tip has a spiral-cut ratchet design that slides into the ferrule easily then grabs on the way out.



Cat.No	Description	Pk
TR-K205315	Ferrule Remover for 0,4 and 0,8 mm ID	1













Injection Liner Cleaning Kit

The kit includes four sizes of nylon brush to clean most liners, and one foot of pipe cleaner. The 4 mm and 2 mm diameter brushes clean standard liners. The 1 mm and 0.5 mm diameter brushes can reach inside reversible tapered liners.





Cat.No	Description	Pk
TR-K205215	Injection Liner Cleaning Kit	1






Liners for Agilent Capillary GCs

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L04010	2 mm Splitless		6.5	79	1
	TR-L04010-5	2 mm Splitless		6.5	79	5
	TR-L04010-10	2 mm Splitless		6.5	79	10
	TR-L04012	2 mm Splitless, Quartz	5181-8818	6.5	79	1
	TR-L04012-5	2 mm Splitless, Quartz		6.5	79	5
	TR-L04012-10	2 mm Splitless, Quartz		6.5	79	10
	TR-L04014	4 mm Split/Splitless		6.3	79	1
	TR-L04014-5	4 mm Split/Splitless	210-3003	6.3	79	5
	TR-L04014-10	4 mm Split/Splitless		6.3	79	10
	TR-L04016	4 mm Split/Splitless, Quartz		6.3	79	1
	TR-L04016-5	4 mm Split/Splitless, Quartz		6.3	79	5
	TR-L04016-10	4 mm Split/Splitless, Quartz		6.3	79	10
	TR-L04018	4 mm Split/Splitless, with Deactivated Glass Wool	19251-60540	6.3	79	1
	TR-L04018-5	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	5
	TR-L04018-10	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	10
	TR-L04020	Split Liner 4 mm id with Cup	18740-80190	6.3	79	1
	TR-L04020-5	Split Liner 4 mm id with Cup		6.3	79	5
	TR-L04020-10	Split Liner 4 mm id with Cup		6.3	79	10
	TR-L04022	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	1
	TR-L04022-5	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	5
	TR-L04022-10	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	10
	TR-L04024	Split Cup Liner, 4 mm with OV-1/Chromosorb W-P 80/100	18740-60840	6.3	79	1
	TR-L04024-5	Split Cup Liner, 4 mm with OV-1/Chromosorb W-P 80/100		6.3	79	5
	TR-L04024-10	Split Cup Liner, 4 mm id with OV-1/Chromosorb W-P 80/100		6.3	79	10
	TR-L04026	Single Taper Liner, 2 mm id		6.5	79	1
	TR-L04026-5	Single Taper Liner, 2 mm id		6.5	79	5
	TR-L04026-10	Single Taper Liner, 2 mm id		6.5	79	10
	TR-L04028	Single Taper Liner, 4 mm id	5181-3316	6.5	79	1
	TR-L04028-5	Single Taper Liner, 4 mm id		6.5	79	5
	TR-L04028-10	Single Taper Liner, 4 mm id		6.5	79	10
	TR-L04030	Single Taper Liner, 4 mm id with Deactivated Glass Wool	5062-3587	6.5	79	1
	TR-L04030-5	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79	5
	TR-L04030-10	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79	10
	TR-L04032	Double Taper Liner, 4 mm id	5181-3315	6.5	79	1
	TR-L04032-5	Double Taper Liner, 4 mm id		6.5	79	5
	TR-L04032-10	Double Taper Liner, 4 mm id		6.5	79	10



Liners for Agilent Packed columns GCs

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L04050	Universal Packed Inj. Liner, Deactivated	5181-3382		93	1
	TR-L04050-25	Universal Packed Inj. Liner, Deactivated			93	25
	TR-L04052	Universal Packed Inj. Liner, Not Deactivated	5080-8732	93		1
	TR-L04052-25	Universal Packed Inj. Liner, Not Deactivated		93		25








Liners for Perkin Elmer Capillary GCs

	TR-L04070	Split Liner for Autosystem	N610-1052	4	92	1
	TR-L04070-5	Split Liner for Autosystem		4	92	5
	TR-L04070-10	Split Liner for Autosystem		4	92	10
	TR-L04072	Split Liner for Autosystem with Deactivated Glass Wool		4	92	1
	TR-L04072-5	Split Liner for Autosystem with Deactivated Glass Wool		4	92	5
	TR-L04072-10	Split Liner for Autosystem with Deactivated Glass Wool		4	92	10
	TR-L04074	Split Liner for Autosystem	N-612-1372	2	92	1
	TR-L04074-5	Split Liner for Autosystem		2	92	5
	TR-L04074-10	Split Liner for Autosystem		2	92	10
	TR-L04076	Dimple Splitter	0330-5181		100	1
	TR-L04076-5	Dimple Splitter			100	5
	TR-L04076-10	Dimple Splitter			100	10
	TR-L04078	Splitless	0330-5180		100	1
	TR-L04078-5	Splitless			100	5
	TR-L04078-10	Splitless			100	10



Liners for Perkin Elmer Packed columns GCs

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L04090	Glass Liner for Autosystem	N-610-1048		112	1
	TR-L04090-5	Glass Liner for Autosystem			112	5
	TR-L04090-10	Glass Liner for Autosystem			112	10
	TR-L04092	Glass Liner for 8000 Series, Sigma 2000	0330-2221		101	1
	TR-L04092-5	Glass Liner for 8000 Series, Sigma 2000			101	5
	TR-L04092-10	Glass Liner for 8000 Series, Sigma 2000			101	10











Liners for ThermoFinnigan Capillary GCs

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05000	Split Liner, 3 mm ID	453 20031		105	1
	TR-L05000-5	Split Liner, 3 mm ID			105	5
	TR-L05000-10	Split Liner, 3 mm ID			105	10
	TR-L05002	Split Liner, 5 mm ID	453 20030		105	1
	TR-L05002-5	Split Liner, 5 mm ID			105	5
	TR-L05002-10	Split Liner, 5 mm ID			105	10
	TR-L05004	Splitless Liner, 3 mm ID	453 20032		105	1
	TR-L05004-5	Splitless Liner, 3 mm ID			105	5
	TR-L05004-10	Splitless Liner, 3 mm ID			105	10
	TR-L05006	Splitless Liner, 5 mm ID	453 20033		105	1
	TR-L05006-5	Splitless Liner, 5 mm ID			105	5
	TR-L05006-10	Splitless Liner, 5 mm ID			105	10
	TR-L05008	For Wide Bore Columns	453 00310		105	1
	TR-L05008-5	For Wide Bore Columns			105	5
	TR-L05008-10	For Wide Bore Columns			105	10
	TR-L05010	Cup Liner	453 00320		105	1
	TR-L05010-5	Cup Liner			105	5
	TR-L05010-10	Cup Liner			105	10
	TR-L05012	PTV Liner, 2 mm ID	453 22045		120	1
	TR-L05012-5	PTV Liner 2 mm ID			120	5
	TR-L05012-10	PTV Liner 2 mm ID			120	10



Liners for Shimadzu Capillary GCs

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05020	Split Liner 14A	221-32544-01		99	1
	TR-L05020-5	Split Liner 14A			99	5
	TR-L05020-10	Split Liner 14A			99	10
	TR-L05022	Splitless Liner 14A	221-32544-00		99	1
	TR-L05022-5	Splitless Liner 14A			99	5
	TR-L05022-10	Splitless Liner 14A			99	10






Liners for Varian Capillary GCs for Injector 1177

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05030	2 mm Splitless		6.5	79	1
	TR-L05030-5	2 mm Splitless		6.5	79	5
	TR-L05030-10	2 mm Splitless		6.5	79	10
	TR-L05032	2 mm Splitless, Quartz	392611924	6.5	79	1
	TR-L05032-5	2 mm Splitless, Quartz		6.5	79	5
	TR-L05032-10	2 mm Splitless, Quartz		6.5	79	10
	TR-L05034	4 mm Split/Splitless		6.3	79	1
	TR-L05034-5	4 mm Split/Splitless		6.3	79	5
	TR-L05034-10	4 mm Split/Splitless		6.3	79	10
	TR-L05036	4 mm Split/Splitless, Quartz		6.3	79	1
	TR-L05036-5	4 mm Split/Splitless, Quartz		6.3	79	5
	TR-L05036-10	4 mm Split/Splitless, Quartz		6.3	79	10
	TR-L05038	4 mm Split/Splitless, with Deactivated Glass Wool	392611934	6.3	79	1
	TR-L05038-5	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	5
	TR-L05038-10	4 mm Split/Splitless, with Deactivated Glass Wool		6.3	79	10
	TR-L05040	Split Liner 4 mm id with Cup	392611931	6.3	79	1
	TR-L05040-5	Split Liner 4 mm id with Cup		6.3	79	5
	TR-L05040-10	Split Liner 4 mm id with Cup		6.3	79	10
	TR-L05042	Split Cup Liner, 4 mm id with Deactivated Glass Wool	392611932	6.3	79	1
	TR-L05042-5	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	5
	TR-L05042-10	Split Cup Liner, 4 mm id with Deactivated Glass Wool		6.3	79	10
	TR-L05044	Split Cup Liner, 4 mm id with OV-1/Chrom. W-P 80/100	392611933	6.3	79	1
	TR-L05044-5	Split Cup Liner, 4 mm id with OV-1/Chromosorb W-P 80/100		6.3	79	5
	TR-L05044-10	Split Cup Liner, 4 mm id with OV-1/Chromosorb W-P 80/100		6.3	79	10
	TR-L05046	Single Taper Liner, 2 mm id	392611926	6.5	79	1
	TR-L05046-5	Single Taper Liner, 2 mm id		6.5	79	5
	TR-L05046-10	Single Taper Liner, 2 mm id		6.5	79	10
	TR-L05048	Single Taper Liner, 4 mm id	392611927	6.5	79	1
	TR-L05048-5	Single Taper Liner, 4 mm id		6.5	79	5
	TR-L05048-10	Single Taper Liner, 4 mm id		6.5	79	10



Cat.No

	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05050	Single Taper Liner, 4 mm id with Deactivated Glass Wool	392611936	6.5	79 1
	TR-L05050-5	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79 5
	TR-L05050-10	Single Taper Liner, 4 mm id with Deactivated Glass Wool		6.5	79 10
	TR-L05052	Double Taper Liner, 4 mm id	392611929	6.5	79 1
	TR-L05052-5	Double Taper Liner, 4 mm id		6.5	79 5
	TR-L05052-10	Double Taper Liner, 4 mm id		6.5	79 10

Liners for Varian Capillary GCs for Injector 1075/1077

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05054	4 mm Open Split Liner	16-000830-00		72 1	
	TR-L05054-5	4 mm Open Split Liner			72 5	
	TR-L05054-10	4 mm Open Split Liner			72 10	
	TR-L05056	4 mm Open Split Liner with Glass Wool	01-900109-01		72 1	
	TR-L05056-5	4 mm Open Split Liner with Glass Wool			72 5	
	TR-L05056-10	4 mm Open Split Liner with Glass Wool			72 10	
	TR-L05058	Frit Split Liner			72 1	
	TR-L05058-5	Frit Split Liner	01-900109-3		72 5	
	TR-L05058-10	Frit Split Liner	16-000830-01		72 10	
	TR-L05060	Splitless, Borosilicate Glass	01-900109-05		74 1	
	TR-L05060-5	Splitless, Borosilicate Glass	03-949437-90		74 5	
	TR-L05060-10	Splitless, Borosilicate Glass	03-949437-00		74 10	
	TR-L05062	Splitless, Quartz			74 1	
	TR-L05062-5	Splitless, Quartz			74 5	
	TR-L05062-10	Splitless, Quartz			74 10	

Liners for Varian Capillary GCs for Injector 1093/1094

	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05064	0.5 mm SPI			54 1	
	TR-L05064-5	0.5 mm SPI	01-900109-06		54 5	
	TR-L05064-10	0.5 mm SPI	03-918332-01		54 10	
	TR-L05066	0.8 mm SPI			54 1	
	TR-L05066-5	0.8 mm SPI	01-900109-07		54 5	
	TR-L05066-10	0.8 mm SPI	03-918332-02		54 10	

Liners for Varian Capillary GCs for Injector 1078/1079


	Cat.No	Description	Similar Item No.	OD (mm)	Lenght (mm)	Pk
	TR-L05068	3.4 mm ID X 5 mm OD			54 1	
	TR-L05068-5	3.4 mm ID X 5 mm OD			54 5	
	TR-L05068-10	3.4 mm ID X 5 mm OD			54 10	



Chart Paper

- High Quality Chart Papers
- Available for many popular Integrators and recorders
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Thermal Paper

Papers for Hewlett Packard

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K443181	5880A, 3888A	8.5" x 184', Z-fold blue	5	5080-8778
TR-K443182		8.5" x 184', Z-fold black	5	9270-0658
TR-K443192	3380A, 3385A Int.	8.5" x 184', Z-fold blue	5	5080-8735
TR-K443193	5840A, 5880 GC, 1082, 1084 LC	8.5" x 184', Z-fold black	5	
TR-K443194	3392, 3393A Int.	4.2" x 400', roll blue	2	5080-8800
TR-K443195		4.2" x 400', roll black	2	9270-1134
TR-K443191	3396A	9.5" x 272', roll, ink jet	4	5181-1219
TR-K443179	3396A	8.5" x 230', Z-fold ink jet	5	5062-3561

Papers for Shimadzu

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K441610	CR1A, CR1B	8 3/16" x 170', roll black	1 roll	221-13391-01
TR-K443612	CR3A	8 3/16" x 167', roll black	10	221-25412-00
TR-K441613	CR4A	255 mm x 45.1 m, black	1 roll	223-02000-12
TR-K443615	CR5A	208 mm x 45.1 m, black	10	223-02037-81
TR-K441617	CR7A	10 1/6" x 148'	1 roll	200-91527

Papers for Varian

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K443620	3400/3500/3600	4.3" x 150', black	2	03-917650
TR-K443604	Vista 401/402	8.5" x 184', Z-fold, black	5	03-906362-0
TR-K441599	4270/4290	9.4" x 183', roll, black	1 roll	00-997096-01

Papers for Waters

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K441608	730	8.5" x 184', Z-fold, blue	1	74703

Papers for Hitachi

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K443170		234 mm x 48.8 m, black	9	661-7501

Papers for Perkin Elmer

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K441189	LCI-100	283 mm x 30.5 m, roll black	1 roll	N-625-1026

Papers for Spectra Physics

Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
TR-K443596	SP-4000 Series	9.4" x 184', Z-fold, black	5	A0022-020
TR-K443598	SP-4270, SP-4290	9.4" x 167', roll, black	10	A2157-020

Chromojet, CH1, CH2

Recorder Paper

Manufacturer	Cat.No	Model Number	Chart Type	pK.	Manuf. Chart Paper Nbr.
Houston	TR-K443198	D-5000, B-5000	11" X 100' roll, 0-10 English	4	EC-103
Kipp & Zonen	TR-K441199	BD111/12, BD40/41	230 mm x 20.1 m, 0-100	1 roll	XR-9
Linear	TR-K441184	1201/1202/1210	230 mm x 25.3 m, roll	1 roll	0100-0026
Linear	TR-K441186	142/143	120 mm x 30.5 m, roll	1 roll	0100-0011
Perkin Elmer	TR-K441395	56/200/561	276 mm x 30.5 m, roll	1 roll	056-7300

Helium Gas Leak Check and Flowmeter GC 525 **Tk**

Helium Gas Leak Check



- Pipe fittings
- Welding parts
- Pressure regulators

Specifications

Detection Method:	Thermal Conductivity Detector
Target gas:	Helium
Range:	High/Low
Sensibility:	Minimum Detection Limit 0.01 mL/min
Display:	LCD
Power Supply:	Rechargeable Battery
Operation Temp:	10-35°C
Dimensions:	65 (W) x 37 (D) x 143 (H) mm
Weight:	330g approx.
Accessories:	Recharger AC 100 - 220v

Cat.No	Description
GL-2702-1941	Helium Gas Leak Detector LD 229

525 GC Flowmeter

Flow Measurement

Accurate and repeatable 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 GC Flowmeter provides as standard, measurement of eight gases commonly used in gas chromatography. In addition to the standard flow measurement 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. The user can easily switch between standard flow and linear velocity with a single button press.

Split Flow Calculation

Split flow 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.

Specifications

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

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

Tk Teknokroma 2t Head Space Sampler



The First Manual System
For Static Head Space

Technical Specifications

Heating temperature Range:	up to 140°C.
Variable injection:	up to 2,5 ml.
Temperature accuracy:	+/- 0,75°C
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 25°C to 70°C with 1 ml syringe and 6 empty 20 ml vials:	20 minutes
Safety temperature:	175°C
Power:	110 / 220 +/- 10% VAC.

It is according the Pharmacopeia test:

European Pharmacopeia 7th. (2011).

USP 35-NFO (2012).

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

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

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

The new 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 Head Space Sampler Tk



1

Put the syringe into the black holder.



4

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.



2

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



5

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



3

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

Performance qualification

To check the Head Space sampler, proper performance, the following reproducibility 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 l of benzene and 2.5 µl of toluene to 100 ml of water (25ppm), stir up until it is completely dissolved.

Adjust headspace 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	Toluene 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%

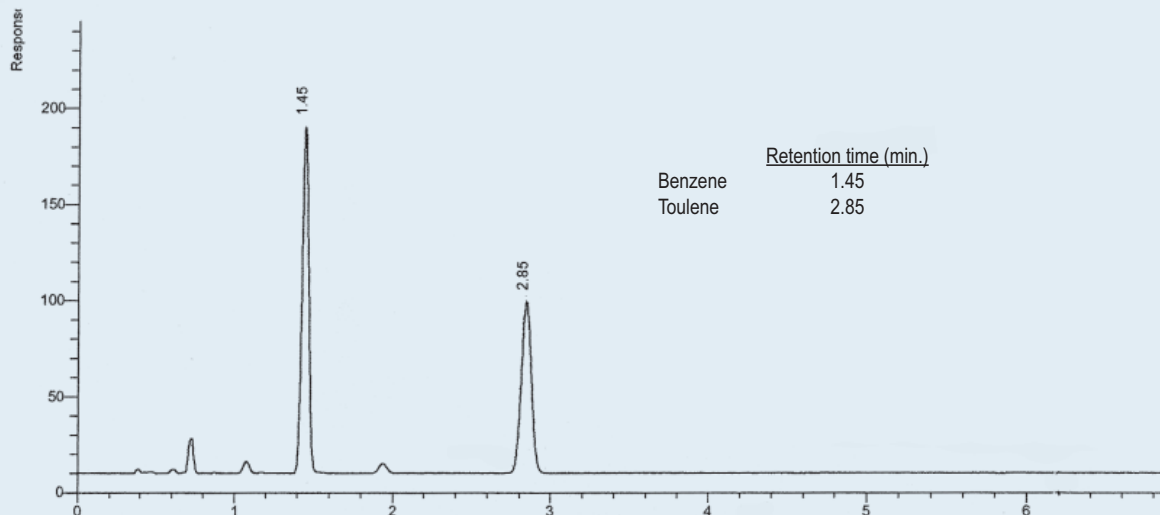
Cat.No	Description
TR-132110	2t Sampler for Static Head Space mod. 5060 (syringe not included)
TR-132113	APE Syringe nod. 1001 HS 1 ml.
TR-132112	APE Syringe nod. 1002 HS 2.5 ml.

Chromatographic Parameters

Column: **TRB-1**, P/N TR-113015
 Dimensions: 15m x 0,53mm x 3µm
 Injection: 0,7 ml, head space, (split 1:2), 150°C
 Carrier gas: He, 4psi (27.6 kPa)
 Oven temperature: 60°C (10 min.)
 Detector: FID, 250°C
 Sample: 5ml in 10ml vials (25ppm benzene/toluene in water)

Headspace conditions

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





Cat.No	P/N Manufacturer	Description	Pk
CC-C4020-10	5182-0838	10 ml Vial, Flat Bottom 23 x 46 mm, Beveled Edge	100
CC-C4020-410		10 ml Vial, Flat Bottom 23 x 46 mm, Square Rim	1000
CC-C4020-210	5183-4475	10 ml Vial, Round Bottom 23 x 46 mm, Beveled Edge	100



CC-C4020-20		20 ml Vial, Flat Bottom 23 x 75 mm, Beveled Edge	100
CC-C4020-25		20 ml Vial, Flat Bottom 23 x 75 mm, Square Rim	1000
CC-C4020-2		20 ml Vial, Round Bottom 23 x 75 mm, Beveled Edge	100

20 mm Crimp Seals with Prefitted Septa for Headspace Vials



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/Translucent Blue Silicone (-60 to +200°C)	100
CC-C4020-42AP	Pressure Release	Clear PTFE/Translucent Blue Silicone (-60 to +200°C)	100



CC-C4020-37AP	Pressure Release	Aluminium Foil/White High Temp. Silicone (-60 to +220°C)	100
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CC-C4020-31	Molded Polypropylene	SepCap Integral Molded Polypropylene Storage Cap	250
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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



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

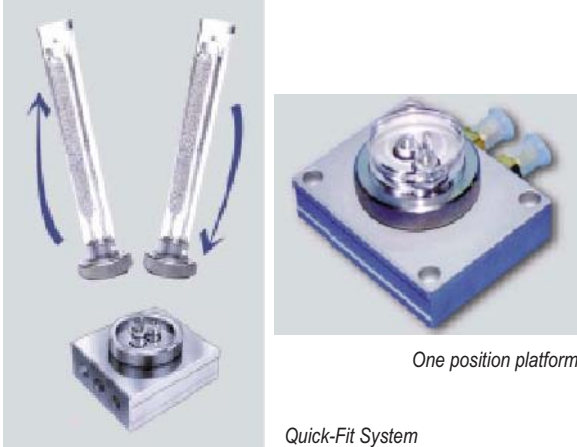
- Longer lifetime of analytical columns, avoids bleeding, espec. important for MS and ECD.
- Better sensitivity, decreases baseline noise, eliminates spikes.
- Filter-change during analysis within seconds, system stays online.

Purifier Cartridge Capacity

Type of Purifier	Outlet Gas Quality	Usable for	Indicator Color Change	Capacity		
				H ₂ O(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		1000	
Hydrocarbon	> 6.0	Inert carrier gas, air hydrogen	No indicator			12 (as n-butane)
Combi (moisture/hydrocarbon)	> 6.0	Inert carrier gas, air hydrogen	Brown to white	3.5		6 (as n-butane)
Triple (moisture/oxygen/hydrocarbon)	> 6.0		Brown to white Green to grey	1.8	500	4 (as n-butane)

Specifications 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-F0301	Triple Filter (O ₂ /Moisture/Hydrocarbons)
SG-B0010	1-position baseplate

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-F0302	Triple Filter; conditioned with Helium (O ₂ /Moisture/Hydrocarbons)
SG-B0010	1-position baseplate

Fuel Gas Purification System used in a FID

Removal of moisture and hydrocarbons in the gases of the FID for a better baseline

In this configuration, you need to use: 2 units of 1-position baseplate + 2 Combi filters (hydrocarbons/moisture)

One combi filter for purifying Air and other combi filter for purifying hydrogen

SG-B0010	1-position baseplate (you need 2 pieces of 1 position base plate)
SG-F0201	Combi Filter -hydrocarbons/moisture, (you need tow Combi Filters)

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 (Hydr carbons/Moisture) for purifying gases used in a FID.

SG-B0010	1-position baseplate (you need 3 pieces)
SG-F0301	Triple Filter (O ₂ /Moisture/Hydrocarbons)
SG-F0201	Combi Filter (Noisture/Hydrocarbons) - you need 2 Combi Filters

High Capacity Purifiers for Carrier and 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.

SG-B0010	1-position baseplate (you need 4 pieces)
SG-F0101	Moisture Filter, Standard, Ultra Capacity
SG-F0102	Oxygen Filter, Standard, Ultra Capacity
SG-F0103	Hydrocarbons Filter, Standard, Ultra Capacity, pk/1. (You need 2 filters)

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 + 2 Hydrocarbons purifiers for nitrogen gas + particle filter

SG-B0021-B4	2-position baseplate, 1/4" Brass for 2 High Flow Gas Filters
SG-F0103	Hydrocarbons Filter, Standard, Ultra capacity, pk/1 (you need 2 units)
SG-B0060	0.5 micron Particle Filter 1/4", pk/1

TK 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, 1/4" 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 Quality	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 H2O	>3
Oxygen	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	3000 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 H2O; 18 g HCs ³	>2
Triple2	>6.0 (99.9999%)	160 psi (11 bar)	25 L/min	Inert Carrier	6 g H2O; 12 g HCs ³	>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 O2 in the incoming gas stream for oxygen purifiers is 0.5%.

Click-On Inline Purifier



Cat.No	Description	pK
SG-C01005	Click-On Inline Triple Trap (Oxygen/Moisture/Hydrocarbons) Cartridge - Stainless Steel	1 unit
SG-C01061	Click-On Inline Indicating Triple He Trap (Oxygen/Moisture/Hydrocarbons) Cartridge - Glass	1 unit
SG-C01041	Click-On Inline Indicating Combi (Oxygen/Moisture) Cartridge - Glass	1 unit
SG-C01001	Click-On Inline Moisture Cartridge - Stainless Steel	1 unit
SG-C01002	Click-On Inline Oxygen Cartridge - Stainless Steel	1 unit
SG-C01003	Click-On Inline Hydrocarbon Cartridge - Stainless Steel	1 unit
SG-C01004	Click-On Inline Combi (Oxygen/Moisture) Cartridge - Stainless Steel	1 unit
SG-C01007	Click-On Inline Combi (Hydrocarbons/Moisture) Cartridge - Stainless Steel	1 unit

Click-On Connectors

Cat.No	Description	pK
SG-C02001	Click-On Connectors 1/4" Brass	2 units
SG-C02002	Click-On Connectors 1/8" Brass	2 units
SG-C02010	Click-On Connectors 1/4" SS	2 units
SG-C02011	Click-On Connectors 1/8" SS	2 units
SG-C02020	Click-On Double Connectors to connect SS Trap with indicating trap	1 unit



SB Base Plates

Cat.No	Description	pK
SG-EF-4002-B4	Base Plate for 1 E-Line Filter 1/4" Brass	1 unit
SG-EF-4002-B8	Base Plate for 1 E-Line Filter 1/8" Brass	1 unit

E-Line Cartridges

Cat.No	Description	pK
SG-EF-1001	Indicating Oxygen Filter SS	1 unit
SG-EF-1002	Indicating Moisture Filter SS	1 unit
SG-EF-1003	Indicating Hydrocarb Filter SS	1 unit
SG-EF-1004	Indicating Triple Filter SS	1 unit
SG-EF-1006	Indicating Combi Filter (Hydrocarbon/Moisture/SS)	1 unit



Capillary Survival Kit™

Save 35% over items bought individually.

Each kit includes:

- Magnifier with built-in light
- Slide-Lok tweezers for holding small items; "spacing" the column proper distances into the injection port, etc.
- 15 cm steel ruler
- 3 column scribes, for cleanly-cut columns
- 2 Universal Unions for joining broken capillary columns
- Single-ended pinvise holds drill bits
- 3 Drill Bits 0.4 mm, 0.5 mm and 0.8 mm
- Multipurpose Septum Pick
- Nylon Brushes 1/8", 3/16" and 1/4" od
- Open-end wrench, 1/4" + 5/16"
- High-temperature string (>400°C) 25 ft.
- Ferrule Remover
- Pipecleaners 5 each 1/8" od and 1/4" od

Cat.No	Description
TR-K-205625	Capillary Survival Kit

Packed Column Change Kit



This has everything you need for hooking up columns in the GC lab. The Column Change Kit includes three ratchet wrenches, 7/16", 1/2" and 9/16"; one Imp™ Tubing cutter, and one roll of Teflon™ tape, 1/2" x 520". The ratchet wrenches are ideal for tight spaces; the ratchet tips can be opened, then snapped closed around fittings.

Cat.No	Description
TR-K205250	Column Change Kit

Fine Wire Kit



The Fine Wire Kit lets you clean many small items around the lab; also useful for bending into microhooks, other uses. The Kit contains a pin vise, and 30 stainless steel wires, 10 each of the following sizes: 0.006", 0.010" and 0.020".

Cat.No	Description
TR-K205230	Fine Wire Kit

Needle Cleaning Kit



This Kit is specifically designed for cleaning syringes and needles. It includes one bottle of organic, biodegradable cleaning solution, and 10 each of five different diameter

tungsten wires, ranging in diameter from 0.0035" to 0.0121". Suggested cleaning procedures are included. This kit is especially recommended for cleaning Hamilton Syringes.

Cat.No	Description
TR-K76620	Needle Cleaning Kit

FID Cleaning Kit



The Flame Detector Cleaning Kit improves sensibility while reducing noise and spikes. Use it to clean both the jet tip and collector. The FID Cleaning Kit includes everything you'll need: three

jet reamers (0.16", 0.19" and 0.024") with a unique spiral design that can clean without scratching; a mini drill bit (0.0102"), two wire minibrushes, one brass and one stainless steel; and a dual-ended handle for the reamers and brushes.

Cat.No	Description
TR-K205220	FID Cleaning Kit

Injection Port Cleaning Kit



This is designed for cleaning all GC Injection ports, including those in Shimadzu instruments. Included are three stainless steel brushes, 5mm (for

Shimadzu), 1/4" and 3/8", and one scraper for removing septum residue.

Cat.No	Description
TR-K206211	Inj. Port Cleaning Kit

Utility Ring Stand



This nickel-plated ring stand is useful for holding bubble flowmeters, as well as wide variety of standard lab equipment. The support rod is 5/16" od x 20". Clamps are available separately. The plastic-coated jaws hold around glassware from, 3/8" to 1^{3/8}" in diameter. The small clamp is useful for securing items 3/8" in diameter and less (10 ml and less bubble flowmeters; thermometers). Rotates 360°C. The Ring Stand Clamps are made from zinc-plated steel.

Cat.No	Description
TR-K205570	Utility Ring Stand
TR-K205571	Large Ring Stand Clamp
TR-K205572	Small Ring Stand Clamp

Glass Tubing Cutter



For shortening glass columns or inserts; other applications involving glass tubing. The hardened steel cutting wheel scores tubing as it is turned; cuts tubing up to 1.5".

Cat.No	Description
TR-K205595	Glass Tubing Cutter
TR-K2055969	Spare Cutting Wheels, 5/pk

Stopwatch



This 1/100th second Stopwatch has split/lap and normal time. It displays hours, minutes, seconds, day, date and month. Quartz accuracy. Useful for measuring gas flow with bubble flowmeters. Has alarm feature.

Cat.No	Description
TR-K205200	Stopwatch

Adjustable Wrench



6 inch or 10 inch. The 6" wrench opens to 15/16" for all common Swage-lok connectors. The 10" wrench opens to 15/16" for standard CGA fittings.

Chromoneplated, drop-forged steel.

Cat.No	Description
TR-K205586	Adjustable Wrench 6 inch
TR-K205588	Adjustable Wrench 10 inch

Ratchet Wrench



The jaws of the Ratchet Wrench open, to slip over fittings already in place.

Makes tightening or loosening in cramped areas easy. Three sizes available: 7/16", 1/2" or 9/16"

Cat.No	Description
TR-K205593	Ratchet Wrench 7/16"
TR-K205592	Ratchet Wrench 1/2"
TR-K205591	Ratchet Wrench 9/16"

Goose-neck Flashlight



Illuminates hard-to-reach areas. The Goose-neck flashlight has a flexible neck which can be bent as desired. Includes batteries.

Cat.No	Description
TR-K205628	Goose-neck Flashlight

Jeweler's ScrewDrivers



Six flat-head screwdrivers with convenient swivel-top handles. Baldes are from 0.025" to 0.100" in width.

Cat.No	Description
TR-K205676	Jeweler's ScrewDrivers

Allen Wrench Set



Standard or Metric. The standard (USA) Allen wrenches come in a set of 9, from 0.050" to 3/16". The metric Allen wrenches come in a set of 7, from 1.5mm to 6mm.

Cat.No	Description
TR-K205670	Allen Wrench Set Standard
TR-K205671	Allen Wrench Set Metric

Micro Hook



This is a multi-purpose hook used for pulling O-rings, springs, or septum fragments.

Cat.No	Description
TR-K205678	Micro Hook

Magnet on a Stick



This is used to pick up small objects such as screws and nuts from instrument cabinets and circuit boards.

Cat.No	Description
TR-K205630	Magnet on a Stick

Threadulator Thread Cutter



Cleans up cross-threaded fittings on columns, etc.; use with welded instrument fittings to avoid expensive replacement. Knurled outer handle for secure gripping; hardless steel cutter. Available in three sizes.

Cat.No	Description
TR-K205638	Threadulator, 1/16"
TR-K205640	Threadulator, 1/8"
TR-K205642	Threadulator, 1/4"

Teflon™ Tape



This is great for leak-proofing fittings; dry-lubricating joints. Do not use over ferrules. Teflon tape comes in rolls of 520 inches, 1/2" wide.

Cat.No	Description
TR-K205117	Teflon Tape

TK Maintenance Kits & Tools

Capillary/HPLC Wrench Set



This set includes 4 wrenches for use on 1/32", 1/16", or 1/8" nuts. The wrench ends are 3/16", 1/4", 5/16", 3/8" and 7/16".

Cat.No	Description
TR-K205320	Capillary/HPLC Wrench Set

Mirror on a Stick



The Mirror on a Stick lets you peer around corners or tight spaces; also used at the outlet of flame detectors; condensation on the mirror indicates the flame is lit.

Cat.No	Description
TR-K205632	Mirror on a Stick

Open End Wrenches



This set fits most types of fittings. Sizes range from 5/16" to 9/16" in 1/16" increments. Made from

chromeplated steel. 5 wrenches.

Cat.No	Description
TR-K205622	Open End Wrenches



Lighted Magnifier

This is perfect for inspecting capillary end cuts and syringe tips. The 11/4" x 11/4 lens magnifiers 4x; small bifocal insert lens measures 8x. Keep one in your desk. Batteries included.

Cat.No	Description
TR-K205648	Lighted Magnifier

Needle-Nose Pliers



These are useful for picking up or clamping small parts. Comes with vinyl grips for sure grip.

Cat.No	Description
TR-K205626	Needle-Nose Pliers

4-in-1 Screwdriver



Comes with two double-ended heads, each with a flat and phillips head. Just flip the end to change the tip.

Cat.No	Description
TR-K205624	4-in-1 Screwdriver

Wire Stripper/Crimper



Useful for cutting or stripping wire, and crimping on connectors. For repairs, maintenance, prototyping.

Cat.No	Description
TR-K205574	Wire Stripper/Crimper



Vials

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Vial Comparison Chart 138-139

Autosampler Vials, Closures and Inserts for HPLC and GC for AGILENT

Features:

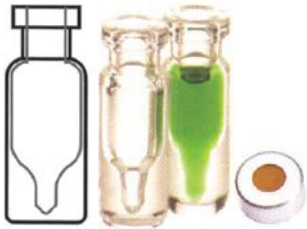
- Wide opening vial is easier to fill
- Fit most autosamplers that accommodate the 12x32 mm vial format
- Superior quality 33 expansion borosilicate clear glass (Type 1, Class A) or 51A amber glass
- Uniformly flat bottom for security with inserts
- I-D™ vials feature write-on patch with graduations at 0.5, 1.0 and 1.5 mL.
- Target Colorband™ crimp top vials feature color-coded graduated write-on patch
- Vials with an 11 mm crimp finish require aluminium seal closures
- Crimp/snap vials can be used with either 11 mm aluminium seals or Snap-It™ snap caps

Wide Opening Crimp Top Vials & Crimp Caps (12 x 32 mm):

	Cat.No	P/N Manufacturer	Description	Pk
	CC-C4011-1	5181-3375	Vial 2 ml Clear, Wide Opening Crimp Top	100
	CC-C4011-1AP	5181-1210	11 mm Crimp Seal, with PTFE/Red Rubber, standar septum	100
	CC-C4011-1W	5182-0543	Vial 2 ml Clear, Wide Opening Crimp Top write-on patch with graduations 0.5, 1.0 and 1.5 ml.	100
	CC-C4011-2A	5181-1211	11 mm Crimp Seal, with red PTFE/White Silicone/Red PTFE, for aggressive solvents	100
	CC-C4011-2		Vial 2 ml Amber, Wide Opening Crimp Top	100
	CC-C4011-2W	5181-3376	Vial 2 ml Amber, Wide Opening Crimp Top write-on patch with graduations 0.5, 1.0 and 1.5 ml.	100
	TR-400012		11 mm Crimp Seal, with PTFE/Red Rubber standard	100
	CC-C4011-LV1W		MacroVial 250 µl Fused Insert Vial, Clear Glass I-D, Write-on patch.	100
	TR-400012		11 mm Crimp Seal, with PTFE/Red Rubber standard	100
	CC-03-FIV		300 µl Glass insert, fused into a 2 ml Crimp Top Vial, Write-on patch.	500
	TR-400012		11 mm Crimp Seal, with PTFE/Red Rubber standard	100



Cat.No	P/N	Manufacturer	Description	Pk
CC-C4011-LV2W			MacroVial 250 ul. Fused Insert Vial, Amber Glass I-D, write-on patch	100
TR-400012			11 mm Crimp Seal, with PTFE/Red Rubber standard	100



CC-C4011-10			Solid Glass MicroVial 400 µl	12
TR-400012			11 mm Crimp Seal, with PTFE/Red Rubber standard	100

Crimp Seals With Different Septum Materials



CC-C4011-3A			11 mm Crimp Seal, with Polypropylene, for Corrosive Solvents	100
CC-C4011-4A			11 mm Crimp Seal, with PTFE/White Silicone, for High Purity Septum	100
CC-C4011-5A			11 mm Crimp Seal, with Black Viton Elastomer, for ECD, High Chemical Resistance	100
CC-C4011-1AP			11 mm Crimp Seal, with PTFE/Red Rubber, Standard Septum	100

Wide Opening Snap It & Snap Caps (12 x 32 mm):

Snap-it Vials can be used with Snap Caps or aluminium seals closures



Cat.No	P/N	Manufacturer	Description	Pk
CC-C4011-5	5182-0544		Snap-It™ Vial 2 ml Clear, Wide Opening	100
CC-C4011-6			Snap-It™ Vial 2 ml Amber, Wide Opening	100



CC-C4011-5W	5182-0546		Snap-It™ Vial 2 ml Clear, Wide Opening. Write-on patch with graduations 0.5, 1.0 and 1.5 ml.	100
CC-C4011-51B	5182-3458		Blue Snap Cap with PTFE/Red Rubber	100



CC-C4011-6W	5182-0545		Snap-It™ Vial 2 ml Amber, Wide Opening. Write-on patch with graduations 0.5, 1.0 and 1.5 ml.	100
CC-C4011-54G	5182-3457		Green Snap Cap with red PTFE/white Silicone, High purity septum	100

Tk Vials for Agilent



Cat.No	P/N Manufacturer	Description	Pk
CC-C4011-LV1		MacroVial 250 µl. Fused Insert Snap-It Vial, Clear Glass	100



CC-C4011-LV2		MacroVial 250 µl. Fused Insert Snap-It Vial, Amber Glass	100
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Closures Snap Caps for Snap-it Vials



CC-C4011-53R		Red Snap Cap with red PTFE/White Silicone/Red PTFE, for aggressive solvents, resists coring.	100
CC-C4011-55B		Blue Snap Cap with blue PTFE/White Silicone Pre-slit , reducing coring, needle damage, allows venting	100
CC-C4011-50		Clear Snap Cap integral molded polypropylene single use economy cap, not resealable	100
CC-C4011-52B		Blue Snap Cap, virgin PTFE, Highly inert, not resealable, single use	100

Wide Opening Screw Thread Vials, Screw Caps and Septa for Agilent



CC-C4000-1	5182-0714	Vial, 2 ml Clear, Wide Opening Screw Top.	100
CC-C4000-51G	5182-0718	Green Screw Cap with Ivory PTFE/Red Rubber.	100



CC-C4000-1W	5182-0715	Vial, 2 ml Clear, Wide Opening Screw Top write-on patch with graduation 0.5, 1.0 and 1.5 ml	100
CC-C4000-55B	5183-2076	Blue, Screw Cap with Blue PTFE/Silicone, Pre-slit	100



CC-C4000-2W	5182-0716	Vial, 2 ml Amber, Wide Opening Screw Top write-on patch with graduation 0.5, 1.0 and 1.5 ml	100
CC-C4000-53G	5182-0724	Green Screw Cap, with Red PTFE/White Silicone/Red PTFE.	100



Cat.No	P/N	Manufacturer	Description	Pk
CC-C4000-9	5183-2030		High Recovery Vial, 1,5 ml, Clear Screw Top.	100
CC-C4000-54 R	5182-0722		Red Screw Cap with Red PTFE/White Silicone	100

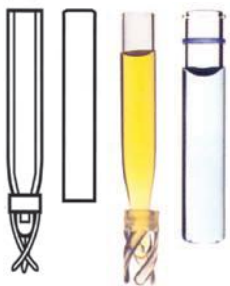


CC-C4000-LV1	5183-2076		MacroVial , Fused Insert, 350 µl, Screw Top	100
CC-C4000-55B	5183-2076		Blue Screw Cap, with PTFE/White Silicone, Pre-slit	100



CC-C4000-V1	5184-3550		Micro-V™, Vial, Clear, 1.5 ml, Screw Top with 150 µl reservoir	100
CC-C4000-55B	5183-2076		Blue Screw Cap, with Blue PTFE/White Silicone, Pre-slit	100

Inserts for Vial of 2 mL Crimp Cap and Screw Cap



CC-C4010-630	5181-1270		300 µl Polyspring Glass Conical Insert, with graduation and polyspring support	100
CC-C4010-631	5181-3377		250 µl Flat Bottom Glass MicroSert.	500
CC-C4010-630P			300 µl Polyspring Conical Insert Polypropilene	100

Kit for Micro Insert Crimp Cap



TR-400013 + CC-4010-630 + TR-400012 Kit for Micro Insert Crimp Cap

Kit for Micro Insert Screw Cap



TR-400008 + CC-4010-630 + TR-400007B Kit for Micro Insert Screw Cap

Autosampler Vials, Closures and Inserts for HPLC WATERS ALLIANCE

Wide Opening Screw Thread Vials (6 mm neck opening, 9 mm Cap) 2 mL (12x32 mm), Caps and Septa



Cat.No	P/N Manufacturer	Description	Pk
CC-C4000-1	186000273	Vial, 2 ml, Clear, Wide Opening, Screw Top.	100
CC-C4000-54B	WAT058874+ WAT058875	Blue Screw Cap with Red PTFE/White Silicone	100



CC-C4000-1W	186000845	Vial, 2 ml Clear, Wide Opening Screw Top write-on patch with graduation 0.5, 1.0 and 1.5 ml	100
CC-C4000-55B	186000305	Blue Screw Cap, with Blue PTFE/White Silicone, Pre-slit	100



CC-C4000-LV2	186001130	Microvial, Fused Insert Amber 350 µl, Screw Top	100
CC-C4000-LV1	186001128	Macrovial, Fused Insert, 350 µl, Screw Top	100
CC-C4000-55B		Blue Screw Cap with Blue PTFE/White Silicone Pre-slit	100
CC-C4000-54B	WAT058874+ WAT058875	Blue Screw Cap with Red PTFE/White Silicone	100



CC-C4000-V1		Micro-V, Vial, Clear, 1.5 ml, Screw Top.	100
CC-C4000-55B	186000305	Blue Screw Cap, with Blue PTFE/White Silicone, Pre-slit	100



CC-C4010-630	WAT094170	300 µl Conical Glass Insert	100
CC-C4010-630P		300 µl Conical Insert, Polypropylene with graduation with polyspring support	100
CC-C4010-627L	WAT072704	350 µl Conical Glass Insert Pulled Point	100
CC-C4011-631	WAT072704	400 µl Glass Flat Bottom Insert	500

CC-C4010-630, 630P, 627L, 631

Wide Opening Screw Thread Vials, 2 mL (12x32 mm) (10-425) (6 mm neck opening, 10 mm Cap)



Cat.No	P/N Manufacturer	Description	Pk
CC-C4010-1	WAT063300	Vial, 2 ml (10-425) 12 x 32 mm, Clear, Wide Opening, Screw thread	100
CC-C4010-55BLK		Black Screw Cap (10-425) with Bue PTFE/Silicone, Pre-slit	100



CC-C4010-1W	186000845	Vial, 2 ml (10-425) 12 x 32 mm Clear, Wide Opening Screw Top write-on patch with graduation 0.5, 1.0 and 1.5 ml	100
CC-C4010-60BLK	WAT058875 + WAT058874	Black Screw Cap (10-425) with Red PTFE/ White Silicone	100



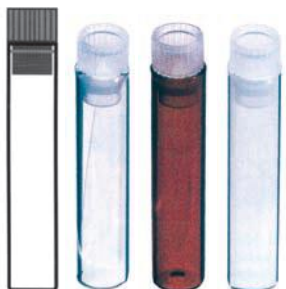
CC-C4010-2W		Vial, 2 ml (10-425) 12 x 32 mm Amber, Wide Opening Screw Top write-on patch with graduation 0.5, 1.0 and 1.5 ml	100
CC-C4010-55BLK		Black Screw Cap (10-425) with Bue PTFE/ White Silicone, Pre-slit	100

Wide Opening Screw Thread 4 mL Vial (15x45 mm) Screw Thread for Waters 48-Position Carrusel WISP Autosampler Vials



CC-C4015-11W	186000840	Vial, 4 ml (15x45 mm) Clear, Screw Top write-on patch with graduation 1.0, 2.0, 3.0 and 4.0 ml	100
CC-C4015-2W	186001135	Vial, 4 ml (15x45 mm) Amber, Screw Top write-on patch	100
CC-C4015-75A	186000841	Black Screw Cap (15x45) with Red PTFE/White Silicone	100
CC-C4015-55BLK	186000842	Black Screw Cap (15x45), Blue PTFE/White Silicone Pre-slit	100

Shell Vials, Sep Caps, 8x40 mm for Waters-96 Position Tray



CC-C4015-96	WAT025054	1 ml (8x40 mm) Clear Glass Shell vial with SepCap	200
CC-C4015-99	WAT025053	1ml (8x40 mm) AmberGlass Shell vial with SepCap	200
CC-C4015-95P		1ml (8x40 mm) Polypropylene Shell vial with SepCap	250

Autosampler Vials, Closures and Inserts for SHIMADZU (8-425)

Standard Opening 12x32 mm Screw Thread Vials, Caps and Septa

- Standard neck vial 8-425 thread finish, 12x32 mm outer profile
- Superior quality 33 expansion borosilicate clear glass (Type 1, Class A) or 51A amber glass
- Uniformity flat bottom for security inserts
- I-D™ vials feature write-on patch with graduations at 0.5, 1.0 and 1.5 mL
- Deactivated vials are Silanized or Kimshield™ pretreated



CC-C4013-12



CC-C4013-2W CC-C4013-1W

Cat.No	Max. Fill volume	Description	Pk
CC-C4013-1	1.8 mL	2 mL Vial Clear Glass	100
CC-C4013-1W	1.8 mL	2 mL Vial Clear Glass I-D w/patch	100
CC-C4013-2	1.8 mL	2 mL Vial Amber Glass	100
CC-C4013-2W	1.8 mL	2 mL Vial Amber Glass I-D w/patch	100
CC-C4013-12	150 µL	150 µL MicroVial™ Clear Solid Glass	100

Limited Volume Polypropylene and Glastic Vials with 8-425 Finish

- Polypropylene vials are an economical alternative to glass for some applications
- Precision-formed tips are designed to aid sample recovery for limited volume applications
- Glass TPX vial features pre-inserted glass insert



CC-C4013-15GST



CC-C4013-11, -13

Cat.No	Max. Fill volume	Description	Pk
CC-C4013-11	250 µL	250 µL Virgin Polypropylene MicroVial™	100
CC-C4013-13	650 µL	750 µL Virgin Polypropylene MicroVial™	1000
CC-C4013-15GST	100 µL	150 µL Clasic Glass Insert TPX MicroVial™	100

Assembled Caps and Septa for 8-425 Convenient standard Opening Vials for Shimadzu

- Pre-assembled caps and septa are convenient and minimize contamination from handling
- Phenolic caps can be autoclaved
- Kim-Lok cap/septum assemblies feature a molded centering ring to eliminate septum movement during injection
- Storage cap has a solid top and pre-inserted PTFE disk liner



Kim-Lok™ Caps
CC-C4013-61Y

Cat.No	Cap Type	Description	Pk
CC-C4013-63A	Open Top cap w/flange	Black polypropylene cap, Red PTFE/White silicone	100
CC-C4013-64W	Open Top cap w/flange	White polypropylene cap, Blue PTFE/White silicone-Pre-slit	100
CC-C4013-61Y	Kim-Lok cap w/flange	Yellow polypropylene cap, Kim-Lok Red PTFE/White silicone	100

Wide Opening Screw Thread Vial, 2 mL, 12x32 for Shimadzu (10-425), and Screw Cap



CC-C4010-1, CC-C4010-1W



CC-C4015-96 CC-C4015-96A

CC-C4010-LV1

Cat.No	Max. Fill volume	Description	Pk
CC-C4010-1	1.8 mL	2 mL Clear Glass Vial (10-425)	100
CC-C4010-1W	1.8 mL	2 mL Clear Glass Vial w/patch (10-425)	100
CC-C4010-LV1	1.8 mL	350 µL Fused Insert	100
CC-4010-35W		Polypropylene Open Top cap, White cap, Red PTFE/White Silicone for Shimadzu	100
CC-4010-35BLK		Polypropylene Open Top cap, Black cap, Red PTFE/White Silicone for Shimadzu	100
CC-C4015-96A	150 µL	Polyspring Borosilicate Glass Inserts, Conical with pulled-point interior.	100
CC-C4015-96	1 mL	Clear Borosilicate glass vials with SepCaps	200

Teknokroma Vials

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

Teknokroma Econo Vials 12 x 32 mm Crimp Cap Screw Top



Cat.No	Description	Pk
TR-400013	Vial, 2 ml Clear, Wide Opening Crimp Top Vial	100
TR-400012	11 mm Crimp Seal, with PTFE/Red Rubber, standard septum	100
TR-400021	11 mm Crimp Seal, with PTFE/Silicona septum	100



TR-400010	Vial 2 ml Clear, Wide Opening Crimp Top write-on patch	100
TR-400012	11 mm Crimp Seal, with PTFE/Red Rubber, standard septum	100
TR-400021	11 mm Crimp Seal, with PTFE/Silicona septum	100



TR-400011	Vial 2 ml Amber, Wide Opening Crimp Top write-on patch	100
TR-400012	11 mm Crimp Seal, with PTFE/Red Rubber, standard septum	100
TR-400021	11 mm Crimp Seal, with PTFE/Silicona septum	100



TR-400014	Vial 2 ml Clear (9-425), Wide Opening Screw Top	100
TR-400007B	Blue screw cap (9-425) with bonded PTFE/Silicone for wide opening vial	100
TR-400020	Blue screw cap (9-425) with bonded Blue PTFE/Silicone for wide opening vial Pre-Slit	100
TR-400025	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone pk	100
TR-400026	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone Pre-Slit	100



TR-400008	Vial 2 ml Clear (9-425), Wide Opening Screw Top write-on patch	100
TR-400007B	Blue screw cap (9-425) with bonded PTFE/Silicone for wide opening vial	100
TR-400020	Blue screw cap (9-425) with bonded Blue PTFE/Silicone for wide opening vial Pre-Slit	100
TR-400025	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone pk	100
TR-400026	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone Pre-Slit	100



TR-400003	Vial 2 ml Amber (9-425), Wide Opening Screw Top write-on patch	100
TR-400007B	Blue screw cap (9-425) with blue PTFE/Silicone for wide opening vial	100
TR-400020	Blue screw cap (9-425) with bonded Blue PTFE/Silicone for wide opening vial Pre-Slit	100
TR-400025	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone pk	100
TR-400026	Blue screw(9-425) Cap with Ring with Blue PTFE/Silicone Pre-Slit	100

Tk Teknokroma Head Space Vials



Teknokroma Econo Head Space Vials

Cat.No	Description	Pk
TR-400016	Rounded Bottom 10 ml 23 x 46 mm	238
TR-400017	Rounded Bottom 20 ml 23 x 75 mm	238
TR-400023	Rounded Bottom 10 ml 23 x 46 mm	100
TR-400024	Rounded Bottom 20 ml 23 x 75 mm	100

Crimpers, Decrimpers, and Decapping Pliers for 8 mm Top Vials



Cat.No	Description	Use	Pk
CC-C4008-100	Manual Crimper	Attaches 8 mm aluminium crimp seals	1
CC-C4008-101	Decapping Pliers	Removes 8 mm aluminium crimp seals	1
CC-C4008-102	Manual Decrimper	Removes 8 mm aluminium seals without vial damage	1

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 20mm Crimp Top and Screw Sample Vials

Cat.No	Vial Description	Volume/size	Pk
TR-000005	Clear, Crimp Top Vial	8 mL	100
TR-000004	Clear, Crimp Top Vial	12 mL	100
TR-000003	Clear, Crimp Top Vial	25 mL	100
TR-000001	Clear, Crimp Top Vial	60 mL	90
TR-000008	Amber, Crimp Top Vial	8 mL	100
TR-000007	Amber, Crimp Top Vial	12 mL	100
TR-000006	Amber, Crimp Top Vial	25 mL	144



Teknokroma Screw Thread Vials

Cat.No	Vial Description	Volume/size	Pk
TR-000013	Clear, Screw Thread Vial	12 mL	100
TR-000026	Clear, Screw Thread Vial	25 mL	100
TR-000012	Amber, Screw Thread Vial	8 mL	188
TR-000009	Amber, Screw Thread Vial	50 mL	78



Teknokroma Butil Stopper

Cat.No	Vial Description	Volume/size	Pk
TR-000029	Butil Stopper	13 mm	100
TR-000019	Butil Stopper	20 mm	500
TR-000031	Butil Stopper for Liofilized	20 mm	100



Teknokroma Aluminium Screw Caps

Cat.No	Vial Description	Volume/size	Pk
TR-000017	Aluminium Crimp Seal only	20 mm	500
TR-000027	Aluminium Crimp Seal only	13 mm	100



Teknokroma Solid Screws (without central hole)

Cat.No	Vial Description	Volume/size	Pk
TR-000021	Bakelite Screw Cap (without septa)	16 mm	100



Teknokroma Septum

Cat.No	Vial Description	Volume/size	Pk
TR-000018	Teflon silicone	20 mm	100



CC-4020-10 CC-4020-410 CC-4020-210



CC-4020-20 CC-4020-25

Cat.No	P/N Manufacturer	Description	Pk
CC-C4020-10	5182-0838	10 ml Vial, Flat Bottom 23 x 46 mm, Beveled Edge	100
CC-C4020-410		10 ml Vial, Flat Bottom 23 x 46 mm, Square Rim	1000
CC-C4020-210	5183-4475	10 ml Vial, Round Bottom 23 x 46 mm, Beveled Edge	100
CC-C4020-20		20 ml Vial, Flat Bottom 23 x 75 mm, Beveled Edge	100
CC-C4020-25		20 ml Vial, Flat Bottom 23 x 75 mm, Square Rim	1000
CC-C4020-2		20 ml Vial, Round Bottom 23 x 75 mm, Beveled Edge	100

20 mm Crimp Seals with Prefitted 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/Translucent Blue Silicone (-60 to +200°C)	100
CC-C4020-42AP	Pressure Release	Clear PTFE/Translucent 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

CC-C4020-102



CC-C4020-100

CC-C4020-101



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

Target® LoVial™ Wide Opening 12x32 Crimp Top Vials Tk



CC-C4011-1, 1W



CC-C4011-2W



CC-C4011-LV1



CC-C4011-1240



CC-C4011-LV1W-LV2W



CC-C4011-10

Target® LoVial™ Crimp Top Vials - Wide Opening 2 mL 12x 32

Cat.No	Vial Description	Maximum Fill Volume	Finish	Pk
CC-C4011-1	2 mL LoVial, 2 mL Clear Glass Vial	1.8 mL	Crimp	100
CC-C4011-1W	2 mL LoVial, 2 mL Clear Glass I-D Vial w/patch	1.8 mL	Crimp	100
CC-C4011-2	2 mL LoVial, 2 mL Amber Glass Vial	1.8 mL	Crimp	100
CC-C4011-2W	2 mL LoVial, 2 mL Amber Glass I-D Vial w/patch	1.8 mL	Crimp	100



CC-C4011-V2-V1

Microsampling Vials for use with 11 mm Aluminium Crimp Seals

Cat.No	Vial Description	Maximum Fill Volume	Finish	Pk
CC-C4011-LV1	MacroVial™ Fused Insert Snap-It Vial, Clear Glass	250 µL	Crimp/Snap	100
CC-C4011-LV1W	MacroVial™ Fused Insert Vial, Clear Glass I-D w/patch	250 µL	Crimp	100
CC-C4011-LV2	MacroVial™ Fused Insert Snap-It Vial, Amber Glass	250 µL	Crimp/Snap	100
CC-C4011-LV2W	MacroVial™ Fused Insert Vial, Amber Glass I-D w/patch	250 µL	Crimp	100
CC-C4011-10	Solid Glass MacroVial™	400 µL	Crimp	12
CC-C4011-V1	MicroV™ Clear Glass Microsampling Vial, 15 µL Reservoir	1.1 mL	Crimp	100
CC-C4011-V2	MicroV™ Amber Glass Microsampling Vial, 15 µL Reservoir	1.1 mL	Crimp	100
CC-C4011-9	1.5 mL High Recovery MicroVial	1.5 mL	Crimp	100
CC-C4011-1.7CB	1.7 mL Conical Bottom Crimp Top LoVial	1.1 mL	Crimp	1000
CC-C4011-1240	2.5 mL Clear Glass Crimp Top Vial 40 mm vial Height	2.3 mL	Crimp	1000
CC-C4011-1PT	900 µL Precision Taper Vial, Clear Glass	700 µL	Crimp	100



CC-C4011-1PT



CC-C4011-14

Deactivated Vials, Crimp Top

Cat.No	Vial Description	Maximum Fill Volume	Finish	Pk
CC-C4011-S1	2 mL Clear Glass Vial, NSC Silanized Crimp	1.8 mL	Crimp	100
CC-C4011-S1W	2 mL Clear Glass I-D Vial w/patch, NSC Silanized Crimp	1.8 mL	Crimp	100
CC-C4011-S2W	2 mL Amber Glass I-D Vial w/patch, NSC Silanized Crimp	1.8 mL	Crimp	100
CC-C4011-S9	1.5 mL High Recovery MicroVial, NSC Silanized Crimp	1.5 mL	Crimp	100
CC-C4011-K1W	2 mL Clear Glass I-D Vial w/patch, Kimshield™ Deactivated	1.8 mL	Crimp	100
CC-C4011-K2W	2 mL Amber Glass I-D Vial w/patch, Kimshield™ Deactivated	1.8 mL	Crimp	100



CC-C4011-13



CC-C4011-16

Limited Volume Plastic Crimp Top Vials

Cat.No	Vial Description	Residual Volume	Finish	Pk
CC-C4011-13	250 µL Virgin Polypropylene MicroVial™, Crimp/Snap	3 µL	Crimp/Snap	100
CC-C4011-16	350 µL Virgin Polypropylene MicroVial™, Crimp/Snap	5 µL	Crimp/Snap	100
CC-C4011-11	600 µL Virgin Polypropylene MicroVial™, Crimp/Snap	6 µL	Crimp/Snap	100
CC-C4011-14	800 µL Virgin Polypropylene Flat Bottom Vial, Crimp/Snap	30 µL	Crimp/Snap	100



CC-C4011-11

Aluminium Crimp Seals with Prefitted Septa for 12x32 mm Vials

Cat.No	Seal Description	Seal Color	Pk
CC-C4011-1AP	Clear PTFE/Red Rubber Standard GC septum	Silver	100
CC-C4011-2A	Red PTFE/White Silicone/Red PTFE for Aggressive Solvents	Silver	100
CC-C4011-3A	Polypropylene for Corrosive Solvents	Silver	100
CC-C4011-4A	Red PTFE/White Silicone, High Purity septum	Silver	100
CC-C4011-5A	Black Viton Elastomer, ECD, High Chemical Resistance	Silver	100



CC-C4011-2A, -3A, -4A, 5A

Tk Inserts for Lo Vial™ Crimp-Top & Snap-it Vials

Target Polyspring™ and Conical Inserts for Wide Opening Target vials



CC-C4010-630 CC-C4010-630P



CC-C4010-629L



CC-C4011-631

- These inserts all have a nominal O.D. of 6mm to fit Target wide opening vials
- Polyspring® inserts feature a polyethylene spring to center the bottom of the insert and to provide a cushion against needle contact.
- Precision point inserts minimize residual sample losses
- Deactivated inserts are Silinized or Kimshield™ pretreated

Cat.No	Insert Description	Pk
CC-C4010-630	Target Polyspring Borosilicate Glass Inserts. Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity.	100
CC-C4010-S630	Silinized Target Polyspring Borosilicate Glass Inserts Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity. Silinized to close off all active sites.	100
CC-C4010-630P	Target Polyspring Polypropylene Inserts. Conical with precision-formed interior and attached Polyspring. 250 µL capacity. Graduated volume marks.	100
CC-C4010-627L	Target Borosilicate Glass Inserts. Conical with pulled-point interior. 300 µL capacity.	
CC-C4010-629L	Target Borosilicate Glass Inserts. Conical with precision-formed mandrel interior. 300 µL capacity.	100
CC-C4010-S629	Silinized Target Borosilicate Glass Inserts. Conical with precision-formed mandrel interior. 300 µL capacity. Silinized to close off all active sites.	100

Target MicroSerts™ - Flat Bottom Inserts

- An economical, limited volume alternative
- Custom fit to Target vials, extremely flat bottom
- Won't push-up, protects syringe needle
- Easy, open-end identification from our exclusive coloured line at top of insert.

Cat.No	Vial Description	Maximum Fill Volume	Pk
CC-C4011-631	Target Borosilicate Glass MicroSerts. Flat Bottom, 400 µL capacity.		500
CC-C4011-S631	Silinized Target Borosilicate Glass MicroSerts. Flat Bottom, 400 µL capacity. Silinized to close off all active sites.		500

11 mm Crimping & Decapping Tools

- Use with any Target or standard-opening 2 mL, 12 x 32 mm crimp top vials



Cat.No	Description	Pk
CC-C4012-100	Manual Crimper, 11 mm	1
CC-C4012-101	Decapping Pliers, 11 mm	1
CC-C4012-102	Manual Decrimper, 11 mm	1

Vial Racks for all 2 mL, 12 x 32 mm Vials

- Polypropylene vial racks are resistant to most solvents
- Racks feature alphanumeric indexing for easier vial identification
- Racks can be stacked for efficient storage



Cat.No 1 pk	Description	Pk
CC-C4011-25	Polystyrene 2 mL, Storage Rack with Clear Lid, 100 holes, (10x10) with alpha-numeric indexing, with cover	1
CC-C4012-25	Polypropylene 2 mL, Vial Rack, 50 holes (5x10), with alpha-numeric indexing	1

Target™ Snap-It Glass Vials, Wide Opening 2 mL, 12x32



CC-C4011-5W

- Wide-opening 2 mL, 12 x 32 mm vial
- Borosilicate glass
- Meet extremely tight tolerances
- I-D™ vial with graduated write-on patch measures 0.5, 1.0 and 1.5 mL

Cat.No	Target Snap-It Vial Description	Pk
CC-C4011-5	Clear	100
CC-C4011-5W	Clear I-D (graduated write-on patch)	100
CC-C4011-6	Amber I-D	100
CC-C4011-6W	Amber I-D (graduated write-on patch)	100



CC-C4011-6W

Microsampling Vials for Use with Snap-It Snap Cap.

- Wide-opening, 12 x 32 mm vials
- Borosilicate glass
- Sample concentrations and injections in one vial, no transferring to limited volume inserts.



CC-C4011-LV1

Cat.No	Target Snap-It Vial Description	Pk
CC-C4011-4	Snap-It High Recovery Glass Vial, Clear glass, 1.5 mL with 30 µL reservoir	100
CC-C4011-LV1	Macroval™, Snap-It/Crimp, Clear glass, Fused 350 µL, Insert Vial	100
CC-C4011-LV2	Macroval™, Snap-It/Crimp, Amber glass, Fused 350 µL, Insert Vial	100
CC-C4011-V5	Micro-V™, Snap-It/Crimp Top, Clear glass microvial, 1.5 mL capacity, 15 µL reservoir	100
CC-C4011-V6	Micro-V™, Snap-It/Crimp Top, Amber glass microvial, 1.5 mL capacity, 15 µL reservoir	100
CC-C4011-11	Virgin Polypropylene, Microvial, Crimp/Snap-It, 450 µL capacity , 6 µL residual	100
CC-C4011-14	Virgin Polypropylene, Microvial, Crimp/Snap-It, 700 µL capacity, Flat bottom, 30 µl residual	100



CC-C4011-V5

Target Crim & Snap-It Seals



CC-C4011-4

Seals 11 mm Crimp Seals with Septa for all 2 mL, 12x32 mm Crimp Top Vials

Cat.No	Seal Colors	Septa	Pk
CC-C4011-1AP	Silver	Standard, Clear PTFE/Red Rubber	100

11 mL Snap-It™ Seals with Septa for all 2 mL, 12x32 mm Snap-It Vials

- Eliminates tedious crimping
- Effective Evaporation resistant closure - apply with simple thumb pressure

Cat.No	Seal Colors	Septa	Pk
CC-C4011-50	Clear	Integral Molded Polyethylene, Single Use Economy	100
CC-C4011-51B	Blue	Natural Rubber Septa, PTFE/Red Rubber	100
CC-C4011-52	Clear	Highly Inert Virgin PTFE	100
CC-C4011-53B	Blue	Red PTFE/White Silicone/Red PTFE for Aggressive Solvents	100
CC-C4011-54G	Green	High Purity Septum, Red PTFE/White Silicone	100
CC-C4011-55B	Blue	Pre-Slit Blue PTFE/White Silicone	100

Tk Target Screw Thread Vials, Caps & Septa (10-425)



CC-C4010-2 CC-C4010-2W

Target Screw Thread Vials (10-425) wide opening 2 mL, 12 x 32 mm

- Wide neck accommodates wide 10-425 Thread cap
- Borosilicate glass
- Uniformly flat bottom for security with inserts
- I-D™ vial with write-on patch measures 0.5, 1.0 and 1.5 mL
- **Vial used for Shimadzu and Varian.**

Cat.No	Target Screw Thread Vial Description	Pk
CC-C4010-1	Clear Glass 2 mL	100
CC-C4010-1W	Clear I-D (graduated write-on patch) Glass 2 mL	100
CC-C4010-2	Amber Glass 2 mL	100
CC-C4010-2W	Amber I-D (graduated write-on patch) Glass 2 mL	100
CC-C4010-SI	Silanzed, Clear I-D Glass 2 mL	100
CC-C4010-S1W	Silanzed, Clear I-D (graduated write-on patch) Glass 2 mL	100
CC-C4010-S2W	Silanzed, Amber I-D (graduated write-on patch) Glass 2 mL	100



CC-C4010-11 CC-C4010-14

Target Microsampling Screw Thread Vials

- Wide-opening, 12 x 32 mm vials. Accommodates wide 10-425 Thread Cap.
- Sample concentrations and injections in one vial - no transferring to limited volume inserts
- Borosilicate glass or virgin polypropylene
- Glastic™ vial has clear plastic TPX body with glass flanged insert molded to interior.

Cat.No	Seal Colours	Septa	Pk
CC-C4010-11	Virgin Polypropylene, Microvial 375 µL capacity		100
CC-C4010-14	Virgin Polypropylene, Microvial 550 µL capacity, High Recovery Vial		100
CC-C4010-V1	Micro-V™, Clear glass microvial, 1.5 mL capacity, 150 µL reservoir		100
CC-C4010-LV1	Macroval™, Clear glass, 350 µL fused Insert		100
CC-C4010-V2	MicroV™, 1.5 mL. Tapered Microvial with 150 µL reservoir, Amber glass,		100
CC-C4010-LV2	Macroval™, 350 µL Fused Insert Vial, Amber glass		100



CC-C4010-LV1

Target 10 mm Screw with Septa (10-425)



- Pre-assembled caps with septa
- 10-425 thread finish

Cat.No	Cap Colours	Septa	Pk
CC-C4010-30A	Light Blue	Ivory PTFE/Red Rubber	100
CC-C4010-35W*	White	Shimadzu Red PTFE/White Silicone	100
CC-C4010-35BLK*	Black	Shimadzu Red PTFE/White Silicone	100
CC-C4010-40A	Light Blue	Red PTFE/White Silicone/Red PTFE	100
CC-C4010-55A	Light Blue	Pre-Slit Blue PTFE/White Silicone	100
CC-C4010-55BLK	Black	Pre-Slit Blue PTFE/White Silicone	100
CC-C4010-60A	Light blue	Red PTFE/White Silicone	100
CC-C4010-60BLK	Black	Red PTFE/White Silicone	100

* Screw Caps for Shimadzu



CC-C4010-V1

Target Screw Thread Caps, Inserts & Vial Kits **Tk**



CC-C4010-630 CC-C4010-630P CC-C4011-631

Target Polyspring™ and MicroSert™ Inserts

- Eliminates dead volume - with correct autosampler default setting
- Damage-free syringe needle hits
- Allows complete sample extraction
- Shock-absorbing Polyspring or economical MicroSert
- Self-aligning, stands straight
- Easy, open-end identification from our exclusive coloured line at top of MicroSert

Cat.No	Insert Description	Pk
CC-C4010-630	Target Polyspring Borosilicate Glass Inserts, Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity.	100
CC-C4010-S630	Silanized Target Polyspring Borosilicate Glass Inserts, Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity. Silanized to close off all active sites.	100
CC-C4010-630P	Target Polyspring Polypropylene Inserts, Conical with precision-formed interior and attached Polyspring. 250 µL capacity. Graduated volume marks.	100
CC-C4010-631	Target Borosilicate Glass MicroSerts. Flat Bottom 400 µL capacity.	100

Pre-Assembled Kits - Target Screw Thread (10-425) - 12x32 mm in Storage Rack

- Assembled kits include 100 vials with pre-attached caps and septa
- Packed in convenient vial trays with clear covers
- Vial trays are stackable for easy storage
- Vial trays hold vials upright for easy filling and maintaining sample order

Cat.No	Target Screw Thread Vials	Cap Colours	Septa Cat.Nbr.	Septa	Pk
CC-C4010-17	CC-C4010-1, Clear Glass	Light Blue	CC-C4010-60A	PTFE/Silicone	100
CC-C4010-17A	CC-C4010-2, Amber Glass	Light Blue	CC-C4010-60A	PTFE/Silicone	100
CC-C4010-17AW	CC-C4010-2W, Amber Glass I-D™	Light Blue	CC-C4010-60A	PTFE/Silicone	100
CC-C4010-17BLK	CC-C4010-1, Clear Glass	Black	CC-C4010-60BLK	PTFE/Silicone	100
CC-C4010-17ABLK	CC-C4010-2, Amber Glass	Black	CC-C4010-60BLK	PTFE/Silicone	100
CC-C4010-17W	CC-C4010-1W, Clear Glass I-D™	White	CC-C4010-60A	PTFE/Silicone	100
CC-C4010-19	CC-C4010-1, Clear Glass	Light Blue	CC-C4010-40A	PTFE/Silicone/PTFE	100
CC-C4010-19A	CC-C4010-2, Amber Glass	Light Blue	CC-C4010-40A	PTFE/Silicone/PTFE	100
CC-C4010-19AW	CC-C4010-2W, Amber Glass I-D™	Light Blue	CC-C4010-40A	PTFE/Silicone/PTFE	100
CC-C4010-19W	CC-C4010-1W, Clear Glass I-D™	Light Blue	CC-C4010-40A	PTFE/Silicone/PTFE	100
CC-C4010-S19W	CC-C4010-S1W, Clear I-D™ Silinized	Light Blue	CC-C4010-40A	PTFE/Silicone/PTFE	100
CC-C4010-S20W	CC-C4010-S1W, Clear I-D™ Silinized	Light Blue	CC-C4010-55A	PTFE/Silicone-Pre-Slit	100
CC-C4010-21	CC-C4010-1, Clear Glass	Light Blue	CC-C4010-1A/CC-C4010-10	Solid PTFE	100
CC-C4010-21A	CC-C4010-2, Amber Glass	Light Blue	CC-C4010-1A/CC-C4010-10	Solid PTFE	100
CC-C4010-21W	CC-C4010-1W, Clear Glass I-D™	Light Blue	CC-C4010-1A/CC-C4010-10	Solid PTFE	100
CC-C4010-21AW	CC-C4010-2W, Amber Glass	Light Blue	CC-C4010-1A/CC-C4010-10	Solid PTFE	100
CC-C4010-24W	CC-C4010-1W, Clear Glass I-D™	Light Blue	CC-C4010-65A	PTFE/Silicone-Start-Slit	100
CC-C4010-24AW	CC-C4010-2W, Amber Glass I-D™	Light Blue	CC-C4010-65A	PTFE/Silicone-Start-Slit	100
CC-C4010-57	CC-C4010-1, Clear Glass	White	CC-C4010-35W	PTFE/Silicone, Shimadzu®	100
CC-C4010-57A	CC-C4010-2, Amber Glass	White	CC-C4010-35W	PTFE/Silicone, Shimadzu®	100
CC-C4010-57W	CC-C4010-1W, Clear Glass I-D™	White	CC-C4010-35W	PTFE/Silicone, Shimadzu®	100
CC-C4010-57AW	CC-C4010-2W, Amber Glass I-D™	White	CC-C4010-35W	PTFE/Silicone, Shimadzu®	100
CC-C4010-67	CC-C4010-1, Clear Glass	Black	CC-C4010-35BLK	PTFE/Silicone, Shimadzu®	100
CC-C4010-67A	CC-C4010-2, Amber Glass	Black	CC-C4010-35BLK	PTFE/Silicone, Shimadzu®	100
CC-C4010-67W	CC-C4010-1W, Clear Glass I-D™	Black	CC-C4010-35BLK	PTFE/Silicone, Shimadzu®	100
CC-C4010-67AW	CC-C4010-2W, Amber Glass I-D™	Black	CC-C4010-35BLK	PTFE/Silicone, Shimadzu®	100

Tk Target DP™ Vials & Caps (9-425)



CC-C4000-1

Target DP™ Glass Vials 12x32 mm Screw Thread Glass Vials (9-425)

- Wide Opening 2 mL, 12 x 32 mm vial
- Borosilicate glass
- Fits rotating or robotic arm autosampler trays
- Easy microsample testing with our Microvolume Inserts

Cat.No	Target DP Vial Description	Pk
CC-C4000-1	Clear Glass 2 mL	100
CC-C4000-1W	Clear Glass I-D (graduated write-on patch) 2 mL	100
CC-C4000-2W	Amber Glass I-D (graduated write-on patch) 2 mL	100
CC-C4000-S1	Silanized, Clear Glass 2 mL	100
CC-C4000-S1W	Silanized, Clear Glass I-D (graduated write-on patch) 2 mL	100
CC-C4000-S2W	Silanized, Amber Glass I-D (graduated write-on patch) 2 mL	100



CC-C4000-LV1

CC-C4000-2W

Target DP™ Microsampling Vials

- Wide Opening 12 x 32 mm vials
- Sample concentrations and injections in one vial - no transferring to limited volume inserts
- Borosilicate glass

Cat.No	Target DP Vial Description	Pk
CC-C4000-9	High Recovery, Clear glass, 1.5 mL with 30 µL reservoir	100
CC-C4000-S9	Silanized, High Recovery, Clear glass, 1.5 mL with 30 µL reservoir	100
CC-C4000-9A	High Recovery, Amber I-D glass, 1.5 mL with 30 µL reservoir	100
CC-C4000-LV1	Macroval™, Clear glass, Fused 350 µL Insert vial	100
CC-C4000-LV2	Macroval™, Amber glass, Fused 350 µL Insert vial	100
CC-C4000-V1	Micro-V™, Clear glass microvial, 1.5 mL capacity, 150 µL reservoir	100
CC-C4000-V2	Micro-V™, Amber glass microvial, 1.5 mL capacity, 150 µL reservoir	100



CC-C4000-V2



CC-C4000-9

Target DP™ Polypropylene Caps (no septa)

- An economical choice - purchase caps only and replace septa when needed
- Chose from our five colours for separating assays, lots, and standards

Cat.No	Cap Colour	Pk
CC-C4000-98B	Blue (open top)	100



Target DP™ Septa

Cat.No	Septa Description	Pk
CC-C4000-30	Ivory PTFE/Red Rubber	100
CC-C4000-40	Red PTFE/White Silicone/Red PTFE for use with aggressive solvents	100
CC-C4000-55	Pre-Slit Blue PTFE/White Silicone	100
CC-C4000-57	Pre-Slit Ivory PTFE/Red Rubber	100
CC-C4000-60	Red PTFE/White Silicone for high sensibility chromatography	100





Assembled Target DP Caps with Septa (9-425)

- Convenient screw thread cap with profile design of crimp seal
- No crimping or decapping tools needed
- Easy-on, easy-off convenience with just half-a-turn
- Precision positioned septa form evaporation-proof seal
- Full compatibility with all Target DP components

Cat.No	Cap Colours	Septa	Pk
CC-C4000-51G	Green	Ivory PTFE/Red Rubber	100
CC-C4000-53B	Blue	Red PTFE/White Silicone/Red PTFE	100
CC-C4000-54R	Red	Red PTFE/White Silicone	100
CC-C4000-55B	Blue	Pre-Slit Blue PTFE/White Silicone	100

Target Polyspring™ Inserts



CC-C4010-630 CC-C4010-630P

- Eliminates dead volume - with correct autosampler default setting
- Damage-free syringe needle injections
- Permits maximum sample extraction
- Shock-absorbing Polyspring
- Self-aligning, stands straight

Cat.No	Insert Description	Pk
CC-C4010-630	Target Polyspring Borosilicate Glass Inserts, Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity.	100
CC-C4010-S630	Silanized Target Polyspring Borosilicate Glass Inserts, Conical with precision-formed mandrel interior and attached Polyspring. 250 µL capacity. Silanized to close off all active sites.	100
CC-C4010-630P	Target Polyspring Polypropylene Inserts, Conical with precision-formed interior and attached Polyspring. 250 µL capacity. Graduated volume marks.	100



CC-C4011-631

Target MicroSerts™ - Flat Bottom Inserts

- An economical, limited volume alternative
- Custom fit to Target vials - extremely flat bottom
- Easy, open-end identification from our exclusive coloured line at top of insert

Cat.No	Septa Description	Pk
CC-C4011-631	Target Borosilicate Glass MicroSerts. Flat Bottom. 400 µL capacity.	100
CC-C4011-S631	Silanized Target Borosilicate Glass MicroSerts. Flat Bottom. 400 µL capacity.	100

Tk 4 mL 15x45 mm Screw Thread Vials, Caps, Septa & Inserts



CC-C4015-11W CC-C4015-2W

Screw Thread 4 mL Glass Vials 15x45 mm.

- 4 mL, 45 mm vial, 15-425 Thread
- Borosilicate glass

Cat.No	4 mL Screw Thread Vial Description	Pk
CC-C4015-1	15x45mm Clear glass	100
CC-C4015-11W	15x45mm Clear glass I-D™ (graduated write-on patch)	100
CC-C4015-2	15x45mm Amber glass	100
CC-C4015-2W	15x45mm Amber glass I-D™ (graduated write-on patch)	100
CC-C4015-S1	15x45mm Silanized, Clear glass	100
CC-C4015-S2	15x45mm Silanized, Amber glass	100



Screw Caps for 4 mL Thread Vials

- CC-C4015-5A SepCap has integral septa made of 0.25 mm polypropylene - no septa to order
- CC-C-4015-30A, CC-C4015-40A, CC-C4015-75A, CC-C4015-45W, are pre-assembled with septa

Cat.No	Cap & Septa Description	Pk
CC-C4015-1A	Black Open Top Screw Cap (no septa)	100
CC-C4015-1W	White Open Top Screw Cap (no septa)	100
CC-C4015-5A	SepCaps with 0.25 mm Polypropylene Septa	100
CC-C4015-30A	Black Screw Cap with Ivory PTFE/Red Rubber	100
CC-C4015-40A	Black Screw Cap with Red PTFE/White Silicone/Red PTFE	100
CC-C4015-75A	Black Screw Cap with Red PTFE/White Silicone, 1.90 mm	100
CC-C4015-45W	White Screw Cap with Red PTFE/White Silicone, 1.15 mm	100
CC-C4015-55BLK	Black Screw Open Top Cap, Polypropylene Septa, Blue PTFE/White Silicone Pre-Slit	100

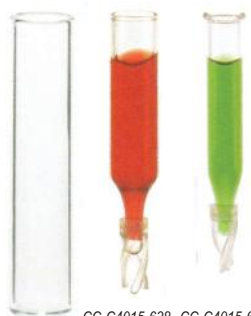


13 mm Septa for 4 mL Screw Caps

Cat.No	Septa Description	Pk
CC-C4015-10	White Virgin PTFE, 0.25 mm, single use	100
CC-C4015-45	Red PTFE, White Silicone, 1.15 mm for thin gauge needles	100
CC-C4015-30	Ivory PTFE, Red Rubber for general chromatography	100
CC-C4015-40	Red PTFE, White Silicone/Red PTFE for aggressive solvents	100

Polyspring™ Glass Inserts - for 15x45, 4 mL Screw vials

- Eliminates dead volume - with correct autosampler default setting
- Damage-free syringe injections
- Permits maximum sample extractions
- Shock-absorbing Polyspring
- Self-aligning, stands straight



CC-C4015-843

CC-C4015-638 CC-C4015-641

Cat.No	Insert Description	Pk
CC-C4015-638	Polyspring Borosilicate Glass Inserts, Conical with pulled-point interior 700 µL capacity.	100
CC-C4015-641	Polyspring Borosilicate Glass Inserts, Conical with pulled-point mandrel interior. Flange at top of insert. 500 µL capacity.	100
CC-C4015-843	MicroSert™, Glass Flat Bottom Insert 1000 µL capacity.	100
CC-C40105-S641	Silanized Borosilicate Polyspring Glass Inserts, Conical with pulled-point mandrel interior. Flange at top of insert. 500 µL capacity.	100

Assembled 4 mL Screw Thread Vial Kits



- Assembled kits include 100 vials with pre-attached caps and septa
- Packaged in convenient vial trays with clear covers or in polybags
- Vial trays are stackable for easy storage and feature alphanumeric indexing
- Vial trays hold vials upright for easy filling and maintaining sample order

Cat.No	4 mL Vials	Cap Colour	Septa	Pk
CC-C4015-17	CC-C4015-1, Clear Glass	Black	CC-C4015-75A Red PTFE/White Silicone	100
CC-C4015-17AW	CC-C4015-2W, Amber Glass I-D	Black	CC-C4015-75A Red PTFE/White Silicone	100
CC-C4015-21	CC-C4015-1, Clear Glass	Black	CC-C4015-1A/4015-10 White Virgin PTFE	100
CC-C4015-21AW	CC-C4015-2AW, Amber Glass I-D	Black	CC-C4015-1A/4015-10 White Virgin PTFE	100



Unassembled 4mL Screw Thread Vial Convenience Kits

- Include 100 vials and 100 caps with pre-assembled septa
- All items remain handy and dusty-free
- Caps with pre-inserted septa are not attached to vials - packed in polybags.

Cat.No	4 mL Screw Thread Vials	Cap with Septa	Pk
CC-C4015-88	CC-C4015-1 Clear	CC-C4015-75A Black Cap with Red PTFE/White Silicone	100
CC-C4015-88AW	CC-C4015-2W Amber I-D	CC-C4015-75A Black Cap with Red PTFE/White Silicone	100

1 mL 8x40 mm SepCap Vials for Waters WISP™ autosamplers



CC-C4015-96 CC-C4015-99

- 1 mL, 8 x 40 mm
- For Waters 96 Position Tray
- SepCaps' starburst center design at 0.25 mm eases syringe needle penetration
- Ridge on SepCap underside centers limited volume insert
- SepCap design allows for easy push-in, pull-out from vial

Cat.No	1 mL Vial Description	Pk
CC-C4015-96	1 mL, Clear Borosilicate glass vials with SepCaps	200
*CC-C4015-99	1 mL, Amber Borosilicate glass vials with SepCaps	200
CC-C4015-95P	1 mL, Virgin Polypropylene SepCap vials with SepCaps	250

* Used by Shimadzu AOC-14/1400, LC-10A, SIL6B, SIL-94

Polyspring™ Glass Inserts for 8x40 mm - 1 mL SepCap Vials

- Eliminates dead volume - with correct autosampler default setting
- Damage-free syringe needle injections
- Permits maximum sample extraction
- Shock-absorbing Polyspring
- Self-aligning, stands straight



CC-C4015-96A CC-C4015-96PA

Cat.No	Insert Description	Pk
*CC-C4015-96A	Polyspring Borosilicate Glass Inserts, Conical with pulled-point interior. 150 µL capacity.	100
CC-C4015-S96A	Silanized Polyspring Borosilicate Glass Inserts, Conical with pulled-point interior. 150 µL capacity. Silanized to close off all active sites.	100
CC-C4015-96PA	Polyspring Polypropylene Inserts, Conical with precision-formed interior and attached Polyspring. 200 µL capacity. Guaranteed volume marks	100

* Used by Shimadzu AOC-14/1400, LC-10A, SIL6B, SIL-94

Tk Sample Storage Vials & Closures



Sample Storage Vials

- Borosilicate glass
- Eliminates leaching of ions
- Provides consistent pH for duration of sample storage lite

Cat.No	Glass	Capacity mL	Capacity Drams	Use Cap Size	Vial Size mm	Pk
CC-B7999-1	Clear	2.0	0.5	8-425	12 x 32	100
CC-B7999-2	Clear	4.0	1	13-425	15 x 45	100
CC-B7999-3	Clear	8.0	2	15-425	17 x 60	200
CC-B7999-12	Clear	12.0	3	15-425	19 x 65	200
CC-B7999-4	Clear	16.0	4	18-400	21 x 70	200
CC-B7999-5	Clear	22.0	6	20-400	23 x 85	200
CC-B7999-6	Clear	40.0	10	24-400	28 x 95	100
CC-B7999-1A	Amber	2.0	0.5	8-425	12 x 32	100
CC-B7999-2A	Amber	4.0	1	13-425	15 x 45	100
CC-B7999-3A	Amber	8.0	2	15-425	17 x 60	200
CC-B7999-12A	Amber	12.0	3	15-425	19 x 65	200
CC-B7999-4A	Amber	16.0	4	18-400	21 x 70	200
CC-B7999-6A	Amber	40.0	10	24-400	28 x 95	100



Screw Caps for Sample Storage Vials

- Polypropylene screw cap won't contaminate sample with syringe needle insertion - unlike phenolic caps that can flake
- Open top without septa

Cat.No	Cap Size	Description	Pk
CC-B7807-8	8-425	Black Open top Cap, Polypropylene	100
CC-B7807-13	13-425	Black Open top Cap, Polypropylene	100
CC-B7807-15	15-425	Black Open top Cap, Polypropylene	100
CC-B7807-18	18-400	Black Open top Cap, Polypropylene	100
CC-B7807-20	20-400	Black Open top Cap, Polypropylene	100
CC-B7807-24	24-400	Black Open top Cap, Polypropylene	100
CC-C4013-66	8-425	Black Open top Cap, Phenolic	1000
CC-C4015-66	13-425	Black Open top Cap, Phenolic	1000



PTFE/Silicone Septa for Sample Screw Caps

- Extremely clean, natural-coloured PTFE laminated to clear Silicone

Cat.No	PTFE	Silicone	Fits Cap	Pk
CC-B7995-8	0.25 mm	0.125 mm	8-425	100
CC-B7995-13	0.25 mm	0.125 mm	13-425	100
CC-B7995-15	0.25 mm	2.30 mm	15-425	100
CC-B7995-18	0.25 mm	2.30 mm	18-400	100
CC-B7995-20	0.25 mm	2.30 mm	20-400	100
CC-B7995-24	0.25 mm	2.30 mm	24-400	100
CC-B7995-26	0.125 mm	3.05 mm	24-400	100



PTFE-Lined Sample Storage Caps. Solid Top Cap

- PTFE on film/foam backing offers broad chemical resistance
- Not autoclavable • Solid top Cap

Cat.No	Thread Size	Color	Pk
CC-B7815-8	8-425	White	100
CC-B7815-13	13-425	White	100
CC-B7815-15	15-425	White	100
CC-B7815-18	18-400	White	100
CC-B7815-20	20-400	White	100
CC-B7815-24	24-400	White	100

Sample Storage Vials Convenience Kits & EPA Vials **Tk**



Non-Assembled Convenience Kits - Sample Vials with PTFE-Lined Storage Caps

- Each carton contains shrink-wrapped vials and PTFE-lined caps in plastic bags

Cat.No	Glass	Capacity mL	Capacity Drams	Use Cap Size	Vial Size mm	Pk
CC-B7800-1	Clear	2	0.5	8-425	12 x 32	100
CC-B-7800-2	Clear	4	1	13-425	15 x 45	100
CC-B7800-3	Clear	8	2	15-425	17 x 60	200
CC-B7800-12	Clear	12	3	15-425	19 x 65	200
CC-B7800-4	Clear	16	4	18-400	21 x 70	200
CC-B7800-20	Clear	20	5	18-400	21 x 70	100
CC-B7800-5	Clear	22	6	20-400	23 x 85	200
CC-B7800-6	Clear	40	10	24-400	28 x 95	100
CC-B7800-1A	Amber	2	0.5	8-425	12 x 32	100
CC-B7800-2A	Amber	4	1	13-425	15 x 45	100
CC-B7800-3A	Amber	8	2	15-425	17 x 60	200
CC-B7800-12A	Amber	12	3	15-425	19 x 65	200
CC-B7800-4A	Amber	16	4	18-400	21 x 70	200
CC-B7800-6A	Amber	40	10	24-400	28 x 95	100



Non-Assembled Convenience Kits - Sample Vials with Caps & Septa

- Each carton contains shrink-wrapped vials and separately packed caps
- Great packaging for storerooms or laboratory cabinets

Cat.No	Glass	Capacity mL	Capacity Drams	Use Cap Size	Vial Size mm	Pk
CC-B7990-1	Clear	2	0.5	8-425	12 x 32	100
CC-B-7990-2	Clear	4	1	13-425	15 x 45	100
CC-B7990-3	Clear	8	2	15-425	17 x 60	200
CC-B7990-12	Clear	12	3	15-425	19 x 65	200
CC-B7990-4	Clear	16	4	18-400	21 x 70	200
CC-B7990-5	Clear	22	6	20-400	23 x 85	200
CC-B7990-6	Clear	40	10	24-400	28 x 95	100
CC-B7990-1A	Amber	2	0.5	8-425	12 x 32	100
CC-B7990-2A	Amber	4	1	13-425	15 x 45	100
CC-B7990-3A	Amber	8	2	15-425	17 x 60	200
CC-B7990-12A	Amber	12	3	15-425	19 x 65	200
CC-B7990-4A	Amber	16	4	18-400	21 x 70	200
CC-B7990-6A	Amber	40	10	24-400	28 x 95	100



EPA Vials with Caps and Septa

- Each carton contains shrink-wrapped vials and separately packed caps
- Great packaging for storerooms or laboratory cabinets

Cat.No	Description	Pk
CC-B7950-B	Clear 40 mL vials, PTFE/Silicone Septa and Caps	100
CC-B7951-B	Amber 40 mL vials, PTFE/Silicone Septa and Caps	100
CC-B7920-B	Clear 20 mL vials, PTFE/Silicone Septa and Caps	100
CC-B7921-B	Amber 20 mL vials, PTFE/Silicone Septa and Caps	100



EPA Vial Components

Cat.No	Description	Pk
CC-B7950-VO	Clear, 40 mL, 28 x 95 mm vials	100
CC-B7951-VO	Amber, 40 mL, 28 x 95 mm vials	100
CC-B7920-VO	Clear, 20 mL, 28 x 57 mm vials	100
CC-B7921-VO	Amber, 20 mL, 28 x 57 mm vials	100
CC-B7950-1A	Caps Only, 24-400	100
CC-B7995-24	Septa Only, 0.01 PTFE/0.09" Silicone	100

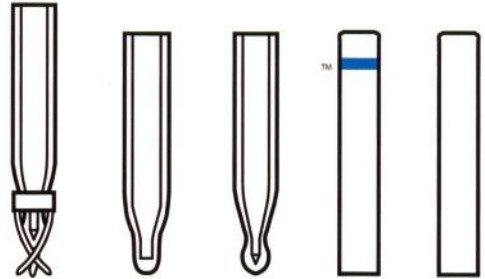
TK Vial Comparison Chart

Target DP™ Vials - 12 x 32 mm



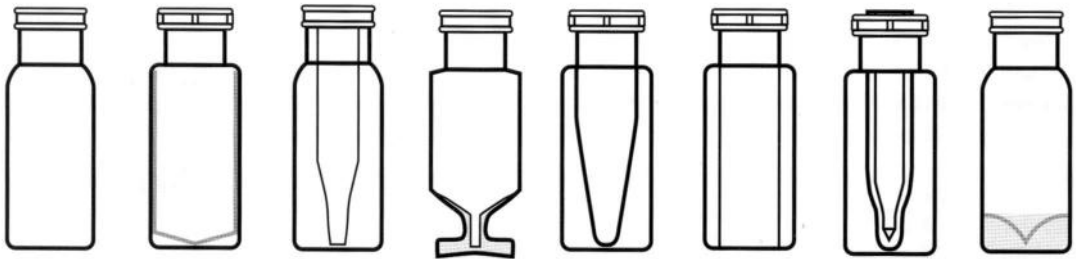
CC-C4000-1 2 mL
 CC-C4000-9 1.5 mL
 CC-C4000-LV1 350 µL
 CC-C4000-V1 1.5 mL

Target™ Microvolumen Inserts



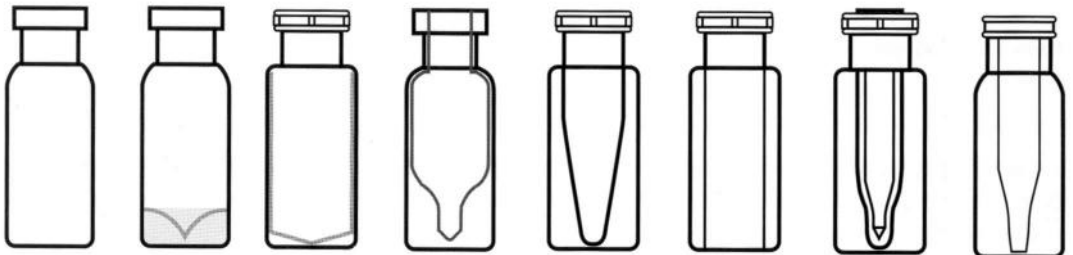
CC-C4010-630 6 x 31 mm 250 µL
 CC-C4010-627L 6 X 31 mm 300 µL
 CC-C4010-629L 6 x 31 mm 300 µL
 CC-C4011-631 6 X 31 mm 400 µL
 CC-C4010-631P 6 X 31 mm 300 µL

Target™ Snap-It-Vials - 12 x 32 mm



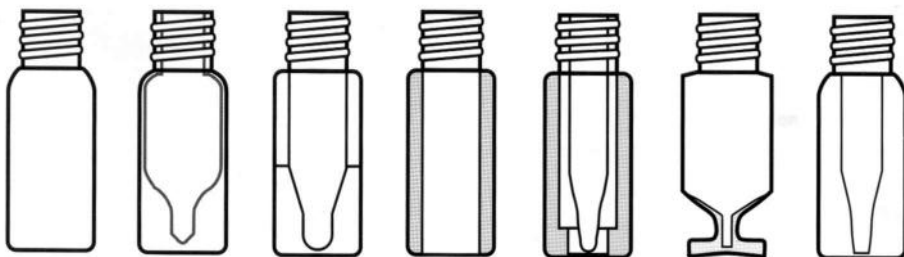
CC-C4011-5 2 mL
 CC-C44011-24 700 µL
 CC-C4011-LV1 350 µL
 CC-C4011-V5 1.5 mL
 CC-C4011-11 450 µL
 CC-C4011-14 700 µL
 CC-C4012-15 250 µL
 CC-C4011-4 1.5 mL

Target™ Crimp Top Vials - 12 x 32 mm



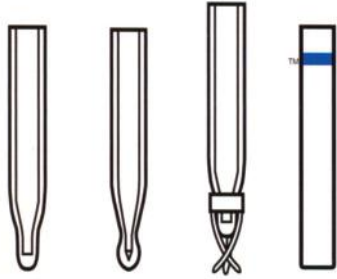
CC-C4011-1 2 mL
 CC-C4011-9 1 mL
 CC-C4011-24 700 µL
 CC-C4011-10 400 µL
 CC-C4011-11 450 µL
 CC-C4011-14 700 µL
 CC-C4012-15 250 µL
 CC-C4011-LV1 350 µL

Target™ Screw Thread Vials - 12 x 32 mm



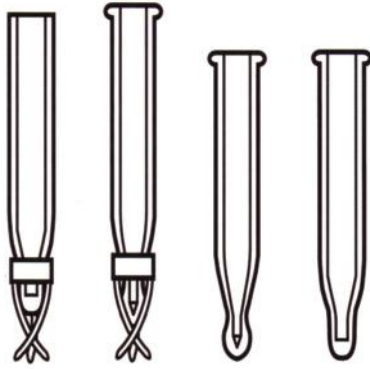
CC-C4010-1 2 mL
 CC-C4010-12 450 µL
 CC-C4010-11 375 µL
 CC-C4010-14 650 µL
 CC-C4010-15 250 µL
 CC-C4010-V1 15 mL
 CC-C4010-LV1 350 µL

Standard Microvolume Inserts



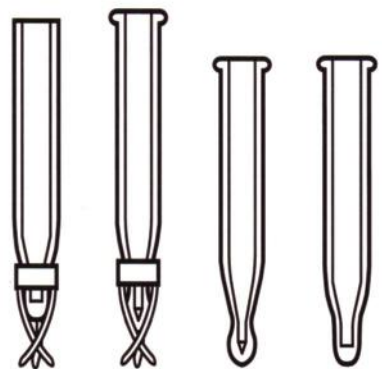
CC-C4012-529L 5 X 31 mm 150 µL
 CC-C4012-531L 5 X 31 mm 150 µL
 CC-C4012-530 5 X 29 mm 150 µL
 CC-C4012-465 5 X 31 mm 200 µL

15x45 4 mL Vial Microvolume Inserts



CC-C4015-638 6 x 38 mm 700 µL
 CC-C4015-641 6 X 41 mm 500 µL
 CC-C4015-642 6 x 42 mm 500 µL
 CC-C4015-643 6 X 42 mm 500 µL

8x40 mm Vials 1 mL Vial Microvolume Inserts



CC-C4015-96A 5 X 36 mm 150 µL
 CC-C4015-96PA 6 X 29 mm 200 µL
 CC-C4015-536 5 X 36 mm 150 µL
 CC-C4015-96P 6 X 29 mm 200 µL

Standard 4mL 15 x 45 mm



CC-C4015-1 4 mL
 CC-C4015-48 4 mL
 CC-C4015-96 1 mL

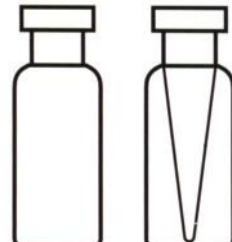
Standard Opening Screw Thread Vials 12 x 32 mm



CC-C4013-1 2 mL
 CC-C4013-12 150 µL
 CC-C4013-11 200 µL

8 mm Crimp Top Vials

Standard Opening Crimp Top Vials 12 x 32 mm



CC-C4012-1 2 mL
 CC-C4012-10 150 µL

Headspace Vials - 23 x 75 mm & 23 x 46 mm



CC-C4020-20 20 mL
 CC-C4020-10 10 mL
 CC-C4020-2 20 mL
 CC-C4020-210 10 mL



Hamilton Syringes

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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 Accuracy 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** - ground glass tip with a cemented needle: not recommended for use with halogenated solvents, such as MeCL₂
- **TEFLON™ Luer Lock** - can be used with luer (Metal of Kel-F®) hub needles, TEFLON® tubing assemblies and connectors can be used, offer flexibility.
- **Cemented** - not recommended for use with halogenated solvents, such as MeCL₂
- **Luer Tip** - 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** - advantageous for laboratories with multiple users; economical since you can replace the needle without having to purchase a new syringe
- **Knurled Hub** - 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.

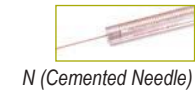
700 Series MICROLITER™ Syringes

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 plunger and the barrel



Hamilton 700 Series Microliter™ Syringes



Cat.No	Model/Needle Term.	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/Needle Term.	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

Cat.No	Model/Needle Term.	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

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)

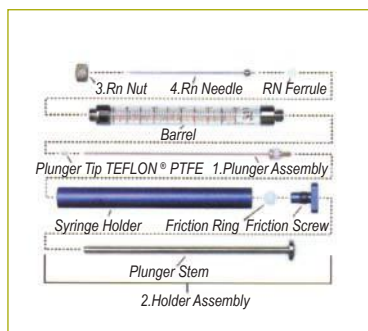


Hamilton 800 Series Microliter™ Syringes

Cat.No	Model/Needle Term.	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 Model	5 µL	10 µL	25 µL	50 µL	100 µL	250 µL
		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, length, point style, and whether 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/Needle Term.	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/Needle Term.	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 length is 100 mm

Tk 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)



Point 2

Hamilton 1700 Series Gastight™ Syringes

Cat.No	Model/Needle Term.	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 liquids
- Precision-machined TEFLON™ PTFE-tipped plungers
- Replaceable plungers



LTN (Cemented Needle)



RN (Removable Needle)



TLL (TEFLON®
Luer Lock w/o slots)



TLL (with slots)



Point 2

Hamilton 1000 Series Gastight™ Syringes

Cat.No	Model/Needle Term.	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



NR (Cemented Needle)



RNR (Removable Needle)



RNCP (GASTIGHT®)



Needles 6pk

Hamilton RNR Microliter™ Serie 600 for Rheodyne Injection Valves

Cat.No	Model/Needle Term.	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

Cat.No	Model/Needle Term.	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/Needle Term.	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/Needle Term.	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



RNW (Removable Needle)



Needles 6pk

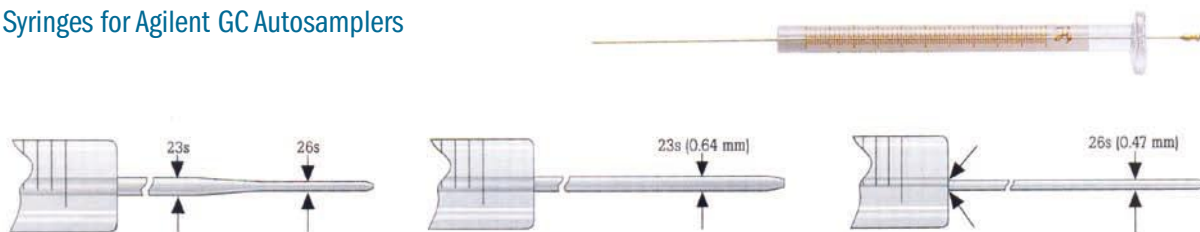
RNW Microliter™ Series 800, 1.700 and 1.800 for Waters™ U6K Injection Valve

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

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

Microliter™ Syringes for Agilent GC Autosamplers 7683, 7673 ALS

Syringe Model & Capacity	75 5 µL	75 5 µL/6 pk	75 5 µL	701 10 µL	701 10 µL	701 10 µL pk/6
ASN 23s (43/AS)	HA-87987	HA-87990	HA-87991 ¹⁾	HA-80387	HA-80398 ¹⁾	HA-80390
ASN 26s (43/AS)	HA-87988	HA-87989	HA-87992 ¹⁾	HA-80338	HA-80399 ¹⁾	HA-80389
ASN 23s-26s (43/AS)	HA-87993	HA-87994	-	HA-80393	-	HA-80391
ASRN 23s (43/AS)	HA-87957	-	-	HA-80357	-	-
ASRN 26s (43/AS)	HA-87958	-	-	HA-80358	-	-
ASRN 23s-26s (43/AS)	HA-87959	-	-	HA-80359	-	-

¹⁾ Point Style 2

Gastight™ Syringes for Agilent GC Autosamplers 7683, 7673 ALS

Syringe Model & Capacity	175 5 µL	175 5 µL/6 pk	1701 10 µL	1701 10 µL/6 pk
ASN 23s (43/AS)	HA-80074	HA-80090	HA-80080	HA-80094
ASN 23s-26s (43/AS)	HA-80076	HA-80092	HA-80079	HA-80096
ASRN 23s (43/AS)	-	-	HA-80087	-
ASRN 26s (43/AS)	-	-	HA-80088	-
ASRN 23s-26s (43/AS)	HA-80086	-	HA-80089	-

Syringes for Agilent GC Autosamplers 7670, 7671, 7672 ALS

Model	Gauge	Volume	Length/Point Style	26s
75 N	26s	5 µL	(51/2)	HA-87900
701 N	26s	10 µL	(51/2)	HA-80300
701 RN	26s	10 µL	(51/2)	HA-80338
701 N	26s	10 µL/6 pk	(51/2)	HA-80366
1701 N	26s	10 µL	(51/2)	HA-80000
1701 RN	26s	10 µL	(51/2)	HA-80011

Modified Microliter™ Syringes for Agilent GC Autosamplers 7683, 7673 ALS

Syringe Model & Capacity	7.000.5 0.5 µL	7001 1 µL	7701 1 µL	7702 2 µL
ASRN 23s (43/AS)	HA-86276	HA-80176	-	-
ASRN 26s (43/AS)	HA-86274	-	HA-202460	HA-202980



Six Pack Replacement (RN) Needles for Agilent GC Autosamplers

Volume	Gauge **	Model 7683, 7673 ALS			Model 7670, 7671, 7672
		23s	26s	23s-26s	26s
0.5 µL	(**/43/AS)	HA-38065 ¹⁾	HA-38063 ¹⁾		
2 µL	(**/43/AS)	-	HA-202981 ¹⁾		
5 µL & 10 µL	(**/43/AS)	HA-7786-01	HA-7786-02	HA-7785-01	
10 µL	(**/51/2)	-	-		HA-7758-02

¹⁾ Replacement needle offered as repair kit including needle, ferrule, and plunger wire (1/pk)

Equivalent Guide Table for Agilent Automatic Injector 6850 ALS for equipments series 6890 and 6850

Syringes	Volume	G/L/PST/	Ref. Agilent	Ref. Hamilton	Ref. GSE
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 6/pk	10 µL	23-26s/42/HP	5181-3360	HA-80321	002822
Syringe 6/pk	5 µL	23-26s/42/HP	5181-8810	HA-87994	001822
Syringe 6/pk	5 µL	23/42/HP	5182-0875	HA-87990	001814
Syringe 6/pk	10 µL	23/42/HP	9301-0725	HA-80390	002814
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			

Syringes for Varian-Chrompack GC Autosamplers



Reference	Model	Volume	Gauge/Lenght/Point Style	Removable needles (RN), 6/pk
Varian CP-8400 - 8410 CP-9010 - 9050				
HA-87900	75 N	5 µL	(26s/51/2)	
HA-80366	701 N	10 µL 6/pk	(26s/51/2)	
HA-80300	701 N	10 µL	(26s/51/2)	
HA-202950	7701 N	1 µL	(.48/51/AS)	
Varian-Chrompack 9020/9025				
HA-202660	1002 LT HS 22	2.5 mL	(22/51/AS)	

Equivalent Guide Table for Varian-Chrompack. CP-8400, CP-8410, CP-9010, CP-9050, CP-9020, CP-9025

Hamilton	Volume	Varian-Chrompack	GSE
HA-87900	5 µL	HM 87900	001000
HA-80300	10 µL	HM 80300	002950
HA-80308	10 µL	SK 0163520	002005
HA-202660	2.5 µL	HM 202660	-

Syringes for Shimadzu GC Autosamplers



Reference	Model	Volume	Gauge/Lenght Point Style	Removable needles (RN), 6/pk	Equivalence SGE
Shimadzu AOC-9					
HA-87930	75 RN 26s	5 µL	(26s/51/2)	HA-7758-02	
HA-80330	701 RN 26s	10 µL	(26s/51/2)	HA-7758-02	
Shimadzu AOC-14/17/20					
HA-202630	75 RSN	5 µL	(22s/43/2)	HA-202645	
HA-202640	701 RSN	10 µL	(22s/43/2)	HA-202645	SGE002898

Syringes for ThermoFinnigan GC Autosamplers



Reference	Model	Volume	Gauge/Lenght/Point Style	Equivalence SGE
Thermo Finnigan HS 250/500/850				
HA-202660	1002 LTN HS 22	2.5 mL	(22/51/5)	
HA-202670	1002 LTN HS	2.5 mL	without needle	
Thermo Finnigan AS 800/2000				
HA-202066	701 SN Fisons	10 µL	(26s/80/AS)	002992
Thermo Finnigan AI/AS 3000				
HA-204000	75 SN	5 µL	(26s/50/2)	
HA-204001	701 SN	10 µL	(26s/50/2)	
HA-204051	75 SN	5 µL	(26s/50/AS)	
HA-204052	701 SN	10 µL	(26s/50/AS)	
HA-204922	1701 RN	10 µL	(26s/50/2)	

Syringes for Perkin-Elmer™ Autosystem GC and Clarus 500 GC



Reference	Model	Volume	O.D./Length/Point Style
Perkin Elmer Autosystem			
HA-88040	75 ASN/PE	5 µL	(0.47/70/3)
HA-88035	75 ASN/PE	5 µL	(0.63/70/3)

Syringes for CTC Combi PAL and GC PAL GC Autosamplers

Reference	Model	Volume	Gauge/Point Style	Plunger Assembly, 10 pk
HA-203185	7701.2 CTC	1.2 µL	(0.48 MM O.D./AS)	
HA-203189	75 N CTC (26s/AS)	5 µL	(26s/AS)	
HA-203197 ¹⁾	75 SN CTC (*/*)	5 µL	(*/*)	
HA-203361	701 N CTC (23s/AS)	10 µL	(23s/AS)	
HA-203362	701 N CTC (23s/26s/AS)	10 µL	(23s-26s/AS)	
HA-203363	701 N CTC (23s/2)	10 µL	(23s/2)	
HA-203072	701 N CTC (26s/2)	10 µL	(26s/2)	
HA-203205	701 N CTC (26s/AS)	10 µL	(26s/AS)	
HA-203198 ¹⁾	701 SN CTC (*/*)	10 µL	(*/*)	
HA-203206 ¹⁾	1701 SN CTC (*/*)	10 µL	(*/*)	
HA-203043	1702 CTC (26s/AS)	25 µL	(26s/AS)	HA-203245
HA-203074	1702 CTC (26s/AS) Slim Line	25 µL	(26s/AS)	HA-203245
HA-203275	1702 CTC (*/*) Slim Line	25 µL	(*/*)	HA-203245
HA-203209 ¹⁾	1702 SN CTC (*/*)	25 µL	(*/*)	HA-203245
HA-203076	1710 CTC (26s/AS)	100 µL	(26s/AS)	HA-203246
HA-203226 ¹⁾	1710 SN CTC (*/*)	100 µL	(*/*)	HA-203246
HA-203078	1725 CTC (26s/AS)	250 µL	(26s/AS)	HA-203249
HA-203219 ¹⁾	1725 SN CTC (*/*)	250 µL	(*/*)	HA-203249
HA-203080	1750 CTC (26s/AS)	500 µL	(26s/AS)	HA-203254
HA-203225 ¹⁾	1750 CTC (*/*)	500 µL	(*/*)	HA-203254

¹⁾ Specify needle gauge, point style, and whether electro-tapered

Syringes for Head Space version for CTC

Reference	Model	Volume	Gauge/Point Style	Plunger Assembly, 1 pk
HA-203082	1001 CTC (23/5)	1 mL	(23/5)	HA-203255
HA-203141	1001 CTC (26/5)	1 mL	(26/5)	HA-203255
HA-203084	1002 CTC (23/5)	2.5 mL	(23/5)	HA-203256
HA-203181	1002 CTC (26/5)	2.5 mL	(26/5)	HA-203256
HA-203086	1005 CTC (23/5)	5 mL	(23/5)	HA-203259
HA-203182	1005 CTC (26/5)	5 mL	(26/5)	HA-203259

Syringes for On-Column Grob GC Injection

Reference	Model	Volume	Gauge/Point Style
HA-200740	701 N Grob	10 µL	(0.23/85/45°)
HA-200741	75 N Grob	5 µL	(0.23/85/45°)
HA-200742	701 N Grob	10 µL	(0.23/75/45°)
HA-200743	75 N Grob	5 µL	(0.23/75/45°)

Syringes for Agilent 1090A LC Autosampler

Reference	Model	Volume
HA-202315	1072 RN w/o needle	25 µL
HA-202325	1075 RN w/o needle	250 µL



Syringes for Shimadzu SIL-6A LC Autosampler

Reference	Model	Volume
HA-7656-01	1710 RN no needle	100 µL



Syringes for Perkin-Elmer™ LC Autosamplers

Reference	Model	Volume
Perkin Elmer Integral™ 4000		
HA-81163	1725 T/PE	250 µL
Perkin Elmer Series 200 Autosampler		
HA-80962	1705 CX	50 µL
HA-81162	1725 CX	250 µL
HA-81262	1750 CX	500 µL
HA-81360	1001 C	1 mL
HA-81460	1002 C	2.5 mL



Syringes for Varian 9100 LC Autosampler

Reference	Model	Volume
HA-0159902	1710 C Special	100 µL

Syringes for Waters™ Wisp™ LC Autosampler

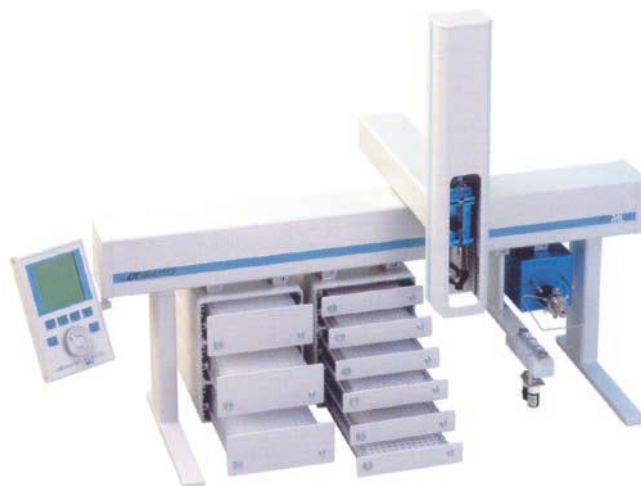
Reference	Model	Volume	Use
HA-80020	1702 WISP	25 µL	WISP Autosampler
HA-80024	1725 WISP	250 µL	WISP Autosampler
HA-81610	1010 W	10 mL	Manual Priming Syringe for WATERS Pumps



Syringes for Spectra-Physics/ThermoFinnigan LC Autosamplers

Reference	Model	Volume
SP8780/8875/8880		
HA-202192	1750 C	500 µL
HA-81460	1002 C	2.5 mL
AS100/300/AS1000/3000/3500		
HA-81162	1725 C	250 µL
HA-81262	1750 C	500 µL
HA-81360	1001 C	1 mL
HA-81460	1002 C	2.5 mL





Syringes for CTC LC Autosamplers

Reference	Model	Volume	Plunger Assembly, 10/pk
LC/HTC/HTS PAL			
HA-203073	701 N CTN (22s/3)	10 µL	
HA-203194	1701 N CTN (22s/3)	10 µL	HA-203239
HA-203075	1702 N CTN (22s/3)	25 µL	HA-203245
HA-203274	1702 N CTN (22s/51/3) Slim Line	25 µL	HA-203276
HA-203077	1710 N CTN (22s/3)	100 µL	HA-203246
HA-203235	1710 N CTN (22s/3)	100 µL	HA-203246
HA-203079	1725 N CTN (22s/3)	250 µL	HA-203249
HA-203349	1750 N CTN (22s/3)	500 µL	HA-203254
HA-203081	1001 CTC (22s/3)	1 mL	HA-203255*
HA-203083	1002 CTC (22s/3)	2.5 mL	HA-203256*
HA-203085	1005 CTC (22s/3)	5 mL	HA-203259*
A200S			
HA-203560	1701 CTC (22s/3) A200S	10 µL	HA-203562
HA-203563	1702 CTC (22s/3) A200S	25 µL	HA-203565
HA-203566	1710 CTC (22s/3) A200S	100 µL	HA-203569

* Plunger Assembly 1/pk

Syringes for Konton 360, 460, and 465 LC Autosamplers



Reference	Model	Volume
HA-201050	1710 AD	100 µL

Syringes for Gynkotek Gina/Dionex ASI-100 LC Autosamplers



Reference	Model	Volume
HA-7654-01	1702 RN w/o Needle	25 µL
HA-7657-01	1725 RN w/o Needle	250 µL

Syringes for Hitachi L-7200/7250, AS1000/2000/42000, and LaChrom LC Autosamplers



Reference	Model	Volume
HA-0160310	1750 Special	500 µL

Removable Needles





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

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

All needles sold in 6 packs.



Small Gauge Needles
27 - 33





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	-	-
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) for 2.5 - 100 μ L Syringes

All needles sold in 6 packs.







Large Gauge Needles
26s - 22

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
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 μ L - 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
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 length, and whether electro-tapered (Point style 5)

²⁾ Please specify length, point style, and whether electro-tapered

PEEK RN and Kel-F™ Hub Needles



PEEK RN and Kel-F™
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 μ L 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 length: 51 mm

Metal Hub (N)

All needles sold in 6 packs.



Metal Hub Needles

Gauge	STT ²⁾ Tubing No Hub					Custom N. ²⁾ Needles Pt.St. 2, 3, 4, AS
		Point Style 2	Point Style 3	Point Style 5	Custom Needles ¹⁾	
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 length, and whether electro-tapered (Point style 5)





2) Please specify length, point style, and whether electro-tapered

Hel-F™ Hub (KF)

All needles sold in 6 packs.



Hel-F™ Hub (KF)

Gauge					Custom ²⁾
	Point Style 2	Point Style 3	Point Style 5	Custom Needles ¹⁾	Needles Pt.St. 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 length, and wether electro-tapered (Point style 5)

2) Please specify length, point style, and wether electro-tapered

Tk 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



Filters & Extraction

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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 paid when using a high volume syringe (more than 10 ml), in order to avoid the maximum operating pressure.

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 an 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 withstand exposure to solvent.
All concentrations are 100% unless noted.

Chemical	Nylon	PTFE	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
Acetonitrile	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 Cellulose	ND	C	ND	IC	IC	C	C	C
Chemical	Nylon	PTFE	PVDF	PES	CA	RC	PP	GMF
Benzyl Benzoate	C	C	ND	IC	C	C	ND	ND
Isopropyl Myristate	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
Kerosene/Gasoline	C	C	C	LC	C	C	IC	C
TetraIn/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
Isopropylacetone	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	IC	C	ND	ND	ND
Dimethylsulfoxide (DSMO)	C	C	IC	IC	C	C	C	C
Isopropyl Ether	ND	C	C	C	C	C	C	ND
MISCELLANEOUS								
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 Polytetrafluoroethylene (Teflon®)

PVDF Polyvinylidene

PES Polyethersulfone

CA Cellulose Acetate

RC Regenerated Cellulose

PP Polypropylene

GMF Glass MicroFiber

TK 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 aggressive 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, 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, Polypropylene, 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 resistance for acids > 1N, ethers, aromatics and halogenated hydrocarbons. Maximum operating temperature 135 °C

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 outlet

Robotic Connections: Female Luer Lock inlet, male Minispike outlet

Filter type: Non sterile

Membranes Selection: PP (Polypropylene), Nylon, Nylon Low Extractables, 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 3 µm HPLC column.

Max. Operating pressure: 13 mm D. 750 Kpa and 25 mm D. 550 Kpa

Retention volumes: 13 mm < 30 µl and 25 mmD. < 120 µl

Max. Filtration volume: 13 mm D. 1-10 ml and 25 mm D. > 10 ml

Filtration area: 13 mm D. 0.95 cm² and 25 mm D. 3.55 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.



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 polypropylene 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.

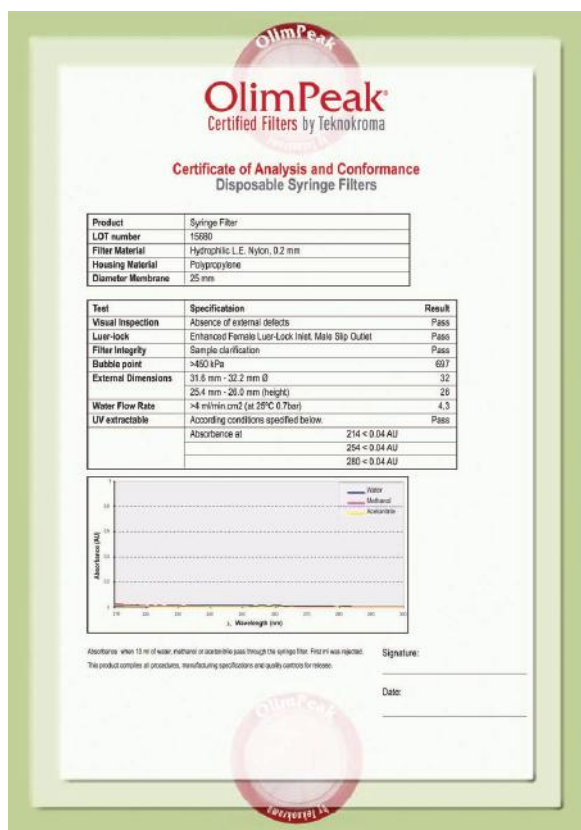
Our new **Certified Syringe Filter Olimpeak™** offer the best value. All filters are supplied with a Certificate of Quality batch to batch as guarantee of product performance and quality.

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™ 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.

Tk Certified Olimpeak™ Syringe Filters

Nylon Olimpeak™ New 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 °C

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

Nylon Low Extractables New Certified Olimpeak™ Syringe Filter with Polypropylene Housing



- One of the traditional membranes used for filtration of HPLC samples is supported Nylon 66. Generally, a small quantity of the sample is passed through this filter prior to injection. This is done to reduce unwanted spikes in the chromatogram due to extractables leaching from the support material or membrane.
- The Nylon Low Extractables, is a HPLC certified 13 and 25 mm D. syringe filter with a unique unsupported Nylon

membrane. This new membrane does not release significant levels of extractables following an acetonitrile challenge.

Reference	Description	Pk
TR-200475	Nylon L.E. Filter, green , 0.45 µm, 25 mm D	100
TR-200470	Nylon L.E. Filter light green 0.20 µm, 25 mm D	100
TR-200465	Nylon, L.E. Filter green 0.45 µm, 13 mm D	100
TR-200460	Nylon L.E. Filter light green 0.20 µm, 13 mm D	100

New !!!!! Nylon Econo Syringe Filter

Teknokroma is launching New Nylon Econo Syringe Filters. If you don't need "Certified Nylon Syringe Filters" but still the highest quality and performance of our OlimPeak filtration units, reduce your cost by using the Nylon Econo Syringe Filter.

Econo Syringe Filter is an orange color PP housing with Nylon membrane available in 0,45 µm , 13 and 25 mm diameter and packed in boxes of 1000 pieces.

Reference	Description	Pk
TR-200100E	Nylon, orange 0,45 µm, 25 mm D.	1000

PTFE New Certified Olimpeak™ Syringe Filter with Polypropylene Housing



- The PTFE (polytetrafluoroethylene) is an hydrophobic membrane resistant to strong acids, aggressive 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 membrane is mechanically strong
- For sterile venting use 0.2 µm pore size, and for transducer 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 °C

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

Polypropylene New 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 °C
- 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

PVDF New 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 °C

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

Regenerated Cellulose New 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-filter membrane
- Maximum operating temperature 110 °C

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

TK Certified Olimpeak™ Syringe Filters

Polyethersulfone New 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 °C

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

Cellulose Acetate New 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 °C

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

M.E. Cellulose New 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

Nitrocellulose New Certified Olimpeak™ Syringe Filter with Polypropylene Housing



- A naturally hydrophilic membrane recommended for clarification and filtration of aqueous samples
- For immunoblotting, the high protein retention of Nitrocellulose is ideal to bind DNA

Reference	Description	Pk
TR-200480	Nitrocellulose Filter, pistachio, 0.45 µm, 25 mm D	100
TR-200482	Nitrocellulose Filter, light pistachio, 0.20 µm, 25 mm D	100
TR-200466	Nitrocellulose Filter, pistachio, 0.45 µm, 13 mm D	100
TR-200467	Nitrocellulose Filter, light pistachio, 0.20 µm, 13 mm D	100

Glass Microfibre GMF New 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 °C

Reference	Description	Pk
TR-200000G	Glass Microfibre GMF, Grey, 1,0 µm 25 mm D	100
TR-200006G	Glass Microfibre GMF, Grey, 2,0 µm 25 mm D	100
TR-200007G	Glass Microfibre GMF, Grey, 5,0 µm 25 mm D	100

MiniTip Certified Olimpeak™ Syringe Filters

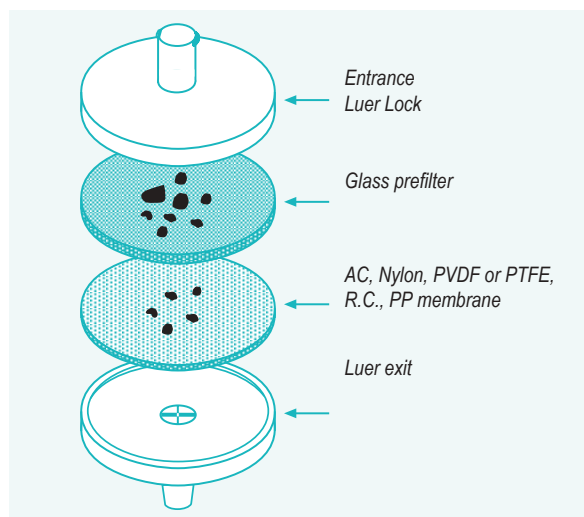


- Teknokroma has designed a new 13 mm syringe filter with a thin outlet called MiniTip, for direct filling of microvials.
- High quality MiniTip syringe filters are available with these membranes: Nylon, PES, PTFE, PVDF, RC, CN, CA, M.E.C and PP.
- Pore size can be 0.45 or 0.20 µm and the lot number 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-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-200465MT10	Mini Tip Nylon L.E. 0.45 µm x 13 mm.D, Green	1000
TR-200460MT10	Mini Tip Nylon L.E. 0.2 µm x 13 mm.D, Light Green	1000
TR-200408MT10	Mini Tip Cellulose Acetate 0.45 µm x 13 mm.D, Orange	1000
TR-200409MT10	Mini Tip Cellulose Acetate 0.2 µm x 13 mm.D, Light Orange	1000
TR-200466MT10	Mini Tip Nitrocellulose 0.45 µm x 13 mm.D, Pistachio	1000
TR-200467MT10	Mini Tip Nitrocellulose 0.2 µm x 13 mm.D, Light Pistachio	1000
TR-200403MT10	Mini Tip Polyethersulfone 0.45 µm x 13 mm.D, Violet	1000
TR-200404MT10	Mini Tip Polyethersulfone 0.2 µm x 13 mm.D, Light Violet	1000

TK Certified Olimpeak™ Syringe Filters

Filter with Glass prefilter New 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	PP	100
TR-200101G	0.2 µm	Nylon/Glass fibre 1 µm	PP	100
TR-200102G	0.45 µm	PTFE/Glass fibre 1 µm	PP	100
TR-200103G	0.2 µm	PTFE/Glass fibre 1 µm	PP	100
TR-200111G	0.45 µm	PP/Glass fibre 1 µm	PP	100
TR-200112G	0.2 µm	PP/Glass fibre 1 µm	PP	100
TR-200445G	0.45 µm	RC/Glass fibre 1 µm	PP	100
TR-200440G	0.2 µm	RC/Glass fibre 1 µm	PP	100
TR-200104G	0.45 µm	M.E.C/Glass fibre 1 µm	PP	100
TR-200105G	0.2 µm	M.E.C/Glass fibre 1 µm	PP	100
TR-200106G	0.45 µm	PVDF/Glass fibre 1 µm	PP	100
TR-200107G	0.2 µm	PVDF/Glass fibre 1 µm	PP	100
TR-200406G	0.45 µm	CA/Glass fibre 1 µm	PP	100
TR-200407G	0.20 µm	CA/Glass fibre 1 µm	PP	100
TR-200401G	0.45 µm	PES/Glass fibre 1 µm	PP	100
TR-200402G	0.20 µm	PES/Glass fibre 1 µm	PP	100
TR-200480G	0.45 µm	NC/Glass fibre 1 µm	PP	100
TR-200482G	0.20 µm	NC/Glass fibre 1 µm	PP	100

Target Syringe Filters (4mm Diameter)



- Assured quality - each lot independently tested for physical properties and membrane tested for UV extractables.
- Secure Luer Lok inlet
- Solvent resistant, low extractables polypropylene housing.

Reference	Description	Pore	Pk
CC-F2504-1	Nylon 4 mm D	0.45 µm	100
CC-F2504-2	Nylon 4 mm D	0.20 µm	100
CC-F2504-3	PTFE 4 mm D	0.45 µm	100
CC-F2504-4	PTFE 4 mm D	0.20 µm	100
CC-F2504-5	PVDF 4 mm D	0.45 µm	100
CC-F2504-6	PVDF 4 mm D	0.20 µm	100
CC-F2504-7	Regenerated Cellulose 4 mm D	0.45 µm	100
CC-F2504-8	Regenerated Cellulose 4 mm D	0.20 µm	100
CC-F2504-9	Polypropylene 4 mm D	0.45 µm	100
CC-F2504-10	Polypropylene 4 mm D	0.20 µm	100
CC-F2504-15	Cellulose Acetate 4 mm D	0.45 µm	100
CC-F2504-16	Cellulose Acetate 4 mm D	0.20 µm	100

Target Syringe Filter with polyethersulfone (PES) membrane



- Provides high flow rates and good throughput volum. Low protein binding and can be used with high temperature liquids.
- Good to excellent flow rate. PES is certified for Ion Chromatography.

PES Certified for Ion Chromatography

Reference	Description	Pore	Pk
CC-F2513-14	PES (polyethersulfone), 17 mm	0.45 µm	100
CC-F2513-17	PES (polyethersulfone), 17 mm	0.20 µm	100
CC-F2500-14	PES (polyethersulfone), 30 mm	0.45 µm	100
CC-F2500-17	PES (polyethersulfone), 30 mm	0.20 µm	100

Target Syringe Filters with Glass microfiber membrane



- GMB membranes are commonly used as pre-filters to remove large particulates and to extend the load capacity of the membrane.
- Membrane of choice for dissolution test.

Glass Microfiber GMF

Reference	Description	Pore	Pk
CC-F2500-18	GMF Glass Microfiber, 30 mm	0.70 µm	100
CC-F2500-19	GMF Glass Microfiber, 30 mm	1.20 µm	100
CC-F2500-20	GMF Glass Microfiber, 30 mm	3.10 µm	100

Target Syringe Filters 30 mm Diameter

Reference	Membrane	Pore	Diameter	Pk
CC-F2500-1	Nylon	0.45 µm	30 mm	100
CC-F2500-2	Nylon	0.20 µm	30 mm	100
CC-F2500-3	PTFE	0.45 µm	30 mm	100
CC-F2500-4	PTFE	0.20 µm	30 mm	100
CC-F2500-13	PTFE	1.00 µm	30 mm	100
CC-F2500-5	PVDF	0.45 µm	30 mm	100
CC-F2500-6	PVDF	0.20 µm	30 mm	100
CC-F2500-7	Regenerated Cellulose	0.45 µm	30 mm	100
CC-F2500-8	Regenerated Cellulose	0.20 µm	30 mm	100
CC-F2500-9	Polypropylene	0.45 µm	30 mm	100
CC-F2500-10	Polypropylene	0.20 µm	30 mm	100
CC-F2500-15	Cellulose Acetate	0.45 µm	30 mm	100
CC-F2500-16	Cellulose Acetate	0.20 µm	30 mm	100

Target Syringe Filters 17 mm Diameter

Reference	Membrane	Pore	Diameter	Pk
CC-F2513-1	Nylon	0.45 µm	17 mm	100
CC-F2513-2	Nylon	0.20 µm	17 mm	100
CC-F2513-3	PTFE	0.45 µm	17 mm	100
CC-F2513-4	PTFE	0.20 µm	17 mm	100
CC-F2513-5	PVDF	0.45 µm	17 mm	100
CC-F2513-6	PVDF	0.20 µm	17 mm	100
CC-F2513-7	Regenerated Cellulose	0.45 µm	17 mm	100
CC-F2513-8	Regenerated Cellulose	0.20 µm	17 mm	100
CC-F2513-9	Polypropylene	0.45 µm	17 mm	100
CC-F2513-10	Polypropylene	0.20 µm	17 mm	100
CC-F2513-14	Polyethersulfone	0.45 µm	17 mm	100
CC-F2513-17	Polyethersulfone	0.20 µm	17 mm	100
CC-F2513-15	Cellulose Acetate	0.45 µm	17 mm	100
CC-F2500-16	Cellulose Acetate	0.20 µm	17 mm	100

750 µL Micro-Centrifugal Filters - Nonsterile



- Filter volumes as low as 50 µl up to 750 µl with low hold-up volume
- Use with any laboratory microcentrifuge
- Virgin polypropylene filter housing with tapered 2 mL, capped receiver tube

750 µL Micro-Centrifugal Filters - Nonsterile

Reference	Membrane	Pore	Pk
CC-F2517-1	Cellulose Acetate	0.22 µm	100
CC-F2517-2	Cellulose Acetate	0.45 µm	100
CC-F2517-3	Nylon	0.2 µm	100
CC-F2517-4	Nylon	0.45 µm	100

2 mL Micro-Centrifugal Filters - Nonsterile



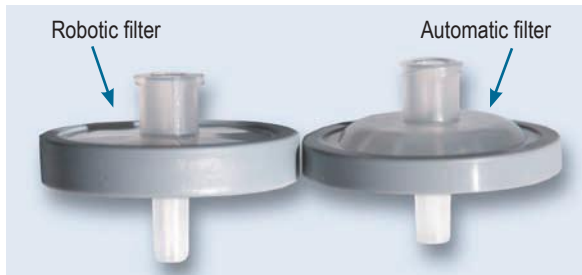
- Filter sample volumes up to 2 mL
- Virgin Polypropylene filter housing with tapered 5mL, capped receiver tube
- Use with benchtop or floor model centrifuges
- 500xG maximum centrifugal force

2mL Micro-Centrifugal Filters - Nonsterile

Reference	Membrane	Pore	Pk
CC-F2520-1	Cellulose Acetate	0.22 µm	25
CC-F2520-2	Cellulose Acetate	0.45 µm	25
CC-F2520-3	Nylon	0.20 µm	25
CC-F2520-4	Nylon	0.45 µm	25
CC-F2520-5	PVDF	0.20 µm	25
CC-F2520-6	PVDF	0.45 µm	25
CC-F2520-7	Regenerated Cellulose	0.20 µm	25
CC-F2520-8	Regenerated Cellulose	0.45 µm	25

TK Certified Olimpeak™ Robotic Syringe Filters

New Certified AUTOMATIC OlimPeak Filter for automatic equipments Sotax and Zymark

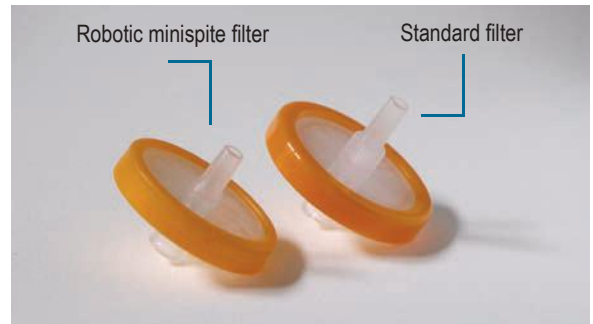


Automatic filter difference

- 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 leuer 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-2-200006A	Fiber Glass	2.00 µm	PP	1000
TR-2-200007A	Fiber Glass	5.00 µm	PP	1000
TR-200100A	Nylon	0.45 µm	PP	1000
TR-200102A	PTFE	0.45 µm	PP	1000
TR-200104A	M.E.Cellulose	0.45 µm	PP	1000
TR-200106A	PVDF	0.45 µm	PP	1000
TR-200111A	Polypropylene	0.45 µm	PP	1000
TR-200440A	Regenerated Cellulose	0.45 µm	PP	1000
TR-200480A	Nitrocellulose	0.45 µm	PP	1000
TR-200406A	Cellulose Acetate	0.45 µm	PP	1000
TR-200401A	Polyethersulfone	0.45 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-200111GA	PP/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200445GA	RC/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200104GA	M.E.C/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200106GA	PVDF/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200406GA	CA/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200401GA	PES/Glass fibre 1 µm	0,45 µm	PP	1000
TR-200480GA	NC/Glass fibre 1 µm	0,45 µm	PP	1000



Robotic filter difference

Certified Olimpeak™ Filters for Robotic Equipments Zotax and Zymark

- Teknokroma has developed new filters to use with robotic apparatus
- They are available in 25 mm D.
- The inlet is a female "Luer Lock" and the outlet is a male luer "Minispike".
- Pore size is 0.45 or 0.20 µm for the following membranes: Nylon, PVDF, PTFE, M.E. Cellulose, PP, Regenerated Cellulose, Cellulose Acetate Nitrocellulose, PES
- For the Glass Microfibre, the pore size is 1.0 µm
- The robotic filters are under strict quality control for reliable performance.
- Each pack contains 1000 units.
- All these filters can be adapted to automatic equipments as Sotax, Zymark, etc.
- The Glass membrane is the good choice for dissolution test.

Reference	Membrane	Pore	Housing	Pk
TR-200000R	Fiber Glass	1.00 µm	PP	1000
TR-2-200006R	Fiber Glass	2.00 µm	PP	1000
TR-2-200007R	Fiber Glass	5.00 µm	PP	1000
TR-200100R	Nylon	0.45 µm	PP	1000
TR-200102R	PTFE	0.45 µm	PP	1000
TR-200104R	M.E.Cellulose	0.45 µm	PP	1000
TR-200106R	PVDF	0.45 µm	PP	1000
TR-200111R	Polypropylene	0.45 µm	PP	1000
TR-200440R	Regenerated Cellulose	0.45 µm	PP	1000
TR-200480R	Nitrocellulose	0.45 µm	PP	1000
TR-200406R	Cellulose Acetate	0.45 µm	PP	1000
TR-200401R	Polyethersulfone	0.45 µm	PP	1000
TR-200100GR	Nylon/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200102GR	PTFE/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200111GR	PP/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200445GR	RC/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200104GR	M.E.C/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200106GR	PVDF/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200406GR	CA/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200401GA	PES/Glass fibre 1 µm	0.45 µm	PP	1000
TR-200480GA	NC/Glass fibre 1 µm	0,45 µm	PP	1000

OlimPeak™ Membrane Filters for Mobile Phase Tk

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-200 140	Nylon	0.45	47	50
TR-200 150	Nylon	0.20	47	50
TR-200 200	PTFE	0.45	47	50
TR-200 210	PTFE	0.20	47	50
TR-200 260	M.E. Cellulose	0.45	47	50
TR-200 270	M.E. Cellulose	0.20	47	50
TR-200 320	PVDF	0.45	47	50
TR-200 330	PVDF	0.20	47	50
TR-200 380	Polipropylene	0.45	47	50
TR-200 390	Polipropylene	0.20	47	50
TR-200 420	Regenerated cellulose	0.45	47	50
TR-200 425	Regenerated cellulose	0.20	47	50
TR-200 456	Nitrocellulose	0.45	47	50
TR-200 457G	Glass Microfiber	1.00	47	50
TR-200 458	Cellulose Acetate	0.45	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 glass DURAN 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 equipment.
TR-F1018	Glass Funnel with 250 ml capacity for the filtering equipment.

TK 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-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-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-200300	PVDF	0.45	25	50
TR-200310	PVDF	0.20	25	50
TR-200360	Polypropylene	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-200002 G	Glass microfibre	1.00	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

Finisterre

by Teknokroma™



Technical Information of Finisterre™ SPE Cartridges

Teknokroma introduces in the market the new 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, NH₂, 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

TK 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 solvents.

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-F034300	Finisterre OA™ HLB	30mg/1ml	100
TR-F034302	Finisterre OA™ HLB	60mg/3ml	50
TR-F034304	Finisterre OA™ HLB	100mg/6ml	30
TR-F034306	Finisterre OA™ HLB	200mg/6ml	30
TR-F034308	Finisterre OA™ HLB	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
- Pesticides, herbicides, fungicides & melamine from food & beverage.

Cat.No	Description		pk
TR-F034320	Finisterre OA™ SCX	30mg/1ml	100
TR-F034322	Finisterre OA™ SCX	60mg/3ml	50
TR-F034324	Finisterre OA™ SCX	100mg/6ml	30
TR-F034326	Finisterre OA™ SCX	200mg/6ml	30
TR-F034328	Finisterre OA™ SCX	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-F034310	Finisterre OA™ DVB	30mg/1ml	100
TR-F034312	Finisterre OA™ DVB	60mg/3ml	50
TR-F034314	Finisterre OA™ DVB	100mg/6ml	30
TR-F034317	Finisterre OA™ DVB	200mg/6ml	30
TR-F034318	Finisterre OA™ DVB	500mg/6ml	30

Finisterre OA™ SAX



Description:

Finisterre OA™ SAX is a polystyrene-divinylbenzene copolymer functionalized by a strong anion exchanger presenting a high selectivity for acids (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-F034330	Finisterre OA™ SAX	30mg/1ml	100
TR-F034332	Finisterre OA™ SAX	60mg/3ml	50
TR-F034334	Finisterre OA™ SAX	100mg/3ml	30
TR-F034336	Finisterre OA™ SAX	200mg/6ml	30
TR-F034338	Finisterre OA™ SAX	500mg/6ml	30

Finisterre OA™ Polymeric SPE Columns **Tk**

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 (pKa >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-F034340	Finisterre OA™ WCX	30mg/1ml	100
TR-F034342	Finisterre OA™ WCX	60mg/3ml	50
TR-F034344	Finisterre OA™ WCX	100mg/6ml	30
TR-F034346	Finisterre OA™ WCX	200mg/6ml	30
TR-F034348	Finisterre OA™ WCX	500mg/6ml	30

Finisterre OA™ WAX



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

- Strong acidic compounds & metabolites from biological fluids & tissues
- Sulfonates & perfluorinated surfactants

Cat.No	Description		pk
TR-F034350	Finisterre OA™ WAX	30mg/1ml	100
TR-F034352	Finisterre OA™ WAX	60mg/3ml	50
TR-F034354	Finisterre OA™ WAX	100mg/6ml	30
TR-F034356	Finisterre OA™ WAX	200mg/6ml	30
TR-F034358	Finisterre OA™ WAX	500mg/6ml	30

Equivalences

Teknokroma	Waters	Phenomenex	Agilent	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 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

Higher Carbon Load: 17.0 %

Silica 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

Finisterre™ C8 SPE Columns



Retention Mechanism: Reverse phase.

Functional Group: Octyl (C8)

Endcapped: yes

Higher Carbon Load: 8.5 %

Silica 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

Finisterre™ C4 SPE Columns



Retention Mechanism: Reverse phase.

Functional Group: Butyl (C4)

Endcapped: yes

Higher Carbon Load: 5.0 %

Silica 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 or C8

- Analgesics from blood

Cat.No	Description	pk
TR-F034040	Finisterre SPE Columns C4 100mg/1ml	100
TR-F034042	Finisterre SPE Columns C4 200mg/3ml	50
TR-F034044	Finisterre SPE Columns C4 500mg/3ml	50
TR-F034046	Finisterre SPE Columns C4 500mg/6ml	30
TR-F034048	Finisterre SPE Columns C4 1000mg/6ml	30
TR-F034050	Finisterre SPE Columns C4 1000mg/12ml	20

Finisterre™ SPE Columns **Tk**

Finisterre™ C2 SPE Columns



Retention Mechanism: Reverse phase.
Functional Group: Ethyl (C2)
Endcapped: yes
Higher Carbon Load: 5.5 %
Silica 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

Finisterre™ PH SPE Columns



Retention Mechanism: Reverse phase.
Functional Group: Phenyl (PH)
Endcapped: yes
Higher Carbon Load: 3.8 %
Silica Base: Irregular Shape
Average Particle Size 50 µm
Pore Diameter: 60 Å
Hardware: Polypropylene
Frit: Polyethylene 20 µm porosity

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

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
Higher Carbon Load: 4.0 %
Silica 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

Finisterre™ NH₂ SPE Columns



Retention Mechanism: Weak anion exchange with aqueous matrix, normal phase with non-polar organic matrix.
Functional Group: Aminopropyl (NH₂)
Endcapped: no
Higher Carbon Load: 5.0 %
Silica 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 NH ₂	100mg/1ml	100
TR-F034142	Finisterre SPE Columns NH ₂	200mg/3ml	50
TR-F034144	Finisterre SPE Columns NH ₂	500mg/3ml	50
TR-F034146	Finisterre SPE Columns NH ₂	500mg/6ml	30
TR-F034148	Finisterre SPE Columns NH ₂	1000mg/6ml	30
TR-F034150	Finisterre SPE Columns NH ₂	1000mg/12ml	20

TK Finisterre™ SPE Columns

Finisterre™ DIOL SPE Columns



Retention Mechanism: Normal phase
Functional Group: DIOL (2OH)
Endcapped: no
Higher Carbon Load: 6.0 %
Silica 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-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

Finisterre™ FLO 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 SPE Column Florisil	100mg/1ml	100
TR-F034162	Finisterre SPE Column Florisil	200mg/3ml	50
TR-F034164	Finisterre SPE Column Florisil	500mg/3ml	50
TR-F034166	Finisterre SPE Column Florisil	500mg/6ml	30
TR-F034168	Finisterre SPE Column Florisil	1000mg/6ml	30
TR-F034170	Finisterre SPE Column Florisil	1000mg/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

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

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

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

Finisterre™ SPE columns are simple to use and allow 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, basically: 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 weight.

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 accessible to the sample. In general for 100 mg of packing you can pass 2 ml of two solvent, generally 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.

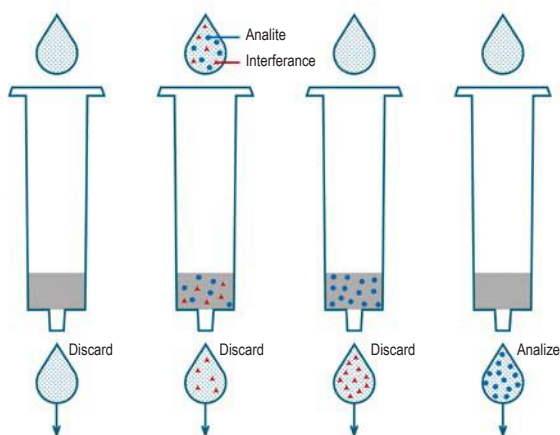
Wash solvents should remove weakly retained interferences without being strong enough to elute the analyte.

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.

TK Select the Different Extraction Procedures



Select the different Extraction Procedures Methods:

Extraction Procedures 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 non-polar compounds requires less polar solvents, and moderately 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 Procedures for Normal Phases

Packings of Normal-phase 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 Procedures 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.

Tk 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, collections racks plates (13 mm, 16 mm tubes, volumetric flask, plate base, plate dimple, lid legs, propylene 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 impuled 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 maintain 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

Description	12 Positions	Pk	16 Positions	Pk	24 Positions	Pk
Glass Chamber	TR-004013	1	TR-004417	1	TR-004825	1
Cover, gasket & 12 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	12	TR-004829	12
Needles - Stainless Steel	TR-004018	12	TR-004422	12	TR-004830	12
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
Stopcocks	TR-004026	1	TR-004430	1	TR-004838	1

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



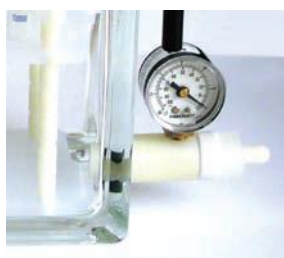
The disposable polypropylene waste container simplifies clean-up of the vacuum chamber in 12 port manifolds. The disposable waste liner is a molded solvent resistant polypropylene liner that fits into the vacuum chamber of the 12 port manifolds. The liner is designed to contain all liquids used in SPE 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 elution of 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

Accessories



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 manifold 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

Applied Separations SPE Products

Applied Separations offers an extended range of kinds and configurations in SPE.

With Applied Separations extraction systems, you can assure results reproducible, less variability, and easy conversion to automatic processes thanks to the strict particle size quality control, the surface activity, pH, the flow, and the interferences.



Spe-ed Standard Columns

Extraction columns in sizes: 1ml, 3ml, 6ml and 12 ml.



Mini Spe-ed Cartridges

Cartridges designed for its manual use but also to be used in Manifolds. The Mini Spe-ed capacity is 1 ml. For silica gel, the content is 450 mg.



Mini Spe-ed Plus Cartridges

With the same configuration as Mini Spe-ed Cartridges, but with a major capacity (2,8 ml). For silica gel, the content is 1.265 mg.

Standard Spe-ed Columns



	100 mg 1ml	200 mg 3 ml	500 mg 3 ml	500 mg 6 ml	1000 mg 6 ml	1000 mg 12 ml
Quantity per Box	100 units	50 units	50 units	30 units	30 units	20 units
C18 Octadecyl C18/18%	AP-12001	AP-12002	AP-12003	AP-12006	AP-12007	AP-12009
C18 Octadecyl C18/14%	AP-2001	AP-2002	AP-2003	AP-2006	AP-2007	AP-2009
C18 Octadecyl C18/22%	AP-12101	AP-12102	AP-12103	AP-12106	AP-12107	AP-12109
C18 Octadecyl C18/OH	AP-12201	AP-12202	AP-12203	AP-12206	AP-12207	AP-12209
C8 Octyl	AP-2011	AP-2012	AP-2013	AP-2016	AP-2017	AP-2019
PH Phenyl	AP-2081	AP-2082	AP-2083	AP-2086	AP-2087	AP-2089
CH Cyclohexyl	AP-2071	AP-2072	AP-2073	AP-2076	AP-2077	AP-2079
C4 Butyl	AP-2021	AP-2022	AP-2023	AP-2026	AP-2027	AP-2029
C2 Ethyl	AP-2061	AP-2062	AP-2063	AP-2066	AP-2067	AP-2069
C1 Methyl	AP-2051	AP-2052	AP-2053	AP-2056	AP-2057	AP-2059
CNe Cyanopropyl (endcaped)	AP-2221	AP-2222	AP-2223	AP-2226	AP-2227	AP-2229
CN Cyanopropyl	AP-2201	AP-2202	AP-2203	AP-2206	AP-2207	AP-2209
SI Silica Gel	AP-2101	AP-2102	AP-2103	AP-2106	AP-2107	AP-2109
FLO Florisil	AP-2111	AP-2112	AP-2113	AP-2116	AP-2117	AP-2119
ALN Alumina (Neutral)	AP-2121	AP-2122	AP-2123	AP-2126	AP-2127	AP-2129
ALA Alumina (Acidic)	AP-2131	AP-2132	AP-2133	AP-2136	AP-2137	AP-2139
ALB Alumina (Basic)	AP-2141	AP-2142	AP-2143	AP-2146	AP-2147	AP-2149
DIO Diol	AP-2151	AP-2152	AP-2153	AP-2156	AP-2157	AP-2159
NH₂ Aminopropyl	AP-2211	AP-2212	AP-2213	AP-2216	AP-2217	AP-2219
SAX N+ Quaternary Amino	AP-2301	AP-2302	AP-2303	AP-2306	AP-2307	AP-2309
COOH Carboxylic Acidic	AP-2311	AP-2312	AP-2313	AP-2316	AP-2317	AP-2319
SCX Benzenesulfonic Acid	AP-2321	AP-2322	AP-2323	AP-2326	AP-2327	AP-2329
PSA Pri/Sec Amino	AP-2241	AP-2242	AP-2243	AP-2246	AP-2247	AP-2249
DEA Diethylamino	AP-2331	AP-2332	AP-2333	AP-2336	AP-2337	AP-2339
PBA Phenylboronic Acid	AP-2341	AP-2342	AP-2343	AP-2346	AP-2347	AP-2349

TK Applied Separations SPE Cartridges

Mini Spe-ed Cartridges



Description	Cat.No	Pk
C18 Octadecyl C18/18%	AP-14002	50
C18 Octadecyl C18/14%	AP-14001	50
C18 Octadecyl C18/22%	AP-14003	50
C18 Octadecyl C18/OH	AP-14004	50
C8 Octyl	AP-14005	50
PH Phenol	AP-14006	50
CH Cyclohexyl	AP-14007	50
C4 Butyl	AP-14009	50
C2 Ethyl	AP-14010	50
C1 Methyl	AP-14011	50
CNe Cyanopropyl (endcaped)	AP-14012	50
CN Cyanopropyl	AP-14013	50
SI Silica Gel	AP-14014	50
FLO Florisil	AP-14015	50
ALN Alumina (Neutral)	AP-14016	50
ALA Alumina (Acidic)	AP-14017	50
ALB Alumina (Basic)	AP-14018	50
DIO Diol	AP-14019	50
NH₂ Aminopropyl	AP-14022	50
SAX N+ Quaternary Amino	AP-14025	50
COOH Carboxylic Acidic	AP-14020	50
SCX Benzenesulfonic Acid	AP-14021	50
PSA Pri/Sec Amino	AP-14023	50
DEA Diethylamino	AP-14024	50

Mini Spe-ed PlusCartridges



Description	Cat.No	Pk
C18 Octadecyl C18/18%	AP-24002	50
C18 Octadecyl C18/14%	AP-24001	50
C18 Octadecyl C18/22%	AP-24003	50
C18 Octadecyl C18/OH	AP-24004	50
C8 Octyl	AP-24005	50
PH Phenol	AP-24006	50
CH Cyclohexyl	AP-24007	50
C4 Butyl	AP-24009	50
C2 Ethyl	AP-24010	50
C1 Methyl	AP-24011	50
CNe Cyanopropyl (endcaped)	AP-14012	50
CN Cyanopropyl	AP-24013	50
SI Silica Gel	AP-24014	50
FLO Florisil	AP-24015	50
ALN Alumina (Neutral)	AP-24016	50
ALA Alumina (Acidic)	AP-24017	50
ALB Alumina (Basic)	AP-24018	50
DIO Diol	AP-24019	50
NH₂ Aminopropyl	AP-24022	50
SAX N+ Quaternary Amino	AP-24025	50
COOH Carboxylic Acidic	AP-24020	50
SCX Benzenesulfonic Acid	AP-24021	50
PSA Pri/Sec Amino	AP-24023	50
DEA Diethylamino	AP-24024	50

Isolation of Polar Organics from aqueous matrices

Spe-ed Advanta is a chemically modified polymeric resin for solid phase extraction SPE .

Spe-ed Advanta is packed in standard 1, 3, and 6 ml SPE cartridges and is effective in removing polar organic compounds from aqueous samples.

Unlike standard C18 and polystyrene divinylbenzene SPE cartridges, the Spe-ed Advanta is:

- Easy wetted with water
- Requires no tedious conditioning steps
- Eliminates poor recoveries associated with the drying of a conditioned sorbent bed

Spe-ed Advanta markedly increases the recoveries of phenols, aromatic and polyhydroxyaromatic compounds from water when compared to C18 and polystyrene divinylbenzene SPE cartridges. In addition to numerous environmental applications, Spe-ed Advanta is successful for preparation of pharmaceutical environmental, biological, clinical, biotechnical, food, and cosmetic samples.

Recoveries of phenols, aromatic compounds and polyhydroxy aromatic compounds by SPE under wet and dry loading conditions.

Compound	Recovery Percentage					
	C18		PS/DVB**		Advanta	
	Wet	Dry	Wet	Dry	Wet	Dry
Phenol	6	3	91	3	100	93
p-Cresol	16	4	91	12	101	94
p-Ethylphenol	66	15	96	37	101	99
Nitrobenzene	54	27	92	51	100	97
2,4 Dimethylphenol	71	21	95	42	100	98
Aniline	9	≥5	94	26	100	96
Benzyl alcohol	10	≥5	92	17	99	99
2,4 Dinitrofluorobenzene	44	4	83	23	98	94
Methylhydroquinone	0	0	77	0	99	94

* Recovery data for additional analytes available upon request.

** Polystyrene Divinyl Benzene

Standard Spe-ed Advanta

Cat.No	Description	Pk
AP-4261	Standard Spe-ed Cartridges 30 mg/1 mL	100
AP-4262	Standard Spe-ed Cartridges 50mg/1 mL	100
AP-4263	Standard Spe-ed Cartridges 100 mg/1 mL	100
AP-4264	Standard Spe-ed Cartridges 100 mg/3 mL	50
AP-4265	Standard Spe-ed Cartridges 200 mg/3 mL	50
AP-4266	Standard Spe-ed Cartridges 500 mg/6 mL	50

Spe-ed Flow Advanta*

Cat.No	Description	Pk
AP-4267	Spe-ed Flow Cartridges 30 mg/1 mL	100
AP-4268	Spe-ed Flow Cartridges 50 mg/1 mL	100
AP-4269	Spe-ed Flow Cartridges 100 mg/1 mL	100
AP-4270	Spe-ed Flow Cartridges 100 mg/3 mL	50
AP-4271	Spe-ed Flow Cartridges 200 mg/3 mL	50
AP-4272	Spe-ed Flow Cartridges 500 mg/6 mL	50

* *Spe-ed* Flow Cartridges are specially designed to allow for the fast, free flowing direct addition of suspended solid laden samples into an SPE cartridge. Please refer to the *Spe-ed* Flow literature for additional information.

Larger cartridge configurations are available upon request.

HPLC Chromatography

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L1	Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 3 to 10 µm in diameter.	MEDITERRANEA SEA18 TRACER EXCEL 120 ODS A TRACER EXCEL 120 ODS B TRACER EXTRASIL ODS2 TRACER EXTRASIL ODS1 Advantix ODS Hyperpack ODS Hyperpack BASIC TSKgel ODS YMC PRO C18 HYPERSIL HYPERSIL BDS HyPURITY C18 LICHROSORB RP18 LICHROSPHER RP18 NUCLEOSIL 100 C18 NUCLEOSIL 120 C18 PARTISIL ODS3
L3	Porous silica microparticles, 5 to 10 µm in diameter.	TRACER EXCEL 120 Si TRACER EXTRASIL Si PINNACLE Si HYPERSIL Si ULTRA Si PINNACLE Si LICHROSORB Si LICHROSPHER Si NUCLEOSIL 100 Si NUCLEOSIL 120 Si PARTISIL Si
L7	Octyl silane chemically bonded to totally porous microsilica particles, 5 to 10 µm in diameter.	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 with 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	Pentafluorophenyl groups chemically bonded to silica particles 5 to 10 µm in diameter	Hypersil GOLD PFP

TK New Hardware Design Column: Ultrafit™ System

New Hardware Design Column: Ultrafit™ System

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

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

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.

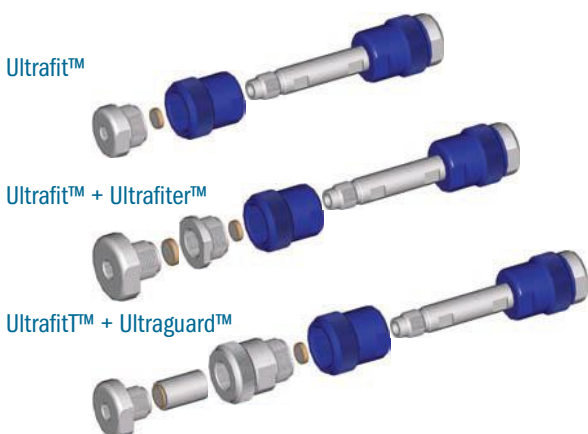
Ultrafit™ System Efficiency

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

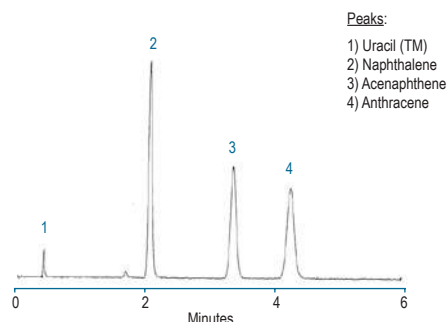
Chromatographic Conditions:

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

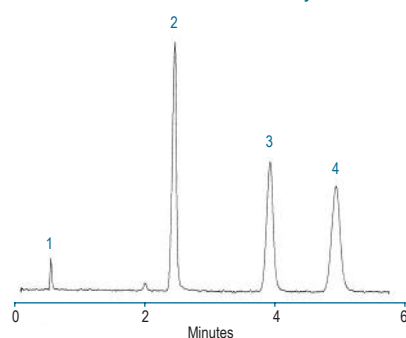
Ultrafit™ System Configuration



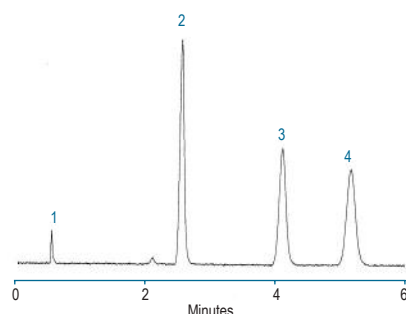
Our Columns **Mediterranea™**, **Europa Peptides™**, **Europa Proteins & Tracer Excel™** are built with the new Ultrafit™ System



Column with Ultrafit™ System



Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™



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.

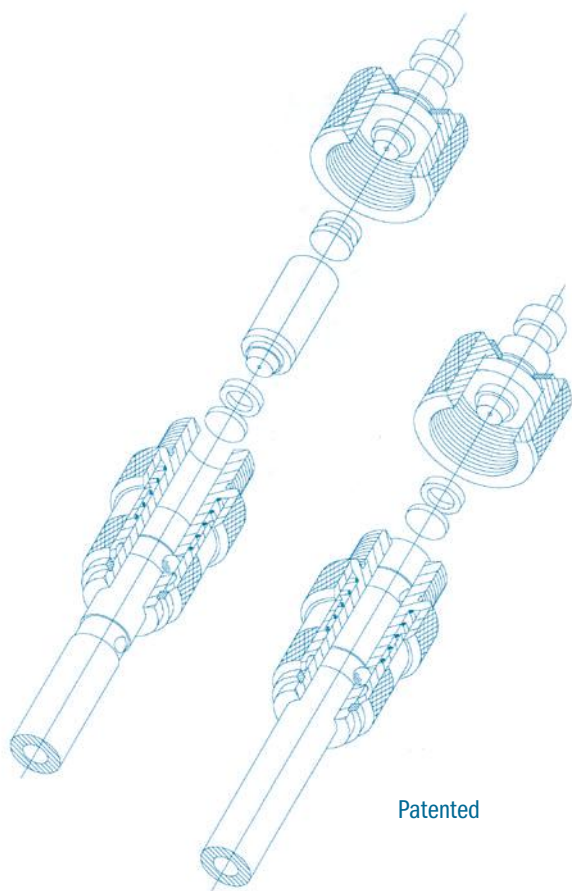
The Novacol™ columns, designed and manufactured by Teknokroma, use the best bonding reagents, packing support materials and proprietary Novabond™ procedures. Novacol™ tubing uniformity and polished interior finish generates higher efficiencies than columns from the major manufacturers. The latest in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

TK Novafix™ HPLC Cartridge System



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

Novafix™ Quality

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

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

Novafix™ Easy Handling

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

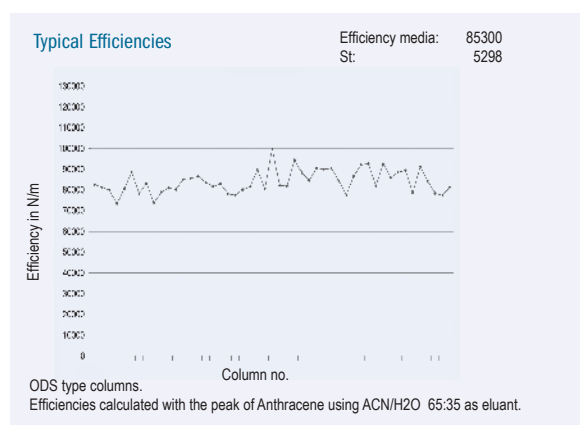
Novafix™ Functional Design

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

Novafix™ Efficiency

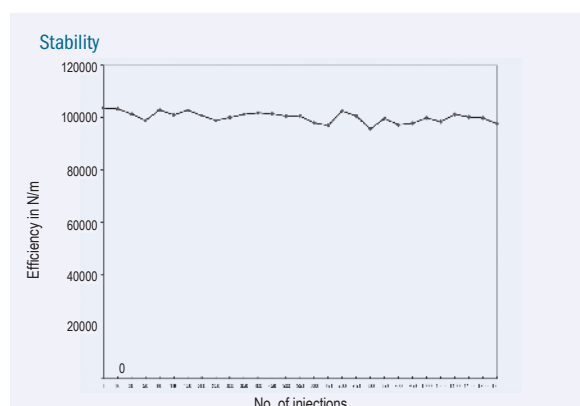
The Novafix™ HPLC Cartridge supplies the highest theoretical efficiency. These typically high efficiencies are achieved due to the zero dead-volume connections and proprietary Novabond™ packing procedures.

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



Novafix™ Stability

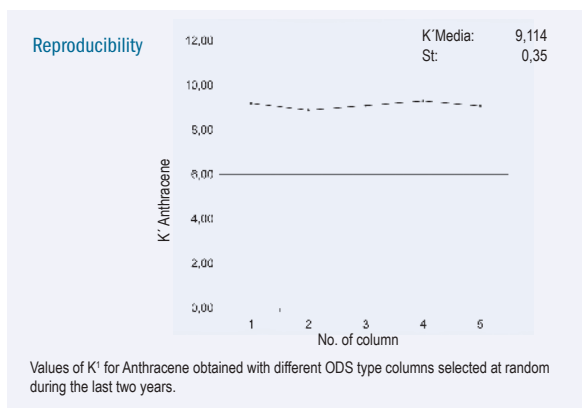
The design of the Novafix™ HPLC Cartridge System ensures not only maximum efficiencies, but also long useful lifetimes. Novafix™ Cartridges provide maximum stability for packing materials in the precolumn and analytical column cartridges, no matter how frequently the precolumn is exchanged.





Novafix™ Reproducibility

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



Novafix™ Versatility

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

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

Guarantee

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

Guard Cartridge

Function	Pkg	Cat.Nbr.
Silica	5 units	TR-015325
ODS	5 units	TR-015326
CN	5 units	TR-015327
NH ₂	5 units	TR-015328
SAX	5 units	TR-015329
SCX	5 units	TR-015330
C-8	5 units	TR-015510
Diol	5 units	TR-015511
C ₆ H ₅	5 units	TR-015512
C-1	5 units	TR-015513
Carbohid.	5 units	TR-015331
Anions	5 units	TR-015335

Economy

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

Kits and Accesories

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

Microbore Columns

Low Dispersion Chromatography

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

Sensibility of Detection

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

Solvents Saving

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

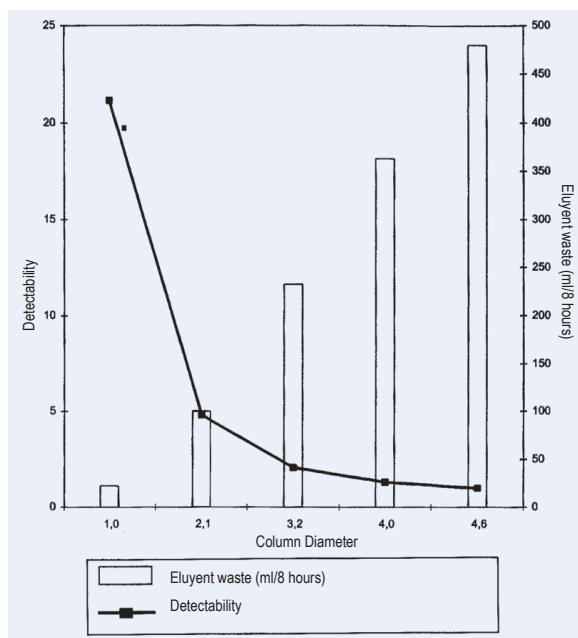
Instrumentation

The level of development achieved by the instrumentation of HPLC allows that these kind of columns can be used by most of the commercialized chromatographs.

In many cases, the 90 % of efficiency loss owed to the chromatograph system, can be eliminated simply with the optimization of connections and the capilar tubes that connect the injector to column and column to detector.

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

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



High-speed chromatography

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

Sensibility of detection

Reducing the size of particle the dispersion of the sample in the inside of the column decreases also.

In this way, the use of ultrarapid columns give a significant improvement of the limit of detection when compared with the one obtained with analytical conventional columns.

High resolution

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

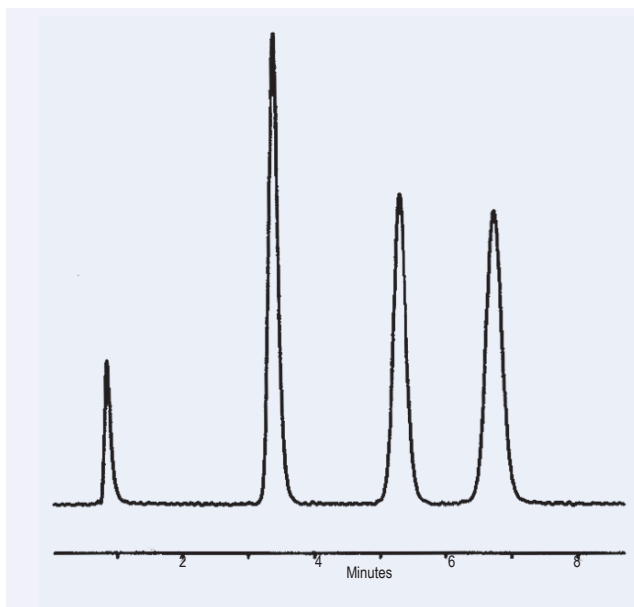
Economy

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 condictions 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 3 μ 3,5 x 0,46 cm

Eluyent: Acetonitrile/H2O 65:35

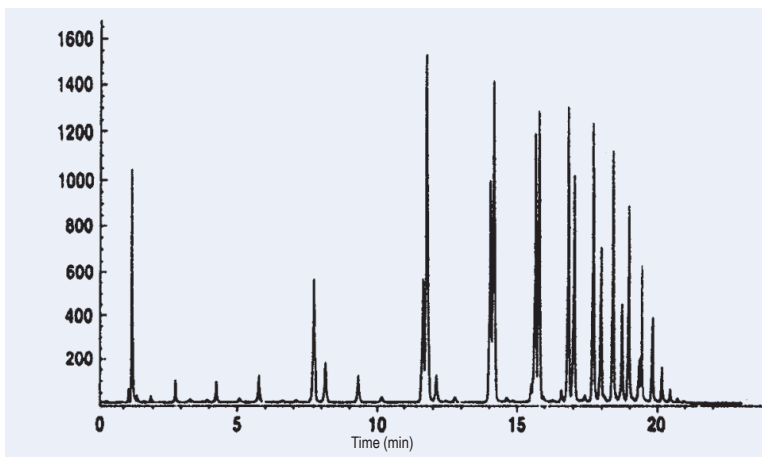
Flow: 4.0 ml/min

Pressure: 110 bar

Sample volume: 10 μl

Temperature: Amb.

Detection: UV 254 nm



Sample : Oligomeres of Polycarbonate

Column: Nucleosil 120 3 μ C-18 25 x 0.4 cm

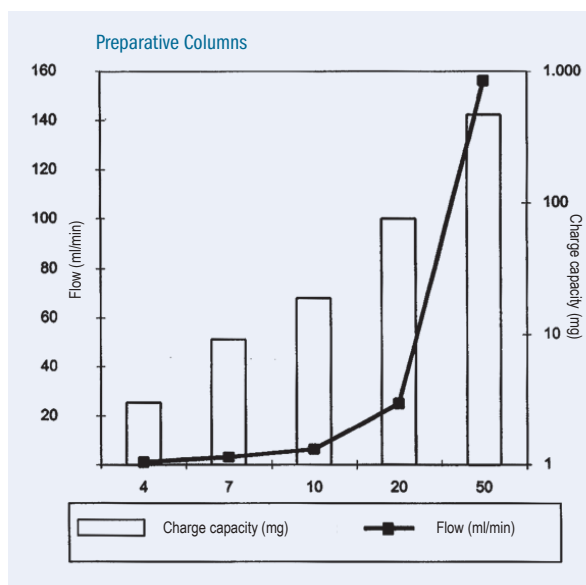
Eluyent: A: 10mM phosphoric acid

B: Acetonitrile

Gradient: 70-100% of B in 30 min

Flow: 3.0 ml/min

Temperature: 70 $^{\circ}\text{C}$; Detection: UV 200 nm



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 μm analytical packing offer exactly the same benefit levels than the correspondent analytical columns.

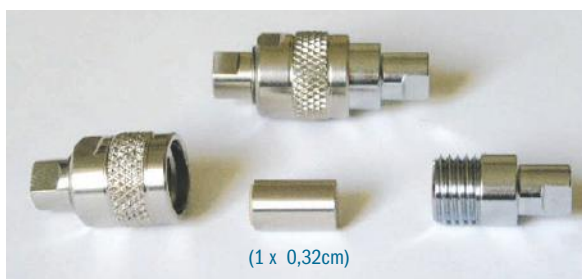
Its high pressure packing ensures a high stability and consequently a long life use of the column.

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.



Reference	Description
TR-C-160	Holder
TR-C-160K1	Holder + 2 cartridges ODS
TR-C-160K2	Holder + 2 cartridges Si
TR-C-160K3	Holder + 2 cartridges C8
TR-C-160K4	Holder + 2 cartridges NH ₂
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	NH ₂ Cartridges (5 units)
TR-C-160-5	SAX Cartridges (5 units)
TR-C-160-6	CN Cartridges (5 units)
TR-C-160-7	PAH Cartridges (5 units)
TR-C-160-8	C6H5 Cartridges (5 units)
TR-C-160-9	CARBOHYDRATES Cartridges (5 units)
TR-C-160-10	ANION Cartridges (5 units)
TR-C-160-11	SCX Cartridges (5 units)
TR-C-160-12	C2 Cartridges (5 units)
TR-C-160-13	300C4 Cartridges (5 units)
TR-C-160-14	300C8 Cartridges (5 units)
TR-C-160-15	DIOL Cartridges (5 units)
TR-C-160-16	300C18 Cartridges (5 units)
TR-C-160-17	C4 Cartridges (5 units)
TR-C-160-18	PRP-1 Cartridges (5 units)
TR-C-160-19	PEPTIDE C18 Cartridges (5 units)
TR-C-160-20	C1 Cartridges (5 units)
TR-C-160-21	C6 Cartridges (5 units)

Guard Columns for HPLC Columns

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

BIOCOMPATIBLE Precolumns

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

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

Guard Column Cartridges, Biocompatible

2.0mm ID X 1 cm, 10 µm

UP-C-280	Reversed Phase C18	3-pk
UP-C-282	Reversed Phase C18	10-pk
UP-C-753	Absorption Si	3-pk
UP-C-754	Absorption Si	10-pk
UP-C-755	Amino Phase NH ₂	3-pk
UP-C-756	Amino Phase NH ₂	10-pk
UP-C-757	Cyano Phase CN	3-pk
UP-C-758	Cyano Phase CN	10-pk

Guard Column Cartridges, Biocompatible

4.3mm ID X 1 cm, 5 µm

UP-C-750	Reversed Phase C18	3-pk
UP-C-752	Reversed Phase C18	10-pk
UP-C-759	Absorption Si	3-pk
UP-C-760	Absorption Si	10-pk
UP-C-761	Amino Phase NH ₂	3-pk
UP-C-762	Amino Phase NH ₂	10-pk
UP-C-763	Cyano Phase CN	3-pk
UP-C-764	Cyano Phase CN	10-pk

Guard Column Cartridge Holders, Biocompatible

UP-C-270 High Pressure, Stainless Steel, with (2) F-200 Fittings

UP-C-283 Low Pressure, Teflon, with (2) P-200/P-245 Fittings

Cartridge Guard Column Kits

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

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

TK Guard Columns for HPLC

Europa™ Guardcolumns

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



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



Tracer Excel™ Guardcolumns

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



Ultraguard™	Ultrafit Guardcolumn adaptor (guard column not included)	TR-010068
Guard Column	ODS 10 x 3.2 mm (5 units)	TR-C-160-1
Guard Column	Si 10 x 3.2 mm (5 units)	TR-C-160-2
Guard Column	C8 10 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™ sea₁₈ Guardcolumns

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



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



COLUMN-GUARD COLUMN CONNECTOR

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

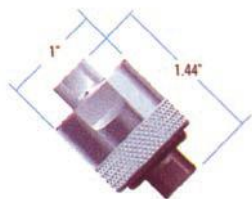


Column-Guard Column connectors U-284 Union Column-Precolumn

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 Mediterranean 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 Mediterranean Sea 18 (2 units)

Spares for Guard Column cartridges

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

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 Mediterranean 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 Mediterranean 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)

Tk mediterranea™ Sea₁₈ New Generation HPLC Column



mediterranea sea₁₈ by Teknokroma



Introduction

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

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

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

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

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

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

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

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

Purity of Silica

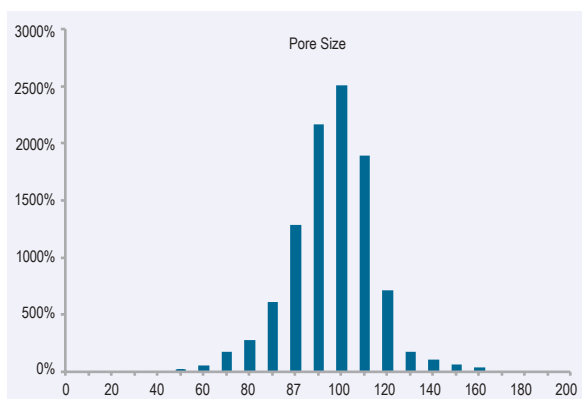
After evaluating many materials as a base for the global-best reverse phase chromatographic packing, the clear consensus is that the special characteristics of silica packings classify them as unsurpassable. No other packing material, apart from ultra-pure silica, achieves the perfect balance of physical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

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

Metals Content (ppm)

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

Porosity (Surface Enhanced Accessibility, SEA)



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

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

Multifunctional Endcapping Deactivation (MED)

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

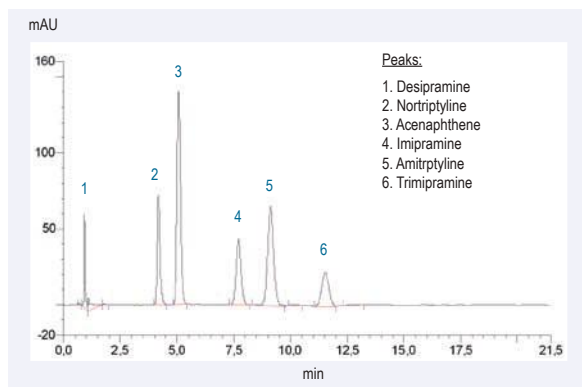
Moreover, the mediterranea™ sea18 column has been designed to show an excellent retention of polar compounds in a 100% aqueous environment without the problems of unwanted interactions which inefficiently endcapped conventional packings produce. Packing chemistry based on the new MED technology, “multifunctional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

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

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

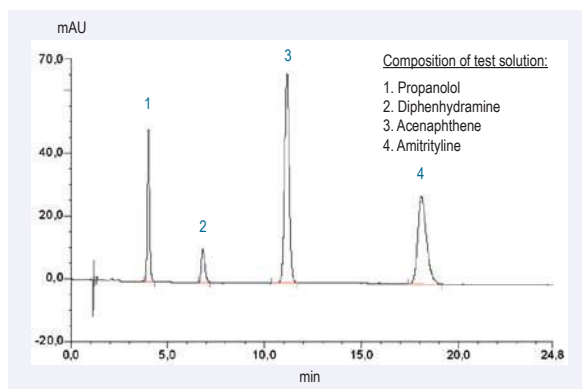
Tk mediterranea™ Sea₁₈ New Generation HPLC Column

Tricyclic Anti-depressants

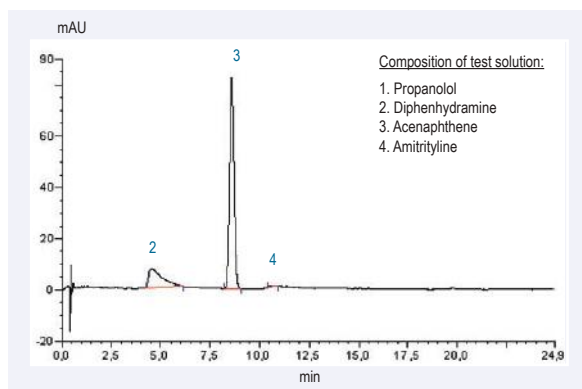


Column: **mediterranea sea 18**, 5 µm 15 x 0,46 cm
 Eluent: Methanol/20mM K₂HPO₄ (pH 7.0) 70:30
 Flow: 1ml/min
 Room Temperature
 Detection: UV 254 nm

Basic Compounds



Column A - mediterranea™ sea 18



Column B - The Competition

Column A: **mediterranea sea 18**, 5 µm 15 X 0,46 cm
 Column B: **Other column from market** 5 µm 15 x 0,46 cm
 Eluient: 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.

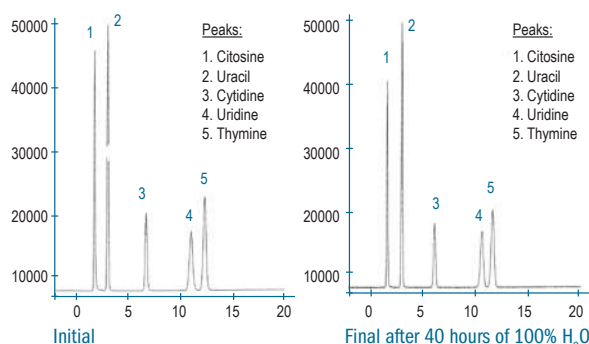
The mediterranea sea18 packing surpasses all the advantages of polar embedded packings by a wide margin and shows none of its inconveniences.

Furthermore, due to its specially optimised endcapping process (MED), the column has guaranteed pH-resistance, reproducibility and long life.

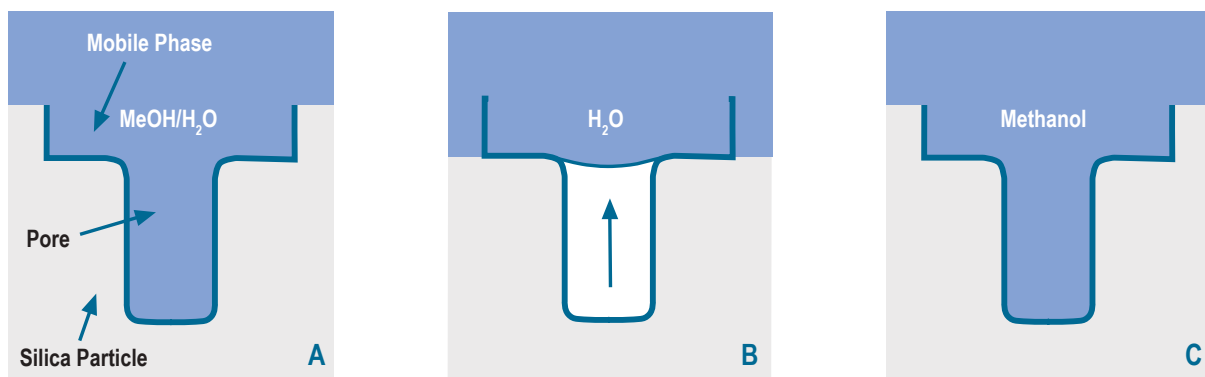
As can be seen, the chromatograms that are obtained after eluting the column with 100% water for more than 40 hours show no appreciable alteration in the retention times or in the efficiency of the chromatographed peaks.

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: H₂O
 Flow: 1ml/min
 Vol. Iny.:10 µl
 Deteción: UV 254 nm



The phenomenon of “Dewetting”

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

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

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

Stop Flow

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

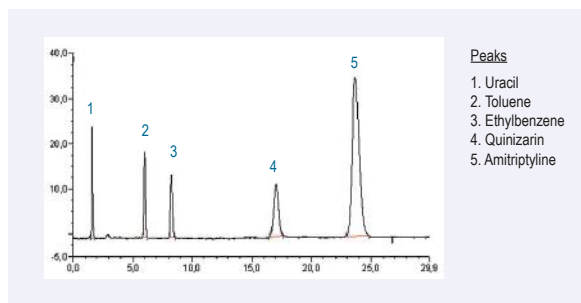
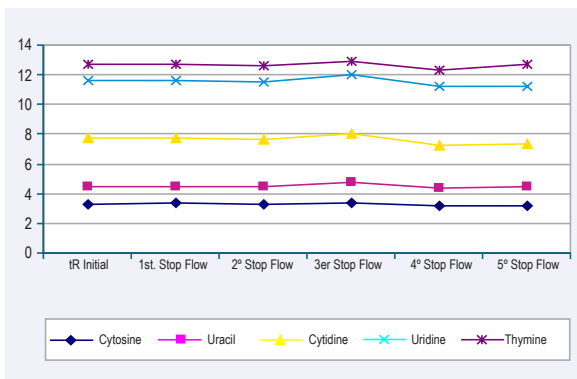
NIST Test for HPLC Packing Characterization

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

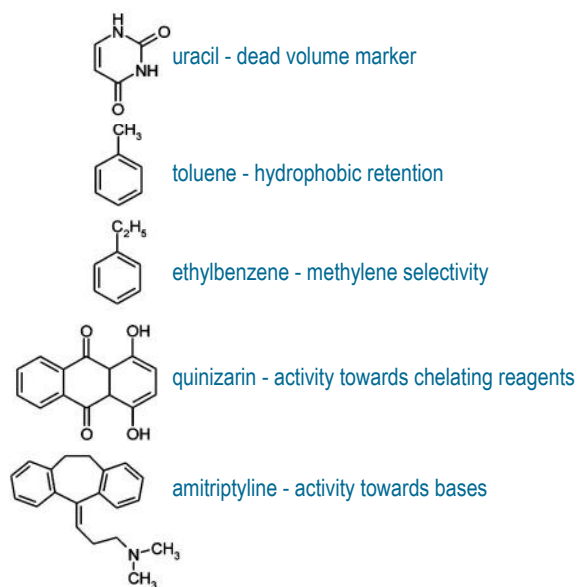
The high number of HPLC reverse phase packings available in the market and the big differences in their chromatographic behaviour has led to the need to design a characterisation and classification method for these packings.

This procedure uses a mixture of five organic components (uracil, toluene, ethylbenzene, quinizarin and amitriptyline) which are chromatographed using exact conditions of mobile phase, flow, and controlled temperatures.

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



Tk mediterranea™ Sea₁₈ New Generation HPLC Column



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.

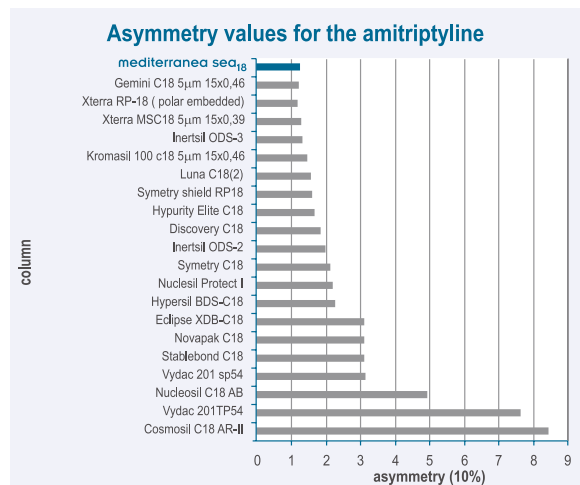
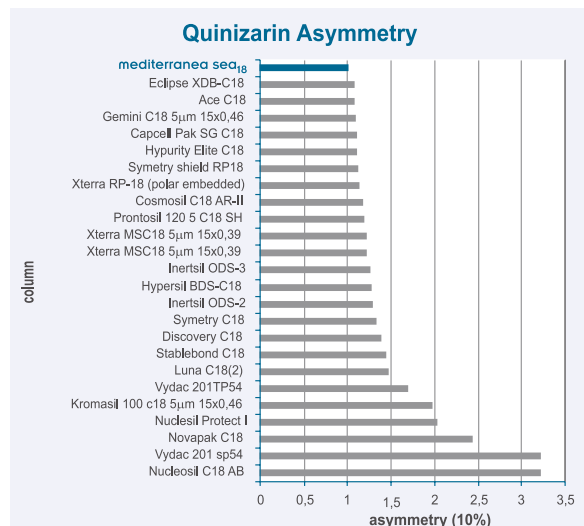
The top-positioning of the mediterranea™ sea18 packing indicates the ultra-high purity of the optimized silica. Teknokroma's ultra-pure silica is your guarantee of reproducibility and of the absence of secondary (and uncontrolled) mechanisms of interaction (common to popular polar-embedded columns).

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™ Sea₁₈ New Generation HPLC Column **Tk**



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.

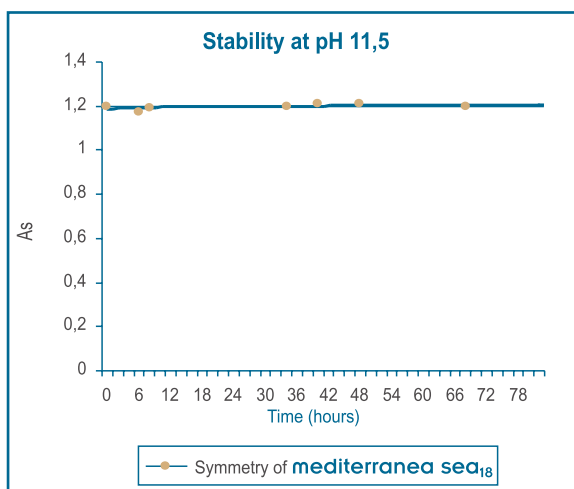
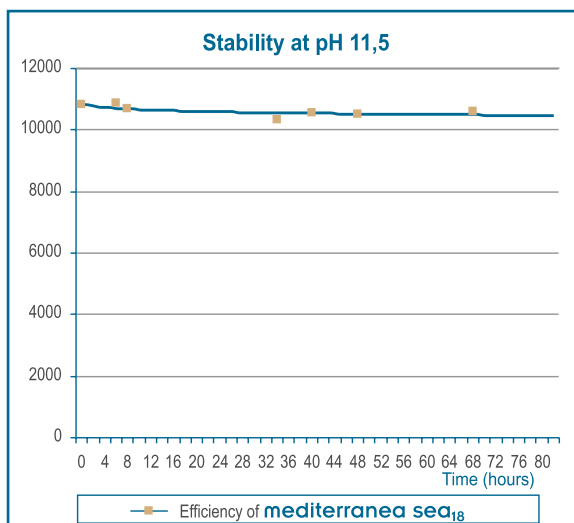
Until quite recently, silica packings were limited to working between pH 2 and pH 7 since below pH 2 the bonds between the C18 chains and the silica particle were hydrolysed, resulting in a gradual loss of retention capacity of the column. Above pH 7 the problem that arose was one of simply dissolving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

Using mediterranea™ sea18 packing makes it 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.

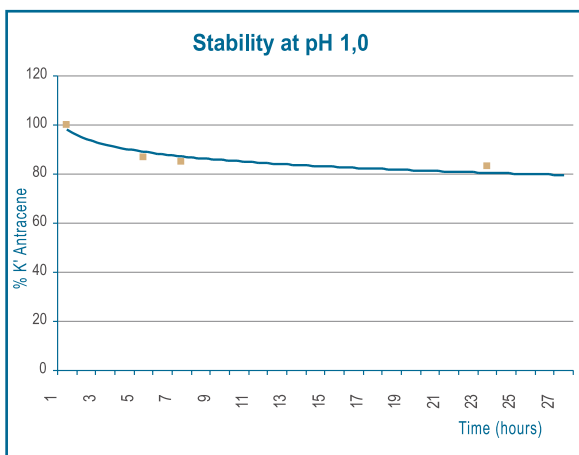
The pH stability graphs show the efficiency of the process.

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//1- methylpyrrolidine 50mM pH 11,5 50:50, 1ml/min 25°C 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.



An eluent of ACN/TFA1% pH 1.0 (10:90) 1ml/min 25°C 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.

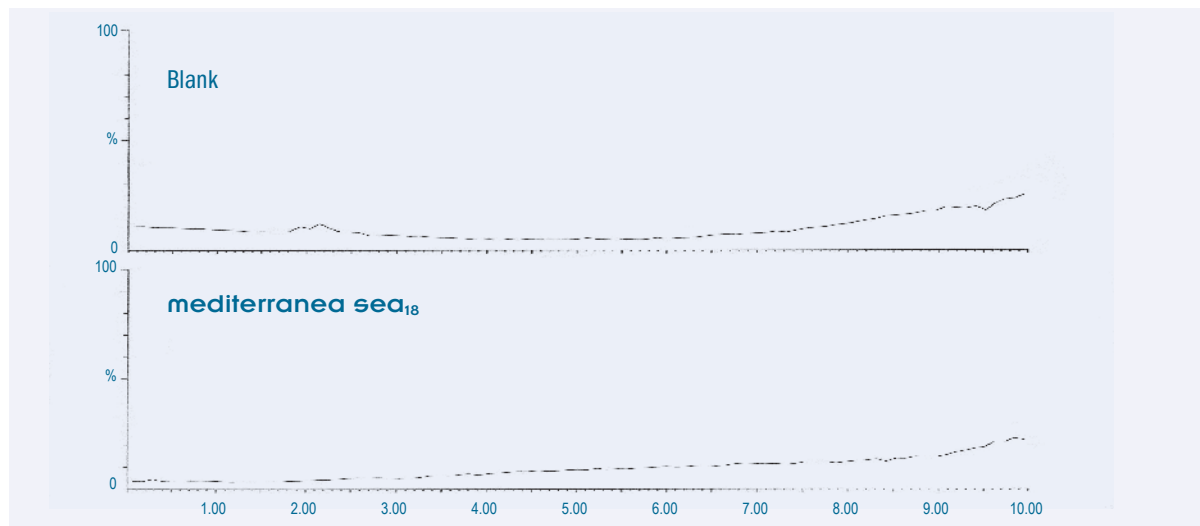
LC-MS Mediterranea™ Sea 18 Columns

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

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

TK mediterranea™ Sea₁₈ New Generation HPLC Column

Bleeding Profile Comparison



Assay by Instituto Químico de Sarrià 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: 25°C

Conditions for MS Detection

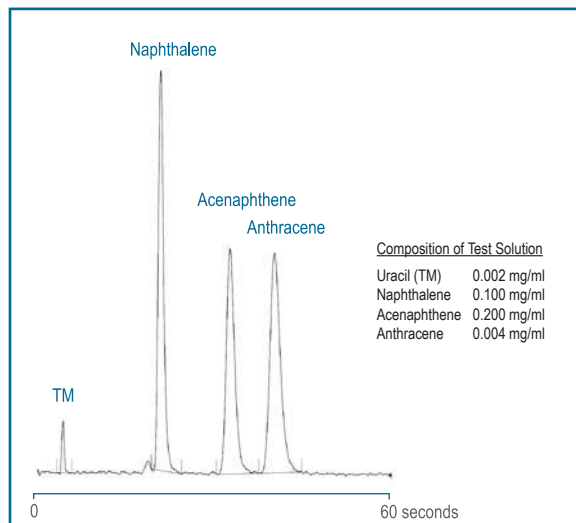
MS Instrument: Waters ZMD
Capillary Voltage: 3kV (ESI positive)
Cone Voltage: 20V
Source block Temp: 100°C
Desolvation Temp: 350°C
Gas: 500l/h
Gas of cone: 35 l/h
Mass Range: 60 to100 amu

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 Injection: 0.5 ml
Temperature: Room
Detección: UV 254 nm

mediterranea™ Sea₁₈ New Generation HPLC Column Tk



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.

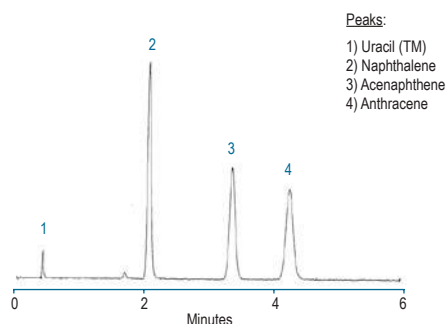
Moreover, the very best material has been selected for the construction of the column, with an ultra-shiny interior finish, of extremely low RMS, ensuring that no tube imperfection in the column will affect the quality of the separation.

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

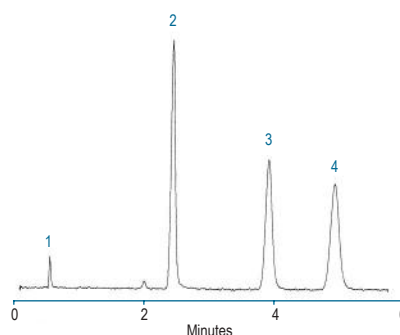
Chromatographic Conditions:

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

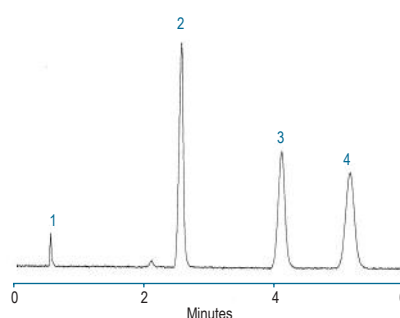


Peaks:
 1) Uracil (TM)
 2) Naphthalene
 3) Acenaphthene
 4) Anthracene

Column with Ultrafit™ System

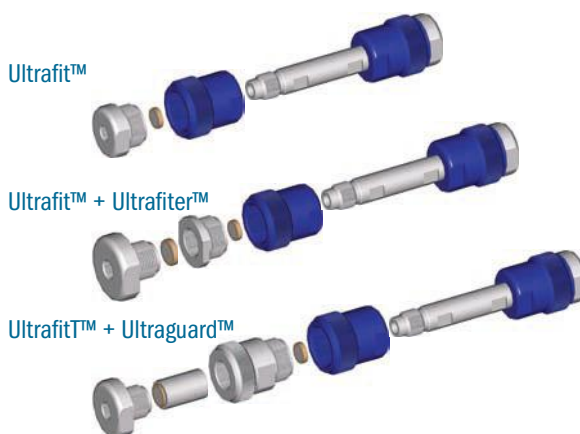


Column with Ultrafit™ System + Ultrafilter™



Column with Ultrafit™ System + Ultraguard™

Ultrafit™ System Configuration



TK mediterranea™ Sea₁₈ New Generation HPLC Column

Analytical Columns 0.46 cm ID mediterranea™ sea₁₈ 5 μm

Packing	Funct.	Length		Diameter	Cat.Nbr.
		μm	cm	cm	
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™ sea₁₈ 5 μm

Packing	Funct.	Length		Diameter	Cat.Nbr.
		μm	cm	cm	
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™ sea₁₈ 5 μm

Packing	Funct.	Length		Diameter	Cat.Nbr.
		μm	cm	cm	
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™ sea₁₈ 5 μm

Packing	Funct.	Length		Diameter	Cat.Nbr.
		μm	cm	cm	
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™ Sea₁₈ New Generation HPLC Column **TK**

SemiPreparative Columns

mediterranea™ sea₁₈ 5 μm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		μm	cm	cm	cm	
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	2.12	TR-010411	
mediterranea	Sea8	5	25	2.12	TR-010412	
mediterranea	Sea4	5	10	0.78	TR-010413	
mediterranea	Sea4	5	15	0.78	TR-010414	
mediterranea	Sea4	5	25	0.78	TR-010415	
mediterranea	Sea4	5	10	1.00	TR-010416	
mediterranea	Sea4	5	15	1.00	TR-010417	
mediterranea	Sea4	5	25	1.00	TR-010418	
mediterranea	Sea4	5	5	2.12	TR-010419	
mediterranea	Sea4	5	10	2.12	TR-010420	
mediterranea	Sea4	5	15	2.12	TR-010421	
mediterranea	Sea4	5	25	2.12	TR-010422	

Novafix™ Cartridges 0.40 cm ID

mediterranea™ sea₁₈ 5 μm

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

Ultrarapid Columns 0.46 cm ID

mediterranea™ sea₁₈ 3 μm

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

Ultrarapid Columns 0.40 cm ID

mediterranea™ sea₁₈ 3 μm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		μm	cm	cm	cm	
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	

TR mediterranea™ Sea₁₈ New Generation HPLC Column

Microbore Columns 0.21 cm ID

mediterranea™ sea₁₈ 3 μm

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

Microbore Columns 0.30 cm ID

mediterranea™ sea₁₈ 3 μm

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

Novafix™ Cartridges 0.40 cm ID

mediterranea™ sea₁₈ 3 μm

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

Other Products

mediterranea™ sea₁₈

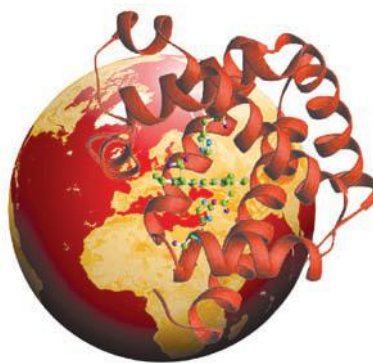
Product	Description	Cat.Nbr.
Ultrafilter™	Ultrafit prefilter adaptor <i>(frit not included)</i>	TR-010067
	Frits of 0.5 μm pore (10 units)	TR-010069
	Frits of 2.0 μm pore (10 units)	TR-010070



Product	Description	Cat.Nbr.
Ultraguard™	Ultrafit Guardcolumn adaptor <i>(guard column not included)</i>	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



by Teknokroma
Europa[®]



Introduction

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

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

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

As a result of these, we launch into the market the Line of Europa HPLC columns, one of the best columns in the field of analysis of biomolecules.

The Europa HPLC columns for peptides and proteins, provide the best performance and unsurpassed efficiency, reliability and reproducibility.

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

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

Furthermore, the proprietary “porification process” (Surface Enhanced Accessibility, SEA) for Europa silica has achieved high surface area without sacrificing important properties like physical resistance 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

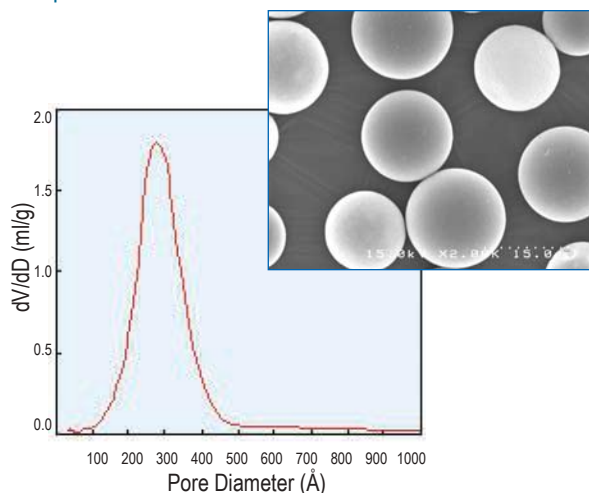
The responsibility for chromatographic separation of peptides and proteins is found inside the particle-within the pores. To obtain a very homogeneous pore distribution the least possible number of nanopores is essential.

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.

TK Europa HPLC Column for Peptides and Proteins

Europa Protein C4 Pore Distribution

Europa Protein C 4 300



Deactivation Process

Thanks to our proprietary 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 symmetrical 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

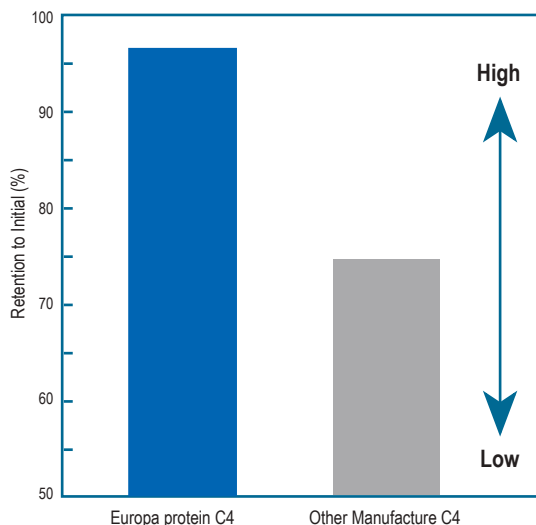
Using Europa C 18 packing materials it is possible to work with eluents from pH 1 to pH 12. Such unusual pH resistance values have been achieved as a result of phase bonding efficiency and a proprietary endcapping process which provides a protective shield against acidic and basic eluents.

Europa columns ensure greater separation efficiency, resistance to extreme pH conditions and can be used for an extended period of time.

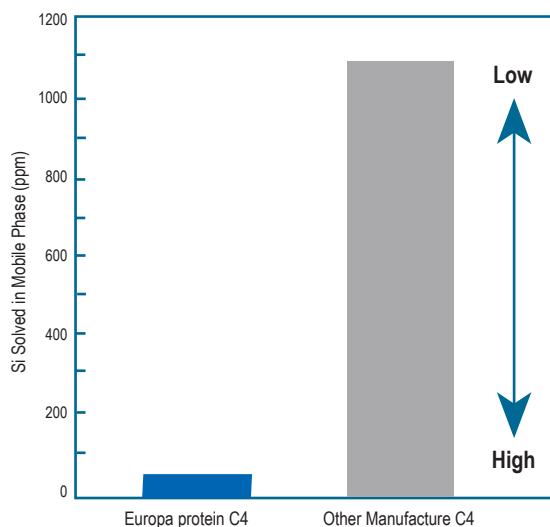
Europa Protein C4 Phase Stability

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

Acid Resistance pH=1



Alkalil Resistance pH=12

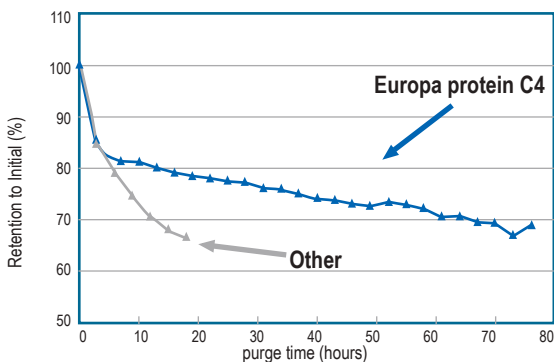


Europa HPLC Column for Peptides and Proteins **Tk**

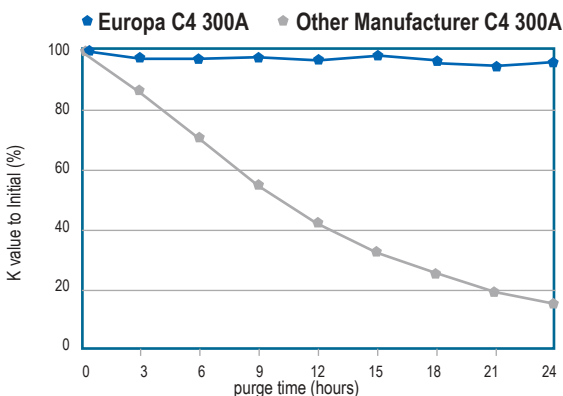
Durability comparison in Alkaline Medium/RT

The graphic below 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 naphthalene after every three hours of purge, using CH₃CN / H₂O 35:65 at 1.7 ml/min and 40°C (UV detection at 254 nm). It is seen that after 80 hours, Europa columns still perform very well.

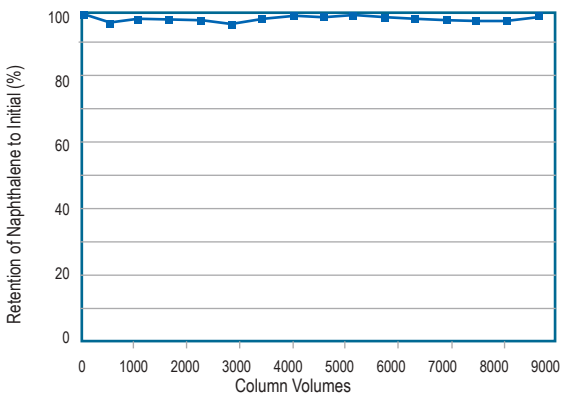


Durability comparison in Acidic Medium / K value



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

Durability under Acidic Condition



Retention time for naphthalene 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.

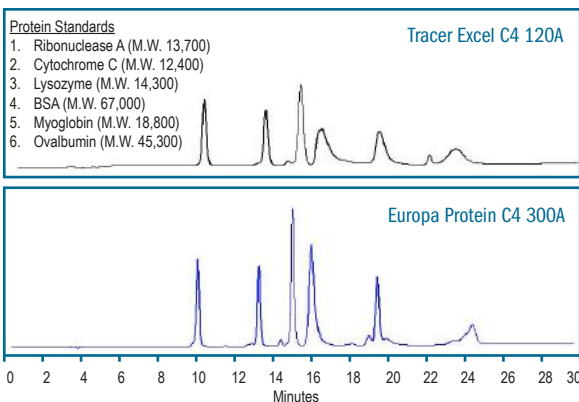
Our "Ultra-Fast" columns are made in 3-5 cm length in order to get quick analytical results, whereas the "High Efficiency" columns are normally in 15-25cm lengths to obtain the best resolution.

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 m²/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: 35°C; 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.

TK Europa HPLC Column for Peptides and Proteins



Europa packaging

Europa C18 Peptide Microbore HPLC Columns



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

Europa C18 Peptide Analytical HPLC Columns



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

Europa C18 Peptide Semi Preparative HPLC Columns



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

Europa C18 Peptide Preparative HPLC Columns



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

Europa HPLC Column for Peptides and Proteins **Tk**

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 m²/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 Columns



Packing	Funct.	µm	Length		Cat.Nbr.
			µm	cm	
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 Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
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 Columns



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		Diameter	Cat.Nbr.
			µm	cm		
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 Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm		
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	

TK 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 Columns



Packing	Funct.	Length		Diameter	Cat.Nbr.
		µm	cm	cm	
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 Columns



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.	Length		Diameter	Cat.Nbr.
		µm	cm	cm	
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.	Length		Diameter	Cat.Nbr.
		µm	cm	cm	
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 Columns



Packing	Funct.	Length		Diameter	Cat.Nbr.
		µm	cm	cm	
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 Columns



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

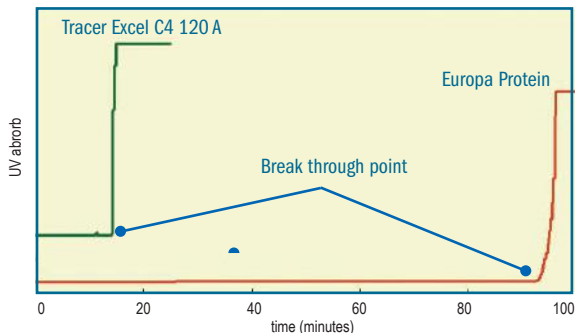
For Guard Columns please refer to pages 197-199

Europa HPLC Column for Peptides and Proteins **Tk**

Europa C4 Protein HPLC Columns

Europa Protein C4 300 A - Loading Capacity of BSA

Protein 300 exhibited the highest loading capacity for proteins

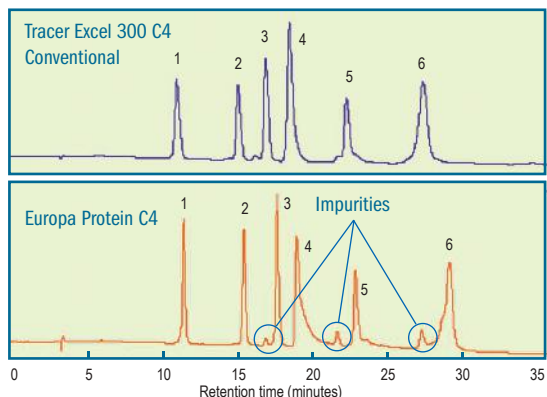


Column: 7 mm I.D. x 250 mm Length; Temperature: 35°C; Detector: UV 220 nm;
Flow Rate: 1.0 ml/min.
Feed: 10 mg/mL BSA in 0.1% TFAaq
 Europa C4 columns are recommended for compounds too strongly retained on C 18 and C 8

Europa Protein C4 300 A - Protein Separation Behaviors

- Similar Hydrophobic Selectivity
- Higher Resolution

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



Column: 6 mm I.D. x 250 mm Length; Temperature: 35°C; 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 Columns



Packing	Funct.	µm	Length		Cat.Nbr.
			cm	cm	
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

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
Europa Protein 300	C4	5	25	0.46	TR-010087	
Europa Protein 300	C4	5	3	0.40	TR-010088	
Europa Protein 300	C4	5	4	0.40	TR-010089	
Europa Protein 300	C4	5	5	0.40	TR-010090	
Europa Protein 300	C4	5	10	0.40	TR-010091	
Europa Protein 300	C4	5	15	0.40	TR-010092	
Europa Protein 300	C4	5	20	0.40	TR-010093	
Europa Protein 300	C4	5	25	0.40	TR-010094	

Europa C4 Protein Microbore HPLC Columns



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		Diameter	Cat.Nbr.
			cm	cm		
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 Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
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 Columns



Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			cm	cm		
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 300Å pore size for biochromatography.
- Exceptional long lifetime.
- Wide range of packings.
- Fully deactivated after functional bonding.

TRACER EXCEL ODS-A

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

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

Maximum Stability

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

Total deactivation

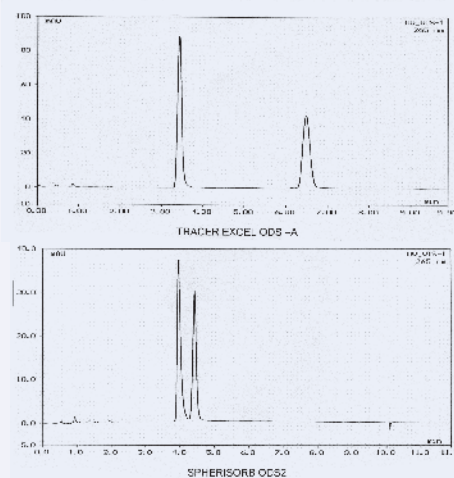
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

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

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

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

Pyridine/Phenol test



Conditions of test

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

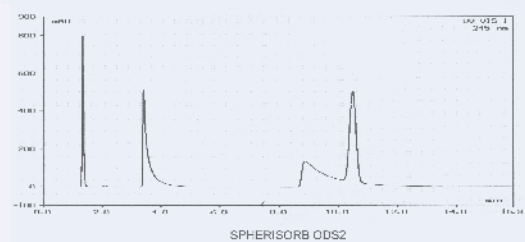
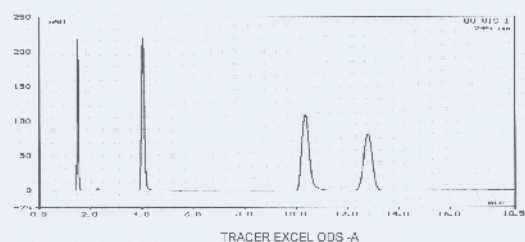
Composition:

Pyridine 2.1µl/ml
Phenol:14 mg/m

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

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

Acid Compounds Test



Conditions of test

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

Composition:

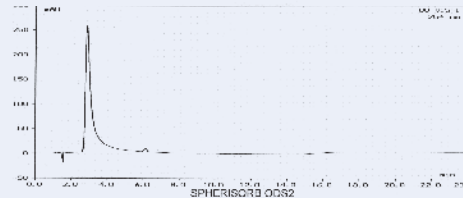
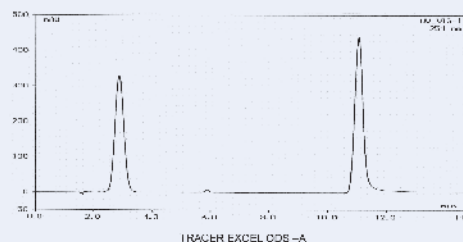
Uracil: 0.5mg/ml
Benzoic acid: 3.6 mg/ml
p-Ethylbenzoic acid: 0.9 mg/ml
Methylbenzene: 3.0 mg/ml

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



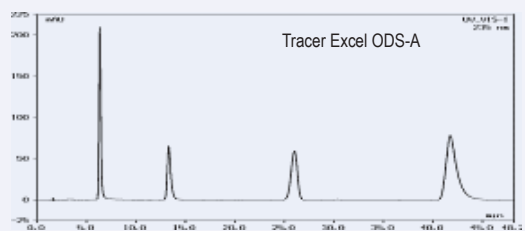
Conditions of test

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
Acetylacetone: 0.5mg/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:

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

Reproducibility

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.

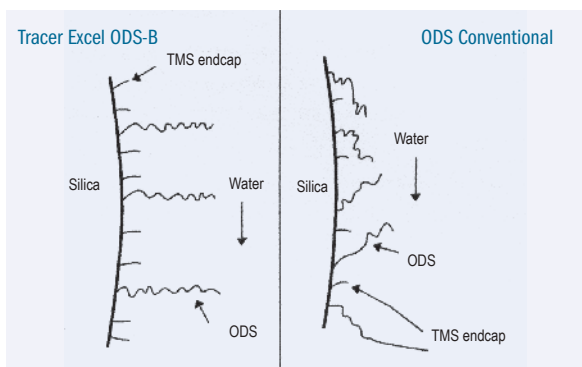
TRACER EXCEL ODS-B

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

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

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

EFFECT OF AQUEOUS ELUTANTS ON THE ORGANIZATION OF HYDROCARBON CHAINS.

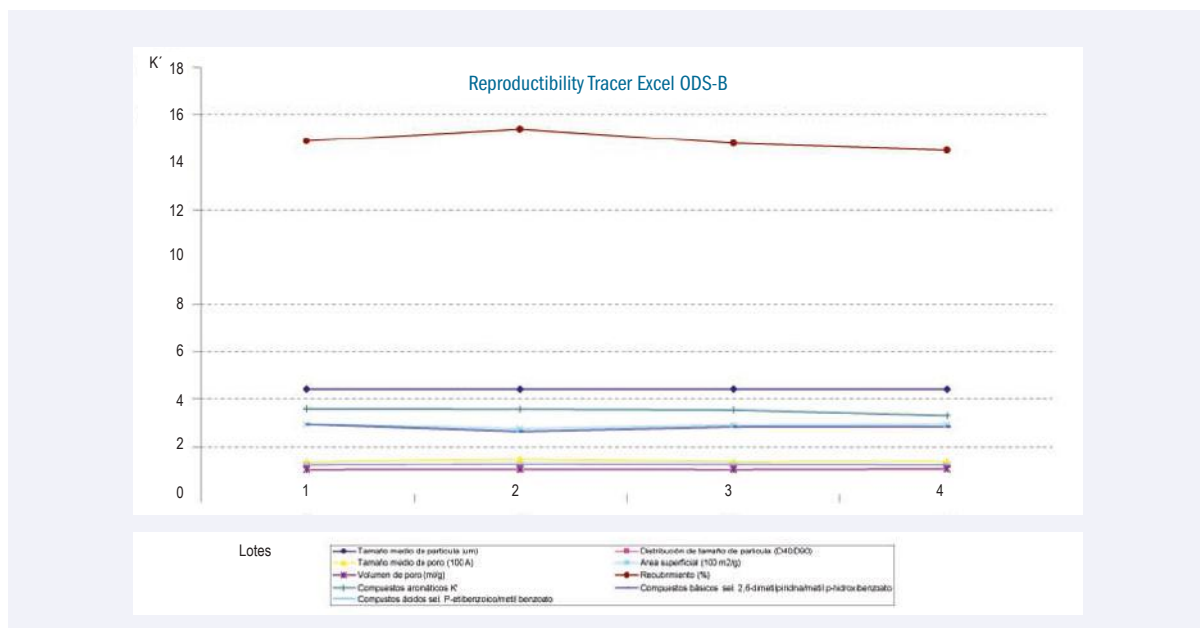
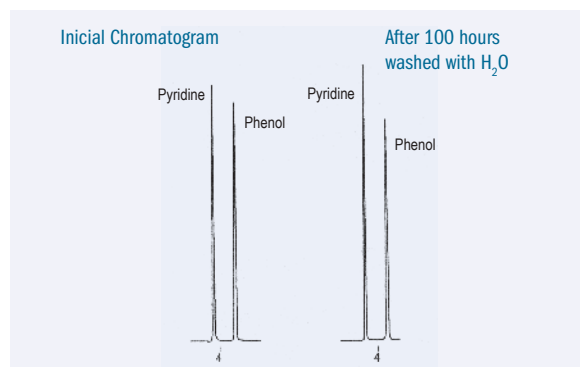


Generally, its field of application is the same as that of the TRACER EXCEL ODS-A, but its field of application is extended for samples which are especially difficult for conventional reversed phases, as is the case in separating oligosaccharides, amino acids, nucleotides and organic acids.

The special chromatographic conditions of TRACER EXCEL ODS-B also provide a specific selectivity for compounds which contain slightly polar groups in their structure.

This column is especially recommended for LC-MS in that, in many cases, the use of plugs or ionic blocking agents are avoided, which negatively affect detection when this technique is used.

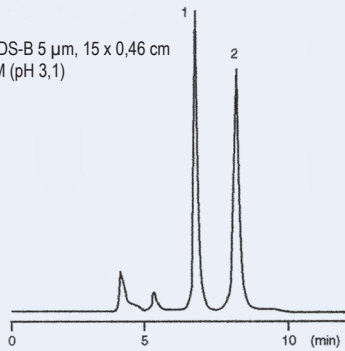
As shown in the chromatogram, after more than 100 hours of operations with water no alteration is observed in retention times, selectivity or distortion in the peaks of pyridine and phenol - a clear indication that no collapse of the bonded phase functionality is adversely achieved with TRACER EXCEL ODS-B columns. Interestingly, the collapsing of bonded phase functionality with the majority of reversed phase columns on the market is typical under these conditions.



Antioxidants

Column: TRACER EXCEL ODS-B 5 μ m, 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 μ m, 15 x 0,46 cm
 Eluant: Phosphate Plug 20 mM (pH 7,0)CH₃CN 95/5 cm
 Flow: 0,6 ml/min.
 Detector: UV 210 nm

Sample: 1 Calcium Pantothenate
 2 Pyridoxine hydrochloride (B₆)
 3 Nicotinamide



Glycolid Acid and Latic Acid

Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: H₃PO₄ 0,1%
 Flow: 0,6 ml/min.
 Temperature: 40°C
 Detector: UV 210 nm

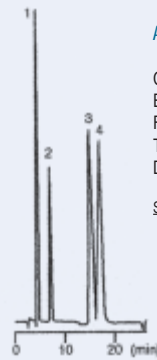
Sample: 1 Glycolic Acid
 2 Lactic Acid



Alcohols

Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: H₂O
 Flow: 0,6 ml/min.
 Temperature: 40°C
 Detector: RID

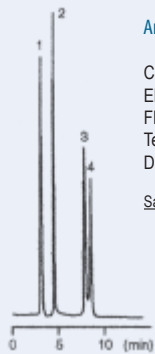
Sample: 1 Methanol
 2 Ethanol
 3 Iso-Propanol
 4 n-propanol



Aminoacids

Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: H₂O
 Flow: 0,6 ml/min.
 Temperature: 40°C
 Detector: RID

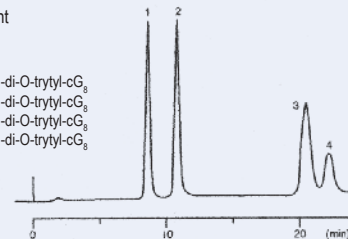
Sample: 1 Alanine
 2 Valine
 3 Isoleucine
 4 Leucine



Cyclodextrin derivatives

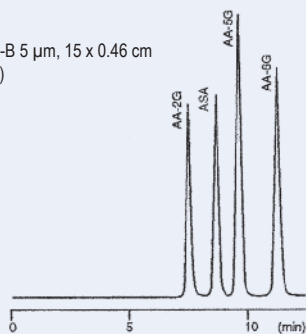
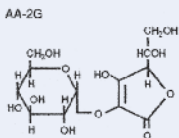
Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: MeOH/H₂O 70:30
 Flow: 0,6 ml/min.
 Temperature: ambient
 Detector: UV240 nm

Sample: 1 6', 6⁵-di-O-trytyl-cG₃
 2 6', 6¹-di-O-trytyl-cG₃
 3 6', 6³-di-O-trytyl-cG₃
 4 6', 6²-di-O-trytyl-cG₃



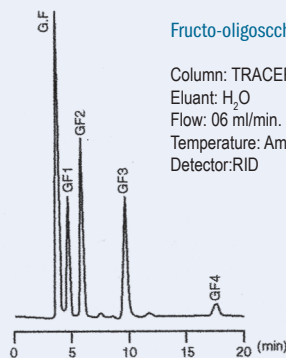
Ascorbic Acid and Glycosides

Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: Phosphate Plug (pH 3,8)
 Flow: 0,4 ml/min.
 Temperature: Ambient
 Detector: UV240 nm



Fructo-oligosaccharides

Column: TRACER EXCEL ODS-B 5 μ m, 15 x 0,46 cm
 Eluant: H₂O
 Flow: 0,6 ml/min.
 Temperature: Ambient
 Detector: RID



Tk Other Tracer Excel Packings

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

Si	Material of the ultrapure silica particle, the basis of all the TRACER EXCEL range.
C8	<p>This packing, made operative with octyl groups and totally endcapped, is extremely versatile.</p> <p>Its use is recommended for highly hydrophobic samples, which are retained excessively on ODS type packings.</p> <p>Developed on the same ultrapure silica as ODS-A and ODS-B, it is extremely reproducible and reliable.</p>
C4	<p>The same ultra pure silica of all the TRACER EXCEL range made operative with butyl groups, giving a moderately hydrophobic packing.</p> <p>Its principle field of application is the separation of peptides and proteins by reverse phase.</p> <p>In this case, the same packing is used with a 300 Å porosity, more suitable for the large size of protein molecules.</p> <p>Another field where this packing can be highly recommended is when the sample contains compounds of a very different hydrophobic nature.</p> <p>This packing permits perfect separation of a sample with a single injection.</p>
C1	<p>The same ultrapure silica of the TRACER EXCEL range is given its special function with tri-methylchlorosilane to create a low hydrophobic reversed phase.</p> <p>Its field of application includes the separation of peptides and proteins by reversed phase.</p> <p>It can also be used as a packing for normal phase with highly polar compounds.</p>
CN	<p>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.</p> <p>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 chromatographer a completely reliable alternative.</p> <p>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.</p>
NH ₂	<p>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.</p> <p>It is recommended for separations of basic compounds under normal phase conditions.</p> <p>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.</p> <p>It is also very suitable for SFC applications</p>
Ph	<p>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.</p>
300 Angstrom	<p>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.</p>

General Properties of Tracer Excel Packings **Tk**

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





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

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

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

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

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

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

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

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

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

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-B	5	TR-021353	TR-021354
Si	5	TR-021395	TR-021364
C8	5	TR-021365	TR-021366
C4	5	TR-021367	TR-021368
C1	5	TR-021369	TR-021370
NH2	5	TR-021371	TR-021372
CN	5	TR-021373	TR-021374
Ph	5	TR-021375	TR-021376

Other configurations available on demand

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

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

Other configurations available on demand





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

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

Other configurations available on demand

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

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

Other configurations available on demand

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

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

Other configurations available on demand

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

Function	µm	L e n g t h c m		
		7.5 cm	15 cm	25 cm
ODS-A	3	TR-016427	TR-016428	TR-015731
ODS-B	3	TR-015732	TR-015733	TR-015734
Si	3	TR-015735	TR-015736	TR-015737
C8	3	TR-015738	TR-015739	TR-015740
C4	3	TR-015741	TR-015742	TR-01543
C1	3	TR-015744	TR-015745	TR-015746
NH2	3	TR-015747	TR-015748	TR-015749
CN	3	TR-015750	TR-015751	TR-015752
Ph	3	TR-015753	TR-015754	TR-015755

Other configurations available on demand

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

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

Other configurations available on demand

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

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-016169	TR-016170
ODS-B	5	TR-016173	TR-016174
Si	5	TR-016177	TR-016178
C8	5	TR-016181	TR-016182
C4	5	TR-016185	TR-016186
C1	5	TR-016189	TR-016190
NH2	5	TR-016193	TR-016194
CN	5	TR-016197	TR-016198
Ph	5	TR-016201	TR-016202





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

Function	µm	L e n g t h c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-016400	TR-016401	TR-016402	TR-016403	TR-016404
C8	5	TR-016400	TR-016406	TR-016407	TR-016408	TR-016409
C4	5	TR-016400	TR-016411	TR-016412	TR-016413	TR-016414

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

Function	µm	L e n g t h c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-416400	TR-416401	TR-416402	TR-416403	TR-416404
C8	5	TR-416405	TR-416406	TR-416407	TR-416408	TR-416409
C4	5	TR-416410	TR-416411	TR-416412	TR-416413	TR-416414

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

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-012395	TR-012396
C8	5	TR-012397	TR-012398
C4	5	TR-012399	TR-012400

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

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-021401	TR-021402
C8	5	TR-021403	TR-021404
C4	5	TR-021405	TR-021406

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

Function	µm	L e n g t h c m		
		7.5 cm	15 cm	25 cm
ODS-A	5	TR-416417	TR-416418	TR-416419
C8	5	TR-416420	TR-416421	TR-416422
C4	5	TR-416423	TR-416424	TR-416425

For Guard Columns please refer to pages 197-198



The new range of Tracer Extrasil packings has been specially developed to replace one of the most popular packings on the market (WS).

All the physical and chromatographic parameters evaluated show a total equivalence between both materials, and what is more important, this has been certified by the excellent results obtained by the many users who up to now have tried this packing.

Economy

Tracer Extrasil represents the most economical choice of HPLC packings.

Reproducibility

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

Guarantee

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

Characteristics of the material

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

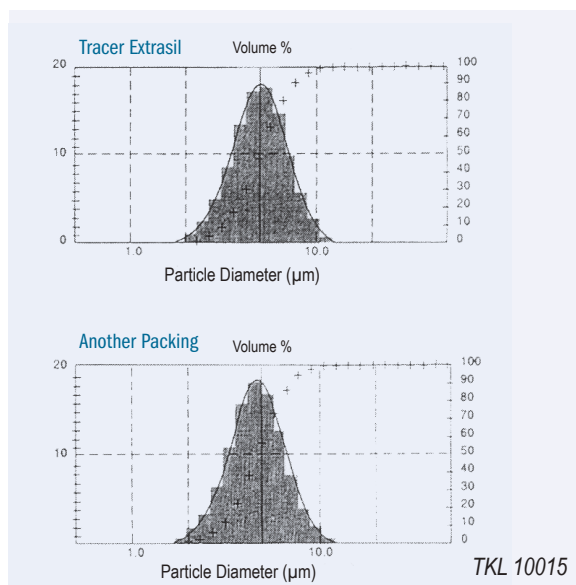
Characteristics

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

Distribution of particle size

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

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



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.

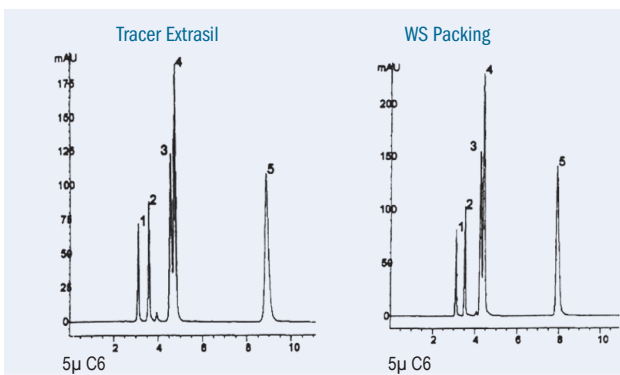


Applications

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.

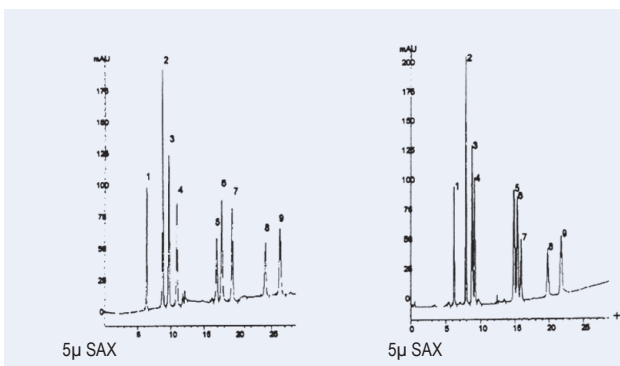
Catecholamines

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



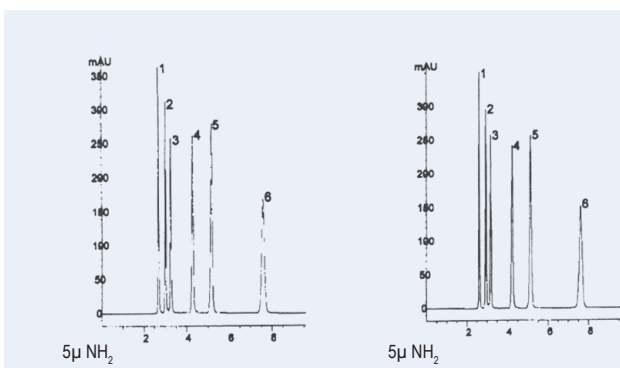
Nucleotides

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



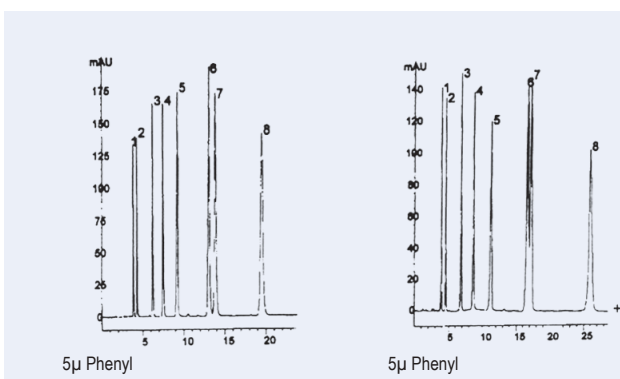
Corticosteroids

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 Cetones

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

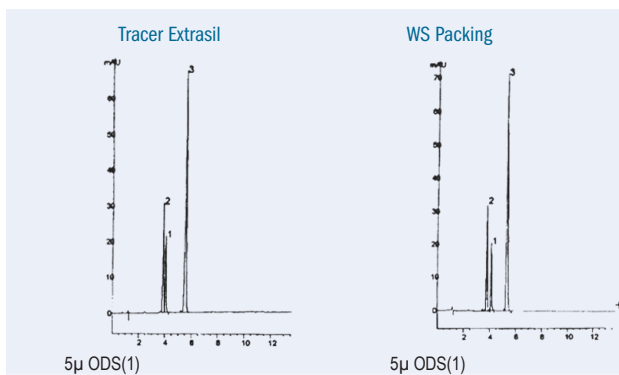


SRM 869

Dimensions: 250 x 4.6 mm
 Mobil Phase: H₂O:CH₃CN (15:85)
 Flow Rate: 2.0mL/min
 Temperature: 35°C
 Detection: UV@ 260nm
 Sample: 1. Benzo (a) pirene (BaP)
 2. Phenantro (3,4-C)
 2. Phenantrene (Ph Ph)
 3. Tetrabenzonaphtalene

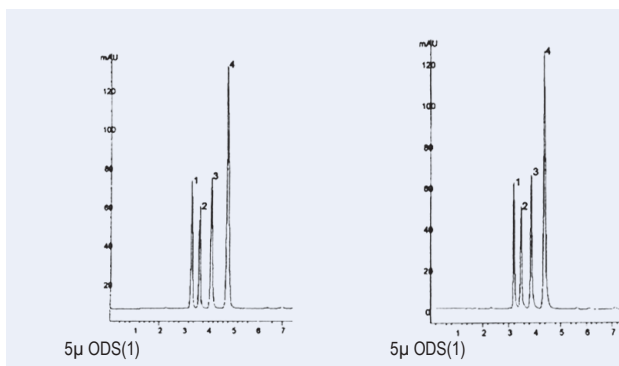
Tracer Extrasil ODS 2 aTBN/BaP = 1,77

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



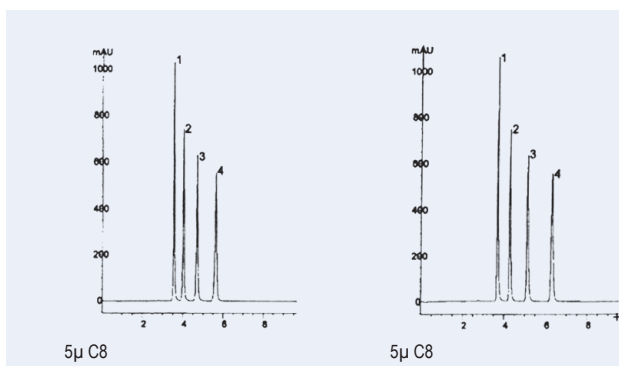
4-Hidroxi benzoates

Dimensions: 250 x 4.6 mm
 Mobil Phase: H₂O:CH₃CN (35:65)
 Flow Rate: 1.0mL/min
 Detection: UV@ 254nm
 Sample: 1. Methyl-4-hidroxi benzoate
 2. Ethyl-4-hidroxi benzoate
 3. Propyl-4-hidroxi benzoate
 4. Butyl-4-hidroxi benzoate



4-Hidroxi benzoates

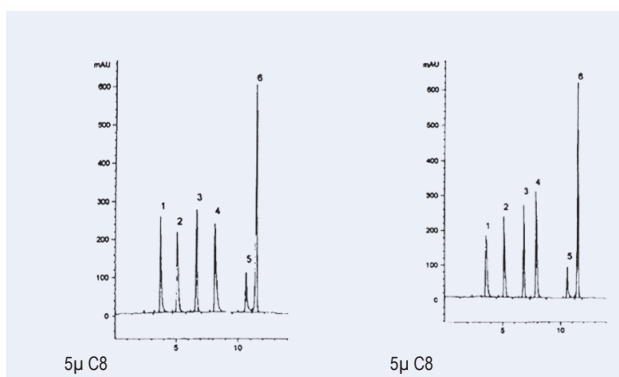
Dimensions: 250 x 4.6 mm
 Mobil Phase: H₂O:CH₃CN (45:55)
 Flow Rate: 1.0mL/min
 Detection: UV@ 254nm
 Sample: 1. Methyl- 4-hidroxi benzoate
 2. Ethyl-4-hidroxi benzoate
 3. Propyl-4-hidroxi benzoate
 4. Butyl-4-hidroxi benzoate



Hidrosoluble Vitamines

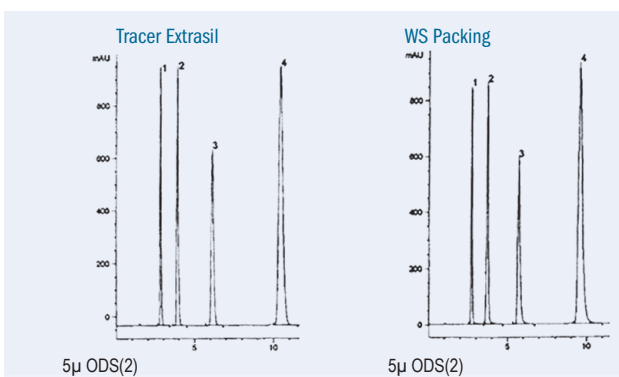
Dimensions: 150 x 4.6 mm
 Mobil Phase: A: 5mM 1-Penta sodic nesulfonate in 0.1% H₃PO₄
 B: 5mM 1-Sodic Pentanesulfonate in 0.1% H₃PO₄ in 80 % CH₃CN A:B (97.5:2.5) to A:B (70:30) in 20 min.

Flow Rate: 1.0mL/min
 Detection: UV@ 254nm
 Sample: 1. Nicotinamine
 2. Pyridoxal
 3. Acide p-amynobenzaic
 4. Tyamine
 5. Folic Acid
 6. Riboflavine



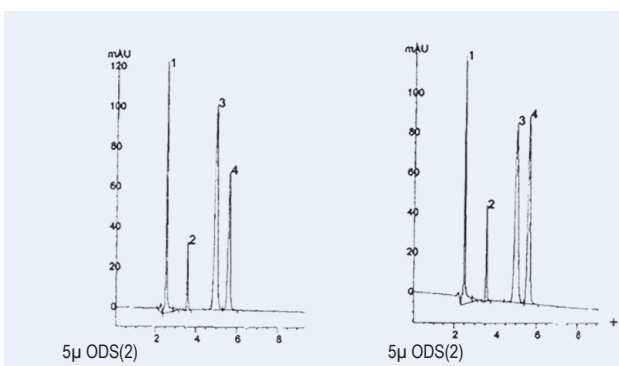
4-Hidroxi benzoat

Dimensions: 150 x 4.6 mm
 Mobil Phase: H₂O:CH₃CN (40:60)
 Flow Rate: 1.0 mL/min
 Temperature: 40°C
 Detection: UV@ 254nm
 Sample:
 1. Methyl-4-hidroxi benzoat
 2. Ethyl-4-hidroxi benzoat
 3. Propyl-4-hidroxi benzoat
 4. Butyl-4-hidroxi benzoat



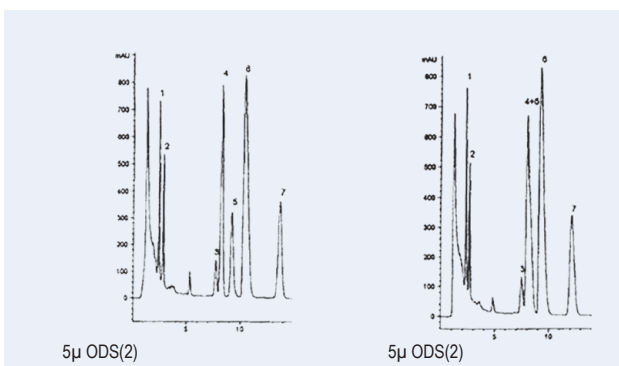
Polar Compounds

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



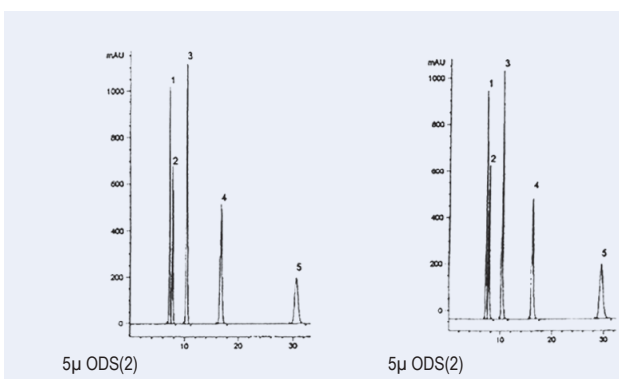
Liposoluble Vitamin

Dimensions: 150 x 4.6 mm
 Mobil Phase: CH₃CN:CH₃OH (75:25)
 Flow Rate: 1.3 mL/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: H₂O:CH₃CN (70:30)
 Flow Rate: 1.0 mL/min
 Detection: UV@ 254nm
 Sample:
 1. Baygon™
 2. Carbofuran
 3. Carbanyl
 4. Propham
 5. Captan



Analytical columns Tracer EXTRASIL

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
ODS1	5	TR-016050	TR-416050	TR-016051	TR-416051	TR-016052	TR-416052	TR-016053	TR-416053	TR-016054	TR-416054
ODS2	5	TR-016055	TR-416055	TR-016056	TR-416056	TR-016057	TR-416057	TR-016058	TR-416058	TR-016059	TR-416059
Si	5	TR-016060	TR-416060	TR-016061	TR-416061	TR-016062	TR-416062	TR-016063	TR-416063	TR-016064	TR-416064
C-1	5	TR-016065	TR-416065	TR-016066	TR-416066	TR-016067	TR-416067	TR-016068	TR-416068	TR-016069	TR-416069
C-6	5	TR-016070	TR-416070	TR-016071	TR-416071	TR-016072	TR-416072	TR-016073	TR-416073	TR-016074	TR-416074
C-8	5	TR-016075	TR-416075	TR-016076	TR-416076	TR-016077	TR-416077	TR-016078	TR-416078	TR-016079	TR-416079
CN	5	TR-016080	TR-416080	TR-016081	TR-416081	TR-016082	TR-416082	TR-016083	TR-416083	TR-016084	TR-416084
NH2	5	TR-016085	TR-416085	TR-016086	TR-416086	TR-016087	TR-416087	TR-016088	TR-416088	TR-016089	TR-416089
Phenyl	5	TR-016090	TR-416090	TR-016091	TR-416091	TR-016092	TR-416092	TR-016093	TR-416093	TR-016094	TR-416094
SAX	5	TR-016095	TR-416095	TR-016096	TR-416096	TR-016097	TR-416097	TR-016098	TR-416098	TR-016099	TR-416099
SCX	5	TR-016100	TR-416100	TR-016101	TR-416101	TR-016102	TR-416102	TR-016103	TR-416103	TR-016104	TR-416104
ODS1	10	TR-016105	TR-416105	TR-016106	TR-416106	TR-016107	TR-416107	TR-016108	TR-416108	TR-016109	TR-416109
ODS2	10	TR-016110	TR-416110	TR-016111	TR-416111	TR-016112	TR-416112	TR-016113	TR-416113	TR-016114	TR-416114
Si	10	TR-016115	TR-416115	TR-016116	TR-416116	TR-016117	TR-416117	TR-016118	TR-416118	TR-016119	TR-416119
C-1	10	TR-016156	TR-416156	TR-016157	TR-416157	TR-016158	TR-416158	TR-016159	TR-416159	TR-016160	TR-416160
C-6	10	TR-016120	TR-416120	TR-016121	TR-416121	TR-016122	TR-416122	TR-016123	TR-416123	TR-016124	TR-416124
CN	10	TR-016130	TR-416130	TR-016131	TR-416131	TR-016132	TR-416132	TR-016133	TR-416133	TR-016134	TR-416134
NH2	10	TR-016135	TR-416135	TR-016136	TR-416136	TR-016137	TR-416137	TR-016138	TR-416138	TR-016139	TR-416139
SAX	10	TR-016151	TR-416151	TR-016152	TR-416152	TR-016153	TR-416153	TR-016154	TR-416154	TR-016155	TR-416155
SCX	10	TR-016146	TR-416146	TR-016147	TR-416147	TR-016148	TR-416148	TR-016149	TR-416149	TR-016150	TR-416150

Ultrarapid columns Tracer EXTRASIL

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

Semi-Preparative columns Tracer EXTRASIL

Function	D i m e n s i o n s				
	Particle size (µm)	15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
ODS 1	5	TR-014501	TR-014502	TR-014503	TR-014504
ODS 2	5	TR-014505	TR-014506	TR-014507	TR-014508
Si	5	TR-014509	TR-014510	TR-014511	TR-014512
C - 1	5	TR-014513	TR-014514	TR-014515	TR-014516
C - 6	5	TR-014517	TR-014518	TR-014519	TR-014520
C - 8	5	TR-014521	TR-014522	TR-014523	TR-014524
CN	5	TR-014525	TR-014526	TR-014527	TR-014528
NH2	5	TR-014529	TR-014530	TR-014531	TR-014532
Phenyl	5	TR-014533	TR-014534	TR-014535	TR-014536
SAX	5	TR-014537	TR-014538	TR-014539	TR-014540
SCX	5	TR-014541	TR-014542	TR-014543	TR-014544
ODS 1	10	TR-014545	TR-014546	TR-014547	TR-014548
ODS 2	10	TR-014549	TR-014550	TR-014551	TR-014552
Si	10	TR-014553	TR-014554	TR-014555	TR-014556
C - 6	10	TR-014557	TR-014558	TR-014559	TR-014560
C N	10	TR-014565	TR-014566	TR-014567	TR-014568
NH2	10	TR-014569	TR-014570	TR-014571	TR-014572
Phenyl	10	TR-014573	TR-014574	TR-014575	TR-014576
SAX	10	TR-014577	TR-014578	TR-014579	TR-014580
SCX	10	TR-014581	TR-014582	TR-014583	TR-014584

Microbore columns Tracer EXTRASIL

Function	D i m e n s i o n s				
	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
C-1	5	TR-021206	TR-021212	TR-021242	TR-021243
C-6	5	TR-021207	TR-021208	TR-021244	TR-021245
C-8	5	TR-021209	TR-021210	TR-021246	TR-021247
CN	5	TR-021211	TR-021213	TR-021248	TR-021249
NH2	5	TR-021214	TR-021215	TR-021250	TR-021251
Phenyl	5	TR-021216	TR-021217	TR-021252	TR-021253
SAX	5	TR-021218	TR-021219	TR-021254	TR-021255
SCX	5	TR-021220	TR-021221	TR-021256	TR-021257

Novafix™ Cartridge Tracer EXTRASIL

Function	Particle size (µm)	D i m e n s i o n s		
		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
ODS1	3	TR-015666	TR-015667	TR-015668
ODS2	3	TR-015669	TR-015670	TR-015671
Si	3	TR-015672	TR-015673	TR-015674
C-1	3	TR-015675	TR-015676	TR-015677
C-6	3	TR-015678	TR-015679	TR-015680
C-8	3	TR-015681	TR-015682	TR-015683
CN	3	TR-015684	TR-015685	TR-015686
NH2	3	TR-015687	TR-015688	TR-015689
Phenyl	3	TR-015690	TR-015691	TR-015692
ODS1	5	TR-015600	TR-015601	TR-015602
ODS2	5	TR-015603	TR-015604	TR-015605
Si	5	TR-015606	TR-015607	TR-015608
C-1	5	TR-015609	TR-015610	TR-015611
C-6	5	TR-015612	TR-015613	TR-015614
C-8	5	TR-015615	TR-015616	TR-015617
CN	5	TR-015618	TR-015619	TR-015620
NH2	5	TR-015621	TR-015622	TR-015623
Phenyl	5	TR-015624	TR-015625	TR-015626
SCX	5	TR-015627	TR-015628	TR-015629
SAX	5	TR-015630	TR-015631	TR-015632
ODS1	10	TR-015633	TR-015634	TR-015635
ODS2	10	TR-015636	TR-015637	TR-015638
Si	10	TR-015639	TR-015640	TR-015641
C-1	10	TR-015642	TR-015643	TR-015644
C-6	10	TR-015645	TR-015646	TR-015647
CN	10	TR-015651	TR-015652	TR-015653
NH2	10	TR-015654	TR-015655	TR-015656
SCX	10	TR-015660	TR-015661	TR-015662
SAX	10	TR-015663	TR-015664	TR-015665

TEKNOKROMA CAN SUPPLY OTHER COMBINATIONS OF DIAMETER AND LENGTH ON APPLICATION

For Guard Columns please refer to pages 198-199



Analytical columns 0.46 cm ID ADVANTIX 5 μ m

Packing	Funct.	μ m	Length		Diameter	Cat.Nbr.
			μ m	cm	cm	
Advantix	ODS	5	3	3	0.46	TR-010221
Advantix	ODS	5	4	4	0.46	TR-010222
Advantix	ODS	5	5	5	0.46	TR-010223
Advantix	ODS	5	10	10	0.46	TR-010224
Advantix	ODS	5	15	15	0.46	TR-010225
Advantix	ODS	5	20	20	0.46	TR-010226
Advantix	ODS	5	25	25	0.46	TR-010080

Analytical columns 0.40 cm ID ADVANTIX 5 μ m

Packing	Funct.	μ m	Length		Diameter	Cat.Nbr.
			μ m	cm	cm	
Advantix	ODS	5	3	3	0.4	TR-410221
Advantix	ODS	5	4	4	0.4	TR-410222
Advantix	ODS	5	5	5	0.4	TR-410223
Advantix	ODS	5	10	10	0.4	TR-410224
Advantix	ODS	5	15	15	0.4	TR-410225
Advantix	ODS	5	20	20	0.4	TR-410226
Advantix	ODS	5	25	25	0.4	TR-410080

New packing made of spherical ultra-pure silica particles, with extremely low metals content, functionalized with groups octadecylsilane of polar embedded type. This polar group included in the base of the hydrocarbonate chains confers to the packing a high deactivation in front of basic compounds, being able to chromatograph with perfectly symmetric peaks all kind of bases, including the most difficult ones. Working with acid pH's are able to easily chromatograph acid compounds, basic and quelants.

Also, the polar group included in the functionalization of the packing provides an especial selectivity very useful in the resolution of mixtures separated in conventional C18 packings.

Microbore columns 0.21 cm ID ADVANTIX 5 μ m

Packing	Funct.	μ m	Length		Diameter	Cat.Nbr.
			μ m	cm	cm	
Advantix	ODS	5	3	3	0.21	TR-010227
Advantix	ODS	5	5	5	0.21	TR-010228
Advantix	ODS	5	10	10	0.21	TR-010229
Advantix	ODS	5	15	15	0.21	TR-010230
Advantix	ODS	5	20	20	0.21	TR-010231
Advantix	ODS	5	25	25	0.21	TR-010232

Microbore columns 0.30 cm ID ADVANTIX 5 μ m

Packing	Funct.	μ m	Length		Diameter	Cat.Nbr.
			μ m	cm	cm	
Advantix	ODS	5	3	3	0.3	TR-010233
Advantix	ODS	5	5	5	0.3	TR-010234
Advantix	ODS	5	10	10	0.3	TR-010235
Advantix	ODS	5	15	15	0.3	TR-010236
Advantix	ODS	5	20	20	0.3	TR-010237
Advantix	ODS	5	25	25	0.3	TR-010238

Semi-preparative columns ADVANTIX 5 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	5	10	0.78	TR-010239	
Advantix	ODS	5	15	0.78	TR-010240	
Advantix	ODS	5	25	0.78	TR-010241	
Advantix	ODS	5	10	1.00	TR-010242	
Advantix	ODS	5	15	1.00	TR-010243	
Advantix	ODS	5	25	1.00	TR-010244	
Advantix	ODS	5	5	2.12	TR-010245	
Advantix	ODS	5	10	2.12	TR-010246	
Advantix	ODS	5	15	2.12	TR-010247	
Advantix	ODS	5	25	2.12	TR-010248	

Novafix™ Cartridges 0.40 cm ID ADVANTIX 5 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	5	7,5	0.4	TR-010249	
Advantix	ODS	5	10	0.4	TR-010250	
Advantix	ODS	5	15	0.4	TR-010251	
Advantix	ODS	5	25	0.4	TR-010252	

Ultrarapid columns 0.46 cm ID ADVANTIX 3 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	3	3	0.46	TR-010253	
Advantix	ODS	3	4	0.46	TR-010254	
Advantix	ODS	3	5	0.46	TR-010255	
Advantix	ODS	3	10	0.46	TR-010256	
Advantix	ODS	3	15	0.46	TR-010257	
Advantix	ODS	3	20	0.46	TR-010258	
Advantix	ODS	3	25	0.46	TR-010259	

Ultrarapid columns 0.40 cm ID ADVANTIX 3 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	3	3	0.4	TR-410253	
Advantix	ODS	3	4	0.4	TR-410254	
Advantix	ODS	3	5	0.4	TR-410255	
Advantix	ODS	3	10	0.4	TR-410256	
Advantix	ODS	3	15	0.4	TR-410257	
Advantix	ODS	3	20	0.4	TR-410258	
Advantix	ODS	3	25	0.4	TR-410259	

Microbore columns 0.21 cm ID ADVANTIX 3 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	3	3	0.21	TR-010260	
Advantix	ODS	3	5	0.21	TR-010261	
Advantix	ODS	3	10	0.21	TR-010262	
Advantix	ODS	3	15	0.21	TR-010263	
Advantix	ODS	3	20	0.21	TR-010264	
Advantix	ODS	3	25	0.21	TR-010265	

Microbore columns 0.30 cm ID ADVANTIX 3 µm

Packing	Funct.	µm	Length		Diameter	Cat.Nbr.
			µm	cm	cm	
Advantix	ODS	3	3	0.3	TR-010266	
Advantix	ODS	3	5	0.3	TR-010267	
Advantix	ODS	3	10	0.3	TR-010268	
Advantix	ODS	3	15	0.3	TR-010269	
Advantix	ODS	3	20	0.3	TR-010270	
Advantix	ODS	3	25	0.3	TR-010271	

For Guard Columns please refer to pages 198-199



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5 Microns Packing

Analytical columns 4.6 mm i.d. HYPERPACK BASIC

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

5 Microns Packing

Analytical columns 4.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	µm	Length Diameter		Cat.Nbr.
			cm	cm	
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

Packing	Funct.	µm	Length Diameter		Cat.Nbr.
			cm	cm	
Hyperpack BASIC	C8	5	3	0.4	TR-411108
Hyperpack BASIC	C8	5	4	0.4	TR-411109
Hyperpack BASIC	C8	5	5	0.4	TR-411110
Hyperpack BASIC	C8	5	10	0.4	TR-411111
Hyperpack BASIC	C8	5	15	0.4	TR-411112
Hyperpack BASIC	C8	5	20	0.4	TR-411113
Hyperpack BASIC	C8	5	25	0.4	TR-411114

5 Microns Packing

Microbore columns 21 mm i.d. HYPERPACK BASIC

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

5 Microns Packing

Microbore columns 3.0 mm i.d. HYPERPACK BASIC

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

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

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

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

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

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

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

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

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

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

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



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

There are a great variety of particle sizes, so that practically all the field of chromatography is covered, from ultrarapid columns with

packings of 3µm, to preparative scale, with packings of 25-40µm, the same selectivity being always maintained.

The packings of 3, 5, 10µm are characterized by their well adapted distribution of particle sizes, which produces a high efficiency and great stability in the HPLC columns.

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

Analytical columns NUCLEOSIL 100

Function	Dimensions										
	Particle size (µm)	10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-011331	TR-411331	TR-011333	TR-411333	TR-011335	TR-411335	TR-011337	TR-411337	TR-011339	TR-411339
C-18	5	TR-011341	TR-411341	TR-011343	TR-411343	TR-011345	TR-411345	TR-011347	TR-411347	TR-011349	TR-411349
C-8	5	TR-011351	TR-411351	TR-011353	TR-411353	TR-011355	TR-411355	TR-011357	TR-411357	TR-011359	TR-411359
P	5	TR-011361	TR-411361	TR-011363	TR-411363	TR-011365	TR-411365	TR-011367	TR-411367	TR-011369	TR-411369
C-2	7	TR-016031	TR-416031	TR-016032	TR-416032	TR-016033	TR-416033	TR-016034	TR-416034	TR-016035	TR-416035
CN	5	TR-011371	TR-411371	TR-011373	TR-411373	TR-011375	TR-411375	TR-011377	TR-411377	TR-011379	TR-411379
Diol	7	TR-011391	TR-411391	TR-011393	TR-411393	TR-011395	TR-411395	TR-011397	TR-411397	TR-011399	TR-411399
NH2	5	TR-011381	TR-411381	TR-011383	TR-411383	TR-011385	TR-411385	TR-011387	TR-411387	TR-011389	TR-411389
NO2	5	TR-016036	TR-416036	TR-016037	TR-416037	TR-016038	TR-416038	TR-016039	TR-416039	TR-016040	TR-416040
N(CH3)2	5	TR-016041	TR-416041	TR-016042	TR-416042	TR-016043	TR-416043	TR-016044	TR-416044	TR-016045	TR-416045
SA	5	TR-011401	TR-411401	TR-011403	TR-411403	TR-011405	TR-411405	TR-011407	TR-411407	TR-011409	TR-411409
SB	5	TR-011411	TR-411411	TR-011413	TR-411413	TR-011415	TR-411415	TR-011417	TR-411417	TR-011419	TR-411419
Si	10	TR-016600	TR-416600	TR-016601	TR-416601	TR-016602	TR-416602	TR-016603	TR-416603	TR-016604	TR-416604
C-18	10	TR-016605	TR-416605	TR-016606	TR-416606	TR-016607	TR-416607	TR-016608	TR-416608	TR-016609	TR-416609
C-8	10	TR-016610	TR-416610	TR-016611	TR-416611	TR-016612	TR-416612	TR-016613	TR-416613	TR-016614	TR-416614
CN	10	TR-016615	TR-416615	TR-016617	TR-416617	TR-016618	TR-416618	TR-016619	TR-416619	TR-016620	TR-416620
NH2	10	TR-016621	TR-416621	TR-016622	TR-416622	TR-016623	TR-416623	TR-016624	TR-416624	TR-016625	TR-416625
NO2	10	TR-016626	TR-416626	TR-016627	TR-416627	TR-016628	TR-416628	TR-016629	TR-416629	TR-016630	TR-416630
SA	10	TR-016631	TR-416631	TR-016632	TR-416632	TR-016633	TR-416633	TR-016634	TR-416634	TR-016635	TR-416635
SB	10	TR-016636	TR-416636	TR-016637	TR-416637	TR-016638	TR-416638	TR-016639	TR-416639	TR-016640	TR-416640

Analytical columns NUCLEOSIL 120

Function	Dimensions										
	Particle size (µm)	4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-016300	TR-416300	TR-016301	TR-416301	TR-016302	TR-416302	TR-016303	TR-416303	TR-016304	TR-416304
C-18	5	TR-016305	TR-416305	TR-016306	TR-416306	TR-016307	TR-416307	TR-016308	TR-416308	TR-016309	TR-416309
C-8	5	TR-016310	TR-416310	TR-016311	TR-416311	TR-016312	TR-416312	TR-016313	TR-416313	TR-016314	TR-416314
C4	5	TR-016162	TR-416162	TR-016163	TR-416163	TR-016164	TR-416164	TR-016165	TR-416165	TR-016166	TR-416166
P	7	TR-016315	TR-416315	TR-016316	TR-416316	TR-016317	TR-416317	TR-016318	TR-416318	TR-016319	TR-416319
CN	7	TR-016320	TR-416320	TR-016321	TR-416321	TR-016322	TR-416322	TR-016323	TR-416323	TR-016324	TR-416324
NH2	7	TR-016325	TR-416325	TR-016326	TR-416326	TR-016327	TR-416327	TR-016328	TR-416328	TR-016329	TR-416329
Si	10	TR-016641	TR-416641	TR-016642	TR-416642	TR-016643	TR-416643	TR-016644	TR-416644	TR-016645	TR-416645
C-18	10	TR-016646	TR-416646	TR-016647	TR-416647	TR-016648	TR-416648	TR-016649	TR-416649	TR-016650	TR-416650
C-8	10	TR-016651	TR-416651	TR-016652	TR-416652	TR-016653	TR-416653	TR-016654	TR-416654	TR-016655	TR-416655

Ultrarapid columns NUCLEOSIL

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

Microbore columns NUCLEOSIL 100

Function	Dimensions				
	Particle size (µm)	10 x 0.21 cm	20 x 0.21 cm	10 x 0.03 cm	20 x 0.03 cm
Si	5	TR-021125	TR-021126	TR-021258	TR-021259
C-18	5	TR-021127	TR-021128	TR-021260	TR-021261
C-8	5	TR-021129	TR-021130	TR-021262	TR-021263
C6 H5	5	TR-021131	TR-021132	TR-021264	TR-021265
C-2	7	TR-021133	TR-021134	TR-021266	TR-021267
CN	5	TR-021135	TR-021136	TR-021268	TR-021269
Diol	7	TR-021137	TR-021096	TR-021270	TR-021271
NH2	5	TR-021097	TR-021098	TR-021272	TR-021273
NO2	5	TR-021099	TR-021100	TR-021274	TR-021275
N(CH3)2	5	TR-021101	TR-021102	TR-021350	TR-021276
SA	5	TR-021103	TR-021104	TR-021277	TR-021278
SB	5	TR-021105	TR-021106	TR-021279	TR-021280

Microbore columns NUCLEOSIL 120

Function	Dimensions				
	Particle size (µm)	10 x 0.21 cm	20 x 0.21 cm	10 x 0.3 cm	20 x 0.3 cm
Si	5	TR-021115	TR-021116	TR-021283	TR-021284
C-18	5	TR-021065	TR-021067	TR-021281	TR-021282
C-8	5	TR-021117	TR-021118	TR-021285	TR-021286
C6 H5	7	TR-021119	TR-021120	TR-021287	TR-021288
CN	7	TR-021121	TR-021122	TR-021289	TR-021290
NH2	7	TR-021123	TR-021124	TR-021291	TR-021292

Semi-preparative columns NUCLEOSIL 120

Function	Dimensions				
	Particle size (µm)	15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014294	TR-014296	TR-014298	TR-014300
C-18	5	TR-014286	TR-014288	TR-014290	TR-014292
C-8	5	TR-014302	TR-014304	TR-014306	TR-014308
C-4	5	TR-014600	TR-014601	TR-014602	TR-014603
C6 H5	7	TR-014310	TR-014312	TR-014314	TR-014316
CN	7	TR-014318	TR-014320	TR-014322	TR-014324
NH2	7	TR-014326	TR-014328	TR-014330	TR-014332
Si	10	TR-014366	TR-014368	TR-014370	TR-014372
C-18	10	TR-014358	TR-014360	TR-014362	TR-014364
C-8	10	TR-014374	TR-014376	TR-014378	TR-014380

Semi-preparative columns NUCLEOSIL 100

Function	Dimensions				
	Particle size (µm)	15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014476	TR-014477	TR-014478	TR-014479
C-2	7	TR-014488	TR-014489	TR-014490	TR-014491
C-8	5	TR-014484	TR-014485	TR-014486	TR-014487
C-18	5	TR-014480	TR-014481	TR-014482	TR-014483
Phenyl	7	TR-014492	TR-014493	TR-014494	TR-014495
CN	5	TR-014496	TR-014497	TR-014498	TR-014499
Diol	7	TR-014585	TR-014586	TR-014587	TR-014588
NH2	5	TR-014589	TR-014590	TR-014591	TR-014592
N(CH3)2	5	TR-014597	TR-014598	TR-014599	TR-014769
SA	5	TR-014770	TR-014771	TR-014772	TR-014773
SB	5	TR-014774	TR-014775	TR-014776	TR-014777

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
NO2	5	TR-014593	TR-014594	TR-014595	TR-014596
Si	10	TR-014733	TR-014734	TR-014735	TR-014736
C-8	10	TR-014737	TR-014738	TR-014739	TR-014740
C-18	10	TR-014741	TR-014742	TR-014743	TR-014744
CN	10	TR-014745	TR-014746	TR-014747	TR-014748
NO2	10	TR-014749	TR-014750	TR-014751	TR-014752
NH2	10	TR-014753	TR-014754	TR-014755	TR-014756
N(CH3)2	10	TR-014757	TR-014758	TR-014759	TR-014760
SA	10	TR-014761	TR-014762	TR-014763	TR-014764
SB2	10	TR-014765	TR-014766	TR-014767	TR-014768

Novafix™ Cartridge NUCLEOSIL 100

Function	Particle size (µm)	Dimensions		
		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si	3	TR-015462	TR-015463	TR-015464
C-18	3	TR-015465	TR-015466	TR-015467
Si	5	TR-015514	TR-015515	TR-015516
C-18	5	TR-015517	TR-015518	TR-015519
C-8	5	TR-015520	TR-015521	TR-015522
C-2	7	TR-015523	TR-015524	TR-015525
C6H5	5	TR-015526	TR-015527	TR-015528
CN	5	TR-015529	TR-015530	TR-015531
NO2	5	TR-015532	TR-015533	TR-015534
NH2	5	TR-015535	TR-015536	TR-015537
N(CH3)2	5	TR-015538	TR-015539	TR-015540
DIOL	7	TR-015118	TR-015119	TR-015120
SA	5	TR-015121	TR-015122	TR-015123
SB	5	TR-015124	TR-015125	TR-015126
Si	10	TR-016598	TR-015541	TR-015542
C-18	10	TR-015543	TR-015544	TR-015545
C-8	10	TR-015546	TR-015547	TR-015548
CN	10	TR-015549	TR-015550	TR-015551
NO2	10	TR-015552	TR-015553	TR-015554
NH2	10	TR-015555	TR-015556	TR-015559
SA	10	TR-015151	TR-015152	TR-015153
SB	10	TR-015154	TR-015155	TR-015156

Novafix™ Cartridge NUCLEOSIL 120

Function	Particle size (µm)	Dimensions		
		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si	3	TR-015468	TR-015469	TR-015470
C-8	3	TR-015471	TR-015472	TR-015473
C-18	3	TR-015474	TR-015475	TR-015476
Si	5	TR-015100	TR-015101	TR-015102
C-18	5	TR-015103	TR-015104	TR-015105
C-8	5	TR-015106	TR-015107	TR-015108
C6H5	7	TR-015109	TR-015110	TR-015111
CN	7	TR-015112	TR-015113	TR-015114
NH2	7	TR-015115	TR-015116	TR-015117
Si	10	TR-015130	TR-015131	TR-015132
C-18	10	TR-015133	TR-015134	TR-015135
C-8	10	TR-015136	TR-015137	TR-015138



This traditional irregular packing is packed following completely optimized 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
Si 60	5	TR-011421	TR-411421	TR-011423	TR-411423	TR-011425	TR-411425	TR-011427	TR-411427	TR-011429	TR-411429
RP-8	5	TR-011441	TR-411441	TR-011443	TR-411443	TR-011445	TR-411445	TR-011447	TR-411447	TR-011449	TR-411449
RP-18	5	TR-011431	TR-411431	TR-011433	TR-411433	TR-011435	TR-411435	TR-011437	TR-411437	TR-011439	TR-411439
RP-Select B	5	TR-016046	TR-416046	TR-016047	TR-416047	TR-011969	TR-411969	TR-016048	TR-416048	TR-011970	TR-411970
Diol	5	TR-011451	TR-411451	TR-011453	TR-411453	TR-011455	TR-411455	TR-011457	TR-411457	TR-011459	TR-411459
NH2	5	TR-011461	TR-411461	TR-011463	TR-411463	TR-011465	TR-411465	TR-011467	TR-411467	TR-011469	TR-411469
CN	5	TR-011471	TR-411471	TR-011473	TR-411473	TR-011475	TR-411475	TR-011477	TR-411477	TR-011479	TR-411479
Si 60	10	TR-011481	TR-411481	TR-011483	TR-411483	TR-011485	TR-411485	TR-011487	TR-411487	TR-011489	TR-411489
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
NH2	10	TR-011521	TR-411521	TR-011523	TR-411523	TR-011525	TR-411525	TR-011527	TR-411527	TR-011529	TR-411529
CN	10	TR-011531	TR-411531	TR-011533	TR-411533	TR-011535	TR-411535	TR-011537	TR-411537	TR-011539	TR-411539

Novafix™ Cartridge LICHROSORB

Function		Dimensions		
Particle size (µm)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 60	5	TR-015196	TR-015197	TR-015198
RP-18	5	TR-015199	TR-015200	TR-015201
RP-8	5	TR-015202	TR-015203	TR-015204
Diol	5	TR-015205	TR-015206	TR-015207
NH2	5	TR-015208	TR-015209	TR-015210
CN	5	TR-015211	TR-015212	TR-015213
RP-Select B	5	TR-015345	TR-015346	TR-015347
Si 60	10	TR-015178	TR-015179	TR-015180
RP-18	10	TR-015181	TR-015182	TR-015183
RP-8	10	TR-015184	TR-015185	TR-015186
Diol	10	TR-015187	TR-015188	TR-015189
NH2	10	TR-015190	TR-015191	TR-015192
CN	10	TR-015193	TR-015194	TR-015195
RP-Select B	10	TR-015561	TR-015562	TR-015563

Semi-preparative Tracer columns LICHROSORB

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

For Guard Columns please refer to pages 198-199

For precolumns of cartridge system Novafix please refer to page 193.



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	TTR-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 NH ₂	5	TR-011591	TR-411591	TR-011593	TR-411593	TR-011595	TR-411595	TR-011597	TR-411597	TR-011599	TR-411599
100 CN	5	TR-011601	TR-411601	TR-011603	TR-411603	TR-011605	TR-411605	TR-011607	TR-411607	TR-011609	TR-411609
100 Diol	5	TR-011611	TR-411611	TR-011613	TR-411613	TR-011615	TR-411615	TR-011617	TR-411617	TR-011619	TR-411619
60 RP-Select B	5	TR-016813	TR-416813	TR-016814	TR-416814	TR-016815	TR-416815	TR-016816	TR-416816	TR-016817	TR-416817
Si 100	10	TR-011621	TR-411621	TR-011623	TR-411623	TR-011625	TR-411625	TR-011627	TR-411627	TR-011629	TR-411629
100 RP-18	10	TR-011631	TR-411631	TR-011633	TR-411633	TR-011635	TR-411635	TR-011637	TR-411637	TR-011639	TR-411639
100 RP-18 ec	10	TR-011641	TR-411641	TR-011643	TR-411643	TR-011645	TR-411645	TR-011647	TR-411647	TR-011649	TR-411649
100 RP-8	10	TR-011651	TR-411651	TR-011653	TR-411653	TR-011655	TR-411655	TR-011657	TR-411657	TR-011659	TR-411659
100 RP-8 ec	10	TR-011661	TR-411661	TR-011663	TR-411663	TR-011665	TR-411665	TR-011667	TR-411667	TR-011669	TR-411669
100 CN	10	TR-011681	TR-411681	TR-011683	TR-411683	TR-011685	TR-411685	TR-011687	TR-411687	TR-011689	TR-411689
100 Diol	10	TR-011691	TR-411691	TR-011693	TR-411693	TR-011695	TR-411695	TR-011697	TR-411697	TR-011699	TR-411699
60 RP-Select B	10	TR-016808	TR-416808	TR-016809	TR-416809	TR-016810	TR-416810	TR-016811	TR-416811	TR-016812	TR-416812

Semi-preparative Tracer columns LICHROSPHER

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

Microbore Tracer columns LICHROSPHER

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

Novafix™ Cartridge LICHROSPHER

Function		Dimensions		
Particle size (μm)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 100	5	TR-015238	TR-015239	TR-015240
100 RP-18	5	TR-015241	TR-015242	TR-015243
100 RP-18 ec	5	TR-015244	TR-015245	TR-015246
100 RP-8	5	TR-015247	TR-015248	TR-015249
100 RP-8 ec	5	TR-015250	TR-015251	TR-015252
100 NH ₂	5	TR-015253	TR-015254	TR-015255
100 CN	5	TR-015256	TR-015257	TR-015258
100 Diol	5	TR-015259	TR-015260	TR-015261
60 RP-Select B	5	TR-015572	TR-015573	TR-015574
Si 100	10	TR-015214	TR-015215	TR-015216
100 RP-18	10	TR-015217	TR-015218	TR-015219
100 RP-18 ec	10	TR-015220	TR-015221	TR-015222
100 RP-8	10	TR-015223	TR-015224	TR-015225
100 RP-8 ec	10	TR-015226	TR-015227	TR-015228
100 NH ₂	10	TR-015229	TR-015230	TR-015231
100 CN	10	TR-015232	TR-015233	TR-015234
100 Diol	10	TR-015235	TR-015236	TR-015237
60 RP-Select B	10	TR-015569	TR-015570	TR-015571



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

Novafix™ Cartridge SUPERSPHER

Function	Particle size (μ m)	D i m e n s i o n s		
		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 60	4	TR-015262	TR-015263	TR-015264
60 RP-8	4	TR-015265	TR-015266	TR-015267
100 RP-18	4	TR-015268	TR-015269	TR-015270
60 RP-8 ec	4	TR-015271	TR-015272	TR-015273
100 RP-18 ec	4	TR-015274	TR-015275	TR-015276

Analytical columns SUPERSPHER

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

For Guard Columns please refer to pages 198-199

For precolumns of cartridge system Novafix please refer to page 193.



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

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

Novafix™ Cartridge PARTISIL

Function Particle size	D i m e n s i o n s (µm)	D i m e n s i o n s		
		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Silica	5	TR-015423	TR-015424	TR-015425
ODS 3	5	TR-015426	TR-015427	TR-015428
C-8	5	TR-015429	TR-015430	TR-015431
PAC	5	TR-015432	TR-015433	TR-015434
Silica	10	TR-015435	TR-015436	TR-015437
ODS	10	TR-015438	TR-015439	TR-015440
ODS 2	10	TR-015441	TR-015442	TR-015443
ODS 3	10	TR-015444	TR-015445	TR-015446
PAC	10	TR-015447	TR-015448	TR-015449
SAX	10	TR-015450	TR-015451	TR-015452
SCX	10	TR-015453	TR-015454	TR-015455

Analytical columns PARTISIL

Function Particle size (µm)	D i m e n s i o n s										
	10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm	
Silica	5 TR-016205	TR-416205	TR-016206	TR-416206	TR-016207	TR-416207	TR-016208	TR-416208	TR-016209	TR-416209	
ODS3	5 TR-016211	TR-416211	TR-016212	TR-416212	TR-016213	TR-416213	TR-016214	TR-416214	TR-016215	TR-416215	
C-8	5 TR-016217	TR-416217	TR-016218	TR-416218	TR-016219	TR-416219	TR-016220	TR-416220	TR-016221	TR-416221	
PAC	5 TR-016222	TR-416222	TR-016223	TR-416223	TR-016224	TR-416224	TR-016225	TR-416225	TR-016226	TR-416226	
Silica	10 TR-016227	TR-416227	TR-016228	TR-416228	TR-016229	TR-416229	TR-016230	TR-416230	TR-016231	TR-416231	
ODS	10 TR-016330	TR-416330	TR-016331	TR-416331	TR-016332	TR-416332	TR-016333	TR-416333	TR-016334	TR-416334	
ODS2	10 TR-011817	TR-411817	TR-011819	TR-411819	TR-011821	TR-411821	TR-011823	TR-411823	TR-011825	TR-411825	
ODS3	10 TR-011827	TR-411827	TR-011829	TR-411829	TR-011831	TR-411831	TR-011833	TR-411833	TR-011835	TR-411835	
PAC	10 TR-016232	TR-416232	TR-016233	TR-416233	TR-016234	TR-416234	TR-016235	TR-416235	TR-016236	TR-416236	
SAX	10 TR-011837	TR-411837	TR-011839	TR-411839	TR-011841	TR-411841	TR-011843	TR-411843	TR-011845	TR-411845	
SCX	10 TR-016237	TR-416237	TR-016238	TR-416238	TR-016239	TR-416239	TR-016240	TR-416240	TR-016241	TR-416241	

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

The nomenclature used by TosohHass describes each packing. Thus, for example, a packing ODS-80TM indicates a packing of 80A pores substituted with octadecylsilane groups. The letter T

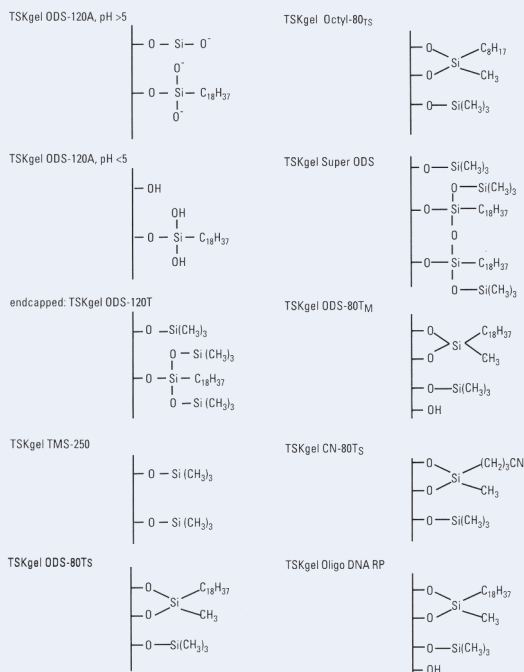
means that the packing has been processed by endcapping with TMS groups.

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

Properties of silica-based TSK-GEL RPC columns

Column	Functional Group	Endcapped	% Carbon	Particle size (µm)	Pore size (µm)	Exclusion limit (Da)
ODS-80 _M	C ₁₈ alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
ODS-80 _S	C ₁₈ alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
OCTYL-80T _S	C ₈ alkyl, monomeric	Yes	11%	5	80	10,000
CN-80T _M	CN, monomeric	Yes	8%	5	80	10,000
SUPER-ODS	C ₁₈ alkyl, polymeric	Yes	8%	2	110	20,000
SUPER-Octyl	C ₁₈ alkyl, polymeric	Yes	5%	2	110	20,000
SUPER-Phenyl	Phenyl, polymeric	Yes	3%	2	110	20,000
ODS-120T	C ₁₈ alkyl, polymeric	Yes	22%	5, 10, 20	120	100-10,000
ODS-120A	C ₁₈ alkyl, polymeric	No	22%	5, 10	120	100-10,000
TMS-250	C ₁ alkyl, monomeric	Yes	5%	10	250	100-200,000
OligoDNA RP	C ₁₈ alkyl, monomeric	No	10%	5	250	up to 165,000

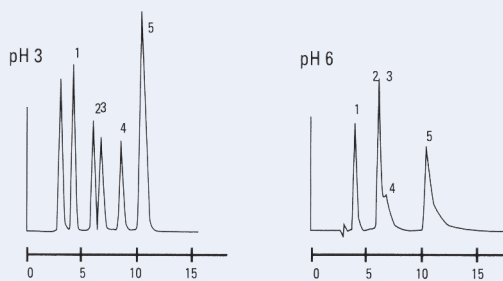
TSK-Gel bonded silica stationary phases



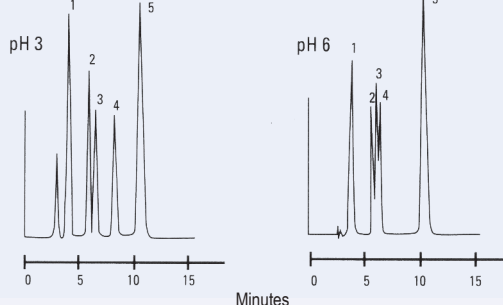
TKL 1016

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

TSKgel ODS-120A



TSKgel ODS-120T (endcapped)



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

TK TSK Gel Reversed Phase - TSK Gel SUPER-ODS

Analytical Columns TSK Gel Reversed Phase

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

Guard Columns TSK Gel Reversed Phase

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

TSK Gel SUPER-ODS

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

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

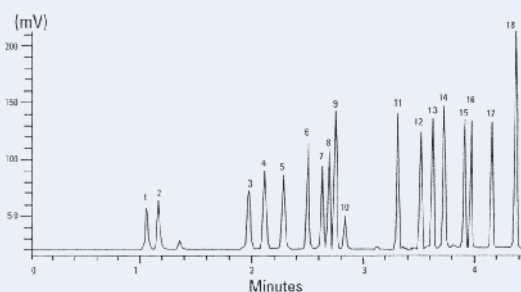
This column is the best choice when it is required to shorten the analysis time for all types of compounds up to 20,000 Daltons, including the most basic.

Ultrarapid columns TSKgel Super-ODS

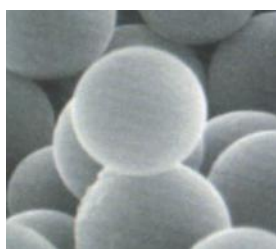
Analytical and preparative column specifications, in reversed phase TSK-GEL.

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

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



Column: TSKgel Super-ODS (4.6mm x 10cm)
Sample: 1. Asp, 2. Glu, 3. Ser, 4. Gly, 5. His, 6. Arg, 7. Thr, 8. Ala, 9. Pro, 10. PTC-NH₂, 11. Try, 12. Val, 13. Met, 14. Cys, 15. Ile, 16. Leu, 17. Phe, 18. Lys
Elution: CH₃CN/H₂O = 60/40
 0min (b:5%), 4min (b:100%)
Flow Rate: 1.5mL/min
Detection: UV @ 254nm
Injection: 5 μL
Temperature: ambient



YMC is known worldwide for the variety, versatility and quality of its HPLC packings. An attention centred originally in the analytical requirements of their clients has evolved to develop a full range of packings whose special selectivity characteristics have made

them essential chromatographic tools in the fields of advanced techniques such as that of combinatorial chemistry, LC-MS, etc.

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

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

YMC columns - Guide to IPC (International Product Code)

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

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

Example:

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

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

The ability of HALO to generate hyper-fast separations comes not only from their small particle size (2.7 µm) but also from the unique Fused-Core particle technology that creates a 0.5 µm porous shell fused to a solid core particle. As mobile phase flow rate is increased to speed-up a separation, the slow mass transfer

of solute molecules inside the particles limits resolving power. Fused-Core particle technology addresses this limitation by providing an incredibly small path (0.5 µm) for diffusion of solutes into and out of the stationary phase, thereby reducing the time solute molecules spend inside the particles and minimizing a major barrier to fast chromatographic separations (Figure 2).

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

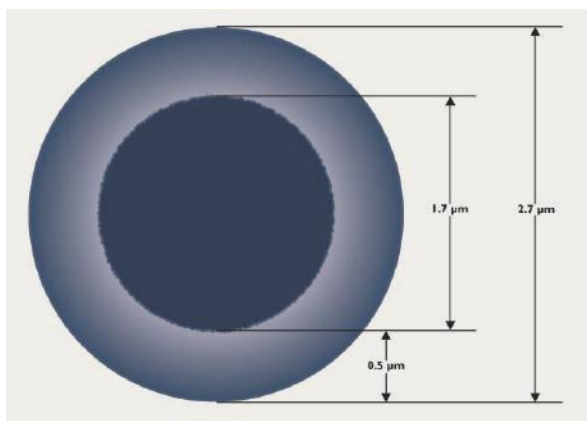


Figure 1 - Fused-Core Particle Technology

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

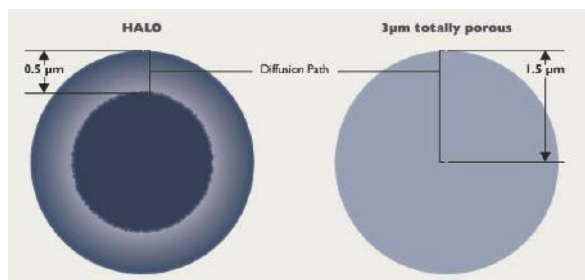


Figure 2 - The shorter diffusion path of HALO reduces axial dispersion

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

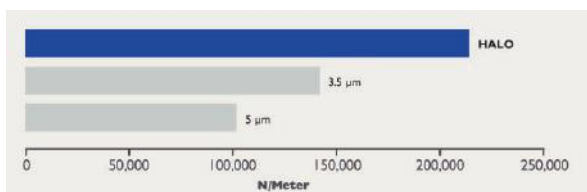
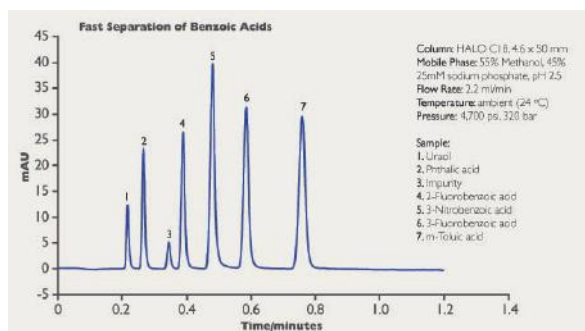


Figure 3. HALO columns deliver more separating power

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

Note: N/Meter values were calculated at the optimum mobile phase linear velocity for each of these stationary phases. Naphthalene was used as the test probe and the mobile phase conditions used were 60% acetonitrile and 40% water at 24 oC.

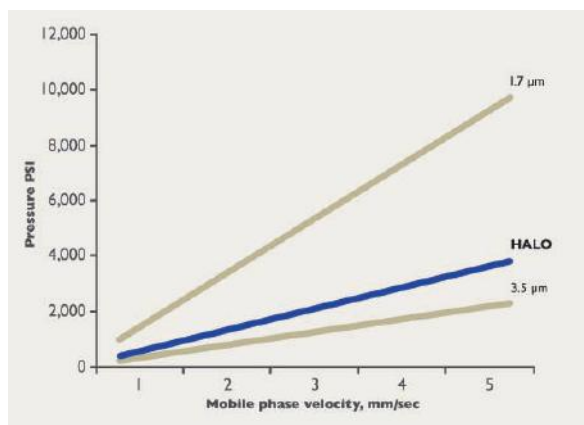


HALO columns are designed for hyper-fast separations so that higher sample throughput can be achieved. In this example, the HALO column separated seven compounds in less than 48 seconds with better than baseline resolution for all peak pairs.

TK HALO™ HyperFast HPLC Column

Halo columns do not require ultra-high pressure

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



Most HPLC systems have operating pressure limits of 6,000 psi (400 bar), or less. As the column packing particle size decreases, the column back pressure increases rapidly.

To use columns packed with sub-2 μm size particles at their optimum flow rate, pressure that exceeds 6,000 psi is often encountered. This necessitates purchasing very expensive "ultra-pressure" equipment to achieve optimum performance. HALO columns, even though they do generate slightly higher back pressure than columns packed with 3.5 μm particles, can be used with most existing HPLC equipment.

Halo Specifications

Stationary Phase Support

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

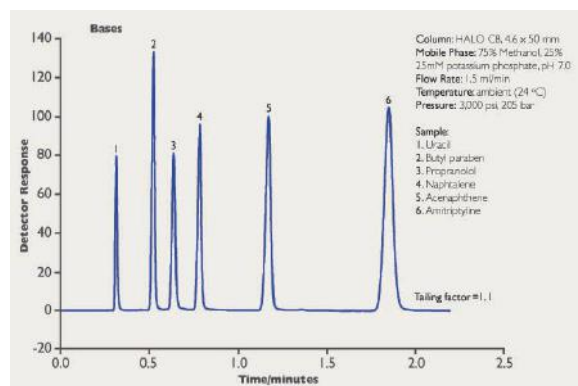
Bonded Phase

- Monomeric bonding chemistry
- Densely bonded phase
- Maximized endcapping
- C18: Octadecyldimethylsilane, 3.5 $\mu\text{moles}/\text{m}^2$
- C8: Octyldimethylsilane, 3.7 $\mu\text{moles}/\text{m}^2$
- pH Range: 2 to 9

Maximum Pressure: 9,000 psi, 600 Bar

Halo is base-deactivated for excellent peak shape

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



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

Ordering Information

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

Zirconia or zirconium dioxide (ZrO₂) is a metal oxide that exists in a variety of crystalline and amorphous forms. The chief advantage of Zirconia in comparison with the traditional silica base packings is its unique and specific selectivity as well as outstanding thermal stability and chemical resistance.

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

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

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

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

Zirchrom™ -PDB

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

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

DiamondBond™ -C18

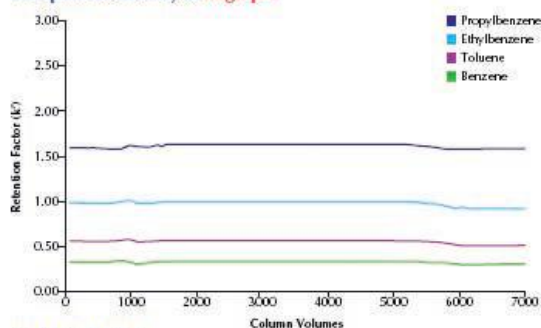
- Excellent selectivity for acidic compounds.
- pH stable between 1 and 14
- Excellent thermal stability for rapid analyses.

This packing contains C18 groups co-valently bonded to the carbon coated surface of the Zirconia. The extreme strength of the carbon-carbon bonds practically eliminates any bleeding of the column whatever, improving derived from the base line, preventing falls in retention times and bettering the sensitivity in all LC/MS applications.

References

The catalogue references for Zirchrom R are made in the following way: PPP-XXYY, where PPP is the number of the phase, XX is the length of the column and YY is the diameter of the same. For example, DBOI-I546 describes a column of 15 cm by 4.6 mm containing DiamondBond -C18.

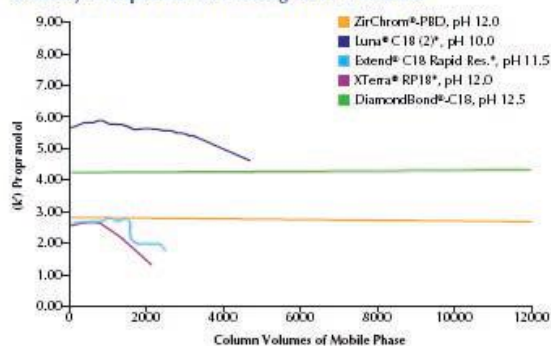
Exceptional Stability at High pH



LC CONDITIONS

Mobile phase: 15/85 ACN/Water, pH 13
Flow rate: 1.0 ml/min
Column: ZirChrom®-PDB, 150 x 4.6 mm I.D.

Stability Comparison of Leading HPLC Columns



Column Format

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

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

Ordering Information

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

TK Hamilton PRP[®]-h1 HPLC Columns



Hamilton PRP[®]-h1 Polymer HPLC Columns

- Chemical Stability
- Full pH Range Stability
- Temperature Stability

The PRP-h1 column line from Hamilton offers a robust alternative to silica based and traditional polymer HPLC columns.

Total Compatibility

The PRP-h1 is a high performance, polymeric, reversed-phase column that delivers separations of a wide variety of analytes under the most extreme analytical conditions. Virtually any organic solvent and mobile phase additives can be employed to optimize analyte separation.

Extended Column Life

Because there is no bonded phase in polymer materials as is the case with silica columns, even harsh solvents such as 1 molar sodium hydroxide can be used to wash contaminants from the column, thus increasing column lifetime.

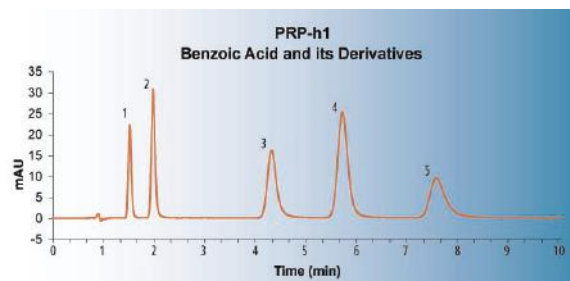
Mobile phases with pH ranging from 1 to 13 can be used without damaging or degrading the stationary phase. This wide pH range opens up more possibilities of solvents and buffers that can be used to elucidate a great separation.

Wide Temperature Range

Common HPLC separation temperatures range between 20 and 85 °C and in some cases may go above 100 °C.

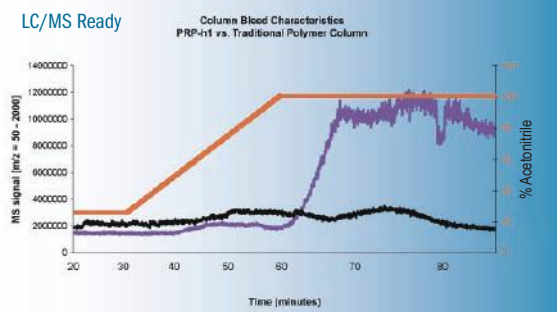
Technical Data

Material:	Cross-linked poly(styrene-co-divinylbenzene) polymer
Particle size:	5 μ
Pore size:	100 Å



Column:	PRP-h1, 5μ, 100Å
Dimensions:	4.1 x 150 mm
Mobile Phase:	A: 10 mmol/L sodiumdihydrogenphosphate, pH = 2.2 B: Acetonitrile
Gradient:	18% B (Isocratic)
Flow Rate:	0.60 mL/min
Temperature:	50 °C
Detection:	UV @ 230 nm
Injection Volume:	5 μL
Sample:	1. 2,4-Dihydroxybenzoic Acid 2. 4-Hydroxybenzoic Acid 3. 2-Acetoxybenzoic Acid (Aspirin) 4. Benzoic Acid 5. 2-Hydroxybenzoic Acid (Salicylic Acid)

LC/MS Ready



Ordering Information

HPLC Columns	PRP-h1 (100Å)			
	50 mm	100 mm	150 mm	250 mm
2.1 mm ID		HA-79250	HA-79249	
4.6 mm ID	HA-79251	HA-79252	HA-79253	HA-79256
10 mm ID		HA-79255	HA-79266	
100 mm ID				HA-79523

Guard Columns

Reference	Description
HA-79257	Analytical Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79258	Analytical Replacement Cartridges (5/pk)
HA-79275	Semiprep/Prep Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79276	Semiprep/Prep Replacement Cartridges (2/pk)

Bulk Resin

Reference	Description
HA-79279	12-20 μm Bulk Resin (1 Gram)



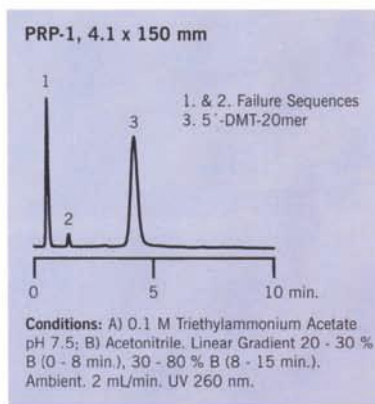
Hamilton Company is the pioneer company in the development and manufacture of polymers for HPLC separations. These polymeric supports combine the inertia, resistance and pH stability of the polymeric resins with the stability under pressure of the silica based packings. Hamilton has developed a full range of resins for the most diverse applications.

The column, Hamilton PRP-1, is a specially designed column for reverse phase separations and exactly fulfills the USP-NF L21 specifications.

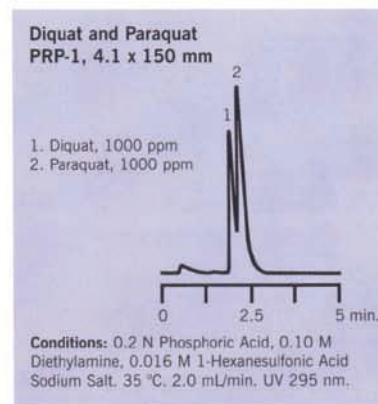
- Columns of 100 Å pore size suitable for general reverse phase applications.
- Stable at pHs of 0 to 14
- Better sample recovery than a silica-base column (thanks to the total absence of silanols).
- Extraordinary lifetime (compatible with whatever concentration of water or organic solvent).
- Various particle sizes.
- Eleven internal diameters of columns.
- Stainless steel or PEEK columns.
- Precolumns

Reversed Phase HPLC Columns

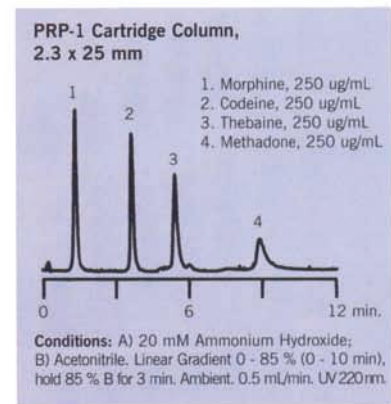
DNA



Herbicides



Pharmaceuticals



Ordering Information

PRP-1 100Å I.D. X Length	Reversed Phase		Particle Size	
	3 (µm)	5 (µm)	7 (µm)	10 (µm)
1.0 x 50 mm		HA-79751	HA-79755	HA-79759
1.0 x 100 mm		HA-79752	HA-79756	HA-79760
1.0 x 150 mm	HA-79847	HA-79753	HA-79757	HA-79761
1.0 x 250 mm		HA-79754	HA-79758	HA-79762
2.1 x 50 mm	HA-79854		HA-79554	
2.1 x 100 mm	HA-79844	HA-79790		
2.1 x 150 mm	HA-79845	HA-79366		HA-79480
2.1 x 150 mm*		HA-79796		
2.1 x 250 mm			HA-79390	HA-79391
2.3 x 25 mm		HA-79789**		
4.1 x 50 mm	HA-79804	HA-79443		
4.1 x 100 mm	HA-79805	HA-79479		HA-79565
4.1 x 150 mm	HA-79806	HA-79444	HA-79529	HA-79425
4.1 x 250 mm		HA-79820	HA-79422	HA-79427
4.6 x 100 mm*		HA-79558		
4.6 x 150 mm*		HA-79423		HA-79351
4.6 x 250 mm*		HA-79571	HA-79380	HA-79381

PRP-1 100Å I.D. X Length	Reversed Phase			Particle Size	
	5 (µm)	7 (µm)	10 (µm)	12-20 (µm)	
7.0 x 100 mm			HA-79495	HA-79713	
7.0 x 300 mm			HA-79719		
7.0 x 305 mm	HA-79795	HA-79545	HA-79426		
10.0 x 100 mm	HA-79355		HA-79499		
10.0 x 150 mm			HA-79349		
10.0 x 250 mm		HA-79531	HA-79496		
21.5 x 150 mm			HA-79532	HA-79497	
21.5 x 250 mm		HA-79352	HA-79478	HA-79428	
30.0 x 300 mm				HA-79718	
50.8 x 100 mm				HA-79498	
50.8 x 150 mm				HA-79716	
50.8 x 250 mm			HA-79567	HA-79493	
101.6 x 250 mm				HA-79525	

* PEEK Hardware.

** Cartridge Column. Cartridge Holder P/N HA-32908 must be purchased separately.

Guard Columns

PRP Guard Columns for:	Steel columns	PEEK columns
Starter Kits (1 holder, 2 cartridges)	HA-79447	HA-79317
Replacement Cartridges (5/pk)	HA-79445	HA-79318

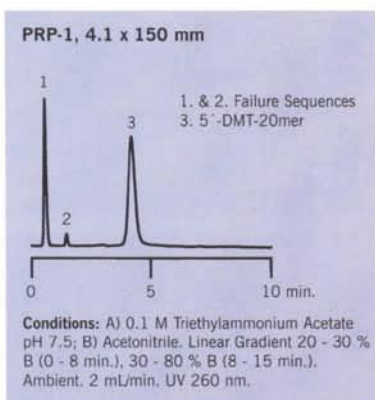
TK Hamilton PRP-3 HPLC Columns

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

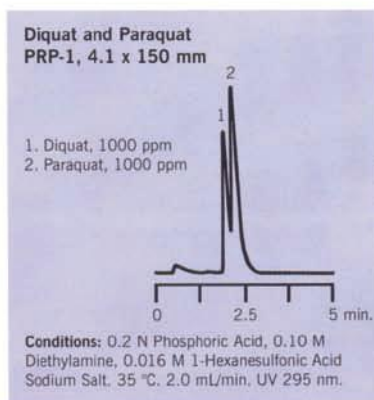
- Stable at pHs between 0 and 14.
- Total absence of silanols.
- Excellent column lifetime (the support can be cleaned with strong acids or bases to eliminate sample residues).
- 100% compatible with whatever organic solvent.
- Particle sizes from 3µm for highly efficient separations

What Types of Samples can PRP-3 Columns separate?

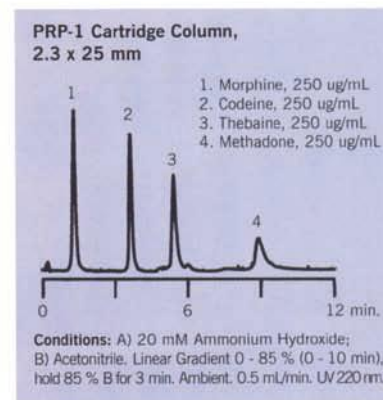
Peptides



Proteins



Proteins



PRP-3 Reversed Phase

PRP-3 I.D. X Length	Reversed Phase	Particle Size	
		3 (µm)	10 (µm)
1.0 x 50 mm			HA-79763
1.0 x 100 mm			HA-79764
1.0 x 150 mm			HA-79765
1.0 x 250 mm			HA-79766
2.1 x 150 mm		HA-79846	HA-79392
4.1 x 50 mm		HA-79807	HA-79467
4.1 x 100 mm		HA-79808	
4.1 x 150 mm		HA-79809	HA-79466

PRP-3 Reversed Phase

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

* PEEK Hardware

PRP-3 Guard Columns

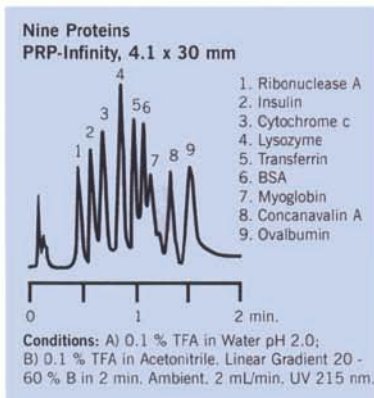
PRP-3 I.D. X Length	Reversed Phase	Particle Size	
		3 (µm)	10 (µm)
Starter Kits (1 holder, 2 cartridges)		HA-79461	HA-79393
Replacement cartridges (5/pk)		HA-79454	HA-79395

Non-porous polymeric packing, specially useful for the reverse phase separation of proteins by means of the use of fast gradients.

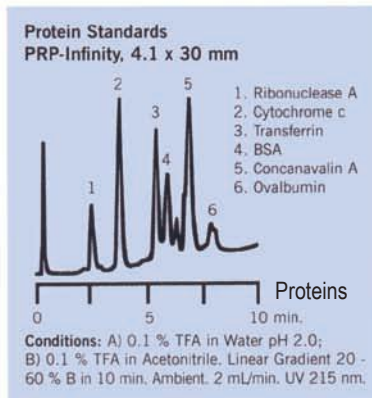
- High efficiency due to its particle size of 4µm.
- Stable at pHs between 0 and 14.
- Total absence of silanols.
- Excellent column lifetime. (the support can be cleaned with strong acids or bases to remove sample residues).
- 100% compatible with all organic solvents.

What Types of Samples can PRP-Infinity Columns separate?

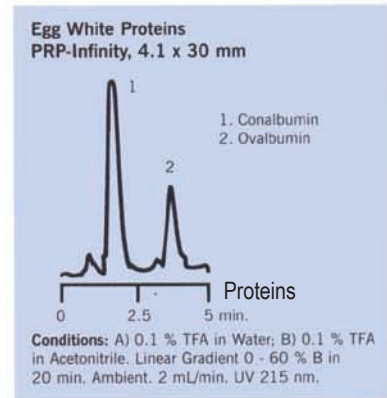
Proteins



Proteins



Proteins



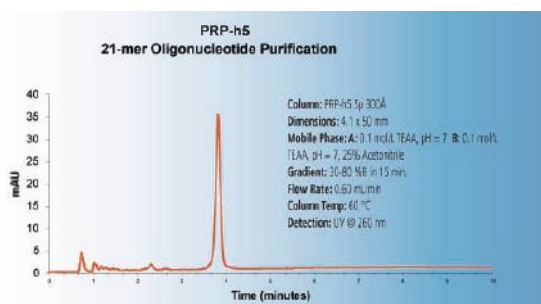
PRP-Infinity. Nonporous Reversed Phase

PRP-3	Reversed Phase	Particle Size
I.D. X Length		4 (µm)
2.1 x 30 mm		HA-79576
2.1 x 100 mm		HA-79748
4.1 x 30 mm		HA-79470
4.1 x 50 mm		HA-79533
10.0 x 60 mm		HA-79527

Tk Hamilton PRP[®]-h5 Polymer HPLC Columns



- Chemical Stability
- Full Range stability
- Enhanced Sample Recovery



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

Total Compatibility

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

Extended Column Life

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

Technical Data

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

Ordering Information

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

Guard Columns

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

Bulk Resin

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

HAMILTON PRP-X400 Analysis for Glifosate **Tk**

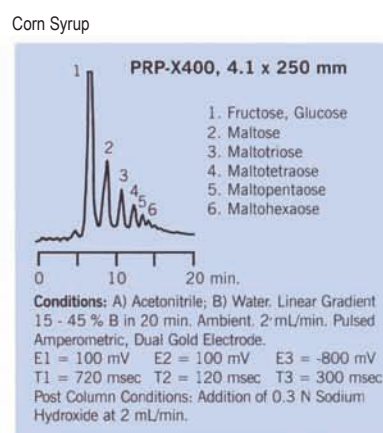
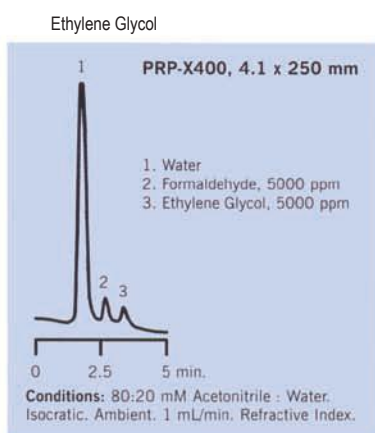
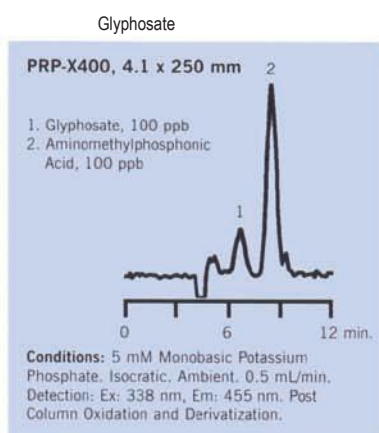
Glifosate and of metabolite aminomethylphosphonic acid in drinking waters. (EPA 547).

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

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

- Analysis times eight minutes less in comparison with other columns.
- Detection of levels of 10ppb with the technique of post-column derivization with OPA.
- Applicable to other separations like ethylene glycol.
- Hamilton recommend the column PRP-X400 for the analysis of the herbicides.

What Types of Samples can PRP-Infinity Columns separate?



Ordering Information

PRP-X400

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

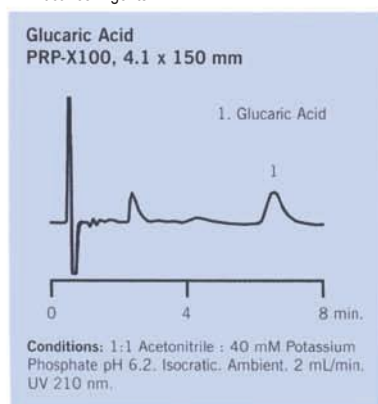
TK Hamilton Columns for the Analysis of Anions

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

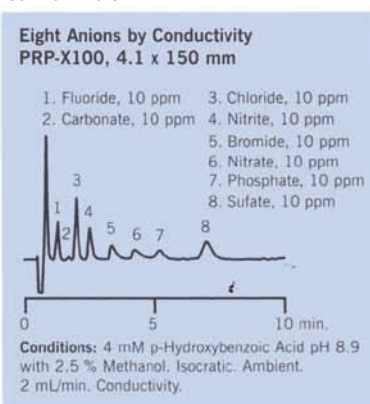
- Easily separate all the anions specified in the EPA300 .0 Part A.
- Perfect separation of the fluoride anion
- Permits the use of organic eluants, facilitating column cleaning.
- Stable at pHs between 0 and 14.
- The PRP-X110 column is recommended for ionic chromatography with direct conductivity or UV detection.
- The PRP-X 110S column is recommended for ion suppression analysis.
- Available in a wide range of column dimensions and particle sizes.

What Types of Samples can PRP-X100 Columns separate?

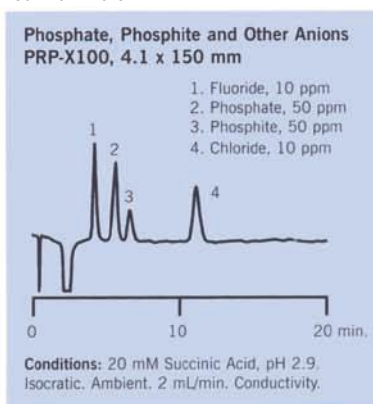
Anticancer Agents



Common Anions



Common Anions



Ordering Information

PRP-X100 Anion Exchange

I.D. X Length	3 (µm)	7 (µm)
1.0 x 50 mm		HA-79775
1.0 x 100 mm		HA-79776
1.0 x 150 mm		HA-79777
1.0 x 250 mm		HA-79778
2.1 x 100 mm		HA-79742
2.1 x 150 mm		HA-79744
2.1 x 250 mm		HA-79746
4.1 x 100 mm	HA-79814	HA-79730
4.1 x 150 mm	HA-79815	HA-79732
4.1 x 250 mm		HA-79734
4.6 x 100 mm*		HA-79736
4.6 x 150 mm*		HA-79738
4.6 x 250 mm*		HA-79740

PRP-X100 Anion Exchange

Length	I.D. X I.D. X 7 (µm)
2.1 x 100 mm	HA-79743
2.1 x 150 mm	HA-79745
2.1 x 250 mm	HA-79747
4.1 x 100 mm	HA-79731
4.1 x 150 mm	HA-79733
4.1 x 250 mm	HA-79735
4.6 x 100 mm*	HA-79737
4.6 x 150 mm*	HA-79739
4.6 x 250 mm*	HA-79741

* PEEK Hardware

Guard Columns

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

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

ICsep Columns for Organic Acid Analysis

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

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

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

Precolumns for every type of column available on application.

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

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

Tk Transgenomic™ CARBOSep Columns

CARBOSep Columns for Carbohydrates Analysis

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

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

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

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

Precolumns for every type of column available on application.

Carbohydrate Columns Specifications Chart

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

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

Transgenomic™ CARBOsep Columns **Tk**

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

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

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

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

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

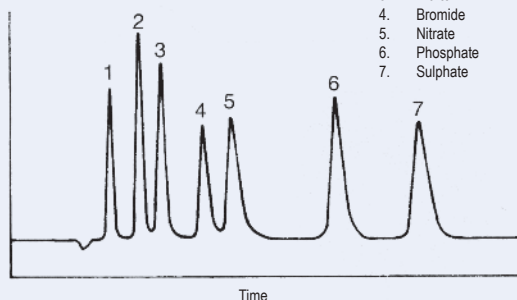
Anions by E.P.A. Method 300.0(a)

Conditions:

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

Sample:

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



TKL 1021

Transgenomic Column	Competitive Columns	Application
ICSepAN300	Dionex AS4A	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , By E.P.A. Method 300.0(a)
ICSepANI	Dionex AS9-HC	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices Cr(III), Cr(VI) as CrO ₃ , CrO ₄ ²⁻
ICSepANSC	Dionex AS4A-SC	Polyvalent Phosphates, Arsenate, Sulfite Selenate, Arsenite, Selenite, F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids
ICSepANISC	Dionex AS9-HC	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices
ICSepAN2	Dionex AS14	Arsenate, Sulfite, Selenate, Arsenite, Selenite, F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight Organic acids
ICSepAN300B	Dionex AS9	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , ClO ₂ ⁻ , ClO ₃ ⁻ , BrO ₃ ⁻
ICSepCN2	Dionex CS15	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺ , Mg ²⁺ , Ca ²⁺ , NH ₄ ⁺ , Cu ²⁺ , Ni ²⁺ , Zn ²⁺ , Co ²⁺ , Cd ²⁺ , Pb ²⁺ , Mn ²⁺ , Fe ²⁺ , Fe ³⁺

ICSep Ordering Information

Description	Cat.No.	Description	Cat.No.
ICSep AN2, 4.6mm x 250mm	TG-ANX-99-8515	ICSep AN2, 4.6mm x 250mm	TG-ANX-99-8515
ICSep AN2 Guard Column, 4.6mm x 50mm	TG-ANX-99-3515	ICSep AN300B, 4.6mm x 250mm	TG-ANX-99-8516
ICSep AN2 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0015	ICSep AN300B Guard Column, 4.6mm x 50mm	TG-ANX-99-3516
ICSep AN1, 4.6mm x 250mm	TG-ANX-99-8511	ICSep AN300B Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0016
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510	ICSep ANSC, 4.6mm x 250mm	TG-ANX-99-8512
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010	ICSep ANSC Guard Column, 4.6mm x 50mm	TG-ANX-99-3512
ICSep AN1-SC, 4.6mm x 250mm	TG-ANX-99-8514	ICSep ANSC Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0012
ICSep AN1-SC Guard Column, 4.6mm x 50mm	TG-ANX-99-3514	ICSep ION-120, 4.6mm x 120mm	TG-ANX-99-6550
ICSep AN1-SC Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0014	ICSep ION-120 Guard Kit, 4.0mm x 24mm	TG-ANX-99-2350
ICSep AN300, 5.5mm x 150mm	TG-ANX-99-7613	ICSep ION-120 Guard Cartridges, 3/pk, 4.0mm x 24mm	TG-ANX-99-0090
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510	ICSep CN2, 3.2mm x 100mm	TG-CTX-99-5250
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010	ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350
		ICSep CN2 FA, 4.6mm x 50mm	TG-CTX-99-3550
		ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350

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

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

The silica based TSK columns are the best choice for the separation by molecular size of peptides and proteins thanks to their high efficiency, low adsorption, and their well defined and controlled distribution of pore size.

The SW columns, of 10µm particle size, have been the most popular since their introduction in the year 1978, and now constitute a market standard. The SWXL are improved on the earlier ones, due to their particle size of 5 microns, which, while maintaining efficiency, cuts analysis time by half. Finally, the columns SuperSW, with 4 micron particles of high efficiency, allows operation with columns of 4.6 mm I.D., achieving a spectacular increase of efficiency and detection sensitivity.

Analytical and preparative TSK-Gel Size Exclusion Silica based products

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

Analytical and preparative TSK-Gel Size Exclusion Silica based products

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

Pore sizes: Super SW2000, CQ-PAK TSK 200, G2000SW and G2000SW_{XL} = 125Å, Super SW3000, CQ-PAK TSK 300, G3000SW, and G3000SW_{XL} = 250Å, G4000SW and G4000SW_{XL} = 450Å.

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

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

Data generated using the following conditions:

Columns: Two 4 µm, 4.6mm x 30cm TSK-GEL Super SW columns in series, two 5 µm, 7.8mm x 30cm TSK-FEL SW_{XL} columns in series; two 10 µm, 7.5mm x 60cm TSK-GEL SW columns in series.

Elution: Globular proteins: 0.3M NaCl in 0.1M (0.05M for SW_{XL} columns) phosphate buffer, pH 7
Dextrans and polyethylene glycols and oxides (PEOs): distilled water

TK TSK-GEL PW and TSK-GEL PW_{XL} Columns

for Molecular Exclusion (GFC) of water soluble polymers.

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

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

Analytical and preparative TSK-Gel Size Exclusion polymer based column

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Molecular weight of sample				
<i>Guard columns</i>				
TH-08034	Oligo Guard Column	6.0	4.0	12.0
TH-08033	PW _{XL} Guard Column	6.0	4.0	12.0
TH-06763	PW-L Guard Column	7.5	7.5	12.0
TH-06762	PW-L Guard Column	7.5	7.5	12.0

Bulk packing

TH-08035	PWXL Top-Off, 1g wet resin		10.0	
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Analytical and preparative TSK-Gel Size Exclusion polymer based column

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

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

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

Data generated using the following conditions:

Column: TSK-GEL PW columns, 7.5mm x 60cm; TSKgelPW_{XL}, G-Oligo-PW & G-DNA-PW, 7.8MM x 30cm

Elution: Polyethylene glycols and oxides: distilled water, dextrans and proteins: 0.2M phosphate buffer, pH 6.8.

Flow rate: 1.0mL/min

Note: * Larger particle sizes of each group are for 21.5mm x 60cm semi-preparative and 55mm or 108mm x 60cm preparative columns.

** Maximum separation range determined from estimated exclusion limits.

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

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

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

TSK-Gel Alpha Series

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

Guard columns

TH-18345	Alpha Guard column	6	4	13
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Exclusion limits for TSK-GEL Alpha Series columns

Exclusion limit (Da for various standards and eluents)

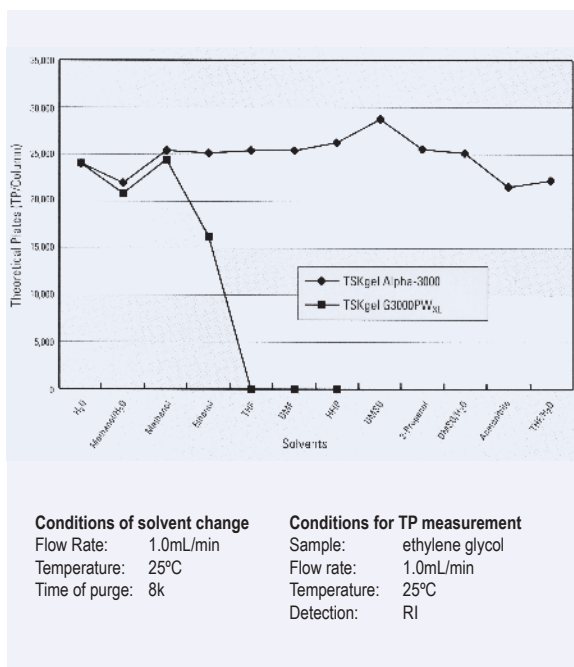
Column	Particle size (μm)	PEO ^a /H ₂ O	PS ^b /10mM LiBr in DMF	PEG ^c /10mM LiBr in MeOH
Alpha-2500	7	5 x 10 ³	1 x 10 ⁴	1 x 10 ⁴
Alpha-3000	7	9 x 10 ⁴	1 x 10 ⁵	6 x 10 ⁴
Alpha-4000	10	x 10 ⁵	1 x 10 ⁶	3 x 10 ⁶
Alpha-5000	10	1 x 10 ⁶	7 x 10 ⁶	N.D.
Alpha-6000	13	> 1 x 10 ⁷	> 1 x 10 ⁷	N.D.
Alpha-M	13	> 1 x 10 ⁷	> 1 x 10 ⁷	N.D.

N.D = not determined

a Polyethylene oxide

b Polystyrene Divinyl Benzene

c Polyethylene glycol



Conditions of solvent change

Flow Rate: 1.0mL/min

Temperature: 25°C

Time of purge: 8k

Conditions for TP measurement

Sample: ethylene glycol

Flow rate: 1.0mL/min

Temperature: 25°C

Detection: RI

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

for Molecular Exclusion Chromatography

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

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

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

Properties of H-type columns

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

* polystyrene standards

** estimate

...TSK-GEL HXL, TSK-GEL HHR Columns **Tk**

of polymers soluble in organic media.

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Stainless Steel columns				
TH-17352	G1000H _{HR}	7.8	30	5
TH-17353	G2000H _{HR}	7.8	30	5
TH-17354	G2500H _{HR}	7.8	30	5
TH-17355	G3000H _{HR}	7.8	30	5
TH-17356	G4000H _{HR}	7.8	30	5
TH-17357	G5000H _{HR}	7.8	30	5
TH-17358	G6000H _{HR}	7.8	30	5
TH-17359	G7000H _{HR}	7.8	30	5
TH-17362	GMH _{HR} -L mixed bed	7.8	30	5
TH-18055	GMH _{HR} -N mixed-bed	7.8	30	5
TH-17392	GMH _{HR} -M mixed-bed	7.8	30	5
TH-17360	GMH _{HR} -H mixed-bed	7.8	30	5
TH-18393	GMH _{HR} -H(S) mixed-bed	7.8	30	13

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Stainless Steel columns				
TH-16131	G1000H _{XL}	7.8	30	5
TH-16134	G2000H _{XL}	7.8	30	5
TH-16135	G2500H _{XL}	7.8	30	5
TH-16136	G3000H _{XL}	7.8	30	6
TH-16137	G4000H _{XL}	7.8	30	6
TH-16652	GMH _{XL} -L mixed bed	7.8	30	6
TH-16138	G5000H _{XL}	7.8	30	9
TH-16139	G6000H _{XL}	7.8	30	9
TH-16140	G7000H _{XL}	7.8	30	9
TH-16141	GMH _{XL} - mixed-bed	7.8	30	9
TH-07112	GMH _{XL} - HT	7.8	30	13
TH-18403	Multipore H _{XL} - M	7.8	30	5
TH-05362	G1000H8	7.5	30	10
TH-05363	G2000H8	7.5	30	10
TH-06717	G2500H8	7.5	30	10
TH-05364	G3000H8	7.5	30	10
TH-05365	G4000H8	7.5	30	10

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)	Use
Guard columns					
TH-18404	MultiporeH _{XL} -M guard column	6.0	4.0	5	For P/N TH-18403
TH-07113	HXL-L Guard column	6.0	4.0	7	For G1000H _{XL} through GMH _{XL} -L
TH-13727	H _{XL} -H Guard column	6.0	4.0	5	For G5000H _{XL} through GMH _{XL}
TH-05156	H8 Guard column	7.5	7.5	10	For 7.5mm ID H8
TH-05157	H6 Guard column	7.5	7.5	13	For 7.5mm ID H6
TH-05158	HM Guard column	7.5	7.5	40	For 7.5mm ID GMBH6 & P/N TH-07112 (order with ODCB)
TH-17368	Guard column H _{HR} -L and H _{HR}	6.0	4.0	5	For G1000-4000H _{HR} and P/N TH-17362
TH-17369	Guard column H _{HR} -H and H _{HR}	6.0	4.0	5	For G5000-7000H _{HR} and P/Ns 18055, 17392 and 17360

TSK COLUMNS FOR IONIC INTERCHANGE AND HYDROPHOBIC INTERACTION ON DEMAND

TK TSK-GEL Columns

for Ionic Exchange (IEC)

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

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

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

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
<i>Glass columns: polymer-based</i>				
TH-14010	CM-5PW Glass, 1000 A	5.0	5.0	10
TH-14011	CM-5PW Glass, 1000 A	8.0	7.5	10
TH-14012	CM-5PW Glass, 1000 A	20.0	15.0	13
TH-13062	SP-5PW Glass, 1000 A	5.0	5.0	10
TH-08803	SP-5PW Glass, 1000 A	8.0	7.5	10
TH-14017	SP-5PW Glass, 1000 A	20.0	15.0	13

PEEK Columns

TH-19686	BioAssist S, 1300 A	4.6	5.0	7
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TSK Cation Exchange Columns

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

TSK Cation Exchange Columns

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

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
<i>Glass columns: polymer-based</i>				
TH-13061	DEAE-5PW Glass, 1000 A	5.0	5.0	10
TH-08802	DEAE-5PW Glass, 1000 A	8.0	7.5	10
TH-14016	DEAE-5PW Glass, 1000 A	20.0	15.0	13
TH-18386	SuperQ-5PW Glass, 1000 A	8.0	7.5	10

PEEK Column

TH-19685	BioAssist Q, 4000 A	4.6	5.0	10
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Stainless Steel Columns, polymer based

TH-13075	DEAE-NPR, nonporous	4.6	3.5	2.5
TH-18249	DNA-NPR, nonporous	4.6	7.5	2.5
TH-42151	DNA-NPR, nonporous	7.5	7.5	2.5

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
<i>Stainless Steel Columns, polymer based</i>				

TH-18757	DEAE-5PW, 1000 A	2.0	7.5	10
TH-07164	DEAE-5PW, 1000 A	7.5	7.5	10
TH-07574	DEAE-5PW, 1000 A	21.5	15.0	13
TH-07930	DEAE-5PW, 1000 A	55.0	20.0	20
TH-18257	SuperQ-5PW, 1000 A	7.5	7.5	10
TH-18387	SuperQ-5PW, 1000 A	21.5	15.0	13
TH-08639	Sugar AXI, 60 A	4.6	15.0	8
TH-08640	Sugar AXG, 60 A	4.6	15.0	10
TH-07157	SAX	6.0	15.0	5

Stainless Steel Columns, silica-based

TH-07166	QAE-2SW, 125 A	4.6	25.0	5
TH-18761	DEAE-2SW, 125 A	2.0	25.0	5
TH-07168	DEAE-2SW, 125 A	4.6	25.0	5
TH-07163	DEAE-3SW, 250 A	7.5	7.5	10

TSK Anion Exchange Columns

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

TK TSK-GEL Columns

for Hydrophobic Interaction Chemistry (HIC)

The great advantage over separations by reverse phase consists in the extremely mild elution conditions which protect the stability of the most sensitive proteins.

TOSO have three different columns available for HIC: TSK-GEL Phenyl-5PW, TSK-GEL Ether-5PW, and TSK-GEL Butyl -NPR.

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

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

TSK Hydrophobic Interaction Columns

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

TSK Hydrophobic Exchange Columns

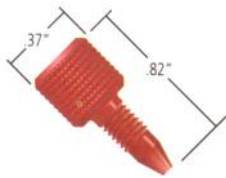
Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)	Use
Guard Column products					
TH-42156	Ether-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18760
TH-14025	Ether-5PW Guardgel Kit, Glass			20	For P/Ns TH-14013 and TH-14014
TH-08643	Ether-5PW Guardgel Kit			20	For P/N TH-08641
TH-16091	Ether-5PW Prep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

One Piece or Two?

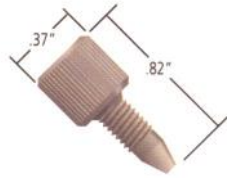
A one-piece fitting is more convenient and less cumbersome, since the ferrule cannot stick in a receiving port and the fitting is more easily found if dropped. With two-Piece Fingertight, you only replace the ferrule instead of the entire unit, making these Fingertights more economical than the one-piece 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").



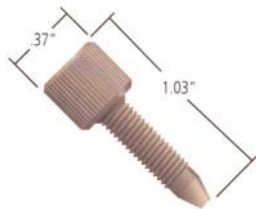
UP-F-100
10-32 Kel-F™ Fitting
Max Pressure 276 bar



UP-F-120
10-32 PEEK™ Fitting
Max Pressure 414 bar



UP-F-127
10-32 PEEK™ Fitting
Max Pressure 414 bar



UP-F-130
10-32 PEEK™ Fitting
Max Pressure 414 bar



UP-M-645
6-40 PEEK/Kel-F™ Fitting
for 1/32" OD tubing
Max Pressure 121-224 bar



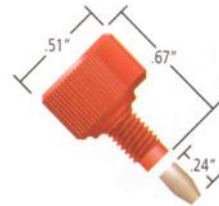
UP-P-100
1/14-28 Kel-F™ Fitting
for 1/8" OD tubing
Max Pressure 69 bar

One-Piece Fingertight Fittings^{1,2}

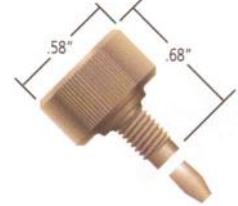
Cat.No.	Description	Qty.
UP-F-100x	Kel-F, Red, 10-32 for 1/16" OD tubing	10-pk
UP-F-120x	PEEK, Natural, 10-32 1/16" OD tubing	10-pk
UP-F-127x	PEEK, Natural, 10-32 Short 1/16" OD tubing	10-pk
UP-F-130x	PEEK, Natural, 10-32 Long 1/16" OD tubing	10-pk
UP-M-645x	PEEK/Kel-F, Natural, 6-40, for 1/32" OD tubing	10-pk
UP-P-100	Kel-F, Natural, 1/4-28, for 1/8" OD tubing	ea.

Two-Piece Fingertight Fittings

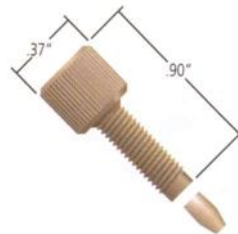
Our original Two-Piece Fingertight Fittings were designed exclusively for 1/16" OD tubing. We now offer optional ferrules for connecting 1/32" OD and 190 µm OD tubing with any Fingertight nut on last page. Our M-215 Conductive Perfluorelastomer Ferrule is designed for mass spectrometer electrospray applications.



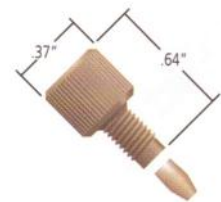
UP-F-200
10-32 Delrin™ Winged Nut
with F-142 PEEK™ Ferrule



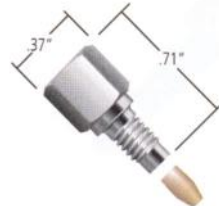
UP-F-300
10-32 PEEK™ Double Winged Nut
with F-142 PEEK™ Ferrule



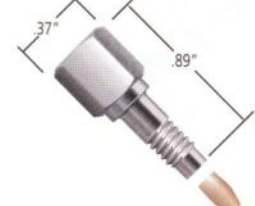
UP-F-330
10-32 PEEK™ Nut
with F-142 PEEK™ Ferrule



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.

TK Fingertight Fittings - Stainless Steel Tubing

360-510 µm OD tubing

For electrospray applications, choose 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
Perfluoroelastomer
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

- 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 100°C). Additionally, PEEK tubing has a very smooth internal surface, which causes less turbulence 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.

TK Inlet Solvent Filters

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.

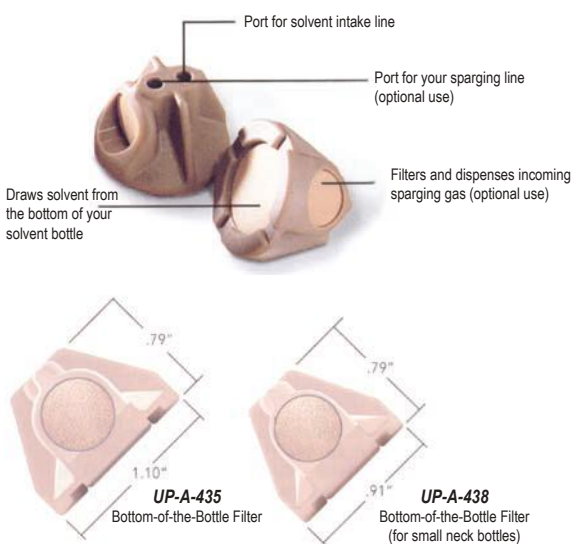
Bottle Caps - PEEK Bottom-of-the-Bottle Solvent Filters

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!



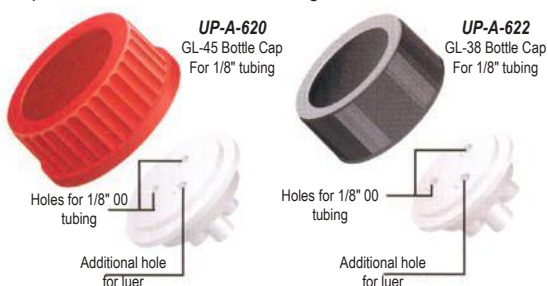
Bottle Caps

- 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 options. 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 Plug. Please see the note to the right.

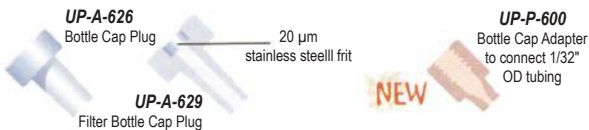


Bottle Caps for UP-GL-45, 1L Bottles

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

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.

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

TK Precolumn and Inline Filters

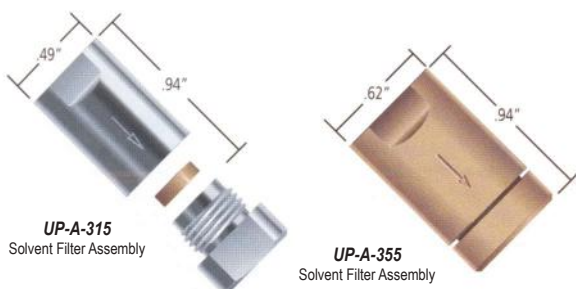
Increase the Life of your Column

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.



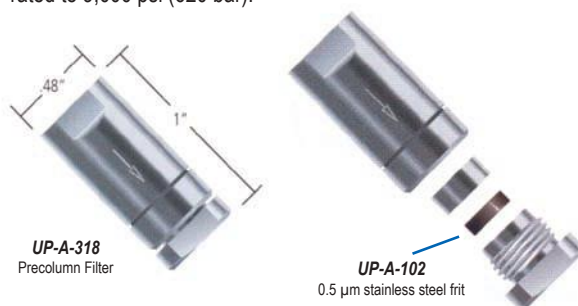
Precolumn Filters

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 (0.61µL*) of any HPLC filter available, ensuring maximum protection with no band broadening. Pressure rated to 9,000 psi (620 bar).



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.



Inline Solvent Filters

Reference	Description	Swept Volume*
UP-A-314	2.0µm Solvent Filter Assembly, with UP-A-100 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.

Agilent Deuterium Lamps



Cat.No	Model	Description	Ref. Agilent
TR-G1103-60001	Agilent 1100	Visible Light Bulb	N/A
TR-LD-AGI-100	Agilent 1050 A	D2 Lamp	79853-60002
TR-LD-AGI-100LL	Agilent 1050 A	Longlife D2 Lamp	79851-60002
TR-LD-AGI-101	Agilent 1050 C 1050 DAD 1090, 1040	D2 Lamp	79883-60002
TR-LD-AGI-104	Agilent 1100 VWD	D2 Lamp	G1314-60100
TR-LD-AGI-104-LL	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 DAD	Longlife D2 Lamp	5181-1530
TR-LD-AGI-106	Agilent 8452	D2 Lamp	08452-60104
TR-LD-AGI-107	Agilent CE System Lamp		2140-0585
TR-LX-AGI-100	Agilent 1046 FLD,	Xe Lamp	2140-0549
TR-LX-AGI-101	Agilent 1100 FLD,	Xe Lamp	2140-0600

Waters Deuterium Lamps



Cat.No	Model	Description	Ref. Waters
TR-LD-WAT-100	Waters 480LC 481LC 481 Lambda Max	D2 Lamp	WAT099499
TR-LD-WAT-101	Waters 484	D2 Lamp	WAT080357
TR-LD-WAT-102	Waters 486	D2 Lamp	WAT080678
TR-LD-WAT-104LL	Waters 996, 2996 PDA	Longlife D2 Lamp	WAT052586
TR-LD-WAT-105LL	Waters 2487 Alliance	Longlife D2 Lamp	WAS081142
TR-LD-WAT-134	Waters 990/991/994	D2 Lamp	WAT021516
TR-LX-WAT-150MO	Waters 470 474 2475	Xe Lamp	3132

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-101-LL	Shimadzu SPD10A, 10A3, 10AV, 10AVP, 20A, 20AV	Longlife D2 Lamp	228-34016-02
TR-LD-SHI-102	Shimadzu Spectrophotometer	D2 Lamp	200-75503-00
TR-LD-SHI-102LL	Shimadzu Spectrophotometer	Longlife D2 Lamp	200-75503-01
TR-LD-SHI-103LL	Shimadzu LC2010	Longlife D2 Lamp	228-37401
TR-LD-SHI-104	Shimadzu SPD-M10A, M10AV	D2 Lamp	N/A
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	N/A
TR-LX-SHI-75XE	Shimadzu RF530 RF510	Xe Lamp	N/A

Varian Deuterium Lamps



Cat.No	Model	Description	Ref. Varian
TR-LD-VAR-100	Varian 2050 2550 5500	D2 Lamp	
TR-LD-VAR-101	Varian 75 series, AA & Spectra A series Superscan	D2 Lamp	5610021800
TR-LD-VAR-102	Varian Cary 1 4 5 100 300 400 500	D2 Lamp	5610013250
TR-LD-VAR-103LL	Varian UV50/100/200 9050 Prostar 310, Vista 5000, 5500	Longlife D2 Lamp	0391615691
TR-LD-VAR-103LLE	Varian UV50/100/200 9050 Prostar 310 Retur bracked	Longlife D2 Lamp	N/A
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-107	Varian Cary 2200/2300, 210, 219	D2 Lamp	5618000100
TR-LD-VAR-122	Varian UV10	D2 Lamp	N/A
TR-LD-VAR-149	Varian UV634 635 Variscan	D2 Lamp	56-100132-00
TR-LX-VAR-100	Varian Prostar 320 , UV-1	Xe Lamp	R007200556
TR-LX-VAR-101	Varian 9070	Xe Lamp	N/A
TR-LX-VAR-152H	Varian Prostar 363	Xe Lamp	392613103

TK Deuterium Lamps for a Detector

Merck Hitachi Deuterium Lamps



Cat.No	Model	Description	Ref. Hitachi
TR-LD-MEH-100	Hitachi L & U Series	D2 Lamp	HITA 890-2430
TR-LD-MEH-101	Hitachi 100-10, 124, 100-40, 100-50, 100-60	D2 Lamp	982-1035
TR-LD-MEH-102	Hitachi 101, 102, 111	D2 Lamp	N/A
TR-LD-MEH-152	Hitachi 181	D2 Lamp	N/A
TR-LX-MEH-152H	Hitachi Fluorescence Detector	Xe Lamp	N/A

Dionex Deuterium Lamps



Cat.No	Model	Description	Ref. Dionex
TR-LD-DIO-100	Dionex CES1 CZESYST 2001 VDM-2	D2 Lamp	40651
TR-LD-DIO-102LL	Dionex PDA-100, PDA-3000, AD-25	Longlife D2 Lamp	939016T
TR-LD-DIO-103	Dionex AD20	D2 Lamp	N/A
TR-LD-DIO-104	Ultimate Dionex UVD 3000 Nano LC	D2 Lamp	N/A
TR-LD-DIO-108	Dionex Durrum	D2 Lamp	N/A
TR-LD-GYN-100LL	Dionex / Gynkotek UVD 320/160/170S 340 DAD	Longlife D2 Lamp	5053, 1204
TR-LX-DIO-150S	Dionex Fluorescence Detector	Xe Lamp	N/A

Gilson Deuterium Lamps



Cat.No	Model	Description	Ref. Gilson
TR-LD-GIL-100	Gilson Holochrome	D2 Lamp	N/A
TR-LD-GIL-101	Gilson 115/116/117/118/119/151/152/155/156	D2 Lamp	100326
TR-LD-GIL-105	Gilson 170 D.A.D.	D2 Lamp	2140-0590
TR-LD-GIL-105LL	Gilson 170 D.A.D.	Longlife D2 Lamp	5181-1530
TR-LX-GIL-150MO	Gilson 122	Xe Lamp	N/A

TSP Deuterium Lamps



Cat.No	Model	Description	Ref. TSP
TR-LD-TSP-100	TSP 3100	D2 Lamp	N/A
TR-LD-TSP-101	TSP SP8400 8480 8430 8440 8450 8490 8200	D2 Lamp	3302-9540
TR-LD-TSP-102	TSP UV100/1000/2000/3000, Focus, CE Series	D2 Lamp	9551-0023
TR-LD-TSP-106	TSP UV 6000 DAD Surveyor	D2 Lamp	108052
TR-LD-TSP-150	TSP LC871	D2 Lamp	N/A
TR-LD-TSP-101	TSP FL2000, FL3000, LC304	Xe Lamp	N/A

ABI Deuterium Lamps



Cat.No	Model	Description	Ref. ABI
TR-LD-ABI-100	ABI 757 759 783A 785A 1000S FS980 120A 130A	D2 Lamp	2900-0484

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-101	PE AAnalyst 100,300,3100,3110,3300	D2 Lamp	N0370119
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-104	Perkin Elmer LC240, 90, 290, 295, 481	D2 Lamp	02712224
TR-LD-PER-105	Perkin Elmer LC295	D2 Lamp	02712266
TR-LD-PER-149	PE Lambda Array 3480	D2 Lamp	C6760011
TR-LD-PER-152	PE M46 M55 55E M57 575 Lambda 1 3 6 LC55 65T	D2 Lamp	N/A
TR-LD-PER-160	PE Lambda 2 4 5 7 to 45 800 900 Bio, 55X series	D2 Lamp	B016-0917
TR-LD-PER-161	Perkin Elmer 3030, 4000, 4100, 5000 Agnelist Zeeman	D2 Lamp	0057-0194
TR-LD-PER-162	Perkin Elmer 1100 , 2100, 4100	D2 Lamp	B0148615
TR-LD-PER-175	PE M550S 550SE M551S M552 M554 555	D2 Lamp	N/A
TR-LD-PER-178	PE 400 410 420 430	D2 Lamp	N/A
TR-LD-PER-181	PE M550 M551 M552 M555	D2 Lamp	B0160917
TR-LD-PER-150MO	PE 203 204 MPF2A MPF3 MPF4 650	Xe Lamp	N/A

Jasco Deuterium Lamps

Cat.No	Model	Description	Ref. Jasco
TR-LD-JAS-100	Jasco 870 875	D2 Lamp	5330-0097
TR-LD-JAS-101	Jasco 975 (B & C Series) 1570 1575, 2075	D2 Lamp	5330-0091
TR-LD-JAS-102	Jasco 530, 550, 560 570	D2 Lamp	N/A
TR-LD-JAS-103	Jasco 975 (A series)	D2 Lamp	5330-0092
TR-LD-JAS-150MO	Jasco 820 821	Xe Lamp	N/A
TR-LD-JAS-274	Jasco 920 921 1520	Xe Lamp	N/A

Kontron Deuterium Lamps

Cat.No	Model	Description	Ref. Kontron
TR-LD-KON-101	Kontron 332/335/430/432/433/770 Uvikon 430	D2 Lamp	93-00636
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-LD-KON-105	Kontron 735, Uvikon 722, 730	D2 Lamp	54-02002
TR-LT-KON-106	Kontron , Uvikon XL, XS, CSA	Tungsten Lamp	96-90297
TR-LD-KON-134	Kontron 440 DAD	D2 Lamp	91-91095
TR-LX-KON-150MO	Kontron SFM25	Xe Lamp	N/A
TR-LT-KON-100	Kontron 900 series	Tungsten Lamp	N/A

Biorad Deuterium Lamps

Cat.No	Model	Description	Ref. Biorad
TR-LD-BIO-100	Biorad 1305 1306	D2 Lamp	N/A
TR-LD-BIO-101	Biorad 206, 300, 1790, BioDimensions,	D2 Lamp	930-6106
TR-LD-BIO-125	Biorad HPE100, MDL1790, CE2000, Biofocus	D2 Lamp	N/A

Beckman Deuterium Lamps

Cat.No	Model	Description	Ref. Beckman
TR-LD-BEC-100	Beckman 163	D2 Lamp	22 947029
TR-LD-BEC-101	Beckman DU500 DU530	D2 Lamp	N/A
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-104	Beckman 164 165 167 System Gold 5200 Acta 24-36	D2 Lamp	236920
TR-LD-BEC-105	Beckman 168	D2 Lamp (prealigned)	538711
TR-LD-BEC-106	Beckman DU60 DU62 DU64 DU65 DU68 DU 70	D2 Lamp	596791
TR-LD-BEC-108	Beckman P/ACE 2000	D2 Lamp	359058
TR-LD-BEC-109	Beckman P/ACE 5000 5010 5500 5510	D2 Lamp	N/A

TK Deuterium Lamps for a Detector

Beckman Deuterium Lamps

Cat.No	Model	Description	Ref. Beckman
TR-LD-BEC-110	Beckman P/ACE MDQ	D2 Lamp	N/A
TR-LD-BEC-149	Beckman 155	D2 Lamp	22 887153

Philips and Unicam Deuterium Lamps

Cat.No	Model	Description	Ref. Philips/Unicam
TR-LD-PHU-100	Unicam 4225	D2 Lamp	N/A
TR-LD-PHU-101	Unicam UV & Helios series	D2 Lamp	9423U/9004B
TR-LD-PHU-102	Unicam 4110	D2 Lamp	4013-166-66428
TR-LD-PHU-104	Unicam SP700 800 1700 1750 1800 8000 8800 8820	D2 Lamp	4013-160-24263
TR-LD-PHU-109	Unicam SP8450 8700 8710 8720 8730 8740 8750	D2 Lamp	N/A
TR-LD-PHU-121	Unicam SP8620 SP8625	D2 Lamp	N/A
TR-LD-PHU-127	Unicam SP8 8150 8200 8400 8500 8600 8740 5600	D2 Lamp	4013-163-75402
TR-LD-PHU-150	Unicam LC3 LCUV 4020 4025	D2 Lamp	4013-164-45861
TR-LD-PHU-171	Unicam 4021 4120 D.A.D.	D2 Lamp	4013-164-39401
TR-LD-PYU-120	Pye Unicam SP500	D2 Lamp	4013-160-94202

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

Cecil Deuterium Lamps

Cat.No	Model	Description	Ref. Cecil
TR-LD-CEC-111	Cecil Series 2 1000 to 9000 CE	D2 Lamp	N/A

Knauer Deuterium Lamps

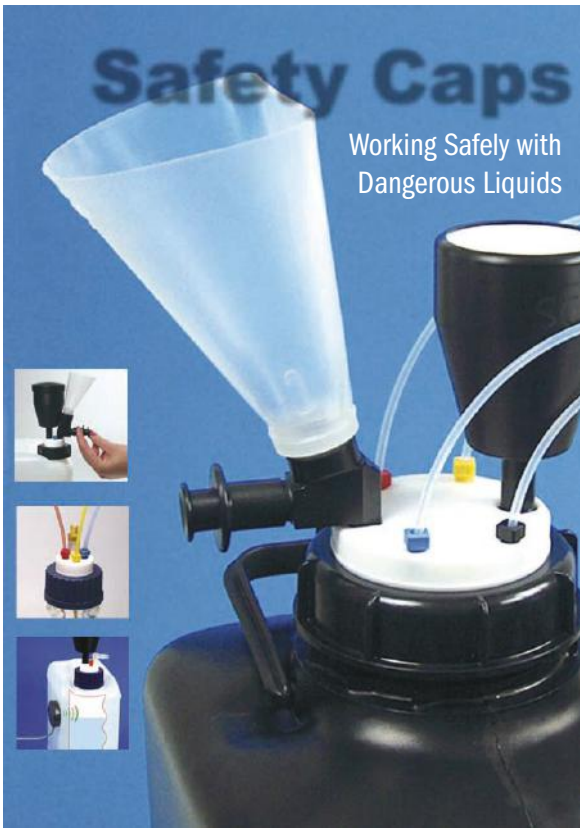
Cat.No	Model	Description	Ref. Knauer
TR-LD-KNA-101LL	Knauer Welchrom K2000 K2500 K2501 D2	Longlife D2 Lamp	N/A

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



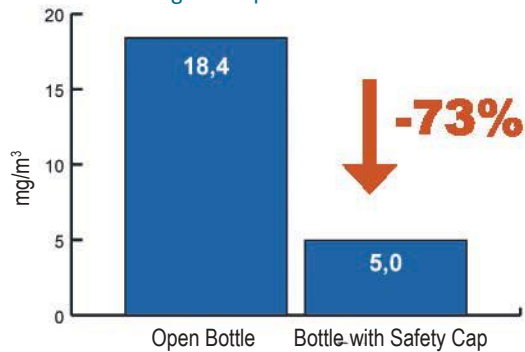
Troubleshooting by SCAT Safety Caps

- **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 Acetonitrile in a test laboratory during HPLC operation

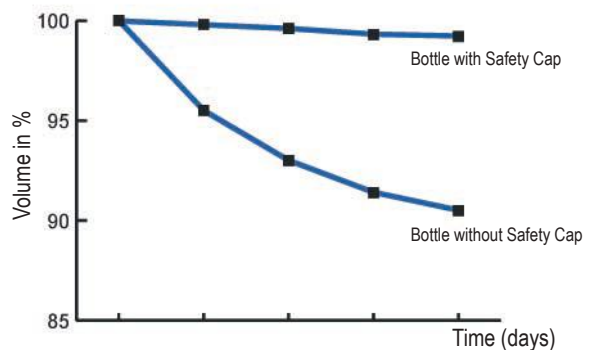


Avoid shrinkage

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)



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.

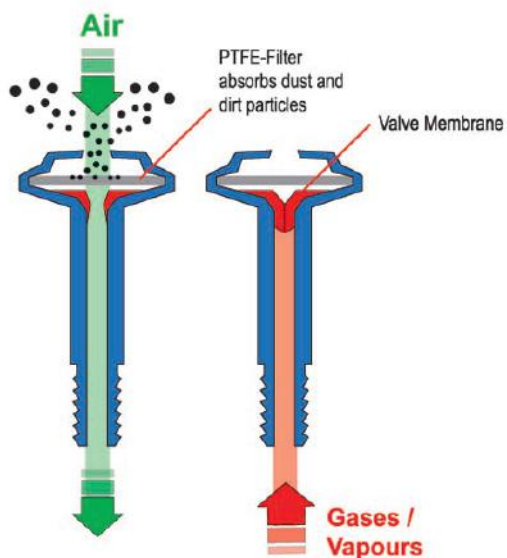
Tk HPLC Safety Caps

Safe and comfortable

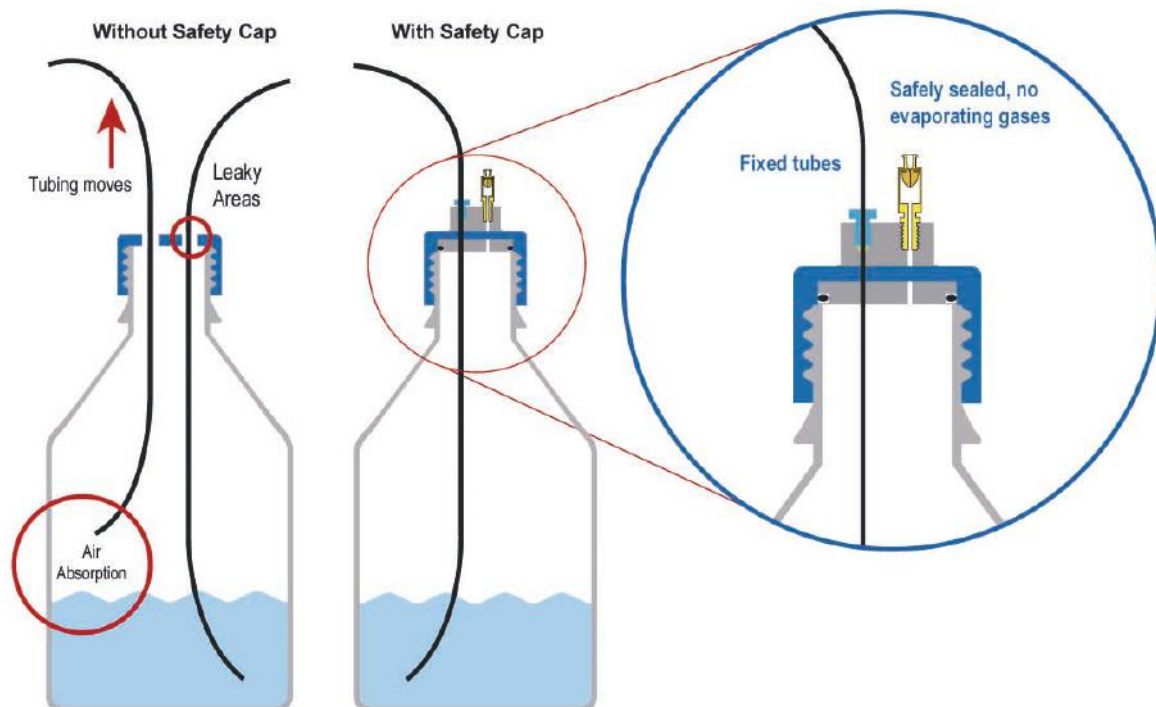
Safety Caps rotate freely without twisting tubes. Even when using multiple connectors, you can easily exchange your containers and reservoirs without interruptions.

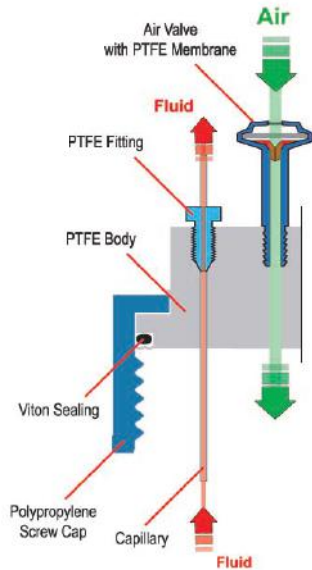


Air Valve Function



The Difference in Liquid Handling





Safety Caps GL 45 - Safe Fluid Supply

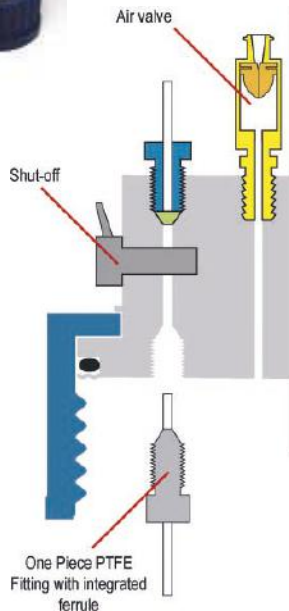
Safe venting for pressure equalization during the solvent supply by integrated air valve. Protection against dangerous solvent vapours.

Available connectors for tubing:

- 1.6mm (1/16") OD
- 2.3mm OD
- 3.2mm (1/8") OD

Cat.No	Description
SCA-107019	Safety Cap I, GL 45 1 port for 3.2mm (1/8") OD tubing
SCA-107909	Safety Cap II, GL 45 2 ports for 3.2mm (1/8") OD tubing
SCA-107910	Safety Cap III, GL 45 3 ports for 3.2mm (1/8") OD tubing
SCA-108032	Safety Cap I, GL 45 for 3/16" tubing 1 port for 4.7mm (3/16") OD tubing

Adapters for other thread sizes available



Safety Caps GL 45 - with Shut-Off

Remove or exchange your reservoirs easily by using the **shut-off** to stop the liquid flow. Especially recommended for HPLC use.

Available connectors for tubing:

- 1.6mm (1/16") OD
- 2.3mm OD
- 3.2mm (1/8") OD

Cat.No	Description
SCA-107119	Safety Cap I with Shut-Off, GL 45 1 port for 3.2mm (1/8") OD tubing
SCA-107919	Safety Cap II with Shut-Off, GL 45 2 ports for 3.2mm (1/8") OD tubing
SCA-107920	Safety Cap III with Shut-Off, GL 45 3 ports for 3.2mm (1/8") OD tubing

Adapters for other thread sizes available



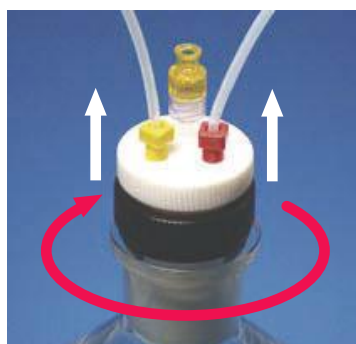
Safety Caps (2 in 1) for GL 45

Ports with shut-off plus 1 standard port each.

Available connectors for tubing:

- 1.6mm (1/16") OD
- 2.3mm OD
- 3.2mm (1/8") OD

Cat.No	Description
SCA-107219	Safety Cap II (2 in 1), GL 45 1 port (standard), 1 port with shut-off
SCA-107319	Safety Cap III (2 in 1), GL 45 1 port (standard), 2 ports with shut-off



Safety Cap for NS 29/32mm bottles

For ground neck bottles with NS 29/32mm diameter. With counter nut for easy disconnecting and removal even after long time of use. **Ports for tubing with 1.6mm (1/16"), 2.3mm and 3.2mm (1/8") OD.**

Cat.No	Description	Pk
SCA-107607	Safety Cap for NS 29/32 bottles 2 ports for tubing with 3.2mm (1/8") OD	1



Adapter: GL45 to NS 29/32mm

For use with GL45 Safety Caps on bottles with a NS 29/32mm ground neck. **With counter nut** for easy disconnecting and removal even after long time of use.

Cat.No	Description	Pk
SCA-107509	Adapter GL45 to NS 29/32mm Core material: PTFE. Counter nut: PP.	1



NEW !!!

Air Valve for Safety Caps

Appropriate for all Safety Caps. **Recommended service life: 6 months..**

Cat.No	Description	Pk
SCA-107010	Air Valve for Safety Caps	1
SCA-117010;1	Air Valve with Filter Function	1



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
SCA-501117	250 ml	SCA-101994
SCA-501116	500 ml	SCA-101995
SCA-501113	1000 ml	SCA-101996
SCA-501118	2000 ml	SCA-101997
SCA-501125	5000 ml	SCA-101998



Bottles (Brown Glass) - GL 45 Thread

Round bottles (brown glass) with scale (ml) and screw cap.

Cat.No	Volume
SCA-501121	250 ml
SCA-501120	500 ml
SCA-501119	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
SCA-501112	250 ml
SCA-501115	500 ml
SCA-501110	1000 ml

Safety Waste Caps for Safe Disposal of Liquid Waste

Find appropriate Safety Waste Caps for most common thread sizes on the following pages.

The exhaust filters can be used with any SCAT Safety Waste Cap.

Only pure PTFE and PE is used for the construction of Safety Waste Caps, so they have a high chemical resistance against aggressive organic solvents.

The exhaust filters are suitable for all Safety Waste Caps and can be exchanged easily.



The exhaust filter absorbs **99%** of all volatile gases and avoids unfiltered escape of hazardous vapours. The filter is charged with a special granulate which has a specific filtering surface of **1.200 m²/g** - the optimum filter media for any type of solvent vapours. The different sizes of exhaust filters have the following real filtering surface:

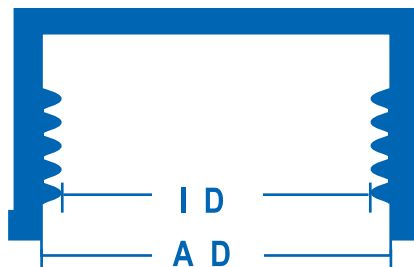
- Size S: **28.800 m²**
- Size M: **57.600 m²**
- Size L: **120.000 m²**

Safety Waste Caps

Each Safety Waste Cap has got a port for the exhaust filter. Fittings and ferrules for tubing with 2.3mm and 3.2mm (1/8") OD are included in delivery.

Adapters and ports for other tubing size are also available.

Please note this information for ordering:



ID = Internal Diameter of the Cap Thread
AD = External Diameter of the Cap Thread



Thread S 60/61



ID approx. 55.5 mm, AD approx. 61 mm



Cat Nbr.	SCA-107918	SCA-107925	SCA-107916	SCA-107944
Tubing Ports	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID	---	1x 6-8mm ID
Antistatic Port	---	---	Yes	Yes

Note: The exhaust filteres are not included. Please order your exhaust filteres separately.



S 60 / S 61 - Containers (PE-HD - optional: conductive PE-HD)

Select from different Materials: PE-HD or **electrically conductive PE-HD**. Each container delivered with screw cap and UN approval.

Cat Nbr.	Volume	Material	Measurements (LxBxH) in mm
SCA-107953	10 L	PE-HD (conductive)	198 x 264 x 298
SCA-108028	10 L	PE-HD (conductive)	230 x 195 x 340
SCA-108027	20 L	PE-HD (conductive)	298 x 198 x 498
SCA-107956	20 L	PE-HD (translucent)	290 x 255 x 390
SCA-107959	30 L	PE-HD (translucent)	380 x 280 x 400
SCA-108042	10 L	PE-HD (conductive)	
NEW		with level floater	380 x 280 x 420
SCA-108043	20 L	PE-HD (conductive)	
NEW		with level floater	298 x 198 x 518
SCA-108056	20 L	PE-HD (translucent)	
NEW		with level floater	290 x 255 x 450

TK HPLC Safety Waste Caps



Thread GL 45



ID approx. 41.5 mm, AD approx. 45 mm



Cat Nbr.	SCA-107912	SCA-107923
Tubing Ports	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID
Antistatic Port	---	---



Leak port for bigger tubing sizes



GL 45 - Containers (PE-HD)

Qualified for any Safety Caps with GL45 thread.
Made of chemically resistant PE-HD.

Cat Nbr.	Volume	Measurements (LxBxH) in mm
SCA-107950	2.5 L	150 x 122 x 194
SCA-107951	5.0 L	192 x 145 x 247
SCA-107952	10.0 L	231 x 192 x 317



Thread S 55



ID approx. 50.5 mm, AD approx. 55 mm



Cat Nbr.	SCA-107917	SCA-107924	SCA-107936	SCA-107943
Tubing Ports	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID	---	1x 6-8mm ID
Antistatic Port	---	---	Yes	Yes



S 55 - Containers (PE-HD)

Qualified for any Safety Caps with S55 thread.
Made of chemically resistant PE-HD.

Cat Nbr.	Volume	Thread	Measurements (LxBxH) in mm
SCA-107957	5.0 L	S 55	182 x 162 x 235
SCA-107955	10.0 L	S 55	230 x 196 x 310



Thread S 51



ID approx. 45.5 mm, AD approx. 50 mm



Cat Nbr.	SCA-107930	SCA-107922	SCA-107935	SCA-107942
Tubing Ports	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID	---	1x 6-8mm ID
Antistatic Port	---	---	Yes	Yes

Note: The exhaust filteres are not included. Please order your exhaust filteres separately.



S 51 - Containers (PE-HD)

Qualified for any Safety Caps with S51 thread.
Made of chemically resistant PE-HD.

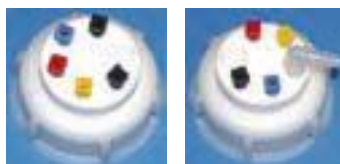
Cat Nbr.	Volume	Thread	Measurements (LxBxH) in mm
SCA-107958	5.0 L	S 51	165 x 190 x 223



Thread S 65



ID approx. 62 mm, AD approx. 65.5 mm



Ports and connectors for other tubing sizes are also available !

Cat Nbr.	SCA-108046	SCA-108047
Tubing Ports	5x 2.3/3.2mm OD	4x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID
Antistatic Port	---	---



S 65 - Containers (PE-HD)

Qualified for any Safety Caps with S65 thread.
Made of chemically resistant PE-HD.

Cat Nbr.	Volume	Measurements (LxBxH) in mm
SCA-107704	10 L	Round Container S65 Height 430mm, Original Screw Cap Ø 210mm.



Thread S 70/71



ID approx. 66 mm, AD approx. 71.5 mm



Cat Nbr.	SCA-107913	SCA-107926	SCA-107915	SCA-107945
Tubing Ports	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD	3x 2.3/3.2mm OD	2x 2.3/3.2mm OD
Leak Ports	---	1x 6-8mm ID	---	1x 6-8mm ID
Antistatic Port	---	---	Yes	Yes



S 70 / S 71 - Containers (PE-HD, electroconductive)

Qualified for any Safety Caps with S70 / 71 thread.
Made of chemically resistant PE-HD, **electroconductive or translucent**

Cat Nbr.	Volume	Measurements (LxBxH) in mm	Kind
SCA-107954	30 L	265 x 425 x 365	electroconductive
SCA-107940	60 L	330 x 360 x 620	electroconductive
SCA-107710	60 L	330 x 360 x 620	translucent



Thread B 83



ID approx. 83 mm, AD approx. 90 mm



Without photo

Ports and connectors for other tubing sizes are also available !

Cat Nbr.	SCA-107034	SCA-107036
Tubing Ports	4x 2.3/3.2mm OD	4x 2.3/3.2mm OD
Leak Ports	1x 6-8mm ID	---
Antistatic Port	---	---



B 83 - Containers (PE-HD)

Qualified for any Safety Caps with B83 thread.
Made of chemically resistant PE-HD.

Cat Nbr.	Volume	Measurements (LxBxH) in mm
SCA-107706	10 L	Round Container B83, Height 390mm, with Screw Cap

Safety Waste Caps - with Safety Funnel

SCAT Safety Funnels are solely opened when disposing waste fluids. When releasing the opening mechanism, the waste container closes automatically. Furthermore you can discharge fluids permanently through the tubing ports (e.g. for HPLC applications).

The exhaust filter avoids unfiltered escape of hazardous vapours. The most reliable way to collect waste fluids.



Cat Nbr.	Thread	Tubing Ports with Safety Funnel
SCA-108132	S 50	2 ports for 2.3/3.2mm OD tubing
SCA-108033	S 55	2 ports for 2.3/3.2mm OD tubing
SCA-108034	S 60 / 61	2 ports for 2.3/3.2mm OD tubing
SCA-108150	S 65	2 ports for 2.3/3.2mm OD tubing
SCA-108035	S 70 / 71	2 ports for 2.3/3.2mm OD tubing
SCA-108151	B 83	4 ports for 2.3/3.2mm OD tubing
SCA-108152	S 90	4 ports for 2.3/3.2mm OD tubing
SCA-108153	S 95	4 ports for 2.3/3.2mm OD tubing 1 leak port for 6-8mm ID tubing

Please order your exhaust filters separately.



Optimum protection: Waste Cap with safety funnel and conductive container with level floater.

TK Exhaust Filters for Safety Caps

120,000 sqm screening surface versus hazardous vapours for clean air.

Our multicomponent granulate offers a specific filtering surface of 1.200 sqm/g and absorbs 99% of all particulate materials evaporating from your solvents.



The screening surfaces of the different filter sizes are:

Size S: 28.800 sqm

Size M: 57.600 sqm

Size L: 120.000 sqm

The lifetime of exhaust filters depends on concentration and chemical quality of the used solvent mixtures. To calculate the individual lifetime of the filters for your application, please ask your Sales Representative.



Optional:
Exhaust filter with splash guard

Exhaust Filters (standard)



Cat Nbr.	SCA-107911	SCA-107914	SCA-107615
Size	S	M	L

Exhaust Filters (with splash guard)



Cat Nbr.	SCA-107985	SCA-107982	SCA-107986
Size	S	M	L
	with splash guard	with splash guard	with splash guard

Join Adapters for Exhaust Filters



Not enough space in your lab? Don't worry - with our special adapters, you can fix the exhaust filter in any position you like. Practical, space-saving and flexible.

The extension offers more free moving space for connecting tubes to the cap. **The adapters can be joined in multiple ways (see photos).**

Cat Nbr.	Description	Picture	Profile
SCA-107621	Extension for exhausted filters <i>(can be joined with any other adapter)</i>		
SCA-107622	Angle adapter (fixed) for exhausted filters <i>(can be joined with any other adapter)</i>		
SCA-107624	Angle adapter for exhausted filters <i>(can be joined with any other adapter)</i>		



Collect your solvents and laboratory waste safely

SCAT Safety Funnels are made up of electroconductive PE-HD. The **ball valve** only opens during disposal of liquid waste. Evaporation of hazardous solvent dases is prevented.



Available for most standard container sizes!
The **earthing cable** (included in delivery) prevents electrostatic charge.



Safety Funnels (PE-HD, electroconductive)

Available with and without sieve. Delivered with antistatic cable.

Cat Nbr.	Cap	Material	Cat Nbr. with sieve
SCA-107672	GL 45	PE-HD (electroconductive), black	SCA-108972
SCA-107674	S 51	PE-HD (electroconductive), black	SCA-108974
SCA-107675	S 55	PE-HD (electroconductive), black	SCA-108975
SCA-107671	S 60 / 61	PE-HD (electroconductive), black	SCA-108971
SCA-107676	S 65	PE-HD (electroconductive), black	SCA-108976
SCA-107678	S 70 / 71	PE-HD (electroconductive), black	SCA-108978
SCA-107677	B 83	PE-HD (electroconductive), black	SCA-108977
SCA-107673	S 90	PE-HD (electroconductive), black	SCA-108973



Safety Funnels (PE-HD)

Available with and without sieve. Delivered with antistatic cable.

Cat Nbr.	Cap	Material	Cat Nbr. with sieve
SCA-107972	GL 45	PE-HD, white	SCA-108672
SCA-107974	S 51	PE-HD, white	SCA-108674
SCA-107975	S 55	PE-HD, white	SCA-108675
SCA-107971	S 60 / 61	PE-HD, white	SCA-108671
SCA-107976	S 65	PE-HD, white	SCA-108676
SCA-107978	S 70 / 71	PE-HD, white	SCA-108678
SCA-107979	B 83	PE-HD, white	SCA-108679
SCA-107973	S 90	PE-HD, white	SCA-108673



Stainless Steel Sieve (singular) for Safety Funnels

Cat Nbr.	Description
SCA-107715	Stainless steel sieve, singular, for safety funnels. Housing: PE-HD, electroconductive, black. Sieve: Stainless steel.

TK Accessories and Consumables

Polypropylene Fittings

For 1.6, 2.3 and 3.2mm OD tubing (same fitting for all sizes).
Please choose suitable PTFE ferrules for your tubing size separately (see below).



Cat Nbr.	Description	Unit
SCA-160304	Polypropylene Fittings, coloured	Box of 10

PTFE Ferrules

For Polypropylene Fittings. Please take care of correct assembling



Cat Nbr.	Description	Unit
SCA-107905	PTFE Ferrules, ID=1.6mm (1/16")	Box of 10
SCA-107906	PTFE Ferrules, ID=2.3mm	Box of 10
SCA-107908	PTFE Ferrules, ID=3.2mm (1/8")	Box of 10

PTFE Plugs for Safety Caps

If several Safety Cap ports are temporarily not in use, you can close them with PTFE plugs. That way you maintain protection against escaping vapours.



Cat Nbr.	Description	Unit
SCA-160504	PTFE Plugs for Standard Ports	Box of 10
SCA-160506	PTFE Plug for Leak Ports	Box of 1
SCA-107620	PTFE Plug for Exhaust Filter Ports	Box of 1

PTFE 3-way Angled Collector for Leak Port

Suitable for the leak port on all Safety Caps. Space-saving version.



NEW

Cat Nbr.	Description	Unit
SCA-160131	3-way Angled Collector for Leak Port 3 Ports for 1.6/2.3/3.2mm OD tubing Materials: Collector PTFE, Fittings Polypropylene	Box of 1
SCA-160130	3-way Angled Collector for Leak Port 2 Ports for 1.6/2.3/3.2mm OD tubing 1 Leak Port for 6-8mm ID tubing Materials: Collector PTFE, Fittings Polypropylene	Box of 1

PTFE Distance Rings for GL45 Safety Caps

Distance Rings for Safety Caps. For short neck bottles.



NEW

Cat Nbr.	Description	Unit
SCA-107020	PTFE Distance Rings for GL 45	Box of 1

Electroconductive Plastic Tubing

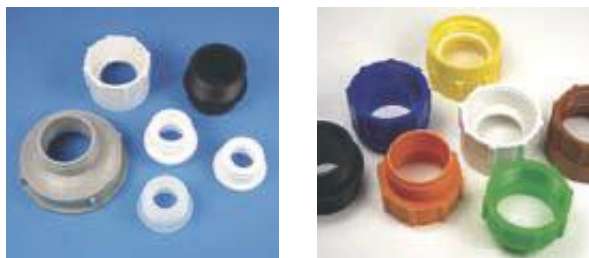
Made of electrically conductive PTFE. Extremely light, for safe transfer of flammable and sensitive fluids



Cat Nbr.	ID	OD	Profile
SCA-10801	6.0 mm	8.0 mm	Plane

Thread Adapters

Suit Safety Caps to nearly any kind of bottle or container. Simply choose a qualified adapter for your thread size.



Cat Nbr.	Container	Safety Cap	Material, Colour
SCA-107993	GL 32	GL 45	PTFE, white
SCA-107996	GL 32	GL 45	Polypropylene, natural
SCA-107992	GL 38	GL 45	PTFE, white
SCA-107995	GL 38	GL 45	Polypropylene, natural
SCA-107991	GL 40/S 40	GL 45	PTFE, white
SCA-107994	GL 40/S 40	GL 45	Polypropylene, natural
SCA-117094	GL 45	S 55	PTFE, white
SCA-107094	GL 45	S 55	Polypropylene, natural
SCA-107093	S 51	GL 45	Polypropylene, natural
SCA-117095	S 51	S 55	PTFE, white
SCA-107095	S 51	S 55	Polypropylene, natural
SCA-107097	S 51	S 60	Polypropylene, natural
SCA-107099	S 55	GL 45	Polypropylene, natural
SCA-107096	S 55	S 60	Polypropylene, natural
SCA-108021	2" BSP	S 60 (interior)	Polypropylene, grey
SCA-108022	2" BSP	S 60 (exterior)	Polypropylene, black
SCA-108444	2" Fine Thread	S 63 - S 65	Polypropylene, white
SCA-107022	2" Fine Thread	TriSure Grob	Polypropylene, orange

Y-Connectors (Polypropylene)

For any kind of flexible tubing (e.g. silicone)



Cat Nbr.	for Tubing ID	Cat Nbr.	for Tubing ID
SCA-107801	3 mm	SCA-107804	6-7 mm
SCA-107802	4 mm	SCA-107806	8-9 mm
SCA-107803	5 mm	SCA-107807	11 mm

Straight Connectors for Leak Port

These connectors fit into the leak port on any SCAT Safety Waste Cap.



Leak port for major sized tubing

Cat Nbr.	OD (Tubing ID)	Cat Nbr.	OD (Tubing ID)
SCA-107811	2-3 mm	SCA-107814	5-6 mm
SCA-107812	3-4 mm	SCA-107816	6-8 mm
SCA-107813	4-5 mm	SCA-107817	10 mm

Angle Connectors for Leak Port

These connectors fit into the leak port on any SCAT Safety Waste Cap.

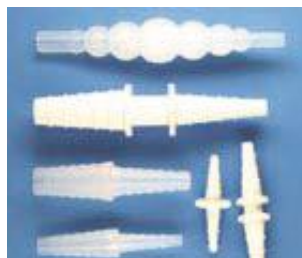


Leak port for major sized tubing

Cat Nbr.	OD (Tubing ID)
SCA-107808	6.40 - 8.00 mm
SCA-107810	9.50 - 10.50 mm

Conical Connectors and Reducers

For any kind of flexible tubing (e.g. silicone).



Cat Nbr.	Side 1 tubing ID	Side 2 Tubing ID
SCA-107818	11 to 15 mm	7 to 12 mm
SCA-107819	7 to 11 mm	4 to 7 mm
SCA-107820	10.5 to 16 mm	6.5 to 12 mm
SCA-107821	12 to 16 mm	4 to 8 mm
SCA-107822	6.5 to 11 mm	3 to 7.5 mm
SCA-107823	6.5 to 11 mm	6.5 to 11 mm
SCA-107824	4.2 to 8 mm	4.2 to 8 mm
SCA-107825	3 to 5.9 mm	3 to 5.9 mm
SCA-107826	5 to 18 mm	7.5 to 18 mm

TK Hamilton SoftGrip™ 2nd. Generation Pipettes

For 50 years, Hamilton has been synonymous with outstanding precision fluid measuring products. We extended our world renowned syringe expertise to the SoftGrip pipettes specifically designed to minimize hand strain, fatigue, and injuries. The results set the standard for quality, comfort, and precision. You'll feel the difference the first time you pick one up.

Outstanding Quality

The SoftGrip pipette, with its award-winning, innovative design,* is built to last just like our precision syringe products. SoftGrip manual pipettes are completely autoclavable for easy decontamination and sterilization.

Total Comfort

The soft, ergonomic shape and low plunger forces of the SoftGrip pipette reduce hand and wrist fatigue as compared to other pipettes. Using SoftGrip pipettes decrease the risk factors associated with pipette-related repetitive stress injuries such as carpal tunnel syndrome.

Guaranteed Accuracy and Precision

SoftGrip pipettes deliver superior accuracy and precision. Every pipette is calibrated at the factory with standards traceable to NIST and shipped with a Certificate of Calibration documenting the pipette's accuracy and precision. Accuracy is guaranteed with Hamilton AdvanTip™ Precision Pipette Tips.



Relaxed Grip

Ergonomically contoured handle with soft, non-slip surface fits perfectly in your hand to minimize fatigue.



Soft Plunger Action

Low-force, sloped plunger button lessens thumb extension and overuse.



Light, Balanced Feel

Curved hilt supports the pipette to provide finer control while pipetting.



Maintains Volume Setting

Isolated volume adjustment ring prevents accidental volume changes.



Enhanced Comfort

Separate tip ejector button with curved shape reduces hand motion.



One Stroke Tip Ejection

Lever-action ejector removes all tips on the first stroke and is easily re-set for left-handed operation.

Hamilton SoftGrip™ 2nd. Generation Pipettes **Tk**

SoftGrip Pipettes – Single Channel

- Wide Selection of Ergonomic Pipettes
- Completely Autoclavable
- Guaranteed Accuracy and Precision

SoftGrip pipettes routinely receive the highest user satisfaction score of 10 on 11 different aspects of a pipette, including plunger and eject forces, weight, diameter, and texture. Choose from six adjustable volume and ten fixed volume SoftGrip pipettes covering 0.2 µL to 1 mL. All pipettes have color-coded plunger buttons and labels for easy volume identification.

SoftGrip air-displacement pipettes are built from high quality, state-of-the-art materials designed to provide years of reliable service. All pipettes are completely autoclavable for easy decontamination and sterilization without the need for disassembly and recalibration.

The isolated volume ring prevents accidental volume changes. A magnified, easy-to-read micrometer ensures reproducible, accurate volume setting. Each pipette meets or exceeds industry standards for accuracy and precision when used with Hamilton AdvanTip Precision Pipette Tips.



SoftGrip Adjustable Volume Pipettes, 0.2 µL - 1 mL

Cat.No.	Volume	Increments (µL)	Color		At 10% of Pipette Volume Accuracy Precision		At 100% of Pipette Volume Accuracy Precision	
					within ±%	within +%	within ±%	within +%
HA-55019-30	0.2-2 µL	0.002	Aqua	●	8.00	4.00	1.20	0.60
HA-55019-32	1-10 µL	0.02	Purple	●	2.50	1.20	0.80	0.40
HA-55019-34	2.5-25 µL	0.02	Forest Green	●	4.50	1.50	0.80	0.20
HA-55019-36	10-100 µL	0.2	Violet	●	1.80	0.70	0.60	0.15
HA-55019-38	30-300 µL	0.2	Brick Red	●	1.20	0.40	0.40	0.15
HA-55019-40	100 µL-1 mL	2.0	Sky Blue	●	1.60	0.50	0.30	0.12

SoftGrip Fixed Volume Pipettes, 5 µL - 1 mL

Cat.No.	Volume	Color		At 100% of Pipette Volume Accuracy Precision	
				within ±%	within +%
HA-55019-01	5 µL	Steel Blue	●	1.40	0.75
HA-55019-03	10 µL	Purple	●	0.80	0.40
HA-55019-05	25 µL	Forest Green	●	0.80	0.30
HA-55019-07	50 µL	Sandstone	●	0.60	0.30
HA-55019-09	100 µL	Violet	●	0.50	0.20
HA-55019-11	200 µL	Mustard	●	0.40	0.18
HA-55019-13	250 µL	Burnt Orange	●	0.40	0.18
HA-55019-15	300 µL	Brick Red	●	0.40	0.18
HA-55019-17	500 µL	Olive Green	●	0.40	0.18
HA-55019-19	1 mL	Sky Blue	●	0.30	0.12

TK Hamilton SoftGrip™ 2nd. Generation Pipettes

Selecting the Right Hamilton AdvanTip Pipette Tip

Pipette Cat.No.	Pipette Volume	Hamilton Tip
HA-55019-30	0.2-2 µL	10 µL
HA-55019-32	1-10 µL	10 µL
HA-55019-34	2.5-25 µL	200 µL
HA-55019-36	10-100 µL	200 µL
HA-55019-38	30-300 µL	300 µL
HA-55019-40	100 µL-1 mL	1000 µL
HA-55019-03	5 µL	10 µL
HA-55019-05	10 µL	10 µL

Pipette Cat.No.	Pipette Volume	Hamilton Tip
HA-55019-07	25 µL	200 µL
HA-55019-09	50 µL	200 µL
HA-55019-11	100 µL	200 µL
HA-55019-13	200 µL	200 µL
HA-55019-15	250 µL	300 µL
HA-55019-17	300 µL	300 µL
HA-55019-19	500 µL	1000 µL
HA-55019-21	1 mL	1000 µL



SoftGrip Single Channel Pipette Carousel

Keeps pipettes safe and within easy reach. Constructed of heavy, solvent-resistant plastic.

Cat.No.	Description
HA-53578-01	Holds Six Single Channel Pipettes



Calibration Labels

Quickly record and view calibration data with labels placed on your pipettes.

Cat.No.	Description
HA-1987-01	Calibration Labels, 120/pk



Calibration Key

For simple calibration in the field, one key is provided with each SoftGrip pipette.

Cat.No.	Description
HA-34002	Calibration Key

Hamilton SoftGrip™ 2nd. Generation Pipettes **Tk**

SoftGrip Pipettes – Multi-Channel

- Easily Adjusts for Left-Hand Operation
- Completely Autoclavable
- Guaranteed Accuracy and Precision

Hamilton SoftGrip pipettes are available as 8-channel and 12-channel adjustable volume manual pipettes in two volume ranges covering 5 µL to 50 µL and 30 µL to 300 µL. The pipettes have color-coded plunger buttons and labels for quick volume identification.

The unique, long tip ejector lever and movable lower body can be rotated a full 360° relative to the handle to provide maximum comfort for left- or right-handed use.

Additionally, the easily activated tip ejector lever releases all the tips in single stroke.

Made of the finest materials, an entire SoftGrip multi-channel pipette can be autoclaved without the need for disassembly and recalibration.

Accuracy and precision is guaranteed when used with Hamilton AdvanTip Precision Pipette Tips.



SoftGrip Multi-Channel Pipettes, 8-Channel, 5 µL - 300 µL

Cat.No.	Volume	Increments (µL)	Color	At 10% of Pipette Volume Accuracy Precision		At 100% of Pipette Volume Accuracy Precision	
				within ±%	within +%	within ±%	within +%
HA-55019-50	5-50 µL x 8	0.02	Sandstone	2.00	2.00	0.80	0.35
HA-55019-52	30-300 µL x 8	0.02	Brick Red	1.20	0.70	0.50	0.30

SoftGrip Multi-Channel Pipettes, 12-Channel, 5 µL - 300 µL

Cat.No.	Volume	Increments (µL)	Color	At 10% of Pipette Volume Accuracy Precision		At 100% of Pipette Volume Accuracy Precision	
				within ±%	within +%	within ±%	within +%
HA-55019-54	5-50 µL x 12	0.02	Sandstone	5.00	2.00	1.00	0.50
HA-55019-56	30-300 µL x 12	0.2	Brick Red	2.40	1.20	1.00	0.50



SoftGrip Multi-Channel Pipette Stand

Keeps pipettes safe and within easy reach. Constructed of heavy, non-skid, metallic casting.

Cat.No.	Description
HA-34195	Holds One Multi-Channel Pipette

Selecting the Right Hamilton AdvanTip Pipette Tip

Pipette Cat.No.	Pipette Volume	Hamilton Tip
HA-55019-50	5-50 µL x 8	200 µL
HA-55019-52	30-300 µL x 8	300 µL
HA-55019-54	5-50 µL x 12	200 µL
HA-55019-56	30-300 µL x 12	300 µL

Calibration Labels

Quickly record and view calibration data with labels placed on your pipettes.

Cat.No.	Description
HA-1987-01	Calibration Labels, 120/pk



Calibration Key

For simple calibration in the field, one key is provided with each SoftGrip pipette.

Cat.No.	Description
HA-34002	Calibration Key



TK Universal AdvanTip™ LT and Precision Pipette Tips

AdvanTip LT Pipette Tips – Low Retention Tips



10 µL Pipette Tips

Volume Range: 0.2-10 µL • Recommended for 2, 5, and 10 µL pipettes.

Description	Low Retention	Standard	Total Tips
10 µL, Bulk, 1000 tips/bag	HA-23008-10		1000
10 µL, Bulk, Extended Length, 1000 tips/bag	HA-23005-14	HA-11005-14	1000
10 µL, Racked, 96 tips/rack	HA-23006-01	HA-11006-01	960
10 µL, Racked, Extended Length, 96 tips/rack	HA-23003-15	HA-11003-15	960
10 µL, Racked, Pre-Sterilized, 96 tips/rack	HA-23003-01	HA-11003-01	960
10 µL, Racked, Extended Length, Pre-Sterilized, 96 tips/rack	HA-23003-25	HA-11003-25	960
10 µL, Racked, Filter, Pre-Sterilized, 96 tips/rack	HA-23003-02	HA-11003-02	960
10 µL, Racked, Extended Length, Filter, Pre-Sterilized, 96 tips/rack	HA-23003-26	HA-11003-26	960
10 µL, Stacked Rack, 96 tips/rack, 5 racks/stack		HA-11003-11	480



100 µL Pipette Tips

Volume Range: 2-100 µL • Recommended for 20, 25, 50, and 100 µL pipettes.

Description	Low Retention	Standard	Total Tips
100 µL, Racked, Filter, Pre-Sterilized, 96 tips/rack	HA-23003-10		960



200 µL Pipette Tips

Volume Range: 2-200 µL • Recommended for 20, 25, 50, 100, and 200 µL pipettes • Also, can be used with 300 µL pipettes when pipetting volumes of 200 µL or less.

Description	Low Retention	Standard	Total Tips
200 µL, Bulk, 1000 tips/bag	HA-23008-20		1000
200 µL, Racked, 96 tips/rack	HA-23006-03	HA-11006-03	960
200 µL, Racked, Pre-Sterilized, 96 tips/rack	HA-23003-03	HA-11003-03	960
200 µL, Racked, Filter, Pre-Sterilized, 96 tips/rack*	HA-23003-04	HA-11003-04	960
200 µL, Stacked Rack, 96 tips/rack, 5 racks/stack		HA-11003-05	480

* Not for use with 100 µL Softouch Pipettes. See 100 µL tips.



300 µL Pipette Tips

Volume Range: 2-300 µL • Recommended for 250 and 300 µL pipettes.

Description	Low Retention	Standard	Total Tips
300 µL, Bulk, 1000 tips/bag	HA-23008-30		1000
300 µL, Racked, 96 tips/rack	HA-23006-06	HA-11006-06	960
300 µL, Racked, Pre-Sterilized, 96 tips/rack	HA-23003-06	HA-11003-06	960
300 µL, Racked, Filter, Pre-Sterilized, 96 tips/rack	HA-23003-07	HA-11003-07	960

Universal AdvanTip™ LT and Precision Pipette Tips Tk



1 mL Pipette Tips

Volume Range: 100-1000 µL • Recommended for 500 and 1000 µL pipettes.

Description	Low Retention	Standard	Total Tips
1000 µL, Bulk, 1000 tips/bag	HA-23008-40		1000
1000 µL, Racked, 100 tips/rack	HA-23006-08		1000
1000 µL, Racked, Pre-Sterilized, 100 tips/rack	HA-23003-08	HA-11003-08	1000
1000 µL, Racked, Filter, Pre-Sterilized, 100 tips/rack	HA-23003-09	HA-11003-09	1000

Macrovolume Pipette Tips



1200 µL Macrovolume Pipette Tips

Volume Range: 500-1200 µL • Recommended for 1200 µL SofTouch™ electronic pipettes.

Description	Low Retention	Standard	Total Tips
1200 µL, Racked, 96 tips/rack, 10 racks/box		HA-11009-18	960



5 mL Macrovolume Pipette Tips

Volume Range: 100-5000 µL • Recommended for 5 mL SofTouch electronic pipettes.

Description	Low Retention	Standard	Total Tips
5 mL, Bulk, 100 tips/bag		HA-11009-10	100
5 mL, Racked, 50 tips/rack, 10 racks/box 1		HA-1006-28	500



Design offers many advantages

- All electrodes are printed with an indelible serial number
- Individual test certificates with measured values
- Indelible marking means long-term readability
- Ergonomic electrode head
- Proven electrolyte sealing system
- High-quality seal between electrode head and cable (IP 68)
- Integrated, captive seal at the electrode plug head
- Blue interior buffer gives visual indication of contact with the pH diaphragm

Watering cap with screw lock

- Easy removal of the watering cap by means of the screw lock
- Secure sealing in the watering cap
- No spilling of electrolyte when removing the watering cap



LIQ-GLASS

HA-238000 Liq-Glass (without cable)

HA-238180 Liq-Glass BNC

HA-238185 Liq-Glass DIN

- Robust, combination pH electrode for daily laboratory use
- Universally applicable, even in strong acids as well as in normal laboratory use
- Ideally suited for acid/base titrations
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: 3 M KCl (refillable)
 Diaphragm: ceramic
 Temperature sensor: no

T: -10 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head, 1 m BNC or 1 m DIN



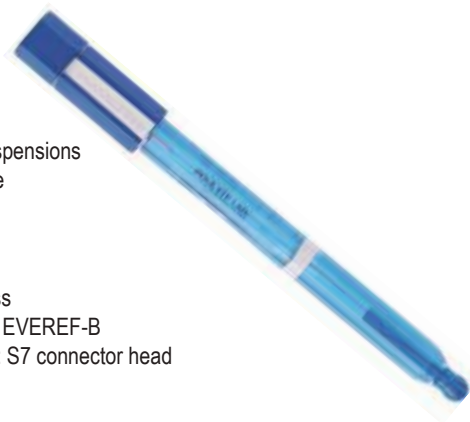
POLILYTE LAB

HA-238403 Polilyte Lab

- Maintenance-free, robust, combination pH electrode for easy use
- Universally applicable, especially suited for measurements in emulsions and suspensions
- Thanks to the SINGLE PORE clogging of the diaphragm is practically impossible
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: POLISOLVE (maintenance-free)
 Diaphragm: SINGLE PORE
 Temperature sensor: no

T: -10 to 80°C
 Shaft material: glass
 Reference system: EVEREF-B
 Sensor connection: S7 connector head



FLUSHTRODE

HA-238060 Flushtrode

- Easy-to-clean, combination glass electrode with sleeve diaphragm
- Ideally suited for viscous samples, ion-weak media, or media containing protein (e.g. cosmetics)
- For samples containing protein, the electrode should be filled with PROTELYTE (HA-238038)
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: 3 M KCl (refillable)
 Diaphragm: sleeve diaphragm
 Temperature sensor: no

T: -10 to 80°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



SLIMTRODE

HA-238150 Slimtrode

- pH electrode with 6 mm shaft diameter, for measurements in test tubes
- Universally applicable, even in strong acids as well as in normal laboratory use
- Long-term-stable EVEREF system
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: 3 M KCl (refillable)
 Diaphragm: ceramic
 Temperature sensor: no

T: 0 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



FILLTRODE

HA-242064 Filltrode

- Robust pH electrode with plastic shaft
- Multiple applications, thanks to its flat membrane: e.g. for viscous media
- Easy to clean
- The ring diaphragm prevents clogging
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: SKYLYTE-CL (refillable)
 Diaphragm: ring diaphragm
 Temperature sensor: no

T: 0 to 60°C
 Shaft material: plastic
 Reference system: EVEREF
 Sensor connection: S7 connector head



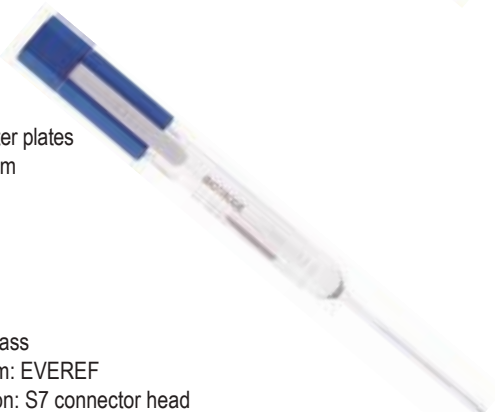
BIOTRODE

HA-238140 Biotrode

- Combination pH electrode for measurements in very small volumes, e.g. microtiter plates
- Ideally suited for solutions containing protein, prevents clogging of the diaphragm
- Long-term-stable EVEREF system
- Requires an immersion depth of only 7 mm
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: Protelyte (refillable)
 Diaphragm: ceramic
 Temperature sensor: no

T: 0 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



MINITRODE

HA-238100 Minitrode

- Combination pH electrode for measurements in very small volumes, e.g. vials
- Long-term-stable EVEREF system
- Requires an immersion depth of only 7 mm
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: 3 M KCl (refillable)
 Diaphragm: ceramic
 Temperature sensor: no

T: 0 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



FLATRODE

HA-238401 Flatrode

- pH electrode with super-flat membrane for measurements of surfaces, e.g. paper, agar plates
- Robust plastic shaft and ring diaphragm
- Ring diaphragm guarantees quick response time because of enhanced contact between sample and reference
- Long-term-stable EVEREF system
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: SKYLYTE-CL (refillable)
 Diaphragm: ring diaphragm
 Temperature sensor: no

T: 0 to 60°C
 Shaft material: Plastic
 Reference system: EVEREF
 Sensor connection: S7 connector head



FOODTRODE

HA-238285 Foodtrode

- Robust, combination pH electrode for measurements in media containing protein
- 3 ceramic diaphragms guarantee quick and accurate measurements
- Easy to clean
- Long-term-stable, thanks to EVEREF system
- Serial number, certificate

Specifications: pH: 0 – 14
 Electrolyte: PROTELYTE (refillable)
 Diaphragm: 3 x ceramic
 Temperature sensor: no

T: -10 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



DOUBLE PORE

HA-238400 Double Pore

- Maintenance-free, combination pH puncture electrode
- Especially for use with solid and semi-solid samples
- Ideally suited for measurements in meat and cheese
- SINGLE POREs makes blockage of the diaphragm practically impossible
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: POLISOLVE (maintenance-free)
 Diaphragm: 2 x SINGLE POREs
 Temperature sensor: no

T: 0 to 60°C
 Shaft material: glass
 Reference system: Ag/AgCl
 Sensor connection: S7 connector head



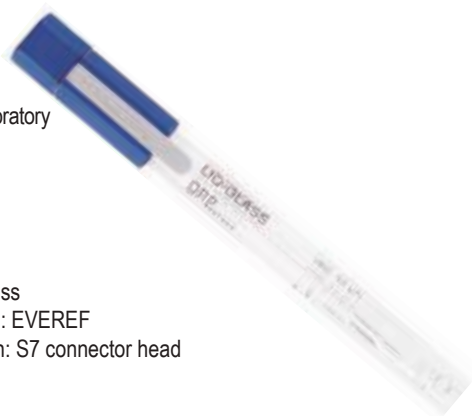
LIQ-GLASS ORP

HA-238145 Liq-Glass ORP

- Robust, combination Redox electrode for all usual Redox measurements in the laboratory
- Universally applicable, even in strong acids as well as in normal laboratory use
- Long-term-stable EVEREF system
- Serial number, certificate

Specifications: Redox: ± 000 mV
 Electrolyte: 3 M KCl (refillable)
 Diaphragm: 3 x ceramic
 Temperature sensor: no

T: -10 to 100°C
 Shaft material: glass
 Reference system: EVEREF
 Sensor connection: S7 connector head



POLYPLAST ORP

HA-238385 Polyplast ORP

HA-238384 Polyplast ORP BNC

- Robust, maintenance-free, combination Redox electrode
- Shatter-proof plastic shaft
- Especially for water and sewage
- Serial number, certificate

Specifications: Redox: ± 000 mV
 Electrolyte: POLISOLVE (maintenance-free)
 Diaphragm: SINGLE PORE
 Temperature sensor: no

T: 0 to 60°C
 Shaft material: Plastic
 Reference system: Ag/AgCl
 Sensor connection: S7 connector head or 1 m BNC



POLYPLAST

HA-238380 Polyplast

HA-238381 Polyplast BNC

- Robust, maintenance-free, combination pH electrode
- Shatter-proof plastic shaft
- Especially for water and sewage
- Serial number, certificate

Specifications: pH: 0 to 14
 Electrolyte: POLISOLVE (maintenance-free)
 Diaphragm: SINGLE PORE
 Temperature sensor: no

T: 0 to 60°C
 Shaft material: Plastic
 Reference system: Ag/AgCl
 Sensor connection: S7 connector head or 1 m BNC



DURACAL pH Buffers

Cat. Nbr.	pH Value	Accuracy	Stability (in months)	Certified by	Packaging unit
HA-238917	4.01	$\pm 0.01 / \pm 0.02$	24/60	DKD	3 X 500 mL
HA-238918	7.00	$\pm 0.01 / \pm 0.02$	24/60	DKD	3 X 500 mL
HA-238919	9.21	± 0.02	60	DKD	3 X 500 mL

Redox Buffers

Cat. Nbr.	Redox Value	Accuracy	Stability (in months)	Certified by	Packaging unit
HA-238228	271 mV	± 5 mV	24	None	500 mL
HA-238322	475 mV	± 5 mV	24	None	250 mL
HA-238227	475 mV	± 5 mV	24	None	500 mL

Tk HPLC Column Heaters



CIL heaters can accommodate any type of length of HPLC columns from any supplier.

Main features are:

- Functional and Compact**
 Can be used with any instrument and any column
 Remote control
 Rheodyne or Vici valves can be installed internally
 Mobile phase preheating (optional)
- Accurate**
 The opposite metal mesh beds guarantee uniform temperature spread as the metal acts as an ideal heat conductor while, at the same time, allowing air to circulate freely (patented).
 Electronic temperature regulation produces reproducible retention times (CV < 1%)
- Safe**
 Mobile phase leaks easily detectable (leak detector)



Standard Column Heaters

Cat. Nbr.	Model	Dimensions	T range	Stability	Accuracy	Applications
CI-100-025-220P	Croco-Cil Short	25x8x8 cm	RT-99°C	±0.1°C	±0.5°C	Short columns and guard columns
CI-100-040-220P	Croco-Cil Standard	40x8x8 cm	RT-99°C	±0.1°C	±0.5°C	Standard length columns and guard columns
CI-100-080-220P	Croco-Cil Double Length	80x8x8 cm	RT-99°C	±0.1°C	±0.5°C	Long columns
CI-100-040-220TW	Croco-Cil Triple Wide	40x24x8 cm	RT-99°C	±0.1°C	±0.5°C	GPC, 1" ID columns
CI-G3080	Gecko-2000	40x8x10.5 cm	30-80°C	±0.2°C	±1.0°C	Anal. Column and guard columns
CI-560PEL	560CIL (Peltier Effect)	40x10x10 cm	5-60°C	±0.5°C	±1.0°C	Anal. Column and guard columns
CI-99PEL	IglooCil (Peltier Effect)	41x16x11 cm	5-99°C	±0.5°C	±0.8°C	Anal. Column and guard columns

TK Sample Injection Rheodyne™ Valves

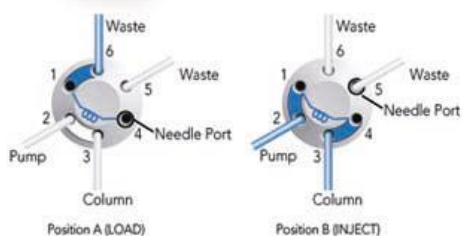
Complet range of HPLC sample injectors, from nanoscale to preparative applications.

Rheodyne Injecion Valves for Microscale Applications

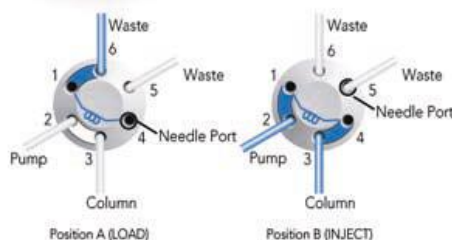
Model 8125

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

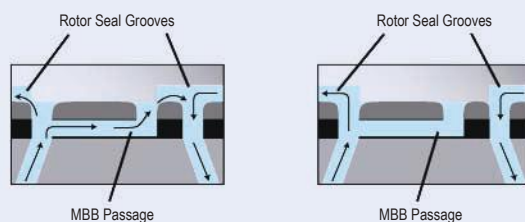
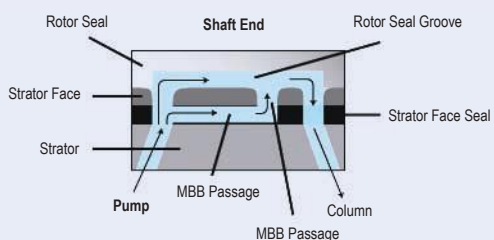


Cat.No	Description	Stator Material
RH-7725	Dual Mode Analytical Injector	Stainless Steel
RH-7725i	Dual Mode Analytical Injector with switch	Stainless Steel
RH-9725	Dual Mode Analytical Injector	PEEK
RH-9725i	Dual Mode Analytical Injector wiyh switch	PEEK



Patented Rheodyne MBB Design:

Flow paths of Model 7725 and 9725 with patented Rheodyne MBB design



Rheodyne Injecion 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.

Rheodyne Injection Valves for Preparative Applications

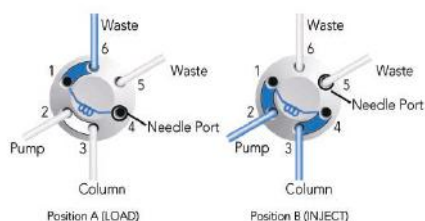
Models 3725-038, 3725i-038, 3725 and 3725i



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 using 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 threaded 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

TK 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

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



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



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Environmental

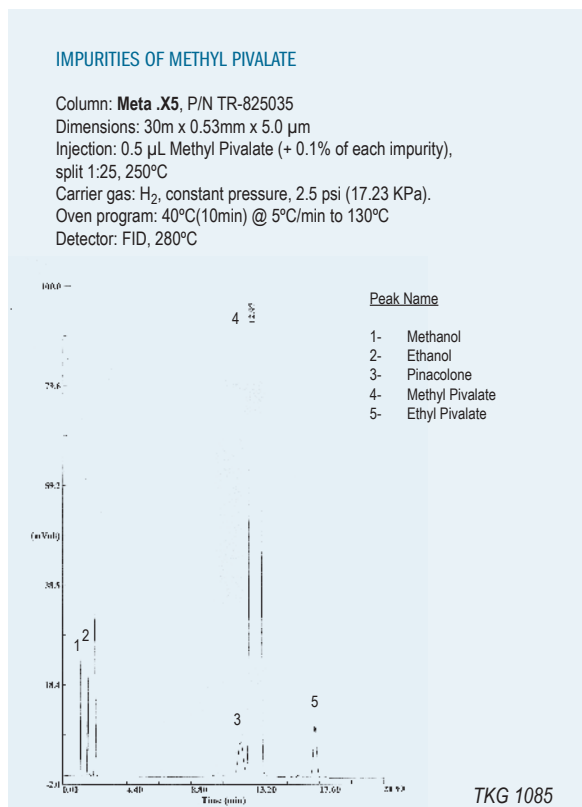
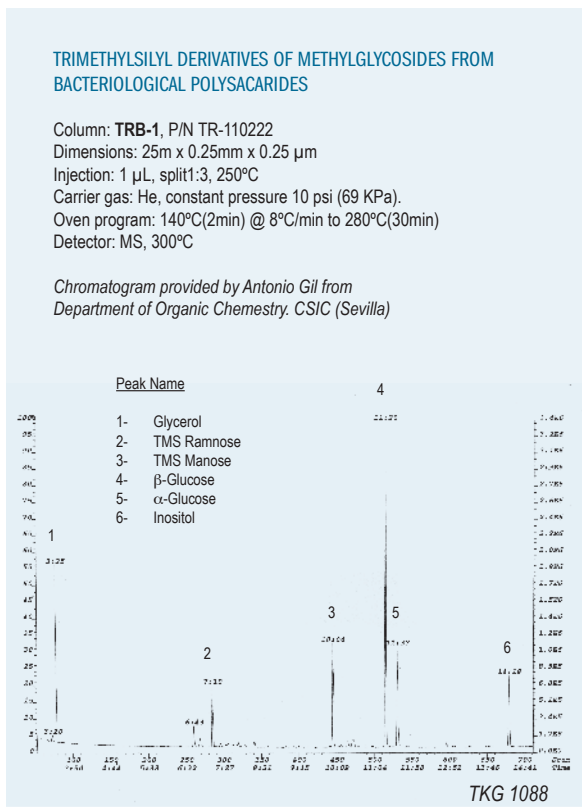
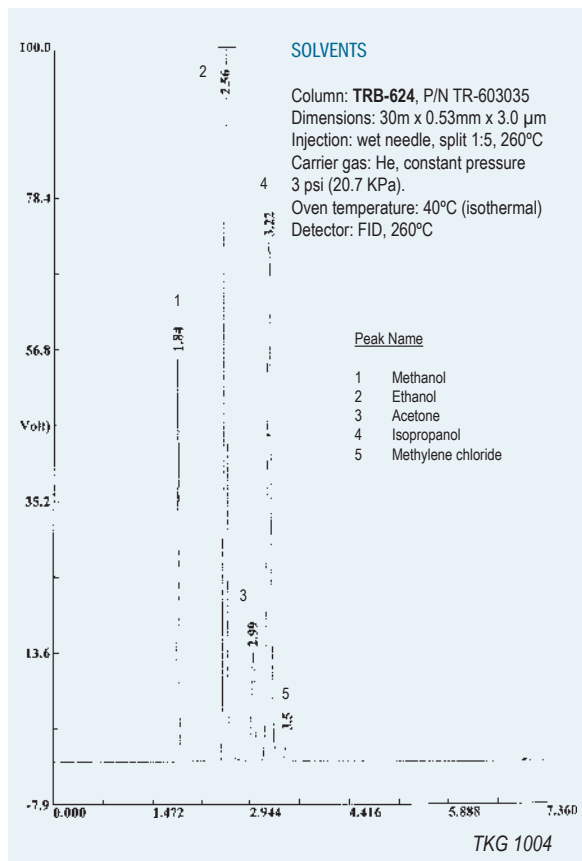
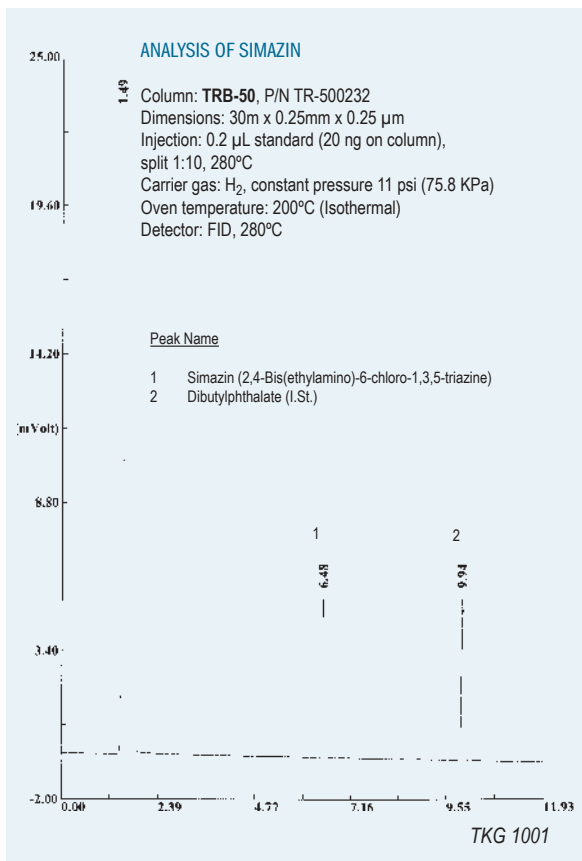
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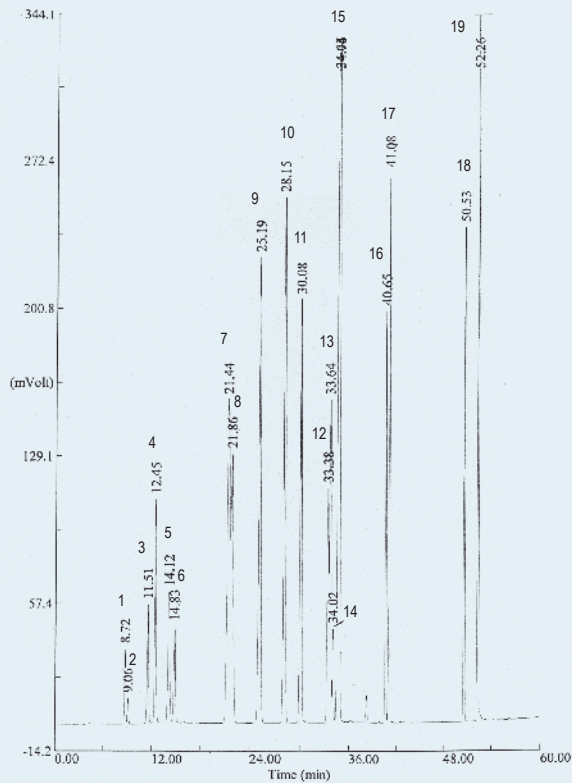


ANALYSIS OF SOLVENTS

Column: **TRB-WAX**, P/N TR-142065
 Dimensions: 60m x 0.53mm x 2.0 µm
 Injection: wet needle, split, 250°C
 Carrier gas: H₂, constant pressure 4 psi (27.6 KPa).
 Oven program: 55°C(20min) @ 3°C/min to 220°C(15min)
 Detector: FID, 260°C

Peak Name

- 1- Acetone
- 2- Methyl acetate
- 3- Ethyl acetate
- 4- Methanol + MEK
- 5- Isopropanol
- 6- Ethanol
- 7- MIKB
- 8- Methoxypropyl acetate
- 9- Isobutyl acetate
- 10- Toluene
- 11- Methoxypropanol
- 12- n-butyl acetate
- 13- Isobutanol
- 14- n-butanol
- 15- p,m-xylenes
- 16- o-xylene
- 17- Ethylglycol
- 18- Diacetone alcohol
- 19- Butyl glycol



TKG 1003

SEPARATION OF MONOMERS IN PAINTS

Column: **Meta WAX**, P/N TR-811035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 1 µL Monomers mixture (20ppm, 100ppm toluene in DMSO), split 1:50, 240°C
 Carrier gas: He, 4 psi (27.6 KPa)
 Oven temperature: 40°C(5min) @ 15°C/min to 180°C(15min)
 Detector: FID, 240°C

Peak Name

- 1- Methyl acrylate
- 2- Toluene
- 3- Butyl acrylate
- 4- Styrene



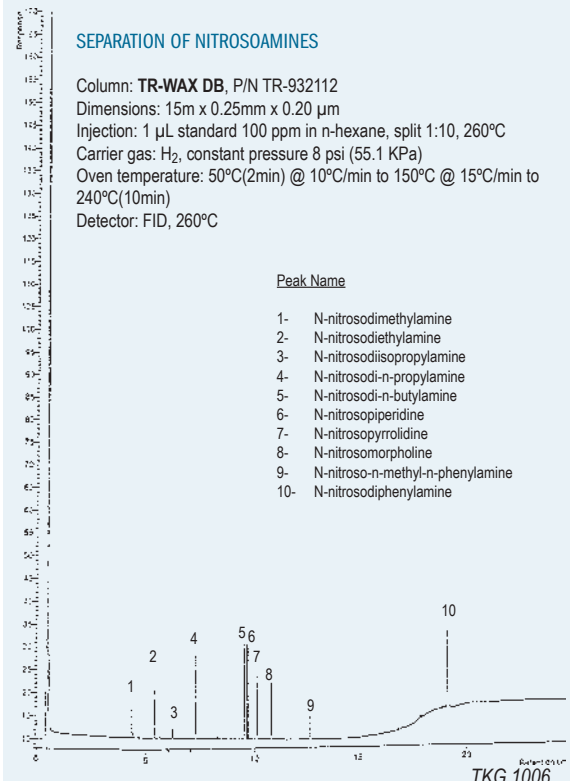
TKG 1005

SEPARATION OF NITROSOAMINES

Column: **TR-WAX DB**, P/N TR-932112
 Dimensions: 15m x 0.25mm x 0.20 µm
 Injection: 1 µL standard 100 ppm in n-hexane, split 1:10, 260°C
 Carrier gas: H₂, constant pressure 8 psi (55.1 KPa)
 Oven temperature: 50°C(2min) @ 10°C/min to 150°C @ 15°C/min to 240°C(10min)
 Detector: FID, 260°C

Peak Name

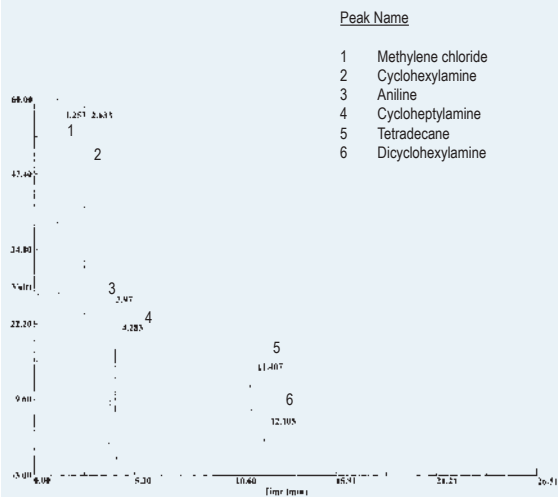
- 1- N-nitrosodimethylamine
- 2- N-nitrosodiethylamine
- 3- N-nitrosodiisopropylamine
- 4- N-nitrosodi-n-propylamine
- 5- N-nitrosodi-n-butylamine
- 6- N-nitrosopiperidine
- 7- N-nitrosopyrrolidine
- 8- N-nitrosomorpholine
- 9- N-nitroso-n-methyl-n-phenylamine
- 10- N-nitrosodiphenylamine



TKG 1006

SODIUM CYCLAMATE IMPURITIES

Column: **TRB-5A**, P/N TR-210533
 Dimensions: 30m x 0.32mm x 0.5 µm
 Injection: 1 µL (50-500 ppm), split 1:15, 280°C
 Carrier gas: He, constant pressure 17 psi (117.1 KPa)
 Oven program: 85°C (1 min) @ 8°C/min to 150°C (10min)
 @ 30°C/min to 220°C (5min)
 Detector: FID, 280°C

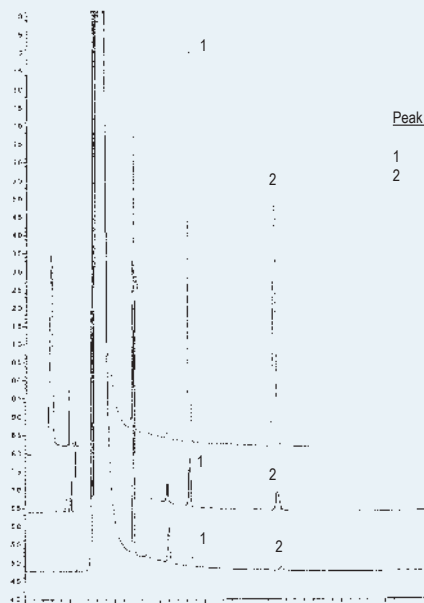


Peak Name	Retention Time (min)
1 Methylene chloride	1.261
2 Cyclohexylamine	2.331
3 Aniline	2.97
4 Cycloheptylamine	4.283
5 Tetradecane	11.407
6 Dicyclohexylamine	12.105

TKG 1007

PHENOL IN RESINS

Column: **TRB-624**, P/N TR-603035
 Dimensions: 30m x 0.53mm x 3.0 µm
 Injection: 1 µl (0,5,5 and 50ppm), split 1:5, 260°C
 Carrier gas: He, constant pressure 5 psi (34.5 KPa).
 Oven temperature: 150°C (isothermal)
 Detector: FID, 280°C

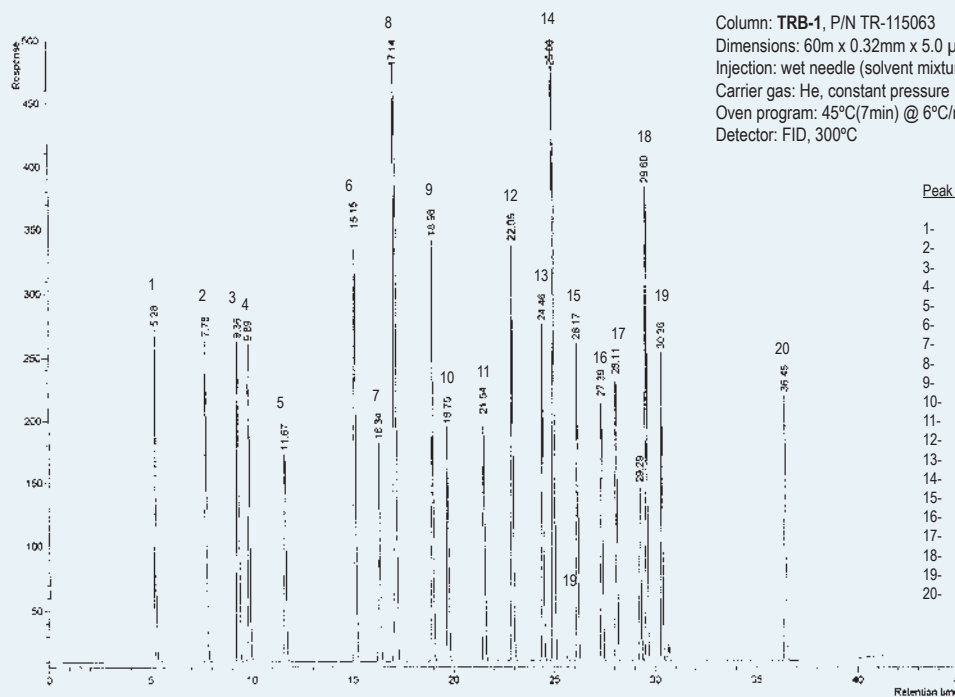


Peak Name	Retention Time (min)
1 Phenol	1.261
2 Anisol	2.331

TKG 1008

SEPARATION OF SOLVENTS

Column: **TRB-1**, P/N TR-115063
 Dimensions: 60m x 0.32mm x 5.0 µm
 Injection: wet needle (solvent mixture), split 1:100, 280°C
 Carrier gas: He, constant pressure 14 psi (96.5 KPa).
 Oven program: 45°C (7min) @ 6°C/min to 260°C (5min)
 Detector: FID, 300°C

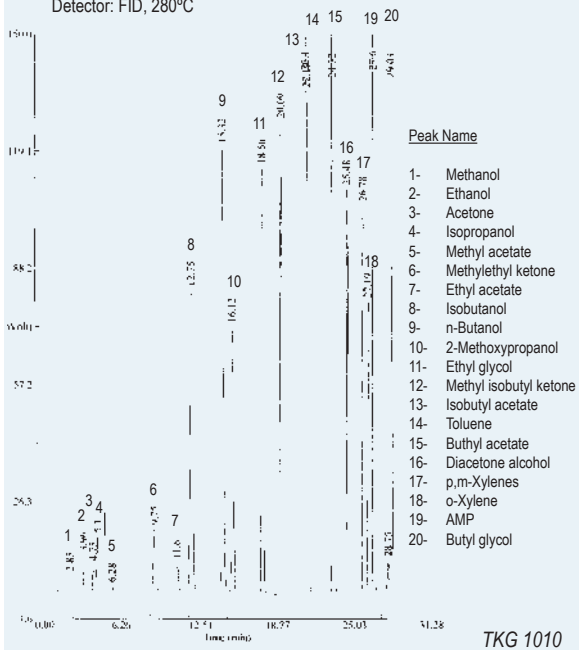


Peak Name	Retention Time (min)
1- Methanol	5.26
2- Ethanol	7.72
3- Acetone	8.35
4- Isopropanol	8.53
5- Methyl acetate	11.67
6- Methylene glycol	15.15
7- Ethyl acetate	16.36
8- n-Butanol	17.14
9- Isobutanol	18.96
10- 2-Methoxypropanol	19.75
11- Ethyleneglycol	21.54
12- Methyl isobutyl ketone	22.05
13- Isobutyl acetate	24.46
14- Toluene	24.69
15- Butyl acetate	26.17
16- Diketone alcohol	27.39
17- 2-Methoxypropanol acetate	28.11
18- Xylene	29.80
19- Butyl glycol	30.26
20- Butyl glycol acetate	36.45

TKG 1009

SEPARATION OF SOLVENTS

Column: **TRB-1**, P/N TR-115065
 Dimensions: 60m x 0.53mm x 5.0 µm
 Injection: 0,1 µl solvent mix, split, 250°C
 Carrier gas: H₂, constant pressure 6.5 psi (45 KPa).
 Oven program: 40°C (10min) @ 5°C/min to 200°C(15min)
 Detector: FID, 280°C

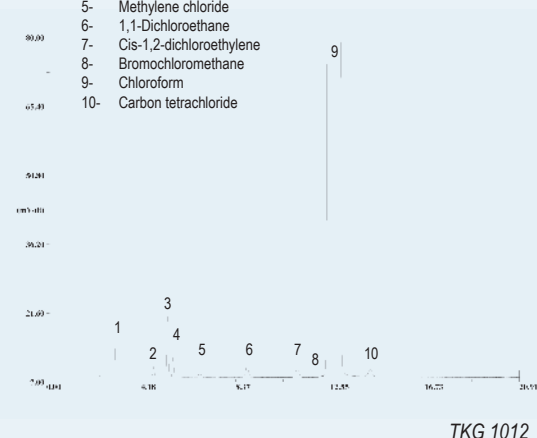


CHLOROFORM IMPURITIES

Column: **TRB-624**, P/N TR-603035
 Dimensions: 30m x 0.53mm x 3.0 µm
 Injection: 1 µl split 1:6, 260°C,
 Liner: single tape with wool
 Carrier Gas: He, 3psi (20.7 KPa), 21.9cm/s (40°C)
 Program temperature: 40°C
 Detector: FID, 200°C

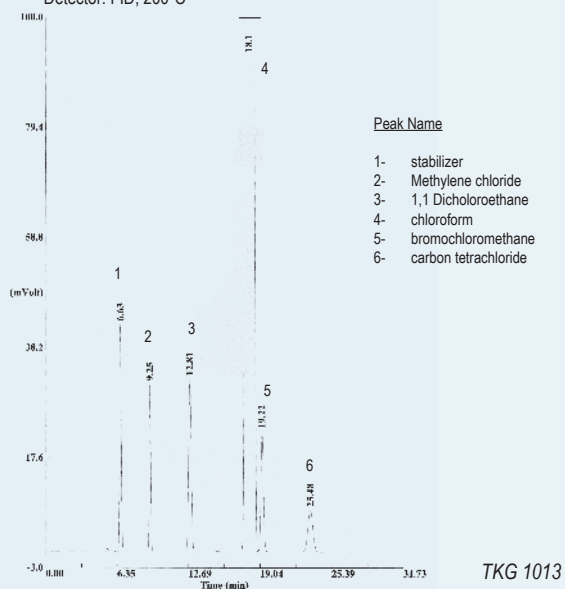
Peak Name

- 1- Methyl chloride
- 2- ?
- 3- Amylene
- 4- 1,1-Dichloroethylene
- 5- Methylene chloride
- 6- 1,1-Dichloroethane
- 7- Cis-1,2-dichloroethylene
- 8- Bromochloromethane
- 9- Chloroform
- 10- Carbon tetrachloride



CHLOROFORM IMPURITIES

Column: **Meta.VOC**, P/N TR-943035
 Dimensions: 30m x 0.53mm x 3.0 µm
 Injection: 1 µl chloroform, split, 5:1, 150°C
 Carrier gas: He, constant pressure 2 psi (13.8 KPa), 19.53 cm/s (30°C)
 Oven program: 30°C (isothermal)
 Detector: FID, 200°C



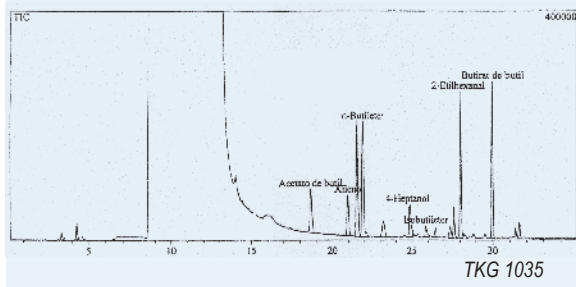
IMPURITIES OF n-BUTANOL

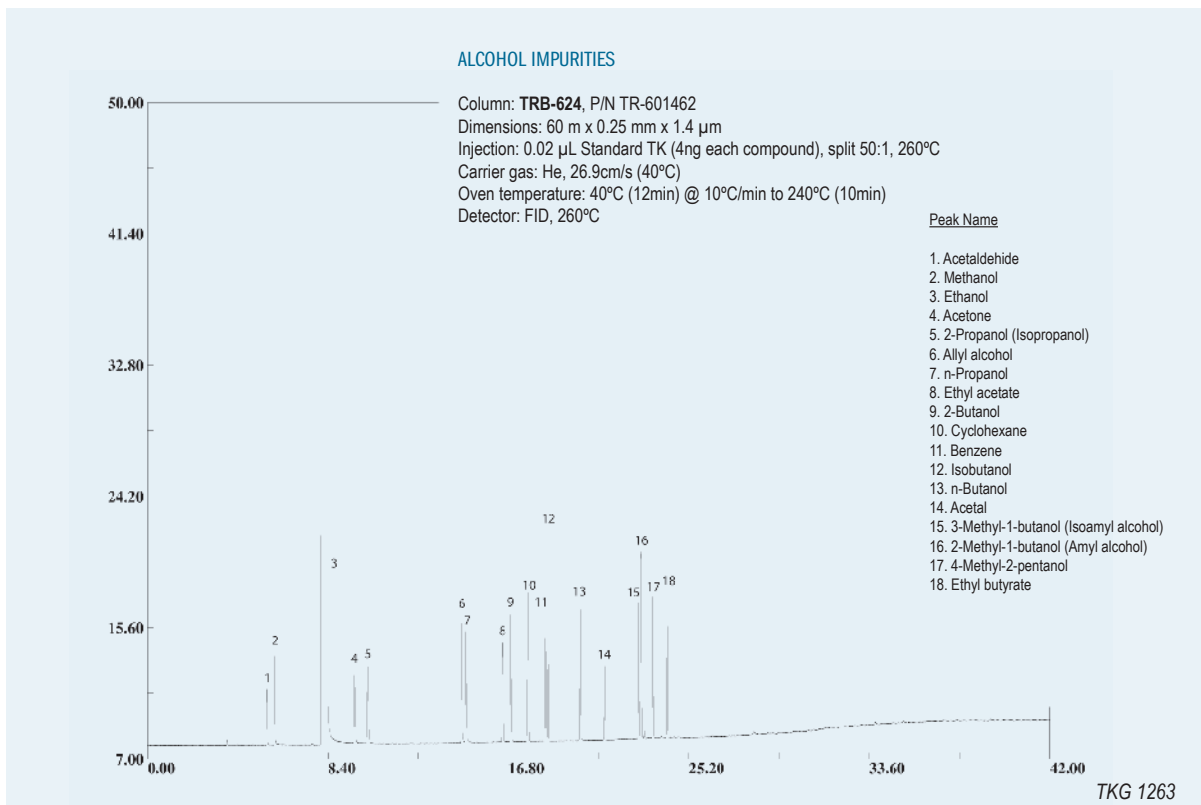
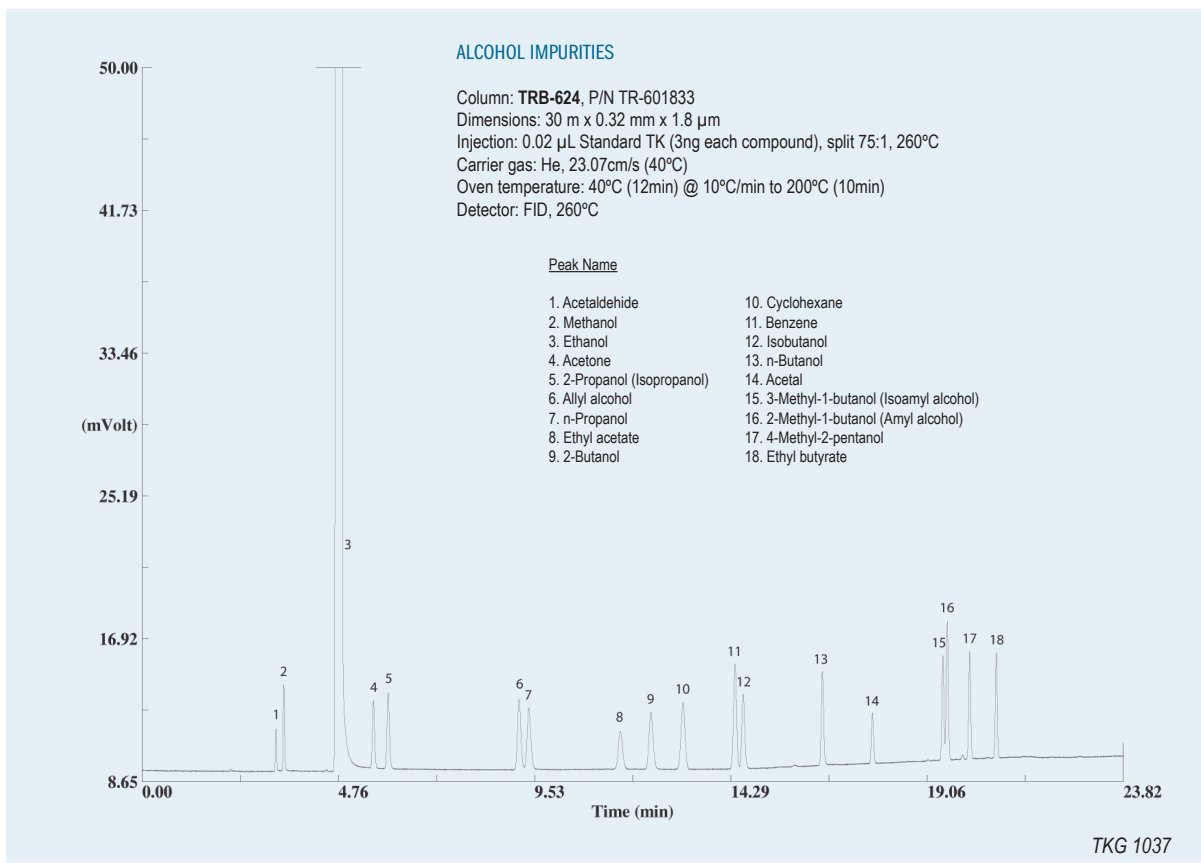
Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µl n-Butanol, split 1:20, 250°C
 Carrier gas: He, constant flow 1 mL/min
 Oven temperature: 40°C @ (5min) @ 4°C/min to 200°C
 @ 15°C/min to 300°C
 Detector: MS, 280°C (interphase)

Chromatogram provided by F. Sisteré from IUCT

Peak Name

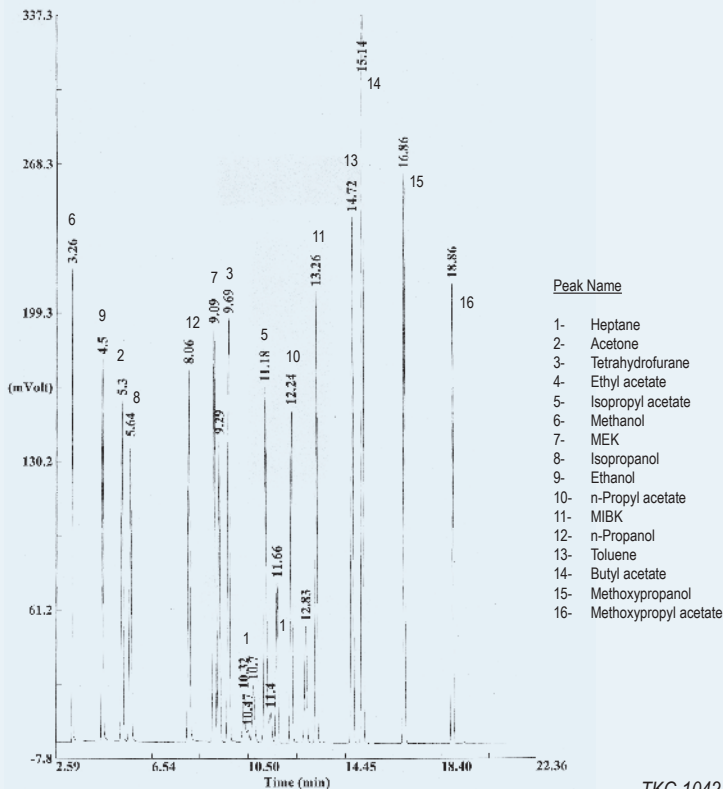
- 1- Butyl acetate
- 2- Xylene
- 3- n-Butylether
- 4- 4-Heptanol
- 5- Isobutylether
- 6- 2-Ethylhexanal
- 7- Butyl butyrate





SEPARATION OF SOLVENTS

Column: **TRB-624**, P/N TR-603075
 Dimensions: 75m x 0.53mm x 3.0 μ m
 Injection: 0.2 μ L, split 1:5, 260°C
 Carrier gas: H₂, constant pressure 7.8 psi (53.74 KPa).
 Oven temperature: 40°C(5min) @ 7°C/min to 240°C
 Detector: FID, 280°C



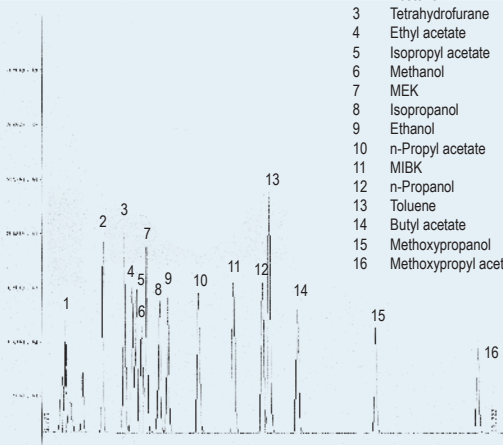
TKG 1042

SEPARATION OF SOLVENTS

Column: **TRB-WAX**, P/N TR-141253
 Dimensions: 50m x 0.32mm x 1.2 μ m
 Injection: 1 μ L standard (500 ng/mL comp.), split 1:25, 260°C
 Carrier gas: He, constant pressure 12 psi (82.7 Kpa)
 Oven temperature: 65°C(7min) @ 4°C/min to 117°C
 Detector: FID, 260°C

Chromatogram provided by
 Jaime Piedrabuena from Danisco

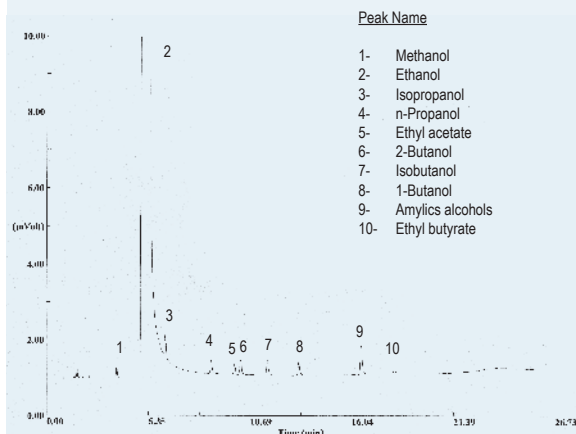
Peak Name
1 Heptane (isomers mixture)
2 Acetone
3 Tetrahydrofuran
4 Ethyl acetate
5 Isopropyl acetate
6 Methanol
7 MEK
8 Isopropanol
9 Ethanol
10 n-Propyl acetate
11 MIBK
12 n-Propanol
13 Toluene
14 Butyl acetate
15 Methoxypropanol
16 Methoxypropyl acetate



TKG 1052

IMPURITIES OF ETHANOL

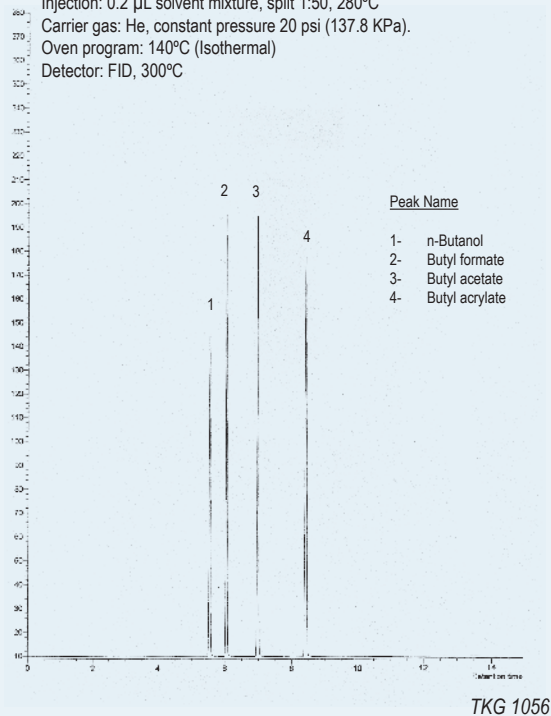
Column: **TRB-G43**, P/N TR-163035
 Dimensions: 30m x 0.53mm x 3.0 μ m
 Injection: 1 μ L standard alcohols (20 ppm/comp), split 1:5, 200°C
 Carrier gas: He, constant pressure 2.6 psi (17.9 KPa).
 Oven temperature: 42°C(4min) @ 5°C/min to 140°C(4min)
 Detector: FID, 200°C



TKG 1054

SEPARATION IMPURITIES OF BUTYL ACRYLATE

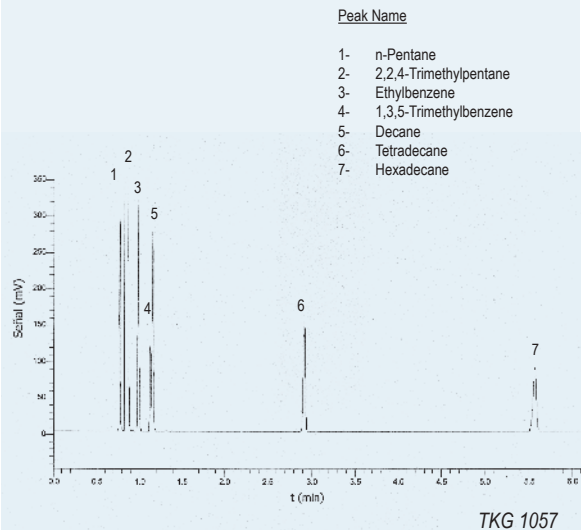
Column: **TRB-1**, P/N TR-111052
 Dimensions: 50m x 0.25mm x 1.0 μ m
 Injection: 0.2 μ L solvent mixture, split 1:50, 280°C
 Carrier gas: He, constant pressure 20 psi (137.8 kPa).
 Oven program: 140°C (Isothermal)
 Detector: FID, 300°C



SEPARATION OF HYDROCARBONS (FAST CHROMATOGRAPHY)

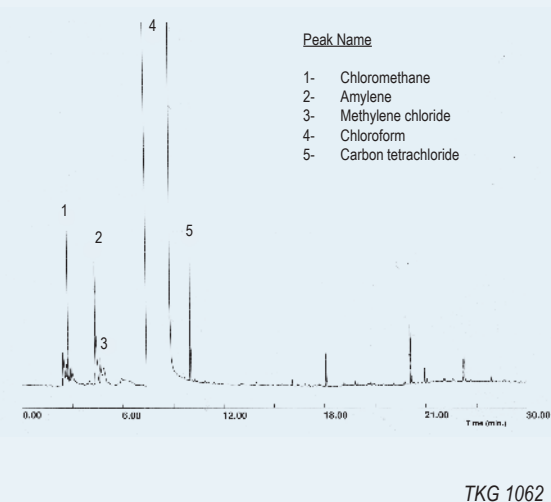
Column: **TRB-1**, P/N TR-110441
 Dimensions: 10m x 0.10mm x 0.40 μ m
 Injection: 0.5 μ L standard Hydrocarbons
 (0.95%/comp. in 2,2,4-Trimethylpentane), split 1:200, 200°C
 Carrier gas: He, constant pressure 40 psi (275.6kPa).
 Oven temperature: 190°C (Isothermal)
 Detector: FID, 200°C

Chromatogram provided by J.I. Gómez Cívicos, M^aA. Uguina Zamorano and J.L. Sotelo Sancho from Universidad Complutense de Madrid



CHLOROFORM PURITY

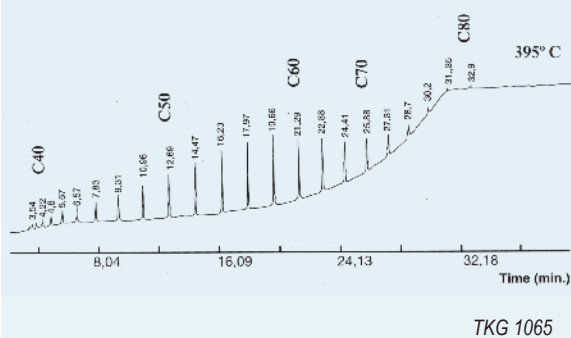
Column: **TRB-5**, P/N TR-121063
 Dimensions: 60m x 0.32mm x 1.0 μ m
 Injection: 250°C, 2 μ L (split 20:1)
 Carrier gas: H₂, 11 psi (75.8 kPa).
 Oven temperature: 40°C (8 min) to 200°C(5min) @ 10°C/min
 Detector: FID, 250°C



POLYWAX 655

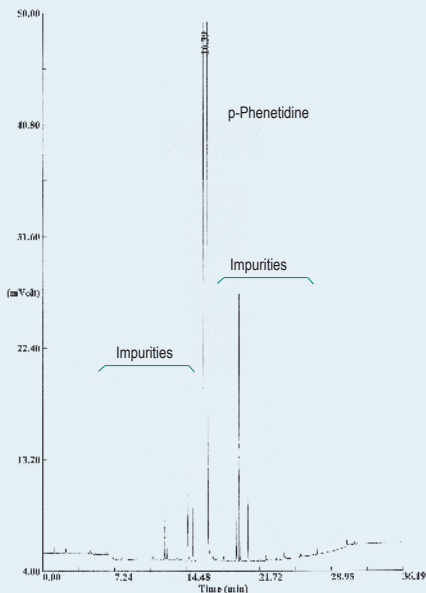
Column: **TRB-5ht**, P/N TR-620112
 Dimensions: 15m x 0.32mm x 0.1 μ m
 Injection: 0, 2 μ L (split) 2% Polywax 655 in Carbon sulfide
 Oven program: 70°C to 250°C @ 70°C/min. to 395°C(10min)
 @ 5°C/min.
 Detector: FID, 410°C

(base line without compensation)



IMPURITIES OF p-PHENETIDINE

Column: **TRB-5A**, P/N TR-210532
 Dimensions: 30m x 0.32mm x 0.50 μ m
 Injection: p-Phenetidine wet needle, split 1:50, 260°C
 Carrier gas: H₂, 11 psi (69 kPa)
 Oven temperature: 80°C(5min) @ 7°C/min to 260°C (6min)
 Detector: FID, 300°C

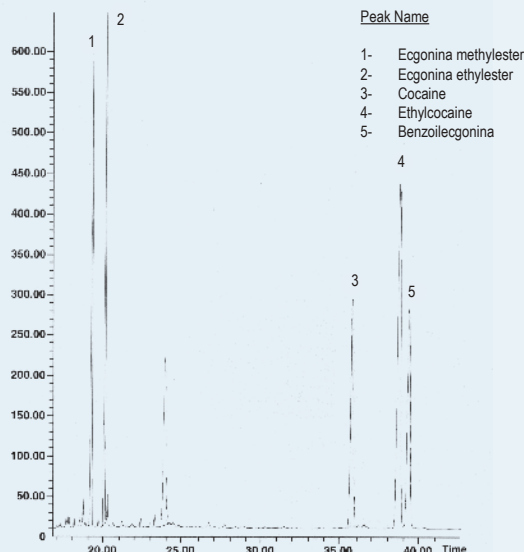


TKG 1090

DRUGS IN URINE

Column: **TRB-5ms**, P/N TR-520129
 Dimensions: 25m x 0.20mm x 0.11 μ m
 Injection: 250°C, 1 μ l splitless (BSTFA Derivatives in ACN)
 Carrier gas: He, 15 psi (103.3 kPa)
 Oven temperature: 60°C (1') @ 10°C/min. to 220°C @ 10°C/min.
 Detector: FID, 280°C

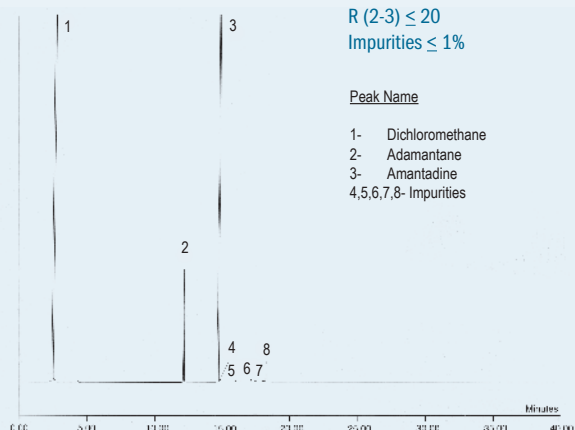
Chromatogram provided by Jordi To, Hospital Clinico from Barcelona.



TKG 1067

AMANTADINE HYDROCHLORIDE IMPURITIES

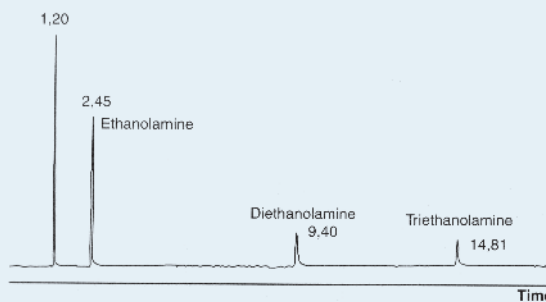
Column: **TRB-5 AMINE**, P/N TR-211035
 Dimensions: 30m x 0.53mm x 1.0m
 Injection: 2 μ l (split 1:50), 220°C
 Carrier gas: He, 4.2 psi (28.9 kPa)
 Oven temperature: 70°C (5') to 250°C (20min) @ 10°C/min.
 Detector: FID, 300°C
 Sample: Test solution according to USP 25



TKG 1074

ETHANOLAMINES SEPARATION (25 ng/peak level)

Column: **TRB-5 AMINE**, P/N TR-210533
 Dimensions: 30m x 0.32mm x 0.50 μ m
 Injection: 2 μ l (split 1:50), 280°C
 Carrier gas: H₂, 7 psi (48.2 kPa)
 Oven temperature: 50°C (2') to 200°C @ 10°C/min.
 Detector: FID, 300°C
 Sample: Ethanolamines solution in methanol (1,25 mg/ml)

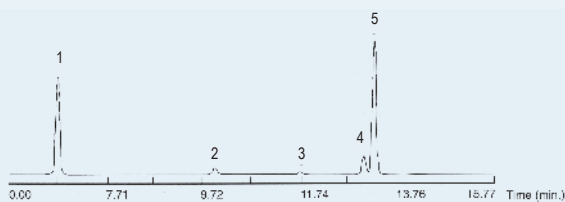


TKG 1075

USP SOLVENTS <USP> COLUMN TRB-G27+GUARDCOLUMN 5M

Column: **TRB-G27**, P/N-175035
 Dimensions: 30m x 0.53mm x 5.0 µm
 Oven temp.: 35°C(5') to 175°C@ 8°C/min. to 260°C (16')@35°C/min.
 Carrier gas: He, 4.5 psi (31 KPa), 35 cms. to 35°C
 Injector temp: 70°C
 FID temp: 260°C
 Injection: Direct injection of 1 µl (Unilliner), standard disolution in distilled water (1:10)

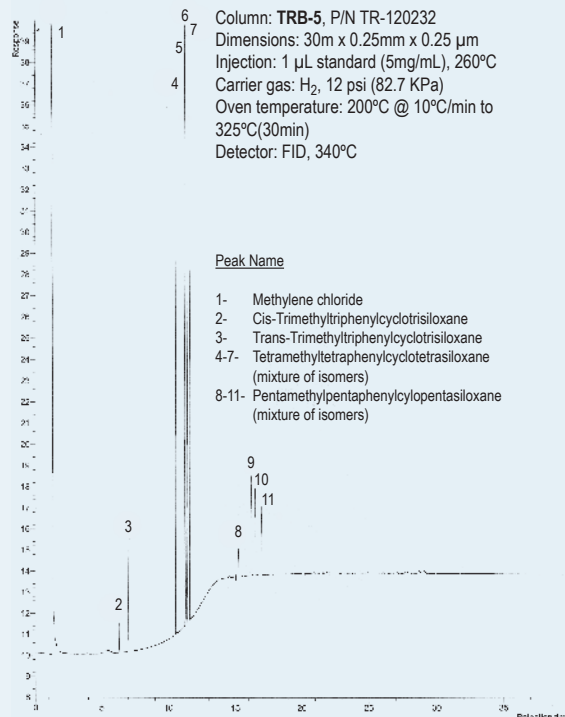
Standard	Concentration
1- Methylene chloride	600ppm
2- Chloroform	60ppm
3- Benzene	2ppm
4- Trichloroethylene	80ppm
5- 1,4 - Dioxan	380ppm



TKG 1076

ANALYSIS OF CYCLOSILOXANES

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (5mg/mL), 260°C
 Carrier gas: H₂, 12 psi (82.7 KPa)
 Oven temperature: 200°C @ 10°C/min to 325°C(30min)
 Detector: FID, 340°C

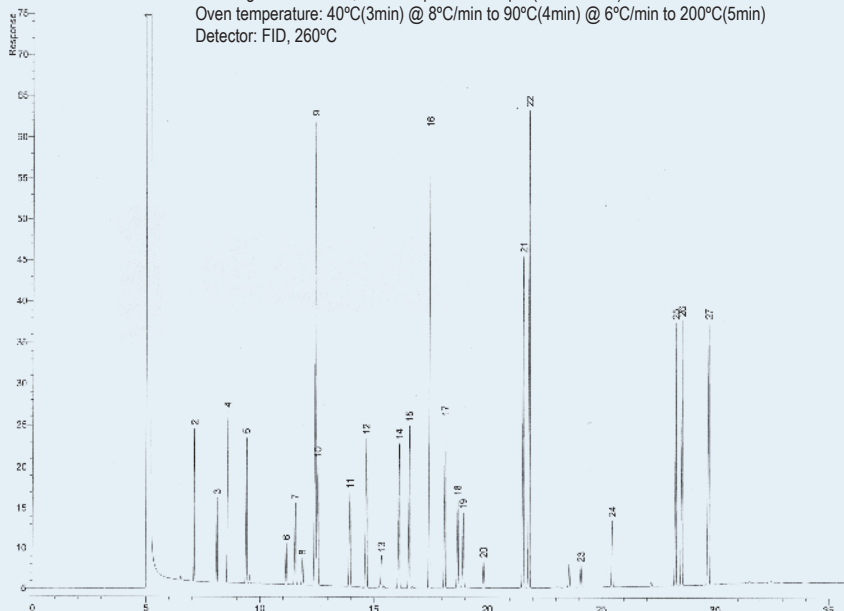


Peak Name
1- Methylene chloride
2- Cis-Trimethyltriphenylcyclotrisiloxane
3- Trans-Trimethyltriphenylcyclotrisiloxane
4-7- Tetramethyltetraphenylcyclotetrasiloxane (mixture of isomers)
8-11- Pentamethylpentaphenylcyclopentasiloxane (mixture of isomers)

TKG 1094

EPA 601/602 PURGEABLE HALOCARBONS MIX PLUS 2-CHLOROETHYL VINYL ETHER

Column: **TRB-624**, P/N TR-601462
 Dimensions: 60m x 0.25mm x 1.4 µm
 Injection: 0.5 µL EPA 601/602 Purgeable Halocarbons Mix (2000 ng/mL), split 1:50, 260°C
 Carrier gas: He 30cm/s, constant pressure 35 psi (241.15 KPa)
 Oven temperature: 40°C(3min) @ 8°C/min to 90°C(4min) @ 6°C/min to 200°C(5min)
 Detector: FID, 260°C



Peak Name
1- Methanol
2- 1,1-Dichloroethylene
3- Methylene chloride
4- trans-1,2-Dichloroethylene
5- 1,1-Dichloroethane
6- Chloroform
7- 1,1,1-Trichloroethane
8- Carbon Tetrachloride
9- Benzene
10- 1,2-Dichloroethane
11- Trichloroethylene
12- 1,2-Dichloropropane
13- Bromodichloromethane
14- 2-Chloroethyl vinyl ether
15- cis-1,3-Dichloropropene
16- Toluene
17- trans-1,3-Dichloropropene
18- 1,1,2-Trichloroethane
19- Tetrachloroethylene
20- Dibromochloromethane
21- Chlorobenzene
22- Ethylbenzene
23- Bromoform
24- 1,1,2,2-Tetrachloroethane
25- 1,3-Dichlorobenzene
26- 1,4-Dichlorobenzene
27- 1,2-Dichlorobenzene

TKG 1093

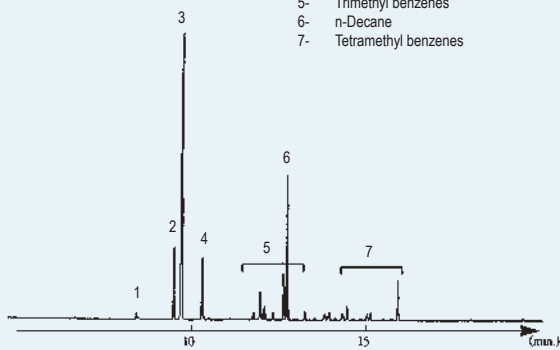
SOLVENTS IN WATER

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 m
 Injection: 1 µL, split
 Carrier gas: He
 Oven temperature:
 Detector: FID

Chromatogram provided by J. Teixidor and E. Bosch from
 Laboratory Dr. Riera

Peak Name

- 1- Butyl acetate
- 2- Ethyl benzene
- 3- m,p-Xylene
- 4- o-Xylene
- 5- Trimethyl benzenes
- 6- n-Decane
- 7- Tetramethyl benzenes



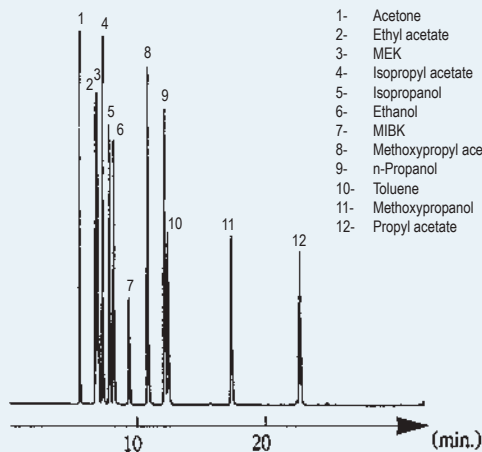
TKG 1160

INDUSTRIAL SOLVENTS

Column: **TR-WAX**, P/N TR-141253
 Dimensions: 50m x 0.32mm x 1.2 µm
 Injection: 0.1 µL, split
 Carrier gas: H₂, 16 psi (110.24 KPa)
 Oven temperature: 60°C @ 2°C/min to 125°C
 Detector: FID, 250°C

Peak Name

- 1- Acetone
- 2- Ethyl acetate
- 3- MEK
- 4- Isopropyl acetate
- 5- Isopropanol
- 6- Ethanol
- 7- MIBK
- 8- Methoxypropyl acetate
- 9- n-Propanol
- 10- Toluene
- 11- Methoxypropanol
- 12- Propyl acetate



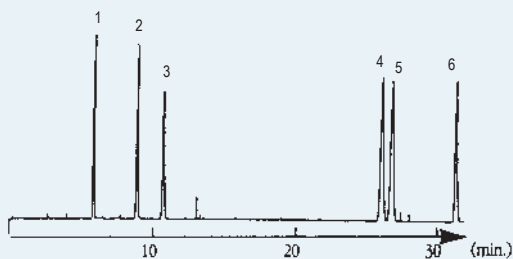
TKG 1161

INDUSTRIAL SOLVENTS

Column: **TR-WAX**, P/N TR-141233
 Dimensions: 30m x 0.32mm x 1.2 µm
 Injection: 0.1 µL, split
 Carrier gas: He, 12 psi (82.7 KPa)
 Oven temperature: 40°C @ 1°C/min to 70°C @ 7.5°C/min to 125°C
 Detector: FID, 250°C

Peak Name

- 1- Acetone
- 2- Methanol
- 3- Ethanol
- 4- p-Xylene
- 5- m-Xylene
- 6- o-Xylene



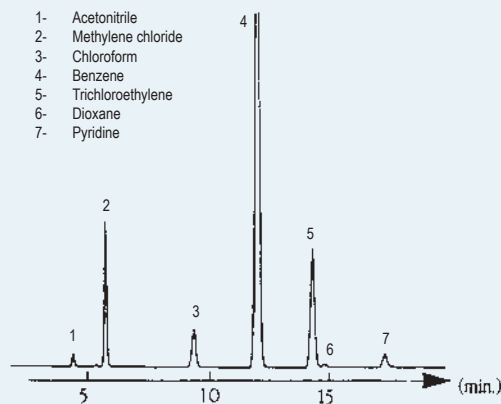
TKG 1162

INDUSTRIAL SOLVENTS IN RAW MATERIALS

Column: **TRB-5**, P/N TR-125035
 Dimensions: 30m x 0.53mm x 5.0 µm
 Injection: 1 µL, head space
 Carrier gas: N₂, 5 mL/min
 Oven temperature: 40°C(5min) @ 3°C/min to 110°C
 Detector: FID

Peak Name

- 1- Acetonitrile
- 2- Methylene chloride
- 3- Chloroform
- 4- Benzene
- 5- Trichloroethylene
- 6- Dioxane
- 7- Pyridine

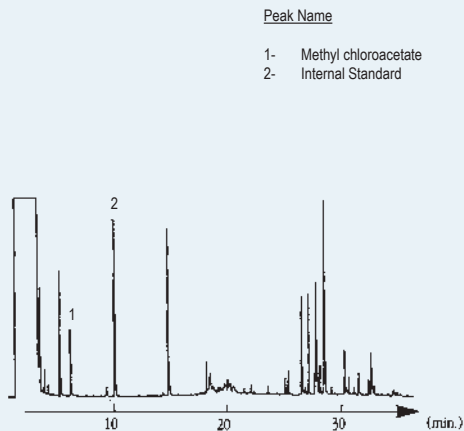


TKG 1163

IMPURITIES IN RAW MATERIALS Analysis of Monochloroacetic acid

Column: **TRB-5**, P/N TR-120233
 Dimensions: 30m x 0.32mm x 0.25 μ m
 Injection: splitless 1 min, 260°C
 Carrier gas: He, 8 psi
 Oven temperature: 30°C(12min) @ 10°C/min to 250°C
 Detector: FID, 260°C

Chromatogram provided by A. Tintó from MOEHS, S.A., Barcelona.

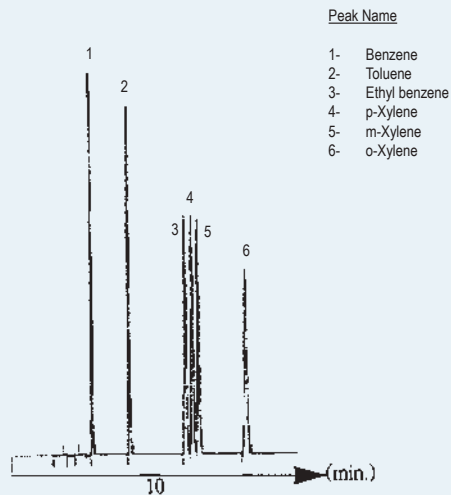


TKG 1164

AROMATIC SOLVENTS

Column: **TRB-WAX**, P/N TR-141233
 Dimensions: 30m x 0.32mm x 1.2 μ m
 Injection: split
 Carrier gas: He, 10 psi (68.9 KPa)
 Oven temperature: 80°C (Isothermal)
 Detector: FID, 250°C

Chromatogram provided by E. Cura from SGS, S.A., Barcelona.

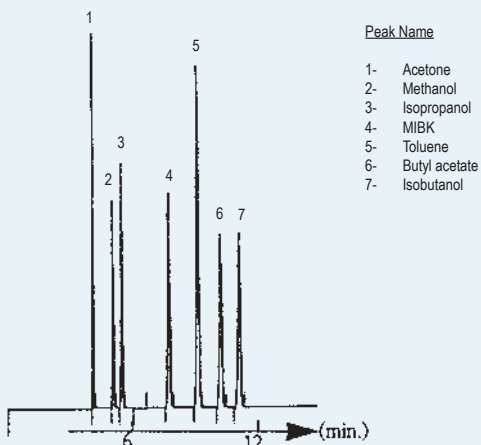


TKG 1165

MIXTURE OF SOLVENTS

Column: **TRB-WAX**, P/N TR-141233
 Dimensions: 30m x 0.32mm x 1.2 μ m
 Injection: split
 Carrier gas: He, 10 psi (68.9 KPa)
 Oven temperature: 75°C (Isothermal)
 Detector: FID, 250°C

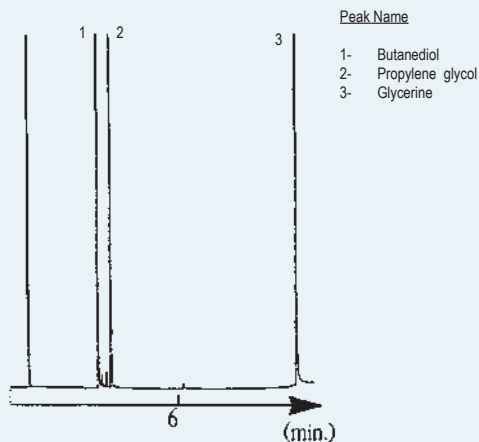
Chromatogram provided by E. Cura from SGS, S.A., Barcelona.



TKG 1166

GLYCOLS IN WATER

Column: **TRB-FFAP**, P/N TR-150535
 Dimensions: 30m x 0.53mm x 0.5 μ m
 Injection: 1 μ L, split
 Carrier gas: H₂, 2 psi (13.8 KPa)
 Oven temperature: 100°C @ 10°C/min to 220°C
 Detector: FID

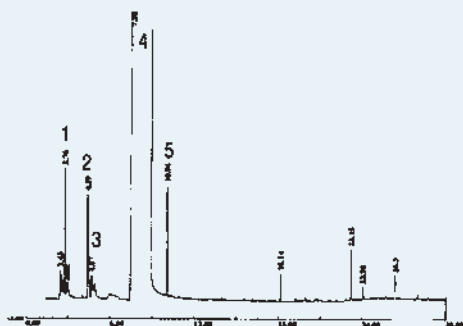


TKG 1167

PURITY OF CHLOROFORM

Column: **TRB-5**, P/N TR-121063
 Dimensions: 60m x 0.32mm x 1.0 µm
 Injection: 2 µL, split, 260°C
 Carrier gas: H₂, 11 psi (75.8 KPa)
 Oven temperature: 40°C(8min) @ 10°C/min to 200°C(5min)
 Detector: FID, 260°C

- | Peak Name |
|-------------------------|
| 1- Methyl chloroform |
| 2- Amylene |
| 3- Methylene chloride |
| 4- Chloroform |
| 5- Carbon tetrachloride |

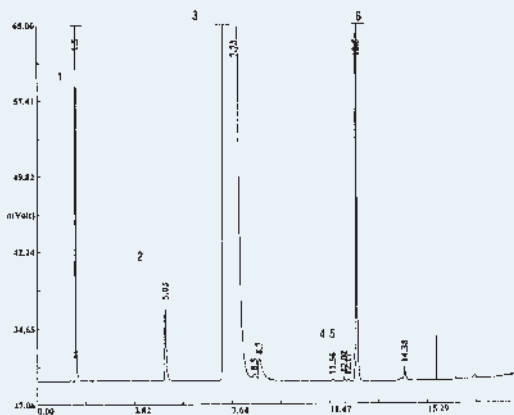


TKG 1168

IMPURITIES OF DIMETHYLACETAMIDE

Column: **TRB-WAX**, P/N TR-140232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 0.3 µL, split, 260°C
 Carrier gas: H₂, 11 psi (78.8 KPa)
 Oven temperature: 75°C(7min) @ 10°C/min to 200°C
 Detector: FID, 280°C

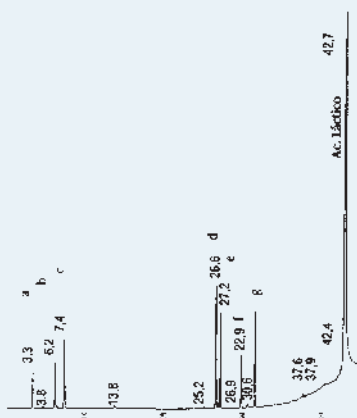
- | Peak Name |
|-------------------------|
| 1- Methanol |
| 2- Dimethylformamide |
| 3- Dimethylacetamide |
| 4- Propylene glycol |
| 5- Ethylene glycol |
| 6- Monomethyl acetamide |



TKG 1169

IMPURITIES OF LACTIC ACID

Column: **TRB-FFAP**, P/N TR-151035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 0.5 µL, split, 260°C
 Carrier gas: H₂, 3 psi (20.7 KPa)
 Oven temperature: 45°C(15min) @ 8°C/min to 240°C(15min)
 Detector: FID, 280°C

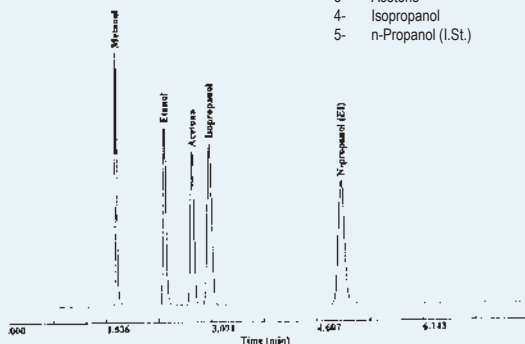


TKG 1170

ALCOHOLS IN BLOOD

Column: **TRB-G43**, P/N TR-163035
 Dimensions: 30m x 0.53mm x 3.0 µm
 Injection: 1 µL, split, alcohols standard
 Carrier gas: H₂, 4 psi (27.6 KPa)
 Oven temperature: 35°C (isothermal)
 Detector: FID, 250°C

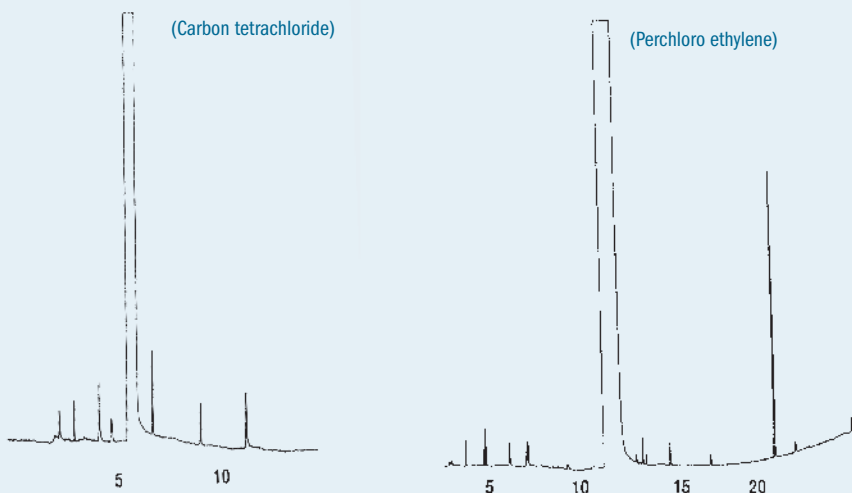
- | Peak Name |
|-----------------------|
| 1- Methanol |
| 2- Ethanol |
| 3- Acetone |
| 4- Isopropanol |
| 5- n-Propanol (I.St.) |



TKG 1172

IMPURITIES IN SOLVENTS

Column: **TRB-1**, P/N TR-110352
 Dimensions: 50m x 0.25mm x 0.33 μm
 Injection: 1 μL, split, neat solvent
 Carrier gas: H₂, 19 psi (130.9 KPa)
 Oven temperature: 35°C(5min) @ 6°C/min to 150°C(5min)
 Detector: FID, 275°C



TKG 1171

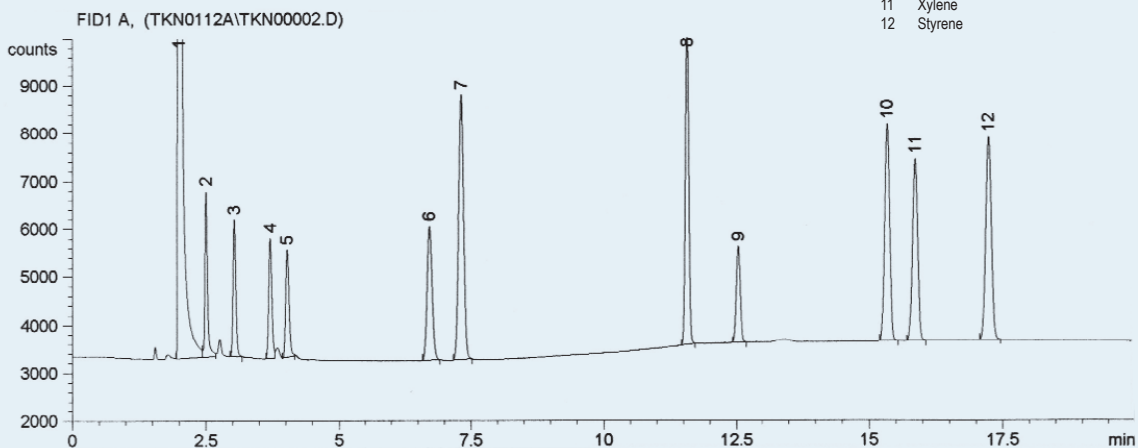
POLLUTANTS IN BLOOD

Column: **MetaBLOOD 1**, P/N TR-853035
 Dimensions: 30m x 0.53mm x 3.0μm
 Injection: 1 mL Head Space 2t (vial 70°C), alcohols and aromatics in blood (2-20 ppm), split 1:30, 225°C
 Carrier gas: He, 5 psi
 Oven temperature: 45°C(7 min) @ 10°C/min to 90°C(10min)
 Detector: FID, 300°C

Chromatogram provided by Dra. Guadalupe Montoya and Dra. Isabel Bonaparte de General Lab (Barcelona)

Peak Name

- 1 Methanol
- 2 Ethanol
- 3 Isopropanol
- 4 Acetone
- 5 n-Propanol
- 6 Methyl ethyl ketone (MEK)
- 7 Benzene
- 8 Toluene
- 9 Methyl isobutyl ketone (MIBK)
- 10 Ethylbenzene
- 11 Xylene
- 12 Styrene

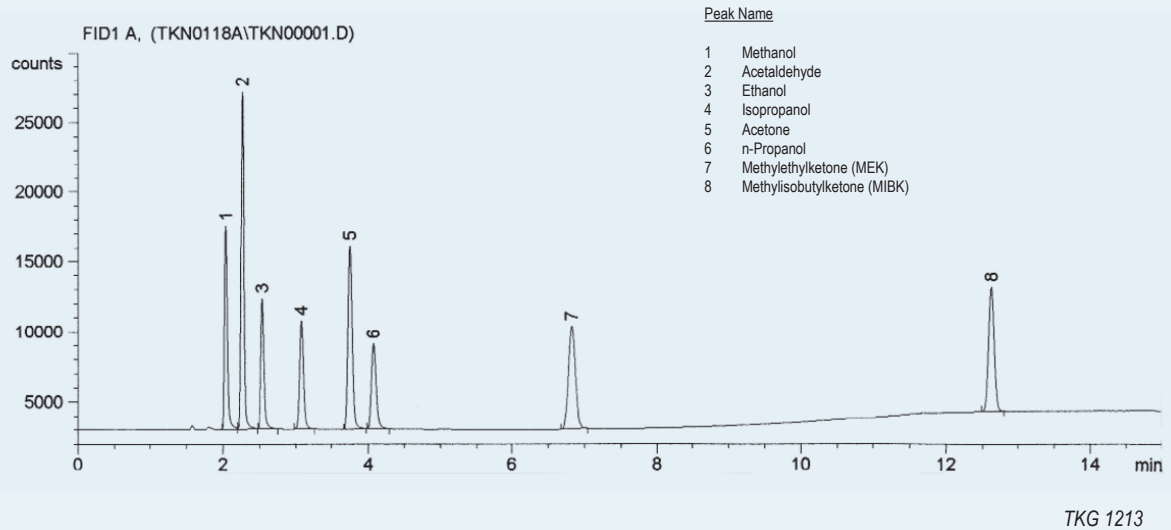


TKG 1210

POLLUTANTS IN BLOOD

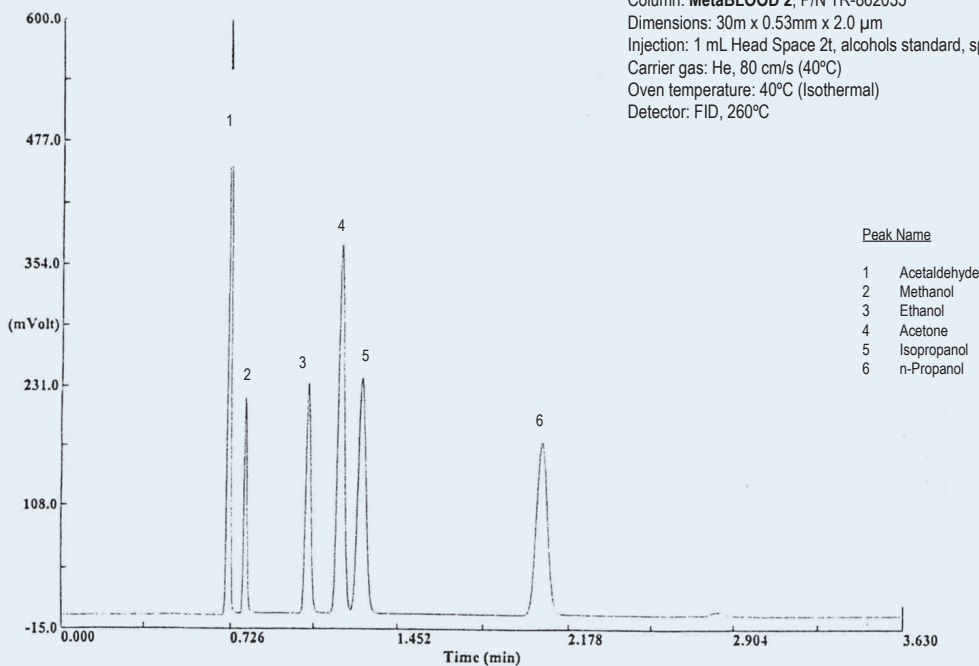
Column: **MetaBLOOD 1**, P/N TR-853035
 Dimensions: 30m x 0.53mm x 3.0µm
 Injection: 1 mL Head Space 2t (vial 70°C), alcohols and aromatics in blood (2-20 ppm), split 1:30, 225°C
 Carrier gas: He, 5 psi
 Oven temperature: 45°C(7 min) @ 10°C/min to 90°C(10min)
 Detector: FID, 300°C

Chromatogram provided by Dra. Guadalupe Montoya and Dra. Isabel Bonaparte de General Lab (Barcelona)



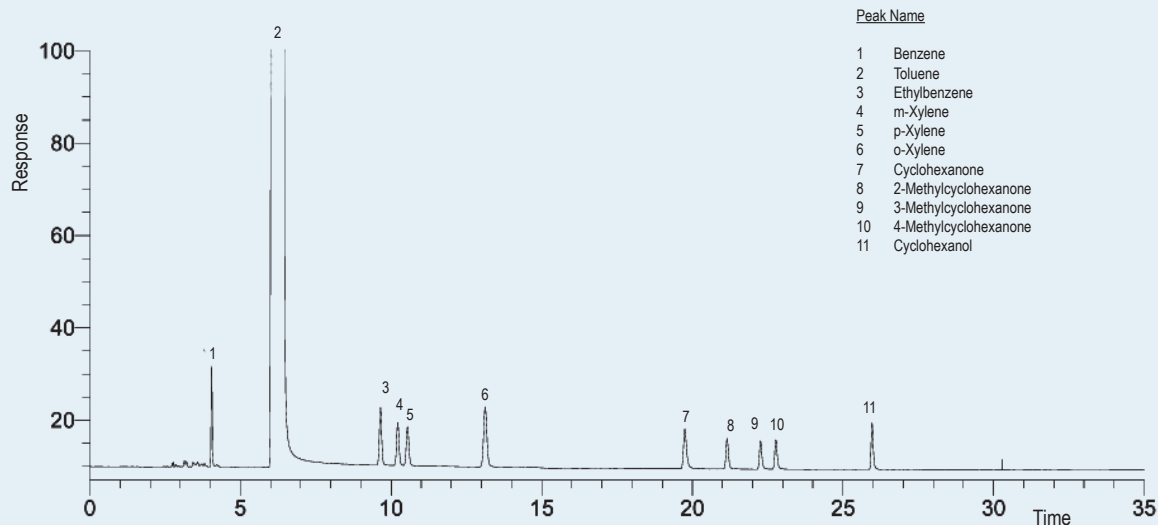
ALCOHOLS IN BLOOD

Column: **MetaBLOOD 2**, P/N TR-862035
 Dimensions: 30m x 0.53mm x 2.0 µm
 Injection: 1 mL Head Space 2t, alcohols standard, split 1:10, 250°C
 Carrier gas: He, 80 cm/s (40°C)
 Oven temperature: 40°C (Isothermal)
 Detector: FID, 260°C



IMPURITIES IN TOLUENE

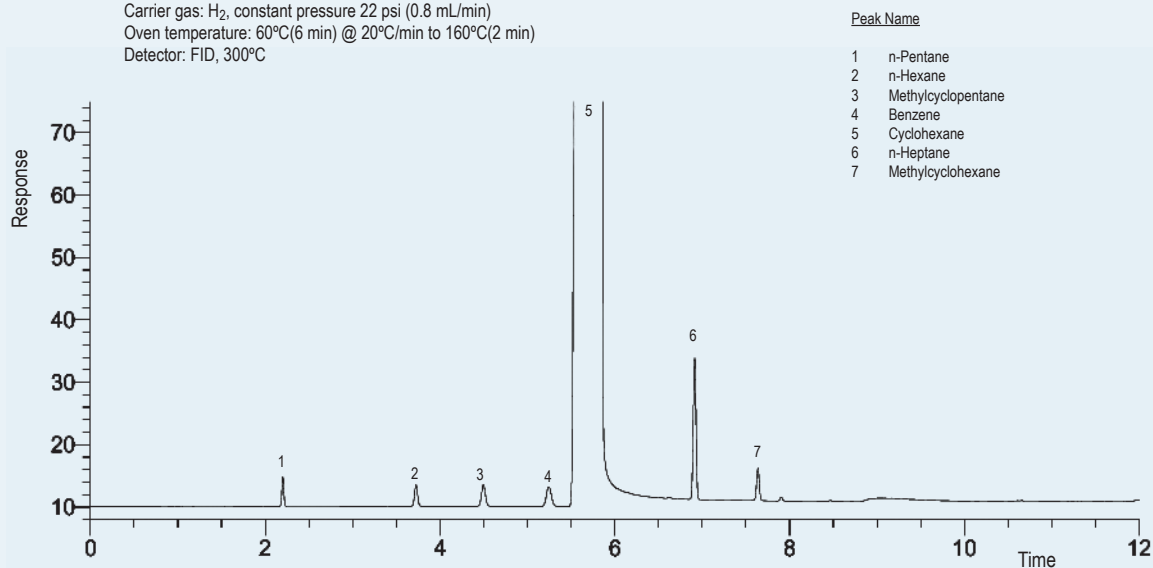
Column: **TRB-PAG**, P/N TR-550232
 Dimensions: 30m x 0.25mm x 0.25µm
 Injection: 1 µL Toluene Standard, split 1:50, 260°C
 Carrier gas: He, constant pressure 11 psi (75.8 Kpa)
 Oven Temperature: 40°C @ 6°C/min to 230°C(5min)
 Detector: FID, 260°C



TKG 1194

IMPURITIES IN CYCLOHEXANE

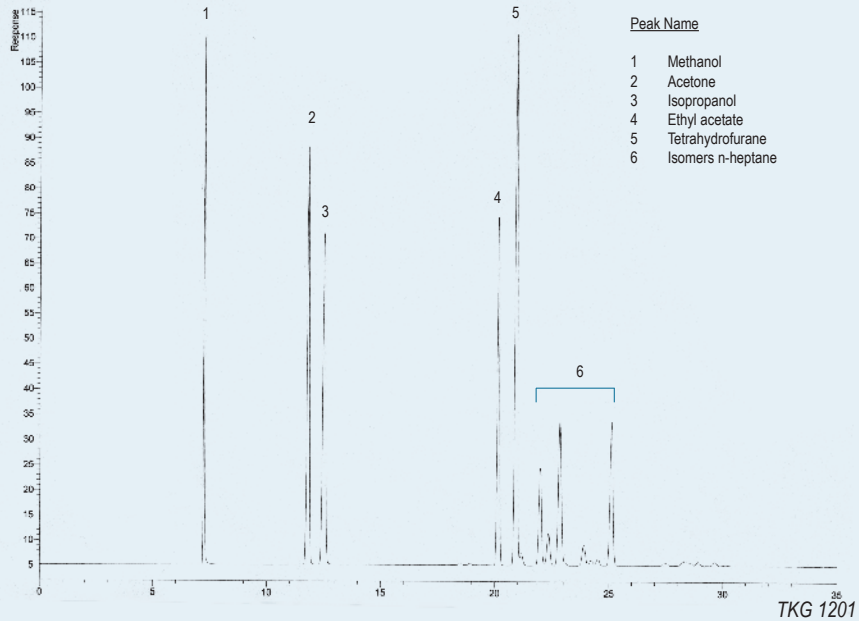
Column: **TRB-1**, P/N TR-111226
 Dimensions: 25m x 0.15mm x 1.2 µm
 Injection: 1µL Cyclohexane, split 1:100, 260°C
 Carrier gas: H₂, constant pressure 22 psi (0.8 mL/min)
 Oven temperature: 60°C(6 min) @ 20°C/min to 160°C(2 min)
 Detector: FID, 300°C



TKG 1195

MIXTURE OF SOLVENTS AND ISOMERS OF N-HEPTANE

Column: **TRB-624**, P/N TR-603075
 Dimensions: 75m x 0.53mm x 3.0 µm
 Injection: mixture of solvents (wet needle), split 1:100, 250°C
 Carrier gas: He, constant pressure 8 psi (55.7 Kpa)
 Oven temperature: 40°C(15 min) @ 15°C/min to 75°C(15 min)
 Detector: FID, 250°C

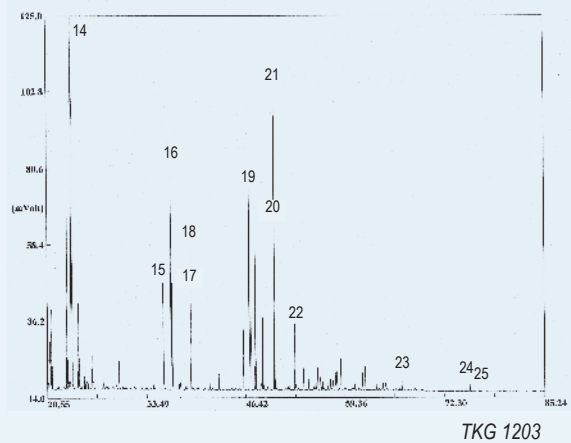
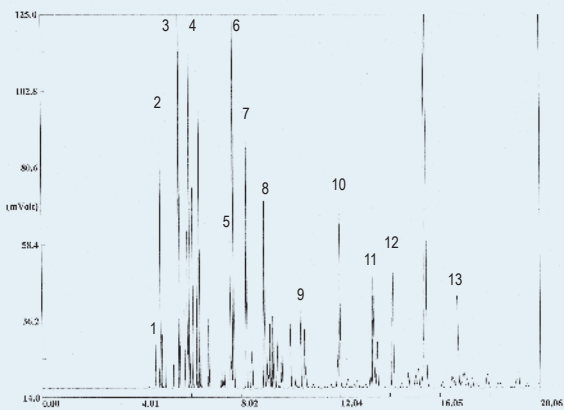


PETROL

Column: **TRB-PETROL**, P/N TR-110592
 Dimensions: 100m x 0.25mm x 0.50µm
 Injection: 0.1µL petrol, split 100:1, 280°C
 Carrier gas: H₂, constant pressure 221Kpa (35°C)
 Oven temperature: 35°C(18min) @ 2°C/min to 200°C(5min)
 Detector: FID, 280°C

Peak Name

1 isobutane	14 toluene
2 n-butane	15 ethylbenzene
3 isopentane	16 m-xylene
4 pentane	17 p-xylene
5 2,3-dimethylbutane	18 o-xylene
6 2-methylpentane	19 1-methyl-3-ethylbenzene
7 3-methylpentane	20 1,3,5-trimethylbenzene
8 hexane	21 1,2,4-trimethylbenzene
9 2,4-dimethylpentane	22 1,2,3-trimethylbenzene
10 benzene	23 naphtalene
11 2-methylhexane	24 2-methylnaphtalene
12 3-methylhexane	25 1-methylnaphtalene
13 n-heptane	



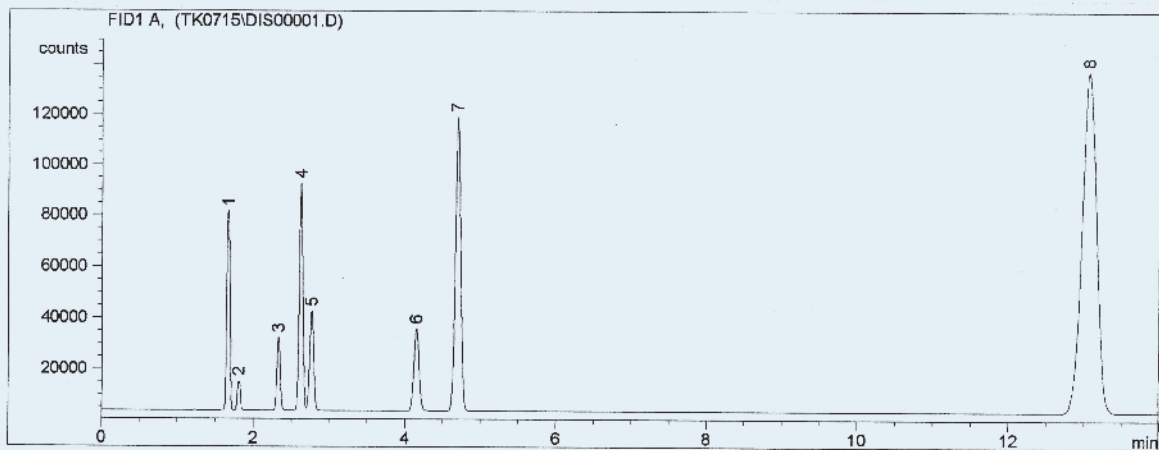
ALCOHOLS IN BLOOD

Column: **MetaBLOOD 2**, P/N TR-862035
 Size: 30m x 0.53mm x 2.0µm
 Carrier gas: He, 5 psi
 Oven Temperature: 45°C (15 min)
 Injection: 1 mL Head Space 2t (vial 70°C), alcohols in blood (2-20 ppm), split 1:20, 225°C
 Detector: FID, 300°C

Chromatogram provided by Dra. Guadalupe Montoya y Dra. Isabel Bonaparte from General Lab (Barcelona)

Peak Name

- 1 Acetaldehyde
- 2 Methanol
- 3 Ethanol
- 4 Acetone
- 5 Isopropanol
- 6 n-Propanol
- 7 Methyl ethyl ketone (MEK)
- 8 Methylisobutylketone (MIBK)



TKG 1209

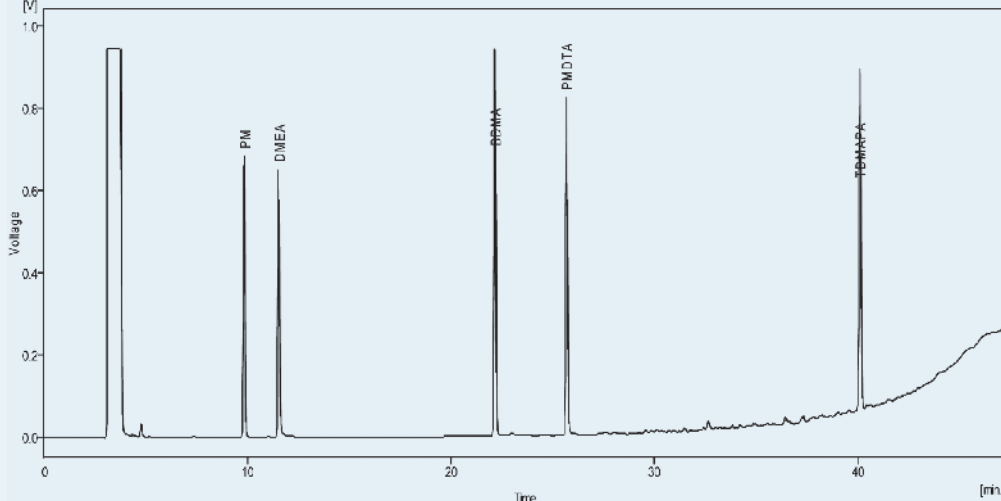
AMINES

Column: **TRB-624**, P/N TR-603065
 Size: 60m x 0.53mm x 3.0µm
 Injection: 1 µl amines standard, split 1:5, 260°C
 Carrier Gas: He, 8 mL/min
 Program temperature: 40°C (1min) @ 5°C/min to 260°C (10min)
 Detector: FID KONIK-TECH, 270°C

Sample

- PM (1-methoxy-2-propanol)
- DMEA (N,N-dimethylethanamine)
- BDMA (N,N-dimethylbenzylamine)
- PMDTA (pentamethyldiethylenetriamine)
- TDMAPA (N,N,N-tris(3-dimethylaminopropyl)amine)

Chromatogram provided by Ariadna Galve from KONIK-TECH, S.A



TKG 1214

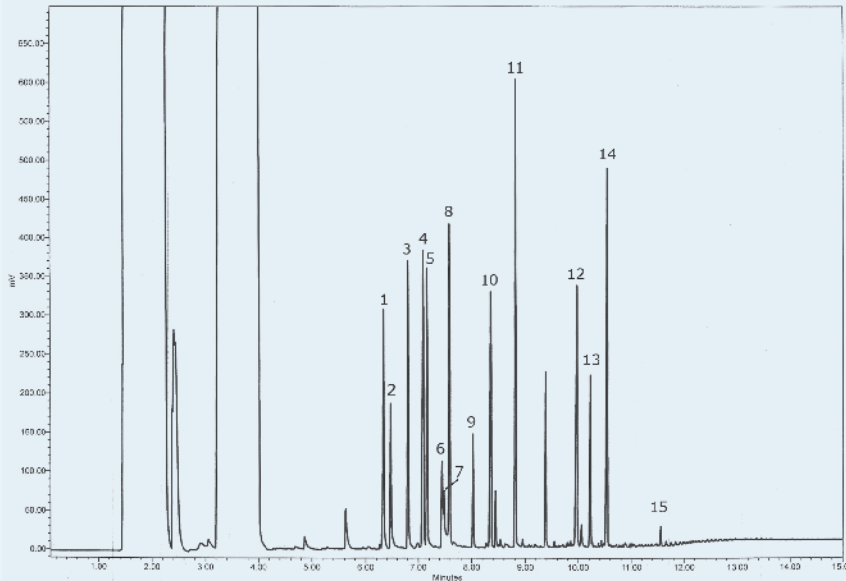
AMINOACIDS

Column: **TRB-50ht**, P/N TR-531332
 Size: 30m x 0.25mm x 0.15µm
 Injection: 2 µl standard AA-S-18 Sigma (2.5µmol/ml), split, 300°C
 Carrier gas: He, 1mL/min
 Program temperature: 50°C (2min) @ 30°C/min to 350°C (3min)
 Detector: MS Polaris Q, EI, 200°C, transfer line 200°C

Peak Name

- 1 Alanine
- 2 Glycine
- 3 Valine
- 4 Leucine
- 5 Isoleucine
- 6 Serine
- 7 Threonine
- 8 Proline
- 9 Hydroxyproline
- 10 Methionine
- 11 Phenylalanine
- 12 Lysine
- 13 Histidine
- 14 Tyrosine
- 15 Cystine

Chromatogram provided by Antonio Tintó from Moehs S.A.



TKG 1215

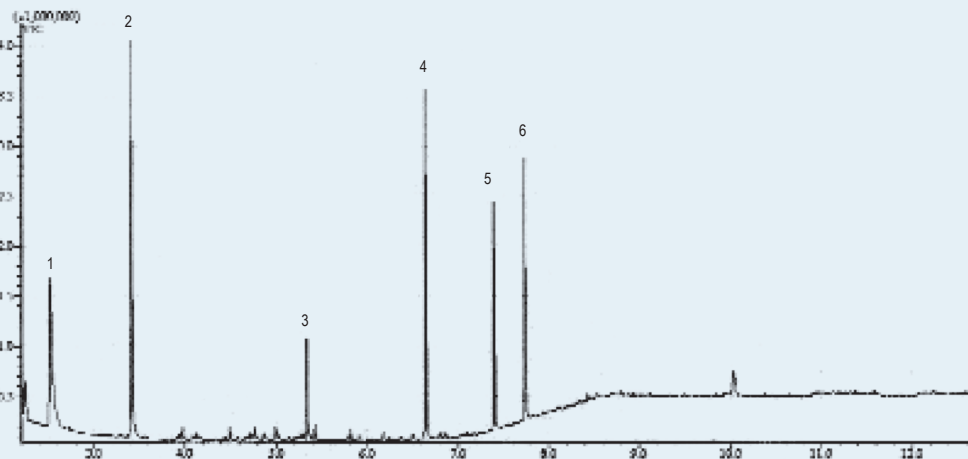
HYDROCARBONS

Column: **TRB-1ht**, P/N TR-610133
 Size: 30m x 0.32mm x 0.1µm
 Injection: hydrocarbons standard 1250 ppb, splitless, 250°C
 Carrier gas: He, constant flow 2 mL/min
 Program Temperature: 50°C (1 min) @ 40°C/min to 320°C (5 min)
 Detector: MS, ion source 200°C, Interfase 280°C, scan 20-600

Peak Name

- 1 C10
- 2 C12
- 3 C24
- 4 C28
- 5 C30
- 6 C40

Chromatogram provided by Vanesa Riu de ILERSAP, Mollerussa (Lleida).



TKG 1221

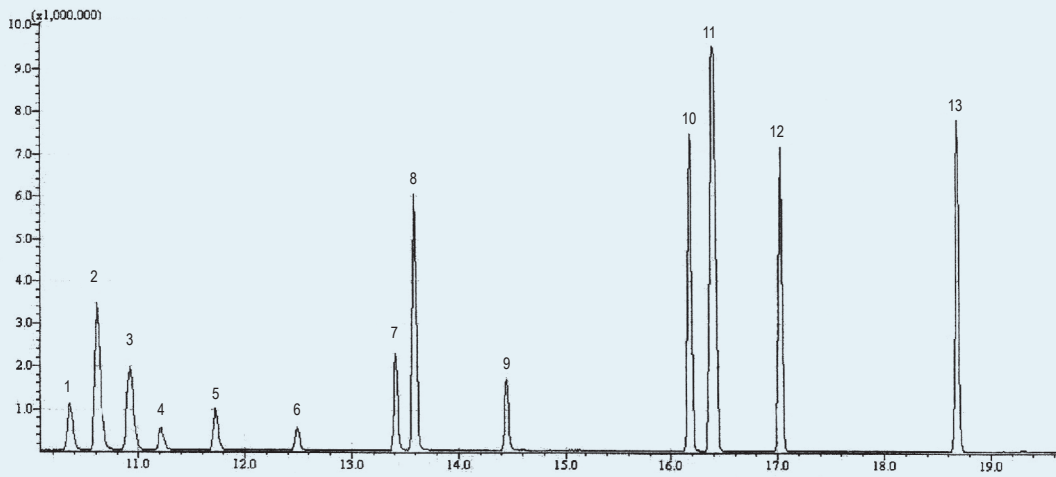
VOLATIL SOLVENTS NO HALOGENATED

Column: **TRB-1**, P/N TR-111062
 Size: 60m x 0.25mm x 1.0µm
 Injection: 1 mL Headspace (70°C, 20min), split 1:5, 250°C
 Carrier Gas: He, constant flow 1mL/min
 Program Temperature: 40°C(2 min) @ 8°C/min to 240°C(10 min)
 Detector: MS, ion source 200°C, Interfase 250°C, scan 20-400

Chromatogram provided by Vanesa Riu de ILERSAP, Mollerussa (Lleida).

Peaks

- 1 Isobutyl acetate
- 2 Benzene
- 3 Cyclohexane
- 4 3-Pentanone
- 5 Propyl acetate
- 6 Methyl isobutyl ketone
- 7 Isobutyl acetate
- 8 Toluene
- 9 Butyl acetate
- 10 Ethylbenzene
- 11 m,p-Xylene
- 12 o-Xylene
- 13 Isobutyl Ketone



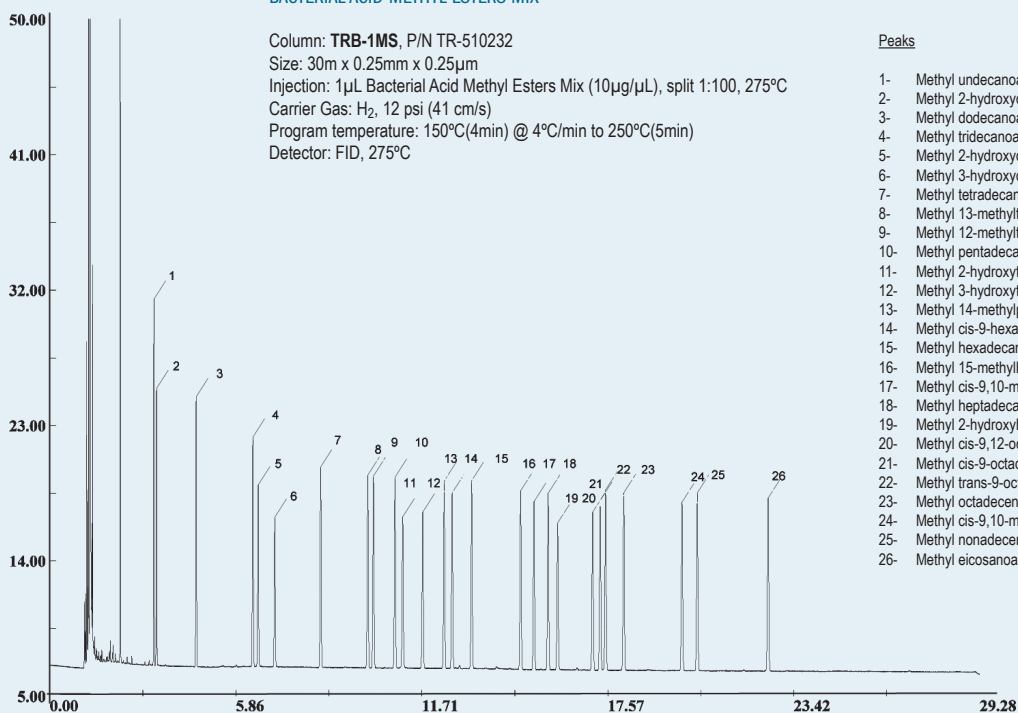
TKG 1220

BACTERIAL ACID METHYL ESTERS MIX

Column: **TRB-1MS**, P/N TR-510232
 Size: 30m x 0.25mm x 0.25µm
 Injection: 1µL Bacterial Acid Methyl Esters Mix (10µg/µL), split 1:100, 275°C
 Carrier Gas: H₂, 12 psi (41 cm/s)
 Program temperature: 150°C(4min) @ 4°C/min to 250°C(5min)
 Detector: FID, 275°C

Peaks

- 1- Methyl undecanoate
- 2- Methyl 2-hydroxydodecanoate
- 3- Methyl dodecanoate
- 4- Methyl tridecanoate
- 5- Methyl 2-hydroxydodecanoate
- 6- Methyl 3-hydroxydodecanoate
- 7- Methyl tetradecanoate
- 8- Methyl 13-methyltetradecanoate
- 9- Methyl 12-methyltetradecanoate
- 10- Methyl pentadecanoate
- 11- Methyl 2-hydroxytetradecanoate
- 12- Methyl 3-hydroxytetradecanoate
- 13- Methyl 14-methylpentadecanoate
- 14- Methyl cis-9-hexadecanoate
- 15- Methyl hexadecanoate
- 16- Methyl 15-methylhexadecanoate
- 17- Methyl cis-9,10-methylenehexadecanoate
- 18- Methyl heptadecanoate
- 19- Methyl 2-hydroxyheptadecanoate
- 20- Methyl cis-9,12-octadecadienoate
- 21- Methyl cis-9-octadecanoate
- 22- Methyl trans-9-octadecanoate
- 23- Methyl octadecanoate
- 24- Methyl cis-9,10-methyleneoctadecanoate
- 25- Methyl nonadecanoate
- 26- Methyl eicosanoate



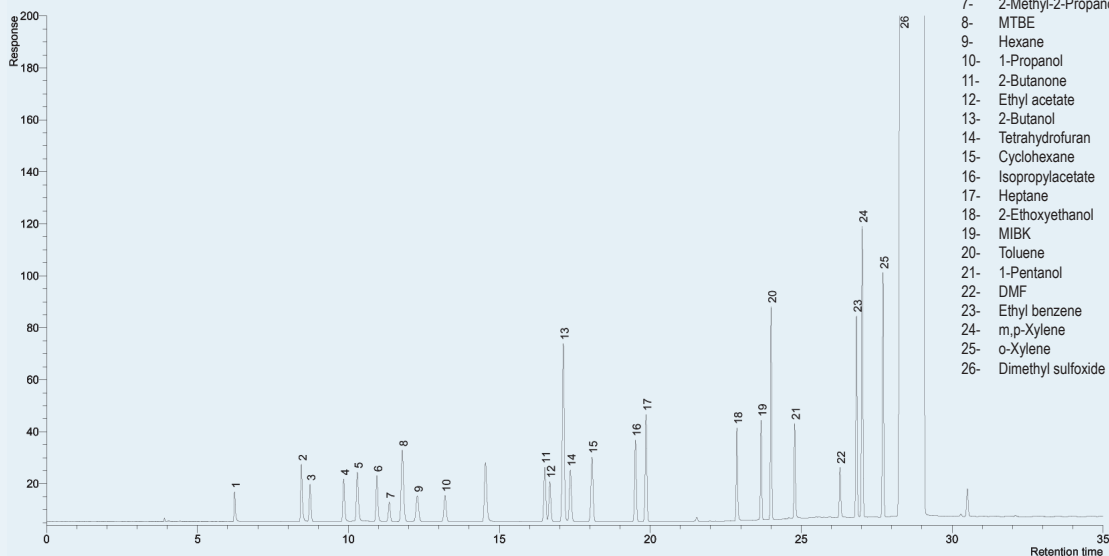
TKG 1231

RESIDUAL SOLVENTS IN DMSO

Column: **TRB-624**, P/N TR-601863
 Size: 60m x 0.32mm x 1.8µm
 Injection: 1µL mixture of solvents (500 ppm in DMSO), split 1:50, 260°C
 Carrier gas: He, constant pressure 16 psi
 Program Temperature: 40°C(5 min) @ 2°C/min to 60°C @ 9°C/min to 115°C @ 35°C/min to 220°C(15min)
 Detector: FID, 260°C

Peak Name

- 1- Methanol
- 2- Ethanol
- 3- Acetone
- 4- 2-Propanol
- 5- Acetonitrile
- 6- Methylene chloride
- 7- 2-Methyl-2-Propanol
- 8- MTBE
- 9- Hexane
- 10- 1-Propanol
- 11- 2-Butanone
- 12- Ethyl acetate
- 13- 2-Butanol
- 14- Tetrahydrofuran
- 15- Cyclohexane
- 16- Isopropylacetate
- 17- Heptane
- 18- 2-Ethoxyethanol
- 19- MIBK
- 20- Toluene
- 21- 1-Pentanol
- 22- DMF
- 23- Ethyl benzene
- 24- m,p-Xylene
- 25- o-Xylene
- 26- Dimethyl sulfoxide



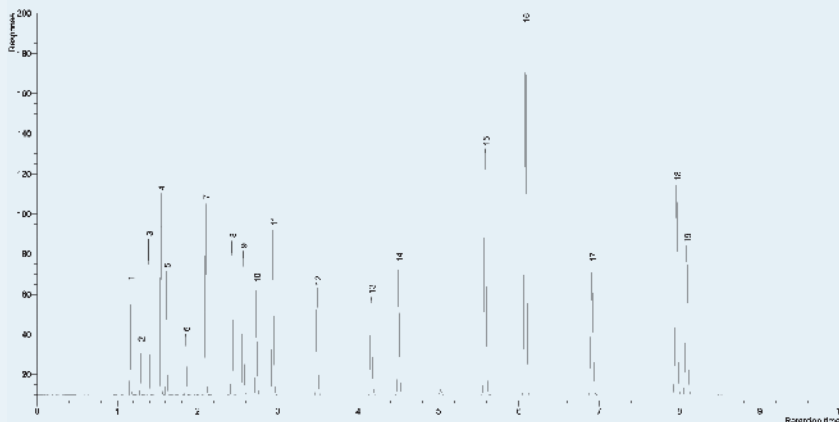
TKG 1232

COMMON INDUSTRIAL SOLVENTS

Column: **TRB-1**, P/N TR-111033
 Size: 30m x 0.32mm x 1.0µm
 Injection: 0.01µL Neat solvents, split 1:300, 200°C
 Carrier Gas: H2, 7 psi
 Program temperature: 30°C @ 8°C/min to 140°C(2min)
 Detector: FID, 200°C

Peaks

- 1- Methanol
- 2- Methyl formate
- 3- Ethanol
- 4- Acetone
- 5- Isopropanol
- 6- Dichloromethane
- 7- n-Propanol
- 8- Methyl ethyl ketone
- 9- Sec-Butanol
- 10- Ethyl acetate
- 11- Isobutanol
- 12- Isopropyl acetate
- 13- Nitropropane
- 14- 1,4-Dioxane
- 15- Toluene
- 16- Mesityl oxide
- 17- Diacetone alcohol
- 18- m-Xylene
- 19- Cyclohexanone



TKG 1234

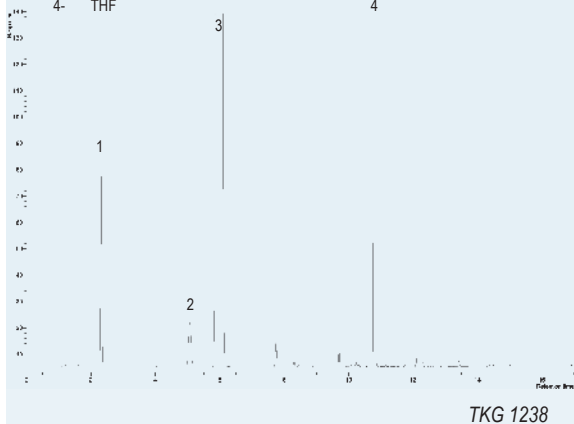
REACTION PRODUCTS OF 1,1-DIETHOXY BUTANE

Column: **TRB-624**, P/N TR-603035
 Size: 30m x 0.53mm x 3.0µm
 Injection: 0.5 µl, split 1:5, 260°C
 Carrier Gas: He, 6 psi
 Program temperature: 40°C (6min) @ 30°C/min to 200°C (5min)
 Detector: FID, 260°C

Chromatogram provided by Ion Aguirre from *Escuela Superior de Ingeniería de Bilbao (Spain)*

Peak Name

- 1- Butanal
- 2- Ethanol
- 3- 1,1-Diethoxy butane
- 4- THF

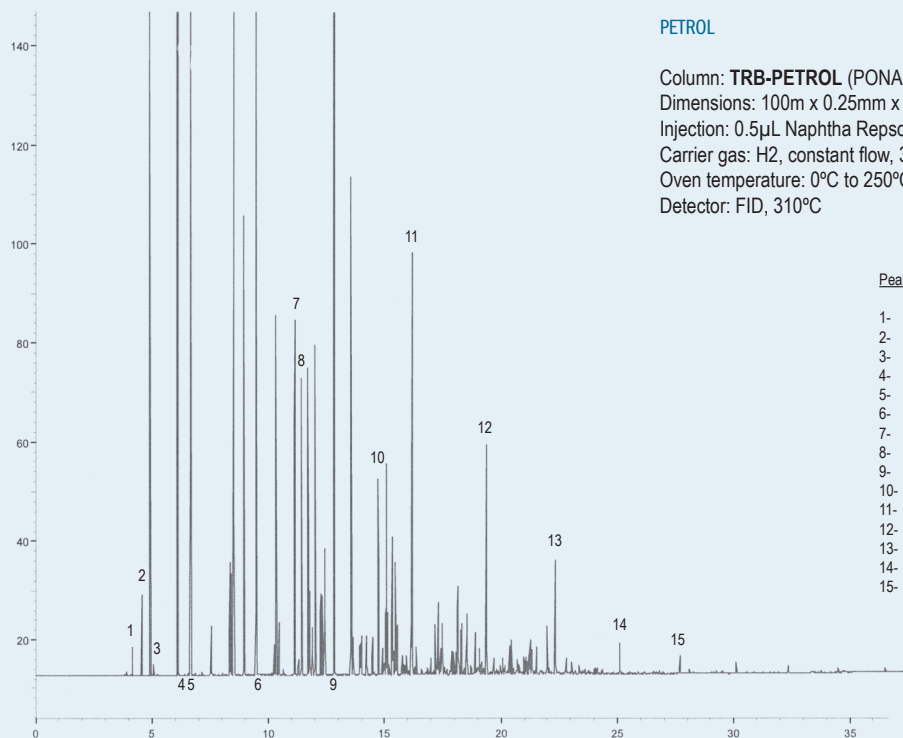
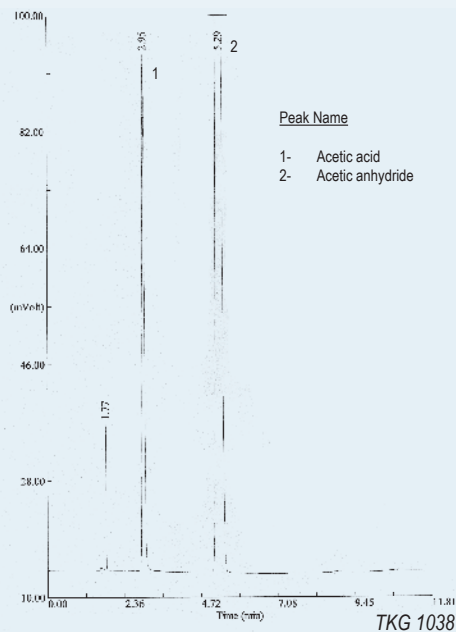


SEPARATION OF ACETIC ACID AND ACETIC ANHYDRIDE

Column: **TRB-1**, P/N TR-115035
 Dimensions: 30m x 0.53mm x 5.0 µm
 Injection: wet needle (solvent mixture), split 1:100, 200°C
 Carrier gas: H₂, constant pressure 3 psi (20.7 KPa).
 Oven program: 90°C
 Detector: FID, 260°C

Peak Name

- 1- Acetic acid
- 2- Acetic anhydride



PETROL

Column: **TRB-PETROL** (PONA Column), P/N TR-110592
 Dimensions: 100m x 0.25mm x 0.50µm
 Injection: 0.5µL Naphtha Repsol, split 1:250, 250°C
 Carrier gas: H₂, constant flow, 30 psi (206.7 KPa)
 Oven temperature: 0°C to 250°C
 Detector: FID, 310°C

Peak Name

- 1- Propane
- 2- Isobutane
- 3- Butane
- 4- Isopentane
- 5- n-Pentane
- 6- n-Hexane
- 7- Benzene
- 8- Cyclohexane
- 9- n-Heptane
- 10- Toluene
- 11- n-Octane
- 12- n-Nonane
- 13- n-Decane
- 14- n-Undecane
- 15- n-Dodecane

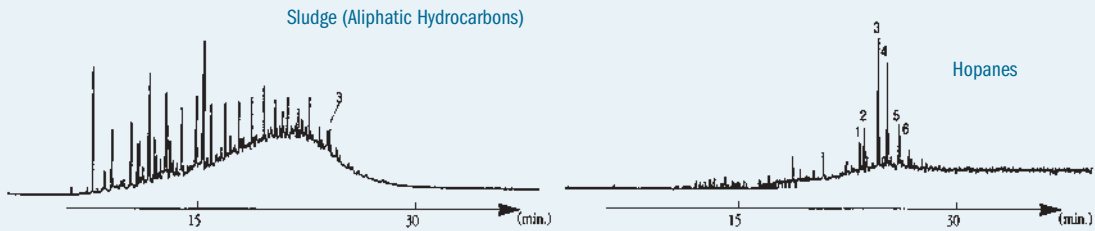
TKG 1267

ANALYSIS OF SOIL AND SLUDGE OF A WATER-TREATMENT PLANT

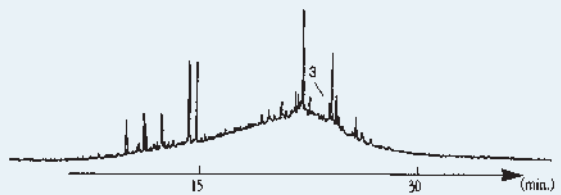
Column: **TRB-5**, P/N TR-120233
 Dimensions: 30m x 0.32mm x 0.25 µm
 Injection: splitless 1 min
 Carrier gas: He, 20 psi
 Oven temperature: 65°C(1.2 min) @ 30°C/min to 90°C(1 min) @ 10°C/min to 300°C(15 min)
 Detector: MS

Peak Name	
1-	Tg
2-	Tm
3-	C29 ab
4-	C30 ab
5-	C31 ab (22S)
6-	C31 ab (22R)

Chromatogram provided by T. Vaguero, L. Stronguió and L. Comellas from CETS Institut Químic de Sarrià, Barcelona.



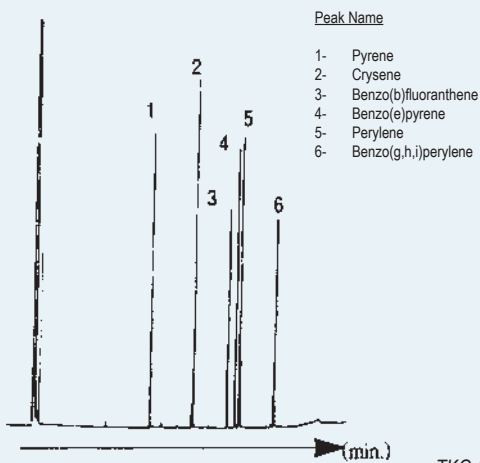
Soil + Sludge (Aliphatic Hydrocarbons)



TKG 1154

ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, cold on-column
 Carrier gas: H₂, 50 cm/s
 Oven temperature: 110°C @ 6°C/min to 300°C
 Detector: FID, 325°C

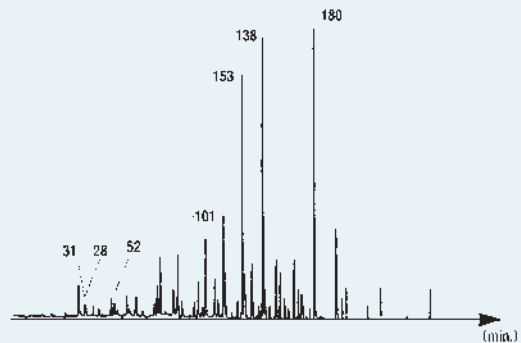


TKG 1156

ANALYSIS OF PCB'S

Column: **TRB-5**, P/N TR-120262
 Dimensions: 60m x 0.25mm x 0.25 µm

Chromatogram provided by A. de Pablo from ASINEL S.A., Madrid.

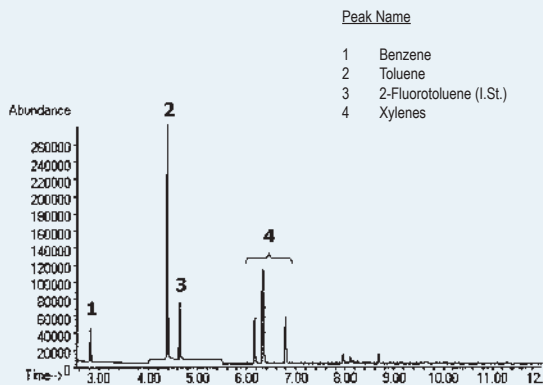


TKG 1157

SEPARATION OF BTX

Column: **Meta.X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 1 μ L BTX mixture, split 1:20, 250°C
 Carrier gas: He, constant pressure 10 psi (68.9 KPa)
 Oven temperature: 40°C (2min) @ 10°C/min to 100°C @ 20°C/min to 200°C
 Detector: MS, SIM, 250°C transfer line

Chromatogram provided by Bàrbara Bagó and Lluís Comellas from Institut Químic de Sarrià (IQS), Barcelona.

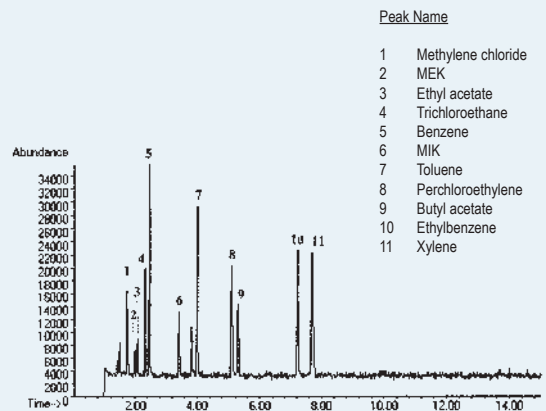


TKG 1014

SEPARATION OF VOLATIL SOLVENTS

Column: **Meta.X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 1 μ L solvents mixture, Head Space, split 1:20, 250°C
 Carrier gas: He, constant pressure 11 psi (75.8 KPa)
 Oven program: 50°C (10min) @ 3°C/min to 90°C (0,5min) @ 30°C/min to 200°C(5min)
 Detector: MS, full scan, 250°C transfer line

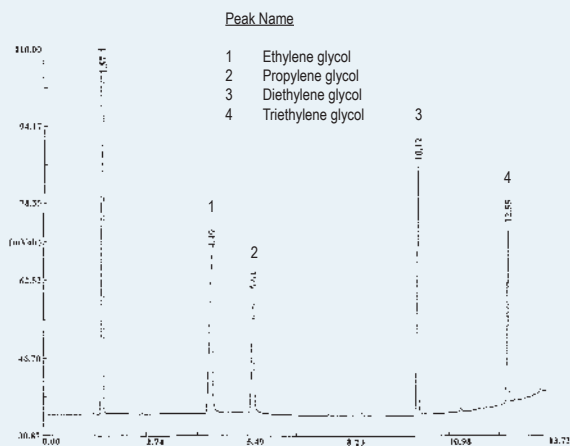
Chromatogram provided by Bàrbara Bagó and Lluís Comellas from Institut Químic de Sarrià (IQS), Barcelona.



TKG 1015

GLYCOLS

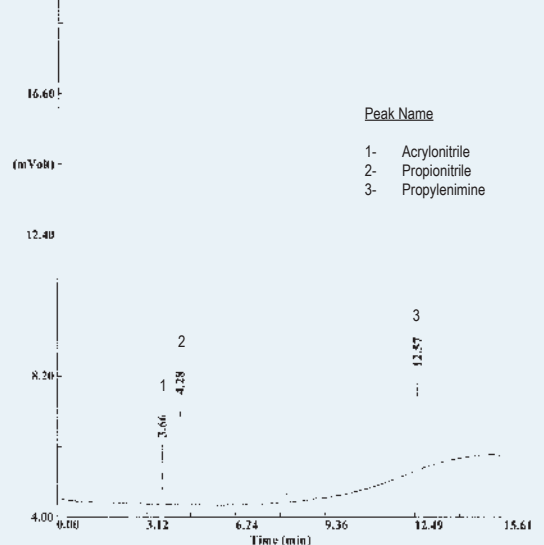
Column: **TRB-F50**, P/N TR-571015
 Dimensions: 15m x 0.53mm x 1.0 μ m
 Injection: 0.4 μ L Glycols mixture in Methanol, split 1:50, 15ng/comp on column, 250°C
 Carrier gas: H₂, constant pressure 1.5 psi (10.3 KPa), 40.15 cm/s (40°C)
 Oven program: 40°C (5min) to 210°C/(10min) @ 15°C/min
 Detector: FID, 280°C



TKG 1016

NITRILES AND AMINES IN WATER

Column: **TRB-5A**, P/N TR-210532
 Dimensions: 30m x 0.25mm x 0.5 μ m
 Injection: 0.5 μ L (0.1mg/mL) aqueous sample, split 1:25, 200°C
 Carrier Gas: He, constant pressure 12 psi (82.7 KPa).
 Oven Temperature: 50°C(5min) @ 15°C/min to 200°C
 Detector: FID, 280°C

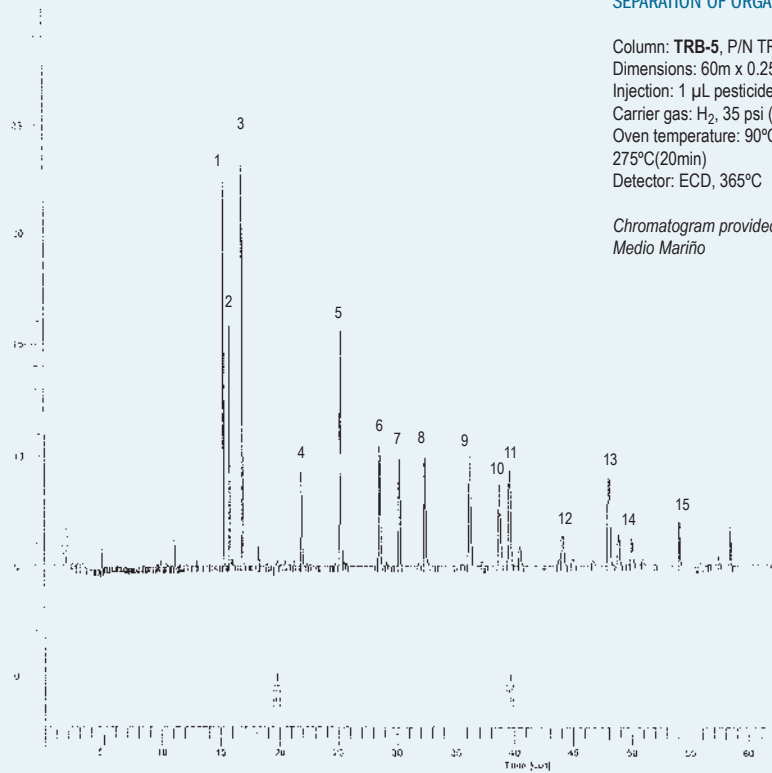


TKG 1020

SEPARATION OF ORGANOCHLORINATED PESTICIDES

Column: **TRB-5**, P/N TR-120262
 Dimensions: 60m x 0.25mm x 0.25 μ m
 Injection: 1 μ L pesticides standard, 270°C
 Carrier gas: H₂, 35 psi (241.1 KPa)
 Oven temperature: 90°C(8min) @ 30°C/min to 215°C(40min) @ 5°C/min to 275°C(20min)
 Detector: ECD, 365°C

Chromatogram provided by Nieves Caro from Centro Control de Calidad do Medio Mariño



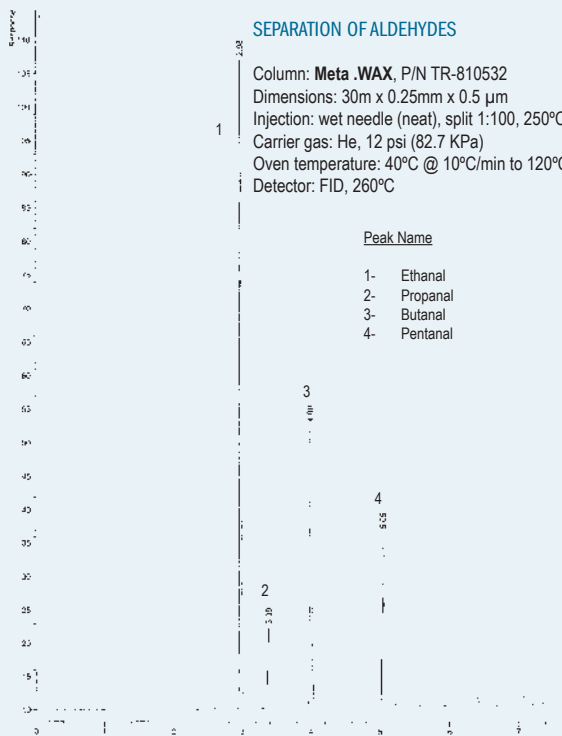
Peak Name

- 1- α -HCH
- 2- HCB
- 3- γ -HCH
- 4- Heptachlor
- 5- Aldrin
- 6- Isodrin
- 7- Heptachlorepoide
- 8- PCB-155
- 9- Transnonador
- 10- 4,4'-DDE
- 11- Dieldrin
- 12- Endrin
- 13- 4,4'-DDD
- 14- 2,4-DDT
- 15- 4,4'-DDT

TKG 1017

SEPARATION OF ALDEHYDES

Column: **Meta .WAX**, P/N TR-810532
 Dimensions: 30m x 0.25mm x 0.5 μ m
 Injection: wet needle (neat), split 1:100, 250°C
 Carrier gas: He, 12 psi (82.7 KPa)
 Oven temperature: 40°C @ 10°C/min to 120°C
 Detector: FID, 260°C



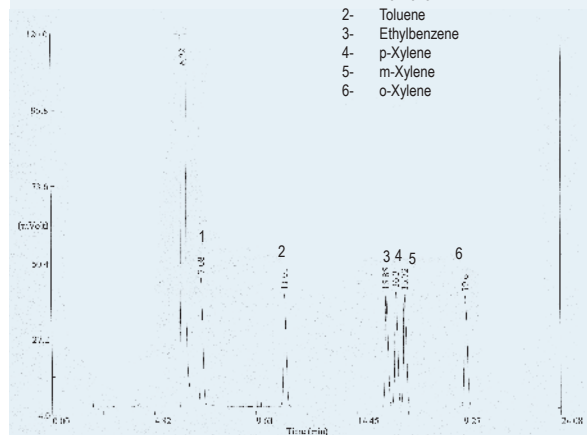
Peak Name

- 1- Ethanal
- 2- Propanal
- 3- Butanal
- 4- Pentanal

TKG 1018

SEPARATION OF BTEX ISOMERS

Column: **Meta .WAX**, P/N TR-811035
 Dimensions: 30m x 0.53mm x 1.0 μ m
 Injection: 1 μ L BTEX sample (50 ppm on column), 200°C
 Carrier gas: He, 25 cm/s (35°C)
 Oven temperature: 35°C @ 2°C/min to 75°C(5min)
 Detector: FID, 260°C



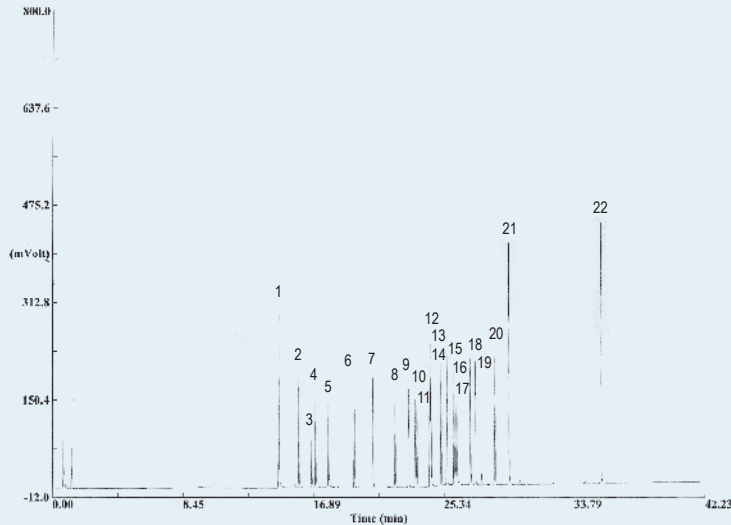
Peak Name

- 1- Benzene
- 2- Toluene
- 3- Ethylbenzene
- 4- p-Xylene
- 5- m-Xylene
- 6- o-Xylene

TKG 1019

CHLORINATED PESTICIDES

Column: **Meta.X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL chlorinated pesticide mix, splitless (0.5 min), 250°C (50-170 ppb on-column)
 Carrier gas: H₂, constant pressure 20 psi (137.8 KPa)
 Oven program: 80°C (5min) to 100°C @ 15°C/min to 160°C @ 8°C/min to 285°C(5min) @ 5°C/min
 Detector: ECD, 310°C

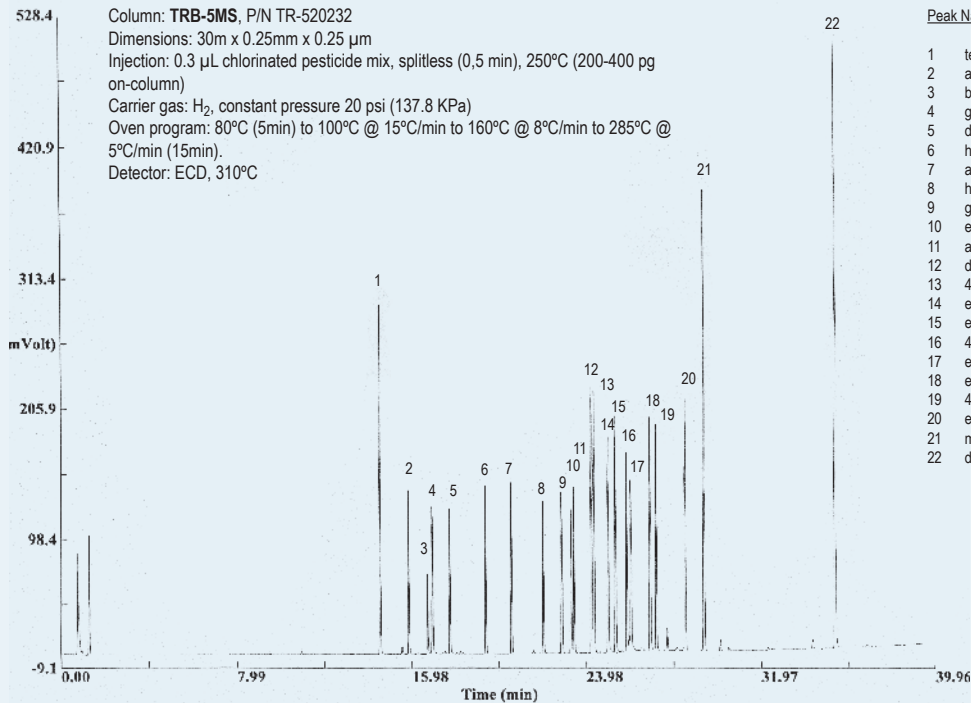


Peak Name
1 tetrachloro-m-xylene
2 alpha-BHC
3 beta-BHC
4 gamma-BHC
5 delta-BHC
6 heptachlor
7 aldrin
8 heptachlor epoxide
9 gamma-chlordane
10 endosulfan I
11 alpha-chlordane
12 dieldrin
13 4,4'-DDE
14 endrin
15 endosulfan II
16 4,4'-DDD
17 endrin aldehyde
18 endosulfan sulfate
19 4,4'-DDT
20 endrin ketone
21 methoxychlor
22 decachlorobiphenyl

TKG 1021

CHLORINATED PESTICIDES

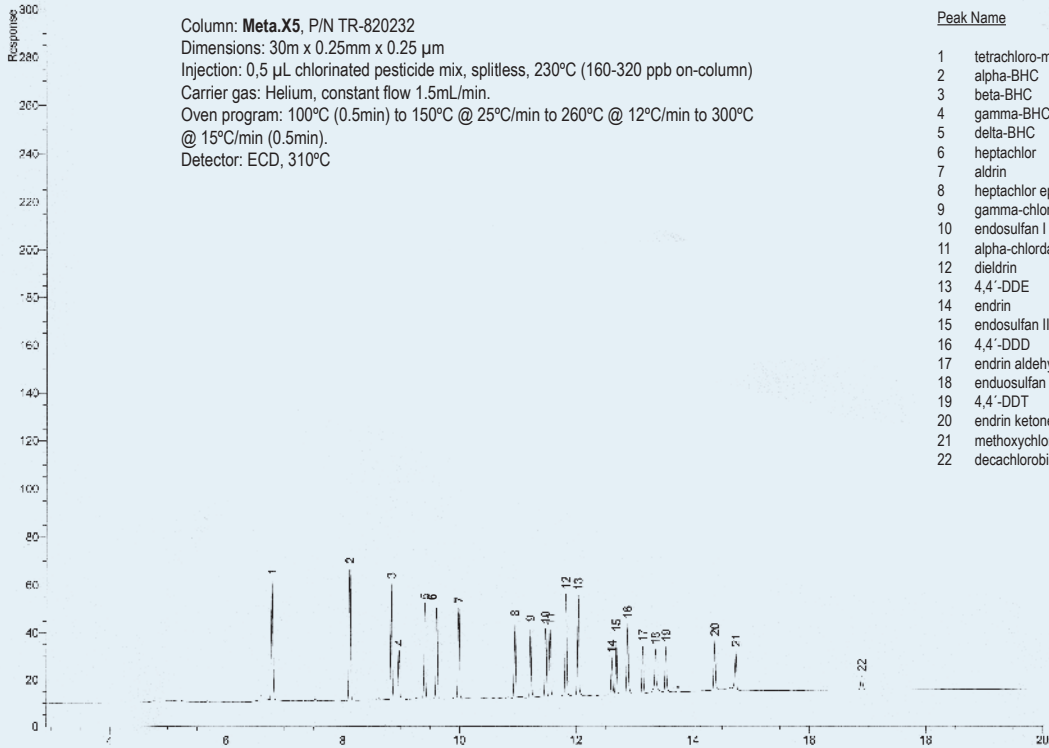
Column: **TRB-5MS**, P/N TR-520232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 0.3 µL chlorinated pesticide mix, splitless (0.5 min), 250°C (200-400 pg on-column)
 Carrier gas: H₂, constant pressure 20 psi (137.8 KPa)
 Oven program: 80°C (5min) to 100°C @ 15°C/min to 160°C @ 8°C/min to 285°C @ 5°C/min (15min).
 Detector: ECD, 310°C



Peak Name
1 tetrachloro-m-xylene
2 alpha-BHC
3 beta-BHC
4 gamma-BHC
5 delta-BHC
6 heptachlor
7 aldrin
8 heptachlor epoxide
9 gamma-chlordane
10 endosulfan I
11 alpha-chlordane
12 dieldrin
13 4,4'-DDE
14 endrin
15 endosulfan II
16 4,4'-DDD
17 endrin aldehyde
18 endosulfan sulfate
19 4,4'-DDT
20 endrin ketone
21 methoxychlor
22 decachlorobiphenyl

TKG 1022

CHLORINATED PESTICIDES



Column: **Meta.X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 0.5 μ L chlorinated pesticide mix, splitless, 230°C (160-320 ppb on-column)
 Carrier gas: Helium, constant flow 1.5mL/min.
 Oven program: 100°C (0.5min) to 150°C @ 25°C/min to 260°C @ 12°C/min to 300°C @ 15°C/min (0.5min).
 Detector: ECD, 310°C

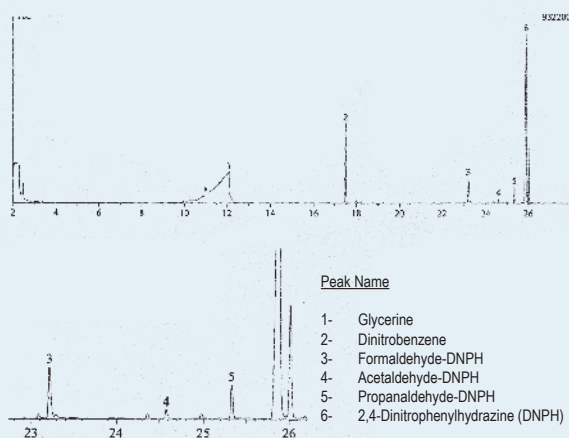
Peak Name
1 tetrachloro-m-xylene
2 alpha-BHC
3 beta-BHC
4 gamma-BHC
5 delta-BHC
6 heptachlor
7 aldrin
8 heptachlor epoxide
9 gamma-chlordane
10 endosulfan I
11 alpha-chlordane
12 dieldrin
13 4,4'-DDE
14 endrin
15 endosulfan II
16 4,4'-DDD
17 endrin aldehyde
18 endosulfan sulfate
19 4,4'-DDT
20 endrin ketone
21 methoxychlor
22 decachlorobiphenyl

TKG 1023

ALDEHYDES IN AIR SAMPLE

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 1 μ L Aldehydes in Air Sample after extraction (derivatisized with DNPH), splitless (1 min), 250°C
 Carrier gas: He, constant flow 1 mL/min
 Oven temperature: 50°C(1min) @ 10°C/min to 300°C
 Detector: MS, 280°C (transfer line)

Chromatogram provided by F. Sisteré from IUCT

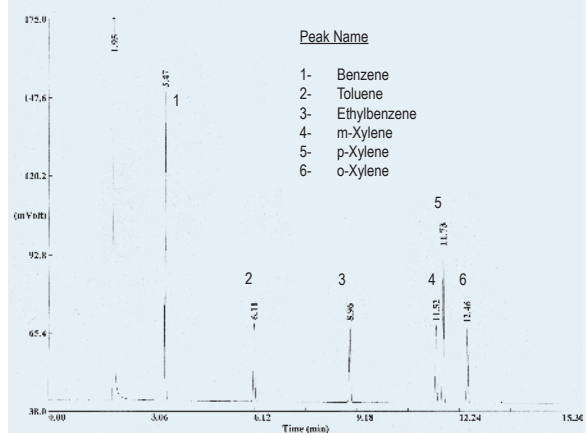


Peak Name
1- Glycerine
2- Dinitrobenzene
3- Formaldehyde-DNPH
4- Acetaldehyde-DNPH
5- Propanaldehyde-DNPH
6- 2,4-Dinitrophenylhydrazine (DNPH)

TKG 1036

SEPARATION OF BTEX ISOMERS

Column: **TRB-624**, P/N TR-601833
 Dimensions: 30m x 0.32mm x 1.8 μ m
 Injection: 1 μ L BTEX sample (50 ppm on column), 260°C
 Carrier gas: H₂, 6.9 psi (47.9 KPa)
 Oven temperature: 40°C @ 8°C/min to 240°C(10min)
 Detector: FID, 260°C

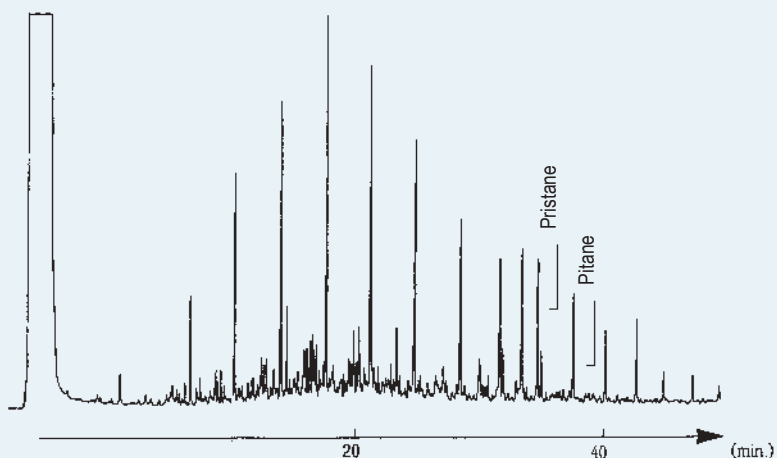


Peak Name
1- Benzene
2- Toluene
3- Ethylbenzene
4- m-Xylene
5- p-Xylene
6- o-Xylene

TKG 1043

ANALYSIS OF HYDROCARBONS (GASOIL)

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, splitless 0.7min
 Carrier gas: H₂, 50 cm/s (110°C)
 Oven temperature: 60°C(3 min) @ 4°C/min to 300°C
 Detector: FID, 305°C

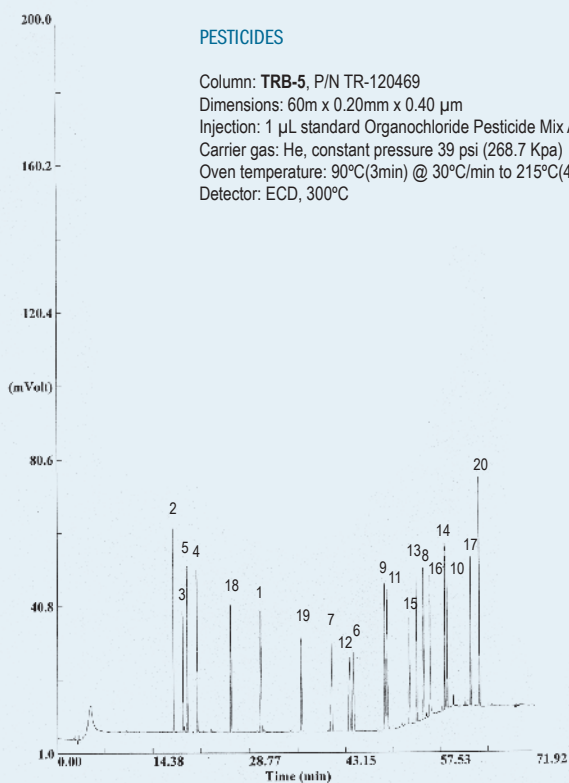


Chromatogram provided by Dr. Caixach from Laboratori Espectrometria de Masses, CSIC, Barcelona

TKG 1173

PESTICIDES

Column: **TRB-5**, P/N TR-120469
 Dimensions: 60m x 0.20mm x 0.40 µm
 Injection: 1 µL standard Organochloride Pesticide Mix AB#2, splitless(1min), 270°C
 Carrier gas: He, constant pressure 39 psi (268.7 Kpa)
 Oven temperature: 90°C(3min) @ 30°C/min to 215°C(40min) @ 5°C/min to 275°C(30min)
 Detector: ECD, 300°C



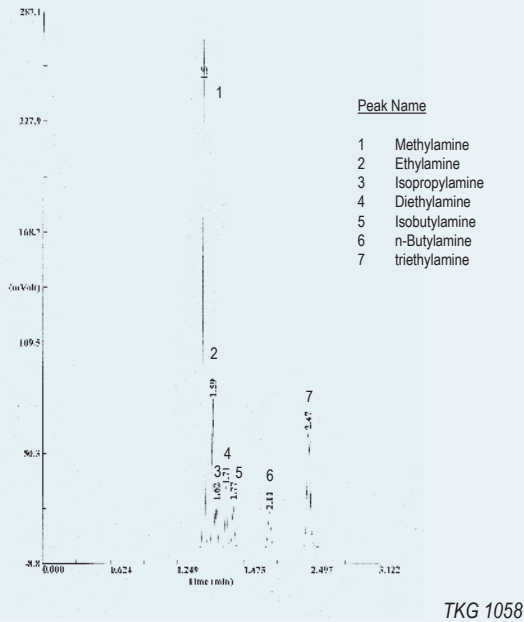
Peak Name

- 1- Aldrin
- 2- α-BHC
- 3- β-BHC
- 4- δ-BHC
- 5- γ-BHC (lindane)
- 6- α-chlordane
- 7- γ-chlordane
- 8- 4,4'-DDD
- 9- 4,4'-DDE
- 10- 4,4'-DDT
- 11- Dieldrin
- 12- Endosulfan I
- 13- Endosulfan II
- 14- Endosulfan sulfate
- 15- Endrin
- 16- Endrin aldehyde
- 17- Endrin ketone
- 18- Heptachlor
- 19- Heptachlor epoxide (B)
- 20- methoxychlor

TKG 1055

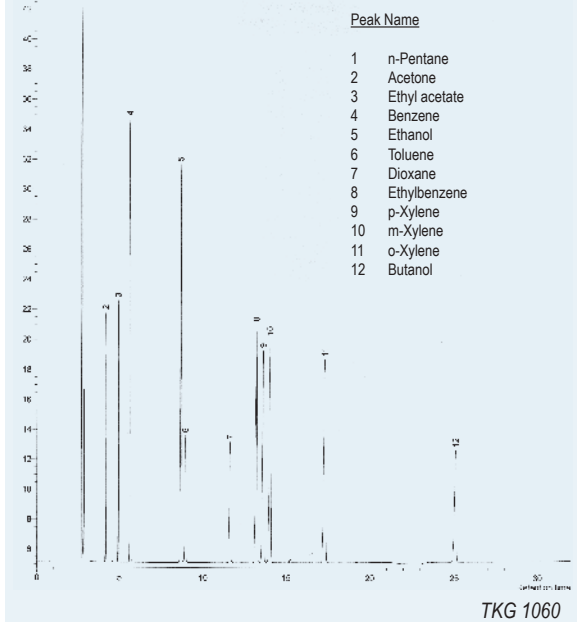
AMINES

Column: **TR-WAX.DB**, P/N TR-931035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 1 µL Amines mixture, Head Space, split 1:50, 260°C
 Carrier gas: H₂, constant pressure 1.8 psi (12.40Kpa)
 Oven temperature: 60°C
 Detector: FID, 280°C



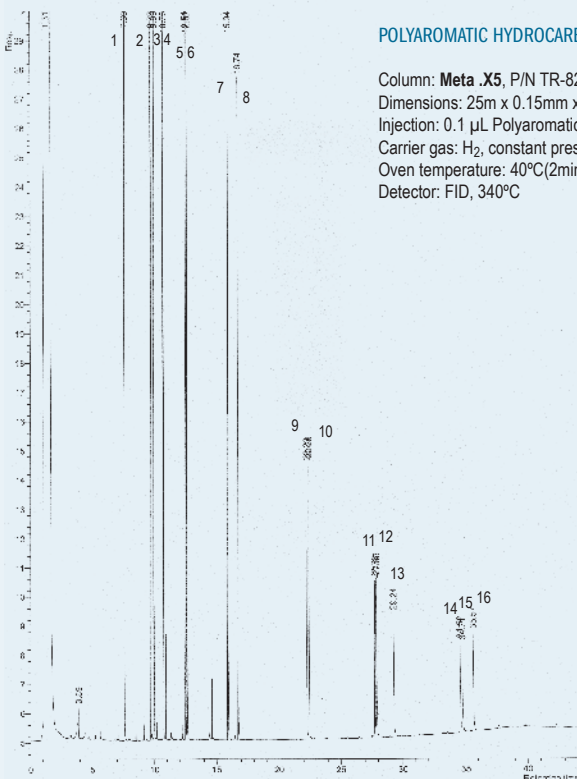
SEPARATION OF SOLVENTS

Column: **TR-Meta.WAX 400**, P/N TR-402153
 Dimensions: 50m x 0.32mm x 0.20 µm
 Injection: 0.5 µL standard(split 1:50), 200°C
 Carrier gas: He, 16 psi (110.2 Kpa)
 Oven Temperature: 30°C(2') @ 1°C/min to 80°C
 Detector Temperature: FID, 200°C



POLYAROMATIC HYDROCARBONS

Column: **Meta .X5**, P/N TR-821326
 Dimensions: 25m x 0.15mm x 0.15 µm
 Injection: 0.1 µL Polyaromatic hydrocarbons, (200ng/comp), splitless 30s, 300°C
 Carrier gas: H₂, constant pressure 35 psi (241.1 Kpa)
 Oven temperature: 40°C(2min) @ 20°C/min to 200°C @ 4°C/min to 310°C(5min)
 Detector: FID, 340°C



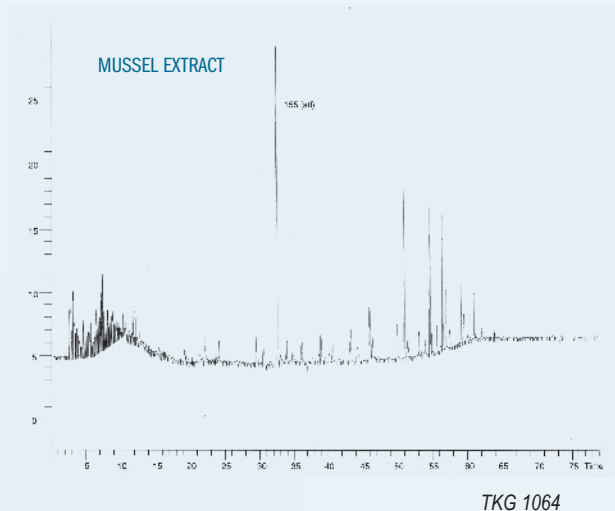
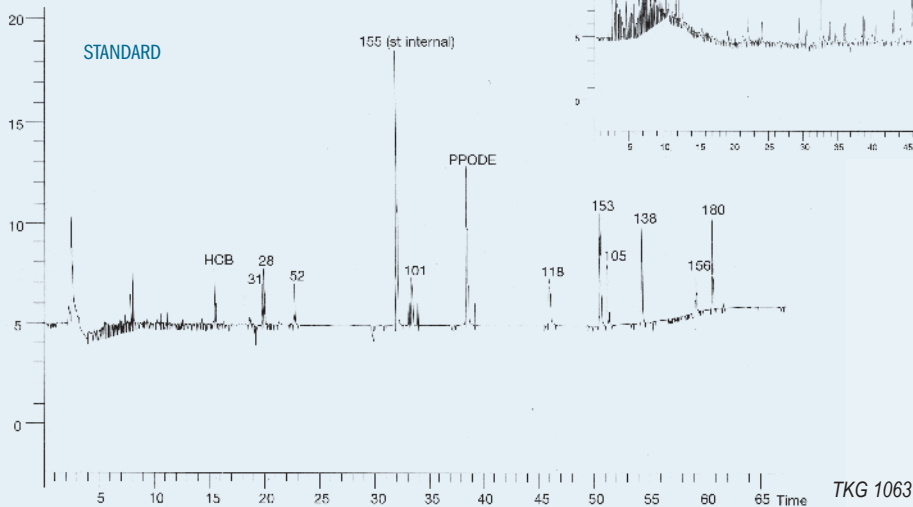
Peak Name	Retention Time (min)
1	Naphthalene
2	Acenaphthylene
3	acenaphthene
4	Fluorene
5	Phenanthrene
6	Anthracene
7	Fluoranthene
8	Pyrene
9	Benzo(a)anthracene
10	Chrysene
11	Benzo(b)fluoranthene
12	Benzo(k)fluoranthene
13	Benzo(a)pyrene
14	Indeno(1,2,3)pyrene
15	Dibenzo(a,h)anthracene
16	Benzo(g,h,i)perylene

TKG 1061

PCB'S IN MUSSELS

Column: **TRB-5**, P/N TR-120262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: PCBs in Mussle, split (1:30) 270°C
 Carrier gas: H₂, 35 psi (241.1 kPa)
 Oven program: 90°C (8') to 215°C(40') @ 30°C/min. to 275°C(20') @ 5°C/min.
 Detector: ECD, 365°C, make up Argon/methane

Chromatogram provided by Nieves Caro from Centro Control de Calidad do Medio Mariño.



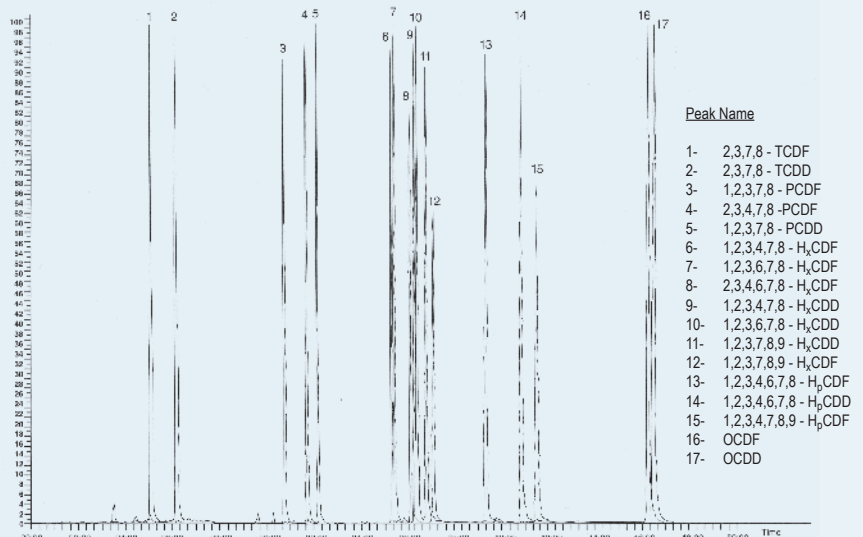
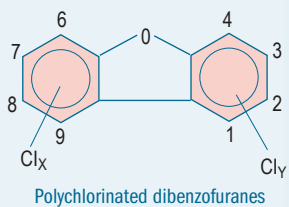
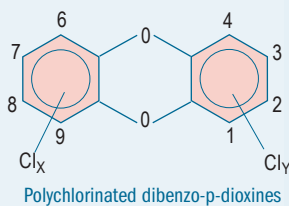
DIOXINES AND FURANES SEPARATION

Column: **TRB-5ms**, P/N TR-520262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: 1 µl, splitless, 1', 300°C
 Carrier gas: He, 250 kPa, Pcte.

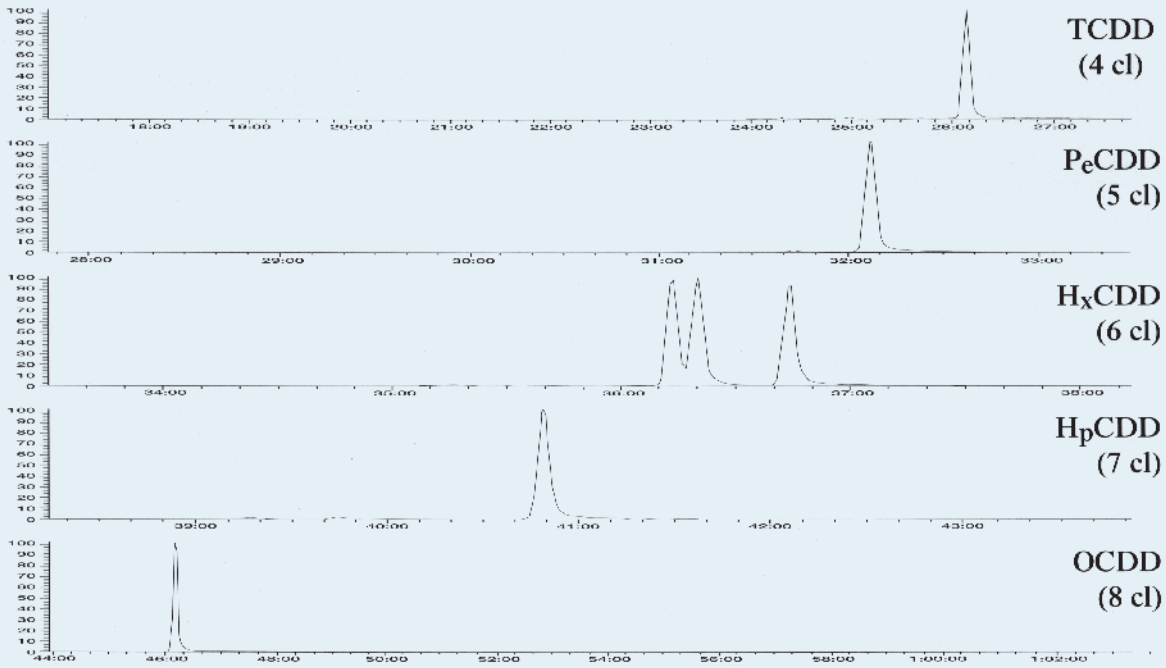
Oven program: 150°C to 200°C @ 30°C/min. to 235°C(10') @ 3°C/min. to 300°C
 Detector: MS (SIR), 260°C
 Sample: EPA 1613CS3 standard

Chromatogram provided by Jordi Diaz from Laboratorio Medioambiental IQS.

SEPARATION OF ANALOGUES 2,3,7,8, SUBSTITUTED BY A PCDDs AND PCDFs STANDARD

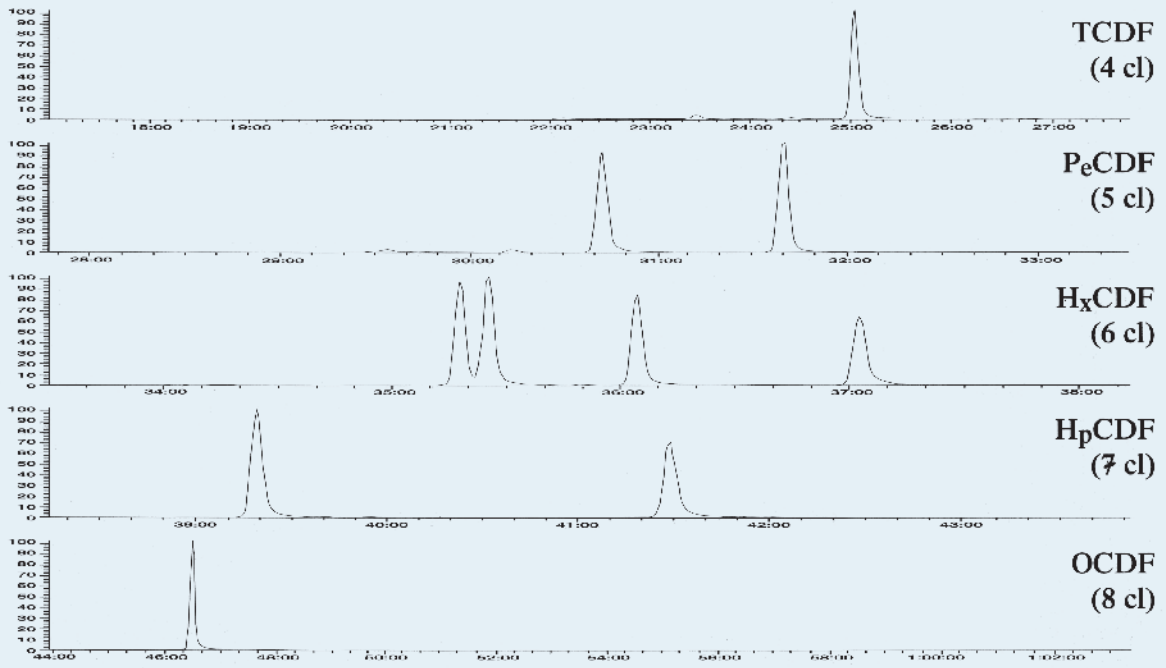


TRB-5MS DIOXINES



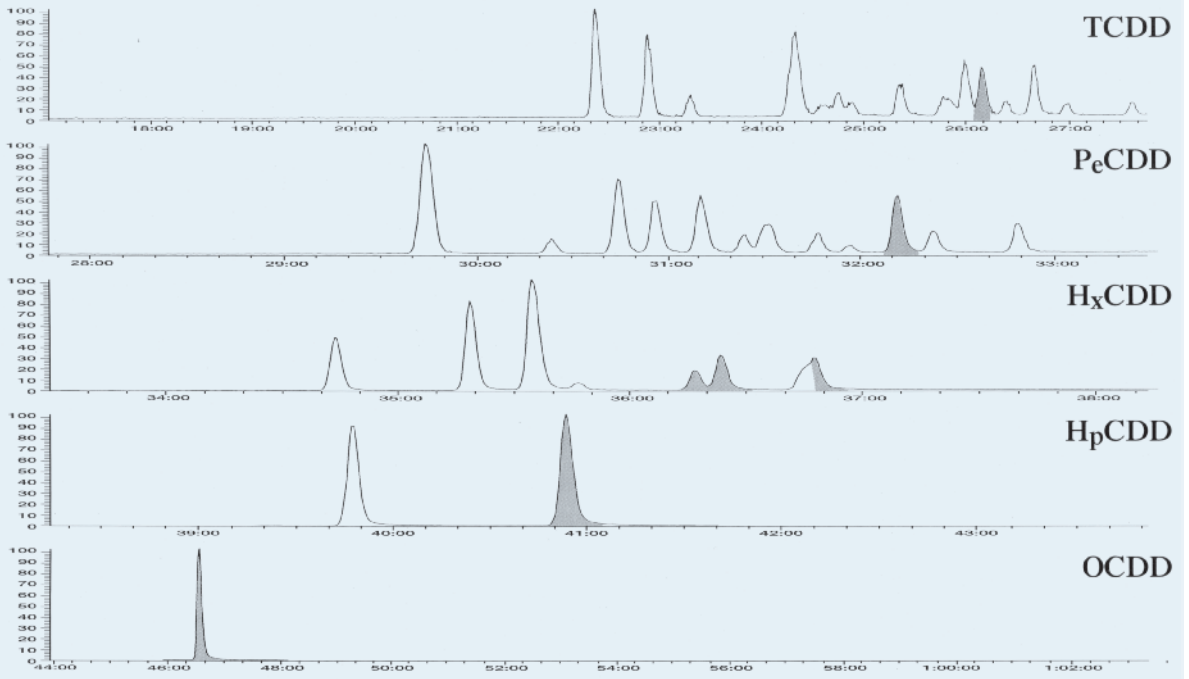
TKG 1070

TRB-5MS FURANES



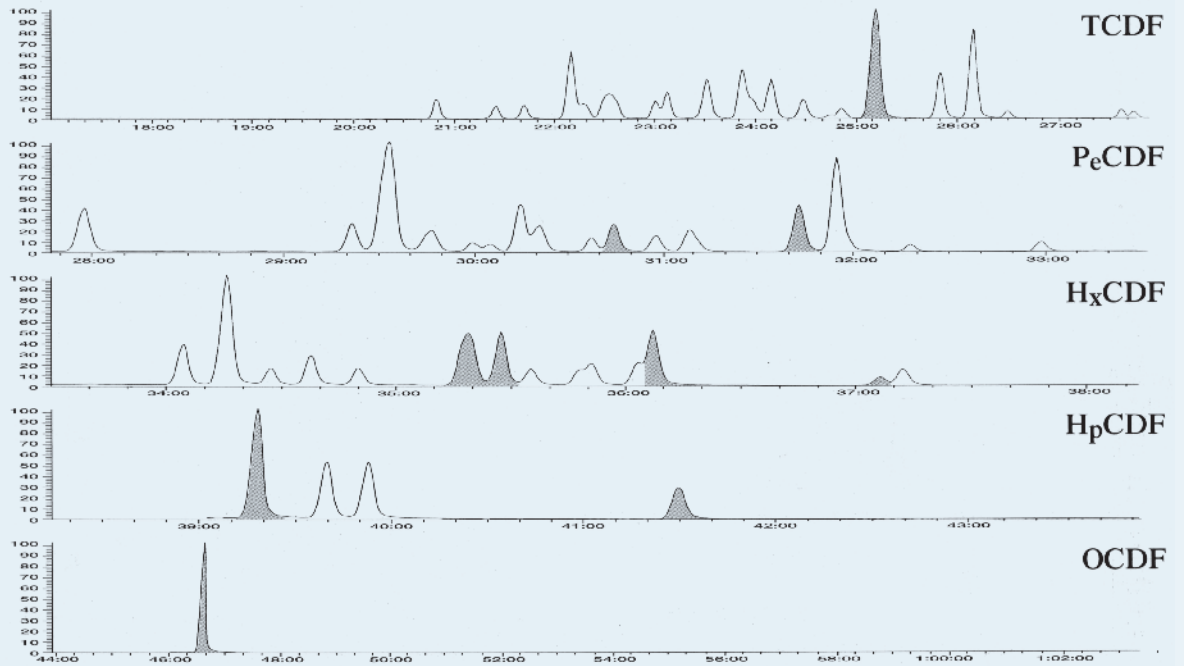
TKG 1070-2

TRB-5MS DIOXINES. EMISION SAMPLE



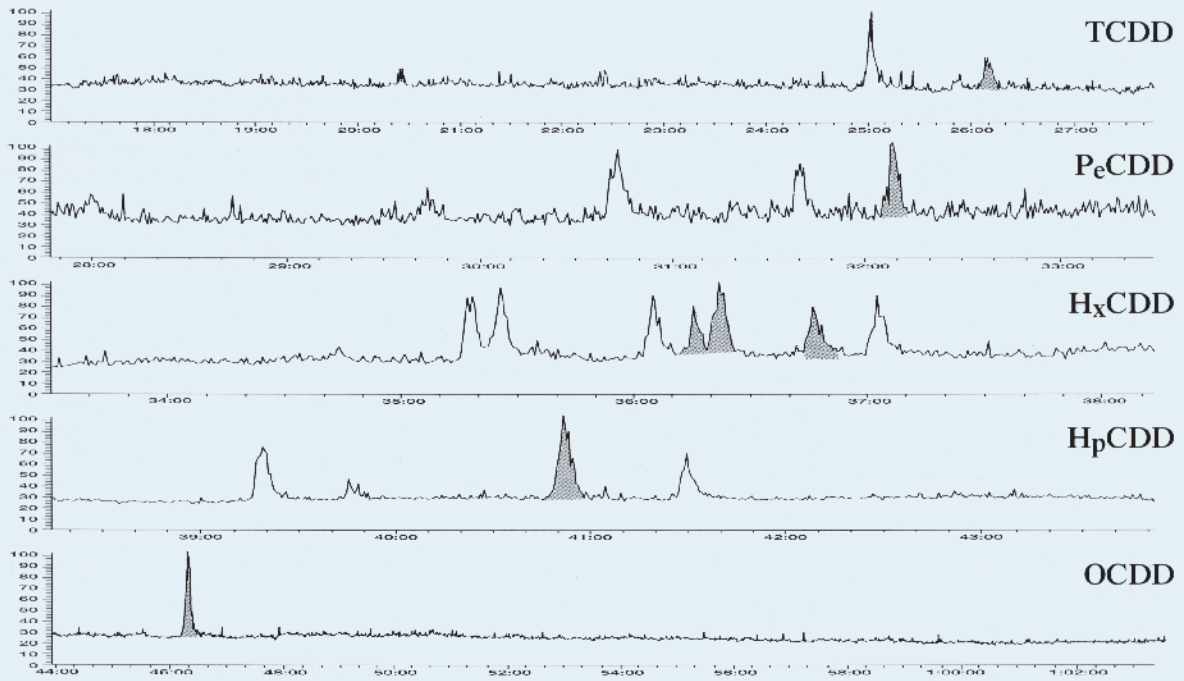
TKG 1071-2

TRB-5MS FURANES. EMISION SAMPLE



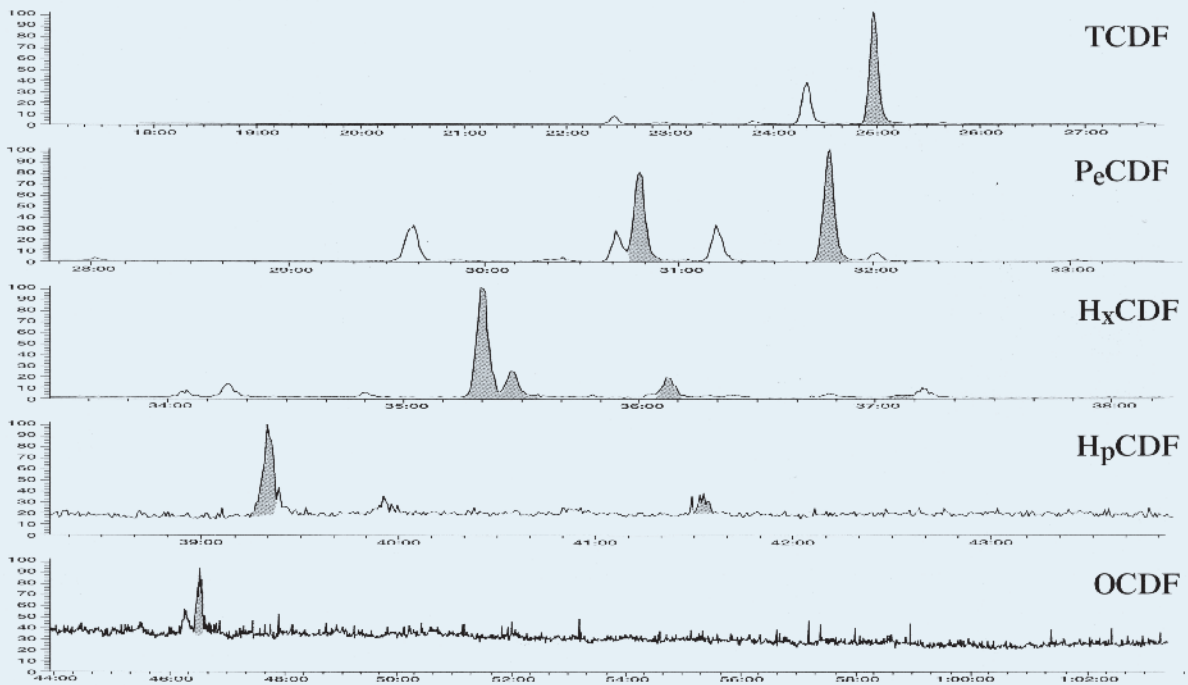
TKG 1071

TRB-5MS DIOXINES - FOOD SAMPLE

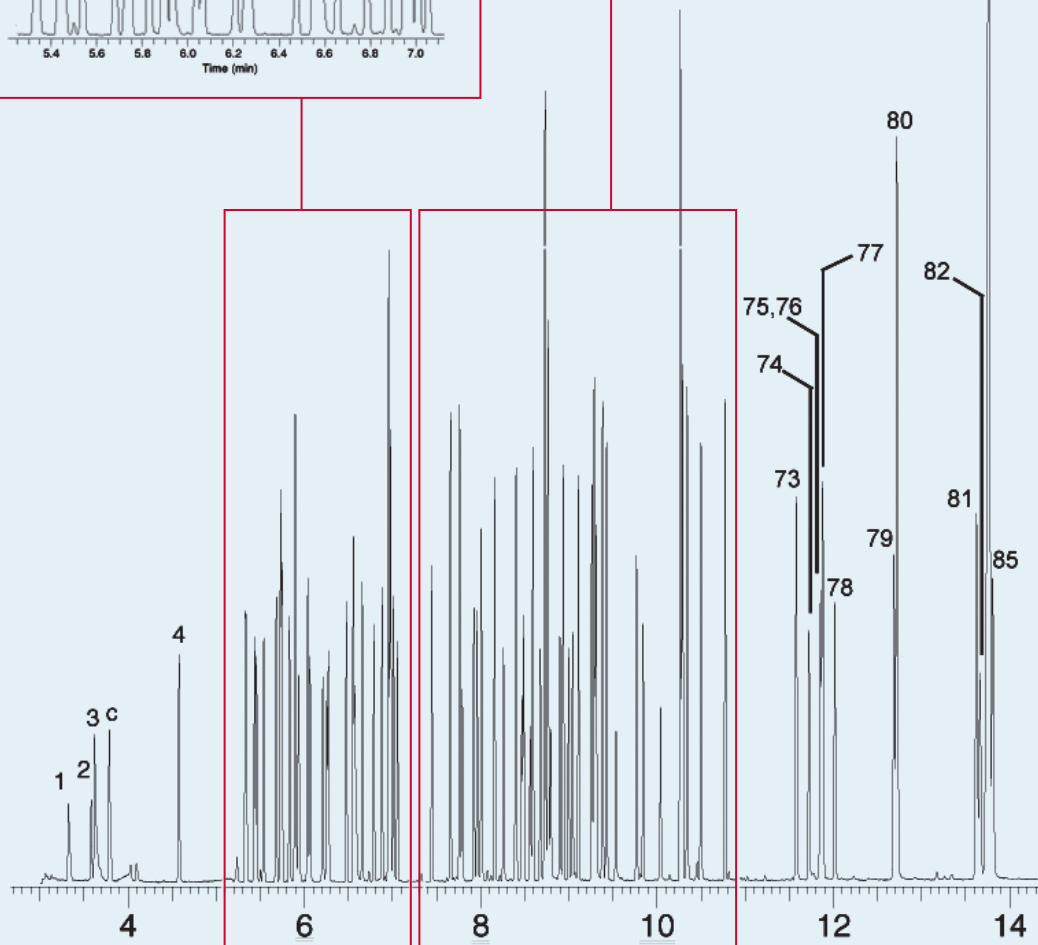
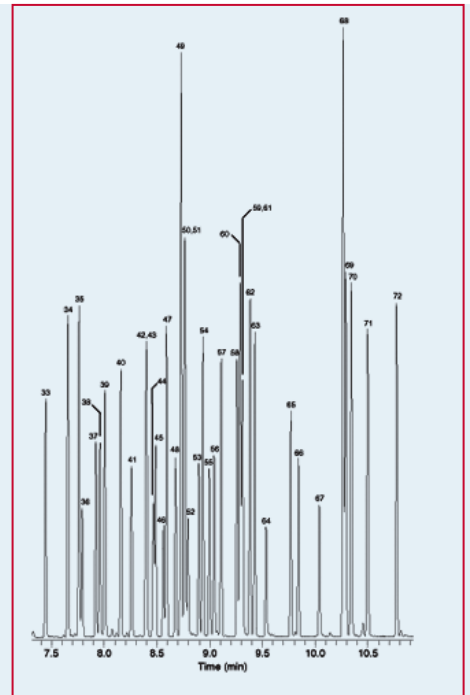
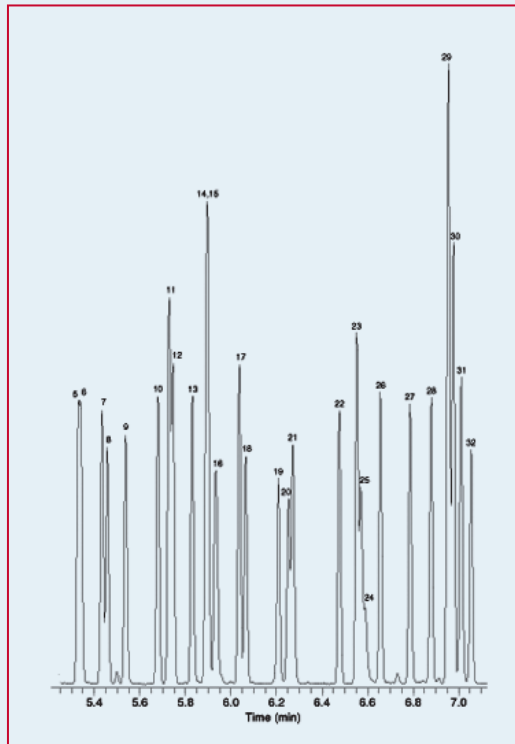


TKG 1072

TRB-5MS FURANES - FOOD SAMPLE



TKG 1073

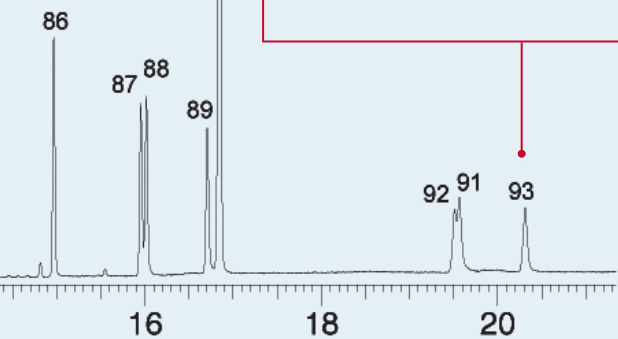
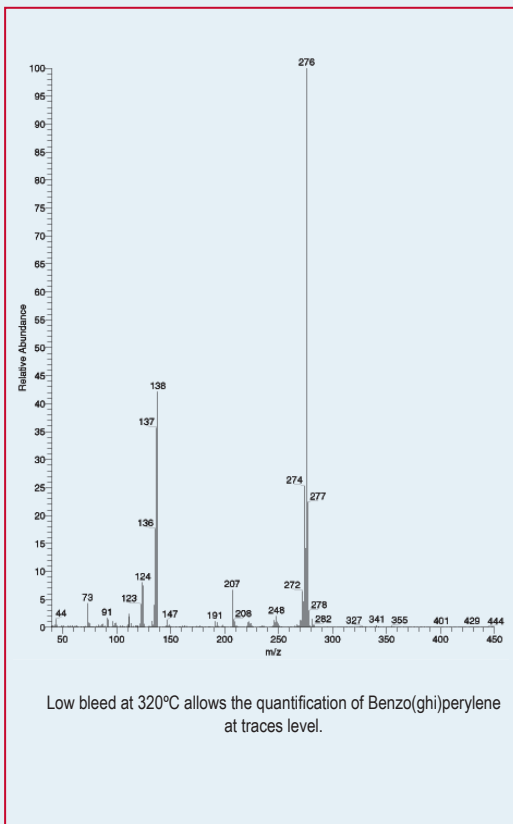


OPTIMUM RESOLUTION IN SEMIVOLATILE COMPOUNDS ANALYSIS

Column: **Meta.X5**, 30m x 0.25mm x 0.5µm (P/N: TR-820532)
 Inj.: Splitless w/Surge: pulse 25psi @ 0.30min, 40ml/min @ 0.25min
 Inj. temp.: 250°C
 Oven temp.: 35°C (1min) to 280°C @ 25°C/min to 320°C (5min) @ 6°C/min
 Carrier gas: Helium, constant flow @ 1.2ml/min
 Det.: MS
 Transfer line temp.: 280°C
 Ionization mode: EI
 Scan range: 35-550amu
 Sample: 1µl of 10ppm (IS 40ppm) Mix US EPA Method 8270
 Liner: 4mm Drilled Uniliner (hole near bottom)

Peak Name

- | | |
|------------------------------------|---------------------------------|
| 1. 1,4-dioxane | 47. acenaphthylene |
| 2. N-nitrosodimethylamine | 48. 3-nitroaniline |
| 3. pyridine | 49. acenaphthene-d10 |
| c. toluene | 50. 2,4-dinitrophenol |
| 4. 2-fluorophenol | 51. acenaphthene |
| 5. phenol-d6 | 52. 4-nitrophenol |
| 6. phenol | 53. 2,4-dinitrotoluene |
| 7. aniline | 54. dibenzofuran |
| 8. bis(2-chloroethyl)ether | 55. 2,3,5,6-tetrachlorophenol |
| 9. 2-chlorophenol | 56. 2,3,4,6-tetrachlorophenol |
| 10. 1,3-dichlorobenzene | 57. diethyl phthalate |
| 11. 1,4-dichlorobenzene-d4 | 58. 4-chlorophenyl phenyl ether |
| 12. 1,4-dichlorobenzene | 59. 4-nitroaniline |
| 13. benzyl alcohol | 60. fluorene |
| 14. 2-methylphenol | 61. 4,6-dinitro-2-methylphenol |
| 15. 1,2-dichlorobenzene | 62. diphenylamine |
| 16. bis(2-chloroisopropyl)ether | 63. azobenzene |
| 17. 3-methylphenol/ 4-methylphenol | 64. 2,4,6-tribromophenol |
| 18. N-nitroso-di-n-propylamine | 65. 4-bromophenyl phenyl ether |
| 19. Hexachloroethane | 66. hexachlorobenzene |
| 20. nitrobenzene-d5 | 67. pentachlorophenol |
| 21. nitrobenzene | 68. phenanthrene-d10 |
| 22. isophorone | 69. phenanthrene |
| 23. 2,4-dimethylphenol | 70. anthracene |
| 24. Benzoic acid | 71. carbazole |
| 25. 2-nitrophenol | 72. di-n-butyl phthalate |
| 26. bis(2-chloroethoxy)methane | 73. fluoranthene |
| 27. 2,4-dichlorophenol | 74. benzidine |
| 28. 1,2,4-trichlorobenzene | 75. pyrene-d10 |
| 29. naphthalene-d8 | 76. 3,3'-dimethylbenzidine |
| 30. naphthalene | 77. pyrene |
| 31. 4-chloroaniline | 78. p-terphenyl-d14 |
| 32. hexachlorobutadiene | 79. benzyl butyl phthalate |
| 33. 4-chloro-3-methylphenol | 80. bis(2-ethylhexyl)adipate |
| 34. 2-methylnaphthalene | 81. bis(2-ethylhexyl)phthalate |
| 35. 1-methylnaphthalene | 82. 3,3'-dichlorobenzidine |
| 36. hexachlorocyclopentadiene | 83. benzo(a)anthracene |
| 37. 2,4,6-trichlorophenol | 84. chrysene-d12 |
| 38. 2,4,5-trichlorophenol | 85. chrysene |
| 39. 2-fluorobiphenyl | 86. di-n-octyl phthalate |
| 40. 2-chloronaphthalene | 87. benzo(b)fluoranthene |
| 41. 2-nitroaniline | 88. benzo(k)fluoranthene |
| 42. 1,4-dinitrobenzene | 89. benzo(a)pyrene |
| 43. dimethyl phthalate | 90. perylene-d12 |
| 44. 1,3-dinitrobenzene | 91. dibenzo(a,h)anthracene |
| 45. 2,6-dinitrotoluene | 92. indeno(1,2,3-cd)pyrene |
| 46. 1,2-dinitrobenzene | 93. benzo(ghi)perylene |



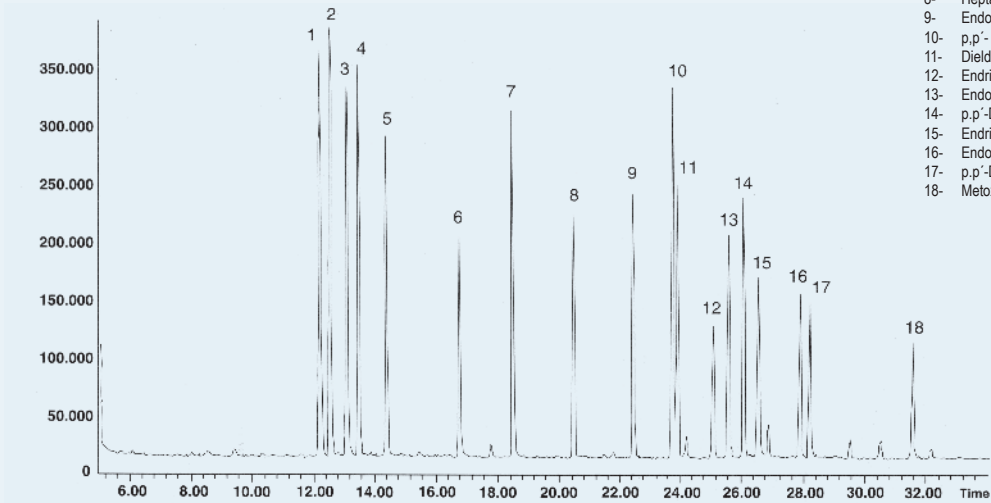
PESTICIDES ANALYSIS

Column: **Meta X5** P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1.0 µl standard, 10 ppm in Isooctane, splitless, 250°C
 Carrier gas: He, constant pressure, 9 psi (62 kPa)
 Oven program: 100°C (3.1min.) to 170°C @ 50°C/min. to 300°C(5.6min.) @ 5°C/min.
 Detector: MSD @ 280°C, scan 50-500 amus

Peak Name

- 1- α-Hexachlorocyclohexane
- 2- Hexachlorobenzene
- 3- γ-Hexachlorobenzene
- 4- β-Hexachlorocyclohexane
- 5- Heptachlor
- 6- δ-Hexachlorocyclohexane
- 7- Aldrin
- 8- Heptachlor epoxide
- 9- Endosulfan I
- 10- p,p'-DDE
- 11- Dieldrin
- 12- Endrin
- 13- Endosulfan II
- 14- p,p'-DDD
- 15- Endrin Aldehyde
- 16- Endosulfan sulfate
- 17- p,p'-DDT
- 18- Metoxychlor

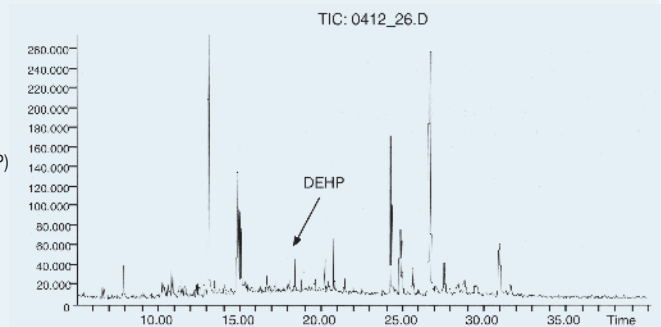
Chromatogram supplied by J. Diaz from Chromatography Department, IQS.



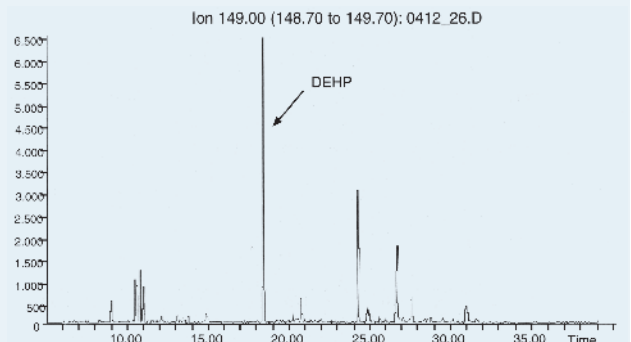
TKG 1078

PURIFIER SLUDGE ANALYSIS

Column: **Meta X5** P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 2.0 µl standard (split 1:50), 280°C
 Carrier gas: He, 9 psi (62 kPa)
 Oven temperature: 120°C (1min.) to 300°C (21min.) @ 10°C/min.
 Detector: MS, full scan 50-550 amu, 280°C
 Sample: Urban purifier sludge (250ppm di (2-ethylhexyl) phthalate, DEHP)



Chromatogram from B. Bagó, J. Diaz. Chromatography Dep. IQS.



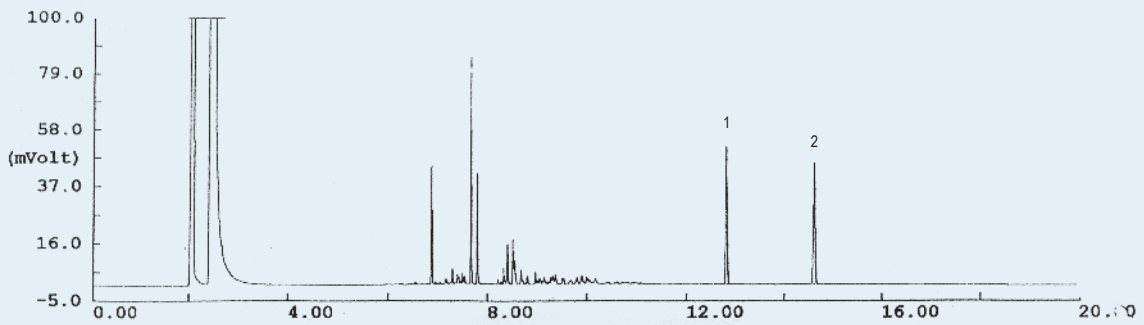
TKG 1080- TKG 1081

SEPARATION OF PESTICIDES

Column: **Meta .X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (600 mg/L), split 1:20, 200°C
 Carrier gas: He, 1mL/min
 Oven program: 90°C(1min) @ 20°C/min to 200°C @ 3°C/min to 220°C
 Detector: ECD, 250°C

Chromatogram provided by AINIA

Peak Name	RT (min)
1 Nonadecane (Internal Standard)	12.79
2 Chlorpiryphos	14.59



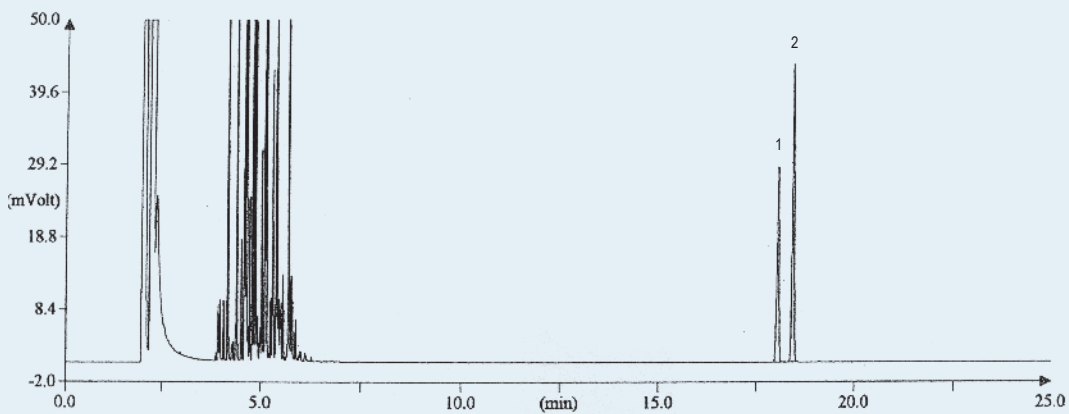
TKG 1084

SEPARATION OF PESTICIDES

Column: **Meta .X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (717 mg/L), split 1:20, 200°C
 Carrier gas: He, 1mL/min
 Oven program: 70°C(1min) @ 20°C/min to 150°C @ 3°C/min to 200°C
 Detector: ECD, 250°C

Chromatogram provided by AINIA

Peak Name	RT (min)
1 Methyl chlorpiryphos	18.07
2 Nonadecane (Internal Standard)	18.45



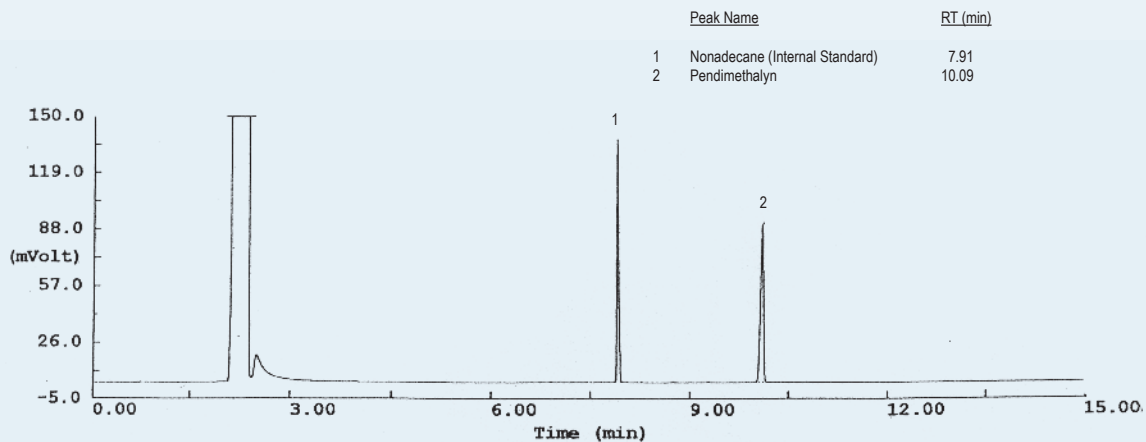
TKG 1085

SEPARATION OF PESTICIDES

Column: **Meta .X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (440 mg/L), split 1:20, 200°C
 Carrier gas: He, 1mL/min
 Oven program: 70°C(1min) @ 20°C/min to 150°C @ 3°C/min to 200°C
 Detector: ECD, 250°C

Chromatogram provided by AINIA

TKG 1258

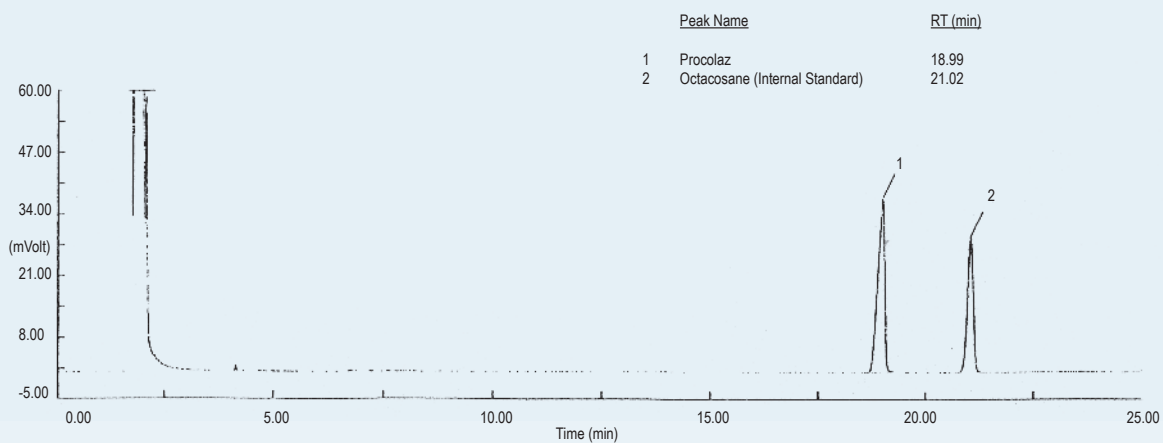


TKG 1086

SEPARATION OF PESTICIDES

Column: **Meta .X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (1950 mg/L), split 1:20, 200°C
 Carrier gas: He, 1mL/min
 Oven program: 70°C(1min) @ 20°C/min to 150°C @ 3°C/min to 200°C
 Detector: ECD, 250°C

Chromatogram provided by AINIA



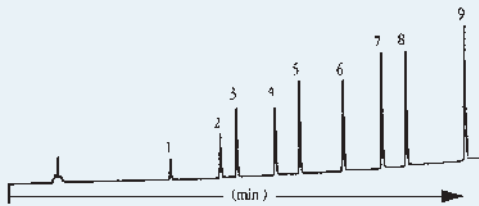
TKG 1087

FREE ACIDS IN WATER

Column: **TRB-FFAP**, P/N TR-151035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 1 µL, split
 Carrier gas: He, 4 psi (27.56 KPa)
 Oven temperature: 120°C @ 4°C/min to 220°C
 Detector: FID, 275°C

Peak Name

- 1- Acetic acid
- 2- Propionic acid
- 3- Isobutyric acid
- 4- Butyric acid
- 5- Isovaleric acid
- 6- Valeric acid
- 7- Isocaproic acid
- 8- Caproic acid
- 9- Heptanoic acid



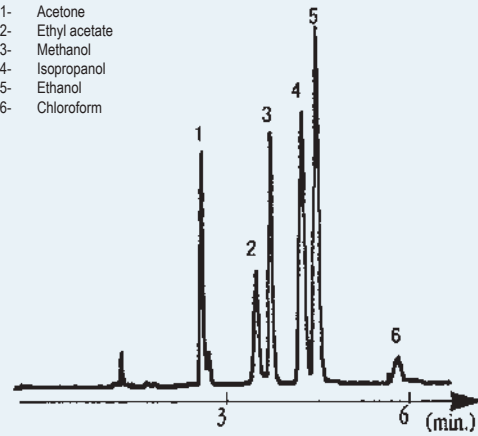
TKG 1148

SOLVENTS IN WATER (100 ppm)

Column: **TRB-WAX**, P/N TR-142065
 Dimensions: 60m x 0.53mm x 2.0 µm
 Injection: 1 µL, split
 Carrier gas: He, 14 psi (96.46 KPa)
 Oven temperature: 60°C (Isothermal)
 Detector: FID, 280°C

Peak Name

- 1- Acetone
- 2- Ethyl acetate
- 3- Methanol
- 4- Isopropanol
- 5- Ethanol
- 6- Chloroform



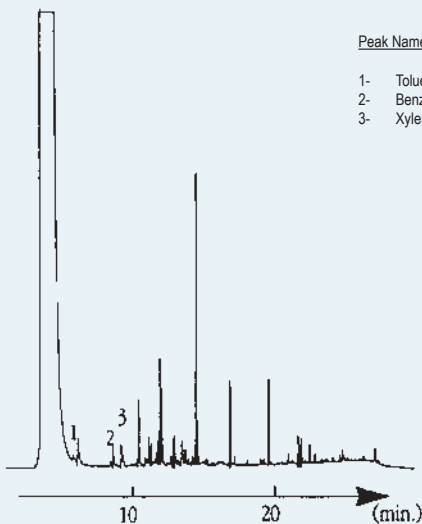
TKG 1158

ANALYSIS OF FIRE RESIDUES (PYROLISIS)

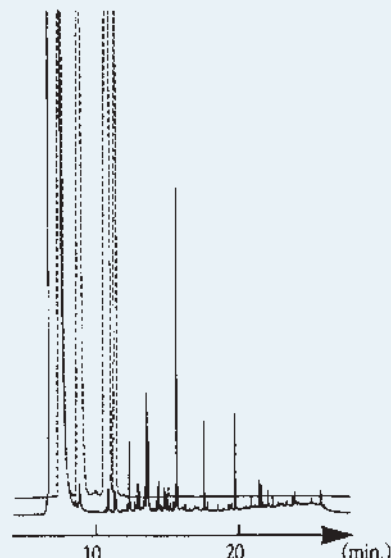
Column: **TRB-5**, P/N TR-120262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: 1 µL, splitless
 Carrier gas: He, 1.8 mL/min
 Oven temperature: 150°C @ 2°C/min to 225°C
 Detector: FID, 300°C

Peak Name

- 1- Toluene
- 2- Benzene
- 3- Xylene



Chromatogram provided by Montse Elias and Jordi Codina from Laboratori General d'Assaigs i Investigacions

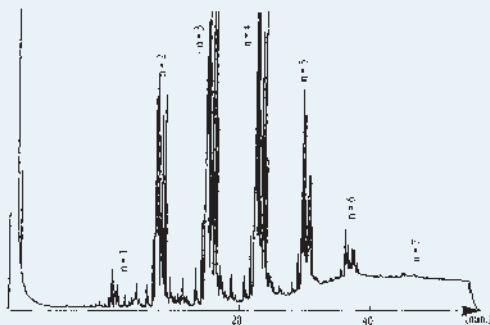


TKG 1150

ANALYSIS OF NONYLPHENOLS

Column: **TRB-5**, P/N TR-120262
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, split
 Carrier gas: H₂, 50 cm/s (110°C)
 Oven temperature: 110°C @ 20°C/min to 220°C(1min) @ 4°C/min to 300°C
 Detector: FID, 310°C

Chromatogram provided by Dr. Caixach from Laboratori Espectrometria Masses, CSIC, Barcelona.

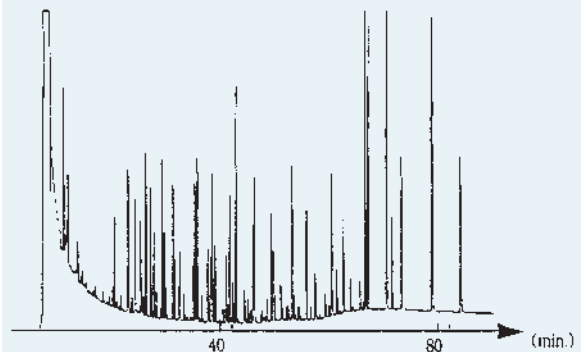


TKG 1151

ANALYSIS OF AROCLORS

Column: **TRB-5**, P/N TR-122168
 Dimensions: 60m x 0.22mm x 0.20 µm
 Injection: splitless
 Carrier gas: H₂, 150 KPa
 Oven temperature: 80°C(3,1min) @ 50°C/min to 190°C(5min) @ 1°C/min to 230°C(4min) @ 4°C/min to 260°C
 Detector: ECD, 350°C

Chromatogram provided by C. Rodríguez and L. Comellas from Institut Químic de Sarrià, Barcelona.



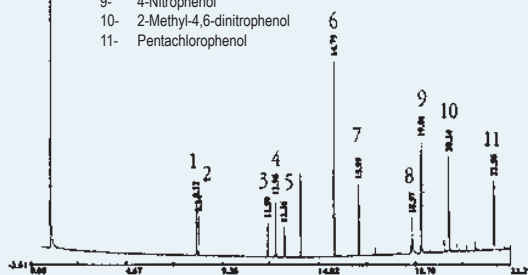
TKG 1152

PHENOLS EPA 604

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, split, 2 to 6 ng/comp, 250°C
 Carrier gas: H₂, 12 psi (82.68 KPa)
 Oven temperature: 80°C(4min) @ 8°C/min to 250°C
 Detector: FID, 280°C

Peak Name

- 1- Phenol
- 2- Chlorophenol
- 3- 2-Nitrophenol
- 4- 2,4-Dimethylphenol
- 5- 2,4-Dichlorophenol
- 6- 4-Chloro-3-methylphenol
- 7- 2,4,6-Trichlorophenol
- 8- 2,4-Dinitrophenol
- 9- 4-Nitrophenol
- 10- 2-Methyl-4,6-dinitrophenol
- 11- Pentachlorophenol



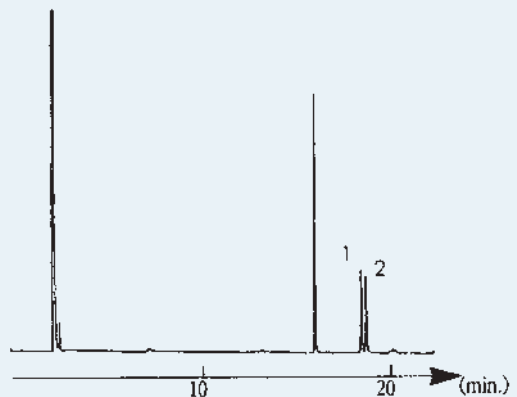
TKG 1153

ANALYSIS OF PESTICIDES

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, split
 Carrier gas: He, 14 psi (96.46 KPa)
 Oven temperature: 150°C @ 5°C/min to 265°C
 Detector: FID, 325°C

Peak Name

- 1- Captan
- 2- Folpet

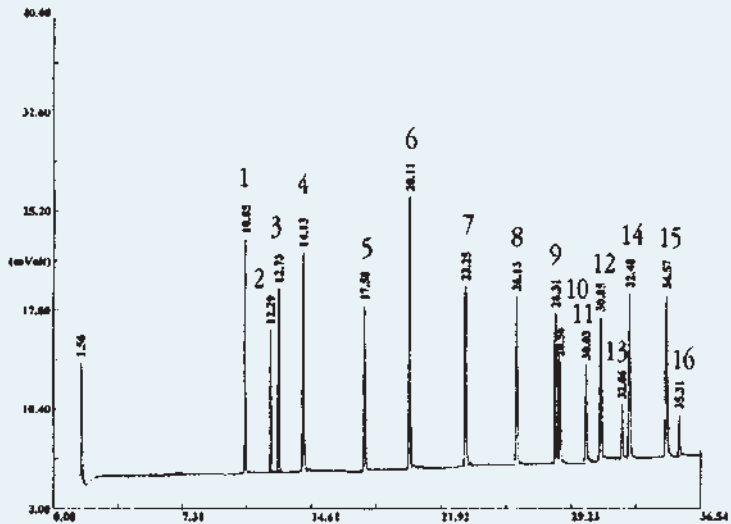


TKG 1155

ORGANOCHLORINATED PESTICIDES EPA 608

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 0.8 µL pesticides standard (40-400 pg), split, 230°C
 Carrier gas: H₂, 42 cm/s (150°C)
 Oven temperature: 150°C @ 2°C/min to 225°C
 Detector: FID, 300°C

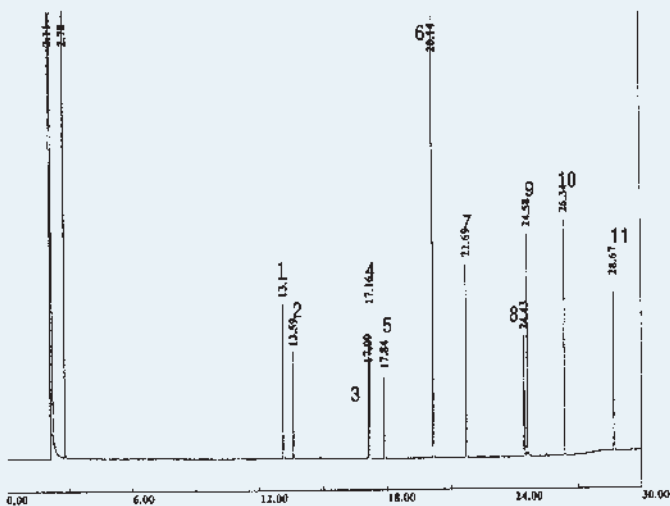
- Peak Name
- 1- α-BHC
 - 2- β-BHC
 - 3- γ-BHC
 - 4- δ-BHC
 - 5- heptachlor
 - 6- aldrin
 - 7- heptachlor epoxide
 - 8- endosulfan I
 - 9- dieldrin
 - 10- 4,4'-DDE
 - 11- endrin
 - 12- endosulfan II
 - 13- 4,4'-DDD
 - 14- endrin aldehyde
 - 15- endosulfan sulfate
 - 16- 4,4'-DDT



TKG 1149

SEPARATION OF PHENOLS EPA 604

Column: **TRB-5**, P/N TR-120469
 Dimensions: 60m x 0.20mm x 0.4 µm
 Injection: 1 µL standard phenols EPA 604, split
 Carrier gas: H₂, 38.5 psi (265.27 KPa)
 Oven temperature: 50°C(4min) @ 8°C/min to 250°C(5min)
 Detector: FID, 280°C



- Peak Name
- 1- Phenol
 - 2- 2-Chlorophenol
 - 3- 2-Nitrophenol
 - 4- 2,4-Dimethylphenol
 - 5- 2,4-Dichlorophenol
 - 6- 4-Chloro-3-methylphenol
 - 7- 2,4,6-Trichlorophenol
 - 8- 2,4-Dinitrophenol
 - 9- 4-Nitrophenol
 - 10- 2-Methyl-4,6-dinitrophenol
 - 11- Pentachlorophenol

TKG 1159

AROCLOL 1254 IN ISOCTANE (10 PPM)

Column: **TRB-5MS**, P/N TR-520262

Size: 60m x 0.25mm x 0.25µm

Injection: splitless 60s, 270°C

Sample: 1 µL Aroclors 1242, 1254 and 1260 standards in isooctane (10ppm), (1 ppm PCB30 and PCB209 internal standards)

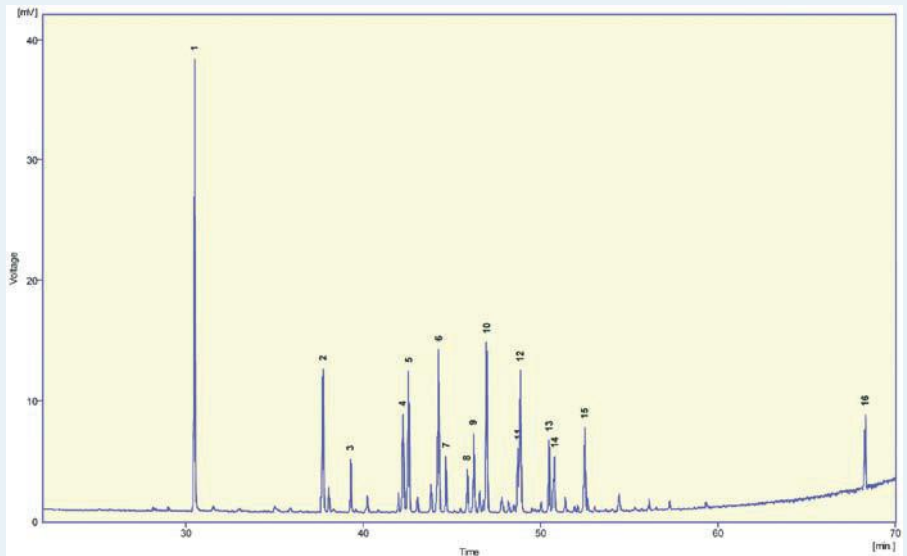
Carrier Gas: He, 1mL/min

Program temperature: 70°C (1min) @ 30°C/min to 130°C @ 2.5°C/min to 300°C (15min)

Detector: MS KONIK-TECH, Modo EI+ (70 eV), SIM m/z 186, 222, 292, 326, 360, 394, 430, 464, 498 (50 ms), Source 140°C, Interface 300°C, Photomultiplier 1000V.

Peak Name

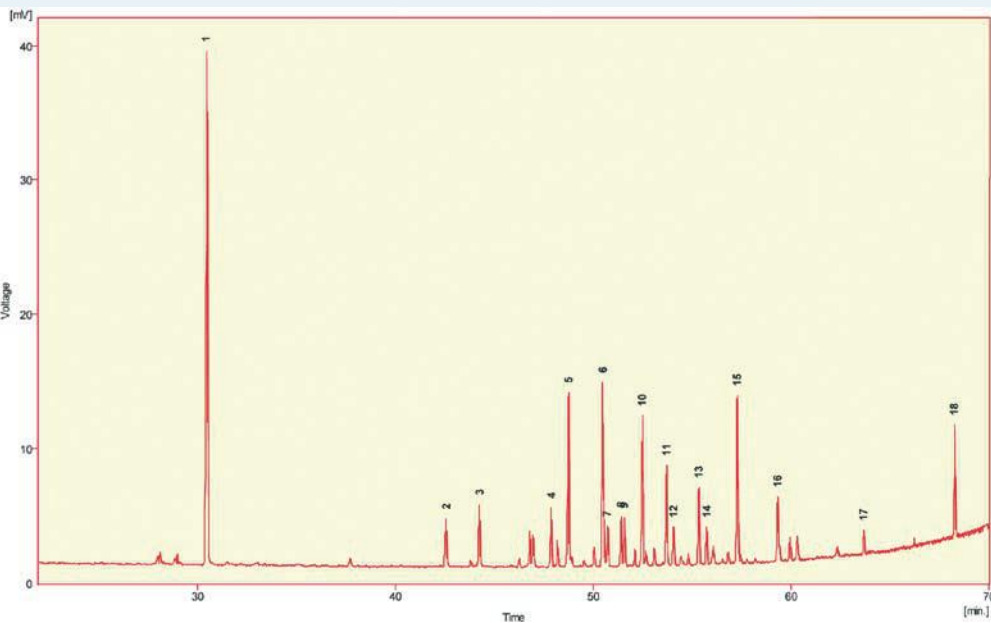
- 1 PCB30 (IS)
- 2 PCB52
- 3 PCB44
- 4 PCB70
- 5 PCB66 / PCB95
- 6 PCB101
- 7 PCB99
- 8 PCB97
- 9 PCB87
- 10 PCB110
- 11 PCB149
- 12 PCB118
- 13 PCB153
- 14 PCB105
- 15 PCB138
- 16 PCB209 (IS)



Chromatogram provided by José Antonio Muñoz from KONIK-TECH, S.A

TKG 1224

AROCLOL 1260 IN ISOCTANE (10 PPM)

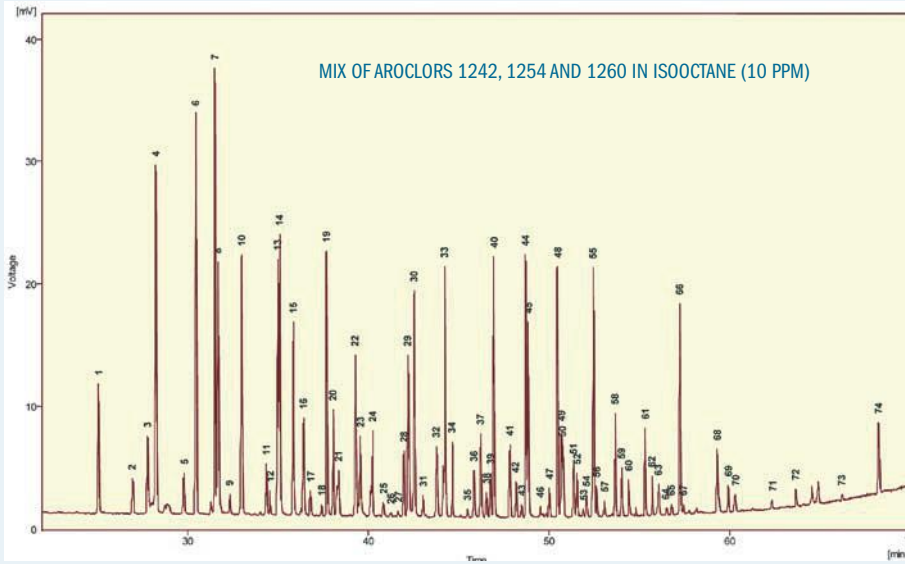


Peak Name

- 1 PCB30 (IS)
- 2 PCB95
- 3 PCB101
- 4 PCB151
- 5 PCB149
- 6 PCB153
- 7 PCB132
- 8 PCB141
- 9 PCB179
- 10 PCB138/PCB163
- 11 PCB187
- 12 PCB183
- 13 PCB174
- 14 PCB177
- 15 PCB180
- 16 PCB170
- 17 PCB194
- 18 PCB209 (IS)

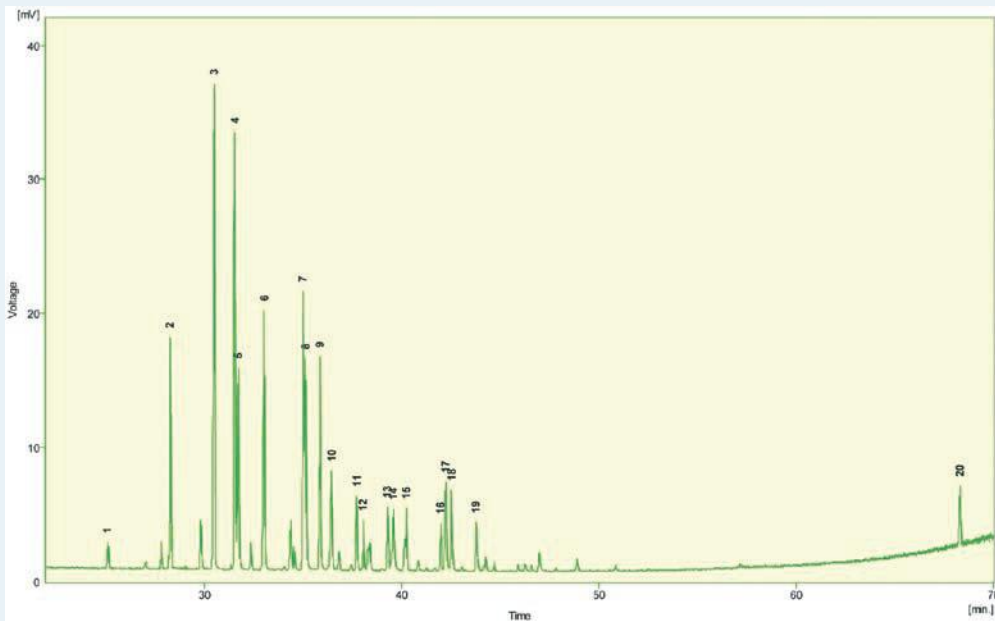
TKG 1225

ID	Compound	Rt (min)	ID	Compound	Rt (min)	ID	Compound	Rt (min)	ID	Compound	Rt (min)
1	PCB4 / PCB10	25,10	13	PCB31	35,01	25	PCB40	40,85	38	PCB85	46,58
2	PCB7 / PCB9	26,96	14	PCB28	35,12	26	PCB67 / PCB100	41,28	39	PCB136	46,79
3	PCB6	27,80	15	PCB20 / PCB33 / PCB53	35,85	27	PCB63	41,69	40	PCB110	46,98
4	PCB5 / PCB8	28,25	16	PCB22 / PCB51	36,45	28	PCB74	41,98	41	PCB151 / PCB82	47,88
5	PCB19	29,84	17	PCB45	36,84	29	PCB70	42,23	42	PCB135	48,19
6	PCB30 (IS)	30,48	18	PCB46	37,44	30	PCB66 / PCB95	42,57	43	PCB107	48,51
7	PCB18	31,55	19	PCB52 / PCB69	37,73	32	PCB56 / PCB60	43,79	44	PCB149 / PCB123	48,74
8	PCB15 / PCB17	31,71	20	PCB49	38,08	33	PCB101 / PCB90	44,26	45	PCB118	48,87
9	PCB24 / PCB27	32,36	21	PCB47 / PCB48 / PCB75	38,39	34	PCB99	44,67	46	PCB134	49,52
10	PCB16 / PCB32	33,02	22	PCB44	39,30	35	PCB83	45,50	47	PCB146	50,05
11	PCB26	34,37	23	PCB37 / PCB42 / PCB59	39,58	36	PCB97	45,86	48	PCB153	50,50
12	PCB25	34,58	24	PCB41 / PCB64	40,25	37	PCB87 / PCB115	46,24	49	PCB132	50,71
									50	PCB105	50,79
									51	PCB141	51,40
									52	PCB179	51,57
									53	PCB130	51,93
									54	PCB137 / PCB176	52,08
									55	PCB138 / PCB160 / PCB163	52,48
									56	PCB158	52,67
									57	PCB129 / PCB178	53,11
									58	PCB187	53,69
									59	PCB183	54,05
									60	PCB128	54,43
									61	PCB174	55,35
									62	PCB177	55,73
									63	PCB171 / PCB156	56,07
									64	PCB201 / PCB157 / PCB173	56,51
									65	PCB172	56,80
									66	PCB180	57,27
									67	PCB193	57,47
									68	PCB170 / PCB190	59,33
									69	PCB199	59,94
									70	PCB196 / PCB203	60,34
									71	PCB195 / PCB208	62,38
									72	PCB194	63,68
									73	PCB206	66,23
									74	PCB209 (IS)	68,25



TKG 1226

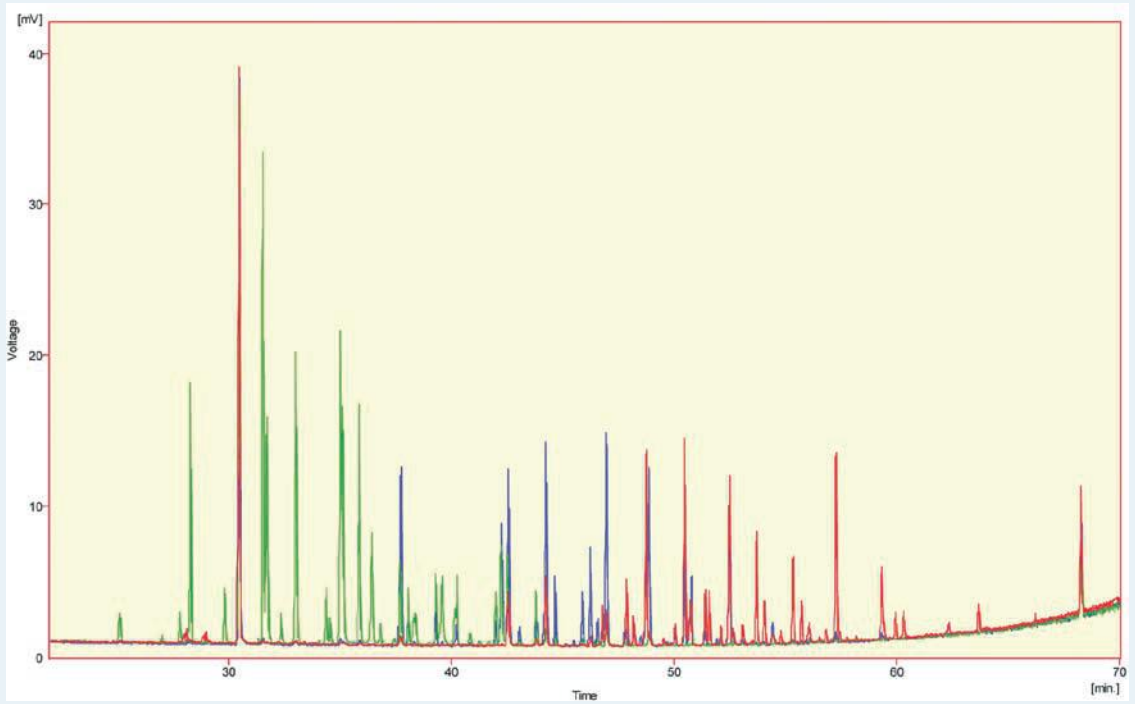
AROCLOR 1242 IN ISOCTANE (10 PPM)



Peak Name	
1	PCB4
2	PCB8
3	PCB30 (IS)
4	PCB18
5	PCB15/PCB17
6	PCB16/PCB32
7	PCB31
8	PCB28
9	PCB33
10	PCB22
11	PCB52
12	PCB49
13	PCB44
14	PCB37/PCB42/PCB59
15	PCB41/PCB64
16	PCB74
17	PCB70
18	PCB66
19	PCB56/PCB60
20	PCB209 (IS)

TKG 1227

SUPERIMPOSED INDIVIDUAL AROCLORS 1242 (GREEN), 1254 (BLUE), 1260 (RED) IN ISOCTANE (10 PPM)



TKG 1223

PCBs

Column: **TRB-5MS**, P/N TR-520262

Size: 60m x 0.25mm x 0.25µm

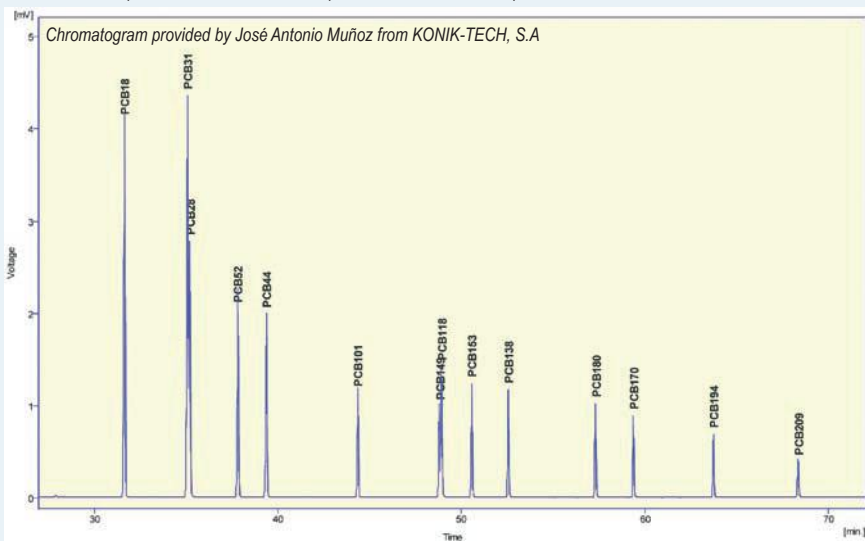
Injection: 1 µL standard mixture of 14 PCBs in isooctane (2ppm), splitless 60s, 270°C

Carrier Gas: He, 1mL/min

Program temperature: 70°C (1min) @ 30°C/min a 130°C @ 2.5°C/min a 300°C (15min)

Detector: MS KONIK-TECH, Mode EI+ (70 eV), SIM m/z 186, 222, 292, 326, 360, 394, 430, 464, 498 (50 ms),

Source Temperature 140°C, Interface temperature 300°C, Photomultiplier 1000V.



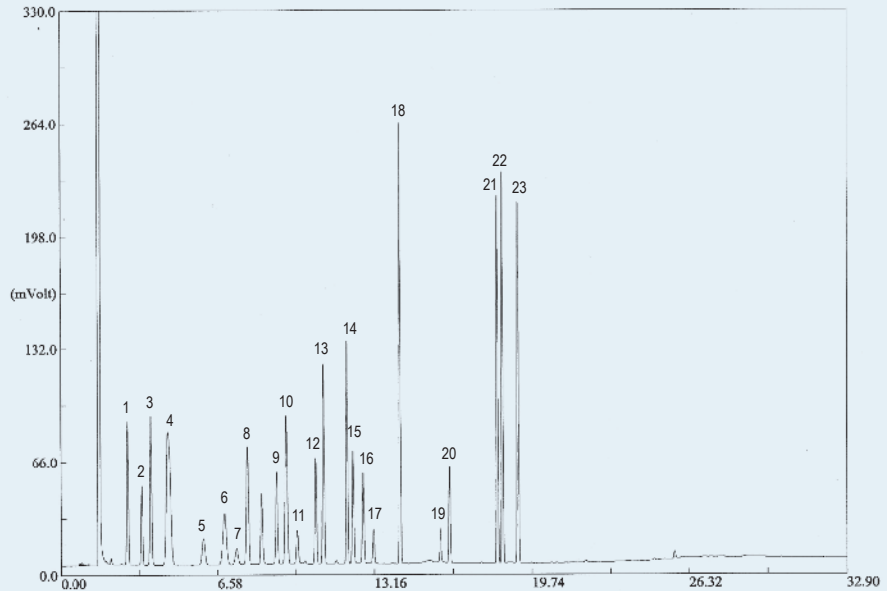
TKG 1222

EPA 601 PURGEABLE HALOCARBONS MIX

Column: **Meta. VOC**, P/N TR-943035
 Size: 30m x 0.53mm x 3.0µm
 Injection: 0.5µL EPA 601 purgeable halocarbons mix + 2-chloroethyl vinyl ether (2000 ng/µL), split 1:50, 280°C
 Carrier gas: He, constant flow 6 mL/min
 Oven Temperature: 40°C(6min) @ 8°C/min a 200°C(5min)
 Detector: FID, 280°C

Peak Name

- 1 1,1-Dichloroethylene
- 2 Methylene chloride
- 3 Trans-1,2-Dichloroethylene
- 4 1,1-Dichloroethane
- 5 Chloroform
- 6 1,1,1-Trichloroethane
- 7 Carbon tetrachloride
- 8 1,2-Dichloroethane
- 9 Trichloroethylene
- 10 1,2-Dichloropropane
- 11 Bromodichloromethane
- 12 2-Chloroethyl vinyl ether
- 13 cis-1,3- Dichloropropene
- 14 trans-1,3-Dichloropropene
- 15 1,1,2-Trichloroethane
- 16 Tetrachloroethylene
- 17 Dibromochloromethane
- 18 Chlorobenzene
- 19 Bromoform
- 20 1,1,2,2-Tetrachloroethane
- 21 1,3-Dichlorobenzene
- 22 1,4-Dichlorobenzene
- 23 1,2-Dichlorobenzene



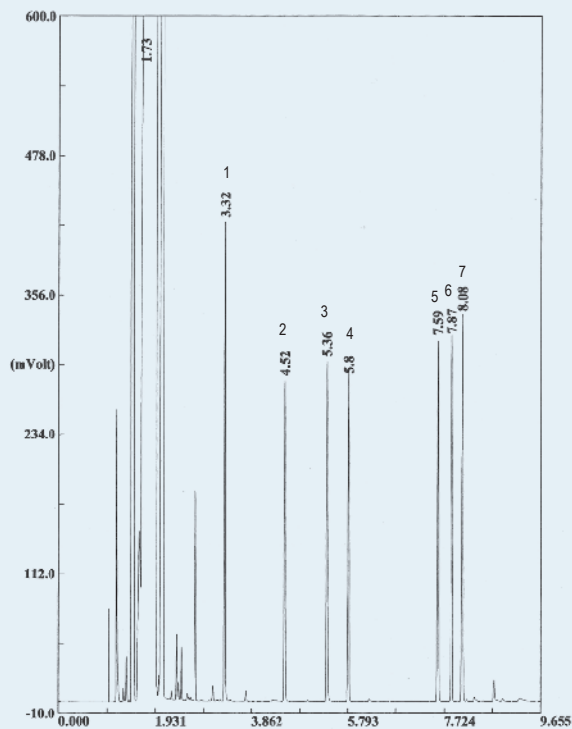
TKG 1205

ANALYSIS OF PYRIDINES

Column: **TRB-5A**, P/N TR-210533
 Size: 30m x 0.32mm x 0.5µm
 Injection: 1µL patrón, split 1:100 (50 ng/comp), 280°C
 Carrier gas: H₂, constant pressure 7 psi
 Oven temperature: 50°C(2min) @ 10°C/min to 180°C(2min)
 Detector: FID, 280°C

Peak Name

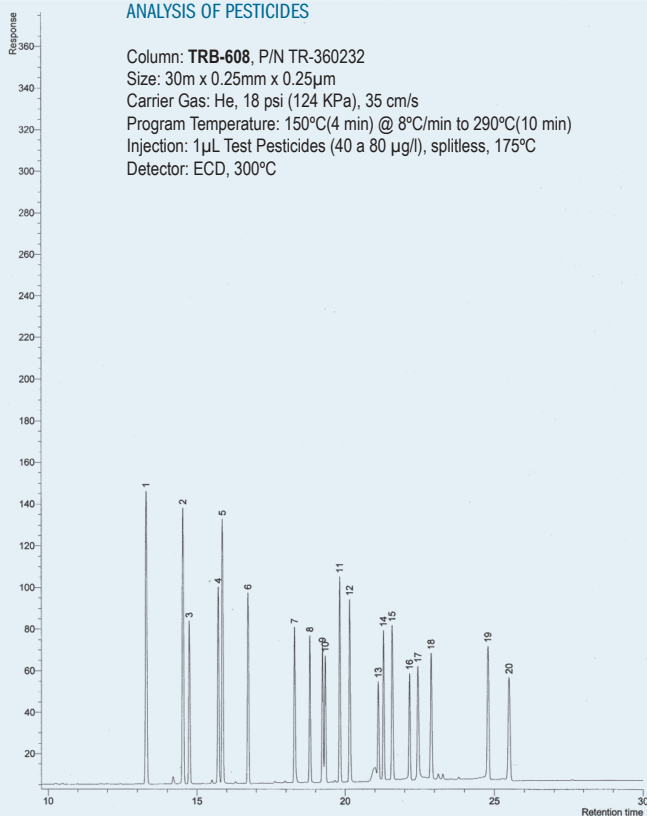
- 1 Pyridine
- 2 2-Picoline
- 3 3-Picoline
- 4 2,6-Lutidine
- 5 3,5-Lutidine
- 6 2,4,6-Collidine
- 7 3,4-Lutidine



TKG 1206

ANALYSIS OF PESTICIDES

Column: **TRB-608**, P/N TR-360232
 Size: 30m x 0.25mm x 0.25µm
 Carrier Gas: He, 18 psi (124 KPa), 35 cm/s
 Program Temperature: 150°C(4 min) @ 8°C/min to 290°C(10 min)
 Injection: 1µL Test Pesticides (40 a 80 µg/l), splitless, 175°C
 Detector: ECD, 300°C



Peak Name

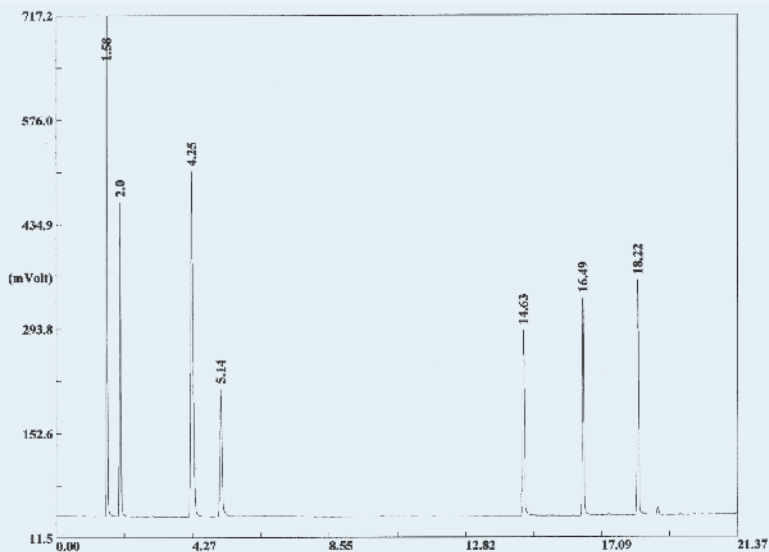
- 1 α-BHC
- 2 β-BHC
- 3 γ-BHC
- 4 Heptachlor
- 5 δ-BHC
- 6 Aldrin
- 7 Heptachlor epoxide
- 8 γ-Chlordane
- 9 α-Chlordane
- 10 Endosulfan I
- 11 p,p'-DDE
- 12 Dieldrin
- 13 Endrin
- 14 p,p'-DDD
- 15 Endosulfan II
- 16 p,p'-DDT
- 17 Endrin aldehyde
- 18 Endosulfan sulfate
- 19 Methoxychlor
- 20 Endrin Ketone

TKG 1211

AMINES

Column: **TRB-5A**, P/N TR-213035
 Size: 30m x 0.53mm x 3.0µm
 Injection: 1µL standard (wet needle), split 1:100 (50 ng/comp), 280°C
 Carrier Gas: H₂, constant pressure, 3 psi
 Program temperature: 35°C(3min) @ 10°C/min to 225°C(2min)
 Detector: FID, 300°C

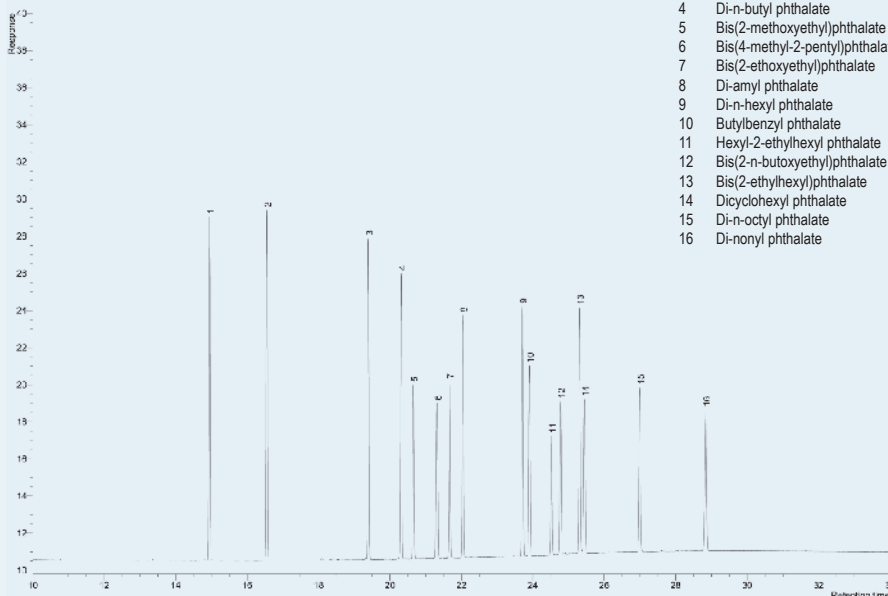
RT (min)	Peak Name
1.58	Ethyl amine
2.0	Isopropylamine
4.25	Isobutylamine
5.14	n-Butylamine
14.63	n-Octylamine
16.49	n-Nonylamine
18.22	n-Decylamine



TKG 1212

SEPARATION OF PHTHALATES

Column: **Meta.X5**, 30m x 0.25mm x 0.25µm (P/N: TR-820232)
 Carrier gas: Helium, 12psi, constant pressure mode
 Injection: 250°C, split ratio 35:1
 Oven temperature: 40°C (1min) to 325°C @ 12°C/min
 Detector: FID, 330°C
 Sample: 1µl Phthalate Ester Mix 1000µg/ml each compound

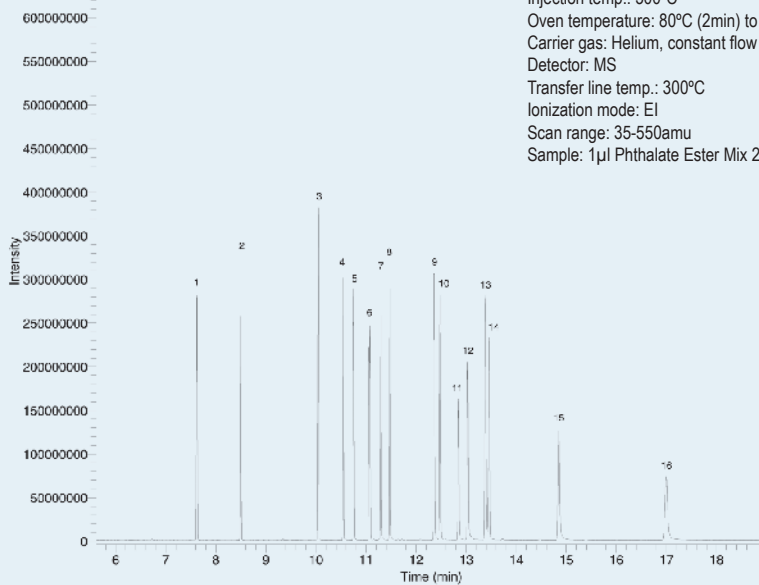


Peak Name
1 Dimethyl phthalate
2 Diethyl phthalate
3 Diisobutyl phthalate
4 Di-n-butyl phthalate
5 Bis(2-methoxyethyl)phthalate
6 Bis(4-methyl-2-pentyl)phthalate isomers
7 Bis(2-ethoxyethyl)phthalate
8 Di-amyl phthalate
9 Di-n-hexyl phthalate
10 Butylbenzyl phthalate
11 Hexyl-2-ethylhexyl phthalate
12 Bis(2-n-butoxyethyl)phthalate
13 Bis(2-ethylhexyl)phthalate
14 Dicyclohexyl phthalate
15 Di-n-octyl phthalate
16 Di-nonyl phthalate

TKG 1243

SEPARATION OF PHTHALATES

Column: **Meta.X5**, 30m x 0.25mm x 0.25µm (P/N: TR-820232)
 Injection: Splitless w/Surge: pulse 20psi @ 0.30min, 25ml/min @ 1min
 Injection temp.: 300°C
 Oven temperature: 80°C (2min) to 280°C (8min) @ 20°C/min
 Carrier gas: Helium, constant flow @ 1.5ml/min
 Detector: MS
 Transfer line temp.: 300°C
 Ionization mode: EI
 Scan range: 35-550amu
 Sample: 1µl Phthalate Ester Mix 20ppm each compound

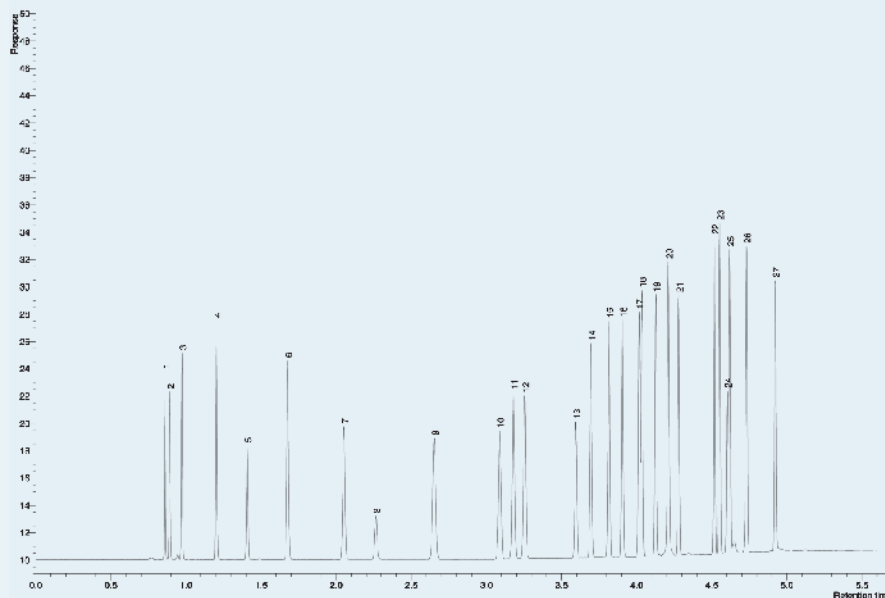


Peak Name
1 Dimethyl phthalate
2 Diethyl phthalate
3 Diisobutyl phthalate
4 Di-n-butyl phthalate
5 Bis(2-methoxyethyl)phthalate
6 Bis(4-methyl-2-pentyl)phthalate isomers
7 Bis(2-ethoxyethyl)phthalate
8 Di-amyl phthalate
9 Di-n-hexyl phthalate
10 Butylbenzyl phthalate
11 Hexyl-2-ethylhexyl phthalate
12 Bis(2-n-butoxyethyl)phthalate
13 Bis(2-ethylhexyl)phthalate
14 Dicyclohexyl phthalate
15 Di-n-octyl phthalate
16 Di-nonyl phthalate

TKG 1244

SEPARATION OF AROMATIC HYDROCARBONS

Column: **SupraWax-280**, 20m x 0.18mm x 0.18µm (P/N: TR-830984)
 Carrier gas: Helium, 33.1psi, constant pressure mode
 Injection: 250°C, split ratio 150:1
 Oven temperature: 60°C (3min) to 140°C (1min) @ 50°C/min
 Detector: FID, 250°C
 Sample: 25ng on-column each compound



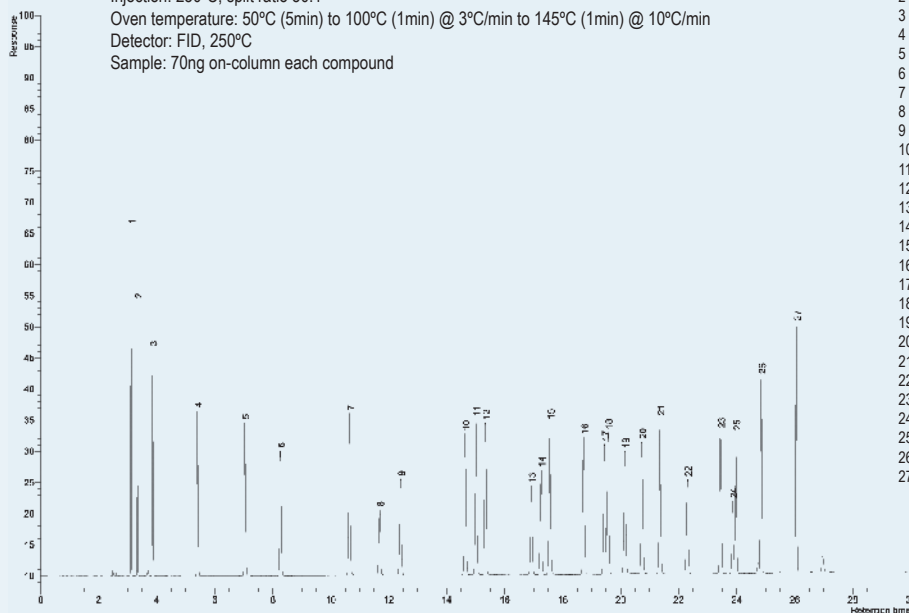
Peak Name

- 1 heptane
- 2 cyclohexane
- 3 octane
- 4 nonane
- 5 benzene
- 6 decane
- 7 toluene
- 8 1,4-dioxane
- 9 undecane
- 10 ethylbenzene
- 11 p-xylene
- 12 m-xylene
- 13 cumene
- 14 dodecane
- 15 o-xylene
- 16 propylbenzene
- 17 p-ethyltoluene
- 18 m-ethyltoluene
- 19 t-butylbenzene
- 20 s-butylbenzene
- 21 styrene
- 22 tridecane
- 23 diethylbenzeneisomer
- 24 diethylbenzeneisomer
- 25 n-butylbenzene
- 26 α-methylstyrene
- 27 phenylacetylene

TKG 1245

SEPARATION OF AROMATIC HYDROCARBONS

Column: **SupraWax-280**, 60m x 0.32mm x 0.5µm (P/N: TR-830563)
 Carrier gas: Helium, 25psi, constant pressure mode
 Injection: 250°C, split ratio 50:1
 Oven temperature: 50°C (5min) to 100°C (1min) @ 3°C/min to 145°C (1min) @ 10°C/min
 Detector: FID, 250°C
 Sample: 70ng on-column each compound



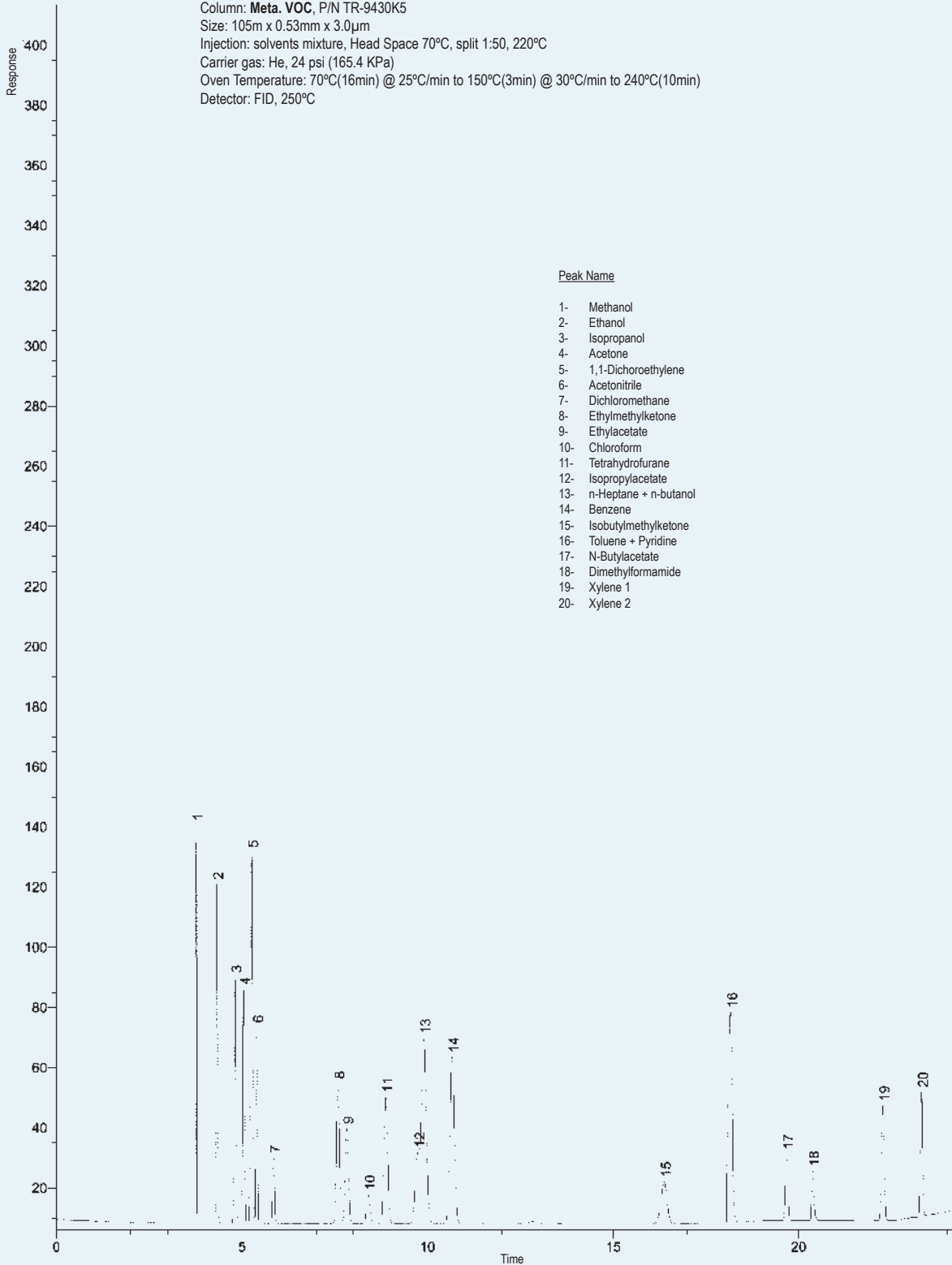
Peak Name

- 1 heptane
- 2 cyclohexane
- 3 octane
- 4 nonane
- 5 benzene
- 6 decane
- 7 toluene
- 8 1,4-dioxane
- 9 undecane
- 10 ethylbenzene
- 11 p-xylene
- 12 m-xylene
- 13 cumene
- 14 dodecane
- 15 o-xylene
- 16 propylbenzene
- 17 p-ethyltoluene
- 18 m-ethyltoluene
- 19 t-butylbenzene
- 20 s-butylbenzene
- 21 styrene
- 22 tridecane
- 23 diethylbenzeneisomer
- 24 diethylbenzeneisomer
- 25 n-butylbenzene
- 26 α-methylstyrene
- 27 phenylacetylene

TKG 1246

SEPARATION OF SOLVENTS

Column: **Meta. VOC**, P/N TR-9430K5
 Size: 105m x 0.53mm x 3.0µm
 Injection: solvents mixture, Head Space 70°C, split 1:50, 220°C
 Carrier gas: He, 24 psi (165.4 KPa)
 Oven Temperature: 70°C(16min) @ 25°C/min to 150°C(3min) @ 30°C/min to 240°C(10min)
 Detector: FID, 250°C

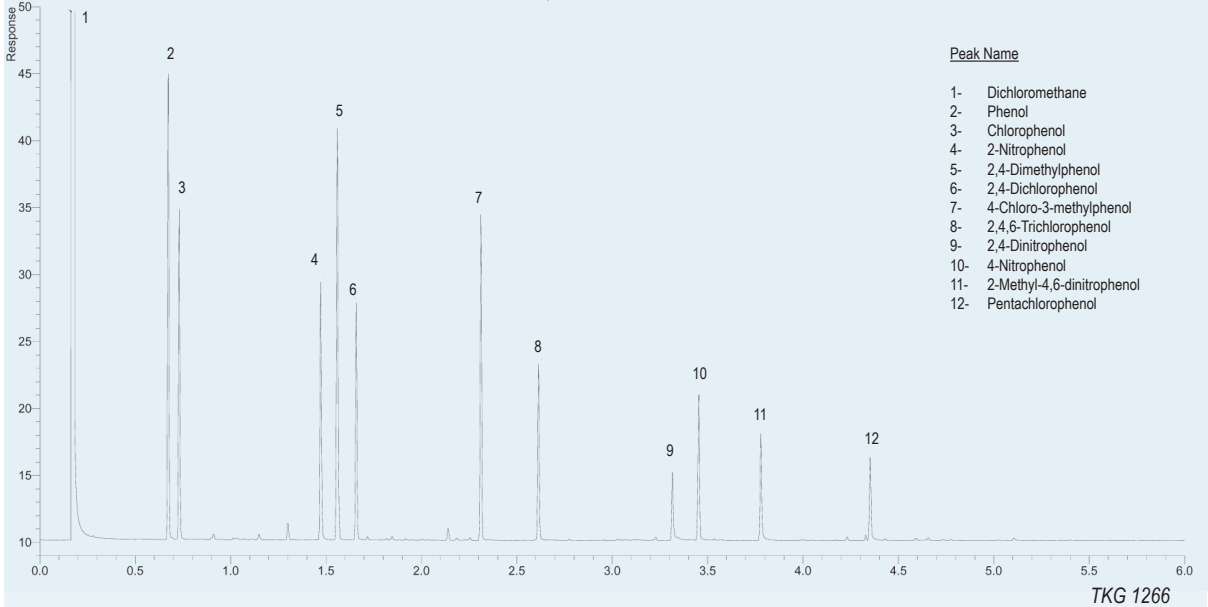


Peak Number	Peak Name
1-	Methanol
2-	Ethanol
3-	Isopropanol
4-	Acetone
5-	1,1-Dichloroethylene
6-	Acetonitrile
7-	Dichloromethane
8-	Ethylmethylketone
9-	Ethylacetate
10-	Chloroform
11-	Tetrahydrofuran
12-	Isopropylacetate
13-	n-Heptane + n-butanol
14-	Benzene
15-	Isobutylmethylketone
16-	Toluene + Pyridine
17-	N-Butylacetate
18-	Dimethylformamide
19-	Xylene 1
20-	Xylene 2

TKG 1257

PHENOLS EPA 604

Column: **TRB-5MS**, P/N TR-520141
 Size: 10m x 0.10mm x 0.10µm
 Injection: split 1:300, 280°C
 Sample: 0.3µL Standard (500 pg/comp)
 Carrier Gas: H₂, 35 psi
 Program temperature: 80°C(1min) @ 30°C/min to 200°C(1min)
 Detector: FID, 280°C

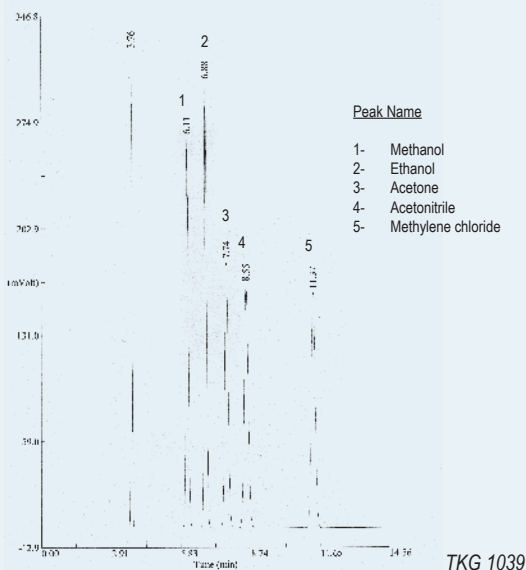


Peak Name

- 1- Dichloromethane
- 2- Phenol
- 3- Chlorophenol
- 4- 2-Nitrophenol
- 5- 2,4-Dimethylphenol
- 6- 2,4-Dichlorophenol
- 7- 4-Chloro-3-methylphenol
- 8- 2,4,6-Trichlorophenol
- 9- 2,4-Dinitrophenol
- 10- 4-Nitrophenol
- 11- 2-Methyl-4,6-dinitrophenol
- 12- Pentachlorophenol

SEPARATION OF SOLVENTS

Column: **TRB-1**, P/N TR-117065
 Dimensions: 60m x 0.53mm x 7.0 µm
 Injection: wet needle (solvent mixture), split 1:100, 260°C
 Carrier gas: He, constant pressure 6 psi (41.3 KPa).
 Oven program: 32°C (isothermal)
 Detector: FID, 260°C

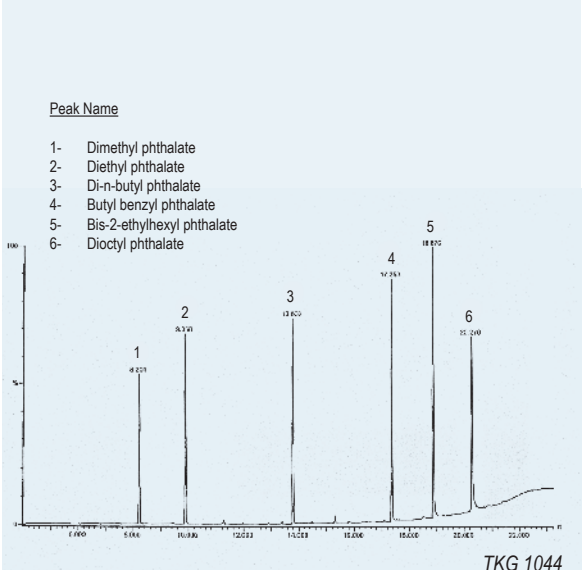


Peak Name

- 1- Methanol
- 2- Ethanol
- 3- Acetone
- 4- Acetonitrile
- 5- Methylene chloride

SEPARATION OF PAE (PHTHALATE ALKYL ESTER) MIX EPA

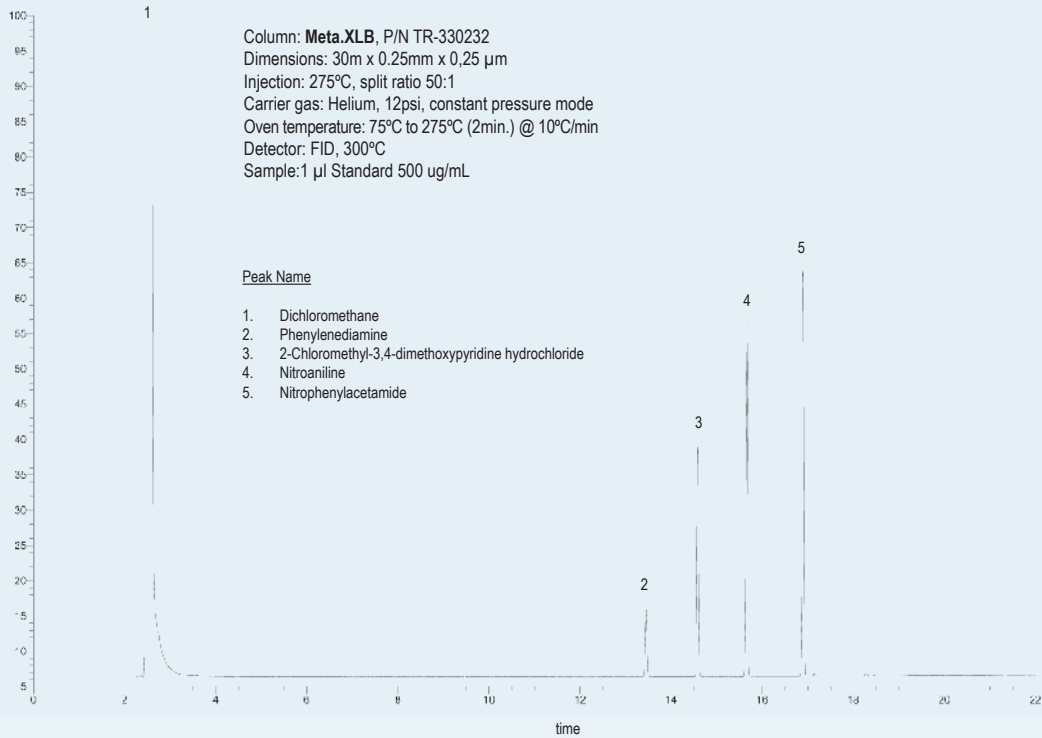
Column: **Meta. X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (7.1ng/g in Hexane), 250°C
 Carrier gas: H₂, constant pressure 12 psi (82.7 KPa).
 Oven temperature: 100°C(1min) @ 10°C/min to 310°C(5min)
 Detector: FID, 310°C



Peak Name

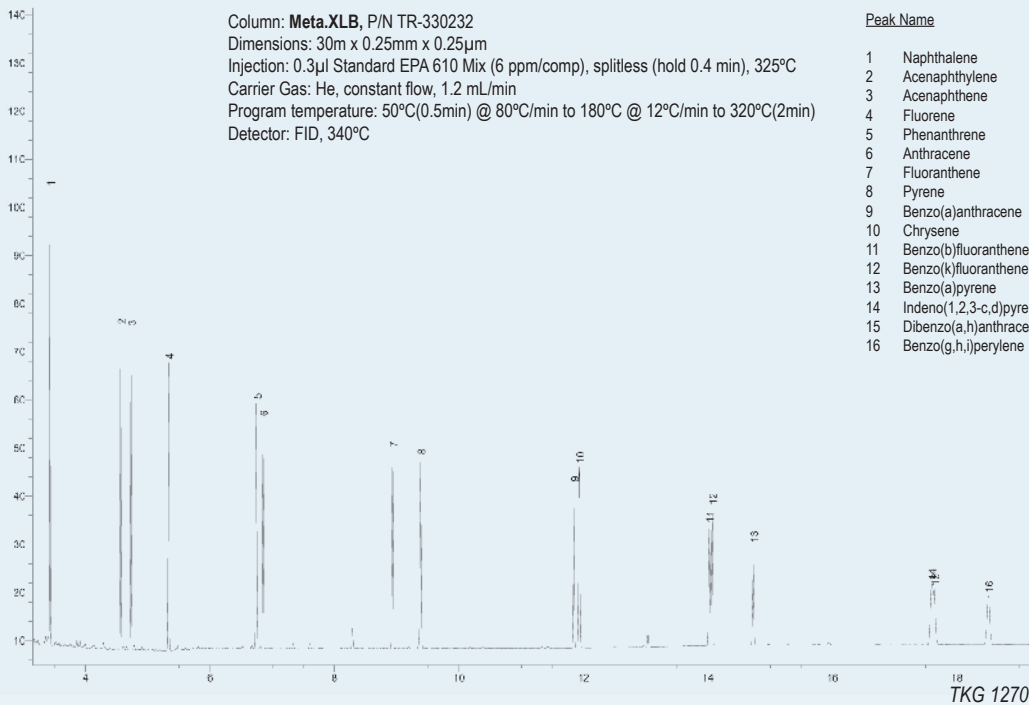
- 1- Dimethyl phthalate
- 2- Diethyl phthalate
- 3- Di-n-butyl phthalate
- 4- Butyl benzyl phthalate
- 5- Bis-2-ethylhexyl phthalate
- 6- Dioctyl phthalate

Aromatic Compounds



TKG 1264

POLYCYCLIC AROMATIC HYDROCARBONS (PAH EPA 610)



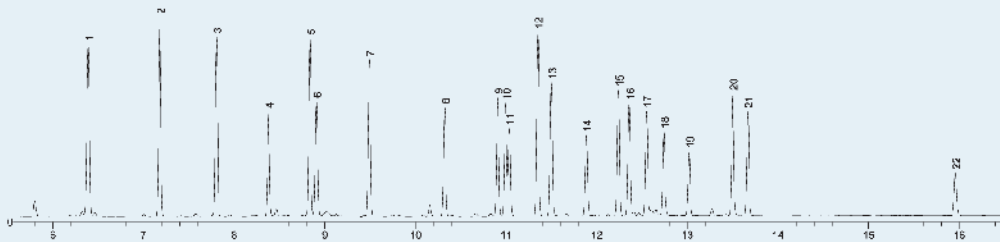
TKG 1270

CLP PESTICIDES (EPA 8081)

Column: **Meta.XLB**, P/N TR-330232
 Dimensions: 30m x 0.25mm x 0.25µm
 Injection: 0.5µl Standard (12-120 ppb, surrogates 50ppb), splitless 30s, 250°C
 Carrier Gas: He, 30psi (206.7 KPa), 45cm/s at 110°C
 Program temperature: 110°C(0.5min) @ 25°C/min to 150°C @ 12°C/min to 260°C @ 15°C/min to 320°C(2min)
 Detector: ECD, 330°C

Peak Name

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



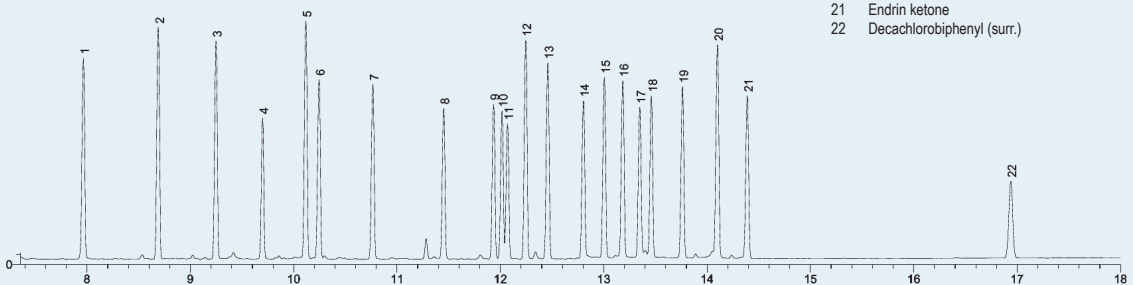
TKG 1269

CLP PESTICIDES (EPA 8081)

Column: **Meta.XLB**, P/N TR-330533
 Dimensions: 30m x 0.32mm x 0.50µm
 Injection: 0.3µl Standard (30 pg/compound), splitless 30s, 250°C
 Carrier Gas: He, 18psi (124 KPa), 43 cm/s at 110°C
 Program temperature: 110°C(0.5min) @ 15°C/min to 320°C(2min)
 Detector: ECD, 340°C (make up N2 30mL/min)

Peak Name

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

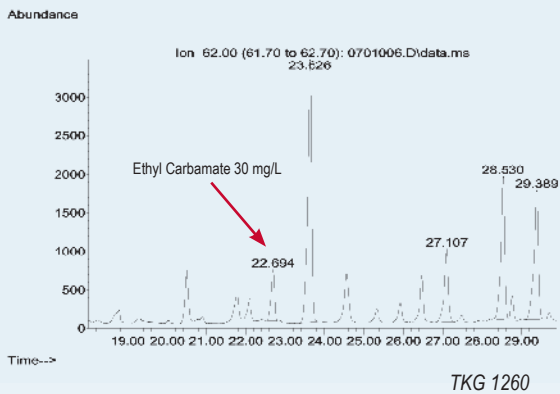


TKG 1271

ETHYL CARBAMATE IN WINE

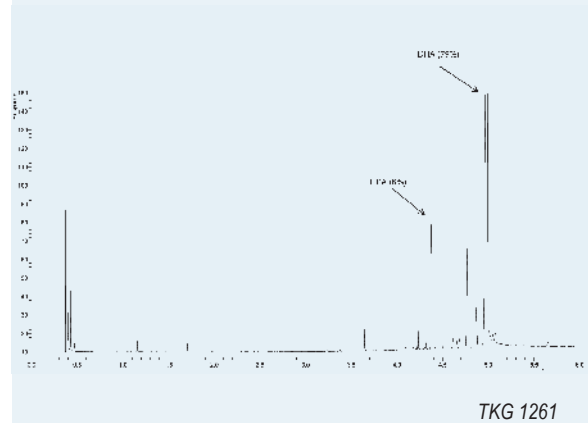
Column: **SupraWax-280**, 20m x 0.18mm x 0.18µm (P/N: TR-830984)
 Carrier gas: Helium, 1mL/min
 Injection: 1µL, split (30ppb of Ethyl Carbamate), 180°C
 Oven temp.: 40°C (0.75min) to 60°C @ 10°C/min to 150°C @ 3°C/min to 220°C(4.25min) @ 30°C/min
 Detector: MS (SIM, m/z 62, 74 and 89), transfer line 220°C

Chromatogram provided by Joan Garcia, INCAVI (Vilafranca del Penedès, Barcelona)



TUNA OIL WITH ADDED DHA

Column: **SupraWax-280**, 15m x 0.10mm x 0.10µm (P/N: TR-830111)
 Injection: 1µL Methylated sample, 280°C, split 100:1
 Carrier Gas: H₂, 45 psi (310.05 KPa)
 Oven: 100°C (0.5min) @ 50°C/min to 280°C (2min)
 Detector: FID, 280°C

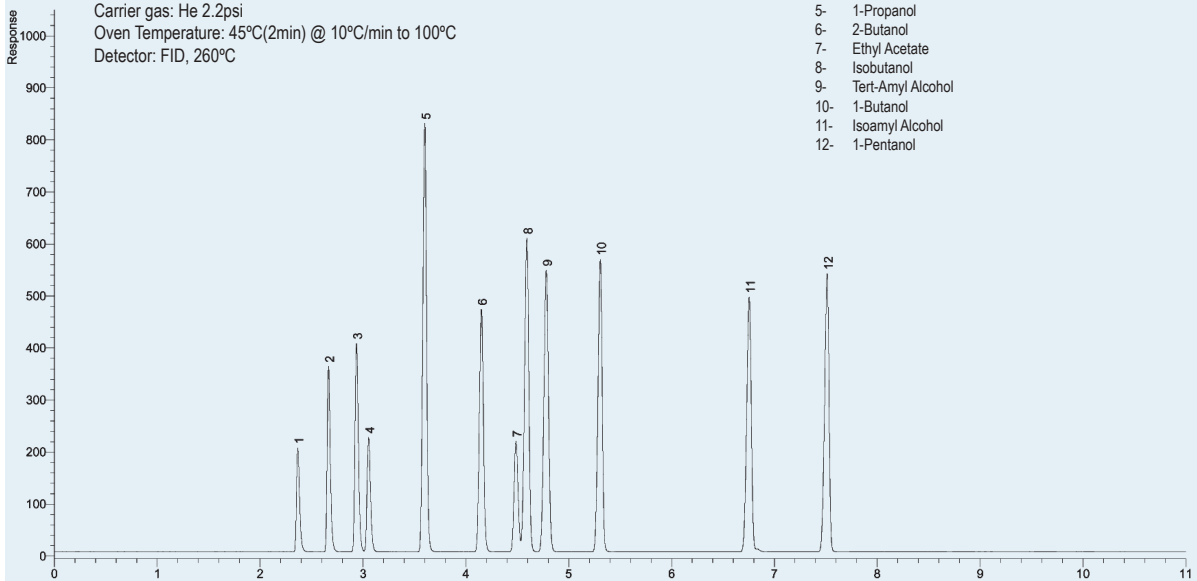


ALCOHOLS

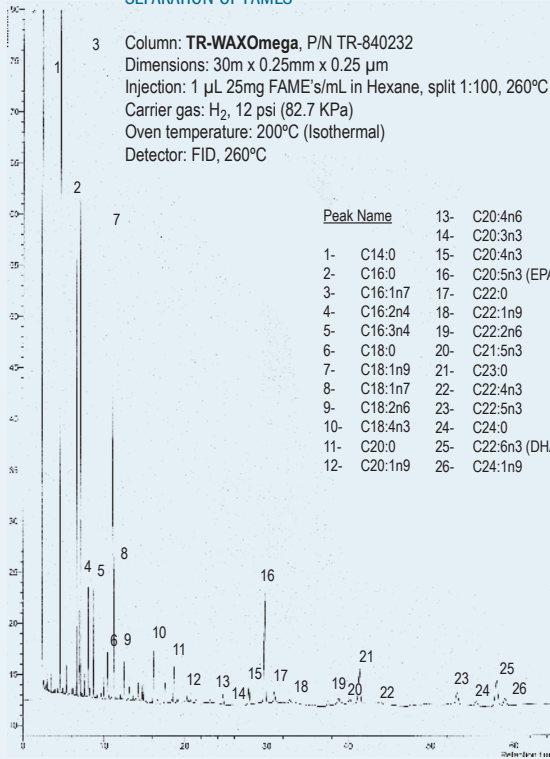
Column: **TRB-20**, P/N TR-201235
 Dimensions: 30m x 0.53mm x 1.2µm
 Injection: wed needle, 260°C, split 1:100
 Carrier gas: He 2.2psi
 Oven Temperature: 45°C(2min) @ 10°C/min to 100°C
 Detector: FID, 260°C

Peak Name

- 1- Methanol
- 2- Ethanol
- 3- 2-Propanol
- 4- Acetone
- 5- 1-Propanol
- 6- 2-Butanol
- 7- Ethyl Acetate
- 8- Isobutanol
- 9- Tert-Amyl Alcohol
- 10- 1-Butanol
- 11- Isoamyl Alcohol
- 12- 1-Pentanol

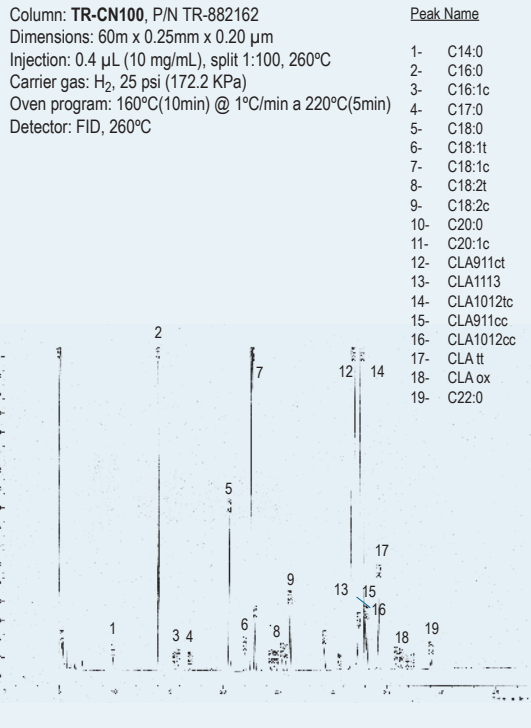


SEPARATION OF FAMES

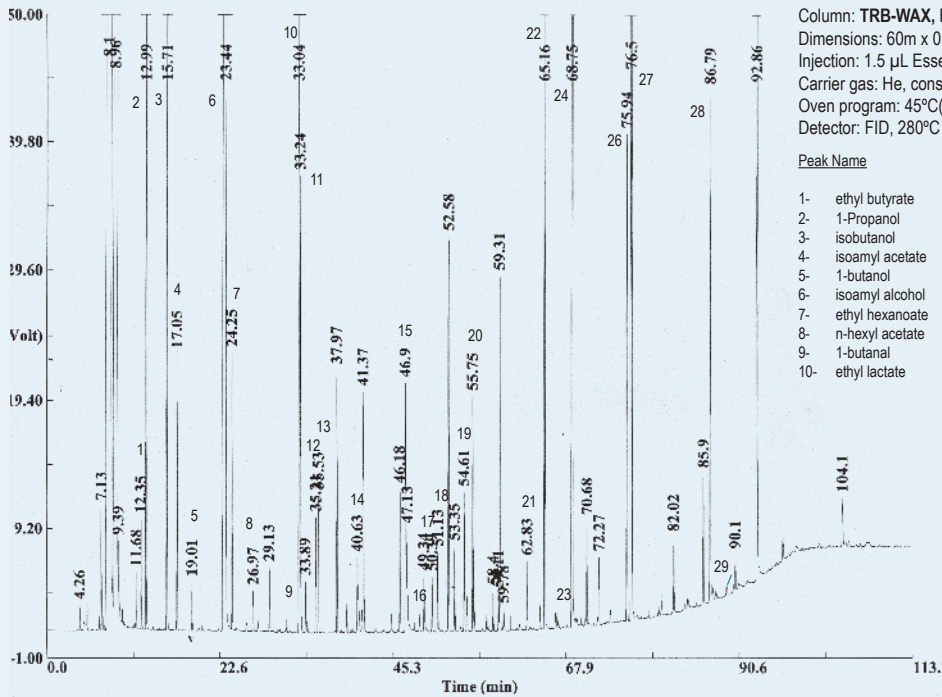


TKG 1027

SEPARATION OF FAMES



TKG 1029



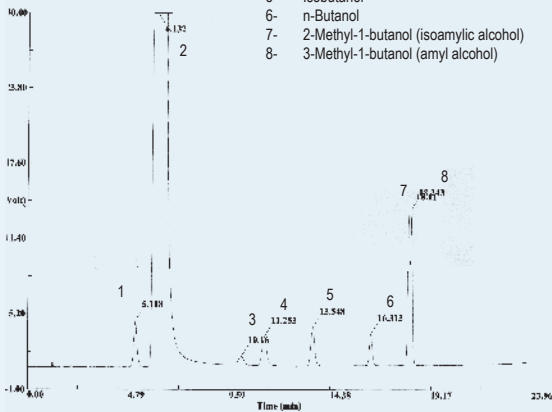
TKG 1031

SEPARATION OF ALCOHOLS

Column: **Meta .WAX**, P/N TR-811035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 1 µL standard, split 1:4, 200°C
 Carrier gas: He, 3 psi (20.7 KPa)
 Oven temperature: 40°C(10min) @ 6°C/min to 125°C(5min)
 Detector: FID, 200°C

Peak Name

- 1- Methanol
- 2- Ethanol
- 3- 2-Butanol
- 4- n-Propanol
- 5- Isobutanol
- 6- n-Butanol
- 7- 2-Methyl-1-butanol (isoamylic alcohol)
- 8- 3-Methyl-1-butanol (amyl alcohol)



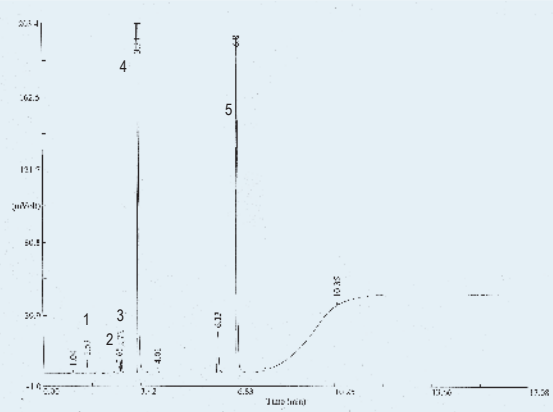
TKG 1030

ANALYSIS OF CHLOROPICRINE IN WINES

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL standard (5mg/L), 200°C
 Carrier gas: H₂, 12 psi (82.7 KPa)
 Oven temperature: 43°C(7min) @ 30°C/min to 120°C(10min)
 Detector: ECD, 300°C

Peak Name

- 1- Monochloroisothiocyanate
- 2- Methyl isothiocyanate
- 3- Dichloroisothiocyanate
- 4- Trichloroisothiocyanate (CHLOROPICRINE)
- 5- Allyl isothiocyanate



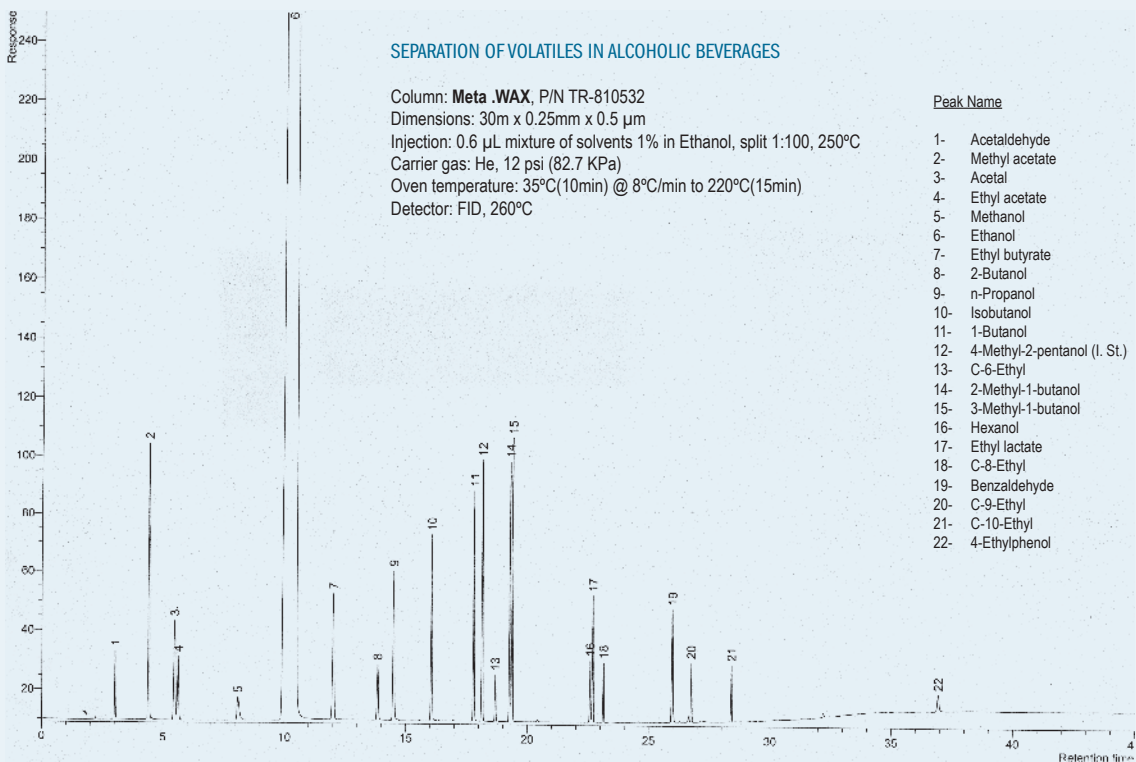
TKG 1032

SEPARATION OF VOLATILES IN ALCOHOLIC BEVERAGES

Column: **Meta .WAX**, P/N TR-810532
 Dimensions: 30m x 0.25mm x 0.5 µm
 Injection: 0.6 µL mixture of solvents 1% in Ethanol, split 1:100, 250°C
 Carrier gas: He, 12 psi (82.7 KPa)
 Oven temperature: 35°C(10min) @ 8°C/min to 220°C(15min)
 Detector: FID, 260°C

Peak Name

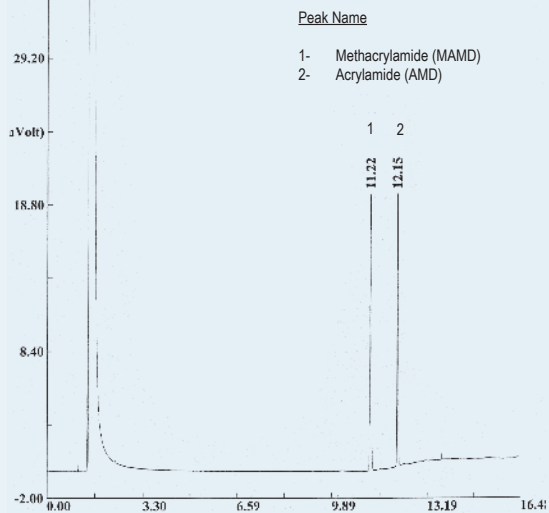
- 1- Acetaldehyde
- 2- Methyl acetate
- 3- Acetal
- 4- Ethyl acetate
- 5- Methanol
- 6- Ethanol
- 7- Ethyl butyrate
- 8- 2-Butanol
- 9- n-Propanol
- 10- Isobutanol
- 11- 1-Butanol
- 12- 4-Methyl-2-pentanol (l. St.)
- 13- C-6-Ethyl
- 14- 2-Methyl-1-butanol
- 15- 3-Methyl-1-butanol
- 16- Hexanol
- 17- Ethyl lactate
- 18- C-8-Ethyl
- 19- Benzaldehyde
- 20- C-9-Ethyl
- 21- C-10-Ethyl
- 22- 4-Ethylphenol



TKG 1026

SEPARATION OF ACRYLAMIDE

Column: **TRB-WAX**, P/N TR-140535
 Dimensions: 30m x 0.53mm x 0.5 µm
 Injection: 1 µL AMD (6ppm)/MAMD (33 ppm) mixture in Metanol, splitless, 250°C
 Carrier gas: H₂, constant pressure, 2 psi (13.78 KPa)
 Oven temperature: 135°C(10min) @ 25°C/min to 190°C(5min)
 Detector: FID, 260°C

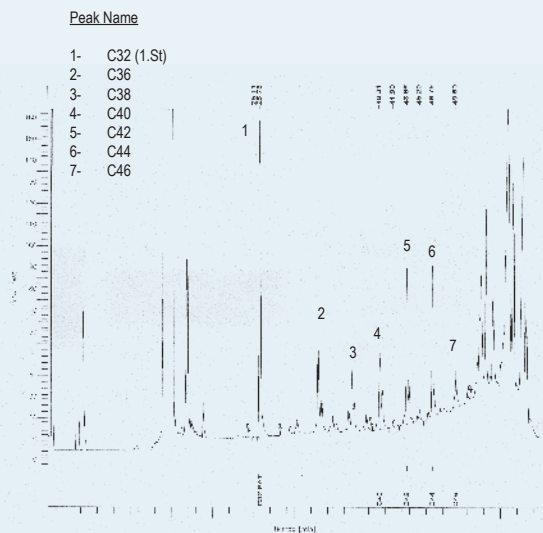


TKG 1033

IDENTIFICATION OF WAX IN OLIVE OIL

Column: **TRB-5**, P/N TR-120113
 Dimensions: 15m x 0.32mm x 0.1 µm
 Injection: 1 µL extraction of Olive Oil following norm, On Column, 280°C
 Carrier gas: H₂, 2mL/min
 Oven program: 85°C @ 35°C/min to 180°C @ 3°C/min to 330°C
 Detector: FID, 350°C

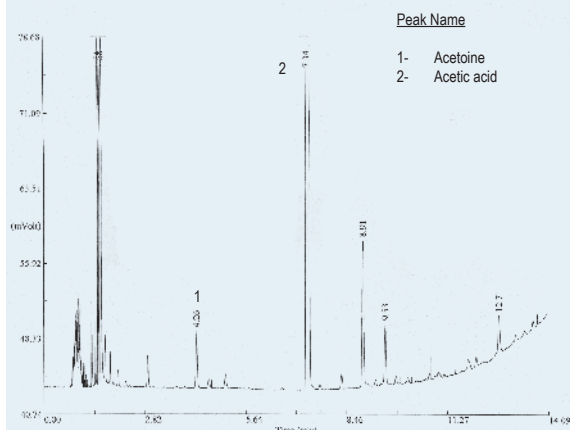
Chromatogram provided by J.E. Trujillo from Ybarra (Sevilla)



TKG 1034

SEPARATION OF ACETOINE IN VINEGAR

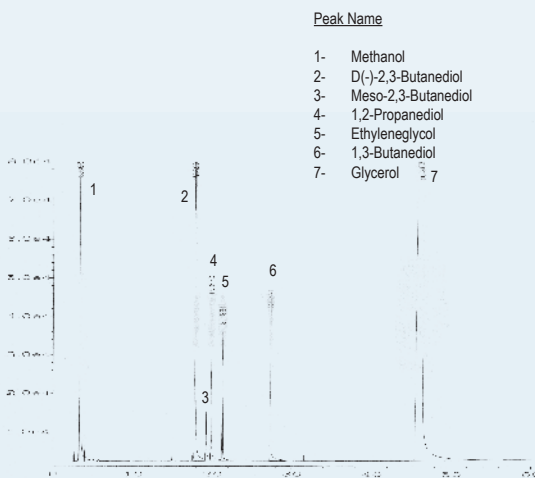
Column: **TRB-FFAP**, P/N TR-151025
 Dimensions: 25m x 0.53mm x 1.0 µm
 Injection: 1 µL, split 1:100, 250°C
 Carrier gas: H₂, constant pressure 2.9 psi (19.98 Kpa)
 Oven temperature: 100°C(5 min) @ 10°C/min a 200°C
 Detector: FID, 250°C



TKG 1040

SEPARATION OF POLYOLS IN WINE

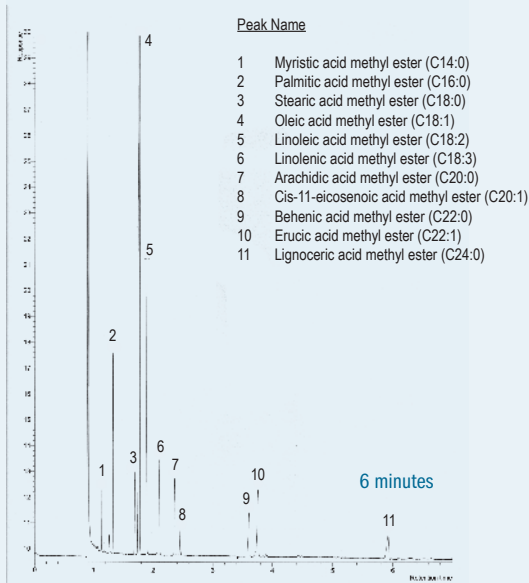
Column: **TRB-FFAP**, P/N TR-150262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: 1 µL, split 1:100, 250°C
 Carrier gas: H₂, constant flow 1mL/min
 Oven temperature: 80°C(5 min) @ 3°C/min to 200°C(15 min)
 Detector: FID, 250°C



TKG 1041

ANALYSIS OF RAPESEED OIL (FAST CHROMATOGRAPHY)

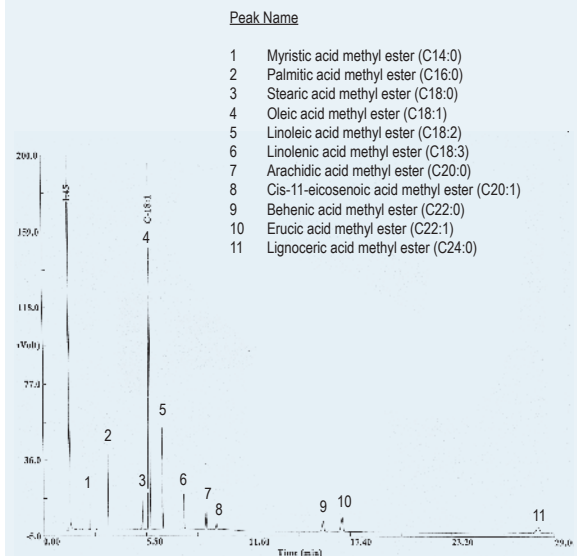
Column: **TRB-WAX**, P/N TR-142181
 Dimensions: 20m x 0.10mm x 0.2 µm
 Injection: 0.7 µL Rapeseed oil, split 1:500, 280°C
 Carrier gas: H₂, constant pressure, 54 psi (372 KPa), 41.15 cm/s
 Oven temperature: 205°C (Isothermal)
 Detector: FID, 280°C



TKG 1045

ANALYSIS OF RAPESEED OIL

Column: **TRB-WAX**, P/N TR-140232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL Rapeseed oil, split 1:50, 280°C
 Carrier gas: H₂, 36.23 cm/s
 Oven temperature: 205°C (Isothermal)
 Detector: FID, 280°C

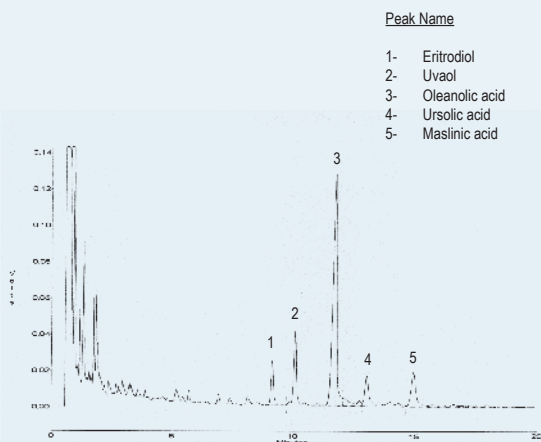


TKG 1046

ALCOHOLS AND TERPENIC ACIDS (OLIVE OIL)

Column: **TRB-35**, P/N TR-351332
 Dimensions: 30m x 0.25mm x 0.15 µm
 Injection: 1 µL extract of leaf of Olive Tree, split 1:20, 300°C
 Carrier gas: H₂, constant pressure 12 psi (82.7 KPa).
 Oven temperature: 275°C
 Detector: FID, 300°C

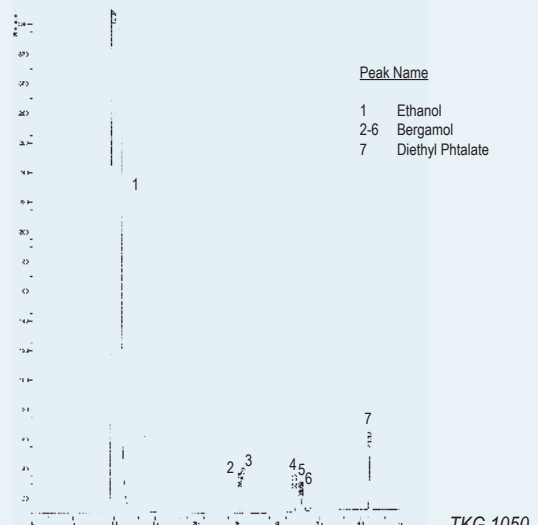
Chromatogram provided by Angeles Guinda from Instituto de la Grasa, CSIC.



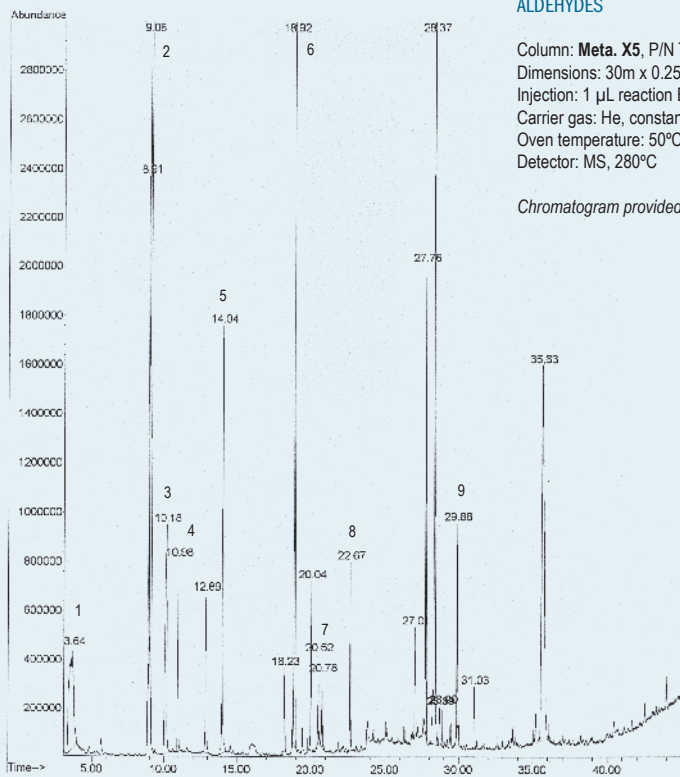
TKG 1049

ANALYSIS BERGAMOL

Column: **Meta.WAX**, P/N TR-810532
 Dimensions: 30m x 0.25mm x 0.5 µm
 Injection: 1 µL standard 0.3% v/v Bergamol/Diethyl Phtalate in Ethanol, split 1:50, 260°C
 Carrier gas: H₂, 12 psi (82.7 KPa).
 Oven temperature: 35°C(10min) @ 8°C/min to 220°C(20min)
 Detector: FID, 260°C



TKG 1050



ALDEHYDES

Column: **Meta. X5**, P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 1 μ L reaction Epoxydecenal and Butylamine, splitless (1.5min), 280°C
 Carrier gas: He, constant pressure 12 psi (82.7 KPa).
 Oven temperature: 50°C(1min) @ 5°C/min to 240°C @ 10°C/min to 300°C
 Detector: MS, 280°C

Chromatogram provided by F. Javier Hidalgo Garcia from Instituto de la Grasa, CSIC.

Peak Name

- 1- Hexanal
- 2- 1-Butylpyrrole
- 3- Butanal
- 4- 2-Octanal
- 5- 3-Nonanal
- 6- 2,4-Decadienal
- 7- 2-Butylacetal
- 8- N-Butyl-2-pentylpyrrole
- 9- N-Butyl-2-(1-hydroxyhexyl)pyrrole

TKG 1051

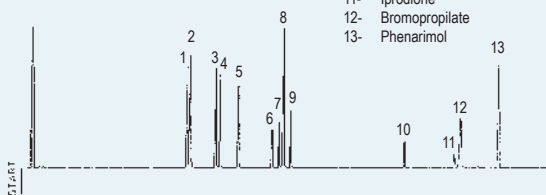
PESTICIDES IN WINES

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 μ m
 Injection: 1 μ L standard in Cyclohexane, 250°C
 Carrier gas: He, 1 mL/min
 Oven temperature: 145°C @ 0.55°C/min to 220°C
 Detector: ECD, 300°C

Chromatogram provided by J. Garcia from INCAVI, Vilafranca del Penedès (Barcelona)

Peak Name

- 1- Methyl parathion
- 2- Vinclozoline
- 3- Phenitrothion
- 4- Diclofluanide
- 5- Chlorpyrifos
- 6- Captan
- 7- Folpet
- 8- Chlolozinate
- 9- Procimidone
- 10- Captafol
- 11- Iprodione
- 12- Bromopropilate
- 13- Phenarimol



TKG 1053

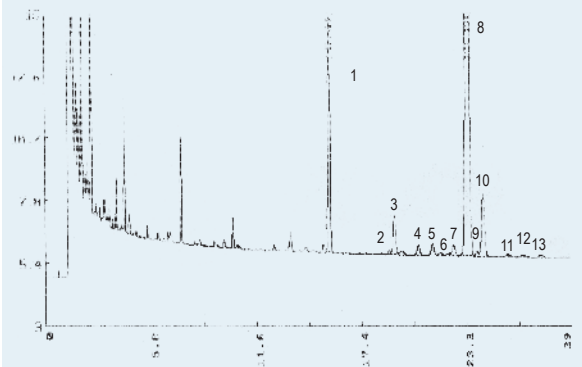
SEPARATION OF STEROLS IN OLIVE OIL (VIRGEN EXTRA)

Column: **TRB-1**, P/N TR-111535
 Dimensions: 30m x 0.53mm x 1.5 μ m
 Injection: 1 μ L extraction of Olive Oil following norm, splitless (1.5min), 280°C
 Carrier gas: He, constant pressure 3 psi (20.7 KPa).
 Oven program: 265°C (Isothermal)
 Detector: FID, 300°C

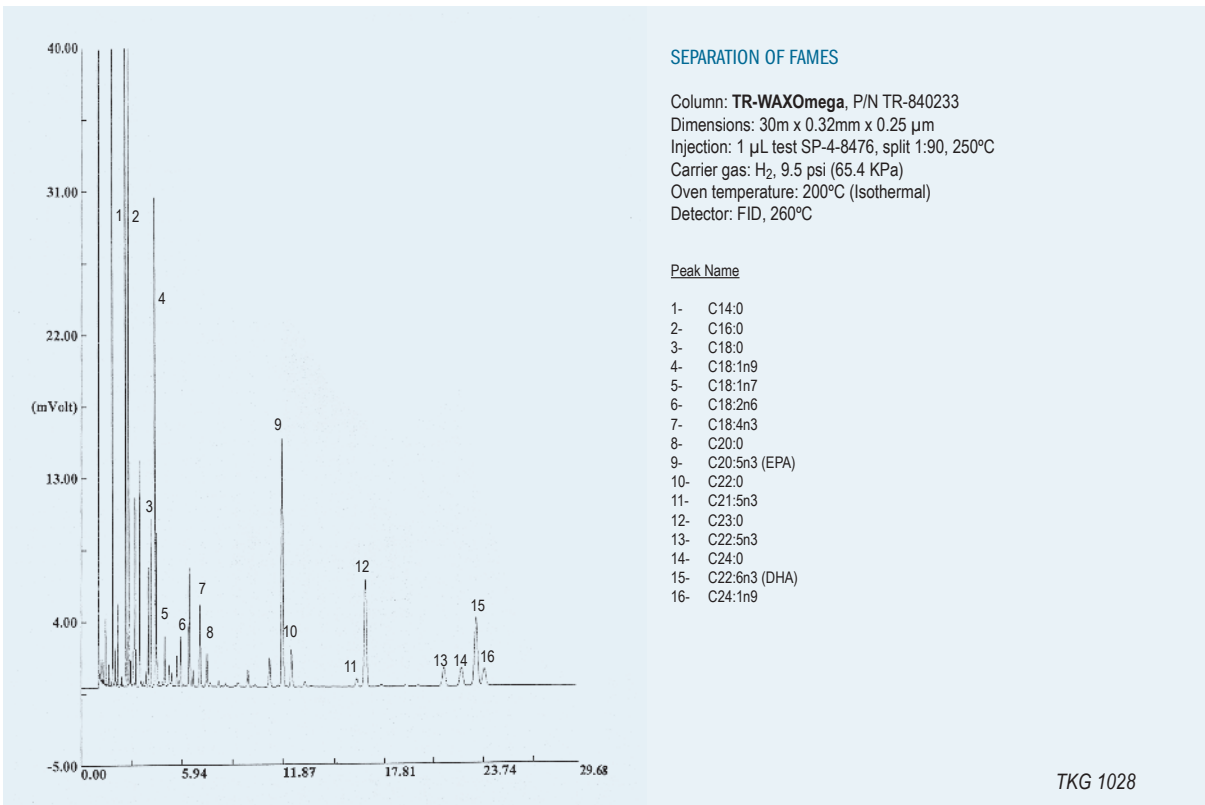
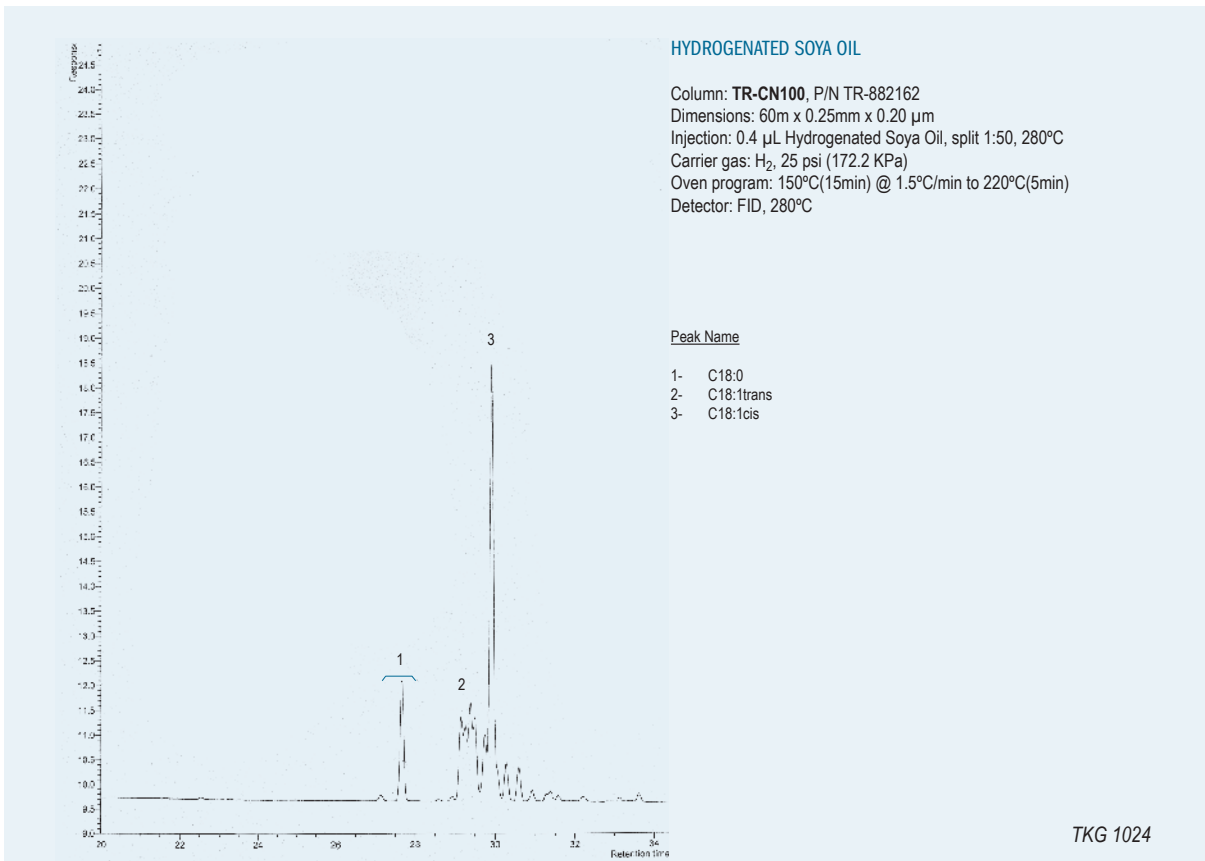
Peak Name

- 1- Cholesterol
- 2- 24-methylenecholesterol
- 3- Campesterol
- 4- Stigmasterol
- 5- δ 7-campesterol
- 6- δ 5,23-stigmasterol
- 7- Chlosterol
- 8- β -sitosterol
- 9- Sitosterol
- 10- δ 5-avenasterol
- 11- δ 5,24-stigmastadienol
- 12- δ 7-stigmasterol
- 13- δ 7-avenasterol

Chromatogram provided by Jesus Rodríguez from Aceites Monterreal (Villa del Río, Córdoba)



TKG 1082



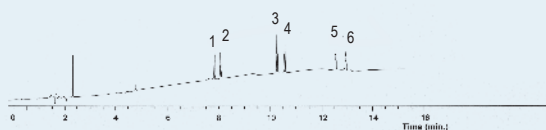
PHENOLS-ANISOL IN WINE

Column: **TR-5MS** P/N TR-520232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 280°C, 1 µL (St 100 ppb), split (30:1)
 Carrier gas: H₂, 1.2 ml/min. 17 psi (117 kPa) to 80°C
 Oven temperature: 80°C to 120°C (5min) @ 10°C/min.
 Detector: ECD, 330°C

Peak Name

- 1- Trichlorophenol
- 2- Trichloroanisole
- 3- Tetrachlorophenol
- 4- Tetrachloroanisole
- 5- Pentachlorophenol
- 6- Pentachloroanisole

Exceptional symmetry of the peaks at traces level



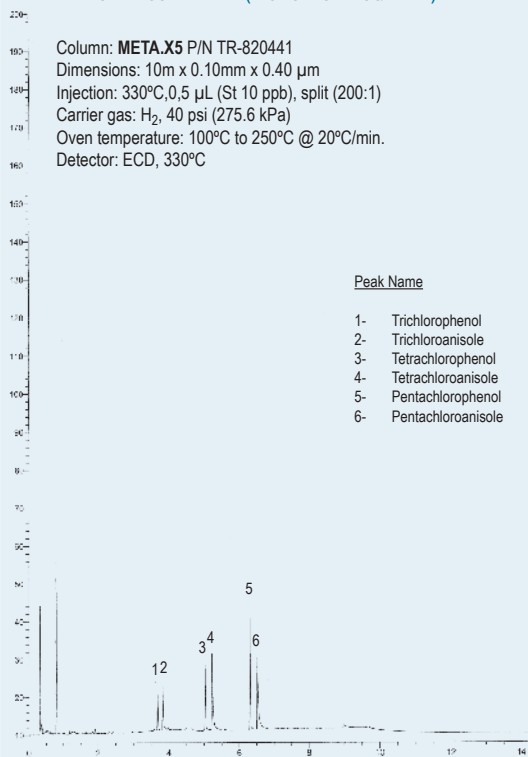
TKG 1068

PHENOL-ANISOL IN WINE (FAST CHROMATOGRAPHY)

Column: **META.X5** P/N TR-820441
 Dimensions: 10m x 0.10mm x 0.40 µm
 Injection: 330°C, 0.5 µL (St 10 ppb), split (200:1)
 Carrier gas: H₂, 40 psi (275.6 kPa)
 Oven temperature: 100°C to 250°C @ 20°C/min.
 Detector: ECD, 330°C

Peak Name

- 1- Trichlorophenol
- 2- Trichloroanisole
- 3- Tetrachlorophenol
- 4- Tetrachloroanisole
- 5- Pentachlorophenol
- 6- Pentachloroanisole



TKG 1193

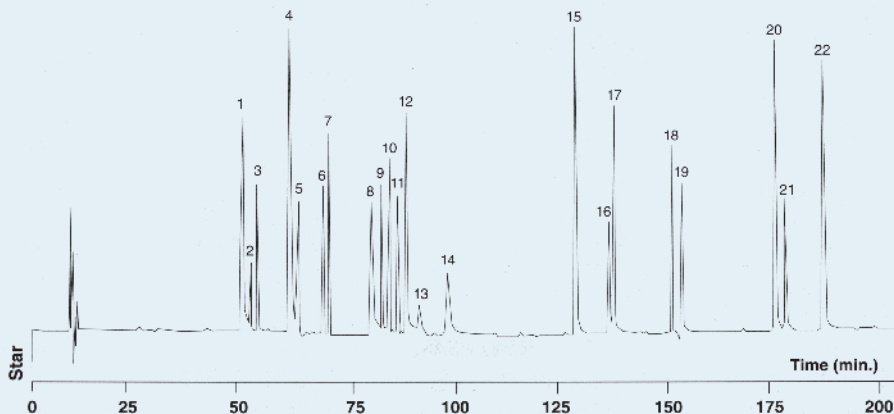
PHYTOSANITARY ANALYSIS IN WINE

Column: **Meta.X5** P/N TR-820232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 2.0 µL split (1:100), 250°C
 Carrier gas: He, 1 ml/min.
 Oven temperature: 140°C to 180°C @ 0.4°C/min. to 270°C(15min.) @ 1°C/min.
 Detector: ECD, 300°C, make up Argon/methane (95/5)
 Sample: Phytosanitary standard INCAVI, (70-680 µg/L of each component)

Chromatogram supplied by M. Jaldo, J. García (Incavi) and J. Marco (Torres, S.A.)

Peak Name

- 1- Methylchlorpyrifos
- 2- Methylparathion
- 3- Vinclozoline
- 4- Fenitrothion
- 5- Dichlofluaniide
- 6- Malathion
- 7- Chlorpyrifos
- 8- Captan
- 9- Penconazol
- 10- Folpet
- 11- Chlozolineate
- 12- Triadimenol + Procimidione
- 13- Triadimenol
- 14- Hexocanazol
- 15- Captafol
- 16- Iprodione
- 17- Bromopropylate
- 18- Fenarimol
- 19- Cyalotrin
- 20- Fenvalerate
- 21- Fenvalerate
- 22- Azoxystrobine

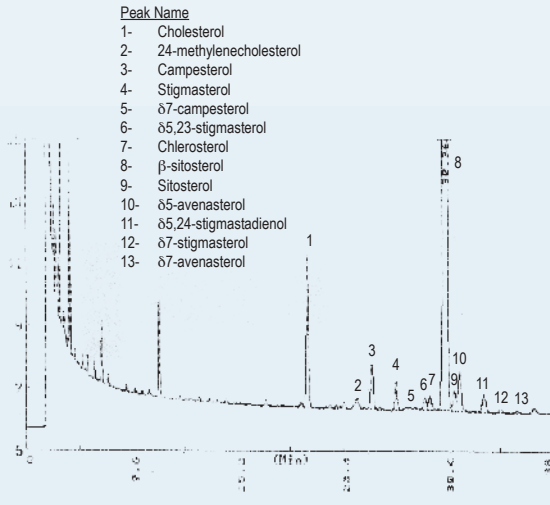


TKG 1079

SEPARATION OF STEROLS IN OLIVE OIL (ORUJO)

Column: **TRB-1**, P/N TR-111535
 Dimensions: 30m x 0.53mm x 1.5 µm
 Injection: 1 µL extraction of Olive Oil following norm, splitless (1.5min), 280°C
 Carrier gas: He, constant pressure 3 psi (20.7 KPa).
 Oven program: 265°C (Isothermal)
 Detector: FID, 300°C

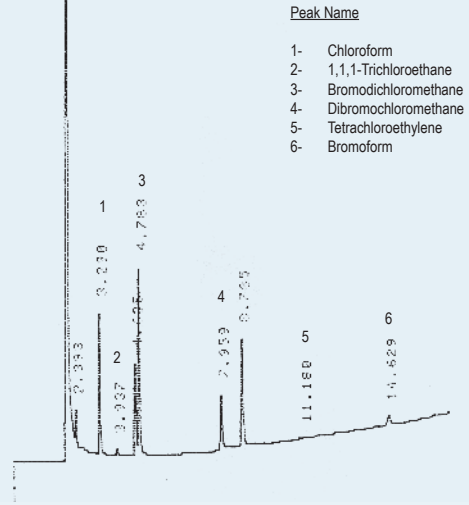
Chromatogram provided by Jesus Rodríguez from Aceites Monterreal (Villa del Río, Córdoba)



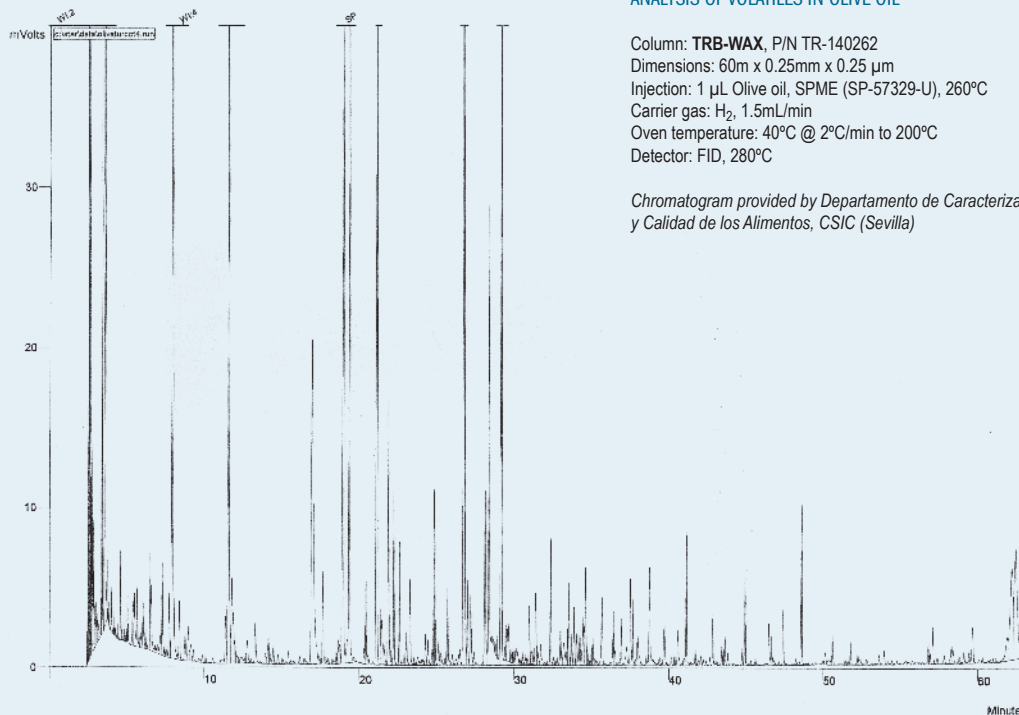
TKG 1083

CHLORINATED SOLVENTS IN OLIVE OIL

Column: **TRB-5**, P/N TR-121033
 Dimensions: 30m x 0.32mm x 1.0 µm
 Injection: 0.5 µL Head Space (2t), standard 0.05 ppm, 150°C
 Carrier gas: He, 7psi (48.2 KPa)
 Oven temperature: 50°C (Isothermal)
 Detector: ECD, 250°C



TKG 1092



ANALYSIS OF VOLATILES IN OLIVE OIL

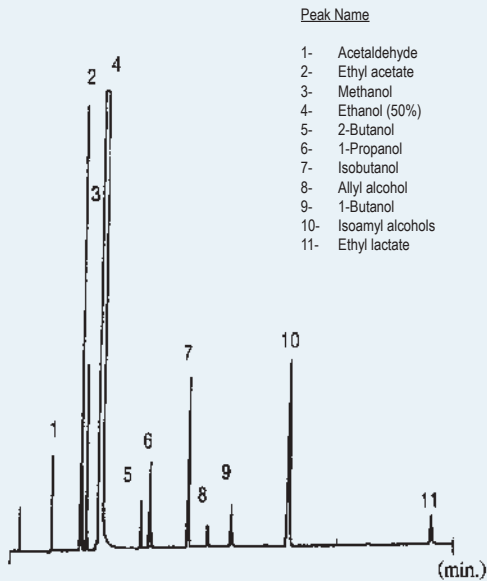
Column: **TRB-WAX**, P/N TR-140262
 Dimensions: 60m x 0.25mm x 0.25 µm
 Injection: 1 µL Olive oil, SPME (SP-57329-U), 260°C
 Carrier gas: H₂, 1.5mL/min
 Oven temperature: 40°C @ 2°C/min to 200°C
 Detector: FID, 280°C

Chromatogram provided by Departamento de Caracterización y Calidad de los Alimentos, CSIC (Sevilla)

TKG 1091

SEPARATION OF VOLATILES IN ALCOHOLIC BEVERAGES

Column: **TRB-WAX**, P/N TR-141035
 Dimensions: 30m x 0.53mm x 1.0 μm
 Injection: 1 μL, split
 Carrier gas: He, 5 psi (34.5 KPa)
 Oven temperature: 40°C @ 2°C/min to 150°C
 Detector: FID, 225°C

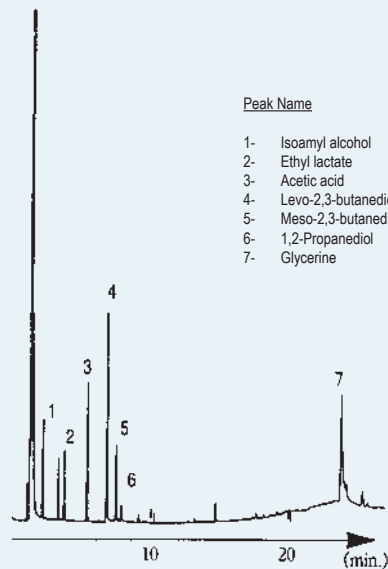


Peak Name
1- Acetaldehyde
2- Ethyl acetate
3- Methanol
4- Ethanol (50%)
5- 2-Butanol
6- 1-Propanol
7- Isobutanol
8- Allyl alcohol
9- 1-Butanol
10- Isoamyl alcohols
11- Ethyl lactate

TKG 1174

ANALYSIS OF GLYCOLS IN WINE

Column: **TRB-FFAP**, P/N TR-151035
 Dimensions: 30m x 0.53mm x 1.0 μm
 Injection: 1 μL, split
 Carrier gas: He, 4 psi (27.6 KPa)
 Oven temperature: 100°C @ 5°C/min to 200°C(10 min)
 Detector: FID, 275°C



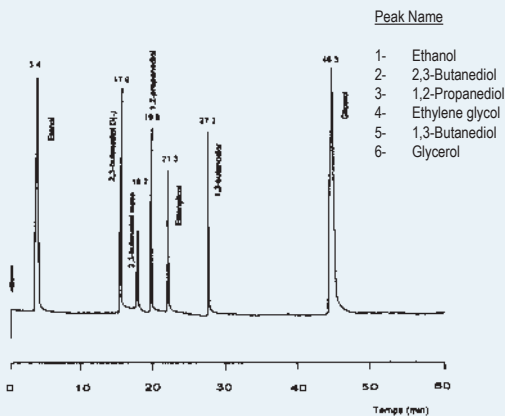
Peak Name
1- Isoamyl alcohol
2- Ethyl lactate
3- Acetic acid
4- Levo-2,3-butanediol
5- Meso-2,3-butanediol
6- 1,2-Propanediol
7- Glycerine

TKG 1175

ANALYSIS OF POLYOLS IN WINE

Column: **TRB-FFAP**, P/N TR-150262
 Dimensions: 60m x 0.25mm x 0.25 μm
 Injection: 1 μL, split (100:1), glycols standard, 205°C
 Carrier gas: H₂, 1 mL/min (80°C)
 Oven temperature: 100°C @ 5°C/min to 200°C(10 min)
 Detector: FID, 275°C

Chromatogram provided by R. Franquet and J. Garcia from INCAVI, Vilafranca del Penedès (Barcelona)

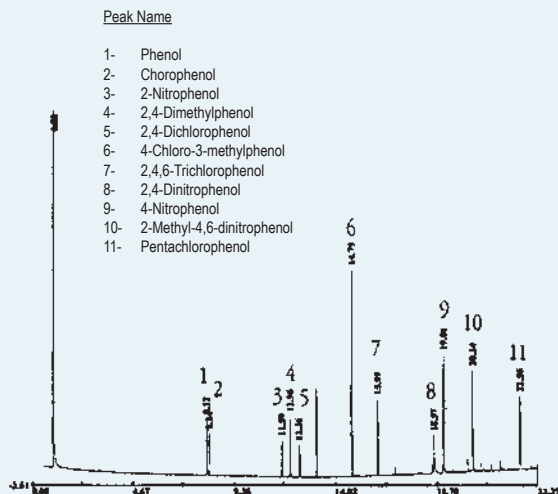


Peak Name
1- Ethanol
2- 2,3-Butanediol
3- 1,2-Propanediol
4- Ethylene glycol
5- 1,3-Butanediol
6- Glycerol

TKG 1176

PHENOLS EPA 604

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 μm
 Injection: 1 μL, split, 2 to 6 ng/comp, 250°C
 Carrier gas: H₂, 12 psi (82.68 KPa)
 Oven temperature: 80°C(4min) @ 8°C/min to 250°C
 Detector: FID, 280°C

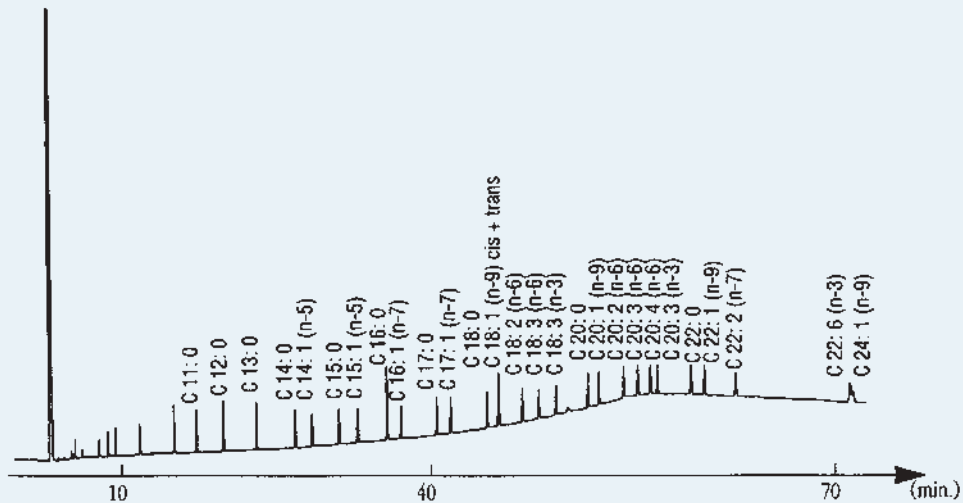


Peak Name
1- Phenol
2- Chorophenol
3- 2-Nitrophenol
4- 2,4-Dimethylphenol
5- 2,4-Dichlorophenol
6- 4-Chloro-3-methylphenol
7- 2,4,6-Trichlorophenol
8- 2,4-Dinitrophenol
9- 4-Nitrophenol
10- 2-Methyl-4,6-dinitrophenol
11- Pentachlorophenol

TKG 1153

SEPARATION OF FAMES

Column: **TR-WAX**, P/N TR-140262
 Dimensions: 60m x 0.25mm x 0.25 μ m
 Injection: 1 μ L, split
 Carrier gas: He, 26 psi (179.1 KPa)
 Oven temperature: 60°C @ 30°C/min to 150°C @ 2°C/min to 240°C
 Detector: FID, 275°C



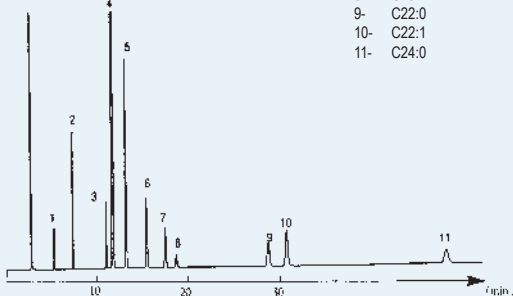
TKG 1177

SEPARATION OF METHYL ESTERS (RAPESEED OIL)

Column: **TRB-WAX**, P/N TR-141035
 Dimensions: 30m x 0.53mm x 1.0 μ m
 Injection: 1 μ L, split
 Carrier gas: He, 4psi (27.6 KPa)
 Oven temperature: 220°C (Isothermal)
 Detector: FID, 280°C

Peak Name

- 1- C14:0
- 2- C16:0
- 3- C18:0
- 4- C18:1
- 5- C18:2
- 6- C18:3
- 7- C20:0
- 8- C20:1
- 9- C22:0
- 10- C22:1
- 11- C24:0



TKG 1179

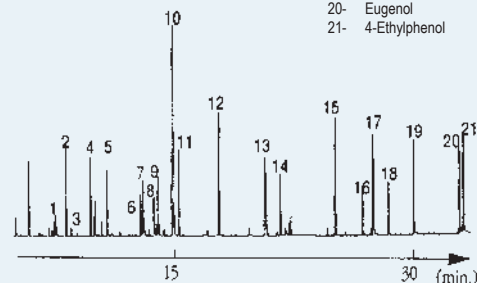
FLAVORS IN WINE

Column: **TRB-WAX**, P/N TR-142168
 Dimensions: 60m x 0.22mm x 0.20 μ m
 Injection: 1 μ L, split
 Carrier gas: He, 1 mL/min
 Oven temperature: 45°C @ 5°C/min to 230°C
 Detector: FID, 250°C

*Chromatogram provided by M. Creixell,
 R. Franquet and J. Garcia from INCAVI,
 Vilafranca del Penedès, Barcelona.*

Peak Name

- 1- 2-Butanol
- 2- Ethyl isovalerate
- 3- 1-Butanol
- 4- Ethyl caproate
- 5- n-Hexyl acetate
- 6- Ethyl lactate
- 7- 1-Hexanol
- 8- 3-Ethoxy-1-propanol
- 9- cis-3-hexen-1-ol
- 10- 2-Octanol (l. St.)
- 11- Ethyl caprylate
- 12- Benzaldehyde
- 13- Ethyl caprate
- 14- γ -Butyrolactone
- 15- 2-Phenylethanol acetate
- 16- Trans- β -methyl- γ -octalactone
- 17- 2-Phenylethanol
- 18- Cis- β -methyl- γ -octalactone
- 19- 4-Ethylguaiaicol
- 20- Eugenol
- 21- 4-Ethylphenol

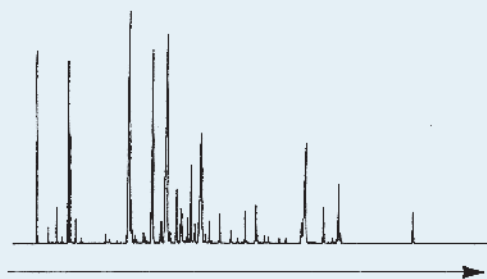


TKG 1180

LAVANDER FLAVOR

Column: **TRB-WAX**, P/N TR-140232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, split
 Carrier gas: He, 90 KPa
 Oven temperature: 80°C @ 4°C/min to 230°C(20 min)
 Detector: FID, 260°C

Chromatogram provided by C. Ibañez from Lucta, S.A, Barcelona.

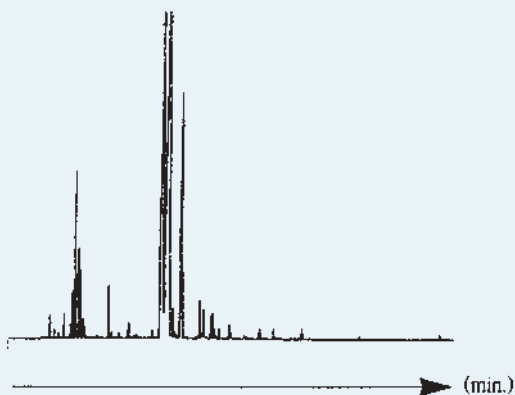


TKG 1181

FLAVORS (LAVANDER, ESSENTIAL OIL)

Column: **TRB-WAX**, P/N TR-140232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL, split
 Carrier gas: He, 90 KPa
 Oven temperature: 80°C @ 4°C/min to 230°C(20 min)
 Detector: FID, 260°C

Chromatogram provided by C. Ibañez from Lucta, S.A, Barcelona.

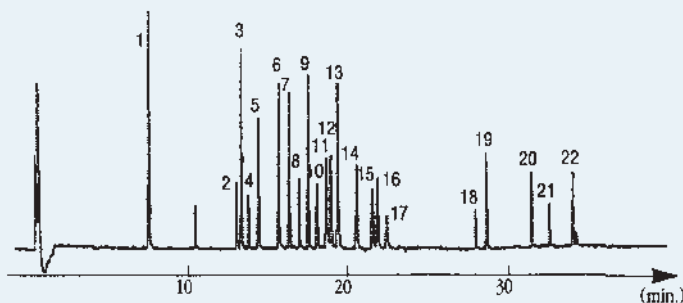


TKG 1182

ANALYSIS OF PESTICIDES

Column: **TRB-5**, P/N TR-120232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: split
 Carrier gas: He
 Oven temperature: 125°C(1 min) @ 8°C/min to 200°C(10 min) @ 20°C/min to 270°C(15 min)
 Detector: FPD, 280°C

Chromatogram provided by E. Casado from Laboratorio de Plagidas of Centro Nacional de Alimentación y Nutrición, Madrid.



Peak Name

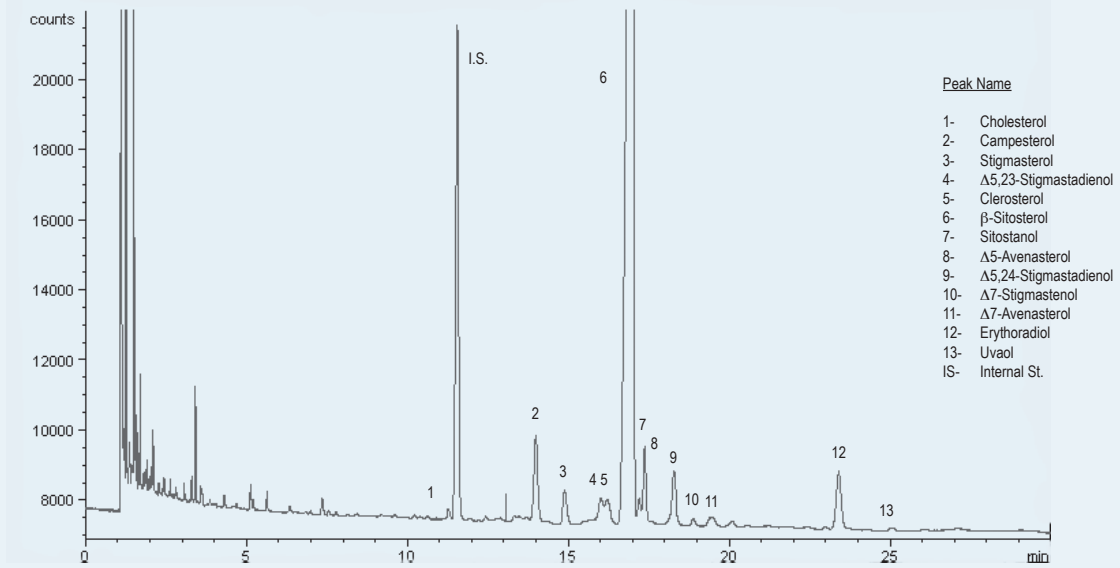
- 1- Metacriphos
- 2- Dioxathion
- 3- Fonofos
- 4- Diazinon
- 5- Etrifos
- 6- Methyl parathion
- 7- Fenclorphos
- 8- Fenitrothion
- 9- Malathion
- 10- Ethyl parathion
- 11- Ruelene
- 12- Methyl bromophos
- 13- Ethyl pirymiphos
- 14- Isofenphos
- 15- Meditathion
- 16- Ethyl bromophos
- 17- Gardona
- 18- Ethion
- 19- Trithion
- 20- Fosalon
- 21- Cumaphos

TKG 1183

STEROLS ANALYSIS (REFINATED OLIVE OIL)

Column: **TRB-STEROL**, P/N TR-182238
 Dimensions: 30m x 0.22mm x 0.22 μm
 Injection: split
 Carrier gas: H₂, 20 psi (137.8 KPa)
 Oven temperature: 275°C (Isothermal)
 Detector: FID, 300°C

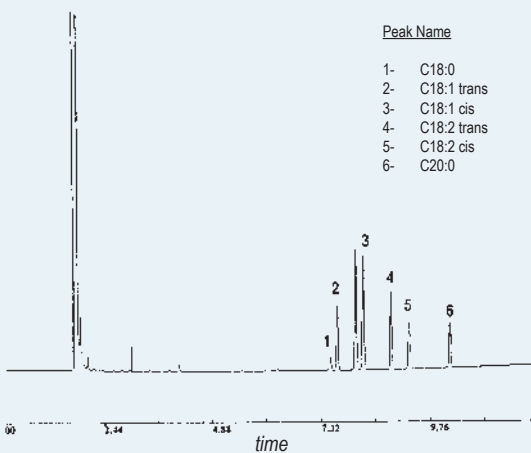
Chromatogram provided by Dr. Manuel León from Instituto de la Grasa, Sevilla



TKG 1184

ANALYSIS OF CIS-TRANS ISOMERS

Column: **TR-CN100**, P/N TR-882133
 Dimensions: 30m x 0.32mm x 0.20mm
 Injection: 1 μL isomers standard, split
 Carrier gas: H₂, 4.5 psi (31 KPa)
 Oven temperature: 140°C @ 4°C/min to 190°C
 Detector: FID, 250°C

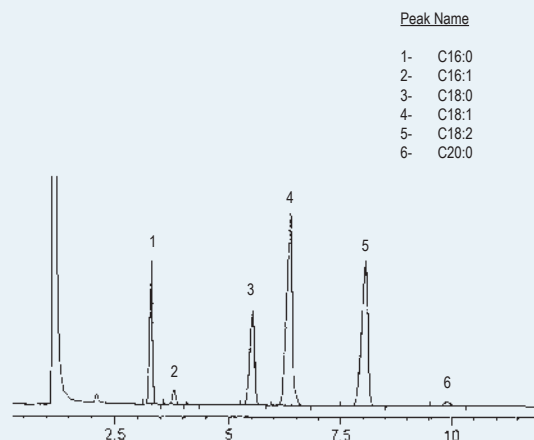


TKG 1185

ANALYSIS OF METHYL ESTERS

Column: **TR-CN100**, P/N TR-882135
 Dimensions: 30m x 0.53mm x 0.20 μm
 Injection: 2 μL FAMES standard, split
 Carrier gas: He, 20 KPa
 Oven temperature: 130°C(5 min) @ 3°C/min to 160°C
 Detector: FID, 250°C

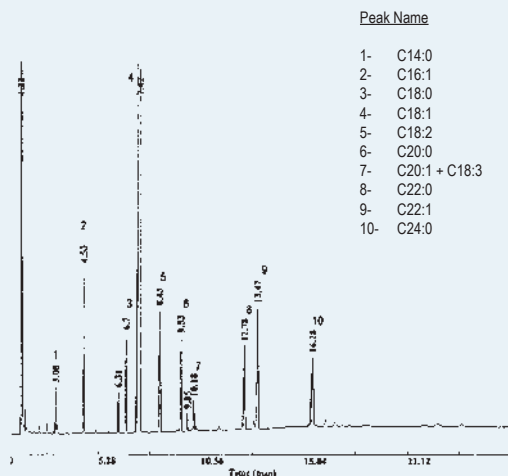
Chromatogram provided by Dr. R. Garcés from Instituto de la Grasa, Sevilla.



TKG 1186

ANALYSIS OF METHYL ESTERS

Column: **TR-CN100**, P/N TR-882113
 Dimensions: 15m x 0.32mm x 0.20 µm
 Injection: 1 µL FAMES standard, split
 Carrier gas: H₂, 2.4 psi (16.6 KPa)
 Oven temperature: 140°C @ 3°C/min to 185°C
 Detector: FID, 250°C

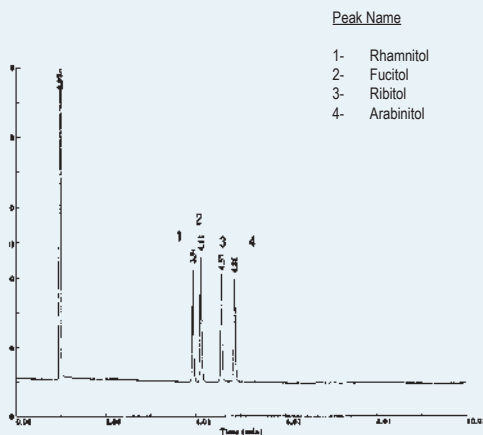


Peak Name
1- C14:0
2- C16:1
3- C18:0
4- C18:1
5- C18:2
6- C20:0
7- C20:1 + C18:3
8- C22:0
9- C22:1
10- C24:0

TKG 1187

SEPARATION OF SUGARS (AS ALDITOL ACETATES)

Column: **TRB-225**, P/N TR-250232
 Dimensions: 30m x 0.25mm x 0.25 µm
 Injection: 1 µL Sugars standard, split
 Carrier gas: H₂, 11 psi (75.8 KPa)
 Oven temperature: 220°C (Isothermal)
 Detector: FID, 250°C

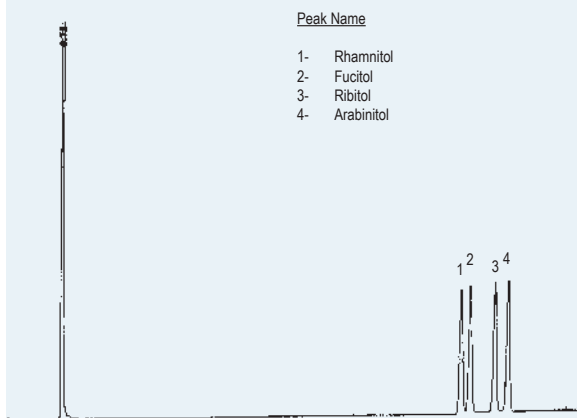


Peak Name
1- Rhamnitol
2- Fucitol
3- Ribitol
4- Arabinitol

TKG 1188

SEPARATION OF SUGARS (AS ALDITOL ACETATES)

Column: **TRB-1701**, P/N TR-130212
 Dimensions: 15m x 0.25mm x 0.25 µm
 Injection: 1 µL Sugars standard, split
 Carrier gas: H₂, 6 psi (41.3 KPa)
 Oven temperature: 180°C @ 4°C/min to 215°C
 Detector: FID, 250°C

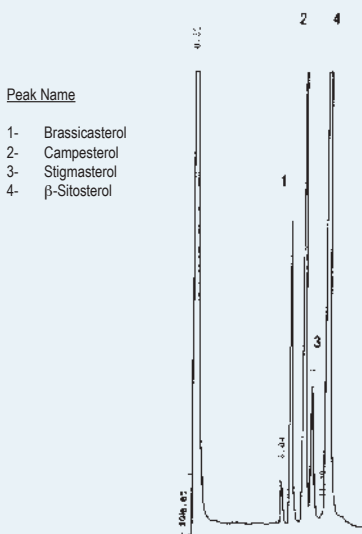


Peak Name
1- Rhamnitol
2- Fucitol
3- Ribitol
4- Arabinitol

TKG 1189

SEPARATION OF STEROLS

Column: **TRB-5**, P/N TR-120535
 Dimensions: 30m x 0.53mm x 0.50 µm
 Injection: 0.1 µL Sterols standard, direct injection
 Carrier gas: H₂, 4 psi (27.6 KPa)
 Oven temperature: 275°C (Isothermal)
 Detector: FID, 300°C

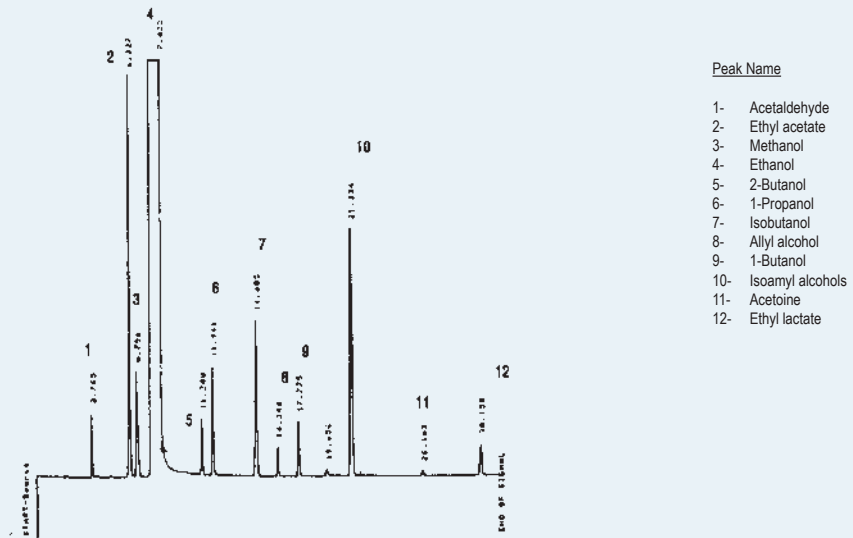


Peak Name
1- Brassicasterol
2- Campesterol
3- Stigmasterol
4- β-Sitosterol

TKG 1190

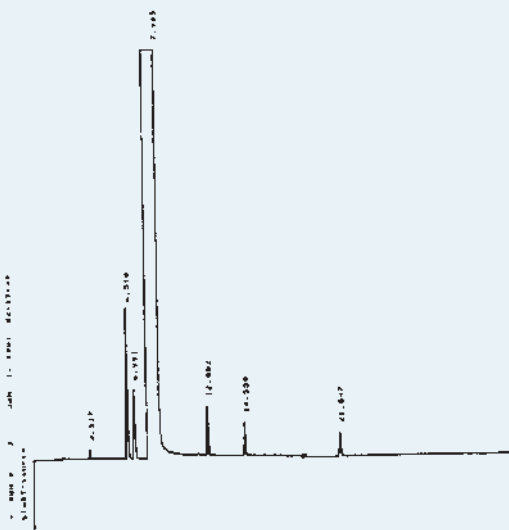
SEPARATION OF VOLATILES IN ALCOHOLIC BEVERAGES

Column: **TRB-WAX**, P/N TR-141035
 Dimensions: 30m x 0.53mm x 1.0 µm
 Injection: 0.3 µL standard, direct injection (injector of packed columns)
 Carrier gas: N₂, 4.5 mL/min
 Oven temperature: 40°C @ 2°C/min to 110°C
 Detector: FID, 250°C



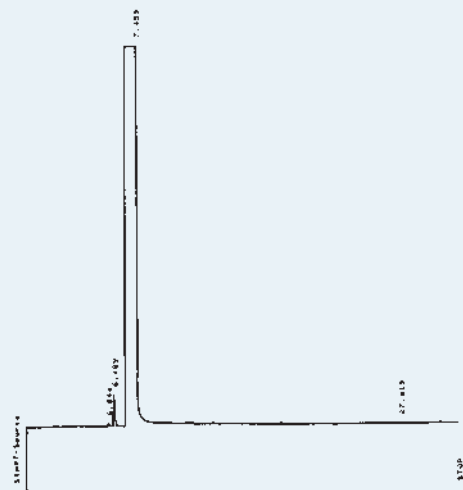
TKG 1191-A

Distilled alcohol



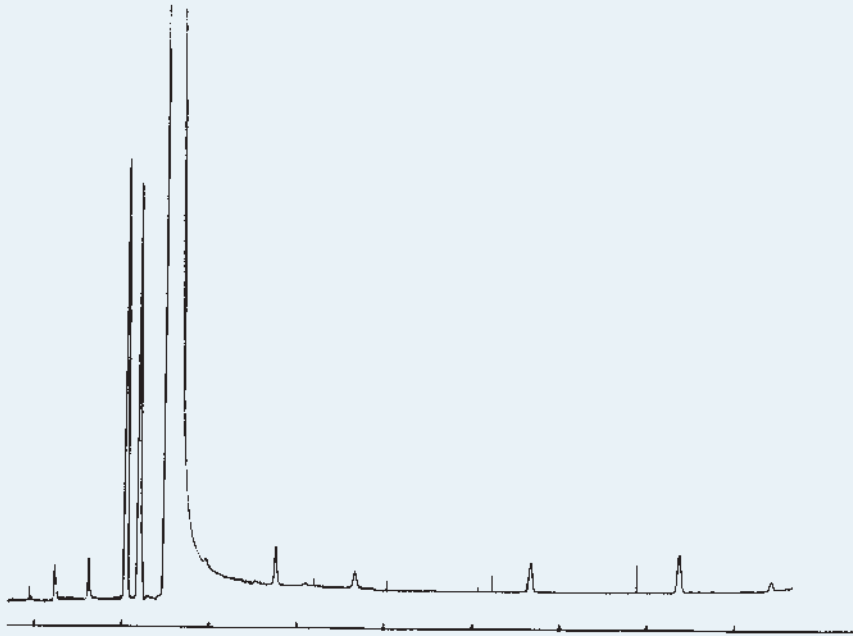
TKG 1191-B

Rectified alcohol



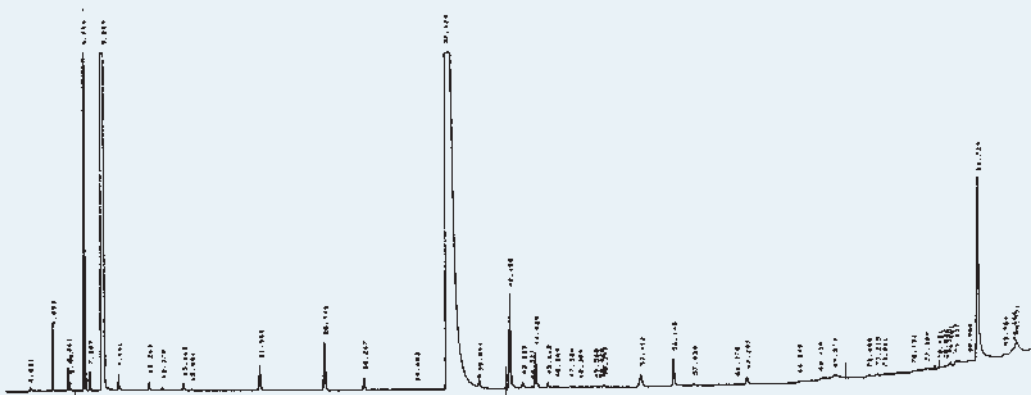
TKG 1191-C

Gin



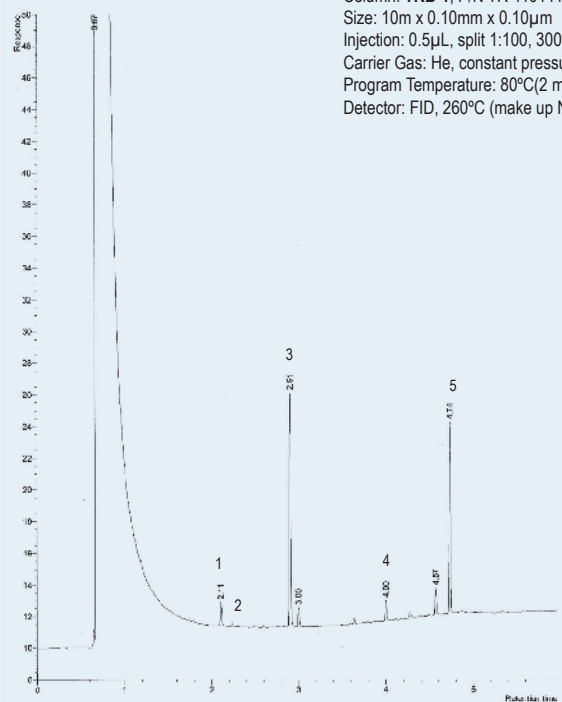
TKG 1191-H

Jerez Vinegar



TKG 1191-I

EXTRACT OF ROSEMARY IN N-PENTANE



Column: **TRB-1**, P/N TR-110141
 Size: 10m x 0.10mm x 0.10µm
 Injection: 0.5µL, split 1:100, 300°C (liner 1mm)
 Carrier Gas: He, constant pressure 35 psi (0.4mL/min)
 Program Temperature: 80°C(2 min) @ 20°C/min to 250°C(5 min)
 Detector: FID, 260°C (make up N2, 60 mL/min)

Peak Name

- 1 α-Pinene
- 2 Camphene
- 3 Eucalyptol
- 4 1,7,7-Tricamphor
- 5 Verbenone

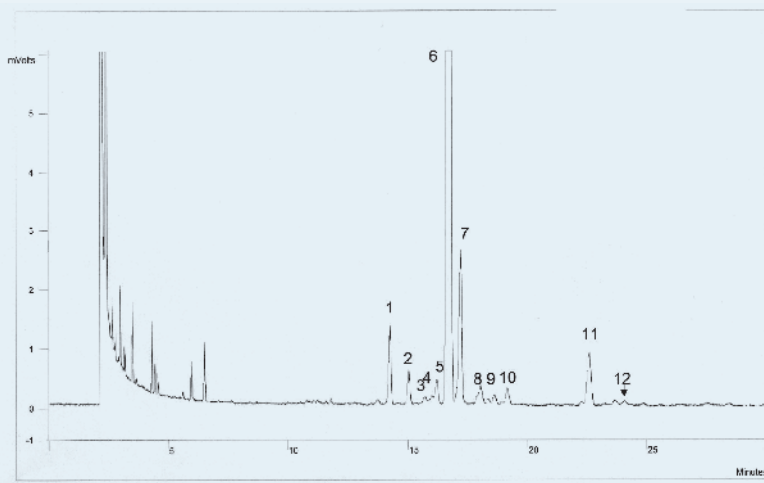
TKG 1196

STEROLS IN OLIVE OIL

Column: **TRB-STEROL**, P/N TR-180738
 Size: 30m x 0.22mm x 0.12µm
 Injection: 1 µL olive oil in diethyl ether (extraction following norm), split 1:30, 250°C
 Carrier Gas: H₂, constant flow 1.6 mL/min
 Oven Temperature: 285°C
 Detector: FID, 320°C

Peak Name

- 1 Campesterol
- 2 Estigmasterol
- 3 Δ⁷-Campesterol
- 4 Δ^{5,23}-Estigmastadienol
- 5 Clerosterol
- 6 β-Sitosterol
- 7 Δ⁵-Avenasterol
- 8 Δ^{5,24}-Estigmastadienol
- 9 Δ⁷-Estigmastenol
- 10 Δ⁷-Avenasterol
- 11 Eritrodiol
- 12 Uvaol



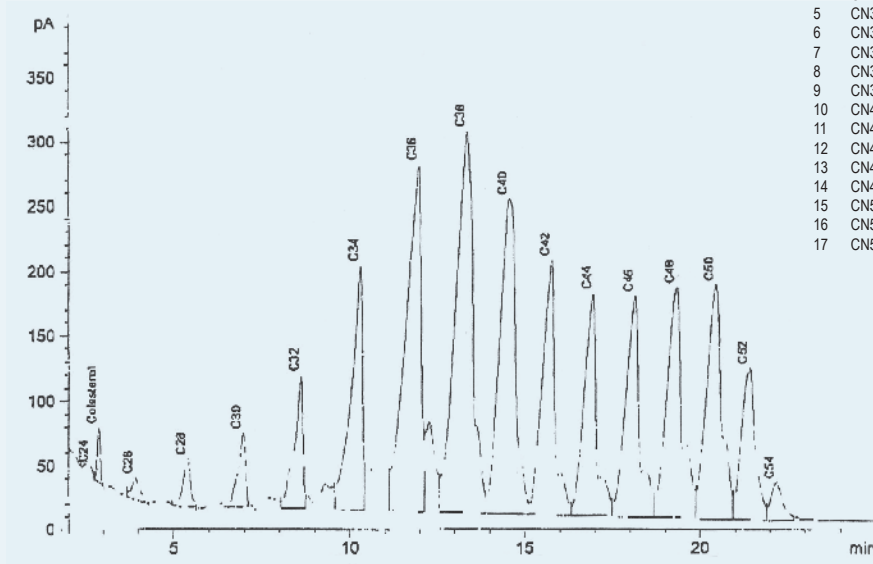
Chromatogram provided by Dr. Manuel León, Instituto de la Grasa (Sevilla).

TKG 1197

TRIGLYCERIDES IN MILKY FAT

Column: **TRB-1ht SimDist**, P/N TR-6113A5 INOX
 Size: 5m x 0.53mm x 0.15µm
 Injection: 1 µL triglycerides of milky fat standard BCR, 370°C, split
 Carrier Gas: He, 15 psi
 Program Temperature: 200°C(1 min) @ 6°C/min to 350°C(5 min)
 Detector: FID, 370°C (N2 make up)

Chromatogram provided by Pablo Ramos Balbona , Remy Picot (Navia, Asturias)



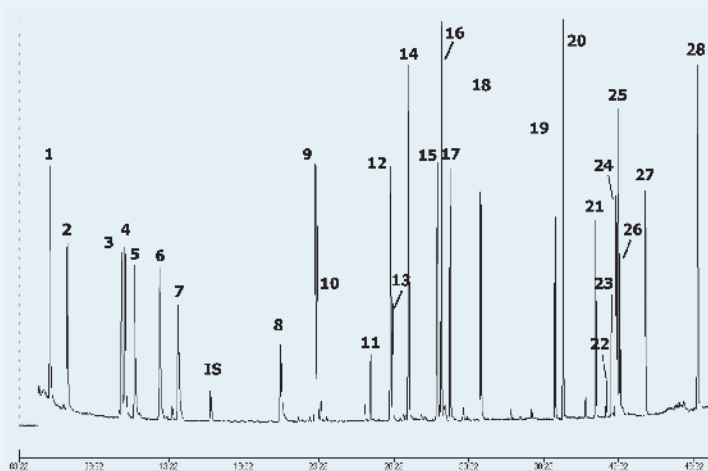
Peak Name	
1	CN24
2	Cholesterol
3	CN26
4	CN28
5	CN30
6	CN32
7	CN34
8	CN36
9	CN38
10	CN40
11	CN42
12	CN44
13	CN46
14	CN48
15	CN50
16	CN52
17	CN54

TKG 1230

ALLERGENS IN COSMETICS

Column: **TRB-WAX**, P/N TR-140232
 Size: 30m x 0.25mm x 0.25µm
 Injection: 1 µl standard (25 µg/ml) in dichloromethane, splitless (60s), 250°C
 Carrier Gas: He, 1mL/min
 Program temperature: 32°C (5min) @ 4°C/min to 250°C (5min)
 Detector: MS KONIK-TECH, Mode EI+ (70 eV), rango mas 35-300, Scan time 35ms,
 Source Temperature 120°C, Interface 250°C, Photomultiplier 750V.

Chromatogram provided by Nieves Sarrion from KONIK-TECH, S.A (Barcelona).



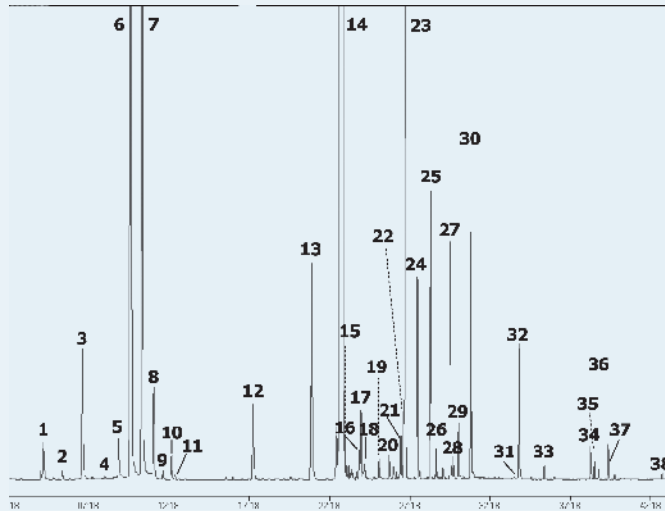
Peak Name	
1	α-Pinene
2	Camphene
3	β-Myrcene
4	α-Terpinene
5	Limonene
6	γ-Terpinene
7	Terpinolene
8	β-citronellal
9	Linalool
10	Linalyl acetate
11	Neral
12	s-Carvone
13	Geranial
14	β-Citronellol
15	α-
16	Geraniol
17	Benzyl alcohol
18	Hydroxycitronellal
19	Eugenol
20	Thymol
21	Cinnamyl alcohol
22	Farnesol (1)
23	Farnesol (2)
24	Isoeugenol
25	Hexyl cinnamal
26	Farnesol (3)
27	Coumarin
28	Benzyl benzoate
IS	Ethyl heptanoate

TKG 1199

Column: **TRB-WAX**, P/N TR-140232
 Size: 30m x 0.25mm x 0.25µm
 Injection: split 1:30, 250°C (liner SPME, fibra: 2cm 50/30 µm DVB/Carboxen/PDMS)
 Sample: 5 µl soap in 4 mL of water (26.6% NaCl)
 Carrier gas: He, 1mL/min
 Program temperature: 32°C (5min) @ 4°C/min to 250°C (5min)
 Detector: MS KONIK-TECH, Mode EI+ (70 eV), range mass 35-300, Scan time 35ms,
 Source Temperature 120°C, Interface Temperature 250°C, Photomultiplier 750V.

Peak Name

- 1 α-Pinene
- 2 Camphene
- 3 β-Pinene
- 4 3-Carene
- 5 β-Myrcene
- 6 Limonene
- 7 Eucalyptol
- 8 γ-Terpinene
- 9 cis-β-Ocimene
- 10 p-Cymene
- 11 Terpinolene
- 12 Methyl octanoate
- 13 (-)-Camphor
- 14 Linalool
- 15 Linalyl acetate
- 16 Methyl decanoate
- 17 4-Terpineol
- 18 Linalyl isobutyrate
- 19 (-)-Menthol
- 20 Citronellol acetate
- 21 Terpineol acetate
- 22 (-)-Borneol
- 23 α-Terpineol
- 24 Nerol acetate
- 25 Geraniol acetate
- 26 Citronellyl
- 27 Nerol
- 28 β-Phenethyl
- 29 Estragole
- 30 Geraniol
- 31 Hydroxycitronellal
- 32 1-Undecanol
- 33 Cinnamal
- 34 Eugenol
- 35 Nerolin
- 36 Thymol
- 37 Carvacrol
- 38 DEP



Chromatogram provided by Nieves Sarrion de KONIK-TECH, S.A

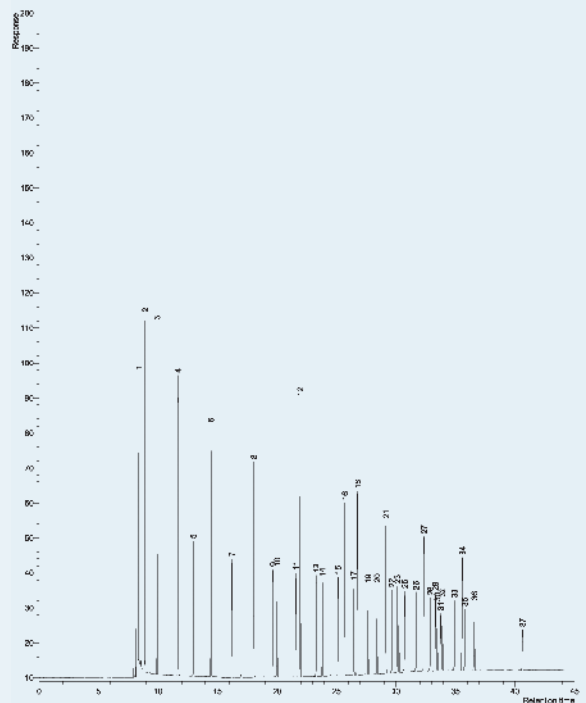
TKG 1228

SEPARATION OF METHYL ESTERS (FAMES)

Column: **TR-CN100**, P/N TR-882192
 Size: 100m x 0.25mm x 0.20µm
 Injection: 1 µL Total FAMES en CH2Cl2 (30 mg/mL), split 1:100, 260°C
 Carrier gas: He 45 psi, 21 cm/s (140°C)
 Program temperature: 140°C(6min) @ 4°C/min to 240°C(10min)
 Detector: FID, 260°C

Peak Name

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



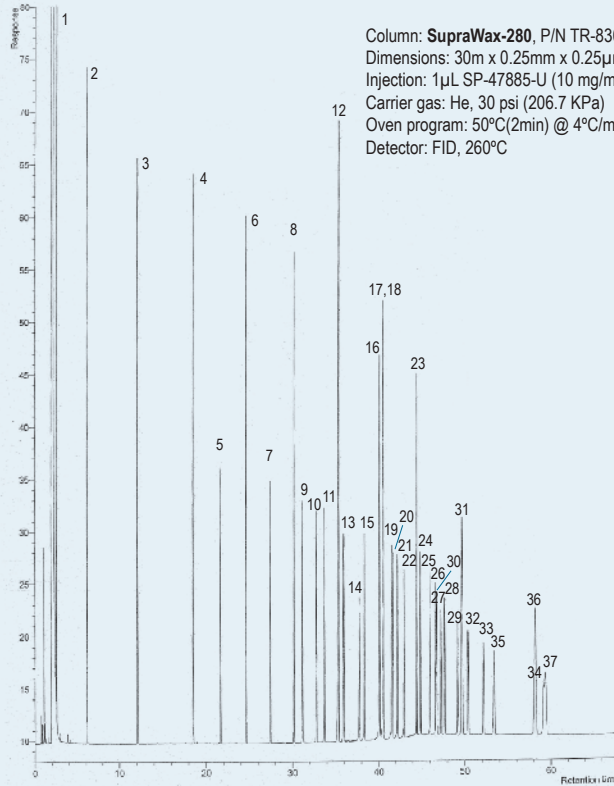
TKG 1229

Peak Name

- 1 C6:0
- 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-heptadecanoic)
- 16- C18:0 (stearic)
- 17- C18:1n9c (oleic) + C18:1n9t (elaidic)
- 18- C18:2n6c (linoleic)
- 19- C18:2n6t (linolelaidic)
- 20- C18:3n6 (γ-linolenic)
- 21- C18:3n3 (α-linolenic)
- 22- C20:0 (arachidic)
- 23- C20:1n9 (cis-11-eicosenoic)
- 24- C20:2 (cis-11,14-eicosadienoic)
- 25- C20:3n6 (cis-8,11,14-eicosatrienoic)
- 26- C21:0 (heneicosanoic)
- 27- C20:3n3 (cis-11,14,17-eicosatrienoic)
- 28- C20:4n6 (arachidonic)
- 29- C20:5n3 (cis-5,8,11,14,17-eicosapentaenoic)
- 30- C22:0 (behenic)
- 31- C22:1n9 (erucic)
- 32- C22:2 (cis-13,16-docosadienoic)
- 33- C23:0 (tricosanoic)
- 34- C24:0 (lignoceric)
- 35- C22:6n3 (cis-4,7,10,13,16,19-docosahexaenoic)
- 36- C24:1n9 (nervonic)

SEPARATION OF FAMES

Column: **SupraWax-280**, P/N TR-830232
 Dimensions: 30m x 0.25mm x 0.25µm
 Injection: 1µL SP-47885-U (10 mg/mL), split 1:100, 260°C
 Carrier gas: He, 30 psi (206.7 KPa)
 Oven program: 50°C(2min) @ 4°C/min to 220°C(15min)
 Detector: FID, 260°C



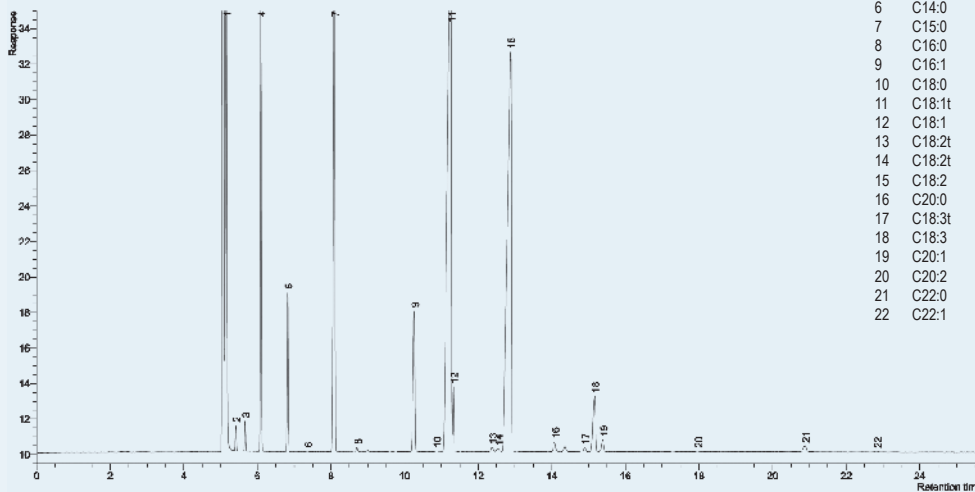
TKG 1237

SEPARATION OF METHYL ESTERS IN SOYA OIL

Column: **TR-CN100**, P/N TR-882162
 Size: 60m x 0.25mm x 0.20µm
 Injection: 1µL Total FAMES en CH2Cl2 (30 mg/mL), split 1:100, 280°C
 Carrier gas: He 25 psi
 Program temperature: 185°C
 Detector: FID, 280°C

Peak Name

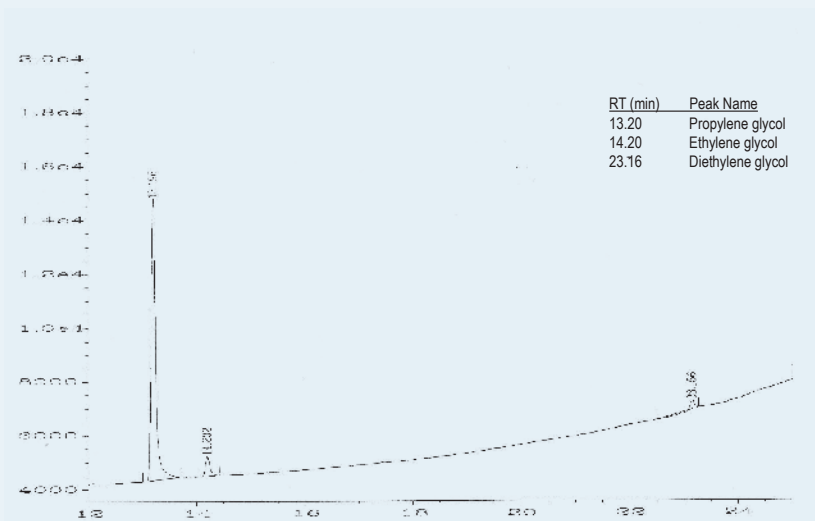
- 1 C6:0
- 2 C8:0
- 3 C10:0
- 4 C12:0
- 6 C14:0
- 7 C15:0
- 8 C16:0
- 9 C16:1
- 10 C18:0
- 11 C18:1t
- 12 C18:1
- 13 C18:2t
- 14 C18:2t
- 15 C18:2
- 16 C20:0
- 17 C18:3t
- 18 C18:3
- 19 C20:1
- 20 C20:2
- 21 C22:0
- 22 C22:1



TKG 1239

GLYCOLS IN WINE

Column: **SupraWAX-280**, P/N TR-831035
 Size: 30m x 0.53mm x 1.0µm
 Injection: 1 µL split 1:50, 220°C
 Carrier gas: He, 5.4 psi
 Program temperature: 100°C (3min) @ 4.5°C/min to 220°C (10min)
 Detector: FID, 260°C



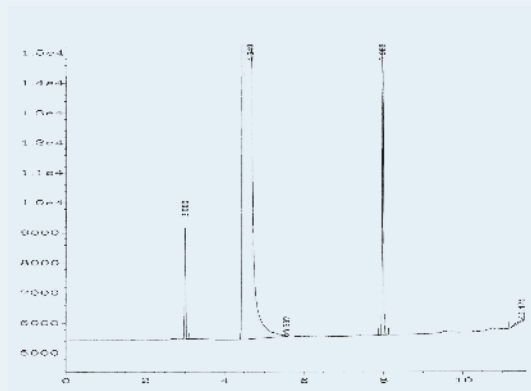
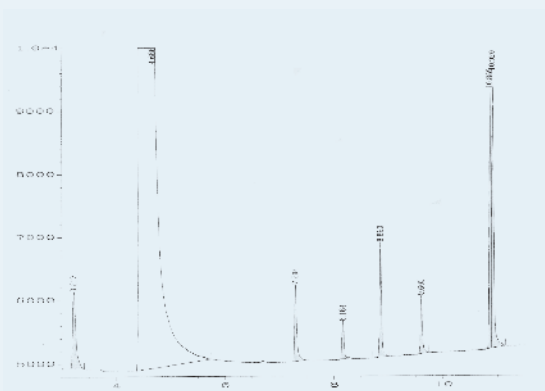
Chromatogram provided by R. Franquet and Joan Garcia from INCAVI (Vilafranca del Penedés, Barcelona)

TKG 1241

METHANOL AND HIGHER ALCOHOLS

Column: **TRB-624**, P/N TR-601432
 Size: 30m x 0.25mm x 1.4µm
 Injection: 1 µL split 1:50, 250°C
 Carrier gas: He, 1mL/min
 Program temperature: 40°C (5min) @ 20°C/min to 200°C (3min)
 Detector: FID, 260°C

RT (min)	Peak Name
3.21	Methanol
4.66	Ethanol
7.29	1-Propanol
8.16	2-Butanol
8.86	Isobutanol
9.60	1-Butanol
10.87	Isoamyl alcohol
10.92	Isoamyl alcohol

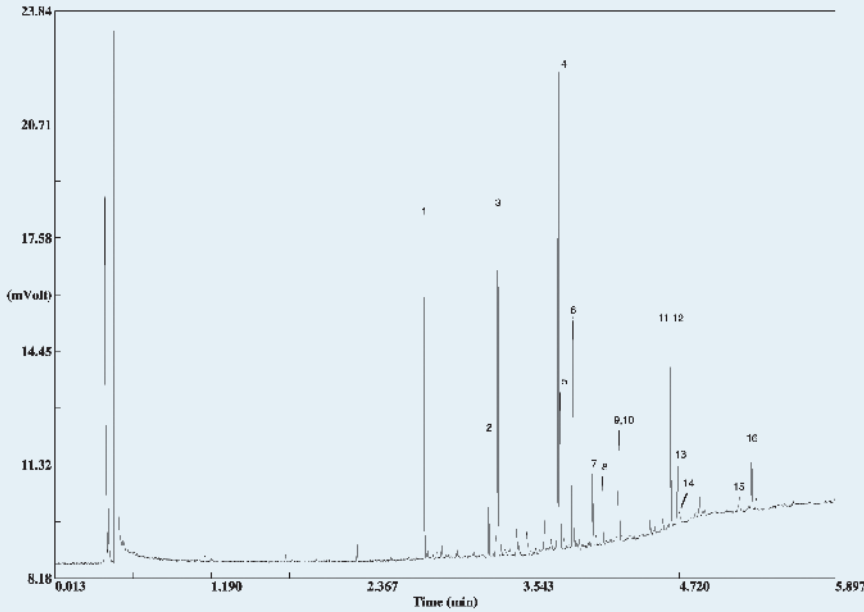


Chromatogram provided by Joan Garcia from INCAVI (Vilafranca del Penedés, Barcelona)

TKG 1242

PUFA I

Column: **SupraWax-280**, 15m x 0.10mm x 0.10µm (P/N: TR-830111)
 Injection: 280°C, split 200:1, precision liner
 Detector: FID, 280°C
 Carrier Gas: H₂, 45 psi (310.05 KPa)
 Oven: 100°C (0.5min) @ 50°C/min to 280°C (2min)
 Sample: 0.2µL PUFA I - Marine Source diluted to 50mg/ml in methylene chloride



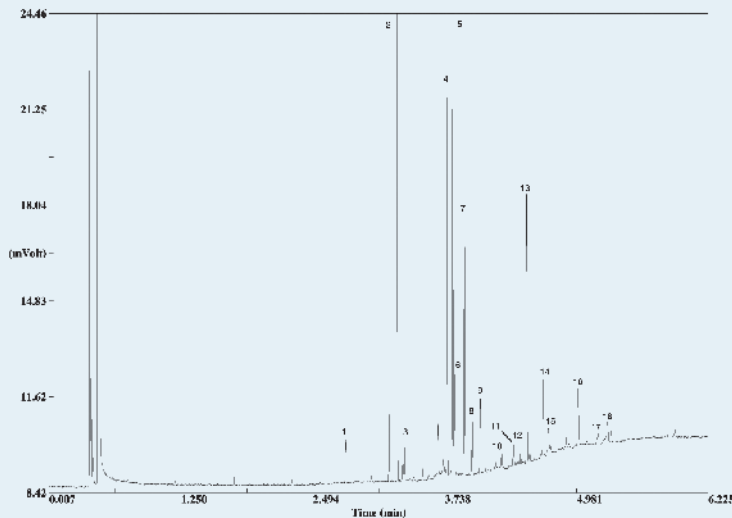
Peak Name

1. C14:0
2. C16:0
3. C16:1ω7
4. C18:1ω9
5. C18:1ω7
6. C18:2ω6
7. C18:3ω3
8. C18:4ω3
9. C20:1ω9
10. C20:1ω11
11. C20:4ω3
12. C20:5ω3
13. C22:1ω11
14. C22:1ω9
15. C22:5ω3
16. C22:6ω3

TKG 1248

PUFA II

Column: **SupraWax-280**, 15m x 0.10mm x 0.10µm (P/N: TR-830111)
 Injection: 280°C, split 200:1, precision liner
 Detector: FID, 280°C
 Carrier Gas: H₂, 45 psi (310.05 KPa)
 Oven: 100°C (0.5min) @ 50°C/min to 280°C (2min)
 Sample: 0.2µL PUFA II - Animal Source diluted to 50mg/ml in methylene chloride



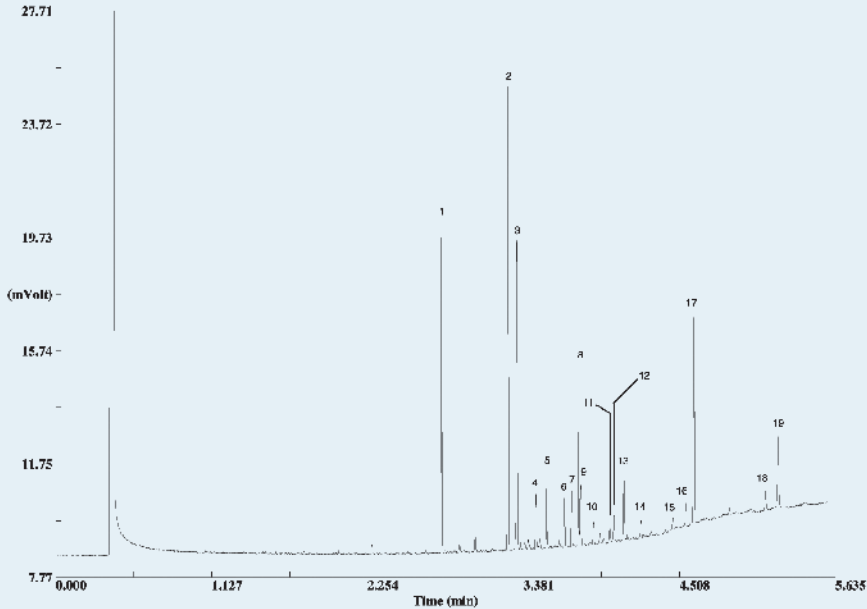
Peak Name

1. C14:0
2. C16:0
3. C16:1ω7
4. C18:0
5. C18:1ω9
6. C18:1ω7
7. C18:2ω6
8. C18:3ω6
9. C18:3ω3
10. C20:1ω9
11. C20:2ω6
12. C20:3ω6
13. C20:4ω6
14. C20:5ω3
15. C22:1ω9
16. C22:4ω6
17. C22:5ω3
18. C24:1

TKG 1249

PUFA III

Column: **SupraWax-280**, 15m x 0.10mm x 0.10µm (P/N: TR-830111)
 Injection: 280°C, split 200:1, precision liner
 Detector: FID, 280°C
 Carrier Gas: H₂, 45 psi
 Oven: 100°C (0.5min) to 280°C @ 50°C/min (2min)
 Sample: 0.1µL PUFA III – Partially Hydrogenate Menhaden Oil diluted to 100mg/ml in hexane

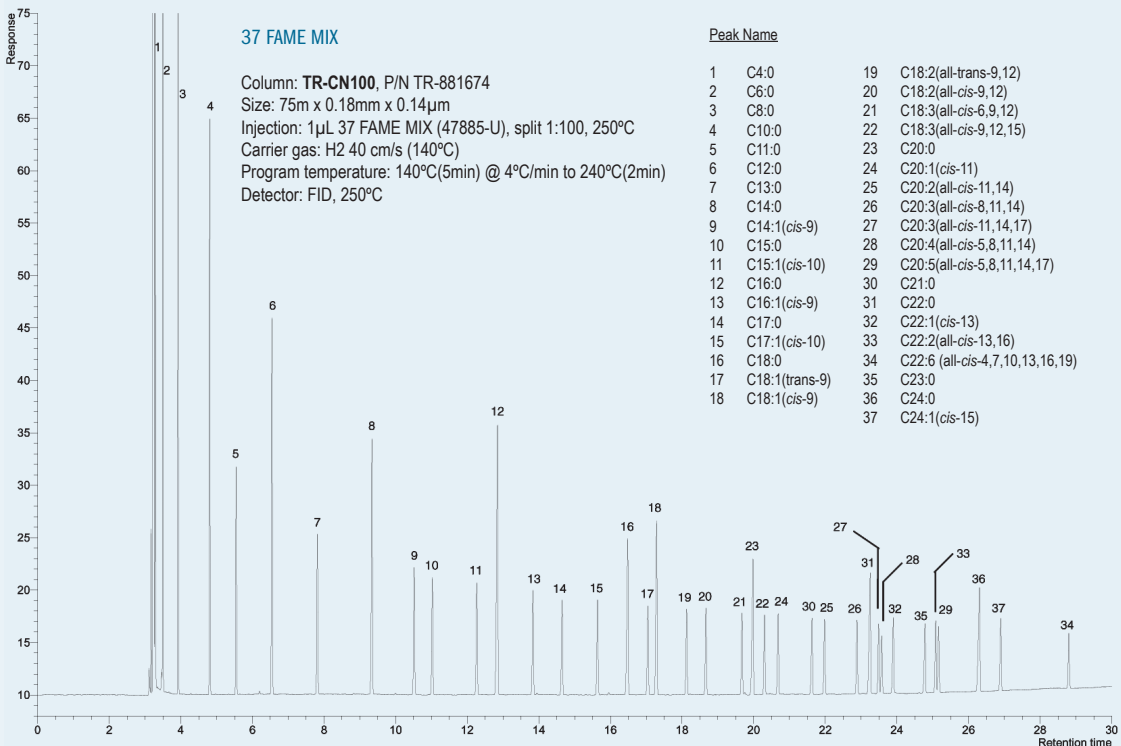


Peak Number	Peak Name
1.	C14:0
2.	C16:0
3.	C16:1ω7
4.	C16:2ω4
5.	C16:3ω4
6.	C16:4ω1
7.	C18:0
8.	C18:1ω9
9.	C18:1ω7
10.	C18:2ω4
11.	C18:3ω4
12.	C18:3ω3
13.	C18:4ω3
14.	C20:1ω9
15.	C20:4ω6
16.	C20:4ω3
17.	C20:5ω3
18.	C22:5ω3
19.	C22:6ω3

TKG 1253

37 FAME MIX

Column: **TR-CN100**, P/N TR-881674
 Size: 75m x 0.18mm x 0.14µm
 Injection: 1µL 37 FAME MIX (47885-U), split 1:100, 250°C
 Carrier gas: H₂ 40 cm/s (140°C)
 Program temperature: 140°C(5min) @ 4°C/min to 240°C(2min)
 Detector: FID, 250°C



Peak Number	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)

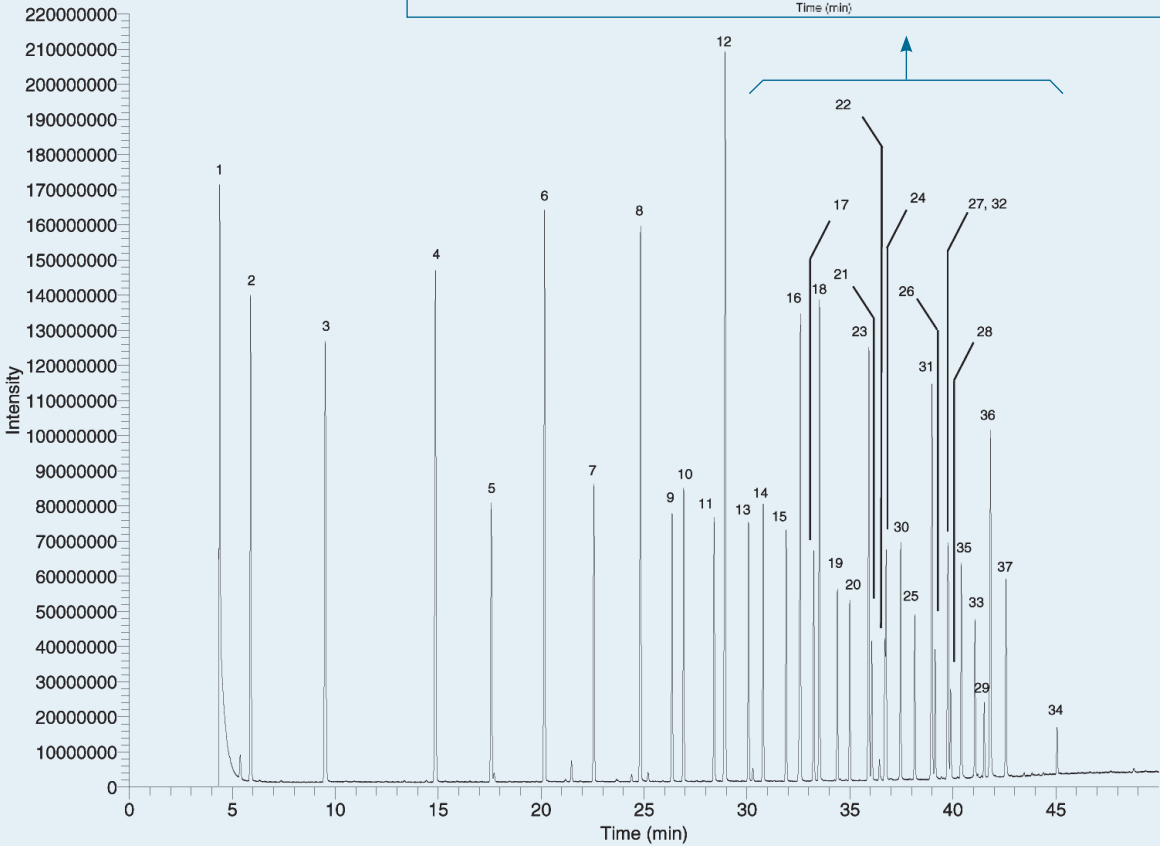
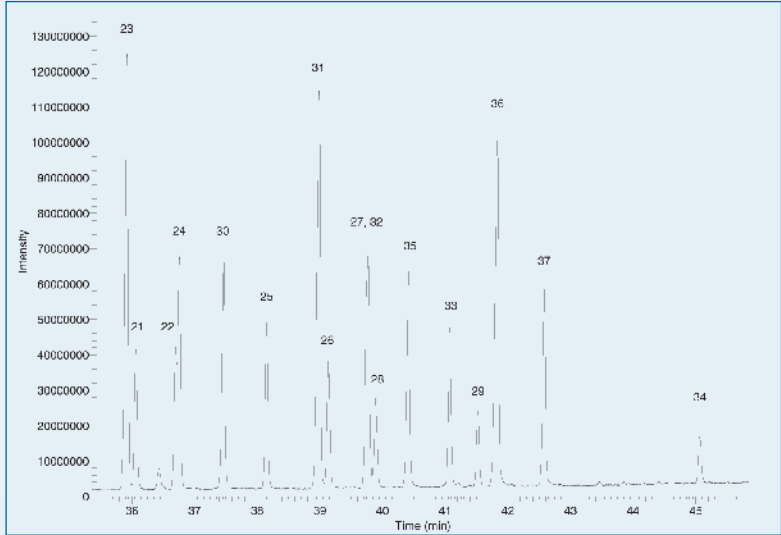
TKG 1250

37 FAME MIX- MS DETECTOR

Column: **TR-CN100**, 60m x 0.25mm x 0.20µm (P/N: TR-882162)
 Injection: 280°C, split 50:1
 Oven: 90°C (7min) to 240°C @ 4°C/min (3min)
 Carrier gas: Helium, constant pressure @ 24psi
 Detector: MS
 Transfer line temp.: 230°C
 Ionization mode: EI
 Scan range: 40-450amu
 Sample: 0.5µL Food Industry FAME Mix 30mg/ml in methylene chloride

Peak Name

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



TKG 1251

Compound	Pages	Compound	Pages
Acenaphthene	42,343,349,365	Bromochloromethane	319
Acenaphthylene	42,343,349,365	Bromodichloromethane	324,359,375
Acetal	63,320	Bromoform	324,359,375
Acetaldehyde	50,63,64,70,320,329,332,369,376,381	4-Bromophenyl phenyl ether	349
Acetaldehyde-DNPH	341	Bromopropylate	372,374
Acetic acid	336,353,370,376	BTX (Benzene Toluene Xylene)	338,341,353
Acetic anhydride	336	BTEX (Benzene Toluene Ethylbenzene Xylene)	339
Acetone	370,381	Butanal	336,339,368,372
Acetone	38,46,47,50,70,316,317,318,319,320,321,325,326,327,328,329,331,332,335,343,353,363,364,367	<i>n</i> -Butane	28,331,336
Acetonitrile	38,47,49,325,335,363,364	Butanediol	326
Acrylamide	370	1,3-Butanediol	370,376
Acrylonitrile	338	2,3-Butanediol	51,56,68,75,376
Adamantane	323	D(-)-2,3-Butanediol	370
Alanine	333	Levo-2,3-Butanediol	376
Alcoholic beverages	381,382,383	Meso-2,3-Butanediol	370,376
Aldrin	31,339,340,341,342,350,360	Butanetriol	71
Allyl alcohol	64,320,376,381	<i>n</i> -Butanol	38,63,64,317,318,319,320,321,322,343,363,367,368,369,376,377,381,388
Allyl isothiocyanate	369	2-Butanol	63,64,320,321,367,369,376,377,381,388
Amantadine	323	sec-Butanol	335
Ametrin	43	tert-Butanol	27
Amyl alcohol (3-methyl-1-butanol)	320,369	2-Butanone (see MEK)	
tert-Amyl alcohol	367	Butyl acetate	46,47,317,318,319,321,322,325,326,334,338,363
Amylene	319,322,327	Butyl acrylate	317,322
Amylic alcohols	321	<i>n</i> -Butylamine	37,343,360
Aniline	318,349	<i>t</i> -Butylamine	37
Anisole	318	<i>n</i> -Butylbenzene	28,362
Anthracene	42,343,349,365	sec-Butylbenzene	28,362
Arabinitol	380	Butyl benzyl phthalate	349,361,364
Arachidic acid methyl ester (C20:0)	58,62,65,66,74,368,371,373,377,379,380,386,387,390,391	Butyl butyrate	319
Arachidonic acid methyl ester (C20:4n6)	58,65,66,74,368,373,377,386,387,390,391	<i>n</i> -Butyl ether	319
Aroclors	356,350,357	Butyl formate	322
Aroclor 1242	357,358	Butyl glycol	317,318,319
Aroclor 1270	356,357,358	Butyl glycol acetate	318
Aroclor 1260	356,357,358	<i>N</i> -Butyl-2-(1-hydroxyhexyl)pyrrole	372
Atraton	43	2-Butyl mercaptan	26
Atrazine	43	tert-Butyl mercaptan	26
55-Avenasterol	372,375,379,384	tert-Butylmethyl ether	61
57-Avenasterol	375,384	2-Butyloctanal	372
Azobenzene	349	<i>N</i> -Butyl-2-pentylpyrrole	372
Azoxystrobin	374	1-Butylpyrrole	372
BDE-28 (2,4,4'-Tribromodiphenyl ether)	44	Butyric acid	353,368
BDE-47 (2,2',4,4'-Tetrabromodiphenyl ether)	44	Butyric acid methyl ester (C4:0)	58,65,66,74,373,386,387,390,391
BDE-66 (2,3',4,4'-Tetrabromodiphenyl ether)	44	<i>y</i> -Butyrolactone	377
BDE-100 (2,2',4,4',6-Pentabromodiphenyl ether)	44	C10 (decane)	22,24,28,30,45,51,52,53,55,56,68,75,322,325,333,336,362
BDE-99 (2,2',4,4',5-Pentabromodiphenyl ether)	44	C10:0 (capric acid methyl ester)	51,56,58,65,66,68,74,75,373,386,387,390,391
BDE-85 (2,2',4,4',6-Pentabromodiphenyl ether)	44	C10-Ethyl	63,369
BDE-154 (2,2',4,4',5,6'-Hexabromodiphenyl ether)	44	C11 (undecane)	22,45,51,52,53,55,56,68,69,75,336,362
BDE-153 (2,2',4,4',5,5'-Hexabromodiphenyl ether)	44	C11:0 (undecanoic acid methyl ester)	51,56,58,65,66,68,74,75,373,377,386,387,390,391
BDE-183 (2,2',3,4,4',5',6'-Heptabromodiphenyl ether)	44	C12 (dodecane)	22,24,30,45,52,53,55,56,69,333,336,362
BDE-209 (2,2',3,3',4,5',5',6'-Nonabromodiphenyl ether)	44	C12:0 (lauric acid methyl ester)	51,56,58,65,66,68,74,75,373,377,386,387,390,391
BDMA (N,N-Dimethylbenzylamine)	332	C13 (tridecane)	22,45,52,53,55,56,69,362
Behenic acid methyl ester (C22:0)	58,62,65,66,74,373,377,380,386,387,390,391	C13:0 (tridecanoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzaldehyde	63,369,377	C14 (tetradecane)	24,25,30,35,40,45,52,53,55,68,318,322
Benzene	27,28,38,46,47,48,69,320,324,325,326,328,330,331,334,336,338,339,341,343,353,362,363,	C14:0 (myristic acid methyl ester)	58,62,65,66,74,368,371,373,377,380,386,387,390,391
Benzidine	349	C14:1 (myristoleic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzo(a)anthracene	42,343,349,365	C15 (pentadecane)	36,59,60,61
Benzo(b)fluoranthene	25,35,40,42,337,343,349,365	C15:0 (pentadecanoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzo(k)fluoranthene	25,35,40,42,343,349,365	C15:1 (cis-10-pentadecanoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzoic acid	25,35,40,349	C16 (hexadecane)	24,30,36,59,60,61,322
Benzoilcegonine	323	C16:0 (palmitic acid methyl ester)	58,62,65,66,74,368,371,373,377,379,386,387,390,391
Benzo(g,h,i)perylene	35,40,42,337,343,349,365	C16:1 (palmitoleic acid methyl ester)	58,65,66,74,373,377,379,380,386,387,390,391
Benzo(a)pyrene	42,343,349,365	C17 (heptadecane)	36,59,60,61
Benzo(e)pyrene	337	C17:0 (heptadecanoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzyl alcohol	349,385	C17:1 (cis-10-heptadecanoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Benzylamine	36,61	C18 (octadecane)	24,30,36,59,60,61
Benzyl benzoate	385	C18:0 (stearic acid methyl ester)	58,62,65,66,74,368,371,373,377,379,380,386,387,390,391
Bergamol	371	C18:1 (oleic acid methyl ester)	368,371,379
α -BHC	31,340,341,342,360,366	C18:1n7	62
β -BHC	31,340,341,342,360,366	C18:1n6c (petroselinic acid methyl ester)	58,65,66,373,377,386,387,390,391
δ -BHC	31,340,341,342,360,366	C18:1n6t (petroselaic acid methyl ester)	66
γ -BHC	31,340,341,342,360,366	C18:1n9 (oleic acid methyl ester)	62
Bis(2-chloroethoxy)methane	349	C18:1n9c (oleic acid methyl ester)	58,65,66,74,373,377,379,386,387,390,391
Bis(2-chloroethyl)ether	349	C18:1n9t (elaidic acid methyl ester)	58,65,66,74,373,377,379,386,387,390,391
Bis(2-chloroisopropyl) ether	349	C18:1n11c (vaccenic acid methyl ester)	66
Bis(2-butoxyethyl) phthalate	361	C18:1n11t (transvaccenic acid methyl ester)	66
Bis(2-ethoxyethyl) phthalate	361	C18:2 (linoleic acid methyl ester)	368,371,379,380
Bis(2-ethylhexyl) adipate	349	C18:2n6 (linoleic acid methyl ester)	62
Bis(2-ethylhexyl) phthalate	349,361,364	C18:2n6c (linoleic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Bis(2-methoxyethyl) phthalate	361	C18:2n6t (linolelaic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
Bis(4-methyl-2-pentyl) phthalate isomers	361	C18:2n9,12c (linoleic acid methyl ester)	66
(-)-Borneol	386	C18:3 (linolenic acid methyl ester)	368,371
Brassicasterol	33,380	C18:3n3 (α -linolenic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
		C18:3n6 (γ -linolenic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
		C18:4n3	62

Compound	Pages
C20 (eicosane)	24,25,30,35,36,40,59,60,61
C20:0 (arachidic acid methyl ester)	58,62,65,66,74,368,371,373,377,379,380,386,387,390,391
C20:1 (cis-11-Eicosenoic acid methyl ester)	74,368,371
C20:1n9 (cis-11-eicosenoic acid methyl ester)	58,65,66,373,377,386,387,390,391
C20:2 (cis-11,14-eicosadienoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
C20:3n3 (cis-11,14,17-eicosatrienoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
C20:3n6 (cis-8,11,14-eicosatrienoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
C20:4n6 (arachidonic acid methyl ester)	58,65,66,74,368,373,377,386,387,390,391
C20:5n3 (cis-5,8,11,14,17-eicosapentaenoic)	58,62,65,66,74,373,386,387,390,391
C21 (heneicosane)	25,35,40
C21:0 (heneicosanoic acid methyl ester)	58,65,66,74,373,386,387,390,391
C22 (docosane)	24,25,30,35,40
C22:0 (behenic acid methyl ester)	58,62,65,66,74,373,377,380,386,387,390,391
C22:1n9 (erucic acid methyl ester)	58,65,66,74,368,371,373,377,380,386,387,390,391
C22:2 (cis-13,16-docosadienoic acid methyl ester)	58,65,66,74,373,377,386,387,390,391
C22:5n3	62
C22:6n3 (cis-4,7,10,13,16,19-docosahexaenoic)	58,62,65,66,74,373,377,386,387,390,391
C23:0 (tricosanoic acid methyl ester)	58,62,65,66,74,373,377,386,387,390,391
C24 (tetracosane)	24,30,333
C24:0 (lignoceric acid methyl ester)	58,62,65,66,74,368,371,373,377,380,386,387,390,391
C24:1n9 (nervonic acid methyl ester)	58,62,65,66,74,373,377,386,387,390,391
C26 (hexacosane)	24,30
C28 (octacosane)	24,30,333
C30 (triacontane)	24,30,333
C32 (dotriacontane)	24,30,370
C34 (tetraatriacontane)	24,30
C36 (hexatriacontane)	24,30,370
C38 (octatriacontane)	24,30,370
C40 (tetracontane)	24,30,322,333,370
C4:0 (butyric acid methyl ester)	58,65,66,74,373,386,387,390,391
C42 (dotetracontane)	370
C44 (tetraetracontane)	24,30,322,370
C46 (hexaetracontane)	370
C5 (pentane)	27,28,322,330,331,336,343
C50 (pentacontane)	322
C6 (hexane)	27,28,30,38,47,330,331,335,336
C60 (hexacontane)	322
C6:0 (caproic acid methyl ester)	58,65,66,74,373,386,387,390,391
C6-Ethyl	63,369
C7 (heptane)	27,28,38,47,321,330,331,335,336,362,363
C70 (heptacontane)	322
C8 (octane)	24,27,28,30,336,362
C8:0 (caprylic acid methyl ester)	58,65,66,74,373,386,387,390,391
C8-Ethyl	63,369
C80	322
C9 (nonane)	27,28,336,362
C9-Ethyl	63,369
Caffeine	67
Campestenol	379
Campesterol	33,372,375,379,380,384
δ7-Campesterol	372,375,379,384
Camphene	384,385,386
(-)-Camphor	386
Capric acid methyl ester (C10:0)	51,56,58,65,66,68,74,75,373,386,387,390,391
Caproic acid	353
Caproic acid methyl ester (C6:0)	58,65,66,74,373,386,387,390,391
Caprylic acid methyl ester (C8:0)	58,65,66,74,373,386,387,390,391
Captafol	372,374
Caplan	354,372,374
Carbazole	25,35,40,349
Carbon tetrachloride	38,47,319,322,324,327,328,359
3-Carene	386
Carvacrol	386
s-Carvone	385
trans-Caryophyllene	63
Cholesterol	372,375,379,384
α-Chlordane	31,340,341,342,360,366
γ-Chlordane	31,340,341,342,360,366
4-Chloroaniline	349
Chlorobenzene	47,324,359
2-Chlorobiphenyl (PCB 1)	44
2-Chloroethyl vinyl ether	324
Chloroform	38,47,48,319,322,324,325,327,353,359,363,375
Chloromethane	322
2-Chloromethyl-3,4-dimethoxypyridine hydrochloride	365
4-Chloro-3-methylphenol	349,354,364,376
2-Chloronaphthalene	349
Chlorophenol	354,364,376
2-Chlorophenol	349
4-Chlorophenyl phenyl ether	349
Chloropicrine	369
Chlorpiriphos	351,372,374
Chlozolate	372,374
Cholesterol	33,372,375

Compound	Pages
Chrysene	42,343,349,365
Cinnamal	386
Cinnamyl alcohol	385
β-Citronellal	385
α-Citronellol	385
β-Citronellol	385
Citronellol acetate	386
Citronellyl	386
Cocaine	323
2,4,6-Collidine	359
Coumarine	385
m-Cresol	67
o-Cresol	67
p-Cresol	67
Crysene	337
Cumaphos	378
Cumene	69,362
Cyaltrolin	374
Cyclogermacrene	57
Cycloheptylamine	208
Cyclohexane	27,38,46,47,320,330,334,335,336,362
Cyclohexanol	330
Cyclohexanone	330
Cyclohexylamine	318
Cyclopentane	28
p-Cymene	386
Cystine	333
4,4'-DDD	31,339,340,341,342,350,360,366
4,4'-DDE	31,339,340,341,342,350,360,366
2,4-DDT	339
4,4'-DDT	31,339,340,341,342,350,360,366
Decachlorobiphenyl	31,44,340,341
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB209)	358,366
2,4-Decadienal	372
n-Decane	22,24,28,30,45,51,52,53,55,56,68,75,322,325,333,336,362
Decanoic acid	368
n-Decylamine	36,61,360
DEHP	350
DEP	386
DHA	367
Diamyl phthalate	361
Diazinon	378
Dibenzo(a,h)anthracene	42,343,349,365
Dibenzofuran	349
Dibromochloromethane	324,359,375
Di-n-butyl phthalate	316,349,361,364
Dicetone alcohol	317,318,319,335
1,2-Dichlorobenzene	324,349,359
1,3-Dichlorobenzene	324,349,359
1,4-Dichlorobenzene	324,349,359
3,3'-Dichlorobenzidine	349
2,3-Dichlorobiphenyl (PCB 5)	44
1,1-Dichloroethane	319,324,359
1,2-Dichloroethane	38,47,324,359
1,2-Dichloroethene	47
cis-1,2-Dichloroethene	47
1,1-Dichloroethylene	319,324,359,363
cis-1,2-Dichloroethylene	319
trans-1,2-Dichloroethylene	324,359
2-Dichloroethylvinylether	359
Dichloroisothiocyanate	369
Dichloromethane (see methylene chloride)	
2,4-Dichlorophenol	35,349,354,364,376
1,2-Dichloropropane	324,359
cis-1,3-Dichloropropene	324,359
trans-1,3-Dichloropropene	324,359
Diclofluamide	372,374
Dicyclohexylamine	56,318
Dicyclohexyl phthalate	361
Dieldrin	31,339,340,341,342,350,360,366
Diethanolamine	323
1,1-Diethoxybutane	336
Diethylamine	37,49,343
Diethylbenzene (isomer)	362
1,3-Diethylbenzene	28
Di-(2-ethylhexyl) phthalate (DEHP)	350
Diethyl phthalate	349,361,364,371
Diethyl succinate	368
Diethyl ether	38,46
Diethylene glycol	338,388
Di-n-hexyl phthalate	361
Diisobutylketone	36
Diisobutyl phthalate	461
1,2-Dimethoxyethane	47

Compound	Pages	Compound	Pages
Dimethylacetamide	47,327	Ethyl caprylate	377
Dimethylamine	37	Ethyl carbamate	367
N,N,N-tris(3-Dimethylaminopropyl)amine (TMAPA)	332	Ethyl cocaine	323
2,4-Dimethylaniline	36,61	Ethylene glycol	318,327,338,370,376,388
2,6-Dimethylaniline	22,36,45,51,52,53,55,56,59,60,61,68,75	Ethylglycol	317
3,3'-Dimethylbenzidine	349	4-Ethyl guaiacol	368,377
N,N-Dimethylbenzylamine	332	Ethyl heptanoate	385
2,2-Dimethylbutane	28	2-Ethyl hexanal	319
2,3-Dimethylbutane	28,331	Ethyl hexanoate	368
N,N-Dimethylethanolamine	332	2-Ethyl hexanoic acid	56
1,2-Dimethyl-4-ethylbenzene	28	Ethyl isovalerate	377
1,3-Dimethyl-4-ethylbenzene	28	Ethyl lactate	63,368,369,376,377,381
1,4-Dimethyl-2-ethylbenzene	28	Ethyl mercaptan	26
Dimethylformamide	38,47,327,335,363	Ethyl palmitate	368
2,3-Dimethylhexane	28	Ethyl parathion	378
2,4-Dimethylhexane	28	m-Ethylphenol	67
2,5-Dimethylhexane	28	p-Ethylphenol	63,67,369,377
Dimethylnaphthalenes	28	o-Ethylphenol	67
2,3-Dimethylpentane	28	Ethyl pyrimiphos	378
2,4-Dimethylpentane	28,331	Ethyl pivalate	316
2,4-Dimethylphenol	349,354,364,376	m-Ethyltoluene	362
2,6-Dimethylphenol	45,51,52,53,55,56,59,60,68,75	p-Ethyltoluene	362
Dimethyl phthalate	349,361,364	Etrimfos	378
Dimethylsulfoxide	335	Eucalyptol	384,386
1,3-Dinitrobenzene	349	Eugenol	377,385,386
1,4-Dinitrobenzene	349	FAME's	58,62,65,66,74,368,371,373,377,379,380,386,387,390,391
Dinitrobenzene	341	Farnesol	57,385
4,6-Dinitro-2-methylphenol	349	trans,trans-Farnesol	57
2,4-Dinitrophenol	25,35,40,349,350,354,364,376	trans,trans-Farnesyl acetate	57
2,4-Dinitrophenylhydrazine (DNPH)	341	Fenchlorphos	378
2,4-Dinitrotoluene	349	Fenitrothion	378
2,6-Dinitrotoluene	349	Fenvalerate	374
Di-n-nonyl phthalate	361	Fluoranthene	42,343,349,365
Di-n-octyl phthalate	349,361,364	Fluorene	42,343,349,365
Diolein	71	2-Fluorobiphenyl	349
Dioxane	325,343	2-Fluorophenol	349
1,4-Dioxane	38,47,48,324,335,349,362	2-Fluorotoluene	338
Dioxathion	378	Folpet	354,372,374
Dioxines	344,345,346,347	Fonofos	378
Diphenylamine	349	Formaldehyde-DNPH	341
DMEA (N,N-Dimethylethanolamine)	332	Fosalon	378
cis-13,16-Docosadienoic acid methyl ester (C22:2)	58,65,66,74,373,377,386,387,390,391	Fucitol	380
cis-4,7,10,13,16,19-Docosahexaenoic acid methyl ester (C22:6n3)	58,62,65,66,74,373,377,386,387,390,391	Furanes	344,345,346,347
Docosane	24,25,30,35,40	Furfural	368
n-Dodecane	22,24,30,45,52,53,55,59,333,336,362	Gardona	378
Dotetracontane	370	Geranial	385
n-Dotricontane	24,30,333	Geraniol	368,385
Ecgonina ethylester	323	cis-Geraniol	57
Ecgonina methylester	323	trans-Geraniol	57,385
cis-11,14-Eicosadienoic acid methyl ester (C20:2)	58,65,66,74,373,377,386	Geraniol acetate	386
n-Eicosane	24,25,30,35,36,40,59,60,61	Geranyl acetate	57
cis-5,8,11,14,17-Eicosapentaenoic acid methylester (C20:5n3)	58,62,65,66,74,373,386,387,390,391	α-Glucose	316
cis-8,11,14-Eicosatrienoic acid methyl ester (C20:3n6)	58,65,66,74,373,377,386,387,390,391	β-Glucose	316
cis-11,14,17-Eicosatrienoic acid methyl ester (C20:3n3)	58,65,66,74,373,377,386,387,390,391	Glycerine	71,326,341,376
cis-11-Eicosenoic acid methyl ester (C20:1)	74,368,371	Glycerol	316,370,376
cis-11-Eicosenoic acid methyl ester (C20:1n9)	58,65,66,373,377,386,387,390,391	Glycine	333
Elaidic acid methyl ester (C18:1n9t)	74,373,377,379	HCB	339
Enantiic acid	368	α-HCH	339
Endosulfan I	31,340,341,342,350,360,366	γ-HCH	339
Endosulfan II	31,340,341,342,350,360,366	Heneicosane	25,40
Endosulfan sulfate	31,340,341,342,350,360,366	Henicosanoic acid methyl ester (C21:0)	58,65,66,74,373,386,387,390,391
Endrin	31,339,340,341,342,350,360,366	2,2',3,4,4',5',6'-Heptabromodiphenyl ether (BDE-183)	44
Endrin aldehyde	31,340,341,342,350,360,366	Heptachlor	31,339,340,341,342,350,360,366
Endrin ketone	31,340,341,342,360,366	Heptachlor epoxide	31,339,340,341,342,350,360,366
Enitrodiol	371,379,384	2,2',3,4',5,5',6'-Heptachlorobiphenyl (PCB 187)	44
Erucic acid methyl ester (C22:1)	58,65,66,368,371,380,386,387,390,391	2,2',3,4,4',5',6'-Heptachlorobiphenyl (PCB 183)	44
Erucic acid methyl ester (C22:1n9)	58,65,66,74,373,377,386,387,390,391	2,2',3,3',4,4',5'-Heptachlorobiphenyl (PCB 170)	44,358
Ethanal	339	2,2',3,4,4',5,5',6'-Heptachlorobiphenyl (PCB 180)	44,337,344,358
Ethanol	27,38,47,50,63,64,70,316,317,318,319,320,321,325,327,328,329,332,335,336,343,353,363,364,367,369,371,376,381,388	Heptacontane	322
Ethanolamine	323	n-Heptadecane	36,59,60,61
Ethion	378	Heptadecanoic acid methyl ester (C17:0)	58,65,66,74,373,377,386,387,390,391
2-Ethoxyethanol	335	cis-10-Heptadecenoic acid methyl ester (C17:1)	58,65,66,74,373,377,386,387,390,391
3-Ethoxy-1-propanol	368,377	Heptane (isomers)	321,331
Ethyl acetate	38,46,47,63,64,317,318,319,320,321,325,331,334,335,338,343,353,363,367,369,376,381	n-Heptane	27,28,38,47,321,330,331,335,336,362,363
Ethyl amine	37,343,360	Heptanoic acid	353
Ethyl benzene	28,46,47,69,322,324,325,326,328,330,331,335,338,339,341,343,362	4-Heptanol	319
Ethyl bromophos	378	2,2',4,4',5,5',6'-Hexabromodiphenyl ether (BDE-154)	44
Ethyl butyrate	63,320,321,368,369	2,2',4,4',5,5',6'-Hexabromodiphenyl ether (BDE-153)	44
Ethyl caprate	377	Hexachlorobenzene	349,350
Ethyl caproate	377	γ-Hexachlorobenzene	350
		2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	44,337,344,358
		2,2',3,4,5,5'-Hexachlorobiphenyl (PCB 141)	44
		2,2',3,4',5',6'-Hexachlorobiphenyl (PCB 165)	358
		2,2',3,5,5',6'-Hexachlorobiphenyl (PCB 151)	44

Compound	Pages
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	44,344,337,358
2,2',4,4',6,6'-Hexachlorobiphenyl (PCB 155)	339
Hexachloro-1,3-butadiene	349
α -Hexachlorocyclohexane	350
β -Hexachlorocyclohexane	350
γ -Hexachlorocyclohexane	350
Hexachlorocyclopentadiene	349
Hexachloroethane	349
Hexacotane	322
Hexacosane	24,30
n-Hexadecane	24,30,36,59,60,61,322
Hexanal	372
n-Hexane	27,28,30,38,47,330,331,335,336
1,2-Hexanediol	25,35,40
Hexanoic acid	368
Hexanol	63,368,369,377
2-Hexanone	47
Hexatetracontane	370
n-Hexatriacontane	24,30,370
cis-3-Hexenol	368,377
Hexocanazol	374
n-Hexyl acetate	368,377
Hexyl cinnamal	385
Hexyl-2-ethylhexyl phthalate	361
Histidine	333
Hydrogen sulfide	26
Hydroxycitronellal	385,386
Hydroxyproline	333
Indane	28
Indeno(1,2,3-cd)pyrene	42,343,349,365
Inositol	316
Iprodione	372,374
Irganox 1010	33
Isoamyl acetate	368
Isoamyl alcohol (2-methyl-1-butanol)	320,367,368,369
Isoamyl alcohols	376,381,388
Isobutane	331,336
Isobutanol	63,64,317,318,319,320,321,326,335,367,368,369,376,381,388
Isobutyacetate	46,317,318,319,334
Isobutylamine	37,343,360
Isobutylbenzene	28
Isobutylether	319
Isobutyl ketone	334
Isobutyric acid	353,368
Isocaproic acid	353
Isodrin	339
Isoeugenol	385
Isofenphos	378
Isoleucine	333
Isooctane	69
Isopentane	28,331,336
Isophorone	349
Isopropanol	38,47,50,70,316,318,319,320,321,325,326,327,328,329,331,332,335,353,363,367
Isopropyl acetate	46,47,321,325,335,363
Isopropylamine	37,343,360
Isopropylbenzene	28
Isovaleric acid	353
Lauric acid methyl ester (C12:0)	51,56,58,65,66,68,74,75,373,377,386,387,390,391
Lavander flavor	378
Lemon oil	72
Leucine	333
Lignoceric acid methyl ester (C24:0)	58,62,65,66,74,368,371,373,377,380,386,387,390,391
Limonene	57,385,386
Linalool	57,385,386
cis-Linalool oxide	57
trans-Linalool oxide	57
Linalyl acetate	57,385,386
Linalyl isobutyrate	386
Linoleic acid methyl ester (C18:2)	368,371,379,380
Linoleic acid methyl ester (C18:2n6c)	58,65,66,74,373,377,386,387,390,391
Linolelaic acid methyl ester (C18:2n6t)	58,65,66,74,373,377,386,387,390,391
Linolenic acid methyl ester (C18:3)	368,371
α -Linolenic acid methyl ester (C18:3n3)	58,65,66,74,373,377,386,387,390,391
γ -Linolenic acid methyl ester (C18:3n6)	58,65,66,74,373,377,386,387,390,391
2,6-Lutidine	359
3,4-Lutidine	359
3,5-Lutidine	359
Lysine	333
Malathion	374,378
Maslinic acid	371
Meditathion	378
MEK	38,46,47,317,318,319,321,325,328,329,332,335,338,363
(-)-Menthhol	386
Mesityl oxide	335

Compound	Pages
Metacriphos	378
Methacrylamide	370
Methanol	37,38,47,50,63,64,70,316,317,318,319,320,321,324,325 326,327,328,329,331,332,335,353,363,364,367,369,370,376,388
Methionine	333
Methoxychlor	31,340,341,342,350,360
1-Methoxy-2-propanol	332
Methoxypropanol	47,317,318,319,321,325
Methoxypropyl acetate	47,317,318,321,325
Methyl acetate	46,63,317,318,319,369
Methyl acrylate	317
Methylamine	37,49,343
Methylantranilate	57
Methyl bromophos	378
2-Methyl-1-butanol	63,64,369
3-Methyl-1-butanol	63,64,369
2-Methyl-2-butene	27
Methyl-tert-butyl ether (MTBE)	36,335
Methyl chloride	319
Methyl chloroacetate	326
Methyl chloroform	327
Methylchlorpiriphos	351,374
Methylcyclohexane	47,330
2-Methylcyclohexanone	330
3-Methylcyclohexanone	330
4-Methylcyclohexanone	330
Methylcyclopentane	330
Methyl decanoate	386
2-Methyl-4,6-dinitrophenol	354,364,376
Compound	Pages
Methyl dodecanoate	334
24-Methylenecholesterol	372,375
Methylene chloride	22,25,35,38,40,45,47,48,51,52,53,56,59,60,67,68 75,316,318,319,322,323,324,325,327,335,338,359,363,364,365
Methyl eicosanoate	334
1-Methyl-2-ethylbenzene	28
1-Methyl-3-ethylbenzene	28,331
1-Methyl-4-ethylbenzene	28
Methylethylketone (MEK)	38,46,47,317,318,319,321,325,328,329,332,335,338,363
Methylethyl sulfide	26
Methyl formate	335
Methyl furfural	368
Methyl heptadecanoate	334
2-Methyl-1-heptene	28
Methyl hexadecanoate	334
Methyl cis-9-hexadecenoate	334
2-Methylhexane	28,331
3-Methylhexane	28,331
Methyl-2-hydroxydecanoate	335
Methyl-2-hydroxydodecanoate	335
Methyl-3-hydroxydodecanoate	335
Methyl 2-hydroxyheptadecanoate	334
Methyl-2-hydroxytetradecanoate	335
Methyl-3-hydroxytetradecanoate	335
Methylisobutylketone (MIBK)	47,317,318,319,321,325,326,328,329,332,334,335,338,363
Methylisothiocyanate	369
Methyl mercaptan	26
Methyl cis-9,10-methylenehexadecanoate	334
Methyl 15-methylhexadecanoate	334
Methyl cis-9,10-methyleneoctadecanoate	334
Methyl-12-methyltetradecanoate	334
Methyl-13-methyltetradecanoate	334
Methyl-14-methyltetradecanoate	334
1-Methylnaphthalene	28,331,349
2-Methylnaphthalene	28,331,349
Methyl nonadecenoate	334
Methyl cis-9,12-octadecadienoate	334
Methyl cis-9-octadecenoate	334
Methyl trans-9-octadecenoate	334
Methyl octadecenoate	334
cis- β -Methyl- γ -octalactone	377
trans- β -Methyl- γ -octalactone	377
Methyl octanoate	386
Methylparathion	372,374,378
Methyl pentadecanoate	334
2-Methylpentane	28,331
3-Methylpentane	28,331
4-Methyl-2-pentanol	63,320,369
2-Methylphenol	349
3-Methylphenol	349
4-Methylphenol	349
Methylpivalate	316
2-Methyl-2-propanol	335
α -Methylstyrene	362

Compound	Pages	Compound	Pages
Methyl tetradecanoate	334	PCB 153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	337,344,358
Methyl tridecanoate	334	PCB 155 (2,2',4,4',6,6'-Hexachlorobiphenyl)	339,344
Methyl undecanoate	334	PCB 141 (2,2',3,4,5,5'-Hexachlorobiphenyl)	44
MIBK	47,317,318,319,321,325,326,328,329,332,334,335,338,363	PCB 187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	44
Monochloroisothiocyanate	369	PCB 170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	44,358
Monolein	71	PCB 180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	337,344,358
Monomethyl acetamide	327	PCB 183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	44
β -Myrcene	57,385,386	PCB 194 (2,2',3,3',4,4',5,5'-Octachlorobiphenyl)	358
Myristic acid methyl ester (C14:0)	58,62,65,66,74,368,371,373,377,380,386,387,390,391	PCB 209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	358
Myristoleic acid methyl ester (C14:1)	58,65,66,74,373,377,386,387,390,391	PCB 206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	44
Naphthalene	28,42,331,343,349,365	Penconazol	374
Neral	385	Pendimethalin	352
Nerol acetate	386	2,2',4,4',6-Pentabromodiphenyl ether (BDE-100)	44
Nerolidol	57	2,2',4,4',5-Pentabromodiphenyl ether (BDE-99)	44
Nerolin	386	2,2',4,4',6-Pentabromodiphenyl ether (BDE-85)	44
Nervonic acid methyl ester (C24:1n9)	58,62,65,66,74,373,377,386,387,390,391	Pentachloroanisole	374
Neryl acetate	57	2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)	44
2-Nitroaniline	349	2,2',4,5,5'-Pentachlorobiphenyl (PCB101)	44,337,344,358
3-Nitroaniline	349	2,3,3',4',6-Pentachlorobiphenyl (PCB 110)	44
4-Nitroaniline	25,35,40,349,365	2,3',4,4',5-Pentachlorobiphenyl (PCB118)	344,358
Nitrobenzene	46,349	Pentachlorophenol	25,35,40,349,354,364,374,376
Nitromethane	47	Pentacontane	322
2-Nitrophenol	349,354,364,376	Pentadecane	36,59,60,61
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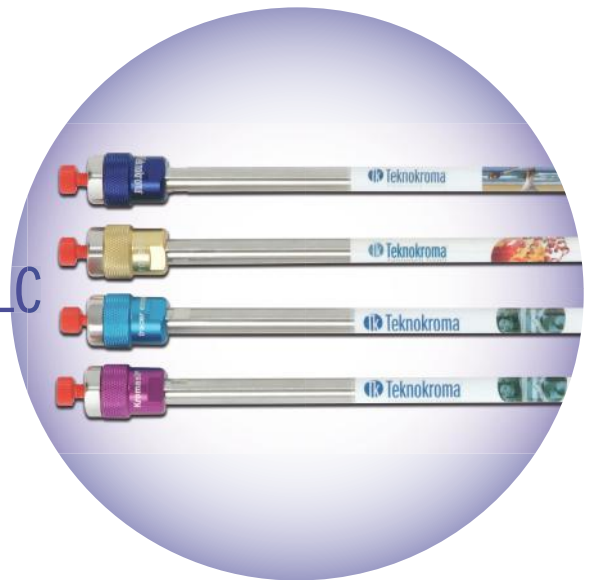
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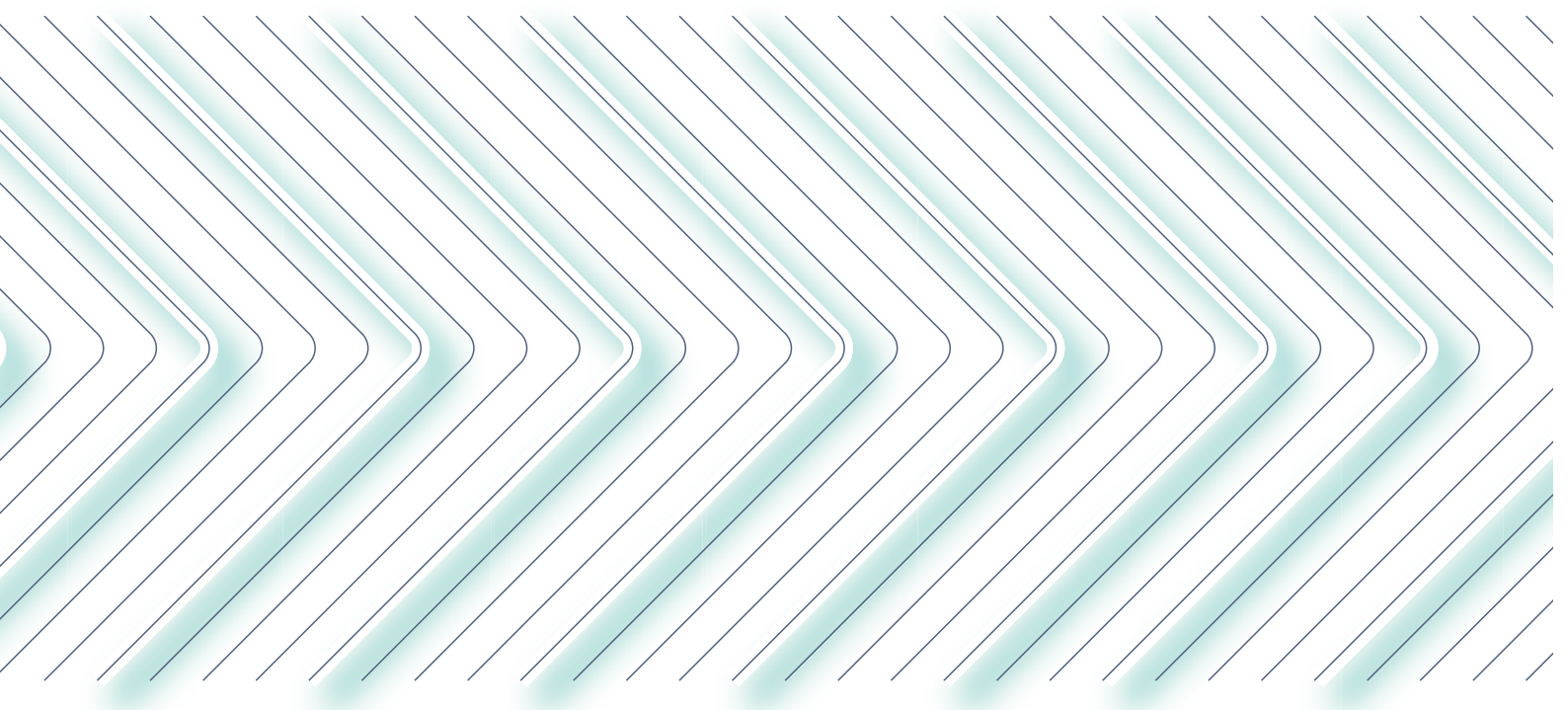


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