CAPILLARY COLUMNS

QCap CAPILLARY COLUMNS

simply Quality

Greyhound CHROMATOGRAPHY AND ALLIED CHEMICALS

GREYHOUND - *setting the standard*

Q Range

As a trusted name in the supply of chromatography consumables and certified reference standards, Greyhound also offers a comprehensive selection of top quality own brand Capillary columns, SPE columns, HPLC columns and Certified syringe filters.
This catalogue contains details of the Q-Cap range of Capillary Columns. Other product catalogues are available on request.

These quality products are backed by the guaranteed reliability and technical support which has become synonymous with the name Greyhound. Visit our website at: www.greyhoundchrom.com

Welcome to a new era in analyte detection and column performance.

Greyhound
CHROMATOGRAPHY
AND ALLIED CHEMICALS

GREYHOUND CHROMATOGRAPHY
Q-Cap CAPILLARY COLUMNS

Index with Capillary Columns onward shown in alphabetical order

GREYHOUND CHROMATOGRAPHY Q-Cap CAPILLARY COLUMNS

Our extensive range of capillary columns are designed and manufactured to the most exacting and rigorous standards. Materials of the highest quality and attention to every detail of the manufacturing process, results in columns which ensure excellent and reproducible performance for even the most difficult types of samples.

Every stage of the manufacturing process, from the inertness of the highest quality fused silica tubing, the phase coating efficiency, film thickness, selectivity and low bleed characteristics of every column are all rigidly monitored. This attention to every details of the manufacturing process means you can be sure the column you purchase today will give you the same precise results as the one you purchased last year or will purchase next year.

Highest Quality Column Specifications

All Q-Cap capillary columns are manufactured under strict ISO 9001:2000 certified quality procedures, thus ensuring consistent reproducibility column after column. Every Q-Cap capillary column is individually tested to meet the most demanding performance standards, the results of which are detailed in the columns test report and installation guide.

Low Bleed

The bleed level of a column is a measure of its stability. It is directly related to the amount of stationary phase in the column and thus the film thickness. It also increases exponentially with temperature. Greyhound Chromatography Q-Cap low bleed columns have longer column lives and enable analysts to work with the latest high sensitivity detectors resulting in less instrument maintenance whilst ensuring quantification of high boiling point and high molecular weight compounds which are analysed by means of high temperature gradients.

Efficiency

Column efficiency is a measure of its separating power. Narrow bore columns, which have a high number of plates per meter have higher separation powers. This results in better resolution between two peaks or can reduce analysis time. Q-Cap capillary columns are available in diameters from 0.1mm to 0.53mmID.

Inertness

The columns inertness will influence the elution and recovery of active (polar) compounds. Peak shape for more acid-base compounds improves the closer the value is to 1.0, resulting in greater quantification of peaks and more accurate and reliable results.

Column-to-Column Reproducibility

The selectivity of a column is measured by its Retention Index (RI) and indicates the elution order of the compounds being analysed. The precision manufacturing processes of all Q-Cap capillary columns ensures that the RI between them is as low as possible resulting in excellent column-to-column reproducibility.

Phase Ratio

A measure of the analytes retention time which varies according to the film thickness of the phase on the column. Columns with a small variance in phase ratio have better column to column retention time reproducibility.

Maximum Operating Temperature

The MAOT (Maximum Allowable Operating Temperature) of a stationary phase is the temperature at which it will continue to function optimally. MAOT details are listed against each column in the catalogue. Thick film coatings have a lower MAOT because they bleed more at higher temperatures. For temperature programmed analysis, the MAOT is usually 20-25°C. higher than for isothermal operation.

Technical Support

Our reputation and ability for providing technical support and solutions to problems in all key areas of chromatography is well known. If you have any questions we can assist you with simply give us a call.

HOW TO SELECT THE RIGHT CAPILLARY COLUMN

Greyhound Chromatography offers more than 1000 different capillary columns and it can be difficult to decide on the most suitable column for your application. The following pages are a guide to the various factors which should be taken into consideration when selecting the right column.

Column Tubing - Fused Silica or Metal?

All Q-CAP fused silica and stainless steel column tubings provide a very high level of inertness and flexibility. Fused silica is the most popular choice of tubing and produces the best column coating efficiency, resulting in better resolution of compounds which elute close together. In harsh operating conditions, e.g. field sampling or high temperature analysis, stainless steel columns (SilCol) are ideal, they resist breakage from abrasion with virtually no risk of damage in the GC even at elevated temperatures.

Stationary Phase Selection

Selecting the most suitable stationary phase for the column will depend on the kind of compounds to be separated. Non polar phases such as GC-1 and GC-5 separate compounds by boiling point.

Intermediate polarity phases such as GC-1301 or GC-1701 combine retention by boiling point with the more selective interaction through hydrogen bridges or dipolar moments etc and thus provide higher selectivity.

The principal mechanisms of polar phases such as GC-2340 (Cyanosilicone with 100% of cyanopropyl groups) lie in the dipole-dipole interactions between the functional groups of the stationary phase and those from the substances to be separated. These types 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 Q-cap columns are cross-linked, which result in high thermal stability. Cross-linking of the stationary phase produces slight changes in the physiochemical characteristics of the phase as well as in its polarity relative to the uncross-linked phase. Thus we also offer columns with non bonded phases which show the selectivity of the original phase (e.g. GC-SE30, GC-SE54, GC-20M etc.). The table on the pages 6-7 details the chemical structures of the various phases used in the manufacture of Greyhound Chromatography 'Q-cap' Capillary Columns.

PLOT *(Porous Layer Open Tubular)* columns are used for the separation of compounds which are gases when at room temperature. Greyhound Chromatography offers an extensive selection of PLOT columns for the analysis of volatile polar compounds, fixed gases, low molecular weight hydrocarbons and reactive analytes e.g. sulfur gases, hydrides and amines.

Column Length

Capillary columns are manufactured in lengths from 10 to 150 meters. Most separations are carried out on columns of 25 to 30 meters in length. These columns offer the highest efficiency with relatively short analysis times. 15 meter columns are used for control analysis, reaction monitoring etc. and for the analysis of high molecular weight substances. Columns of 50 to 60 meters, 100 meters and even 150 meters are used for very complex samples. Greyhound also produce a 150 meter column for the detailed analysis of petroleum and essential oil hydrocarbons.

HOW TO SELECT THE RIGHT CAPILLARY COLUMN - *continued*

Generally, the number of theoretical plates and analysis time are directly proportional to the columns length, while resolution is directly proportional to the square root of the theoretical plates. It is important therefore, to take into account that when we double the length of the column, its resolution only increases by 40%, but analysis time increases by 100%.

Internal diameter

The columns internal diameter is inversely proportional to its separating power. The smaller the diameter, the greater the efficiency but the loading capacity decreases. For samples containing a large number of analytes requiring a column with a high resolution capability, it is recommended to use columns with a small internal diameter, (typically 0.18 to 0.25mm).

For samples with a high range of concentrations, columns with larger internal diameters are recommended (typically 0.32 to 0.53mm) as these larger diameters allow for the injection of a larger sample volume.

0.53mm ID columns have a loading capacity similar to that of packed columns, which they have replaced in many analyses, giving better resolution, greater chemical inertness and reduced analysis time.

0.32-0.53mm 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 GC-MS systems, it is recommended to work with small ID columns (0.10mm, 0.15mm, 0.18mm, 0.20mm and 0.22mm) so as not to exceed the capacity of the vacuum system. The latest 0.10mm ID capillary columns generate high plate numbers resulting in reduced analysis times without loss of resolution. The high efficiencies of these columns (typically 7000 to 10000 plates/meter), facilitate the rapid resolution of complex samples using shorter column lengths, with significantly reduced laboratory costs.

Film Thickness

Film thickness directly affects the columns retention time and the elution temperature of each analyte. The film thickness of the stationary phase deposited inside the column exerts an influence on the number of effective theoretical plates which can be obtained with the column for a given separation, on its loading capacity, bleed level and on the elution temperature of an analyte.

A film thickness of 0.25 to 0.32µm 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. Generally, thin films (0.1µm) should be used for compounds with a high molecular weight such as triglycerides, antioxidants etc., which have elution temperatures over 300°C. Thick films should be used for low boiling analytes, because thick films increase the interaction between the analyte and the stationary phase. Specifically, 3 to 5µm films are used to separate solvents, gases and very volatile substances at room temperature or lower.

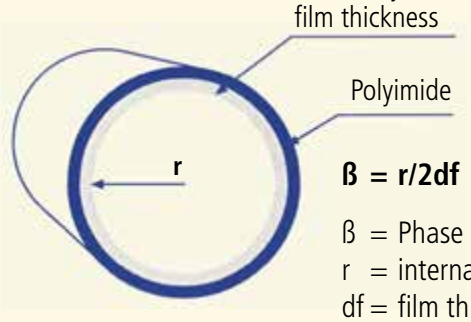
When the thickness of the stationary phase increases, thermal stability decreases and the bleed level is elevated, limiting the maximum operating temperature of the column.

The ß factor defines the relation between the columns internal diameter and the thickness of the stationary phase, similar ß factors will result in the same or very similar retention times and capacity factors. This implies taking into account the columns loading capacity (phase thickness and internal diameter).

Phase Ratio (ß) Value for common column dimensions *

Column ID	Film Thickness (m) 0.10	0.25	0.50	1.0	1.5	3.0	5.0
0.18mm	450	180	90	45	30	15	9
0.25mm	625	250	125	63	42	21	13
0.32mm	800	320	160	80	53	27	16
0.50mm	1325	530	265	128	88	43	27

Phase Ratio (ß)



ß = r/2df

ß = Phase ratio
r = internal radium of tubing
df = film thickness

Phase Ratio (ß) Value for common column dimensions * Factor ß

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

Column Operating Temperatures

GC-5MS	ID (mm)	df (m)	Temp. Limits
	0.20	0.33	-60 to 325-350°C
	0.25	0.25	-60 to 325-350°C
	0.32	1.00	-60 to 325-350°C
	0.53	1.50	-60 to 325-350°C

Every 'Q-Cap' Capillary Column has published maximum and minimum operating temperatures which advises the working limits for the stationary phase. These ranges vary according to the thickness of the phase coating.

Many phases state two maximum operating temperatures. The first is the maximum isothermal operating temperature. The second temperature is the maximum operating temperature under temperature-programmed conditions, when the column can be operated at this higher temperature for short periods during the analysis.

If only one temperature is listed, this is the maximum temperature for both isothermal and temperature programmed analysis.

The minimum operating temperature is the lowest usable temperature at which the column can be used, below this temperature the columns phase solidifies resulting in poor chromatographic results.

Gas-Solid (PLOT) Columns

PLOT (Porous Layer Open Tubular) columns are used for separating very volatile solutes (usually gases) without the requirement for cryogenic or sub-ambient cooling of the oven. PLOT columns will comfortably perform separations at temperatures above 35°C. which would otherwise require column temperatures below 35°C. Using thick film capillary columns.

The stationary phases in PLOT columns are physically different to the polysiloxanes and polyethylene glycols used in coated capillary columns.

Gas-solid stationary phases are tiny, porous particles which adhere to the columns inner wall using a binder or similar process. Solutes are separated dependent on their adsorption properties, and because the particles are porous, size and shape differentiation will also occur. For details on our range of PLOT columns please refer to page 57.

Custom Column Requirements

Occasionally the exact column for your analysis is not available as a standard column – THIS IS NOT A PROBLEM! We can manufacture the exact column you require, to your specifications - Length, ID, Phase and Film Thickness. Simply call us to discuss your requirements and you will have your custom column in record time.

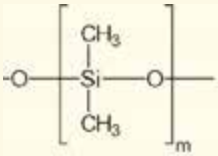
Q Cap

Q-Cap CAPILLARY COLUMN STATIONARY PHASES

Structures, Properties and Uses

GC-1 / GC-1ms

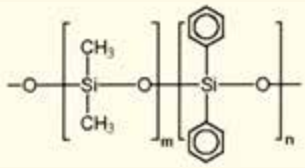
100% poly(dimethyl)siloxane



Polarity: non polar
Uses: waxes, solvents, petroleum products, pharmaceuticals
USP: G1, G2, G38

GC-5 / GC-5ms

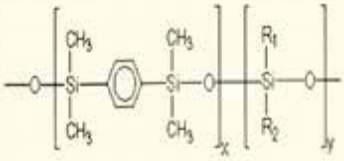
95% dimethyl / 5% diphenyl polysiloxane



Polarity: non polar
Uses: environmental, flavours, aromatic hydrocarbons
USP: G27, G36

GC-X5ms

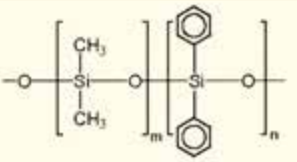
silphenylene phase proprietary



Polarity: non polar
Uses: environmental, flavours PCBs, pesticides,

GC-20

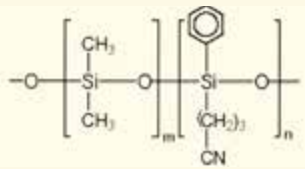
80% dimethyl / 20% diphenyl polysiloxane



Polarity: medium polarity
Uses: environmental, flavours, aromatic hydrocarbons
USP: G28, G32

GC-1301 / GC-624

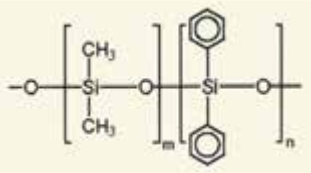
94% dimethyl
(6%) cyanopropylphenyl polysiloxane



Polarity: intermediate polarity
Uses: volatiles, insecticides, pharmaceutical residue solvents
USP: G43

GC-35

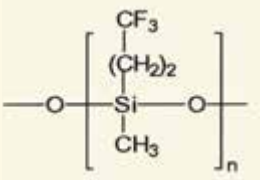
35% diphenyl
65% dimethyl polysiloxane



Polarity: intermediate polarity
Uses: Alcohols, pesticides, PCBs, oxygenates
USP: G42

GC-200

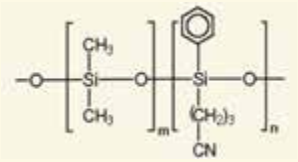
50% Trifluoropropyl
50% Methyl polysiloxane



Polarity: Highly polar
Uses: Fluorocarbons, alcohols, silanes, EPA 609 & 8140
USP: G6

GC-225

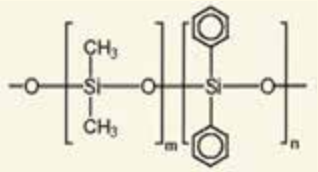
50% Cyanopropylphenyl
50% dimethyl polysiloxane



Polarity: intermediate polarity
Uses: Alcohols, pesticides, PCBs, oxygenates
USP: G19

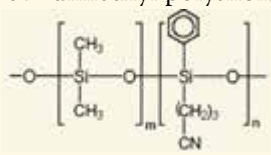
GC-50

50% diphenyl
50% dimethyl polysiloxane



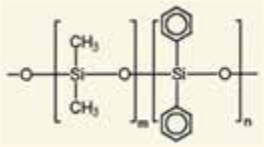
Polarity: intermediate polarity
Uses: steroids, phenols, triglycerides, phthalate esters
USP: G3

GC-1701
14% Cyanopropylphenyl
86% dimethyl polysiloxane



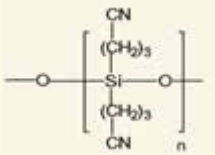
Polarity: intermediate polarity
Uses: Alcohols, pesticides, PCBs, oxygenates
USP: G46

GC-13
86% dimethyl / 14% diphenyl polysiloxane



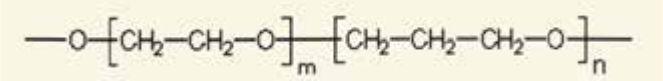
Polarity: intermediate polarity
Uses: environmental, flavours, aromatic hydrocarbons

GC-2340
100% Cyanopropyl polysiloxane



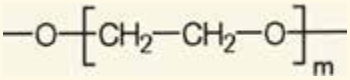
Polarity: very high polarity
Uses: FAMEs and cis-trans isomers of FAMEs
USP: G5

GC-PAG
50% Polyethylene
50% Polypropylene glycol

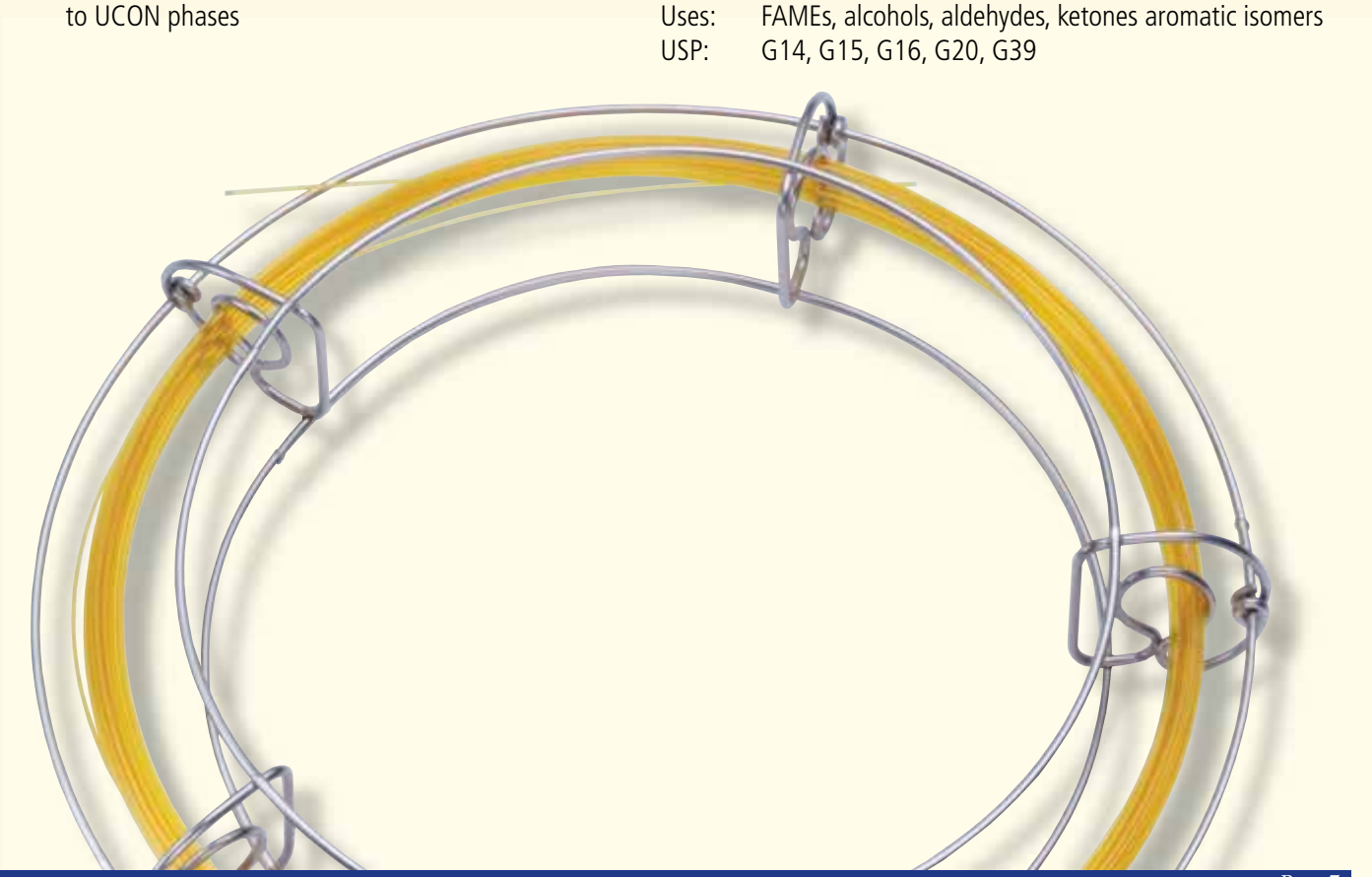


Polarity: Slightly lower than GC-WAX Similar to UCON phases

GC-WAX
100% Polyethylene glycol



Polarity: Highly polar
Uses: FAMEs, alcohols, aldehydes, ketones aromatic isomers
USP: G14, G15, G16, G20, G39



STATIONARY PHASE CROSS REFERENCE GUIDE

GREYHOUND	PHASE COMPOSITION	AGILENT / J&W	ALLTECH	MN
GC-1	100% dimethyl polysiloxane	HP-1, HP-101, ULTRA-1, DB-1	AT-1	OPTIMA-1
GC-1ht		DB-1ht	AT-1ht	
GC-1ms		HP-1MS, DB-1MS	AT-1MS	
GC-SimDist		DB-1ht	SimDist	
GC-Petrol		DB-Petro		
GC-Petrol150				
GC-Sulfur				
GC-1PONA		HP-PONA		
GC-2887		DB-2887		
GC-5	95% dimethyl-5% diphenyl polysiloxane	HP-5, Ultra-2, DB-5, DB-5.625	AT-5	OPTIMA-5
GC-5ht		DB-5ht		
GC-5ms		HP-5MS		OPTIMA-5ms
GC-Sterol				
GC-5Amine				OPTIMA-5A
GC-5.625		DB.5.625		
GC-G27				
GC-5MTI		HP-5Msi		
GC-X5MS	95% dimethyl-5% diphenyl polysilphenylene	DB.5 MS, HP-5TA	AT-5ms	
GC-XLB	proprietary bonded phase	DB-XLB		OPTIMA-XLB
GC-1301	6% cyanopropylphenyl-94% Dimethylpolysiloxane	HP-1301, HP-624, DB-1301, DB-624	AT-624	
GC-624	6% cyanopropylphenyl-94% Dimethylpolysiloxane	HP-1301, HP-624, DB-1301, DB-624	AT-624	
GC-G43	6% cyanopropylphenyl-94% Dimethylpolysiloxane	HP-1301, HP-624, DB-1301, DB-624	AT-624	
GC-13	14% diphenyl-86%dimethyl polysiloxane			
GC-20	20% diphenyl-80% dimethyl polysiloxane		AT-20	
GC-35	35% diphenyl-65% dimethyl polysiloxane	HP-35, DB-35	AT-35	
GC-1701	14% cyanopropylphenyl-86% dimethyl polysiloxane	HP-1701, PAS-1701, DB-1701	AT-1701	
GC-225	50% cyanopropylphenyl-50% dimethyl polysiloxane	HP-225, DB-225	AT-225	
GC-50	50% diphenyl-50% dimethyl polysiloxane	HP-50, DB-17, DB-608	AT-50	
GC-50ht	50% diphenyl-50% dimethyl polysiloxane	DB-17ht		
GC-210	50% trifluoropropylmethyl polysiloxane	DB-210, DB-200	AT-210	
GC-PAG	50% polyethylene-50% polypropyleneglycol			
CHROMWax-10	100% polyethyleneglycol			
GC-2OM	100% polyethyleneglycol	HP-20M, INNOWAX, DB-WAX, DBWAX.etr	AT-WAX	
GC-FFAP	treated polyethyleneglycol for acidic compounds	HP-FFAP, DB-FFAP	AT-1000, FFAP	
GC-WAX-DB	treated polyethyleneglycol for basic compounds	CAM, HP-BasicWax		
GC-MEGOWax	100% polyethyleneglycol			
GC-WAX	100% polyethyleneglycol	HP-WAX, DB-WAX		
GC-2340	100% cyanopropyl polysiloxane			
GC-CRESOL	Proprietary non bonded phase			
GC-17	50% diphenyl-50% dimethyl polysiloxane	HP-17		
GC-VOC	proprietary bonded phase	HP-VOC, DB-502.2		
GC-Volamine	proprietary bonded phase			
GC-608		HP-608		
GC-TCEP	1m2m3-tricyanoethoxy)propane			
GC-CW400				
GC-ALCO1	proprietary boded phase	DB-ALC1		
GC-ALCO2	proprietary bonded phase	DB-ALC2		
GC-BIODIESEL	proprietary bonded phase			
PLOT Phases				
GC-PLOT Molsieve	Molecular Sieve 5Å	HP-PLOT Molesieve		
GC-PLOT AL203/KCL	KCl modified Alumina	HP-PLOT Al203/KLl, GS-Alumina'KCl		
GC-PLOT AL203/S	Na2SO4 modified Alumina	HP-PLOT Al203/"S", GS-Alumina		
GC-PLOT AL203/M	Na2MoO4 modified Alumina	HP-PLOT Al203/"M", GS-Alumina		
GC-PLOT Q	Divinylbenzene polymer	HP-PLOT Q, GS-Q		
CP-PLOT U	Divinylbenzene ethylene glycol dimethacrylate copolymer	HP-PLOT U		
GC-PLOT GasPro	Proprietary Porous Silica	GS-GasPro		

QUADREX	RESTEK	SGE	SUPELCO	VARIAN	USP
	Rtx-1, Rtx-2887	BP-1	SPB-1, EQUITY-1	CP-Sil 5 CB	G1, G2, G9
	Stx-1HT				
	Rtx-1ms			CP-SIL 5CB MS	G1, G2, G9
	MXT-1 SimDist			CP-SimDist	
			Petrocol DH		
			Petrocol DH 150		
			SPB-1 SULFUR		
	Rtx-1 PONA	BP-1 PONA	Petrocol DH 50.2	CP-SIL PONA CB	
	Rtx-2887		PETROCOL-2887		
007-2	Rtx-5	BP-5	SPB-5, PTE-5, SAC-5, Equity-5	CP-SIL8CB	G27, G36
	Rtx-5ms, Rxi-5ms		PTE-5, Equity-5	CP-SIL8-MS	G27, G36
			SAC-5		
	Rtx-5Amine		PTA-5	CP-SIL8-MS	
			PTE-5		
	Rtx-G27		G27		
			PTE-5		
007-5MS	Rxi-5Sil MS	BPX-5	MDN-5, SLB-5MS	CP-SIL8CB MS, VF-5MS	G27, G36
	Rxi-XLB		MDN-12	VF-XMS	
	Rtx-1301, Rtx-624	BPX-624	SPB-1301, OVI-G43		G43
	Rtx-1301, Rtx-624	BPX-624	SPB-1301, OVI-G43		G43
	Rtx-1301, Rtx-624	BPX-624	SPB-1301, OVI-G43		G43
				CP-SIL 13CB	
007-502			SPB-20, VOCOL	CP-SIL 13CB	G28,G32
007-11	Rtx-35	BPX-35	SPB-35		G42
007-1701	Rtx-1701	BP-10	SPB-1701	CP-SIL 19CB	G46
007-225	Rtx-225	BP-225		CP-SIL 43 CB	G19
007-17	Rtx-50, Rxi-17		SPB-50, SPB-2250	CP-SIL 24 CB	G3
007-65HT	Rtx-65			TAB-CB	
007-210	Rtx-200				
			PAG		
			Supelcowax 10		
	STABILWAX	BP-20	SUPELCOWAX-10, Carbowax-20M	CP-WAX 52CB	G14, G15, G16, G39
007-FFAP	STABILWAX-DA	BP-21	NUKOL, SP-1000	CP-WAX 58 CB	G25, G35
	Stabilwax-DB		Carbowax-Aine	CP-WAX 51	
	Famewax		Omegawax		G20
	Rtx-WAX			CP-WAX 57 CB	
	Rt-2340, Rt-2330		SP-2340, SP-2380	CP-SIL 88	G8
				CP-CRESOL	
	Rtx-502.2			VOCOL	
				CP-Volamine	
		BP-608	SPB-608		
	Rt-TCEP		TCEP	CP-TCEP	
				CP Carbowax 400	
	Rtx-BAC1				
	Rtx-BAC2				
	Rtx-Biodiesel				
				CP-PLOT MolSieve	
	Rt-Alumina PLCT			CP-Al203/KCL PLOT	
	Rt-Alumina			CP-ALl203/Na2SO4 PLOT	
	Rt-Q			CP-PoraPLOT Q HT	
				CP-PoraPLOT U	
				CP-Silica PLOT	

** USP Nomenclature see Page 68

Q Cap

GC-1

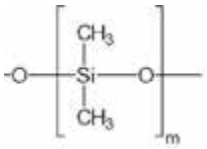
100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Non-polar
- Long lifetime
- Very low bleed at high temperatures
- General purpose column, suitable for a wide range of applications including solvent impurities, PCBs, arochlors, drugs of abuse, gases, sulphur compounds, essential oils, hydrocarbons, semi-volatiles, pesticides, oxygenates.
- High thermal stability

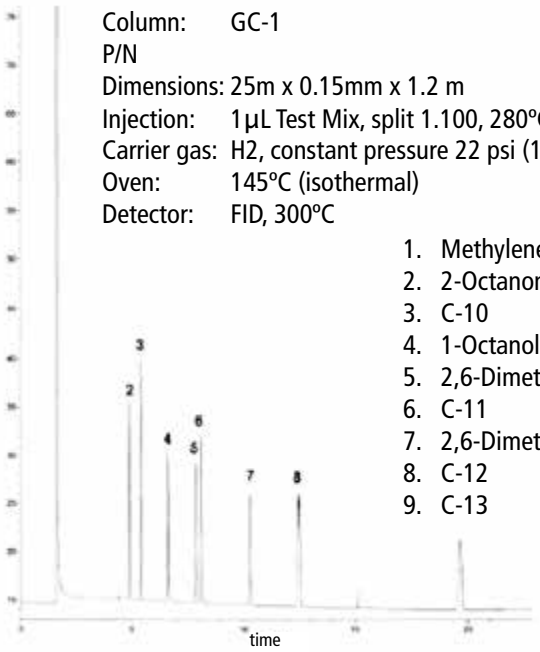
GC-1 Similar Phases

Agilent: DB-1, HP-1, HP101, ULTRA-1
Alltech: AT-1
Macherey-Nagel: OPTIMA-1
Quadrex: 007-1
Restek: Rtx-1, Rtx-2887
SGE: BP-1
Supelco: EQUITY-1, SPB-1, MDN-1
Varian: CP-SIL 5 CB
Others: OV-1, SE-30, DC-200, PE-1, ZB-1

USP: G1, G2, G38



Structure of poly(dimethyl)siloxane



Column: GC-1
P/N
Dimensions: 25m x 0.15mm x 1.2 m
Injection: 1µL Test Mix, split 1.100, 280°C
Carrier gas: H2, constant pressure 22 psi (151.6 kPa)
Oven: 145°C (isothermal)
Detector: FID, 300°C

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

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	5	0,12	-60 to 325/350	10-200000
	10	0,10	-60 to 325/350	10-200001
	10	0,40	-60 to 320/340	10-200002
	20	0,10	-60 to 325/350	10-200003
	20	0,40	-60 to 320/340	10-200004
	40	0,20	-60 to 320/340	10-200005
	40	0,40	-60 to 320/340	10-200006
0,18	10	0,18	-60 to 325/350	10-200010
	10	0,20	-60 to 325/350	10-200011
	10	0,40	-60 to 325/350	10-200012
	20	0,18	-60 to 325/350	10-200013
	20	0,40	-60 to 325/350	10-200014
	40	0,40	-60 to 325/350	10-200015
0,20	12	0,33	-60 to 325/350	10-200020
	15	0,15	-60 to 325/350	10-200021
	15	0,35	-60 to 325/350	10-200022
	15	0,50	-60 to 325/350	10-200023
	25	0,15	-60 to 325/350	10-200024
	25	0,33	-60 to 325/350	10-200025
	25	0,35	-60 to 325/350	10-200026
	25	0,50	-60 to 325/350	10-200027
	30	0,15	-60 to 325/350	10-200028
	30	0,35	-60 to 325/350	10-200029
	30	0,50	-60 to 325/350	10-200030
	50	0,15	-60 to 325/350	10-200031
	50	0,33	-60 to 325/350	10-200032
	50	0,35	-60 to 325/350	10-200033
	60	0,15	-60 to 325/350	10-200034
	60	0,35	-60 to 325/350	10-200035
	60	0,50	-60 to 325/350	10-200036
0,25	15	0,10	-60 to 325/350	10-200040
	15	0,25	-60 to 325/350	10-200041
	15	0,50	-60 to 325/350	10-200042
	15	1,00	-60 to 325/340	10-200043
	25	0,10	-60 to 325/350	10-200044
	25	0,25	-60 to 325/350	10-200045
	25	0,50	-60 to 325/350	10-200046
	25	1,00	-60 to 320/340	10-200047
	30	0,10	-60 to 325/350	10-200048
	30	0,25	-60 to 325/350	10-200049
	30	0,50	-60 to 325/350	10-200050
	30	1,00	-60 to 320/340	10-200051
	50	0,10	-60 to 325/350	10-200052
	50	0,25	-60 to 325/350	10-200053
	50	0,33	-60 to 325/350	10-200054
	50	0,50	-60 to 325/350	10-200055
	50	1,00	-60 to 320/340	10-200056
	60	0,10	-60 to 325/350	10-200057
	60	0,25	-60 to 325/350	10-200058
	60	0,50	-60 to 325/350	10-200059
	60	1,00	-60 to 325/350	10-200060
	100	1,00	-60 to 325/350	10-200061
	105	1,00	-60 to 325/350	10-200062
0,32	15	0,10	-60 to 325/350	10-200070
	15	0,25	-60 to 325/350	10-200071
	15	0,50	-60 to 325/350	10-200072
	15	1,00	-60 to 325/350	10-200073
	15	3,00	-60 to 280/300	10-200074
	25	0,10	-60 to 325/350	10-200075
	25	0,25	-60 to 325/350	10-200076

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	25	0,50	-60 to 325/350	10-200077
	25	0,52	-60 to 325/350	10-200078
	25	1,00	-60 to 325/350	10-200079
	25	3,00	-60 to 280/300	10-200080
	30	0,10	-60 to 325/350	10-200081
	30	0,25	-60 to 325/350	10-200082
	30	0,50	-60 to 325/350	10-200083
	30	1,00	-60 to 325/350	10-200084
	30	1,50	-60 to 325/350	10-200085
	30	3,00	-60 to 280/300	10-200086
	50	0,10	-60 to 325/350	10-200087
	50	0,25	-60 to 325/350	10-200088
	50	0,50	-60 to 325/350	10-200089
	50	1,00	-60 to 325/350	10-200090
	50	3,00	-60 to 280/300	10-200091
	60	0,10	-60 to 325/350	10-200092
	60	0,25	-60 to 325/350	10-200093
	60	0,50	-60 to 325/350	10-200094
	60	1,00	-60 to 325/350	10-200095
	60	3,00	-60 to 280/300	10-200096
	60	5,00	-60 to 260/280	10-200097
0,53	5	0,88	-60 to 260/280	10-200100
	7.5	5,00	-60 to 260/280	10-200101
	10	0,80	-60 to 260/280	10-200102
	10	2,65	-60 to 300/310	10-200103
	10	3,00	-60 to 300/310	10-200104
	10	5,00	-60 to 300/310	10-200105
	15	0,10	-60 to 320/340	10-200106
	15	0,50	-60 to 320/340	10-200107
	15	1,00	-60 to 320/340	10-200138
	15	1,50	-60 to 310/330	10-200108
	15	3,00	-60 to 270/290	10-200109
	15	5,00	-60 to 270/290	10-200110
	15	7,00	-60 to 260/280	10-200111
	25	0,10	-60 to 320/340	10-200112
	25	0,50	-60 to 320/340	10-200113
	25	1,50	-60 to 310/330	10-200114
	25	3,00	-60 to 270/290	10-200115
	25	5,00	-60 to 270/290	10-200116
	30	0,10	-60 to 320/340	10-200117
	30	0,50	-60 to 320/340	10-200118
	30	0,88	-60 to 310/330	10-200119
	30	1,50	-60 to 310/330	10-200120
	30	2,65	-60 to 270/290	10-200121
	30	3,00	-60 to 270/290	10-200122
	30	5,00	-60 to 270/290	10-200123
	30	7,00	-60 to 260/280	10-200124
	50	0,10	-60 to 320/340	10-200125
	50	0,50	-60 to 320/340	10-200126
	50	1,50	-60 to 310/330	10-200127
	50	3,00	-60 to 270/290	10-200128
	50	5,00	-60 to 270/290	10-200129
	60	0,10	-60 to 320/340	10-200130
	60	0,50	-60 to 320/340	10-200131
	60	1,50	-60 to 310/330	10-200132
	60	3,00	-60 to 270/290	10-200133
	60	5,00	-60 to 270/290	10-200134
	60	7,00	-60 to 240/260	10-200135
	100	3,00	-60 to 270/290	10-200136
	105	3,00	-60 to 270/290	10-200137

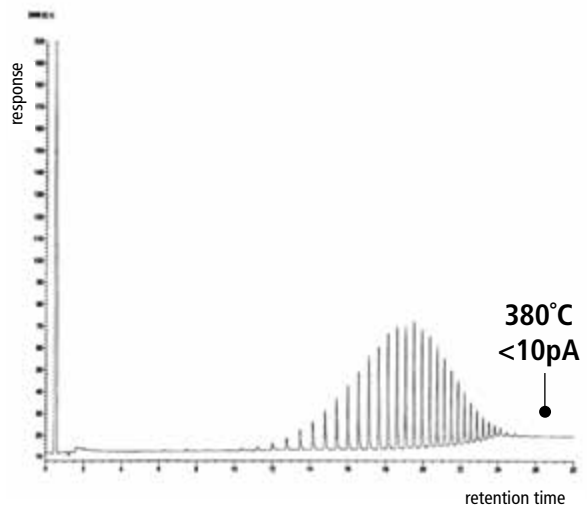
GC-1ht

- 100% Dimethyl polysiloxane
- Bonded and cross-linked phase
- Non-polar
- Specially developed for high temperature analyses (Max. temp. 400°C)
- Ideal for analysis of high boiling point compounds, triglycerides, waxes, crude oils etc.
- Better peak detection at lower concentrations
- High thermal stability

GC-1ht Similar Phases
Agilent: DB-1ht
Alltech: AT-1ht
Restek: Stx-1HT

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.25	15	0,10	-60 to 400	10-200150
	30	0,10	-60 to 400	10-200151
0,32	15	0,10	-60 to 400	10-200160
	30	0,10	-60 to 400	10-200161

Column: GC-1ht + Retention Gap (Intermediate polarity) 5m x 0.53mm ID
P/N 10-200160 +10-201929
Dimensions: 15m x 0.32mm x 0.10 µm
Injection: 0.3µL Polywax 655 (0.1% in CS3), on column (sec. cool 30 s), 280°C.
Carrier gas: H2, constant flow 2ml/min
Oven: 50°C (2 min) @ 15°C
Detector: FID, 390°C



Q Cap

GC-SimDist

100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Maximum temperature 430°C.
- Low bleed at 400°C.
- Distillation range C6 to C120
- Conforms to ASTM Method D-2887
- Available in fused silica and SilCol Metal tubing

GC-SimDist Fused Silica Columns

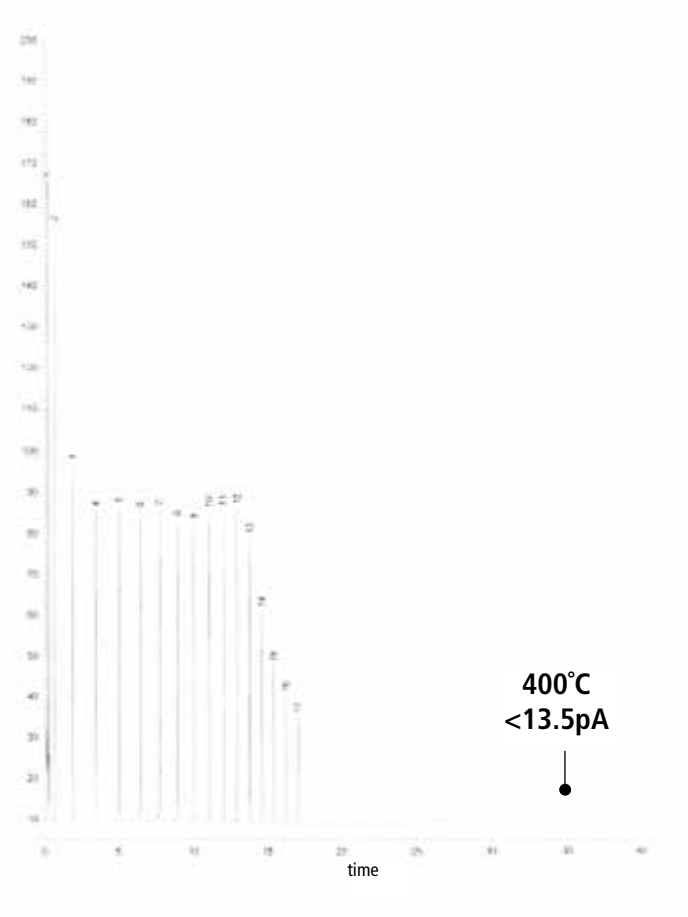
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,32	10	0,10	375/400	10-202060
0,53	5	0,17	375/400	10-202065
	10	0,10	375/400	10-202070

GC-SimDist Similar Phases

Agilent: DB-1S, HP-1MS
Alltech: SimDist
Restek: MXT-1 SimDist
Varian: CP-SimDist

GC-SimDist SilCol Metal Columns

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,53	5	0,10	400/430	10-202100-SC
	5	0,15	400/430	10-202105-SC
	5	0,17	400/430	10-202110-SC
	5	0,88	400/430	10-202115-SC
	5	2,65	400/430	10-202120-SC
	10	0,17	400/430	10-202125-SC
	10	0,50	400/430	10-202130-SC
	10	0,88	400/430	10-202135-SC
	10	1,20	400/430	10-202140-SC
	10	2,65	400/430	10-202145-SC
	10	5,00	400/430	10-202150-SC



Column: GC-SimDist SilCol
5m x 0.53mm x 0.10µm
P/N 10-202000-SC
Carrier: H2, 60 cm/s (40°C)
Oven: 40°C @ 15°C/min to 400°C (15 min)
Injection: 0.4 µL Hydrocarbons C8-C40 (500 ng/µL), 300°C, split 1:20 (3mm ID liner)
Detector: FID, 430°C

1 C8
2 C10
3 C12
4 C14
5 C16
6 C18
7 C20
8 C22
9 C24
10 C26
11 C28
12 C30
13 C32
14 C34
15 C36
16 C38
17 C40

GC-1MS

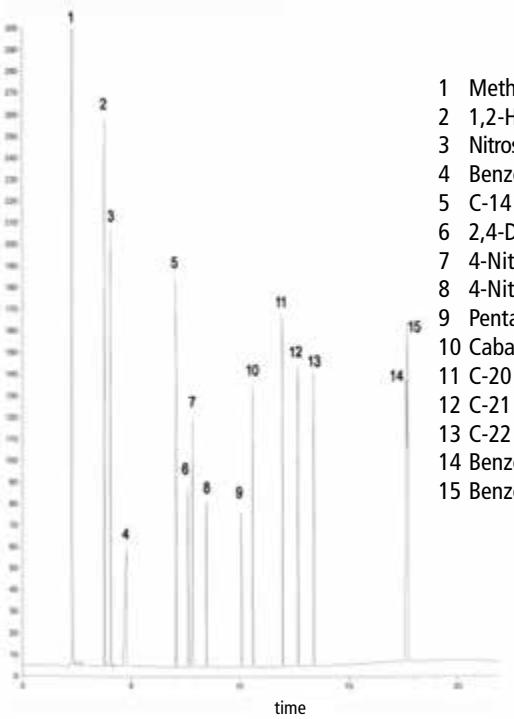
100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Non-polar
- These columns have a selectivity identical to GC-1 and fulfill column bleed specifications which make them compatible with the analysis of trace components using GC/MS
- Excellent chemical inertness towards active constituents
- High thermal stability
- Improved signal-to-noise ratio enabling greater sensitivity to be obtained with the MS, ECD, NPD, SCD, etc. detectors and greater precision in quantitative analysis at trace levels
- Low column bleed means less detector contamination and greater speed in conditioning columns
- Ideal for environmental, food and fragrance, petrochemical and pharmaceutical analysis

GC-1MS Similar Phases

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

Column: GC-1MS
60m x 0.25mm x 0.25µm
P/N 10-200208
Carrier: H2, constant pressure 25 psi (172 kPa).
Oven: 100°C @ 6°C/min to 325°C (5 min)
Injection: 1 µL Test Mix 5 (10 to 20 ng/comp. on column), split 1:100, 280°C.
Detector: FID, 340°C



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 Cabazole
11 C-20
12 C-21
13 C-22
14 Benzo(b)fluoranthene
15 Benzo(k)fluoranthene

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	-60 to 325/350	10-200170
	10	0,40	-60 to 325/350	10-200171
	20	0,10	-60 to 325/350	10-200172
	20	0,40	-60 to 325/350	10-200173
0,18	20	0,18	-60 to 325/350	10-200180
	40	0,18	-60 to 325/350	10-200181
0,20	12	0,33	-60 to 325/350	10-200190
	15	0,33	-60 to 325/350	10-200191
	25	0,33	-60 to 325/350	10-200192
	30	0,33	-60 to 325/350	10-200193
	50	0,33	-60 to 325/350	10-200194
	60	0,33	-60 to 325/350	10-200195
0,25	15	0,10	-60 to 325/350	10-200200
	15	0,25	-60 to 325/350	10-200201
	15	1,00	-60 to 325/350	10-200202
	30	0,10	-60 to 325/350	10-200203
	30	0,25	-60 to 325/350	10-200204
	30	0,40	-60 to 325/350	10-200205
	30	1,00	-60 to 325/350	10-200206
	60	0,10	-60 to 325/350	10-200207

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	60	0,25	-60 to 325/350	10-200208
	60	1,00	-60 to 325/350	10-200209
0,32	15	0,10	-60 to 325/350	10-200220
	15	0,25	-60 to 325/350	10-200221
	15	0,50	-60 to 325/350	10-200222
	15	1,00	-60 to 325/350	10-200223
	30	0,10	-60 to 325/350	10-200225
	30	0,25	-60 to 325/350	10-200226
	30	0,50	-60 to 325/350	10-200227
	30	1,00	-60 to 325/350	10-200228
	50	0.25	-60 to 325/350	10-200233
	60	0,10	-60 to 325/350	10-200229
	60	0,25	-60 to 325/350	10-200230
	60	0,50	-60 to 325/350	10-200231
	60	1,00	-60 to 325/350	10-200232
0,53	15	0,50	-60 to 320/340	10-200240
	15	1,00	-60 to 320/340	10-200241
	15	1,50	-60 to 310/330	10-200242
	30	0,50	-60 to 320/340	10-200243
	30	1,00	-60 to 320/340	10-200244
	30	1,50	-60 to 310/330	10-200245

GC-Sulfur

100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Column specially designed for the analysis of sulfur gases and other volatile sulfur compounds (in natural gas, petrol derivatives, wines, beer, etc.)
- Guaranteed thermal stability, with low column bleed
- Compatible for use with the Sievers Sulfur Chemiluminescence Detector (SCD) and other sulfurspecific detectors.

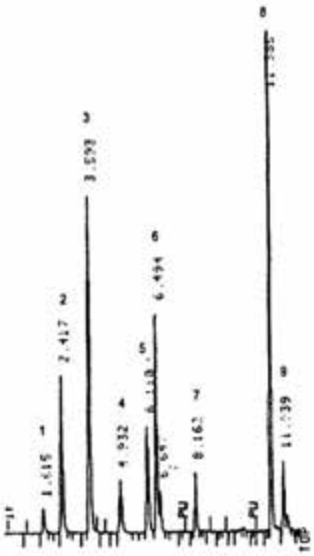
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,32	30	4,00	-60 to 270/290	10-200250

GC-Sulfur Similar Phases
Supelco: SPB-1 SULFUR

Column: GC-Sulfur
P/N 10-200250
Dimensions: 30m x 0.32mm x 4.0µm

Mercaptans

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



GC-Petrol

100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- High resolution
- Designed for the analysis of complex mixtures of hydrocarbons according to the ASTM regulations (American Society for Testing and Materials)
- Suitable for PNA, PONA and PIANO analysis

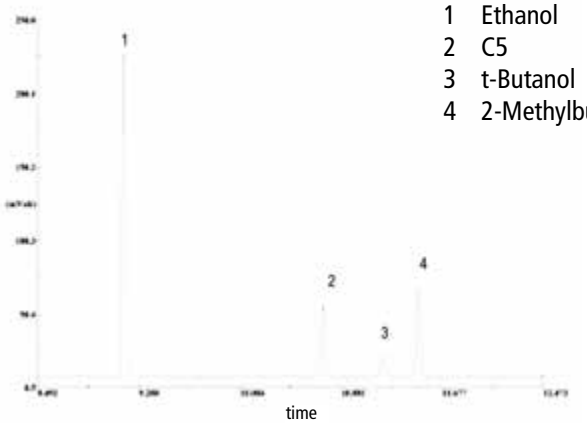
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	100	0,50	-60 to 300/320	10-200260

GC-Petrol Similar Phases
Agilent: DB-Petro
Supelco: Petrocol DH

GC-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

1 Ethanol
2 C5
3 t-Butanol
4 2-Methylbutene-2



GC-Petrol150

100% Dimethyl polysiloxane

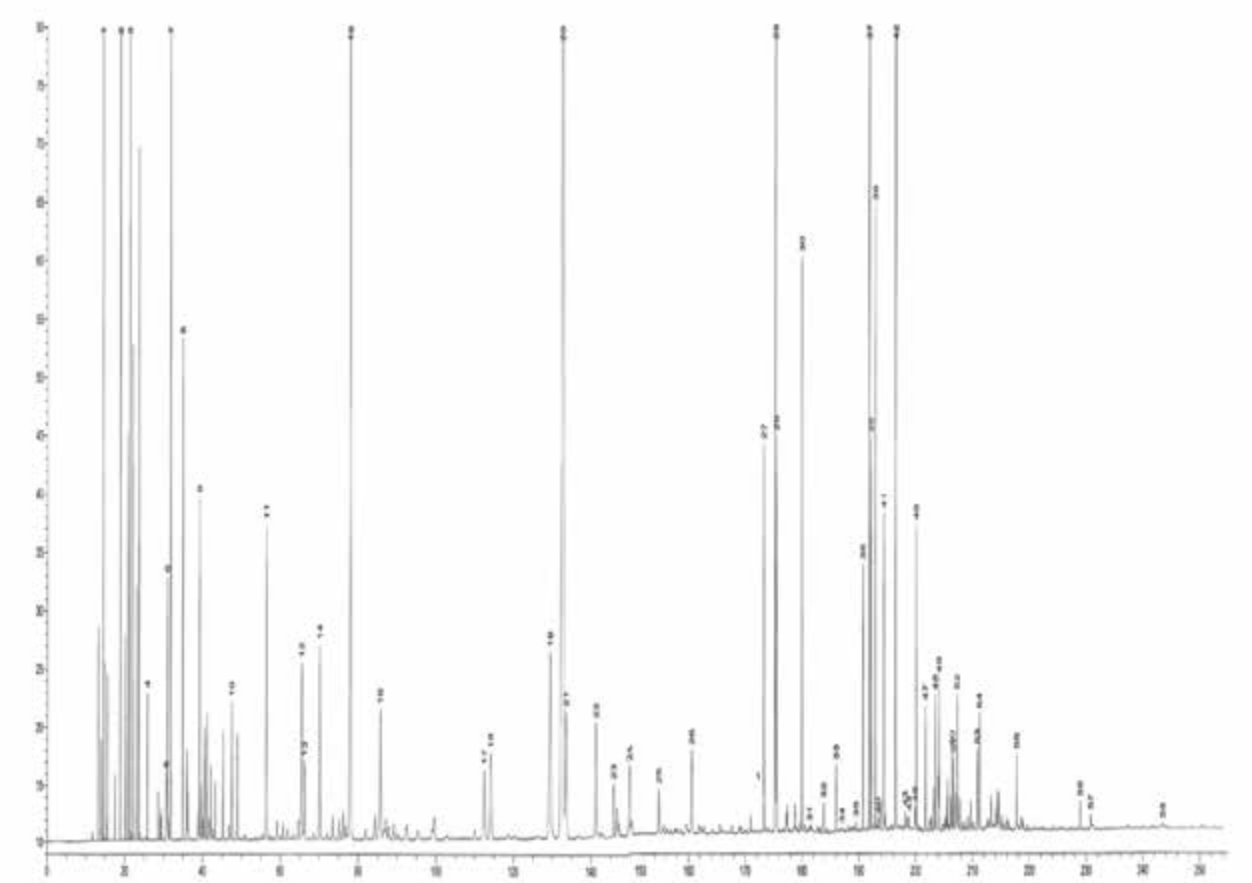
- Maximum resolution for detailed analysis of hydrocarbon gases and petroleum products
- Our longest commercially available column, typically with over 600,000 theoretical plates.

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.25	150	1,00	-60 to 300/320	10-200270

GC-Petrol150 Similar Phase

Supelco: Petrocol DH 150.

Column: GC-Petrol150
150m x 0.25mm x 1.0µm
P/N 10-200270
Carrier gas: He, 75psi (517 kPa) @ 35°C.
Oven: 35°C (hold 135 min.) to 200°C @ 2°C/min (hold 20min.)
Injection: 0.1 µL unleaded gasoline, split 100:1 @ 250°C
Detector: FID, 280°C



1 n-Butane
2 Isopentane
3 n-Pentane
4 2,2-Dimethylbutane
5 Cyclopentane
6 2,3-Dimethylbutane
7 2-Methylpentane
8 3-Methylpentane
9 n-Hexane
10 2,4-Dimethylpentane
11 Benzene
12 2-Methylhexane
13 2,3-Dimethylpentane
14 3-Methylhexane
15 2,2,4-Trimethylpentane
16 n-Heptane
17 2,5-Dimethylhexane
18 2,4-Dimethylhexane
19 2,3,4-Trimethylpentane
20 Toluene
21 2,3,3-Trimethylpentane
22 2,3-Dimethylhexane
23 2-Methylheptane
24 3-Methylheptane
25 2-Methyl-1-heptene
26 n-Octane
27 Ethylbenzene
28 m-Xylene
28 m-Xylene
29 p-Xylene
30 o-Xylene
31 1-Nonene
32 n-Nonane
33 Isopropylbenzene
34 3,3,5- Trimethylheptane
35 2,4,5- Trimethylheptane
36 n-Propylbenzene
37 1 -Methyl-3-ethylbenzene
38 1-Methyl-4-ethylbenzene
39 1 ,3,5-Trimethylbenzene
40 3,3,4- Trimethylheptane
41 1-Methyl-2-ethylbenzene
42 1,2,4- Trimethylbenzene
43 Isobuthylbenzene
44 sec-Buthylbenzene
45 n-Decane
46 1,2,3- Trimethylbenzene
47 Indane
48 1 ,3-Diethylbenzene
49 n-Butylbenzene
50 1 ,4-Dimethyl-2-ethylbenzene
51 1,3- Dimethyl-4-ethylbenzene
52 1 ,2-Dimethyl-4-ethylbenzene
53 1,2,4,5-Tetramethylbenzene
54 1 ,2,3,5-Tetramethylbenzene
55 Naphthalene
56 2-Methylnaphthalene
57 1-Methylnaphthalene
58 Dimethylnaphthalenes

Q Cap

GC-1 PONA

100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Non-polar
- 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

GC-1 PONA. Similar Phases
Agilent: HP-PONA
Restek: Rtx-1 PONA
SGE: BP-1 PONA
Supelco: Petrocol DH 50.2
Varian: CP-SIL PONA CB

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.20	50	0.50	-60 to 320/340	10-200280

GC-2887

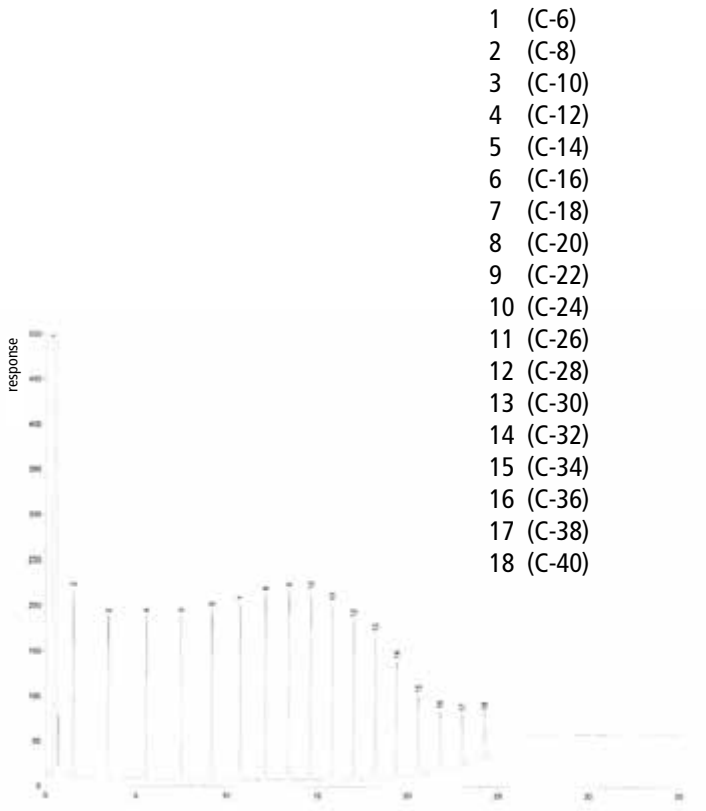
100% Dimethyl polysiloxane

- Bonded and cross-linked phase
- Non-polar
- Designed specifically for simulated distillation according to ASTM method D2887

GC-2887 Similar Phases
Agilent: DB-2887
Restek: Rtx-2887
Supelco: Petrocol-2887

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.53	10	2.65	-60 to 340/360	10-200288

Column: GC-2887
10m x 0.53mm x 2.65µm
P/N 10-200288-SC
Carrier: He, 4psi (27.6 kPa)
Oven: 40°C @ 15°C/min to 360°C. (15 min)
Injection: 1 µL Hydrocarbon mix (500ng/µl), 320°C, split flow 45mL/min
Detector: FID, 370°C



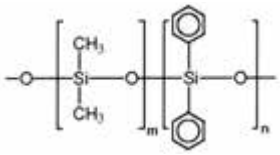
GC-5

(95%) Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non-polar
- High efficiency, long column lifetime
- The most versatile and universal stationary phase in the field of gas chromatography analysis.
- The low percentage of phenyl in the polymer structure gives it a characteristic affinity towards compounds with aromatic rings. GC-5 is the most popular phase due to its great thermal stability and chemical inertness and is the stationary phase of choice for most types of analysis
- Allows the analysis of acidic and basic compounds
- Ideal for environmental analysis e.g. dioxins, PCBs, PCTs, polyaromatic compounds, phenols, herbicides, organochlorine and organophosphorus pesticides, aromatic hydrocarbons, solvents, drugs, oils, etc…

GC-5 Similar Phases
Agilent/JW: DB-5, DB-5.625, HP-5, Ultra-2
Alltech: AT-5
Macherey-Nagel: OPTIMA-5
Quadrex: 007-2
Restek: Rtx-5
SGE: BP-5
Supelco: Equity-5, PTE-5, SAC-5, SPB-5
Varian: CP-SIL 8 CB
Others: OV-5, SE-52, SE-54, ZB-5

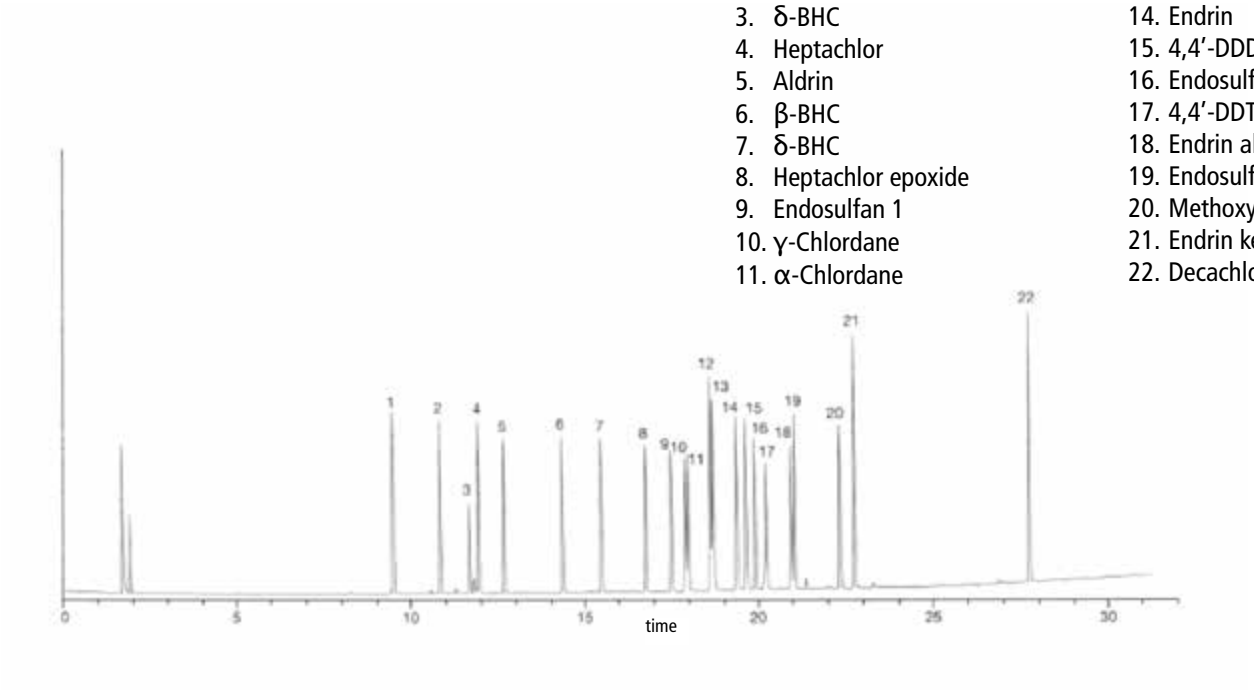
USP Code: G27, F36



Structure of Poly(dimethyldiphenyl)siloxane

Column:	GC-5
	30m x 0.25mm x 0.25µm
P/N	10-200349
Carrier:	H2, constant pressure 12 psi (87.7 kPa) 150°C
Oven:	150°C to 225°C@ 2°C/min (10 min.)
Injection:	1 µL chlorinated pesticides mixture, splitless @230°C (25 - 270 ppb on column)
Detector:	ECD, 310°C

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



GC-5

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	-60 to 325/350	10-200290
	10	0,17	-60 to 325/350	10-200291
	10	0,33	-60 to 325/350	10-200292
	10	0,40	-60 to 320/350	10-200293
	20	0,10	-60 to 325/350	10-200294
	20	0,40	-60 to 320/350	10-200295
0,18	10	0,18	-60 to 320/350	10-200300
	10	0,40	-60 to 320/350	10-200301
	20	0,18	-60 to 320/350	10-200302
	20	0,40	-60 to 320/350	10-200303
	40	0,18	-60 to 320/350	10-200304
0.20	12	0,33	-60 to 325/350	10-200310
	15	0,15	-60 to 325/350	10-200311
	15	0,35	-60 to 325/350	10-200312
	15	0,50	-60 to 325/350	10-200313
	25	0,15	-60 to 325/350	10-200314
	25	0,33	-60 to 325/350	10-200315
	25	0,35	-60 to 325/350	10-200316
	25	0,50	-60 to 325/350	10-200317
	30	0,15	-60 to 325/350	10-200318
	30	0,35	-60 to 325/350	10-200319
	30	0,50	-60 to 325/350	10-200320
	50	0,15	-60 to 325/350	10-200321
	50	0,33	-60 to 325/350	10-200322
	50	0,35	-60 to 325/350	10-200323
	50	0,50	-60 to 325/350	10-200324
	60	0,15	-60 to 325/350	10-200325
	60	0,35	-60 to 325/350	10-200326
	60	0,40	-20 to 300/320	10-200327
	60	0,50	-60 to 325/350	10-200328
0,22	60	0,20	-60 to 325/350	10-200335
0,25	15	0,10	-60 to 325/350	10-200340
	15	0,25	-60 to 325/350	10-200341
	15	0,50	-60 to 325/350	10-200342
	15	1,00	-60 to 320/350	10-200343
	25	0,10	-60 to 325/350	10-200344
	25	0,25	-60 to 325/350	10-200345
	25	0,50	-60 to 325/350	10-200346
	25	1,00	-60 to 320/350	10-200347
	30	0,10	-60 to 325/350	10-200348
	30	0,25	-60 to 325/350	10-200349
	30	0,50	-60 to 325/350	10-200350
	30	1,00	-60 to 320/350	10-200351
	50	0,10	-60 to 325/350	10-200352
	50	0,12	-60 to 325/350	10-200353
	50	0,25	-60 to 325/350	10-200354
	50	0,50	-60 to 325/350	10-200355
	50	1,00	-60 to 320/350	10-200356
	60	0,10	-60 to 325/350	10-200357
	60	0,25	-60 to 325/350	10-200358
	60	0,50	-60 to 325/350	10-200359
	60	1,00	-60 to 325/350	10-200360
0,32	15	0,10	-60 to 325/350	10-200370
	15	0,25	-60 to 325/350	10-200371

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,32	15	0,50	-60 to 325/350	10-200372
	15	1,00	-60 to 325/350	10-200373
	15	3,00	-60 to 280/350	10-200374
	25	0.10	-60 to 325/350	10-200375
	25	0,25	-60 to 325/350	10-200376
	25	0,50	-60 to 325/350	10-200377
	25	1,00	-60 to 325/350	10-200378
	25	3,00	-60 to 280/350	10-200379
	30	0,10	-60 to 325/350	10-200380
	30	0,25	-60 to 325/350	10-200381
	30	0,50	-60 to 325/350	10-200382
	30	1,00	-60 to 325/350	10-200383
	30	3,00	-60 to 280/350	10-200384
	50	0,10	-60 to 325/350	10-200385
	50	0,25	-60 to 325/350	10-200386
	50	0,50	-60 to 325/350	10-200387
	50	1,00	-60 to 325/350	10-200388
	50	3,00	-60 to 280/350	10-200389
	60	0,10	-60 to 325/350	10-200390
	60	0,25	-60 to 325/350	10-200391
	60	0,50	-60 to 325/350	10-200392
	60	1,00	-60 to 325/350	10-200393
	60	3,00	-60 to 280/350	10-200394
0,53	10	2,65	-60 to 270/290	10-200410
	15	0,10	-60 to 320/340	10-200411
	15	0,50	-60 to 320/340	10-200412
	15	1,50	-60 to 310/330	10-200413
	15	3,00	-60 to 270/290	10-200414
	15	5,00	-60 to 270/290	10-200415
	25	0,10	-60 to 320/340	10-200416
	25	0,50	-60 to 320/340	10-200417
	25	1,00	-60 to 320/341	10-200418
	25	1,50	-60 to 310/330	10-200419
	25	3,00	-60 to 270/290	10-200420
	25	5,00	-60 to 270/290	10-200421
	30	0,10	-60 to 320/340	10-200422
	30	0,50	-60 to 320/340	10-200423
	30	0,88	-60 to 310/330	10-200424
	30	1,50	-60 to 310/330	10-200425
	30	2,65	-60 to 270/290	10-200426
	30	3,00	-60 to 270/290	10-200427
	30	5,00	-60 to 270/290	10-200428
	50	0,10	-60 to 320/340	10-200429
	50	0,50	-60 to 320/340	10-200430
	50	1,00	-60 to 320/341	10-200431
	50	1,50	-60 to 310/330	10-200432
	50	3,00	-60 to 270/290	10-200433
	50	5,00	-60 to 270/290	10-200434
	60	0,10	-60 to 320/340	10-200435
	60	0,50	-60 to 320/340	10-200436
	60	1,50	-60 to 310/330	10-200437
	60	3,00	-60 to 270/290	10-200438
	60	5,00	-60 to 270/290	10-200439

GC-5ht

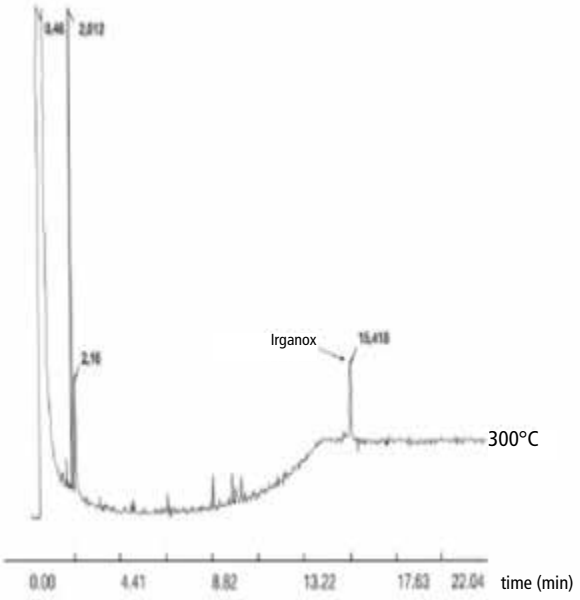
(95%) Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non Polar
- Produced specially for analysis at high temperature up to 400ºC
- Fused silica tube covered with polyimide, resistant to high temperatures
- Excellent symmetry and rapid elution times for high boiling compounds
- Ideal for the analysis of waxes, triglycerides, sterol esters, polyoxyethyleneated alcohols etc

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,10	-60 to 400	10-200450
	30	0,10	-60 to 400	10-200451
0,32	15	0,10	-60 to 400	10-200456
	30	0,10	-60 to 400	10-200457

GC-5ht Similar Phases
Supelco: SAC-5
Agilent: DB-5ht
Others: ZB-5ht

IRGANOX 1010
Column: GC-5ht
15m x 0.25mm x 0.10µm
P/N 10-200450
Carrier: H2, 6psi (41,3 kPa)
Oven: 150°C to 380ºC (10 min.) @ 30°C/min.
Injection: 1 µL (Irganox 1010, 12mg/ml chloroform), split (1:60), 370



GC-Sterol

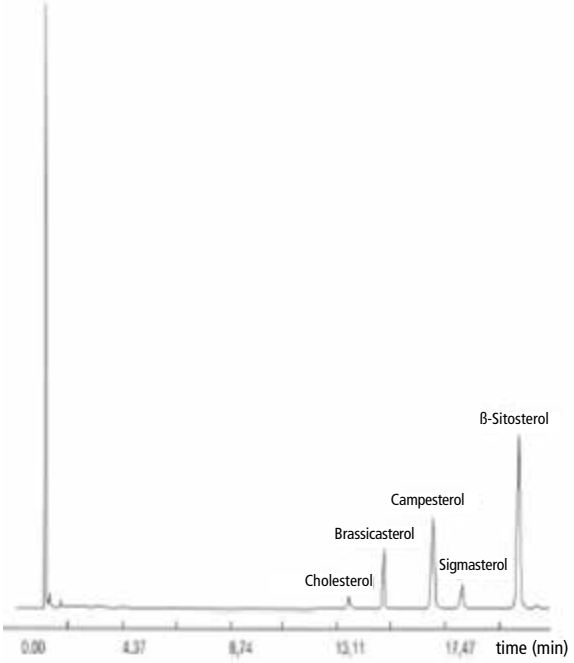
(95%) Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non-polar
- Specifically designed for the analysis of complex mixtures of sterols, from either animal or plant origin
- Special deactivation of the capillary tube wall guarantees a high chemical inertness, low bleed level and permits the analysis of sterols without derivatization
- Column is specifically tested for analysis of sterols

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,22	30	0,22	-60 to 325-350	10-200460
	30	0,12	-60 to 325-350	10-200461

GC-5ht Similar Phases
Supelco: SAC-5

Sterols
Column: GC-Sterol
30m x 0.22mm x 0.22µm
P/N 10-200460
Carrier: H2, 18 psi (124 kPa)
Oven: 265ºC
Injection: 0,5 µl sterols standard, (25 mg/ml.) split (1:100)
Detector: FID 300°C



Q Cap

GC-5MS

(95%) Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non Polar
- GC-5MS columns use the same stationary phase as GC-5, but the polymer synthesis process, the capillary deactivation technique and the bonding and cross-linking procedures have been optimized to obtain the minimum possible bleed level and an exceptional chemical inertness
- Column recommended to work with any selective detector
- The ultra-low bleed and high chemical inertness of GC-5MS columns allows for a better signal-to-noise ratio (higher sensitivity level), and therefore better detection and quantification of sample components at low concentrations.
- Ultra-low bleed makes these columns ideal for GC/MS
- Suitable for a wide variety of analysis, including drugs, solvent impurities, pesticides, PCB congeners, arochlors, hydrocarbons, semi-volatiles and essential oils.

GC-5MS Similar Phases
Aglilent: HP-5MS
Macherey-Nagel: OPTIMA-5ms
Restek: Rtx 5ms, Rxi-5ms
Supelco: PTE-5, Equity-5
Varian: CP-Sil 8 MS

NOTE: DB-5MS is a silarylene based polymer, similar to GC-X5MS. See page 26

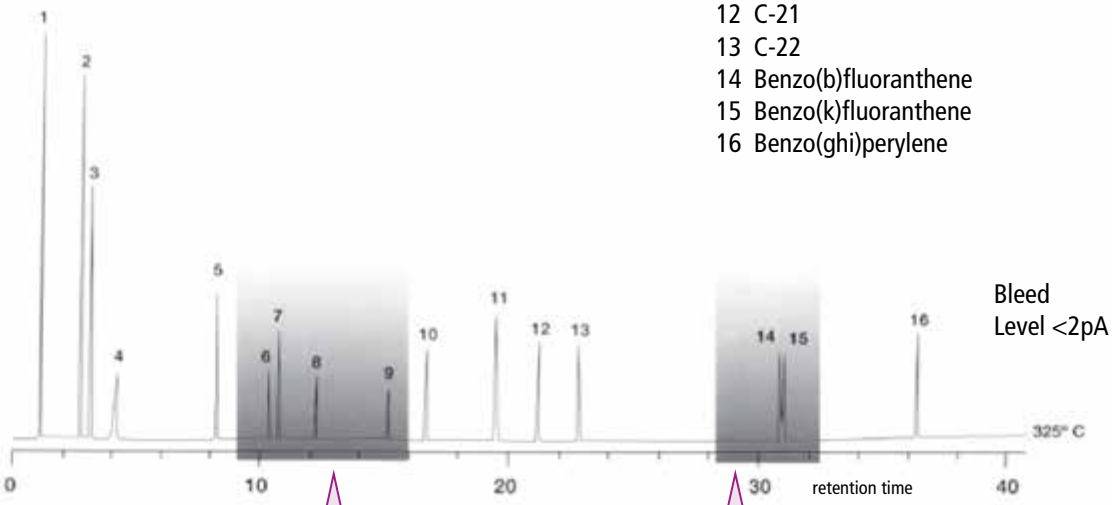
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	-60 to 325-350	10-200470
	10	0,40	-60 to 325-350	10-200471
	20	0,10	-60 to 325-350	10-200472
	20	0,40	-60 to 325-350	10-200473
0,18	20	0,18	-60 to 325-350	10-200480
	40	0,18	-60 to 325-350	10-200481
0,20	12	0,33	-60 to 325-350	10-200490
	15	0,33	-60 to 325-350	10-200491
	25	0,33	-60 to 325-350	10-200492
	25	0,11	-60 to 325-350	10-200493
	30	0,33	-60 to 325-350	10-200494
	50	0,33	-60 to 325-350	10-200495
	60	0,33	-60 to 325-350	10-200496
0,25	15	0,10	-60 to 325-350	10-200500
	15	0,25	-60 to 325-350	10-200501
	15	1,00	-60 to 325-350	10-200502
	30	0,10	-60 to 325-350	10-200503
	30	0,25	-60 to 325-350	10-200504
	30	0,50	-60 to 325-350	10-200505
	30	1,00	-60 to 325-350	10-200506
	50	0,12	-60 to 325-350	10-200507
	60	0,10	-60 to 325-350	10-200508
	60	0,25	-60 to 325-350	10-200509
	60	1,00	-60 to 325-350	10-200510
0,32	15	0,10	-60 to 325-350	10-200520
	15	0,25	-60 to 325-350	10-200521
	15	0,50	-60 to 325-350	10-200522
	15	1,00	-60 to 325-350	10-200523
	25	0,50	-60 to 325-350	10-200524
	30	0,10	-60 to 325-350	10-200525
	30	0,25	-60 to 325-350	10-200526
	30	0,50	-60 to 325-350	10-200527
	30	1,00	-60 to 325-350	10-200528
	60	0,10	-60 to 325-350	10-200529
	60	0,25	-60 to 325-350	10-200530
	60	0,50	-60 to 325-350	10-200531
	60	1,00	-60 to 325-350	10-200532
0,53	15	0,50	-60 to 320-340	10-200540
	15	1,00	-60 to 320-340	10-200541
	15	1,50	-60 to 310-330	10-200542
	30	0,50	-60 to 320-340	10-200543
	30	1,00	-60 to 320-340	10-200544
	30	1,40	-60 to 320-340	10-200545
	30	1,50	-60 to 320-340	10-200546

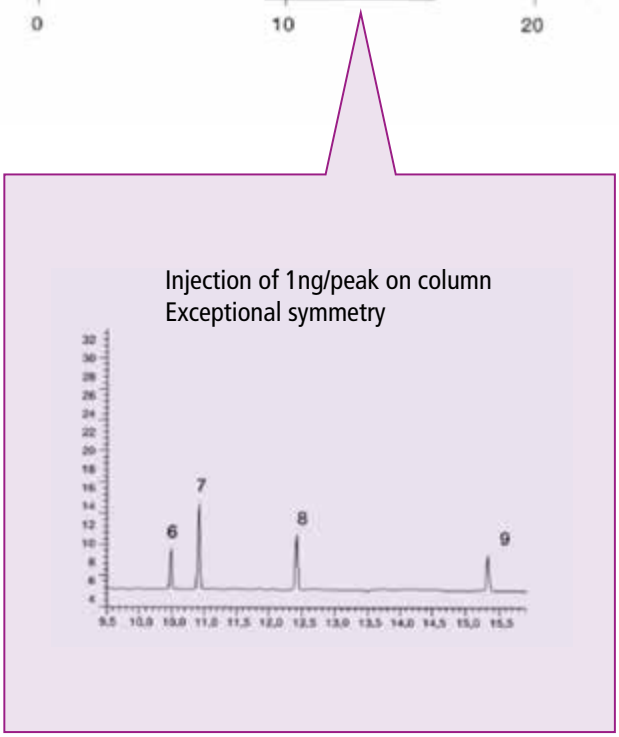
GC5-MS columns have excellent resolution and symmetry throughout their polarity range, for neutral, acidic and basic compounds. All these substances which appear in the analysis of semivolatile traces (for example EPA official methods) can be analyzed on just one column.

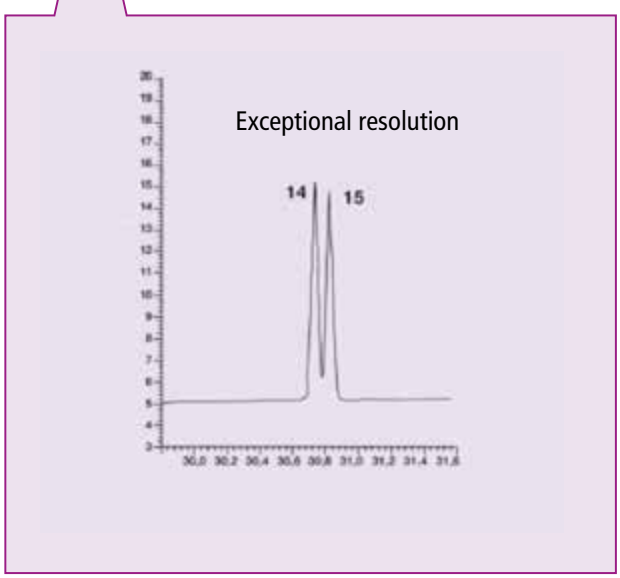
TEST Mix 5

Column:	GC-5ms
	30m x 0.25mm x 0.25µm
P/N	10-200504
Carrier:	H2, 12psi (87.7 kPa)
Oven:	100°C to 325°C (5 min.) @ 6°C/min
Injection:	1 µL split (1:100), 5 to 10 ng/comp. on column, 280°C.
Detector:	FID, 300°C

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







Q Cap

GC-5Amine

95% Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Specially designed for the analysis of amines and other basic analytes
- A special deactivation treatment of the column surface and cross-linking of the phase results in minimal absorption and tailing of basic compounds, including alkylamines, ethanolamines, basic pharmaceuticals, aromatic amines, etc.
- Equivalent selectivity and thermal stability to GC-5 columns

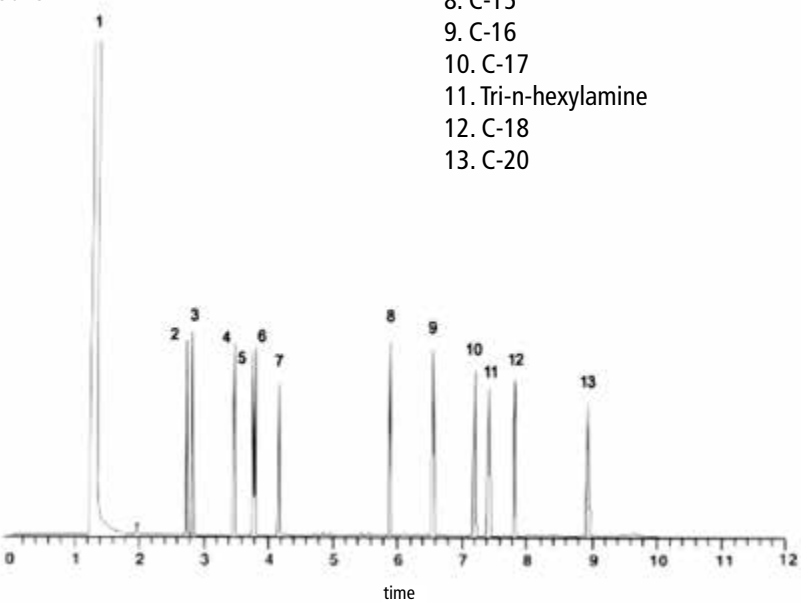
GC-5Amine Similar Phases
Macherey-Nagel: OPTIMA-5A
Restek: Rtx-5Amine
Supelco: PTA-5
Varian: CP-Sil 8 MS

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,50	-60 to 300/315	10-200560
	15	1,00	-60 to 300/315	10-200561
	30	0,50	-60 to 300/315	10-200562
	30	1,00	-60 to 300/315	10-200563
	60	0,50	-60 to 300/315	10-200564
	60	1,00	-60 to 300/315	10-200565
0,32	15	0,50	-60 to 300/315	10-200580
	15	1,00	-60 to 300/315	10-200581
	15	1,50	-60 to 290/305	10-200582
	30	0,50	-60 to 300/315	10-200583
	30	1,00	-60 to 300/315	10-200584
	30	1,50	-60 to 290/305	10-200585
	60	0,50	-60 to 300/315	10-200586
	60	1,00	-60 to 300/315	10-200587
	60	1,50	-60 to 290/305	10-200588
0,53	15	1,00	-60 to 290/305	10-200600
	15	3,00	-60 to 280/295	10-200601
	30	1,00	-60 to 290/305	10-200602
	30	3,00	-60 to 280/295	10-200603
	60	1,00	-60 to 290/305	10-200604
	60	3,00	-60 to 280/295	10-200605

Amines Test Mix

Column: GC-5Amine
30 m x 0.25 mm x 0.5 µm
P/N 10-200562
Carrier: H2, 12 psi (87.7 kPa)
Oven 100°C to 280°C (5 min.) @ 20°C/min
Injection: 1 µL (split 1:50), 280°C
Detector: FID, 300°C
Sample: Test Mix (500ng/µl)

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



GC-Vol-amine

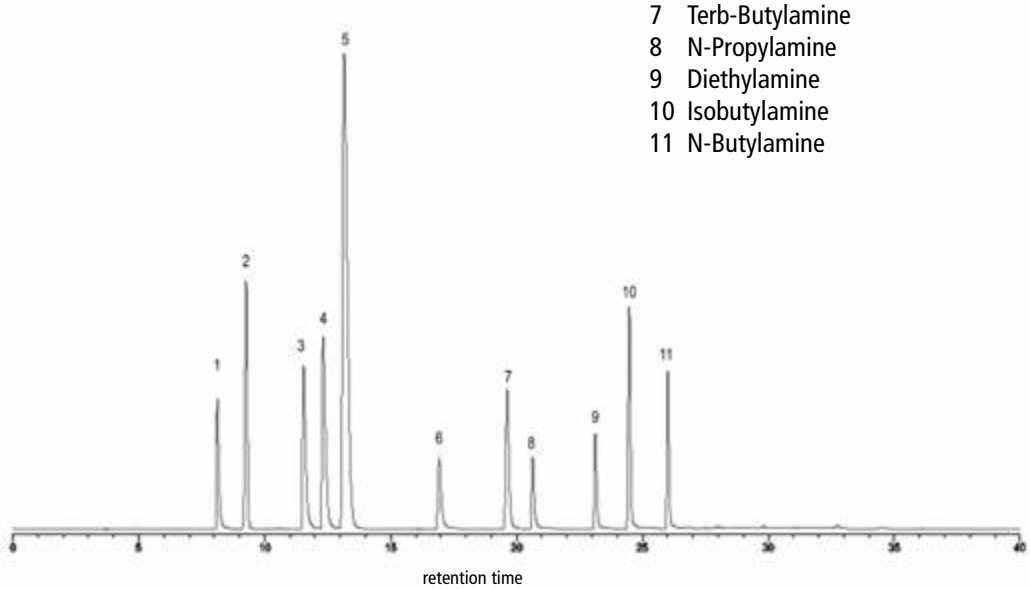
- Optimized for the separation of Volatile Amines
- High temperature stability
- Good peak shape for volatile alcohols, water and ammonia
- Compatible with water samples

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,32	15	5.00	260 to 280	10-200610
	30	5.00	260 to 280	10-200611
	60	5.00	260 to 280	10-200612

GC-Vol-amine Similar Phase
Varian: CP-Volamine

Column: GC-Vol-amine
60 m x 0.32 mm x 5.0 µm
P/N: 10-200612
Carrier: He, 14 psi (96.5 kPa)
Oven: 40ºC (10 min) @ 10ºC/min to 200ºC.
Injection: 100 µL Headspace (2t, 75°C.) split 1:15, 180°C
Detector: FID, 225ºC

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



Q Cap

GC-5.625

95% Dimethyl - (5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non-polar
- Specifically manufactured to fulfill the level of inertness required by EPA methods for the analysis of semi-volatile compounds - designed for methods 625, 1625, 8270 and CLP protocols
- Inertness and minimum absorption for acidic, basic and neutral compounds
- High temperature limit
- Excellent thermal stability and low bleed

GC-5.625 Similar Phases
Agilent: DB.5.625
Restek: Rtx-XTI-5
SGE: BPX-5

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	20	0,18	-60 to 325/350	10-200620
	20	0,36	-60 to 325/350	10-200621
0,20	12	0,33	-60 to 325/350	10-200625
	25	0,33	-60 to 325/350	10-200626
	50	0,33	-60 to 325/350	10-200627
0,25	15	0,10	-60 to 325/350	10-200630
	15	0,25	-60 to 325/350	10-200631
	15	0,50	-60 to 325/350	10-200632
	15	1,00	-60 to 325/350	10-200633
	30	0,10	-60 to 325/350	10-200634
	30	0,25	-60 to 325/350	10-200635
	30	0,50	-60 to 325/350	10-200636
	30	1,00	-60 to 325/350	10-200637
	60	0,10	-60 to 325/350	10-200638
	60	0,25	-60 to 325/350	10-200639
0,32	15	0,10	-60 to 325/350	10-200650
	15	0,25	-60 to 325/350	10-200651
	15	0,50	-60 to 325/350	10-200652
	15	1,00	-60 to 325/350	10-200653
	30	0,10	-60 to 325/350	10-200654
	30	0,25	-60 to 325/350	10-200655
	30	0,50	-60 to 325/350	10-200656
	30	1,00	-60 to 325/350	10-200657
	60	0,10	-60 to 325/350	10-200658
0,53	15	1,50	-60 to 320/340	10-200670
	30	0,50	-60 to 320/340	10-200671
	30	1,00	-60 to 310/330	10-200672
	60	0,25	-60 to 325/350	10-200673

GC-G27

95% Dimethyl-(5%) diphenylpolysiloxane

- Bonded and cross-linked phase
- Non-polar
- The GC-G27 column fulfils the specifications of the American Pharmacopeia (USP), for the test of residual solvents (organic volatile impurities) in pharmaceutical products. Method USP 467.

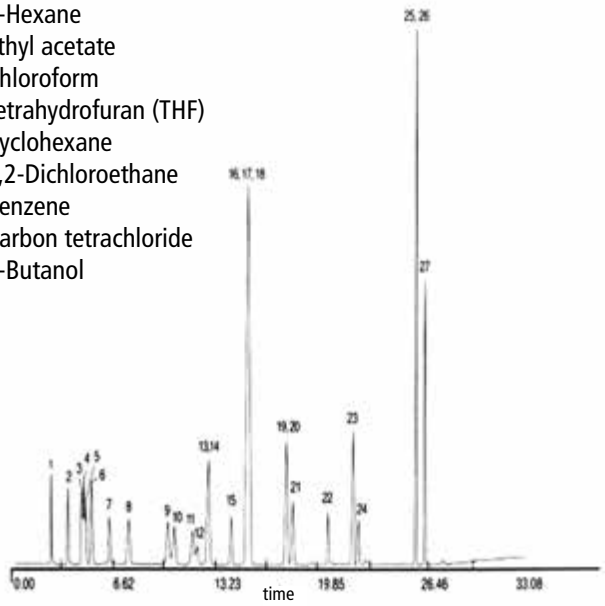
GC-G27 Similar Phases
Restek: Rtx-G27
Supelco: G27

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,53	30	5,00	-60 to 270/290	10-200680

Residual Solvents in Pharmaceutical Products

Column: GC-G27
30m x 0.53mm x 5.0µm
P/N: 10-200680
Carrier: He, 4.5 psi (31 kPa), 35 cm/s. to 35°C.
Oven: 35°C (10 min.) to 100°C @ 5°C/min to 240°C (5 min.) @ 25°C/min.
Injection: 220°C (split 1:80), 5m phenylmethyl deactivated retention gap
Detector: FID, 250°C
Sample: 0.02 µl solvent mixture

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



GC-5MXI

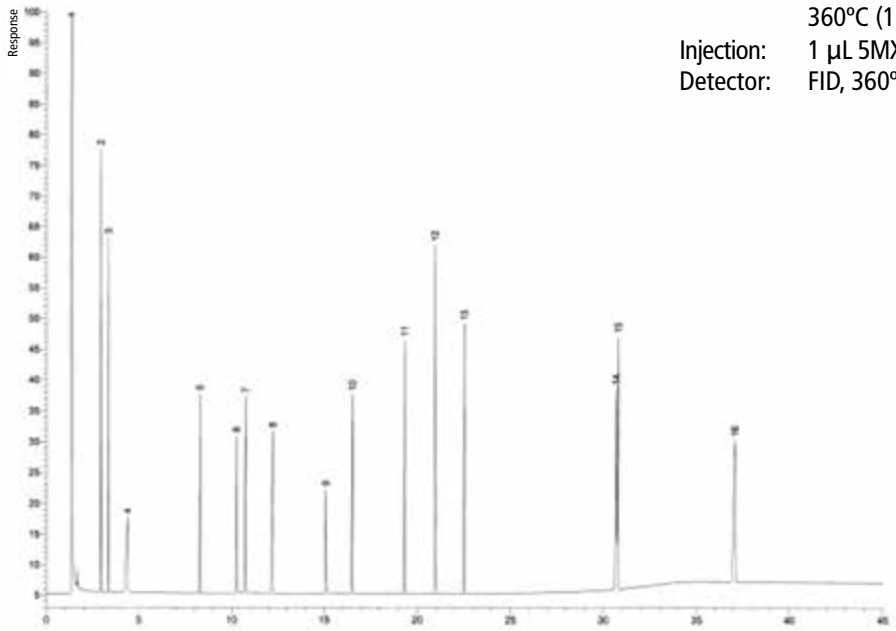
5% Phenyl - (95%) methylpolysiloxane

- Bonded and cross-linked phase
- Maximum inertness and ultra low bleed for trace analysis of acids and bases, such as semi-volatiles
- Column contrasted to meet or exceed performance specifications of US EPA Methods 625, 1625, 8270 and QTM protocols
- Maximum thermal stability (360ºC.)

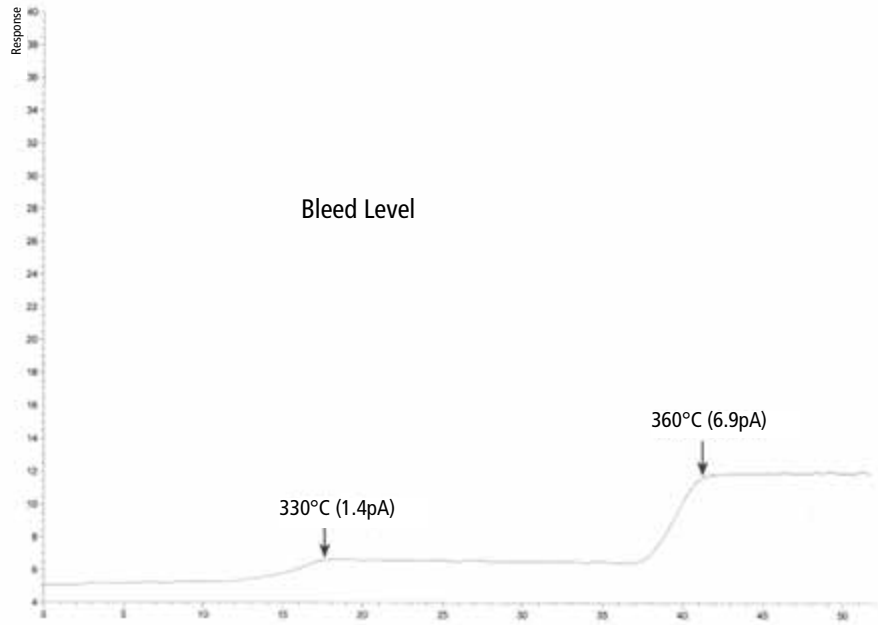
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,25	-60 to 360	10-200690
0,32	30	0,25	-60 to 360	10-200691
0,53	15	0,50	-60 to 330/360	10-200692

GC-5MXI Similar Phases
Agilent: HP-5Msi
Restek : XTI-5
Supelco: PTE-5

Column:	GC-5MXI 30m x 0.25mm x 0.25µm
P/N:	10-200690
Carrier:	H2, 12psi (82.7 kPa)
Oven:	100ºC @ 6ºC/min to 330ºC (15 min.) @ 10ºC/min to 360ºC (15 min.)
Injection:	1 µL 5MXI Test Mix (10 to 20ng/comp), split 1:100, 280ºC
Detector:	FID, 360ºC



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(k)perylene

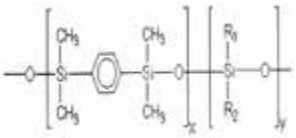


Q Cap

GC-X5MS

Phenyl Arylene polymer

- Bonded and cross-linked phase
- Non-polar
- Preferred column for the analysis of semi-volatile compounds with GC-MS
- Selectivity similar to GC-5
- New generation of column incorporates arylene groups in the polymer structure, which improves thermal stability, reduces bleed level and provides optimal resolution of aromatic compounds
- The manufacturing procedures for this column guarantee its maximum inertness and minimal bleed.
- Quality control test (X5MS) guarantees total inertness and optimal signal/noise ratio for the more active compounds which usually suffer adsorption problems, like 2,4-dinitropherol, 4 nitroaniline and pentachlorophenol.



Structure of Poly(dimethylsiloxy)poly (1,4bis(dimethylsiloxy)phenylen)siloxane

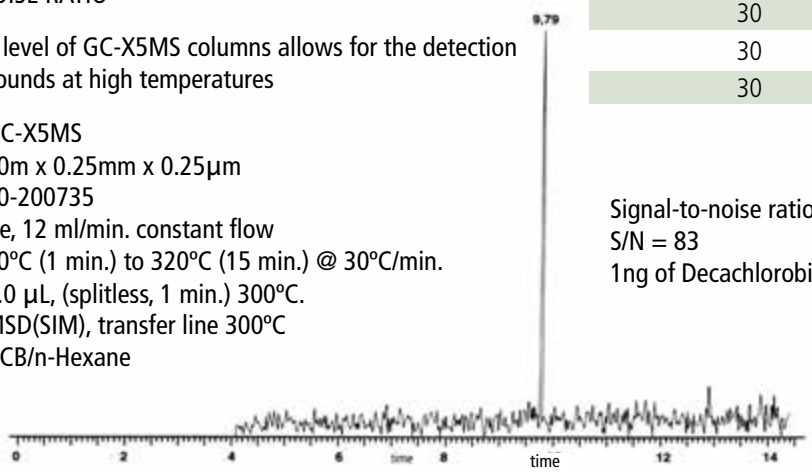
GC-X5MS Similar Phases
Agilent: DB-5 MS, HP-5TA
Alltech: AT-5ms
Quadrex: 007-5MS
Restek: Rxi-5Sil MS
SGE: BPX-5
Supelco: MDN-5, SLB-5MS
Varian: CP-SIL 8CB MS, VF-5MS

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,40	-60 to 325/350	10-200710
0,15	25	0,15	-60 to 325/350	10-200712
0,18	20	0,18	-60 to 325/350	10-200714
	20	0,36	-60 to 325/350	10-200715
	40	0,18	-60 to 325/350	10-200716
0,20	12	0,33	-60 to 325/350	10-200720
	25	0,33	-60 to 325/350	10-200721
	50	0,33	-60 to 325/350	10-200722
0,25	15	0,10	-60 to 325/350	10-200730
	15	0,25	-60 to 325/350	10-200731
	15	0,50	-60 to 325/350	10-200732
	15	1,00	-60 to 325/350	10-200733
	30	0,10	-60 to 325/350	10-200734
	30	0,25	-60 to 325/350	10-200735
	30	0,50	-60 to 325/350	10-200736
	30	1,00	-60 to 325/350	10-200737
	40	0,17	-60 to 325/350	10-200740
	60	0,10	-60 to 325/350	10-200738
	60	0,25	-60 to 325/350	10-200739
0,32	15	0,10	-60 to 325/350	10-200750
	15	0,25	-60 to 325/350	10-200751
	15	0,50	-60 to 325/350	10-200752
	15	1,00	-60 to 325/350	10-200753
	25	0,40	-60 to 325/350	10-200754
	30	0,10	-60 to 325/350	10-200755
	30	0,25	-60 to 325/350	10-200756
	30	0,50	-60 to 325/350	10-200757
	30	1,00	-60 to 325/350	10-200758
	60	0,10	-60 to 325/350	10-200759
	60	0,25	-60 to 325/350	10-200760
0,53	15	0,50	-60 to 320/340	10-200770
	15	1,00	-60 to 320/340	10-200771
	15	1,50	-60 to 320/340	10-200772
	30	0,50	-60 to 320/340	10-200773
	30	1,00	-60 to 320/340	10-200774
	30	1,50	-60 to 310/330	10-200775

SIGNAL-TO-NOISE RATIO

The low bleed level of GC-X5MS columns allows for the detection of trace compounds at high temperatures

Column: GC-X5MS
30m x 0.25mm x 0.25µm
P/N: 10-200735
Carrier: He, 12 ml/min. constant flow
Oven: 60°C (1 min.) to 320°C (15 min.) @ 30°C/min.
Injection: 1.0 µL, (splitless, 1 min.) 300°C.
Detector: MSD(SIM), transfer line 300°C
Sample: DCB/n-Hexane



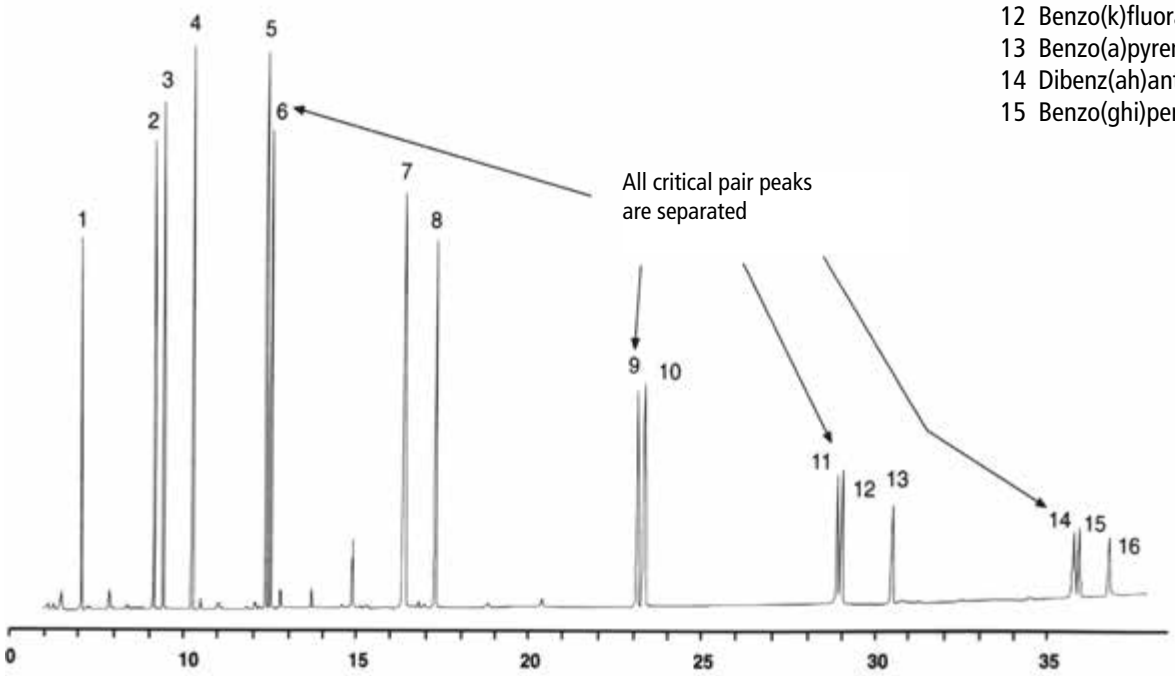
Signal-to-noise ratio
S/N = 83
1ng of Decachlorobiphenyl (DCB)

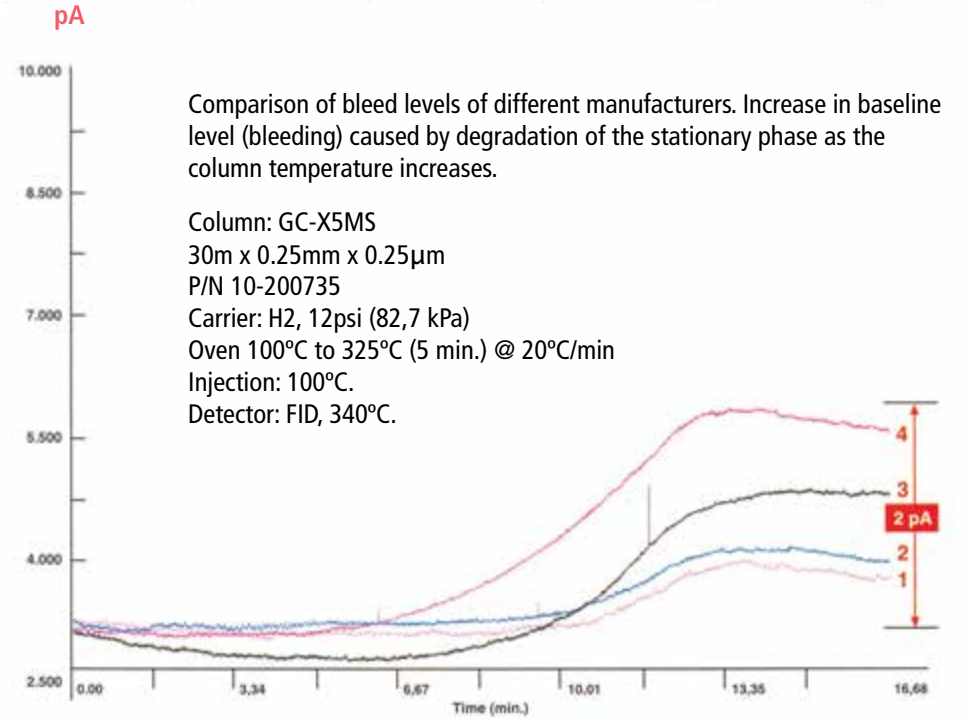
GC-X5MS

SEPARATION OF POLYCYCLIC AROMATIC HYDROCARBONS
(EPA Method 610)

Column: GC-X5MS
30m x 0.25mm x 0.50µm
P/N: 10-200736
Carrier: H2, 16psi (110.2 kPa) Cte.
Oven: 40ºC (1 min.) to 200ºC @ 20ºC/min to 310ºC (5min.)@ 4ºC/min
Injection: 0.3 µL (splitless, 1 min.) 300ºC.
Detector: FID, 340ºC.
Sample: PAH Test Mix (approx. 12ng/comp. in column)

1 Naphthalene
2 Acenaphthylene
3 Acenaphthene
4 Fluorene
5 Phenanthrene
6 Anthracene
7 Fluoranthene
8 Pyrene
9 Chrysene
10 Benz(a)anthracene
11 Benzo(b)fluoranthene
12 Benzo(k)fluoranthene
13 Benzo(a)pyrene
14 Dibenz(ah)anthracene
15 Benzo(ghi)perylene





Comparison of bleed levels of different manufacturers. Increase in baseline level (bleeding) caused by degradation of the stationary phase as the column temperature increases.

Column: GC-X5MS
30m x 0.25mm x 0.25µm
P/N 10-200735
Carrier: H2, 12psi (82,7 kPa)
Oven 100ºC to 325ºC (5 min.) @ 20ºC/min
Injection: 100ºC.
Detector: FID, 340ºC.

Bleed level lower than 1pA at 325°C. (limit <4pA)

1 GC-X5MS
2 Manufacturer A
3 Manufacturer B
4 Manufacturer C

GC-X5 Triazine (proprietary phase)

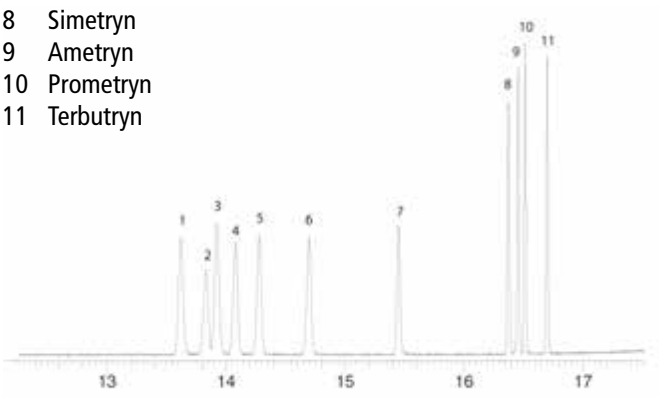
Silphenylene phase, has a selectivity similar to GC-5

- Bonded and crosslinked phase
- Ideal for the separation of Triazine Herbicides as per EPA 609 method
- Low bleed and excellent inertness for the analysis of traces of herbicides by GC/MS.
- General purpose column for pesticides.

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,25	325 to 350	10-202240

Column:	GC-X5 Triazine, 30m x 0.25mm x 0.25 µm
P/N:	10-202240
Carrier:	Helium, constant flow @ 1.0ml/min.
Oven:	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
Injection:	Split 1:25; Temp. 250°C
Sample:	Triazine herbicides EPA 619 2ng/compound on column

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



GC-XLB (proprietary phase)

Silphenylene phase

- Bonded and cross-linked phase
- Low polarity phase with ultra low bleed
- Direct replacement for DB-XLB.
- General purpose column with extended temperature range of (30 to 360ºC)
- Ideal column for GC-MS analysis. Unique selectivity for aromatic compounds (PCBs, PAHs, PBDEs)
- Excellent column for pesticides and herbicides

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

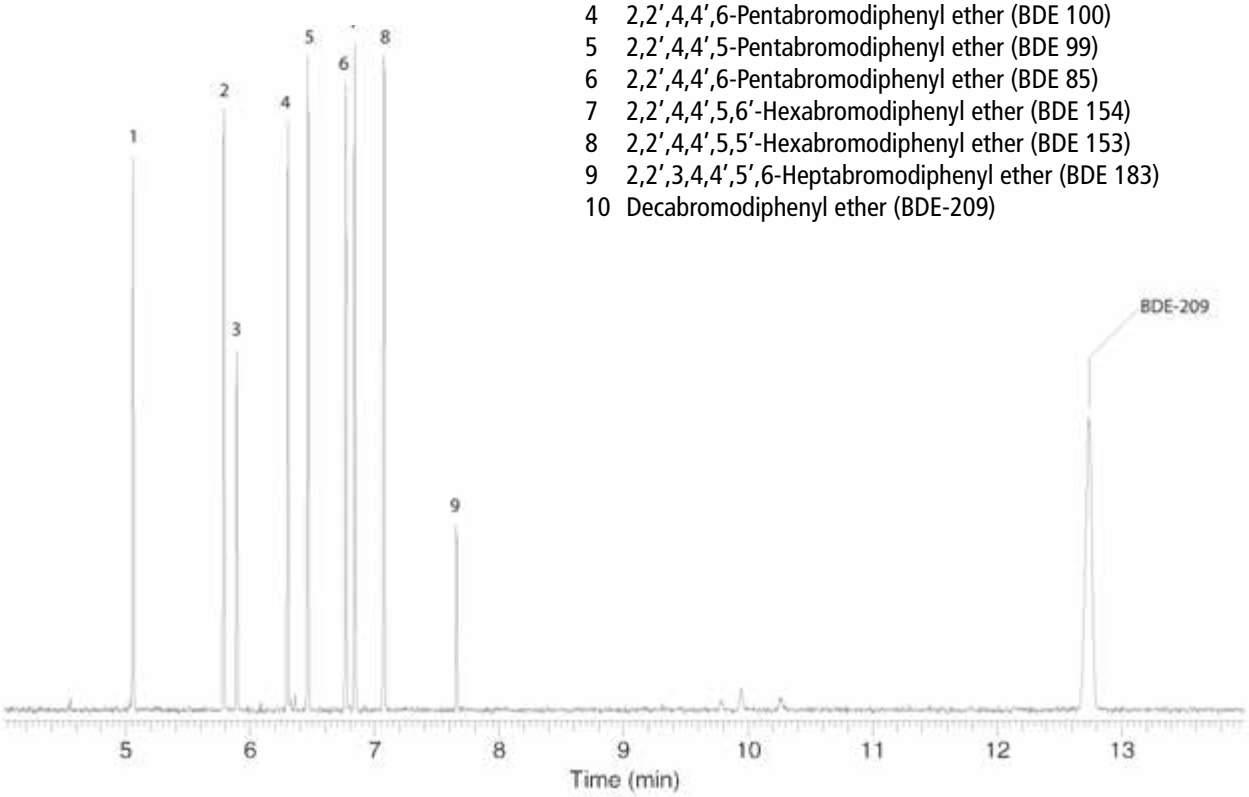
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	30 to 340/360°C	10-202200
0,18	20	0,18	30 to 340/360°C	10-202206
	30	0,18	30 to 340/360°C	10-202207
	60	0,18	30 to 340/360°C	10-202208
0,25	15	0,10	30 to 340/360°C	10-202210
	15	0,25	30 to 340/360°C	10-202211
	15	1,00	30 to 340/360°C	10-202212
	30	0,10	30 to 340/360°C	10-202213
	30	0,25	30 to 340/360°C	10-202214
	30	0,50	30 to 340/360°C	10-202215
	30	1,00	30 to 340/360°C	10-202216
	60	0,25	30 to 340/360°C	10-202217
0,32	15	0,25	30 to 340/360°C	10-202220
	15	1,00	30 to 340/360°C	10-202221
	30	0,10	30 to 340/360°C	10-202222
	30	0,25	30 to 340/360°C	10-202223
	30	0,50	30 to 340/360°C	10-202224
	30	1,00	30 to 340/360°C	10-202225
	60	0,25	30 to 340/360°C	10-202226
0,53	15	1,50	30 to 320/340°C	10-202230
	30	1,50	30 to 320/340°C	10-202231

GC-XLB (proprietary phase)

ANALYSIS OF BROMINATED FLAME RETARDANTS
(Polybrominated Diphenyl Ethers, PBDEs)

Column:	GC-XLB 15m x 0.18mm x 0.072µm
P/N:	10-200205
Injection:	280°C, Splitless w/Surge: Pulse 40psi @ 0.30min, 50ml/min @ 0.4min
Oven:	100°C (0.5min) to 320°C (7min) @ 30ªC/min
Carrier:	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

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 Decabromodiphenyl ether (BDE-209)

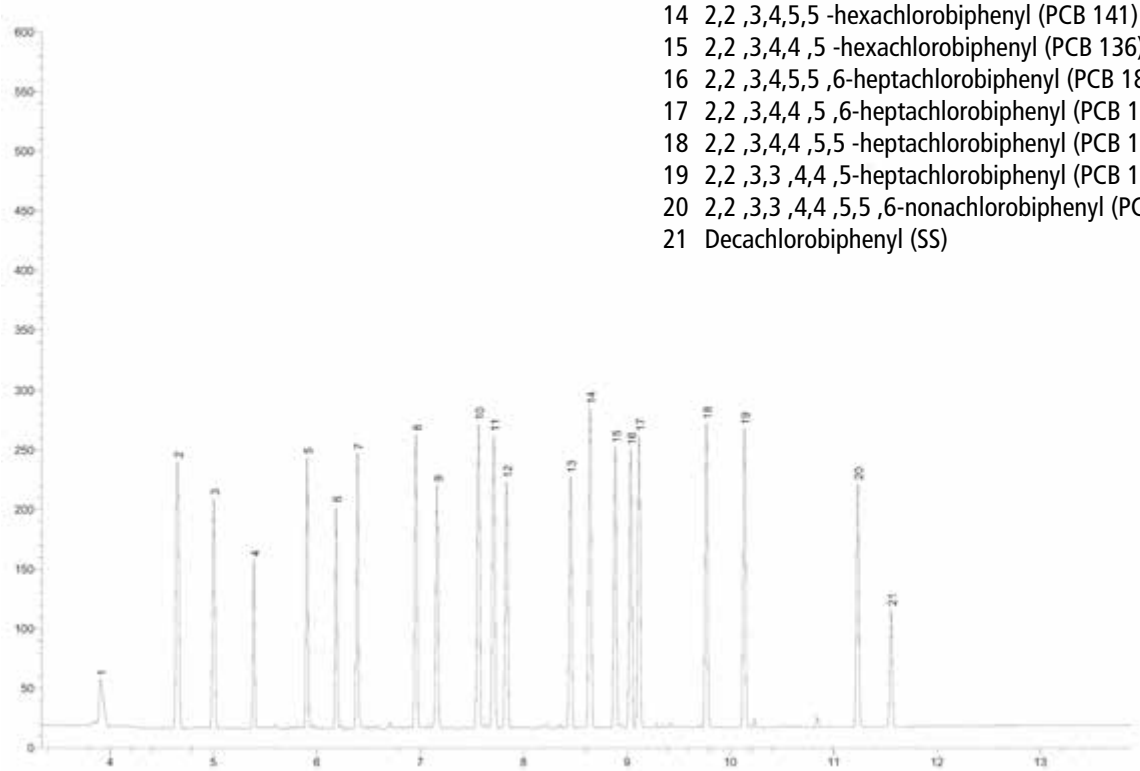


GC-XLB (proprietary phase)

PCBs

Column:	GC-XLB 30m x 0.25mm x 0.25 µm
P/N:	10-202014
Injection:	1 µL PCBs St. in Hexane (200ppb each compound), 100ppb 2,4,5,6-Tetrachloro-m-xylene, 100ppb Decachlorobiphenyl, Splitless (0.75min), 250ºC
Carrier gas:	H2, constant pressure 20psi (137.8 kPa) Linear Velocity: 70cm/seg @ 120ºC
Oven:	120ºC (0.5min) @ 25ºC/min to 260ºC (2min.) @ 25ºC/min to 25ºC (5min)
Detector:	ECD, 330ºC (make up N2 to ml/min)

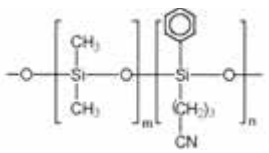
1 2-chlorobiphenyl (PCB 1)
2 2,4,5,6,-tetrachloro-m-xylene (SS)
3 2,3-dichlorobiphenyl (PCB 5)
4 2,2`,5-trichlorobiphenyl (PCB 18)
5 2,4`,5-trichlorobiphenyl (PCB 31)
6 2,2`,5,5`-tetrachlorobiphenyl (PCB 52)
7 2,2`,3,5`-tetrachlorobiphenyl (PCB 44)
8 2,3`,4,4`-tetrachlorobiphenyl (PCB 66)
9 2,2`,4,5,5`-pentachlorobiphenyl (PCB 101)
10 2,2`,3,4,5`-pentachlorobiphenyl (PCB 87)
11 2,3,3 ,4,6`-pentachlorobiphenyl (PCB 110)
12 2,2 ,3,5,5 ,6-hexachlorobiphenyl (PCB 151)
13 2,2 ,4,4 ,5,5 -hexachlorobiphenyl (PCB 153)
14 2,2 ,3,4,5,5 -hexachlorobiphenyl (PCB 141)
15 2,2 ,3,4,4 ,5 -hexachlorobiphenyl (PCB 136)
16 2,2 ,3,4,5,5 ,6-heptachlorobiphenyl (PCB 187)
17 2,2 ,3,4,4 ,5 ,6-heptachlorobiphenyl (PCB 183)
18 2,2 ,3,4,4 ,5,5 -heptachlorobiphenyl (PCB 180)
19 2,2 ,3,3 ,4,4 ,5-heptachlorobiphenyl (PCB 170)
20 2,2 ,3,3 ,4,4 ,5,5 ,6-nonachlorobiphenyl (PCB 26)
21 Decachlorobiphenyl (SS)



GC-1301

94% Dimethyl - (6%) cyanopropylphenyl polysiloxane

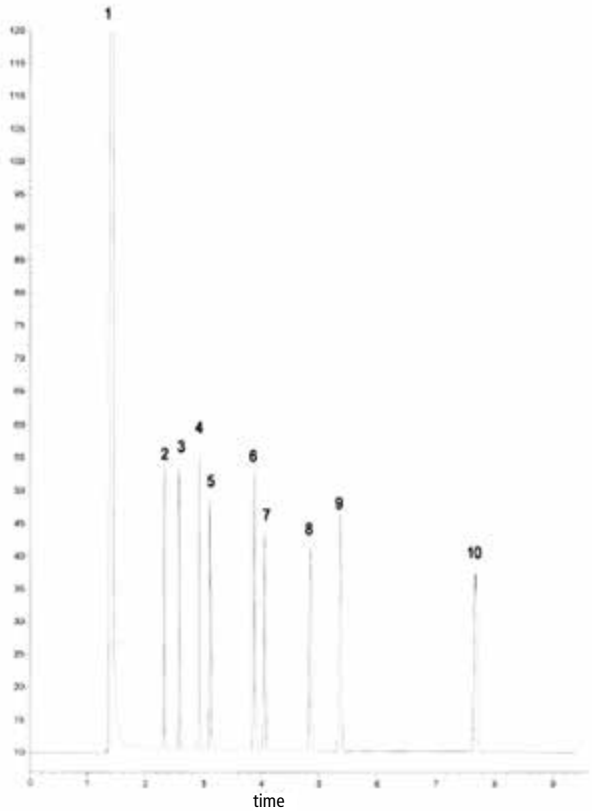
- Bonded and cross-linked phase
- Intermediate polarity
- Ideal column for analyzing mixtures of acidic and basic compounds with a wide polarity range.
- This column is very useful for the analysis of pesticides and herbicides



Structure of Poly(dimethylcyanopropylphenyl)

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	10	0,40	-20 to 280/300	10-200790
0,25	15	0,25	-20 to 280/300	10-200793
	15	1,00	-20 to 260/280	10-200794
	30	0,25	-20 to 280/300	10-200795
	30	1,00	-20 to 260/280	10-200796
	60	0,25	-20 to 280/300	10-200797
	60	1,00	-20 to 260/280	10-200798
0,32	15	0,25	-20 to 280/300	10-200800
	15	1 00	-20 to 260/280	10-200801
	30	0,25	-20 to 280/300	10-200802
	30	1,00	-20 to 260/280	10-200803
	60	0,25	-20 to 280/300	10-200804
	60	1,00	-20 to 260/280	10-200805
0,53	15	1,00	-20 to 260/280	10-200810
	30	1,00	-20 to 260/280	10-200811
	60	1,00	-20 to 260/280	10-200812

GC-1301 Similar Phases
Agilent: DB-624, DB-1301, HP-624, HP-1301
Alltech: AT-624
Restek: Rtx-624, Rtx-1301
SGE: BPX-624
Supelco: SPB-1301, OVI-G43
Others: PE-1301



Column: GC-1301
30m x 0.25mm x 1.0µm
P/N: 10-200796
Carrier: H2, constant pressure 12 psi (82.7 kPa)
Oven: 165°C
Injection: 0.5 µL standard (500 ng/mL), split 1:50, 260°C
Detector: FID, 280°C

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

Q Cap

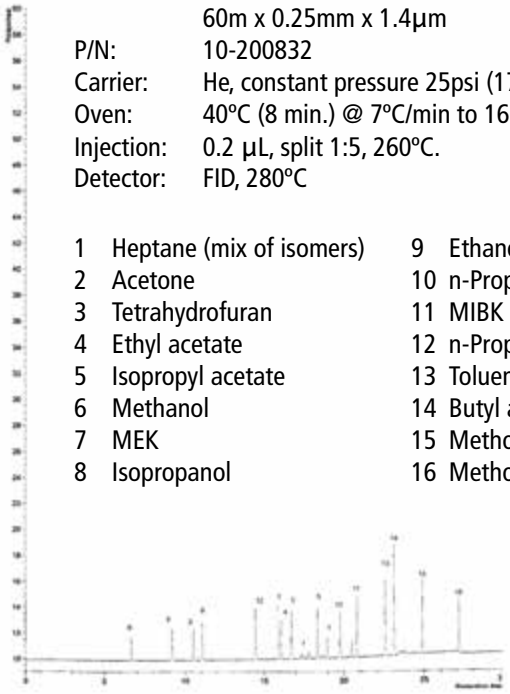
GC-624

94% Dimethyl - (6%) cyanopropylphenyl polysiloxane

- Bonded and cross-linked phase
- Intermediate polarity
- Specially developed for the analysis of Volatile Priority Pollutants
- Column of choice for use with EPA methods 501.3, 502.2, 503.1, 524.2, 601, 602, 8010, 8015, 8020, 8221, 8240 and 8260.
- Excellent inertness for active compounds

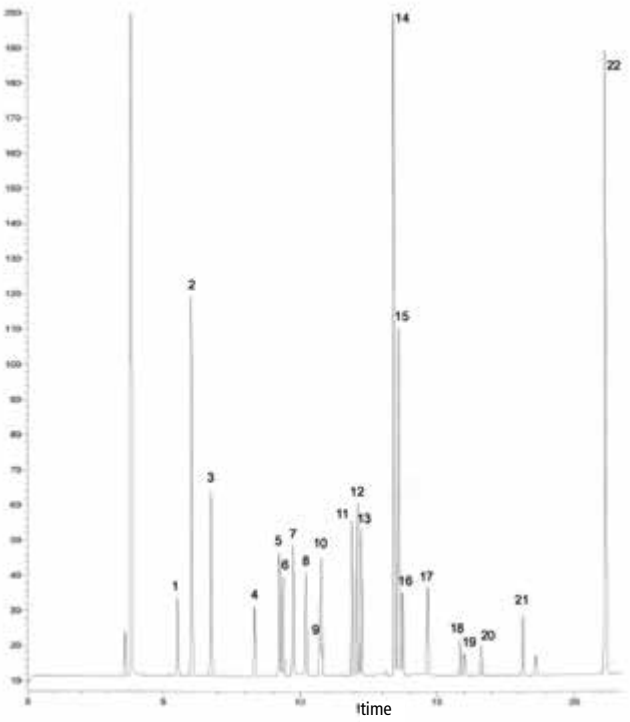
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	20	1,00	-20 to 240/260	10-200820
0,20	25	1,12	-20 to 240/260	10-200825
0,25	30	1,40	-20 to 240/260	10-200831
	60	1,40	-20 to 240/260	10-200832
0,32	15	1,80	-20 to 240/260	10-200840
	30	1,80	-20 to 240/260	10-200841
	60	1,80	-20 to 240/260	10-200842
0,53	25	3.00	-20 to 240/260	10-200850
	30	3,00	-20 to 240/260	10-200851
	60	3,00	-20 to 240/260	10-200852
	75	3,00	-20 to 240/260	10-200853
	105	3,00	-20 to 240/260	10-200854

GC-624 Similar Phases
Agilent: DB-624, DB-1301, HP-624, HP-1301
Alltech: AT-624
Restek: Rtx-624, Rtx-1301
Supelco: OVI-G43, SPB-1301,
SGE: BPX-624



Column: GC-624
60m x 0.25mm x 1.4µm
P/N: 10-200832
Carrier: He, constant pressure 25psi (172.3 kPa)
Oven: 40°C (8 min.) @ 7°C/min to 160°C. (5 min.)
Injection: 0.2 µL, split 1:5, 260°C.
Detector: FID, 280°C

1 Heptane (mix of isomers)
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



Column: GC-624
P/N: 10-200832
Dimensions: 60m x 0.25mm x 1.4µm
Injection: 1 µL, solvents mixture, split 1:100 (20-600 ng/comp.), 260°C
Carrier gas: H2, constant pressure 25psi (172.3 kPa)
Oven: 50°C (5 min.) @ 6°C/min to 220°C.
Detector: FID, 280°C

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

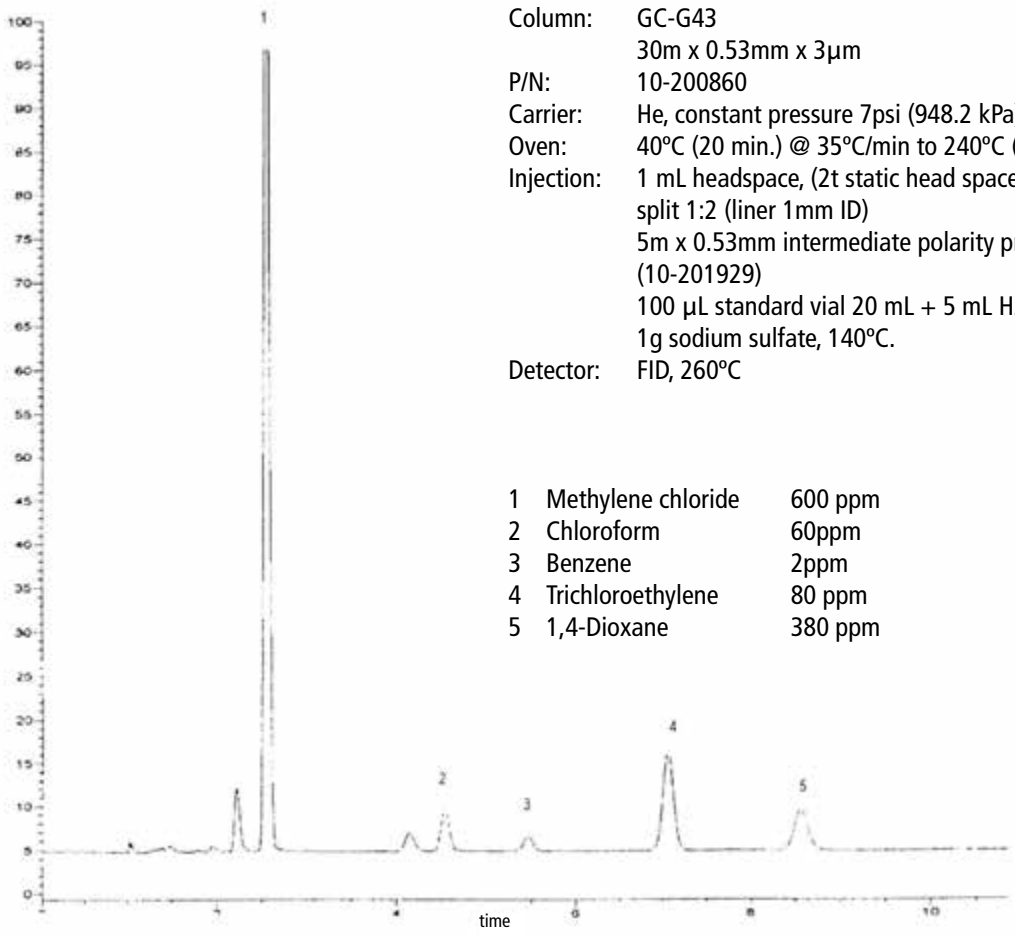
GC-G43

94% Dimethyl - (6%) cyanopropylphenyl polysiloxane

- Bonded and cross-linked phase
- Intermediate polarity
- Complies with 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
- Guaranteed chemical inertness and low bleed
- Specifically 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 10-201929) to trap the non-volatile impurities in the sample

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,53	30	3,00	-20 to 240/260	10-200860

GC-G43 Similar Phases
Agilent: DB-624, DB-1301, HP-624, HP-1301
Alltech: AT-624
Restek: Rtx-624, Rtx-1301,
SGE: BPX-624
Supelco: OVI-G43, SPB-1301
USP Nomenclature: G43



Column: GC-G43
30m x 0.53mm x 3µm
P/N: 10-200860
Carrier: He, constant pressure 7psi (948.2 kPa)
Oven: 40°C (20 min.) @ 35°C/min to 240°C (20 min)
Injection: 1 mL headspace, (2t static head space sampler), split 1:2 (liner 1mm ID)
5m x 0.53mm intermediate polarity precolumn (10-201929)
100 µL standard vial 20 mL + 5 mL H2O + 1g sodium sulfate, 140°C.
Detector: FID, 260°C

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

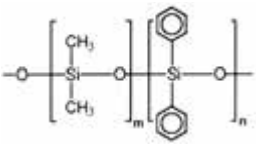
Q Cap

GC-13

(14%) Diphenyl - (86%) dimethylpolysiloxane

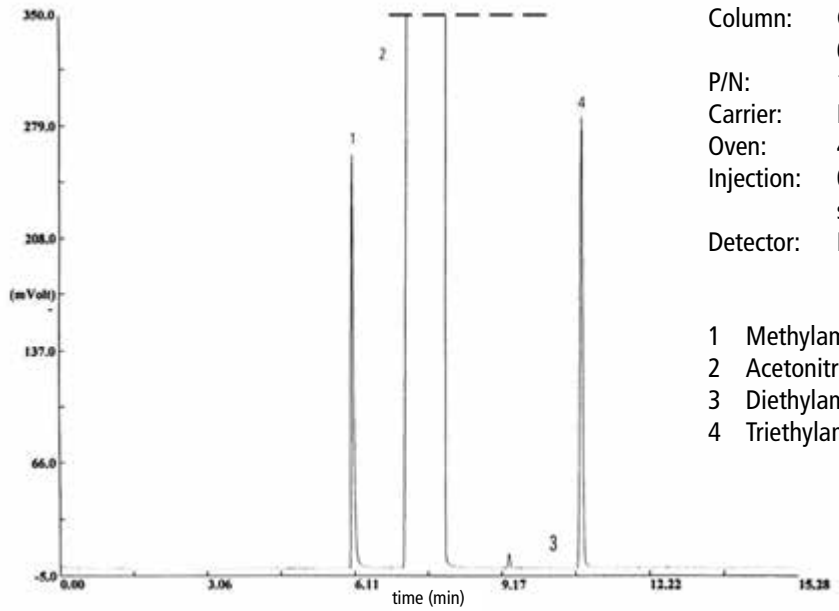
- Bonded and cross-linked phase
- Intermediate polarity
- Guaranteed chemical inertness
- Low bleed with ECD due to the absence of cyano groups in its structure
- Confirmation column alongside GC-1 and GC-5

GC-13 Similar Phases
Varian: CP-SIL 13 CB



Structure of Poly(dimethyldiphenyl)siloxane

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,20	-20 to 300/330	10-200870
	15	0,40	-20 to 300/330	10-200871
	15	1,20	-20 to 300/330	10-200872
	30	0,20	-20 to 300/330	10-200873
	30	0,40	-20 to 300/330	10-200874
	30	1,20	-20 to 300/330	10-200875
	60	0,20	-20 to 300/330	10-200876
	60	0,40	-20 to 300/330	10-200877
	60	1,20	-20 to 300/330	10-200878
0,32	15	0,20	-20 to 300/330	10-200890
	15	0,40	-20 to 300/330	10-200891
	15	1,20	-20 to 300/330	10-200892
	30	0,20	-20 to 300/330	10-200893
	30	0,40	-20 to 300/330	10-200894
	30	1,20	-20 to 300/330	10-200895
	60	0,20	-20 to 300/330	10-200896
	60	0,40	-20 to 300/330	10-200897
	60	1,20	-20 to 300/330	10-200898
0,53	15	1,00	-20 to 300/330	10-200910
	15	2,00	-20 to 300/330	10-200911
	30	1,00	-20 to 300/330	10-200912
	30	2,00	-20 to 300/330	10-200913
	60	1,00	-20 to 300/330	10-200914
	60	2,00	-20 to 300/330	10-200915



Column: GC-13
60m x 0.32mm x 1.2µm
P/N: 10-200898
Carrier: He, constant pressure 14psi (96.5 kPa)
Oven: 40°C (2 min.) @ 10°C/min to 250°C.
Injection: 0.1 µL, Amines mixture (0.02 - 0.2% in Acetonitrile), split: 1:25, 200°C.
Detector: FID, 280°C

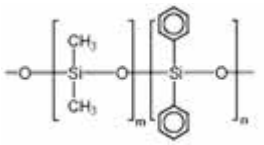
1 Methylamine
2 Acetonitrile
3 Diethylamine
4 Triethylamine

GC-20

(20%) Diphenyl - (80%) Dimethylpolysilioxane

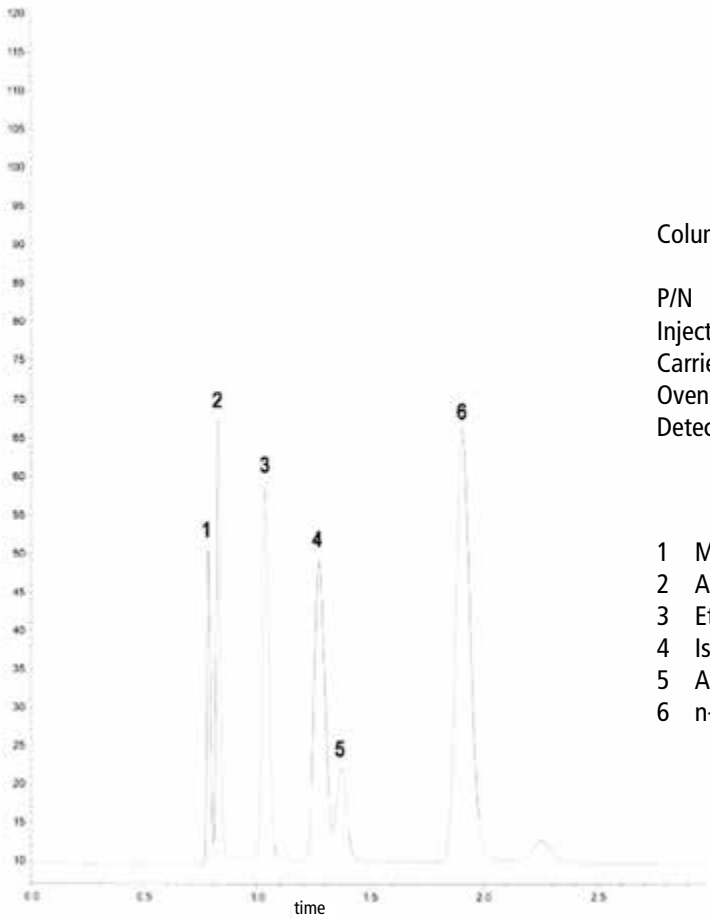
- Bonded and cross-linked phase
- Intermediate polarity
- Low bleed with ECD due to absence of cyano groups in its structure
- Excellent confirmation column

GC-20 Similar Phases
Alltech: AT-20
Quadrex: 007-502
Restek: Rtx-20
Supelco: SPB-20, VOCOL
Varian: CP-SIL 13 CB
Others: PE-7



Structure of Poly(dimethyldiphenyl)siloxane

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,25	-20 to 300/320	10-200920
	15	1,00	-20 to 280/300	10-200921
	30	0,25	-20 to 300/320	10-200922
	30	1,00	-20 to 280/300	10-200923
	60	0,25	-20 to 300/320	10-200924
	60	1,00	-20 to 280/300	10-200925
0,32	15	0,25	-20 to 300/320	10-200930
	15	1,00	-20 to 280/300	10-200931
	30	0,25	-20 to 300/320	10-200932
	30	1,00	-20 to 280/300	10-200933
	60	0,25	-20 to 300/320	10-200934
	60	1,00	-20 to 280/300	10-200935
0,53	15	0,50	-20 to 260/280	10-200940
	15	1,00	-20 to 260/280	10-200941
	30	0,50	-20 to 260/280	10-200942
	30	1,00	-20 to 260/280	10-200943
	60	0,50	-20 to 260/280	10-200944
	60	1,00	-20 to 260/280	10-200945



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

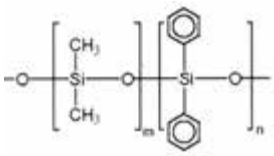
1 Methanol
2 Acetaldehyde
3 Ethanol
4 Isopropanol
5 Acetone
6 n-Propanol

GC-35

(35%) Diphenyl - (65%) Dimethylpolysiloxane

- Bonded and cross-linked phase
- Intermediate polarity
- Low bleed with ECD due to absence of cyano groups in its structure
- Excellent confirmation column

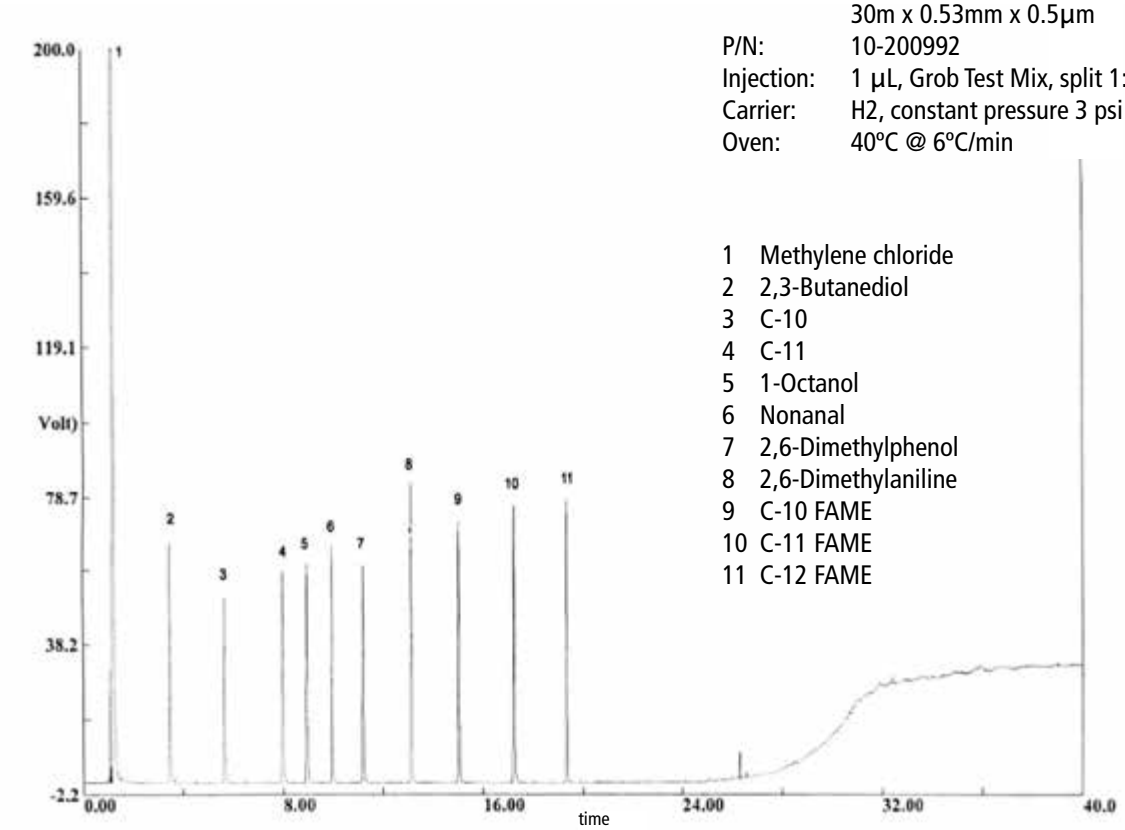
GC-35 Equivalent Phase
Agilent: DB-35, HP-35
Alltech: AT-35
Quadrex: 007-11
Restek: Rtx-35
SGE: BPX-35
Supelco: SPB-35
Others: OV-11, PE-35, ZB-35



Structure of Poly(dimethyl)diphenylsiloxane

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,15	-20 to 300/320	10-200960
	15	0,25	-20 to 300/320	10-200961
	30	0,15	-20 to 300/320	10-200962
	30	0,25	-20 to 300/320	10-200963
	60	0,15	-20 to 300/320	10-200964
	60	0,25	-20 to 300/320	10-200965
0,32	15	0,15	-20 to 300/320	10-200970
	15	0,25	-20 to 300/320	10-200971
	15	0,50	-20 to 290/310	10-200972
	30	0,15	-20 to 300/320	10-200973
	30	0,25	-20 to 300/320	10-200974
	30	0,50	-20 to 290/310	10-200975
	60	0,15	-20 to 300/320	10-200976
	60	0,25	-20 to 300/320	10-200977
	60	0,50	-20 to 290/310	10-200978
0,53	15	0,50	-20 to 260/280	10-200990
	15	1,00	-20 to 260/280	10-200991
	30	0,50	-20 to 260/280	10-200992
	30	1,00	-20 to 260/280	10-200993
	30	3,00	-20 to 260/280	10-200994
	60	0,50	-20 to 260/280	10-200995
	60	1,00	-20 to 260/280	10-200996

Column: GC-35
30m x 0.53mm x 0.5µm
P/N: 10-200992
Injection: 1 µL, Grob Test Mix, split 1:25, 260°C.
Carrier: H2, constant pressure 3 psi (20.7 kPa)
Oven: 40°C @ 6°C/min



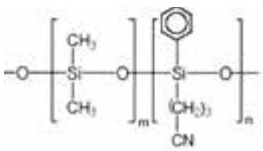
1 Methylene chloride
2 2,3-Butanediol
3 C-10
4 C-11
5 1-Octanol
6 Nonanal
7 2,6-Dimethylphenol
8 2,6-Dimethylaniline
9 C-10 FAME
10 C-11 FAME
11 C-12 FAME

GC-1701

(14%) Cyanopropylphenyl-(86%) dimethyl polysiloxane

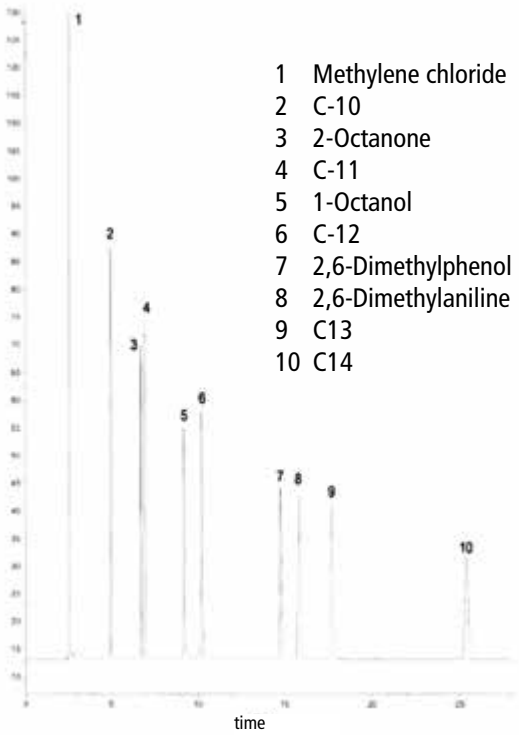
- Bonded and cross-linked phase
- Intermediate polarity
- Excellent column for the analysis of pesticides, PCBs, Drugs, Herbicides and TMS sugars

GC-1701 Similar Phases
Agilent: DB-1701, HP-1701, PAS-1701,
Alltech: AT-1701
Quadrex: 007-1701
Restek: Rtx-1701
SGE: BP-10
Supelco: SPB-1701
Varian: CP-SIL 19 CB
Others: ZB-1701



Structure of Poly(dimethylcyanopropylphenylsiloxane

Column: GC-1701
60m x 0.53mm x 1.5 µm
P/N: 10-201102
Injection: 1 µL standard, split 1:50, 260°C
Carrier: H2, constant pressure 6.2 psi (42.7kPa)
Oven: 130°C
Detector: FID, 280°C



ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	20	0,10	-20 to 280/280	10-201010
	20	0,40	-20 to 280/280	10-201011
0,18	10	0,40	-20 to 280/280	10-201020
	20	0,18	-20 to 280/280	10-201021
0,20	15	0,20	-20 to 280/280	10-201030
	30	0,20	-20 to 280/280	10-201031
	60	0,20	-20 to 280/280	10-201032
0,25	15	0,10	-20 to 280/280	10-201040
	15	0,25	-20 to 280/280	10-201041
	15	0,50	-20 to 270/280	10-201042
	15	1,00	-20 to 260/280	10-201043
	30	0,10	-20 to 280/280	10-201044
	30	0,25	-20 to 280/280	10-201045
	30	0,50	-20 to 270/280	10-201046
	30	1,00	-20 to 260/280	10-201047
	60	0,10	-20 to 280/280	10-201048
	60	0,25	-20 to 280/280	10-201049
	60	0,50	-20 to 270/280	10-201050
	60	1,00	-20 to 260/280	10-201051
0,32	15	0,10	-20 to 280/280	10-201070
	15	0,25	-20 to 280/280	10-201071
	15	0,50	-20 to 270/280	10-201072
	15	1,00	-20 to 260/280	10-201073
	30	0,10	-20 to 280/280	10-201074
	30	0,25	-20 to 280/280	10-201075
	30	0,50	-20 to 270/280	10-201076
	30	1,00	-20 to 260/280	10-201077
	60	0,10	-20 to 280/280	10-201078
	60	0,25	-20 to 280/280	10-201079
	60	0,50	-20 to 270/280	10-201080
	60	1,00	-20 to 260/280	10-201081
0,53	15	0,10	-20 to 270/280	10-201090
	15	0,50	-20 to 260/270	10-201091
	15	1,00	-20 to 250/270	10-201092
	15	1,50	-20 to 240/260	10-201093
	30	0,10	-20 to 270/280	10-201094
	30	0,50	-20 to 260/270	10-201095
	30	1,00	-20 to 250/270	10-201096
	30	1,50	-20 to 240/260	10-201097
	30	2,0	-20 to 240/260	10-201098
	60	0,10	-20 to 270/280	10-201099
	60	0,50	-20 to 260/270	10-201100
	60	1,00	-20 to 250/270	10-201101
	60	1,50	-20 to 240/260	10-201102

Q Cap

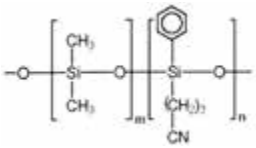
GC-225

(50%) Cyanopropylphenyl - (50%) dimethyl polysiloxane

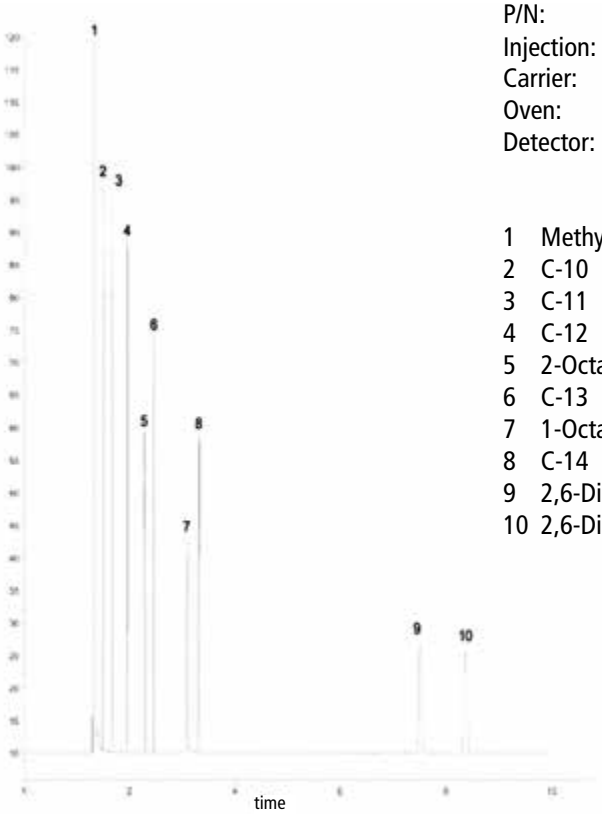
- Bonded and cross-linked phase
- Medium/high polarity
- Excellent for the analysis of carbohydrates, solvents and for separating cis-trans isomers of FAMES

GC-225 Similar Phases
Agilent: DB-225, HP-225
Alltech: AT-225
Quadrex: 007-225
Restek: Rtx-225
SGE: BP-225
Varian: CP-SIL 43 CB
Others: OV-225

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	20	0,10	40 to 220/240	10-201120
0,18	20	0,18	40 to 220/240	10-201125
0,20	15	0,20	40 to 220/240	10-201130
	25	0,20	40 to 220/240	10-201131
	30	0,20	40 to 220/240	10-201132
0,25	15	0,15	40 to 220/240	10-201140
	15	0,25	40 to 220/240	10-201141
	30	0,15	40 to 220/240	10-201142
	30	0,25	40 to 220/240	10-201143
0,32	15	0,15	40 to 220/240	10-201150
	15	0,25	40 to 220/240	10-201151
	30	0,15	40 to 220/240	10-201152
	30	0,25	40 to 220/240	10-201153
0,53	15	1,00	40 to 200/220	10-201160
	30	1,00	40 to 200/220	10-201161



Structure of Poly(dimethylcyanopropylphenylsiloxane



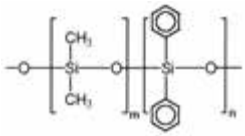
Column: GC-225
30m x 0.25mm x 0.15µm
P/N: 10-201142
Injection: 1 µL, standard mixture, split 1:50, 260°C.
Carrier: H2, constant pressure 12psi (82.7 kPa)
Oven: 110°C.
Detector: FID, 280°C

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

GC-50

(50%) Diphenyl-(50%) dimethyl polysiloxane

- Bonded and cross-linked phase
- Medium polarity
- Excellent confirmation column for GC-5 analyses
- Ideal for analysis of pesticides, herbicides, phthalate esters, free phenols and basic drugs



Structure of Poly(dimethyldiphenyl)siloxane

GC-50 Similar Phases
Agilent: DB-17, DB-608, HP-50+,
Alltech: AT-50
Quadrex: 007-17
Restek: Rtx-50, Rxi-17
Supelco: SPB-50, SPB-2250
Varian: CP-SIL 24 CB
Other: OV-17, PE-17, ZB-50

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	40 to 290/300	10-201170
	10	0,20	40 to 290/300	10-201171
	20	0,10	40 to 290/300	10-201172
0,18	20	0,18	40 to 290/300	10-201180
	20	0,30	40 to 290/300	10-201181
0,25	15	0,15	40 to 300/320	10-201190
	15	0,25	40 to 300/320	10-201191
	15	0,50	40 to 290/310	10-201192
	30	0,15	40 to 300/320	10-201193
	30	0,25	40 to 300/320	10-201194
	30	0,50	40 to 290/310	10-201195
	60	0,15	40 to 300/320	10-201196
	60	0,25	40 to 300/320	10-201197
	60	0,50	40 to 290/310	10-201198
0,32	15	0,15	40 to 300/320	10-201210
	15	0,25	40 to 300/320	10-201211
	15	0,50	40 to 290/310	10-201212
	30	0,15	40 to 300/320	10-201213
	30	0,25	40 to 300/320	10-201214
	30	0,50	40 to 290/310	10-201215
	60	0,15	40 to 300/320	10-201216
	60	0,25	40 to 300/320	10-201217
	60	0,50	40 to 290/310	10-201218
0,53	15	0,50	40 to 270/290	10-201230
	15	1,00	40 to 260/280	10-201231
	30	0,50	40 to 270/290	10-201232
	30	1,00	40 to 260/280	10-201233
	60	0,50	40 to 270/290	10-201234
	60	1,00	40 to 260/280	10-201235

GC-50ht

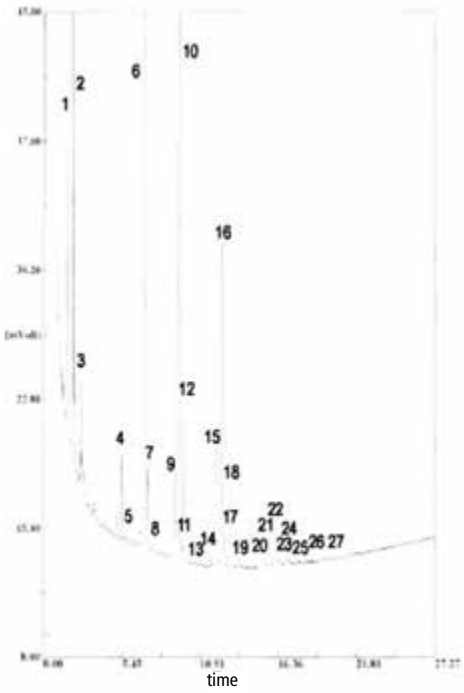
(50%) Diphenyl-(50%) dimethyl polysiloxane

- Bonded and cross-linked phase
- Medium polarity
- High thermal stability
- Ideal column for the analysis of triglycerides

GC-50ht Similar Phases
Agilent: DB17ht
Quadrex: 007-65HT
Restek: Rtx-65
Varian: TAB-CB

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,10	50 to 370	10-201240
	15	0,15	50 to 370	10-201241
	30	0,10	50 to 370	10-201242
	30	0,15	50 to 370	10-201243
0,32	20	0,10	50 to 370	10-201246

Column: GC-50ht
15m x 0.25mm x 0.15µm
P/N: 10-201241
Injection: 0.2mL Triglycerides Palm Oil in Isooctane (50 mg/mL), split 1:12, 380°C
Carrier: H2, constant pressure 9psi (56 kPa)
Oven: 340°C (1 min.) 0.5°C/min.@ 0.5°C/min to 355°C (5 min).
Detector: FID, 380°C



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 ADO

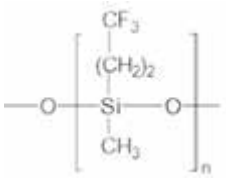
Q Cap

GC-210

(50%) Trifluoropropyl-(50%) Methylpolysiloxane

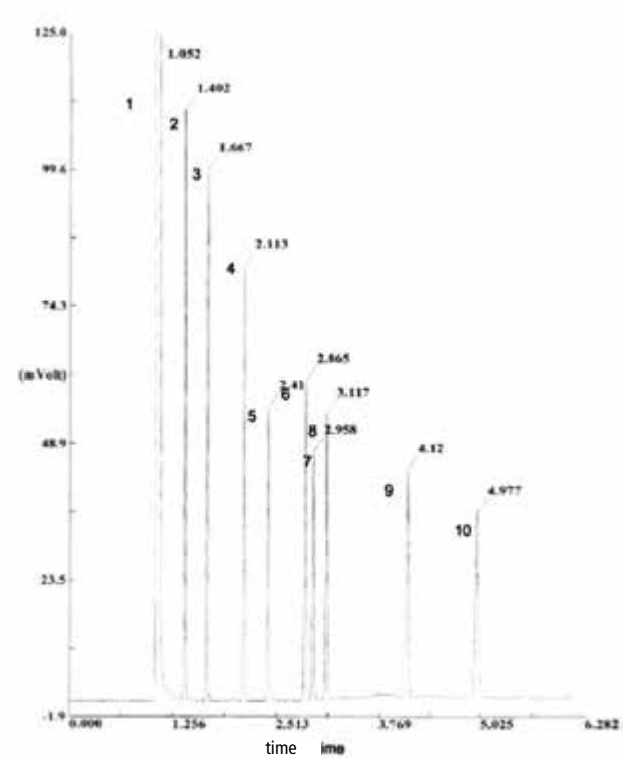
- Bonded and cross-linked phase
- High polarity
- Excellent column for the EPA 609 and 8140 methods and separation of ketones, aldehydes, silanes, glycols, nitro aromatics and herbicides

GC-210 Similar Phases
Agilent: DB-200, DB-210
Alltech: AT-210
Quadrex: 007-210
Restek: Rtx-200
Supelco: SP-2401
Others: OV-210



Structure of Poly(methyltrifluoroproyl)siloxane

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	20	0,20	45 to 240/260	10-201250
0,25	15	0,15	45 to 240/260	10-201260
	15	0,25	45 to 240/260	10-201261
	15	0,50	45 to 240/260	10-201262
	30	0,15	45 to 240/260	10-201263
	30	0,25	45 to 240/260	10-201264
	30	0,50	45 to 240/260	10-201265
0,32	15	0,15	45 to 240/260	10-201270
	15	0,25	45 to 240/260	10-201271
	15	0,50	45 to 240/260	10-201272
	30	0,15	45 to 240/260	10-201273
	30	0,25	45 to 240/260	10-201274
	30	0,50	45 to 240/260	10-201275
0,53	15	1,00	45 to 220/240	10-201280
	30	1,00	45 to 220/240	10-201281



Column: GC-210
30m x 0.32mm x 0.5 µm
P/N: 10-201275
Injection: 1 µL standard (500 ng/mL comp), split 1:50, 260°C
Carrier: H2, constant pressure 7 psi (48.2kPa)
Oven: 100°C
Detector: FID, 280°C

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

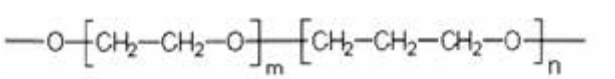
GC-PAG

50% Polyethylene -50% polypropylene glycol

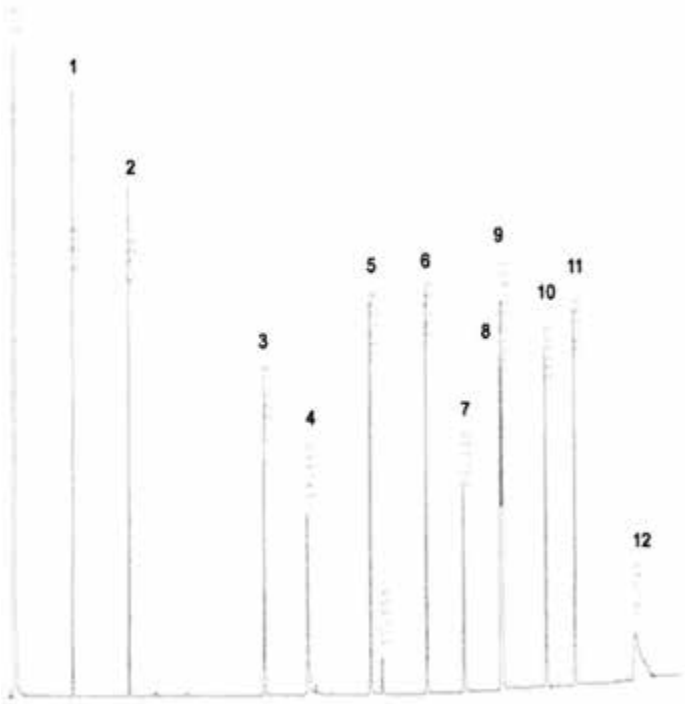
- Bonded and cross-linked phase
- Phase polarity slightly lower than GC-WAX due to the inclusion of propylene oxide groups
- Polarity similar to UCON and Pluronics phases
- PAG Columns are well suited to the analysis of FAMEs and Alcohols

GC-PAG Similar Phase
Supelco: PAG

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,25	30 to 220/230	10-201290
	30	0,25	30 to 220/230	10-201291
	60	0,25	30 to 220/230	10-201292
0,32	15	0,25	30 to 220/230	10-201300
	30	0,25	30 to 220/230	10-201301
	60	0,25	30 to 220/230	10-201302
0,53	15	0,50	30 to 220/230	10-201310
	30	0,50	30 to 220/230	10-201311
	60	0,50	30 to 220/230	10-201312



Structure of Poly(ethylenepropylene)glycol



Column: GC-PAG
P/N: 10-201291
Dimensions: 30m x 0.25mm x 0.25µm
Injection: 0.1 µL, Amines mixture (0.02 - 0.2% in Acetonitrile), Split 1:25, 200°C.
Carrier: H2, constant pressure 11psi (75.8 kPa)
Oven: 40°C @ 6°C/min to 230°C. (5 min)
Detector: FID, 280°C

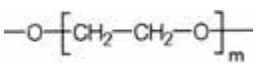
1 C-10
2 C-11
3 Nonanal
4 2,3-Butanediol
5 1-Octanol
6 C-10 FAME
7 Dicyclohexylamine
8 2,6-Dimethylaniline
9 C-11 FAMe
10 2,6-Dimethylphenol
11 C-12 FAME
12 2-Ethyl hexanoic acid

CHROMAWax-10

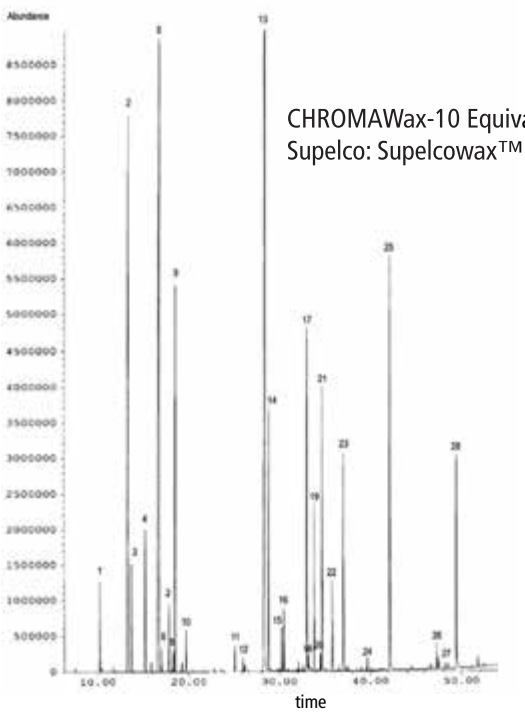
Columns directly equivalent to the SUPELCOWAX™ 10. Based on the popular Carbowax 20M phase.

- Bonded and cross-linked phase
- High polarity
- 100 % Polyethyleneglycol (PEG), interlaced phase and chemically bonded
- Extended use for the analysis of methyl esters of fatty acids (FAMEs) and analysis of solvents, aromas, alcohols and aromatic compounds in the alimentary and essences industry
- Wide range of operating temperatures and high thermal stability (35ºC-280ºC)
- Compatible with water and methanol injections, providing that these solvents be completely vaporized before reaching the column inlet
- Column to column reproducibility is guaranteed
- Column meets USP G16 requirements

NOTE: Column is chemically compatible with water and other injection solvents, but solvents such as methanol and water must be vaporized prior to reaching the column inlet. These solvents should be avoided when using on-column injection. Sensitive to strong inorganic acids.



Structure of Poly(dimethyl)diphenylsiloxane



CHROMAWax-10 Equivalent Phase
Supelco: Supelcowax™ 10.

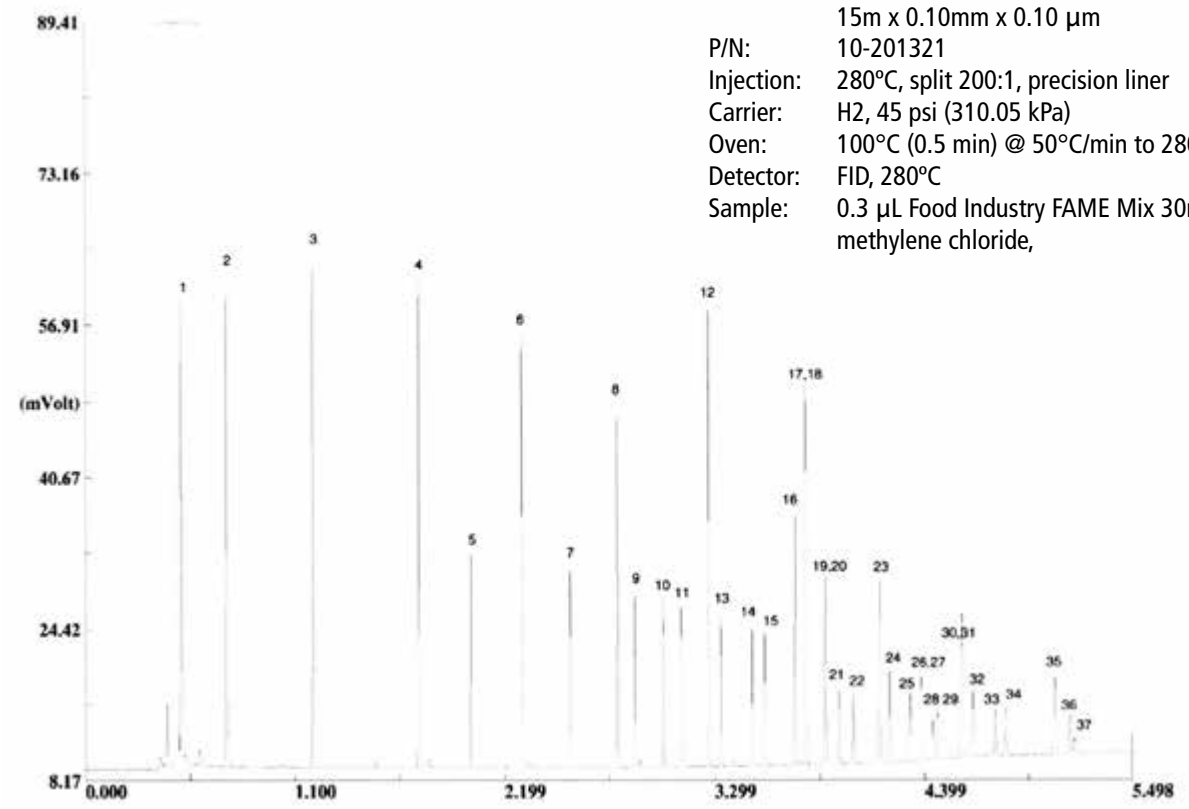
ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	35 to 280	10-201320
	15	0,10	35 to 280	10-201321
	15	0,20	35 to 280	10-201322
	20	0,10	35 to 280	10-201323
	20	0,20	35 to 280	10-201324
0,18	10	0,18	35 to 280	10-201330
	20	0,18	35 to 280	10-201331
	20	0,30	35 to 280	10-201332
	40	0,30	35 to 280	10-201333
0,20	15	0,20	35 to 280	10-201340
	30	0,20	35 to 280	10-201341
	60	0,20	35 to 280	10-201342
	60	0,40	35 to 280	10-201343
0,22	25	0,25	35 to 280	10-201347
0,25	15	0,25	35 to 280	10-201350
	15	0,50	35 to 280	10-201351
	30	0,25	35 to 280	10-201352
	30	0,50	35 to 280	10-201353
	60	0,25	35 to 280	10-201354
	60	0,50	35 to 280	10-201355
0,32	15	0,25	35 to 280	10-201360
	15	0,50	35 to 280	10-201361
	30	0,25	35 to 280	10-201362
	30	0,50	35 to 280	10-201363
	30	1,00	35 to 280	10-201364
	60	0,25	35 to 280	10-201365
	60	0,50	35 to 280	10-201366
	60	1,00	35 to 280	10-201367
0,53	15	0.50	35 to 280	10-201370
	15	1,00	35 to 280	10-201371
	30	0.50	35 to 280	10-201372
	30	1,00	35 to 280	10-201373
	30	1,20	35 to 280	10-201374
	30	2,00	35 to 280	10-201375
	50	1,20	35 to 280	10-201376
	60	1,00	35 to 280	10-201377
	60	2,00	35 to 280	10-201378

Column: CHROMAWax-10
60m x 0.20mm x 0.20µm
P/N: 10-201341
Injection: 0.2 µL, split 1:75, 260ºC.
Carrier: He, 34.7 psi
Oven: 50ºC (4 min.) @ 4ºC/min to 265ºC (10 min)
Detector: MS (Solvent delay, mass range 29:350 m/z), 280ºC

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

CHROMAWax-10

Column:	CHROMAWax-10
	15m x 0.10mm x 0.10 µm
P/N:	10-201321
Injection:	280ºC, split 200:1, precision liner
Carrier:	H2, 45 psi (310.05 kPa)
Oven:	100°C (0.5 min) @ 50°C/min to 280°C (2 min)
Detector:	FID, 280ºC
Sample:	0.3 µL Food Industry FAME Mix 30mg/mL in methylene chloride,



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 C18:0
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 C18:2 (all-cis-6,9,12)
22 C18:3 (all-cis-9,12,15)
23 C20:0
24 C20:1 (cis-11)
25 C20:2 (all-cis-11,14)
26 C20:3 (all-cis-8,11,14)
27 C21:0
28 C20:3 (all-cis-11,14,17)
29 C20:4 (all-cis-5,8,11,14)
30 C20:5 (all-cis-5,8,11,14,17)
31 C22:0
32 C22:1 (cis-13)
33 C22:2 (all-cis-13,16)
34 C23:0
35 C24:0
36 C22:6 (all-cis-4,7,10,13,16,19)
37 C24:1 (cis-15)

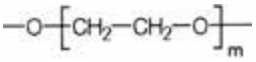
Q Cap

GC-20M

(100%) Polyethylene glycol

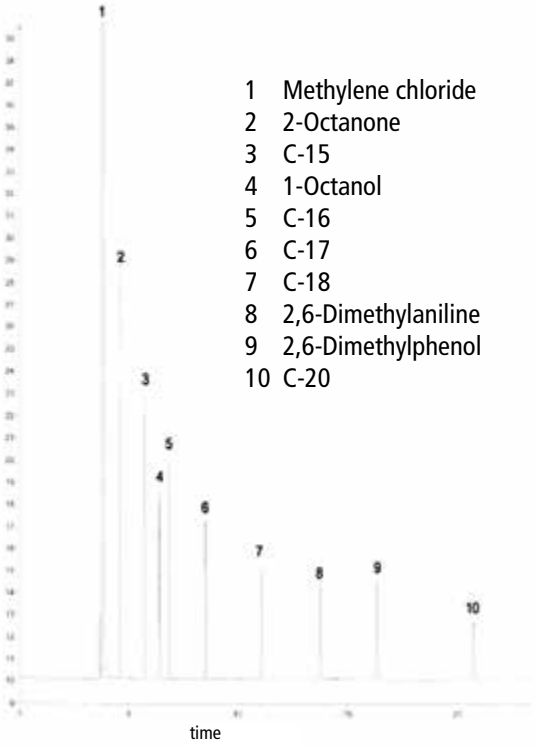
- Bonded and cross-linked phase
- High polarity column
- Wide range of working temperatures and high thermal stability (270°C)
- Ideal for separating alcohols, aldehydes, ketones and aromatic isomers (BTX), polar solvents

GC-20M Similar Phases
Agilent: DB-WAX, DBWAXetr, INNOWAX, HP-20M
Alltech: AT-WAX
Quadrex: 007-CW
Restek: Rtx-WAX, STABILWAX
SGE: BP-20
Supelco: Carbowax 20M , SUPELCOWAX-10,
Varian: CP-WAX 52 CB
Others: OmegaWAX, Superox II, ZB-WAX



Structure of Polyethylene glycol

Column:	GC-20M
	60m x 0.25mm x 0.25 µm
P/N:	10-201418
Injection:	1 µL standard (500 ng/mL comp.), split 1:25, 260°C
Carrier:	H2, constant pressure 24 psi (165kPa)
Oven:	155°C (Isothermal)
Detector:	FID, 280°C



1 Methylene chloride
2 2-Octanone
3 C-15
4 1-Octanol
5 C-16
6 C-17
7 C-18
8 2,6-Dimethylaniline
9 2,6-Dimethylphenol
10 C-20

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	40 to 260/270	10-201390
	10	0,20	40 to 260/270	10-201391
	20	0,10	40 to 260/270	10-201392
	20	0,20	40 to 260/270	10-201393
0,20	15	0,20	40 to 260/270	10-201400
	15	0,40	40 to 260/270	10-201401
	30	0,20	40 to 260/270	10-201402
	30	0,40	40 to 260/270	10-201403
	50	0,40	40 to 260/270	10-201406
	60	0,20	40 to 260/270	10-201404
	60	0,40	40 to 260/270	10-201405
0,22	60	0,20	40 to 260/270	10-201408
0,25	15	0,10	40 to 260/270	10-201410
	15	0,25	40 to 260/270	10-201411
	15	0,50	40 to 260/270	10-201412
	30	0,10	40 to 260/270	10-201413
	30	0,25	40 to 260/270	10-201414
	30	0,50	40 to 260/270	10-201415
	30	1,00	40 to 260/270	10-201416
	60	0,10	40 to 260/270	10-201417
	60	0,25	40 to 260/270	10-201418
	60	0,50	40 to 260/270	10-201419
0,32	15	0,10	40 to 260/270	10-201430
	15	0,25	40 to 260/270	10-201431
	15	0,50	40 to 260/270	10-201432
	25	1,20	40 to 260/270	10-201433
	30	0,10	40 to 260/270	10-201434
	30	0,12	40 to 260/270	10-201435
	30	0,25	40 to 260/270	10-201436
	30	0,50	40 to 260/270	10-201437
	50	1,20	40 to 230/240	10-201438
	60	0,10	40 to 260/270	10-201439
	60	0,25	40 to 260/270	10-201440
	60	0,50	40 to 260/270	10-201441
	60	1,00	40 to 230/240	10-201442
	60	1,20	40 to 230/240	10-201443
	100	1,00	40 to 230/240	10-201444
0,53	10	1,00	40 to 240/250	10-201460
	15	1,00	40 to 240/250	10-201461
	15	2,00	40 to 240/250	10-201462
	30	0,50	40 to 240/250	10-201463
	30	1,00	40 to 240/250	10-201464
	30	1,33	40 to 240/250	10-201465
	30	2,00	40 to 240/250	10-201466
	50	0,50	41 to 240/250	10-201467
	60	1,00	40 to 240/250	10-201468
	60	2,00	40 to 240/250	10-201469

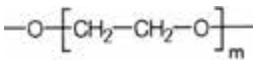
GC-FFAP

100% Polyethylene glycol, modified with nitroterephtalic acid

- Bonded and cross-linked phase
- Designed for analysis of volatile free acids, phenols and glycols
- High thermal stability (250°C)

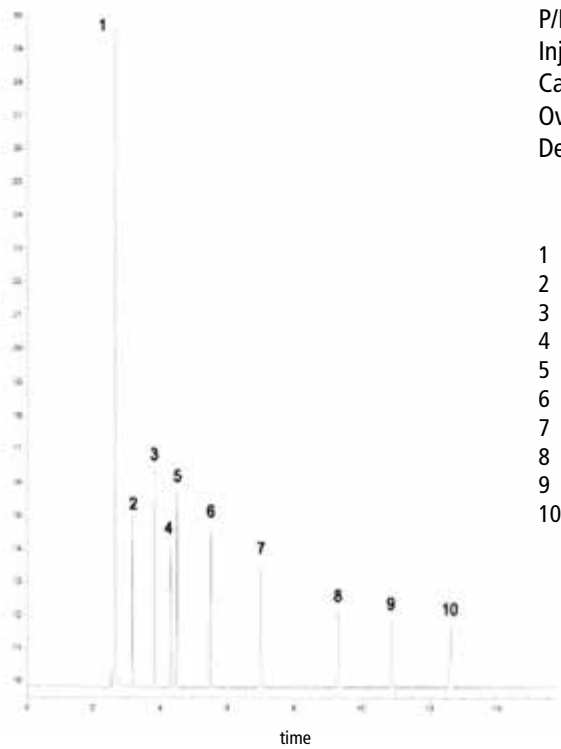
NOTE: We do not recommend the use of water or methanol when rinsing GC-FFAP capillary columns

GC-FFAP Similar Phases
Agilent: DB-FFAP, HP-FFAP
Alltech: AT-1000, FFAP
Quadrex: 007-FFAP
Restek: STABILWAX-DA
SGE: BP-21
Supelco: NUKOL, SPB-1000
Varian: CP-WAX 58 CB
Others: OV-351, SUPEROX-FA, ZB-FFAP



Structure of Polyethylene glycol

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	20	0,10	40 to 240/250	10-201475
0,20	15	0,30	40 to 240/250	10-201480
	30	0,30	40 to 240/250	10-201481
	60	0,30	40 to 240/250	10-201482
0,25	15	0,25	40 to 240/250	10-201490
	20	0,25	40 to 240/250	10-201491
	30	0,25	40 to 240/250	10-201492
	60	0,25	40 to 240/250	10-201493
0,32	15	0,25	40 to 240/250	10-201500
	15	0,50	40 to 240/250	10-201501
	30	0,25	40 to 240/250	10-201502
	30	0,50	40 to 240/250	10-201503
	60	0,25	40 to 240/250	10-201504
	60	0,50	40 to 240/250	10-201505
0,53	15	0,50	40 to 240/250	10-201510
	15	1,00	40 to 230/240	10-201511
	25	1.00	40 to 230/240	10-201512
	30	0,50	40 to 240/250	10-201513
	30	1,00	40 to 230/240	10-201514
	60	0,50	40 to 240/250	10-201515
	60	1,00	40 to 230/240	10-201516



Column: GC-FFAP
60m x 0.25mm x 0.25 µm
P/N: 10-201492
Injection: 1 µL Test Mix (500ng/mL comp.), split 1:100, 260°C
Carrier: H2, constant pressure 24 psi (165kPa)
Oven: 155°C
Detector: FID, 280°C

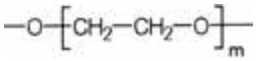
1 Methylene chloride
2 2-Octanone
3 C-15
4 1-Octanol
5 C-16
6 C-17
7 C-18
8 2,6-Dimethylaniline
9 2,6-Dimethylphenol
10 C-20

GC-WAX.DB

(100%) Polyethylene glycol phase- base modified non-bonded.

- Non Bonded Phase
- Symmetrical peaks due to basic deactivation of the Polyethylene glycol (PEG)
- Excellent for analysing basic non-derivatized compounds
- Ideal for separating amines and nitrosamines
- Suitable for EPA Method 607

TRB-WAX.DB Similar Phase
Agilent: CAM, HP-BasicWax
Restek: Stabilwax-DB
Supelco: Carbowax-Amine
Varian: CP-WAX 51

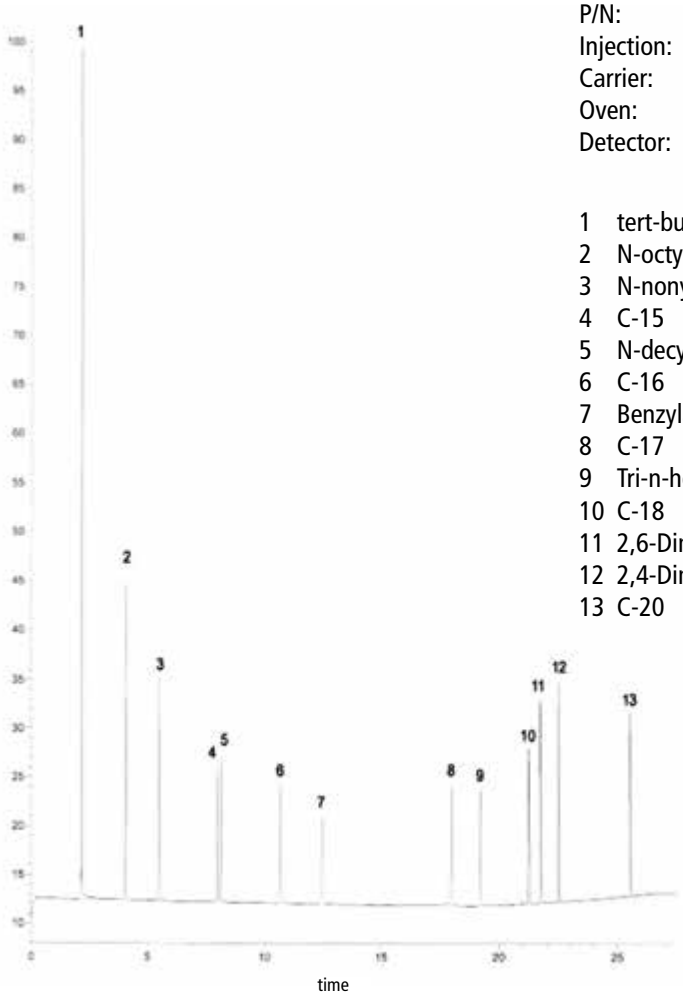


Structure of Polyethylene glycol

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	15	0,20	60 to 210/220	10-201530
	15	0,25	60 to 210/220	10-201531
	30	0,20	60 to 210/220	10-201532
	30	0,25	60 to 210/220	10-201533
	30	0,50	60 to 210/220	10-201534
	60	0,20	60 to 210/220	10-201535
0,32	15	0,25	60 to 210/220	10-201540
	30	0,25	60 to 210/220	10-201541
	30	0,50	60 to 210/220	10-201542
	30	1,00	60 to 210/220	10-201543
	60	1,00	60 to 210/220	10-201544
0,53	15	1,00	60 to 210/220	10-201560
	30	0,50	60 to 210/220	10-201561
	30	1,00	60 to 210/220	10-201562
	30	1,50	60 to 210/220	10-201563
	60	1,00	60 to 210/220	10-201564

Column: GC-WAX.DB
60m x 0.25mm x 0.20 µm
P/N: 10-201535
Injection: 1 µL Test Mix, (500 ng/mL comp.) split 1:50, 260°C
Carrier: H2, constant pressure 24 psi (168 kPa)
Oven: 110°C (15 min) @ 8°C/min to 200°C (10 min)
Detector: FID, 280°C

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



GC-MEGOWax

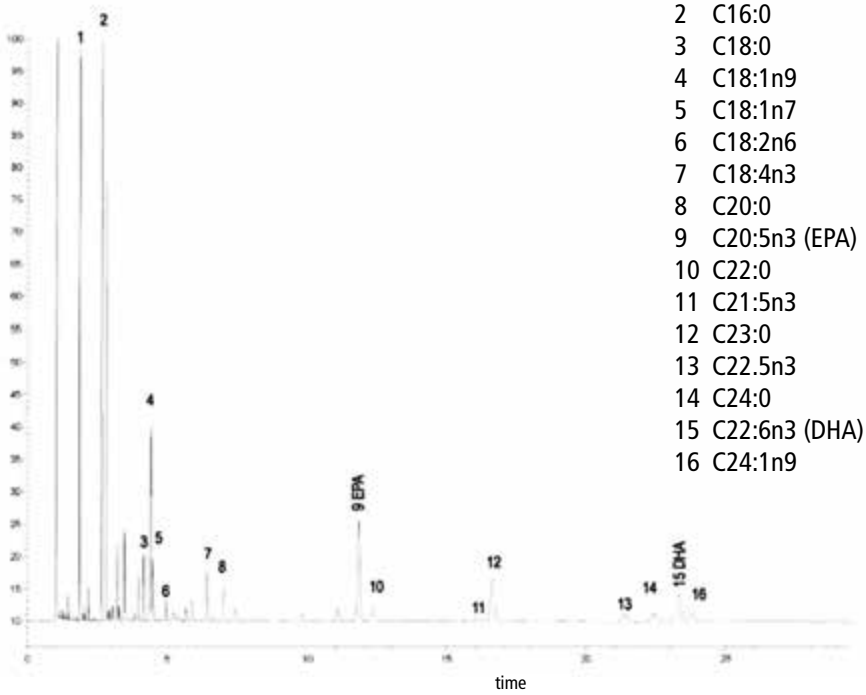
(100%) Polyethylene glycol

- Bonded and cross-linked phase
- High polarity
- Specially designed for analysis of Omega 3 and Omega 6 fatty acids methyl esters

GC-MEGOWax Equivalent Phase
Restek: Famewax
Supelco: Omegawax

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,25	40 to 260/270	10-201570
0,32	30	0,25	40 to 260/270	10-201571
0,53	30	0,50	40 to 260/270	10-201572

Column: GC-MEGOWax
30m x 0.32mm x 0.25 µm
P/N: 10-201571
Injection: 1 µL Test Mix, split 1:90, 250°C
Carrier: H2, 9.5 psi (65.4 kPa)
Oven: 200°C (Isothermal)
Detector: FID, 260°C



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

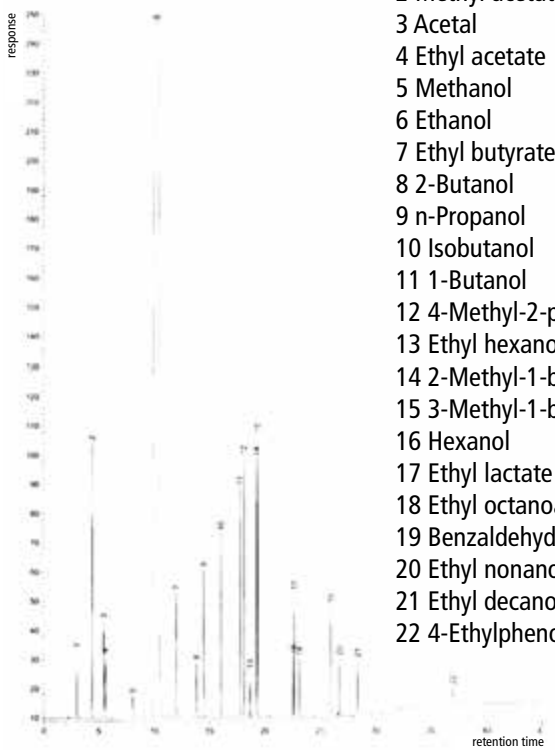
GC-WAX

(100%) Polyethylene glycol

- Bonded and cross-linked phase
- High polarity
- Minimum operating temperature 20°C
- Designed for the analysis of volatiles in alcoholic beverages
- Excellent symmetry for aldehyde and glycol peaks

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

Column: GC-WAX
30m x 0.25mm x 0.5µm
P/N: 10-201606
Injection: 1 µL Alcohol standard mix, split 1:25 @ 260°C.
Carrier gas: He, 12 psi (82.7 kPa)
Oven: 35°C (10 min.) @ 8°C/min to 220°C.(15 min.)
Detector: FID, 260°C



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 (IS)
13 Ethyl hexanoate
14 2-Methyl-1-butanol
15 3-Methyl-1-butanol
16 Hexanol
17 Ethyl lactate
18 Ethyl octanoate
19 Benzaldehyde
20 Ethyl nonanoate
21 Ethyl decanoate
22 4-Ethylphenol

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,10	10	0,10	20 to 240/250	10-201580
	10	0,20	20 to 240/250	10-201581
	20	0,10	20 to 240/250	10-201582
	20	0,20	20 to 240/250	10-201583
0,18	10	0,18	20 to 240/250	10-201590
	20	0,18	20 to 240/250	10-201591
	20	0,30	20 to 240/250	10-201592
	40	0,18	20 to 240/250	10-201593
	40	0,30	20 to 240/250	10-201594
0,20	30	1,40	20 to 240/250	10-201597
0.25	15	0,10	20 to 240/250	10-201600
	15	0,25	20 to 240/250	10-201601
	15	0,50	20 to 240/250	10-201602
	25	0,20	20 to 240/250	10-201603
	30	0,10	20 to 240/250	10-201604
	30	0,25	20 to 240/250	10-201605
	30	0,50	20 to 240/250	10-201606
	60	0,20	20 to 240/250	10-201607
	60	0,25	20 to 240/250	10-201608
0,32	15	0,25	20 to 240/250	10-201610
	15	0,50	20 to 240/250	10-201611
	15	1,00	20 to 230/240	10-201612
	30	0,25	20 to 240/250	10-201613
	30	0,50	20 to 240/250	10-201614
	30	1,00	20 to 230/240	10-201615
	60	0,25	20 to 240/250	10-201616
	60	0,50	20 to 240/250	10-201617
	60	0,64	20 to 240/250	10-201618
	60	1,00	20 to 230/240	10-201619
0,53	15	1,20	20 to 230/240	10-201630
	30	0,50	20 to 230/240	10-201632
	30	1,20	20 to 230/240	10-201633

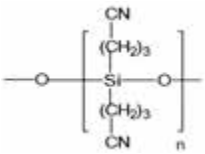
GC-2340

(100%) Cyanopropyl polysiloxane phase,

- Non-bonded
- Highest polarity
- Designed for separating fatty acids methyl esters (FAMEs)
- High selectivity towards cis-trans isomers of FAMEs

GC-2340 Similar Phases
Restek: Rt-2340, Rt-2330
Supelco: SP-2340, SP-2380
Varian: CP-SIL 88

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	75	0,14	40 to 240/250	10-201650
0,25	15	0,20	40 to 240/250	10-201660
	30	0,20	40 to 240/250	10-201661
	50	0.20	40 to 240/250	10-201662
	60	0,20	40 to 240/250	10-201663
	100	0,20	40 to 240/250	10-201664
0,32	15	0,20	40 to 240/250	10-201670
	30	0,20	40 to 240/250	10-201671
	60	0,20	40 to 240/250	10-201672
0,53	15	0,20	40 to 225/250	10-201680
	30	0,20	40 to 225/250	10-201681
	60	0,20	40 to 225/250	10-201682

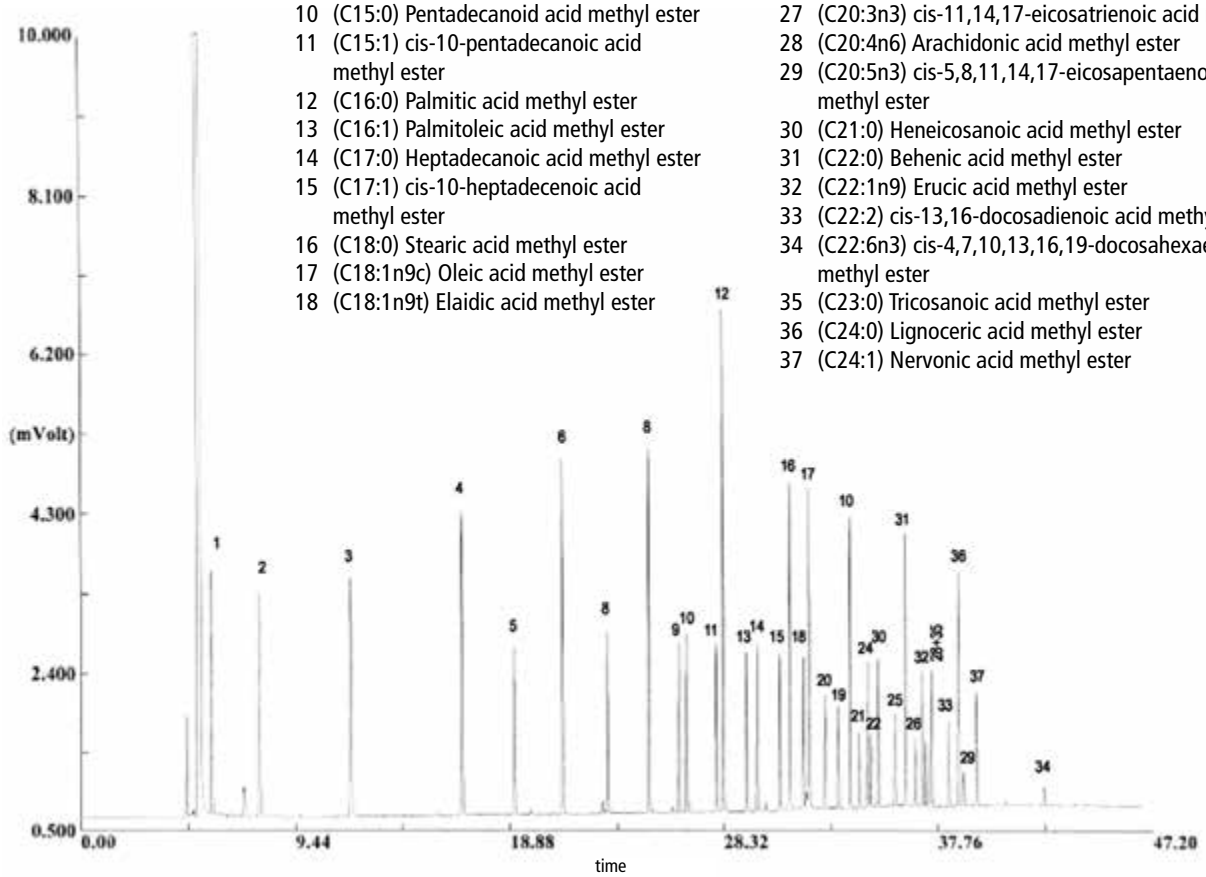


Structure of Cyanopropyl polysiloxane

SEPARATION OF METHYL ESTERS (FAMES)

Column:	GC-2340
	60m x 0.25mm x 0.20 µm
P/N:	10-201663
Injection:	1 µL FAMES Mix (10 mg/mL), split 1:100, 260°C
Carrier:	He, 20.15 cm/s to 185°C
Oven:	90°C (7 min) @ 5°C/min to 240°C (15 min)
Detector:	FID, 260°C

1 (C4:0) Bytyric acid methyl ester
2 (C6:0) Caproic acid methyl ester
3 (C8:0) Caprylic acid methyl ester
4 (C10:0) Capric acid methyl ester
5 (C11:0) Undecanoic acid methyl ester
6 (C12:0) Lauric acid methyl ester
7 (C13:0) Tridecanoic acid methyl ester9 (C14:1) Myristoleic acid methyl ester
10 (C15:0) Pentadecanoid acid methyl ester
11 (C15:1) cis-10-pentadecanoic acid methyl ester
12 (C16:0) Palmitic acid methyl ester
13 (C16:1) Palmitoleic acid methyl ester
14 (C17:0) Heptadecanoic acid methyl ester
15 (C17:1) cis-10-heptadecenoic acid methyl ester
16 (C18:0) Stearic acid methyl ester
17 (C18:1n9c) Oleic acid methyl ester
18 (C18:1n9t) Elaidic acid methyl ester
19 (C18:2n6c) Linoleic acid methyl ester
20 (C18;2n6t) Linolelaidic acid methyl ester
21 (C18:3n6t) γ-Linolenic acid methyl ester
22 (C18:3n3) Linolenic acid methyl ester
23 (C20:0) Arachidic acid methyl ester
24 (C20:1) cis-11-eicosenoic acid methyl ester
25 (C20:2) cis-11,14-eicosadienoic acid methyl ester
26 (C20:3n6) cis-8,11,14-eicosatrienoic acid methyl ester
27 (C20:3n3) cis-11,14,17-eicosatrienoic acid methyl ester
28 (C20:4n6) Arachidonic acid methyl ester
29 (C20:5n3) cis-5,8,11,14,17-eicosapentaenoic acid methyl ester
30 (C21:0) Heneicosanoic acid methyl ester
31 (C22:0) Behenic acid methyl ester
32 (C22:1n9) Erucic acid methyl ester
33 (C22:2) cis-13,16-docosadienoic acid methyl ester
34 (C22:6n3) cis-4,7,10,13,16,19-docosahexaenoic acid methyl ester
35 (C23:0) Tricosanoic acid methyl ester
36 (C24:0) Lignoceric acid methyl ester
37 (C24:1) Nervonic acid methyl ester

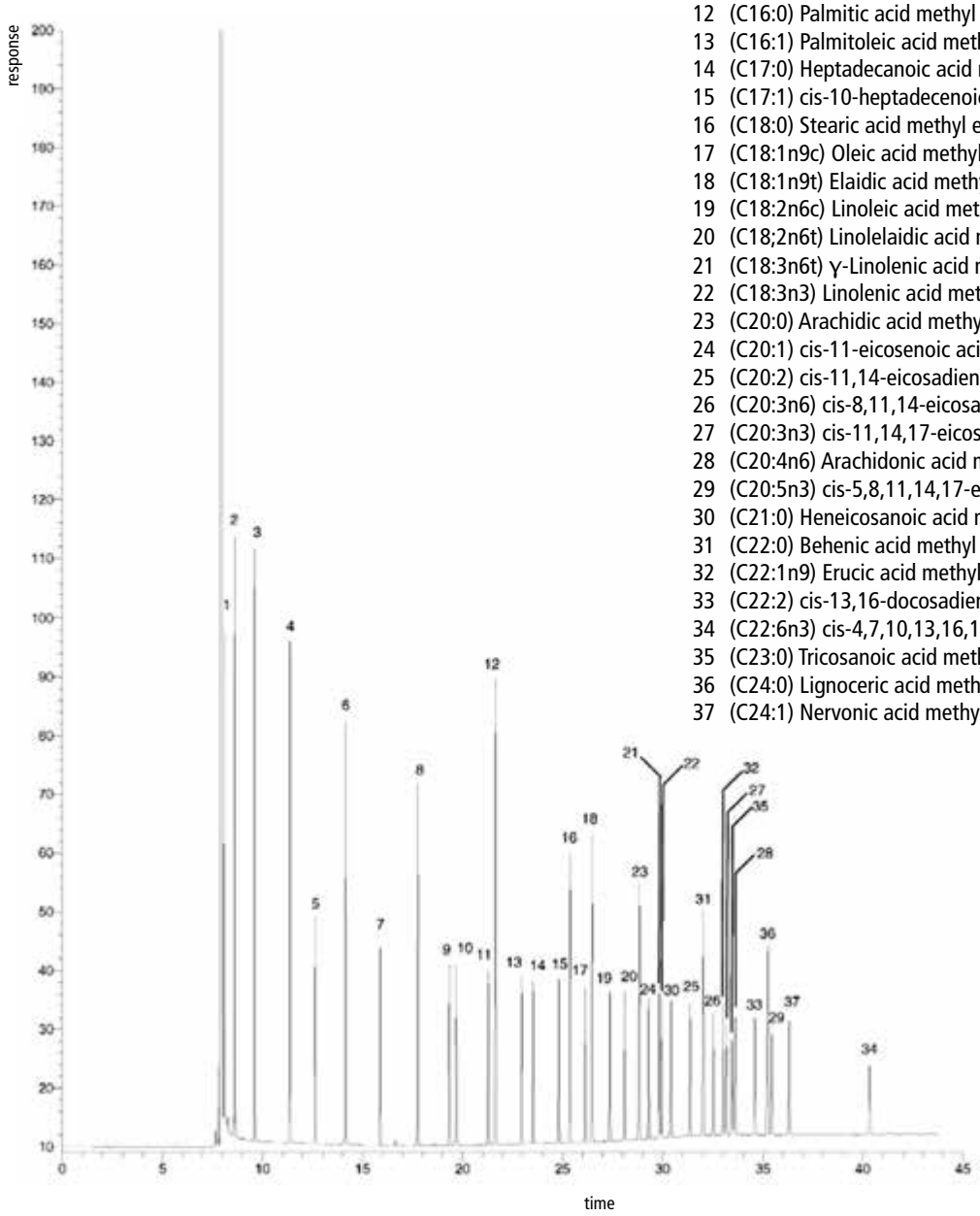


GC-2340

SEPARATION OF METHYL ESTERS (FAMES)

Column:	GC-2340
	100m x 0.25mm x 0.20 µm
P/N:	10-201664
Injection:	1µL FAMES Mix (30 mg/mL), split 1:100, 260ºC
Carrier:	He, 45psi 21 cm/s to 140°C
Oven:	140°C (6 min) @ 4°C/min to 240°C (10 min)
Detector:	FID, 260ºC

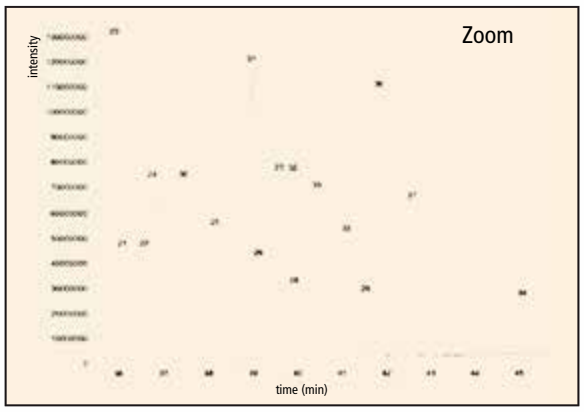
1 (C4:0) Bytyric acid methyl ester
2 (C6:0) Caproic acid methyl ester
3 (C8:0) Caprylic acid methyl ester
4 (C10:0) Capric acid methyl ester
5 (C11:0) Undecanoic acid methyl ester
6 (C12:0) Lauric acid methyl ester
7 (C13:0) Tridecanoic acid methyl ester
8 (C14:0) Myristic acid methyl ester
9 (C14:1)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

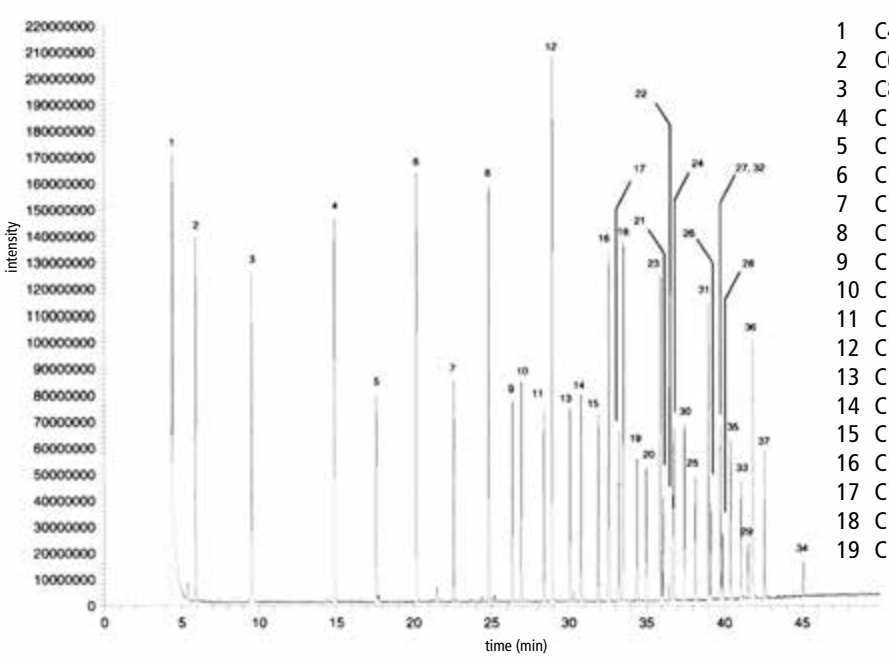


GC-2340

37 FAME Mix - MS Detector

Column:	GC-2340
P/N:	10-201663
Dimensions:	60m x 0.25mm x 0.2µm
Injection:	280ºC, split 50:1
Carrier gas:	He, constant pressure @ 24ºC.
Oven:	90ºC (7 min.) to 240ºC @ 4ºC/min (3 min.)
Detector:	MS
Transfer line temp:	230ºC.
Ionization range:	EI
Scan range:	40-450 amu
Sample:	0.5 µL Food Industry FAME Mix 30mg/mL in methylene chloride

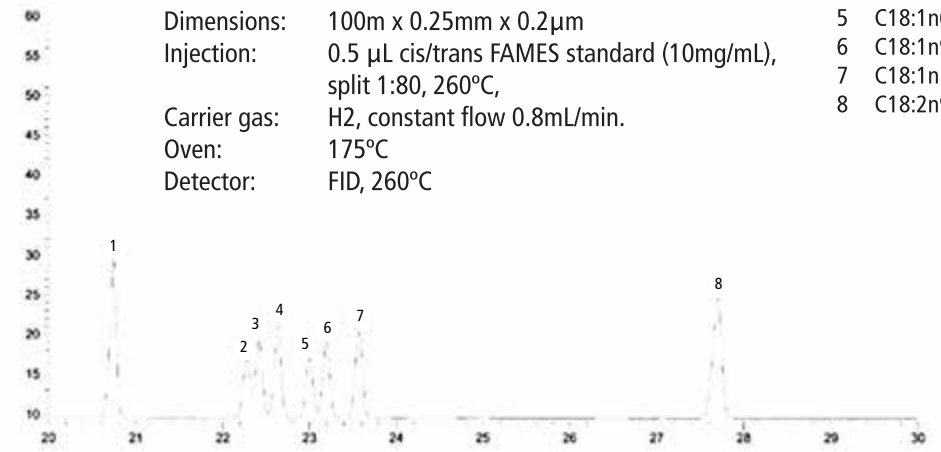




1 C4:0
2 C6:0
3 C8:0
4 C10:0
5 C11:0
6 C12:0
7 C13:0
8 C14:0
9 C14:1 (cis-9)
10 C15:0
11 C15:1 (cis-10)
12 C16:0
13 C16:1 (cis-9)
14 C17:0
15 C17:1 (cis-10)
16 C18:0
17 C18:1 (trans-9)
18 C18:1 (cis-9)
19 C18:2 (all-trans-9,12)
20 C18:2 (all-cis-9,12)
21 C18:3 (all-cis-6,9,12)
22 C18:3 (all-cis-9,12,15)
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)

MAXIMUM SEPARATION OF CIS-TRANS FAMES

Column:	GC-2340
P/N:	10-201664
Dimensions:	100m x 0.25mm x 0.2µm
Injection:	0.5 µL cis/trans FAMES standard (10mg/mL), split 1:80, 260ºC,
Carrier gas:	H2, constant flow 0.8mL/min.
Oven:	175ºC
Detector:	FID, 260ºC



1 C18:0 (Stearic acid methyl ester)
2 C18:1n6t (Petroselaidic acid methyl ester)
3 C18:1n9t (Elaidic acid methyl ester)
4 C18:1n11t (trans-Vaccenic acid methyl ester)
5 C18:1n6c Petroselinic acid methyl ester
6 C18:1n9C Oleic acid methyl ester
7 C18:1n11c (Vaccenic acid methyl ester)
8 C18:2n9,12c (Linoleic acid methyl ester)

GC-CRESOL

Proprietary non bonded phase

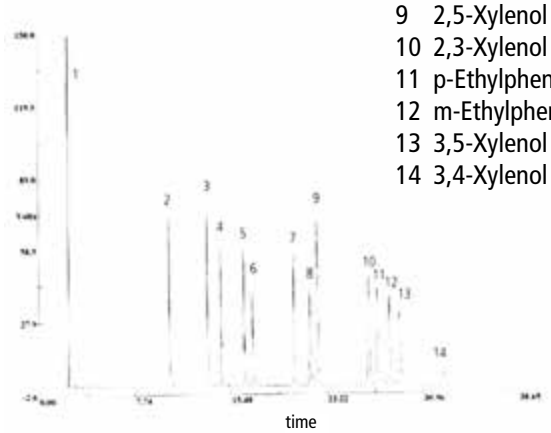
- Highly purified stationary phase
- Column specially designed for analysis of phenolic compounds (phenols, cresylic acids)
- Derivatization of phenolic compounds is not required to obtain required resolution
- Resolves m-cresol/p-cresol and 2.4-xylenol/2.5-xylenol pairs, which are not separated with other columns used for this analysis such as GC-5 and GC-WAX

GC-CRESOL Similar Phase
Varian: CP-CRESOL

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,20	130	10-201690
	60	0,20	130	10-201691

Column: GC-CRESOL
60m x 0.25mm x 0.2µm
P/N: 10-201691
Injection: 1 µL standard Cresols (5000 ng/mL comp.)
split 1:25, 150°C
Carrier: H2, constant pressure 24 psi (165 kPa)
Oven: 130°C
Detector: FID, 150°C

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



GC-17

Polymethylphenylsiloxane phase

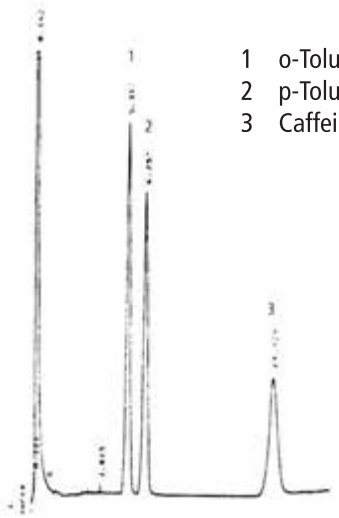
- Non-bonded
- Recommended by pharmacopoeia for determining the impurities of sodium saccharin (o-p-toluene sulphonamides)

GC-17 Similar Phase
Agilent: HP-17

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,25	40 to 220/240	10-201700
0,53	10	2,00	40 to 220/240	10-201701

Column: GC-17
10m x 0.53mm x 2.0µm
P/N: 10-201701
Injection: 260°C, 1ml standard, split (1:4)
Carrier: He, 6.5 psi
Oven: 180°C
Detector: FID, 280°C

1 o-Toluenesulphonamide
2 p-Toluenesulphonamide
3 Caffeine



GC-VOC

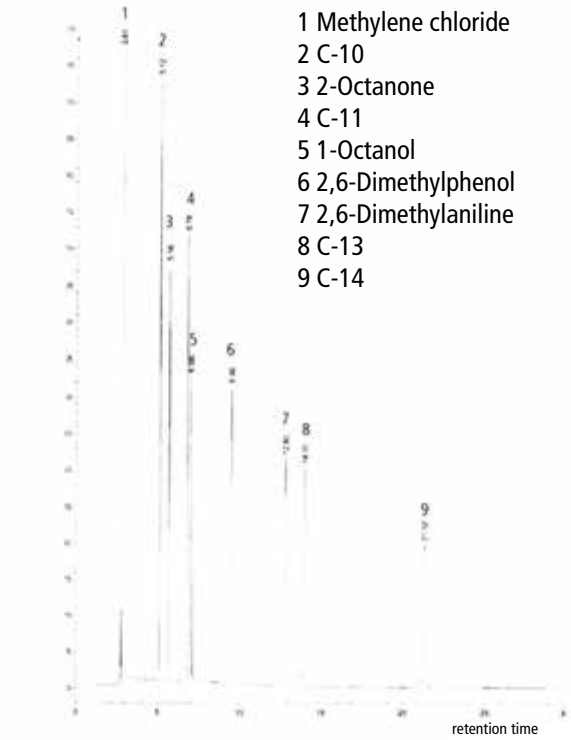
Proprietary product

- Bonded and cross linked phase
- Intermediate polarity
- Developed for the analysis of volatile organic compounds (VOC)

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

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	20	1,00	-20 to 240/250	10-201710
0,20	10	1,20	-20 to 240/250	10-201720
0,25	30	1,50	-20 to 240/250	10-201730
	60	1,50	-20 to 240/250	10-201731
0,32	60	1,80	-20 to 240/250	10-201740
	60	3,00	-20 to 230/240	10-201741
0,53	30	3,00	-20 to 230/240	10-201750
	60	3,00	-20 to 230/240	10-201751
	105	3,00	-20 to 230/240	10-201752

Column: GC-VOC
60m x 0.32mm x 1.8 µm
P/N: 10-201740
Injection: 1 µL standard, (500 ng/mL comp.) split 1:100, 280°C
Carrier: H2, constant pressure 15 psi (103.4 kPa)
Oven: 150°C
Detector: FID, 280°C



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

GC-608

Proprietary product

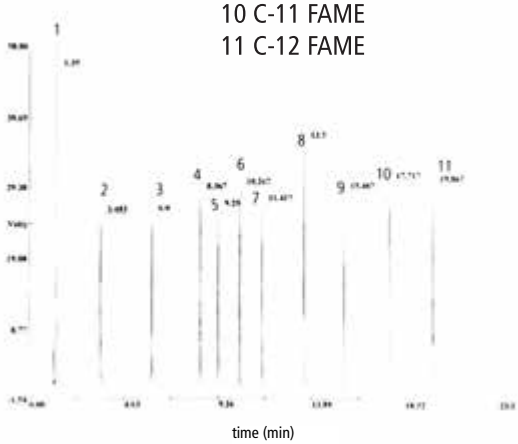
- Bonded and cross linked phase
- Specifically designed for the analysis of chlorinated pesticides and PCBs
- Developed for EPA 508, 608 and 8080 methods..

GC-608 Similar Phases
Agilent: HP-608
SGE: BP-608
Supelco: SPB-608

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,18	20	0,18	-20 to 300/310	10-201760
	15	0,25	-20 to 300/310	10-201764
0,25	30	0,25	-20 to 300/310	10-201765
0,53	15	0,50	-20 to 290/300	10-201770
	15	0,83	-20 to 290/300	10-201771
	30	0,50	-20 to 290/300	10-201772
	30	0,83	-20 to 290/300	10-201773

Column: GC-608
30m x 0.25mm x 0.25 µm
P/N: 10-201765
Injection: 1 µL Grob Mix, split 1:100, 280°C
Carrier: H2, constant pressure 11 psi (75.8 kPa)
Oven: 40°C @ 6°C/min to 300°C. (5 min)
Detector: FID, 340°C

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



Q Cap

GC-TCEP

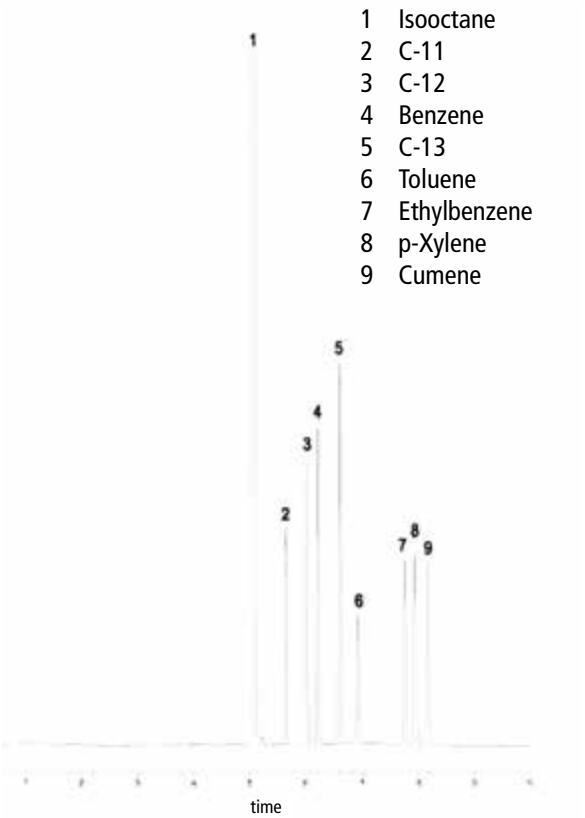
1, 2, 3-tris (2-cyanoethoxy) propane

- Non-bonded phase
- High polarity
- Manufactured for the analysis of alcohols in gasoline
- Separation of the aliphatic hydrocarbons up to C12 in aromatics
- High temperature stability up to 135°C

GC-TCEP Similar Phases
Restek: Rt-TCEP
Supelco: TCEP
Varian: CP-TCEP

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,25	30	0,40	0 to 135	10-201780
	50	0,40	0 to 135	10-201781
	60	0,40	0 to 135	10-201782

Column: GC-TCEP
60m x 0.25mm x 0.40 µm
P/N: 10-201782
Injection: 1 µL Standard (20 ng/mL comp.), split 1:50, 170°C
Carrier: H2, constant pressure 24 psi (165 kPa)
Oven: 110°C
Detector: FID, 170°C



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

GC-CW400

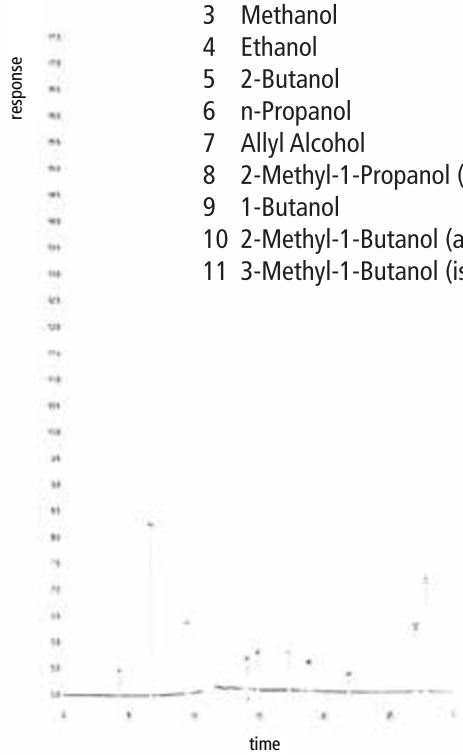
100% Polyethylene glycol (PEG)

- Non-bonded phase
- Manufactured for the analysis of volatiles in alcoholic beverages and solvents
- Maximum resolution of amyl alcohols to detect possible sample falsification
- High plate number even at very low temperatures (<20°C)

GC-CW400 Similar Phase
Varian: CP Carbowax 400

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0,32	50	0,20	0 to 60/80	10-201790

Column: GC-CW400
50m x 0.32mm x 0.20 µm
P/N: 10-201790
Injection: 1 µL Standard, split 1:50, 175°C
Carrier: He, 11 psi (75.8 kPa)
Oven: 30°C (5 min.) @ 4°C/min to 60°C (10 min.)
Detector: FID, 175°C



1 Acetaldehyde
2 Ethyl Acetate
3 Methanol
4 Ethanol
5 2-Butanol
6 n-Propanol
7 Allyl Alcohol
8 2-Methyl-1-Propanol (isobutanol)
9 1-Butanol
10 2-Methyl-1-Butanol (amyl alcohol)
11 3-Methyl-1-Butanol (isoamyl alcohol)

GC-ALCO1 and GC-ALCO2

Specifically developed for reliable analysis of volatiles in blood.

- Bonded and Cross linked phases
- For analysis of volatile compounds in biological fluids
- Fast GC run times
- Can be used in dual systems as analytical and confirmation column
- Order of elution differs for some compounds

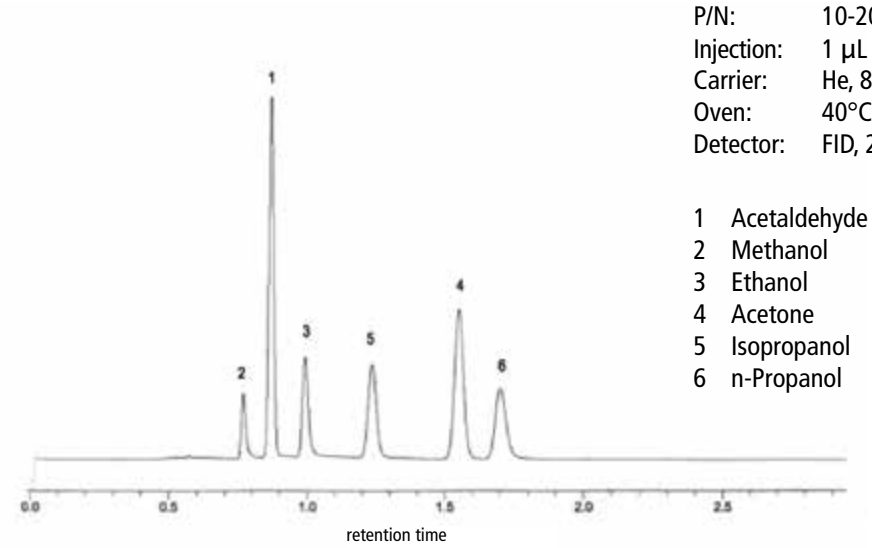
GC-ALCO1 and GC-ALCO2 Equivalent Phases
Agilent: DB-ALC1, DB-ALC2
Restek: Rtx-BAC1, Rtx-BAC2

GC-ALCO1

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	30	1.80	-20 to 240/260	10-201800
0.53	30	3.00	-20 to 240/260	10-201805

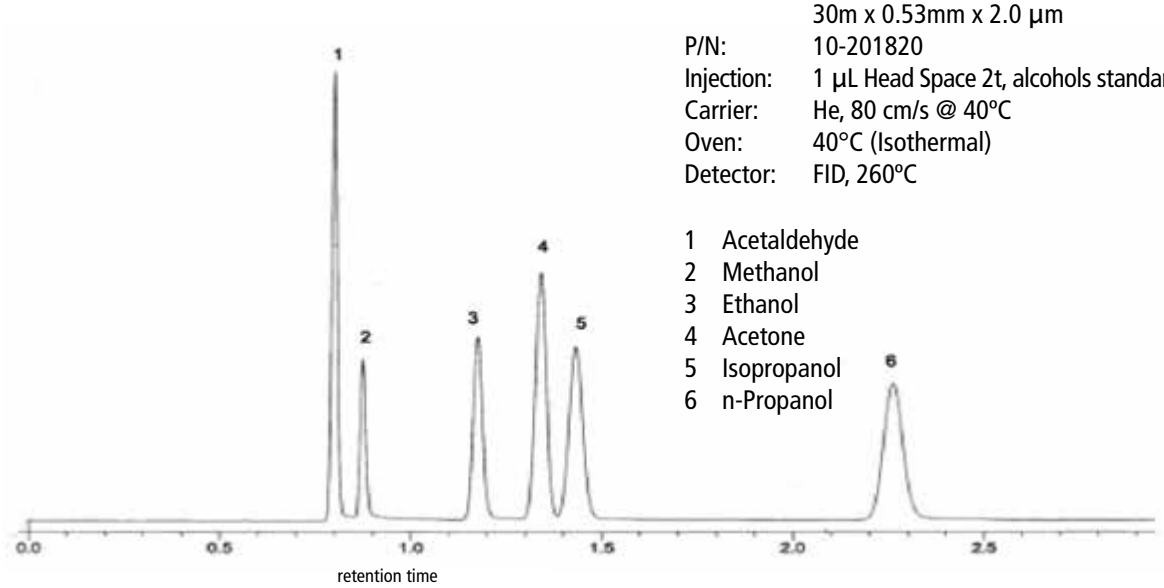
GC-ALCO2

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	30	1.20	-20 to 240/260	10-201810
0.53	30	2.00	-20 to 240/260	10-201820



Alcohols in Blood
Column: GC-ALCO1
30m x 0.53mm x 3.0 µm
P/N: 10-201805
Injection: 1 µL Head Space 2t, alcohols standard, split 1:10, 250°C
Carrier: He, 80 cm/s @ 40°C
Oven: 40°C (Isothermal)
Detector: FID, 260°C

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



Alcohols in Blood
Column: GC-ALCO2
30m x 0.53mm x 2.0 µm
P/N: 10-201820
Injection: 1 µL Head Space 2t, alcohols standard, split 1:10, 250°C
Carrier: He, 80 cm/s @ 40°C
Oven: 40°C (Isothermal)
Detector: FID, 260°C

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

GC-BIODIESEL

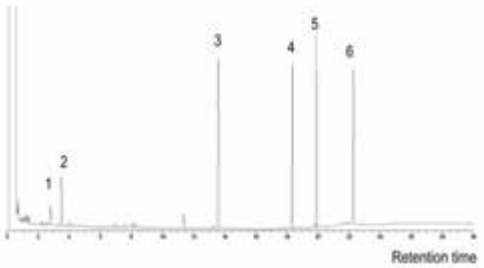
- Manufactured for the analysis of Glycerine and Mono-, Di, Triglycerides under EN14105/ASTM D6584 methods and volatile compounds in biological fluids
- Highly inert for glycerine analysis
- Low column bleed at high temperatures
- Two columns available - silica (high temperature polyimide) and stainless steel (SilCol)
- Can be used in dual systems as analytical and confirmation columns
- Order of elution differs for some compounds

GC-Biodiesel

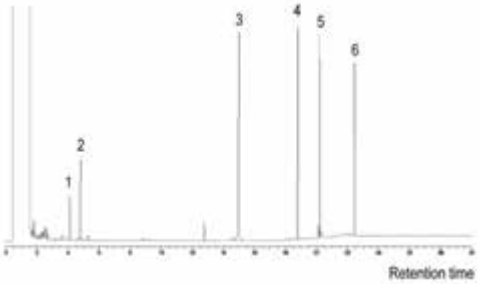
ID (mm)	Length (m)	Film (µm)	Temp	Cat. No.
0,32 (Fused Silica)	10 + 2m x 0.53mm pre-column attached using SilCol connector	0.10	400	10-201830
0,28 (SilCol)	10 + 2m x 0.53mm pre-column attached using SilCol connector	0.10	400	10-201832-SC

GC-BIODIESEL COLUMN
Analysis of Glycerine and Glycerides (EN14105 / ASTM D6584)
Low Bleed at 370°C.

Column: GC-BIODIESEL with retention gap, 2m x 0.53mm ID
Injection: Biodiesel standard, cool on column
Carrier: H2, constant flow 3 mL/min
Oven: 50°C (1 min) @ 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)

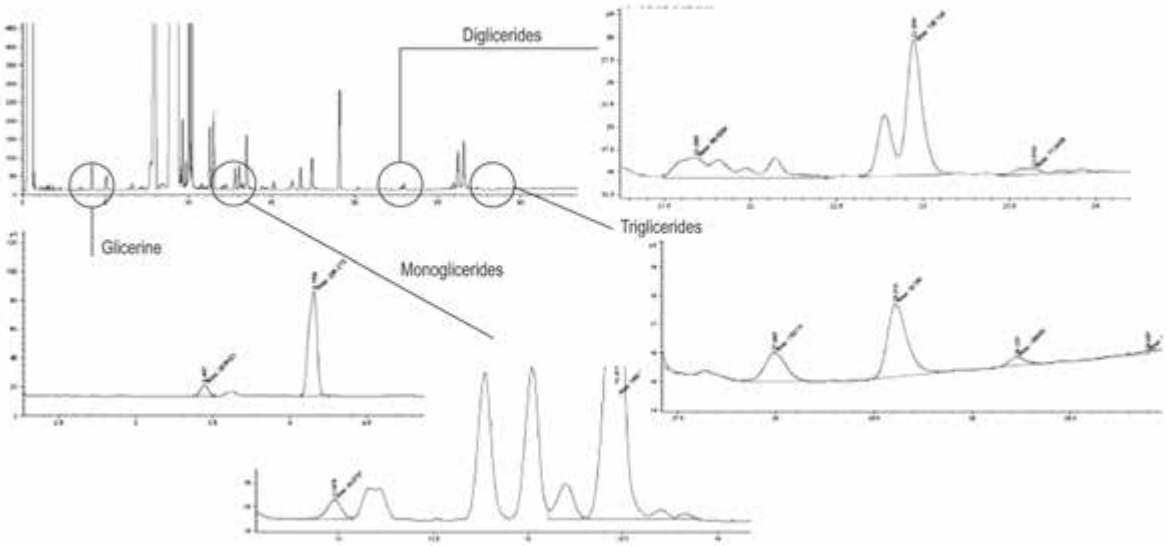


1 Glycerine
2 Buthanetriol (IS 1)
3 Monoolein
4 Tricaprin (IS 2)
5 Diolein
6 Triolein



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

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

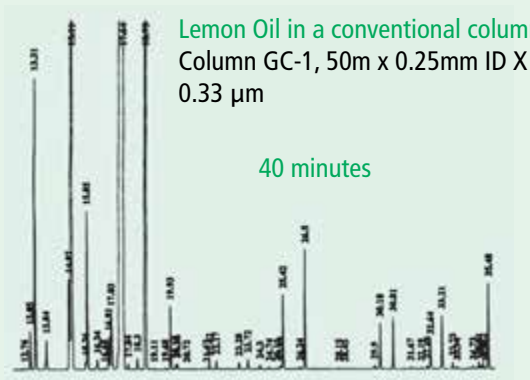


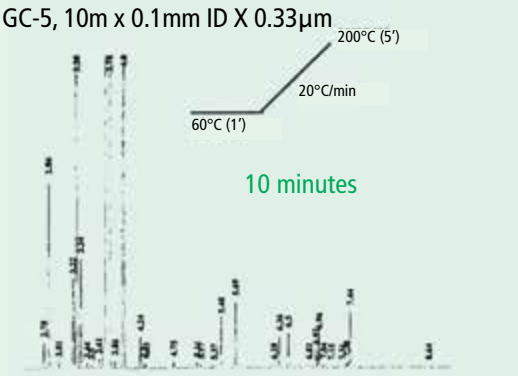
Other Columns for Biodiesel analysis

Methanol analysis (EN-14110)
FAMEs & Linolenic acid methyl ester analysis (EN-14103)
GC-1, 30m x 0.32mm x 3.0µm, P/N 10-200086
CHROMAWax-10, 30m x 0.32mm x 0.25µm, P/N 10-201362

MICROBORE CAPILLARY COLUMNS (0.10mm ID)

Microbore Columns (0.10mm ID) can be connected to a conventional chromatograph fitted with a SPLIT/ SPLITLESS injector and can reduce analysis time significantly without loss of resolution. The high efficiencies of our microbore capillary columns (~7,000 – 10,000 plates/meter), enable complex mixtures to be resolved using shorter columns. The shorter columns are less expensive, reduce analysis time and result in significant savings for the laboratory.





Benefits and limitations of Microbore columns

Operating Pressure (Gas Flow)

Working pressures are higher with microbore columns which can result in ferrule and septum leaks and problems with leaking syringe plungers. Optimum pressure of the carrier gas flow is low (H^2 ~ 0.2cc/min and He ~ 0.1cc/min), which works well with mass detectors since it does not exceed its emptying capacity. Operating microbore columns at below optimum pressures will result in poor performance and resolution.

Sample Capacity

Due to the ID of these columns the sample which can be injected is considerably smaller than with conventional column diameters. Microbore sample capacity is approx. 10 times less than that of a 0.25mm ID column. Therefore the on-column injection should be at least ten times lower for a microbore column.

Injector

Split and splitless injection are recommended with microbore columns. The size of the glass liners are an important factor. Carrier gas flow rates are very low with microbore columns which means 2 to 4mm liners are not suitable due to their large dead volume which results in large peak shapes and subsequent loss of resolution. Therefore, liners with a 0.75 to 1mm ID are recommended and ensure peaks are sharp, well resolved and recovered. Working with small volume liners and microbrore columns means great care must be taken with the purity of the sample being injected. Samples must be clean and as free as possible of nonvolatile residues which contaminate the injection system resulting in absorption of analytes, sample decomposition, ghost peaks etc.

Detector

The gas flows of the detector must be optimised when working with microbore columns. It may be necessary to increase the make up gas flow in some detectors in order to minimise its dead volume and enable the correct sweep of the compounds which 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 quantity of stationary phase 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 favoring the signal/noise ratio and contributing to the detectors not getting contaminated.

Microbore Columns 10µm

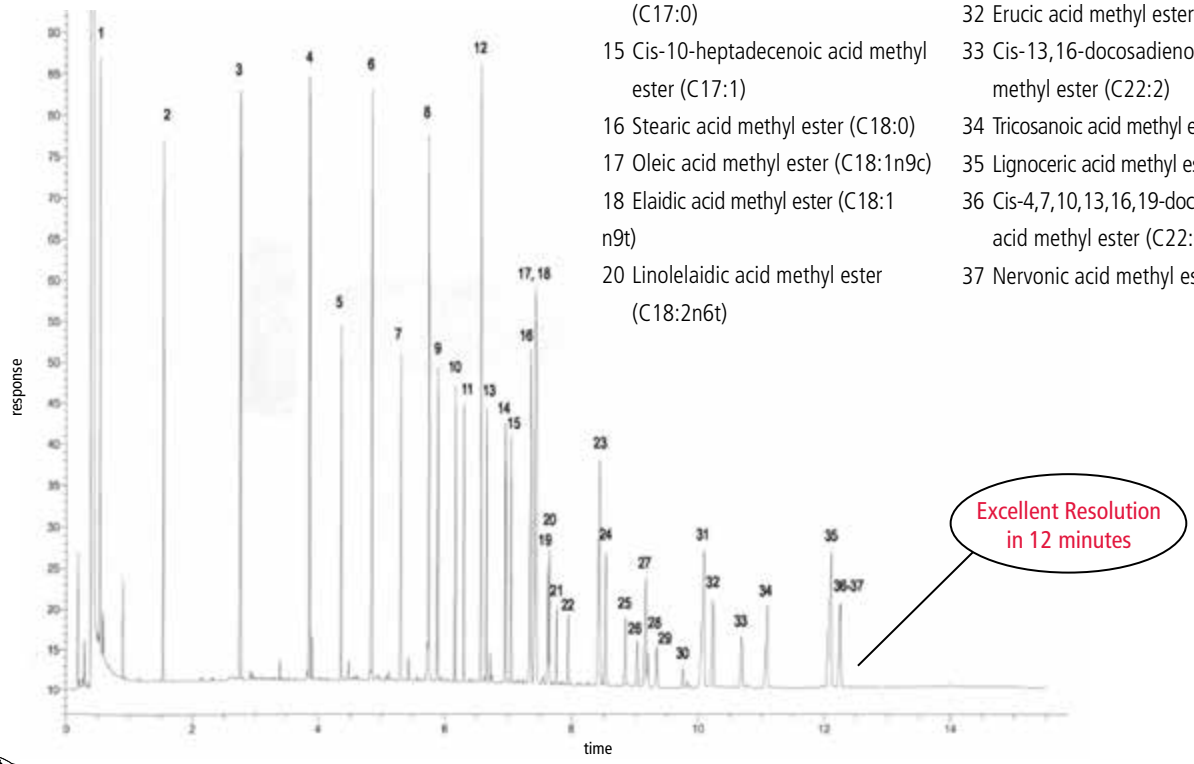
Phase	ID	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
GC-1	0,10	5	0,12	-60 to 325/350	10-200000
GC-1		10	0,10	-60 to 325/350	10-200001
GC-1		10	0,40	-60 to 320/340	10-200002
GC-1		20	0,10	-60 to 325/350	10-200003
GC-1		20	0,40	-60 to 320/340	10-200004
GC-1		40	0,20	-60 to 320/340	10-200005
GC-1		40	0,40	-60 to 320/340	10-200006
GC-1ms	0,10	10	0,10	-60 to 325/350	10-200170
GC-1ms		10	0,40	-60 to 325/350	10-200171
GC-1ms		20	0,10	-60 to 325/350	10-200172
GC-1ms		20	0,40	-60 to 325/350	10-200173
GC-5	0,10	10	0,10	-60 to 325/350	10-200290
GC-5		10	0,17	-60 to 325/350	10-200291
GC-5		10	0,33	-60 to 325/350	10-200292
GC-5		10	0,40	-60 to 320/350	10-200293
GC-5		20	0,10	-60 to 325/350	10-200294
GC-5		20	0,40	-60 to 325/350	10-200295
GC-5MS	0,10	10	0,10	-60 to 325-350	10-200470
GC-5MS		10	0,40	-60 to 325-350	10-200471

Microbore Columns 10µm

Phase	ID (m)	Length (µm)	Film (°C)	Temp Limits	Cat. No.
GC-5MS		20	0,10	-60 to 325-350	10-200472
GC-5MS		20	0,40	-60 to 325-350	10-200473
GC-X5MS	0,10	0,10	0,40	-60 to 325/350	10-200710
GC-1701	0,10	20	0,10	-20 to 280/280	10-201010
GC-1701		20	0,40	-20 to 280/280	10-201011
GC-225	0,10	20	0,10	40 to 220/240	10-201120
GC-50	0,10	10	0,10	40 to 290/300	10-201170
GC-50		10	0,20	40 to 290/300	10-201171
GC-50		20	0,10	40 to 290/300	10-201172
CHROMAWax-10	0,10	10	0,10	35 to 280	10-201320
CHROMAWax-10		15	0,10	35 to 280	10-201321
CHROMAWax-10		15	0,20	35 to 280	10-201322
CHROMAWax-10		20	0,10	35 to 280	10-201323
CHROMAWax-10		20	0,20	35 to 280	10-201324
GC-20M	0,10	10	0,10	40 to 260/270	10-201390
GC-20M		10	0,20	40 to 260/270	10-201391
GC-20M		20	0,10	40 to 260/270	10-201392
GC-20M		20	0,20	40 to 260/270	10-201393
GC-FFAP	0,10	20	0,10	40 to 240/250	10-201475
GC-WAX	0,10	10	0,10	20 to 240/250	10-201580
GC-WAX		10	0,20	20 to 240/250	10-201581
GC-WAX		20	0,10	20 to 240/250	10-201582
GC-WAX		20	0,20	20 to 240/250	10-201583

Column: GC-20M
10m x 0.10mm x 0.10µm
P/N: 10-201390
Carrier: H2, constant pressure 50 psi (344.5 kPa)
Oven: 40°C (1 min) @ 25°C/min to 195°C @ 3°C/min to 205°C @ 8°C/min to 230°C (1min)
Injection: 1µL standard FAMES, (200ng/comp), split 1:50, 280°C
Detector: FID, 280°C

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



CUSTOM MADE CAPILLARY COLUMNS

We can offer bonded and non bonded custom capillary columns manufactured to your own specifications.

Simply advise us of the column length, ID, phase and film thickness you require and we will do the rest.

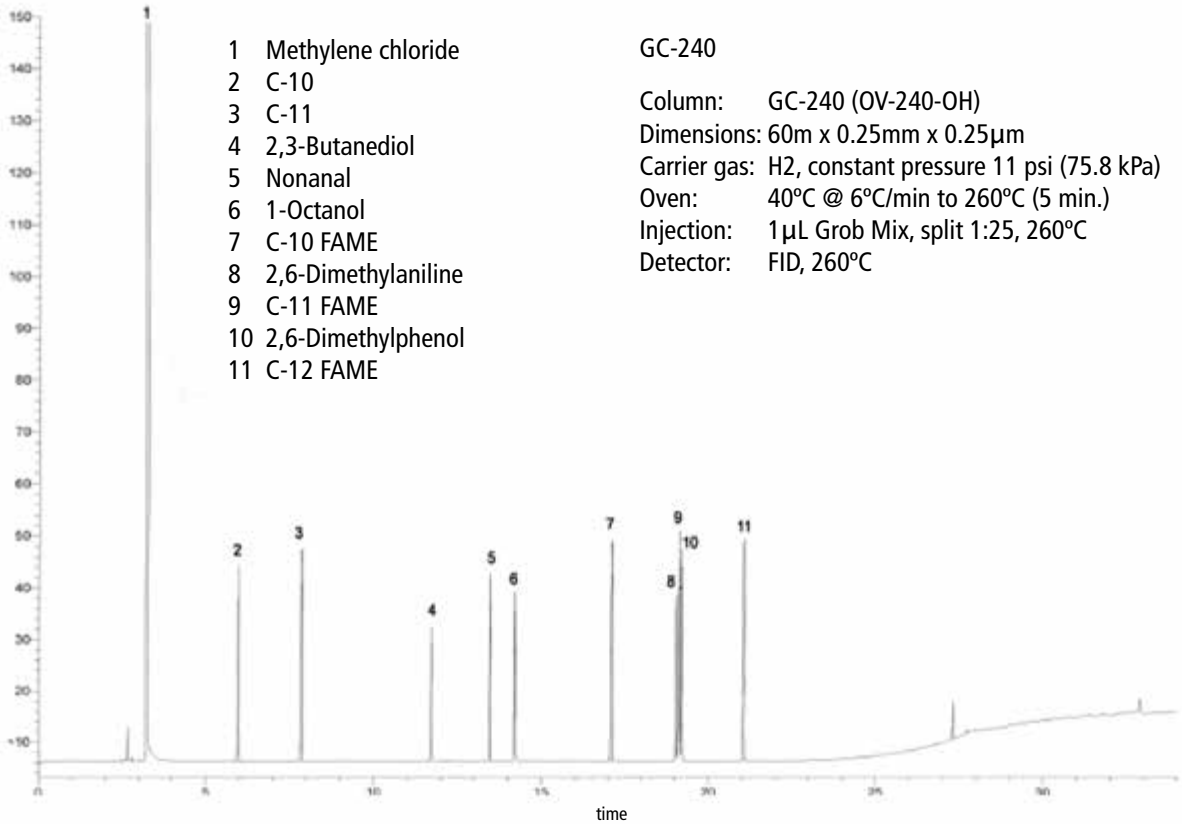
Many less common phases which we can also offer as custom columns for methods which are described in official methods or in scientific bibliography include -

GC-101	100% polydimethylsiloxane phase (silicone fluid)
GC-SE30	100% polydimethylsiloxane phase
GC-SE52	5% phenyl - 95% dimethylpolysiloxane phase
GC-SE54	5% phenyl - 1% vinyl - 94% dimethylpolysiloxane Phase
GC-20M	100% polyethylene glycol (Carbowax 20M) phase

FOR PHASES NOT INCLUDED IN OUR STANDARD LIST, PLEASE CONTACT OUR SALES DEPARTMENT TO DISCUSS YOUR PARTICULAR REQUIREMENTS.

INVERSE GAS CHROMATOGRAPHY COLUMNS

Greyhound supply capillary columns for inverse gas chromatography, used for the characterisation of polymers. We can supply custom made silica columns coated with your polymer, please contact our sales department to discuss your requirements.



GC-240

Column:	GC-240 (OV-240-OH)
Dimensions:	60m x 0.25mm x 0.25µm
Carrier gas:	H2, constant pressure 11 psi (75.8 kPa)
Oven:	40°C @ 6°C/min to 260°C (5 min.)
Injection:	1µL Grob Mix, split 1:25, 260°C
Detector:	FID, 260°C

Q Cap

PLOT COLUMNS

PLOT (Porous Layer Open Tubular) columns are used for the separation of compounds which are gases when at room temperature. Greyhound Chromatography offers an extensive selection of PLOT columns for the analysis of volatile polar compounds, fixed gases, low molecular weight hydrocarbons and reactive analytes e.g. sulfur gases, hydrides and amines. Our range of PLOT columns are available with 0.25mm, 0.32mm and 0.53mmIDs, making column selection very simple.

GC Phase	Composition	Polarity	Temp	Phase Cross Reference
GC-PLOT Molesieve	Molecular Sieve 5Å	N/A	-80 to 300°C	HP-PLOT Molesieve, CP-PLOT MolSieve
GC-PLOT AL203/KCL	KCl modified Alumina	least selective	-80 to 200°C	HP-PLOT Al203/KCl, GS-Alumina/KCL, CP-AL203/KCL PLOT
GC-PLOT AL203/S	Na2SO4 modified Alumina	moderately selective	-80 to 200°C	HP-PLOT AL203/"S", GS-Alumina, CP-AL203/NA2SO4 PLOT, Rt-Alumina
GC-PLOT AL203/M	Na2MoO4 modified Alumina	most selective	-80 to 200°C	HP-PLOT AL203/"M", GS-Alumina
GC-PLOT Q	Divinylbenzene polymer	non-polar	-80 to 280/300°C	HP-PLOT Q, GS-Q, CP-PoraPLOT Q HT, Rt-Q
GC-PLOT U	Divinylbenzene ethylene glycol dimethacrylate copolymer	polar	-80 to 190/200°C	HP-PLOT U, CP-PoraPLOT U
GC-PLOT GasPro	Proprietary Porous Silica	N/A	-80 to 260/300°C	GS-GasPro, CP-Silica PLOT

GC-PLOT MoleSieve

- Molecular Sieve, Zeolite, 5Å
- Ideal PLOT column for the analysis of permanent gases
- Thick and thin coatings available for a range of separations, e.g. Ar/O2 separation at 35°C, O2/N2 within 15 sec.
- Completely immobilized coating ensures a smooth baseline and is ideal for methods using valve switching applications
- Recommended column for the analysis of fixed gases from hydrocarbon streams
- Elution order, H2, He, Ne, O2, N2, CH4, CO - Regeneration of performance from water/CO_2 adsorptions at 250°C for 3hr
- ASTM recommended phase
- Used for analysis of noble gases, air from methane, fuel cells, etc
- Often used with other PLOT columns for fixed gas separations from sample matrix

ID (mm)	Length (m)	Film (m)	Temp Limits (°C)	Cat. No.
0.32	15	25	-80 to 300	10-202030
	30	12	-80 to 300	10-202031
	30	25	-80 to 300	10-202032
0.53	15	25	-80 to 300	10-202035
	15	50	-80 to 300	10-202036
	30	25	-80 to 300	10-202037
	30	50	-80 to 300	10-202038

Similar Phases
HP-PLOT Molesieve
CP-PLOT MolSieve.

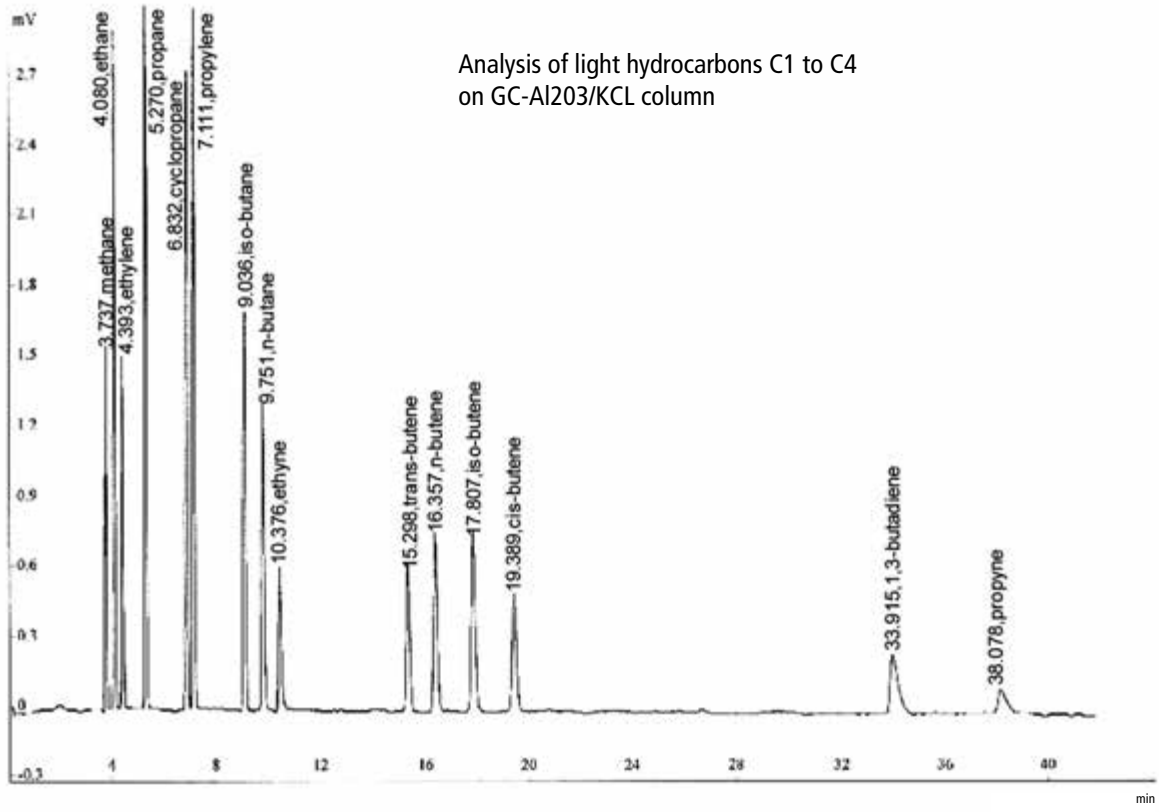
NOTE: As Molecular sieve columns will absorb water over time, resulting in retention time changes, our advanced deactivation process enables the columns to be fully regenerated within 3hrs at 250°C.

GC-PLOT Al203/KCL

- Least polar aluminum oxide phase deactivated with KCl
- Good baseline separation of most C1 to C10 hydrocarbons
- Low retention of olefins relative to comparable paraffins
- Minimum surface adsorption of dienes and halocarbons
- ASTM recommended phase

Similar Phases:
HP-PLOT Al2O3/KCL
GS-Alumina/KCL,
CP-AL2O3/KCL PLOT,
ZB-Alumina/KCl

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.25	30	5	-60 to 200/250	10-202000
0.32	50	8	-60 to 200	10-202002
0.53	30	15	-60 to 200	10-202005
	50	15	-60 to 200	10-202006



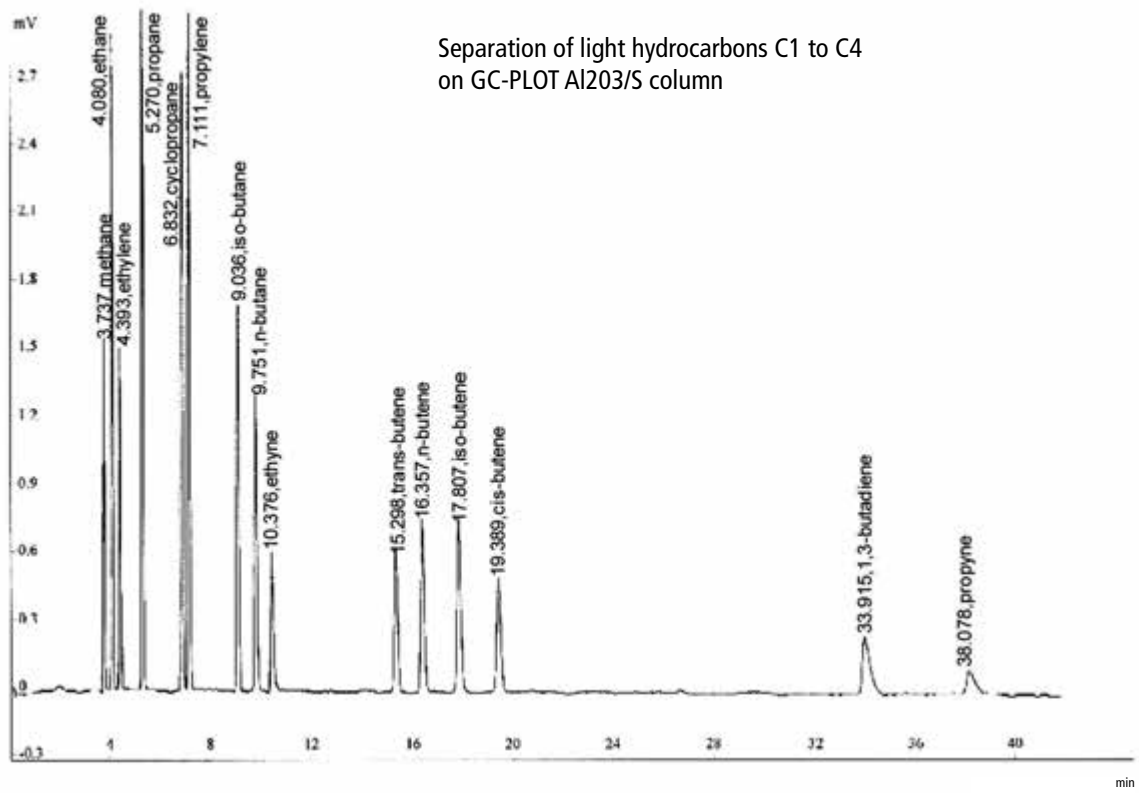
Analysis of light hydrocarbons C1 to C4 on GC-Al203/KCL column

GC-PLOT AL203/S

- Good selectivity (mid polarity) aluminum oxide phase
- Deactivated with Na_2SO_4 salt
- Excellent baseline separation of C1 to C10 hydrocarbons.
- ASTM recommended phase

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.25	30	5	-60 to 200/250	10-202010
0.32	30	8	-60 to 200	10-202012
	50	8	-60 to 200	10-202013
0.53	30	15	-60 to 200	10-202015
	50	15	-60 to 200	10-202016

Similar Phases:
HP-PLOT Al2O3/"S"
GS-Alumina
CP-Al2O3/Na2SO4 PLOT
ZB-Alumina
RT-Alumina



Separation of light hydrocarbons C1 to C4 on GC-PLOT Al203/S column

GC-PLOT AL2O3/M

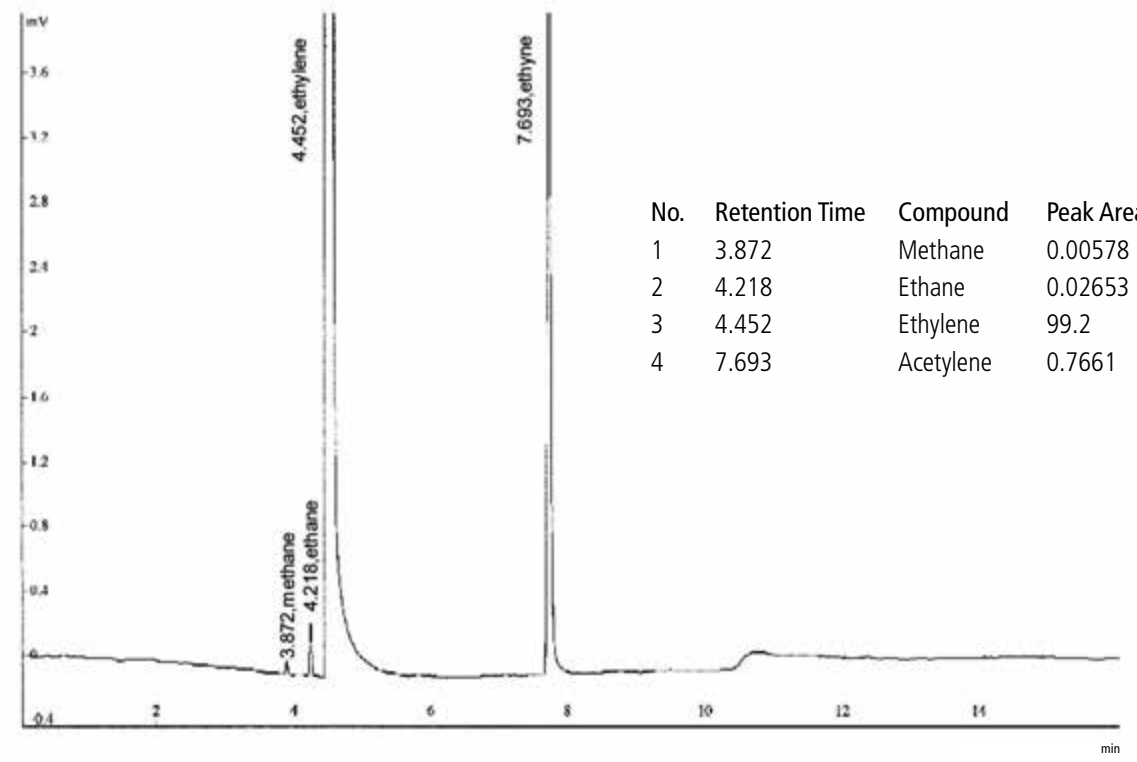
- Strong selectivity (most polar) aluminium oxide phase
- Deactivated with Na2MoO4 salt
- General use column for baseline separation of C1 to C10 hydrocarbons, good baseline separation of cyclopropane from propylene
- Accurate quantitations of dienes and halocarbons
- ASTM recommended phase

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	50	8	-60 to 200	10-202020
0.53	30	15	-60 to 200	10-202025
	50	15	-60 to 200	10-202026

Similar Phases:
HP-PLOT Al2O3/M
GS-Alumina
ZB-Alumina

Analysis of impurity in ethylene using a GC-PLOT Al203 column at 100C. The sample is 99% ethylene and 1% acetylene.

Low levels of methane and ethane impurities (1ppm) are detected at high temperature 100°C, with good peak separation.



No.	Retention Time	Compound	Peak Area	% Peak Area
1	3.872	Methane	0.00578	151
2	4.218	Ethane	0.02653	692
3	4.452	Ethylene	99.2	2587857
4	7.693	Acetylene	0.7661	19986

Q Cap

GC-PLOT Q

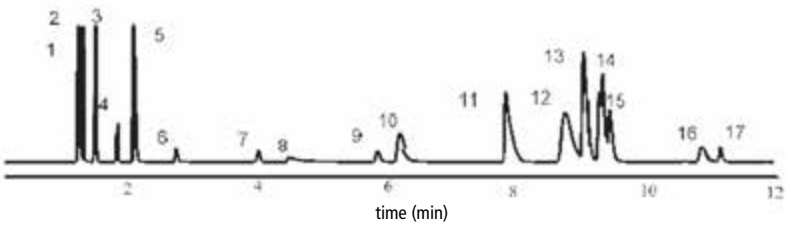
- Divinylbenzene polymer particle, non polar, similar to PoraPak Q
- Immobilized coating giving a smooth baseline ideal for valve switching and liquid sample introduction at low temperatures
- Maximum temperature limit up to 280/300°C
- Baseline separation of Air, CO2, water, sulphur gases, hydrogen chlorine, ammonia/light amines from hydrocarbons such as refinery streams, natural gas, and engine exhaust
- Excellent separation of C1 to C3 isomers, good eparations of C3 to C12, halocarbons
- Excellent inertness and long column lifetime when analysing water/alcohol samples, a good secondary choice to a wax column for alcohol analysis
- Excellent tolerance to strong acid/base samples without affecting retention time
- Good anti-oxidation at 280°C and fast column regeneration back to original performance
- Good choice for analyzing low level solvent residues from a wide range of samples, such as headspace, aqueous, or organic solutions
- Preferred column for residue analysis in petroleum, pharmaceutical, environmental and chemical weapons detection industries
- Preferred column for analysis of polar compounds including oxygenates from hydrocarbon streams: natural gas, refinery gas, dienes, ethylene, propylene

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	15	15	-80 to 280/290	10-202050
	30	15	-80 to 280/290	10-202051
0.53	15	30	-80 to 280/290	10-202055
	30	30	-80 to 280/290	10-202056

Similar Phases:
HP-PLOT Q
GS-Q
CP-PoraPLOT Q HT
Supel PLOT Q
Rt-Q
ZB-PLOT Q

Refinery gas analysis on GC-PLOT Q column
Column: GC-PLOT Q, 0.53mm x 30m
Oven: 60°C. (5 min.); 20°C/min to 200°C (1 min)
Detector: TCD 250°C.

Peak ID:
1 Air
2 Methane
3 Carbon dioxide
4 Ethylene,
5 Ethane
6 Hydrogen sulphur
7 Carbonyl sulphide,
8 Water
9 Propylene
10 Propane
11 Methanol,
12 Iso-butane
13 cis-Butene
14 n-Butane/iso-Butene,
15 trans-Butene
16 iso-Pentane
17 N-Pentane



GC-PLOT U

Divinylbenzene and Ethylene glycol dimethacrylate co-polymer particle, polar, similar to traditional Porapack U.

- Immobilized coating giving a smooth baseline ideal for valve switching and liquid sample introduction at low temperatures
- Improved separation and selectivity of Air, CO_2, water, sulphur gases, hydrogen chlorine, ammonia/light amines from hydrocarbons
- Symmetric water peak shape, water elutes after C3
- Excellent separation of C1 to C3 isomers, good separations of C3 to C12 halocarbons
- Excellent inertness and long column life with water/alcohol samples
- Excellent tolerance to strong acid/base samples without affecting retention times
- Good choice of column for analyzing low level solvent residues from a wide range of samples, such as headspace, aqueous, or organic solutions
- Preferred column for residue analysis in the petroleum, pharmaceutical, environmental and chemical weapon detection industries
- Preferred column for analysis of polar compounds including oxygenates from hydrocarbon streams: natural gas, refinery gas, dienes, ethylene, propylene

Similar Phases:
HP-PLOT U
CP-PoraPLOT U

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	30	10	-80 to 190	10-202260
0.53	30	20	-80 to 190	10-202265

GC-PLOT GasPro

- Proprietary Silica based phase
- Very inert to a wide range of gases including sulfur gases and Freons, symmetrical peak shapes
- Completely immobilized coating ensures a smooth baseline and is ideal for methods using valve switching applications
- Ideal PLOT column for GC/MS applications - no particles
- Preferred column for the analysis for sulfur gases from hydrocarbon streams and air
- Separation of CO and CO_2
- No influence of water on retention times
- Ideal for high-throughput laboratories and online process applications
- ASTM recommended phase

Similar Phase:
CP-Silica PLOT
GS-GasPro

ID (mm)	Length (m)	Film (µm)	Temp Limits (°C)	Cat. No.
0.32	5	5	-80 to 260/300	10-202040
	15	5	-80 to 260/300	10-202041
	30	5	-80 to 260/300	10-202042
	60	5	-80 to 260/300	10-202043

Q Cap

GUARD COLUMNS (RETENTION GAP)

A capillary guard column is a length of 1-10 meters of deactivated fused silica tubing attached to the front of the capillary column. Deactivated fused silica tubing does not contain any stationary phase, however, the surface is deactivated to minimize solute interactions. The tubing is attached to the column with a suitable union or universal press fit connector. Usually the diameter of the guard column is the same as the analytical column. If the tubing sizes are different, it is better to have a larger diameter guard column than a smaller one.

Guard columns trap non-volatile residues and prevents them from collecting on the inlet of the analytical column resulting in longer column life. This greatly reduces the interaction between the sample and the residues as the guard column does not retain the solutes (because it does not contain any stationary phase). Also, the residues do not coat the stationary phase which often results in poor peak shapes. Periodically it is necessary to trim the guard column due to the build-up of residues. Guard columns of 5 to 10 meters allow for considerable trimming before it has to be replaced. Abnormal peak shapes usually indicates that the guard column requires trimming or changing. Various guard columns are available with different polarities, it is important to match the polarity of the solvent with the polarity of the surface deactivation.

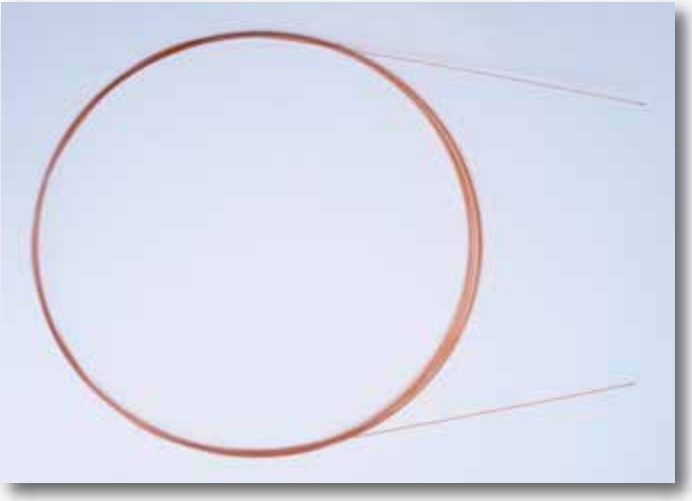
NON POLAR
Methyl deactivated tubing, suitable for pentane/hexane and other non polar solvents.

MEDIUM POLAR
Phenyl-methyl deactivated tubing, (USP 467) suitable for methylene chloride, hexane, toluene and a wide range of similar solvents.

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

BASE-DEACTIVATED
Proprietary deactivation of the tubing, suitable for analysis of amines and other basic compounds.

HYDROSAFE
Proprietary deactivation of the tubing making it suitable for water direct aqueous injections.



I.D. (mm)	Length (mtr)	Non Polar Part No.	Medium Polar Part No.	Polar Part No.	Base Deactivated Part No.	Hydrosafe Part No.
0,25	3 x 1	10-201900	10-201920	10-201940	10-201980	10-201960
	1 x 5	10-201901	10-201921	10-201941	10-201981	10-201961
	1 x 10	10-201902	10-201922	10-201942	10-201982	10-201962
	1 x 20	10-201903	10-201923	10-201943	10-201983	10-201963
0,32	3 x 1	10-201904	10-201924	10-201944	10-201984	10-201964
	1 x 5	10-201905	10-201925	10-201945	10-201985	10-201965
	1 x 10	10-201906	10-201926	10-201946	10-201986	10-201966
	1 x 20	10-201907	10-201927	10-201947	10-201987	10-201967
0,53	3 x 1	10-201908	10-201928	10-201948	10-201988	10-201968
	1 x 5	10-201909	10-201929	10-201949	10-201989	10-201969
	1 x 10	10-201910	10-201930	10-201950	10-201990	10-201970
	1 x 20	10-201911	10-201931	10-201951	10-201991	10-201971

STAINLESS STEEL CAPILLARY COLUMNS (SilCol)

Greyhound 'Q-Cap' Stainless Steel Capillary Columns are manufactured using our SilCol stainless steel tubing. The internal surface is specially treated which results in column tubing with a chemical inertness comparable to that of fused silica. SilCol tubing is currently available with a 0.53mm internal diameter.

SilCol stainless steel capillary columns can be used at higher temperatures (430°C.) than fused silica columns (usually ~ 360°C.) The reason is that the polyimide resin becomes brittle after repeated use at high temperatures, this does not happen with SilCol stainless steel capillary columns. SilCol stainless steel capillary columns can be wound in small diameter coils and will not break under stress.

SilCol stainless steel capillary columns are ideal for use in locations where the possibility of breakage is higher, e.g. process G.C., field instruments and GCs in portable instruments where the small ovens require tightly wound columns. SilCol stainless steel capillary columns are available with most of our popular stationary phases, please call our sales office to discuss your requirements.

To order a SilCol stainless steel capillary column, add the suffix -SC after the corresponding part number for the FSOT column in the catalogue eg:

A 10m x 0.53mmID x 2.65um SilCol Column coated with GC-2887 for SimDist analysis

Cat. No with FSOT Capillary Tubing: 10-202045

Cat. No. with SilCol Stainless Steel Tubing: 10-202045-SC

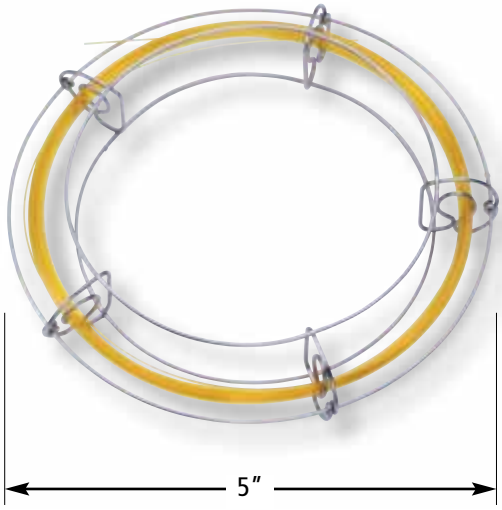
CAPILLARY COLUMNS FOR AGILENT GC 6850

Greyhound 'Q-Cap' Capillary Columns are available wound onto a 5 inch cage to fit the Agilent GC6850 chromatograph.

To order a column on a 5 inch cage simply add -5 to the standard catalogue number

e.g. 30m x 0.25mm x 0.25um coated with GC-5 phase

Column Material	Cat. No.
FSOT Column on 7 inch cage	10-200349
FSOT Column on 5 inch cage	10-200349-5
SilCol Column on 7 inch cage	10-200349-SC
SilCol Column on 5 inch cage	10-200349-5-SC



USP CAPILLARY COLUMN EQUIVALENTS

USP CODE	General Description	Greyhound Chromatography Recommended Phase
G1	Dimethylpolysiloxane oil	GC-1, GC-1ms
G2	Dimethylpolysiloxane gum	GC-1, GC-1ms
G3	50%phenyl-50%methylpolysiloxane	GC-50
G5	3-cyanopropylsiloxane	GC-2340
G6	Poly(ethylenepropylene)glycol	GC-210
G8	90%-3-cyanopropyl-1 0%phenylmethylsiloxane	GC-2340
G9	Methylvinylpolysiloxane	GC-1, GC-1ms
G14	Polyethylene glycol (MW = 951-1050)	GC-20M
G15	Polyethylene glycol (MW = 3000-3070)	GC-20M
G16	Polyethylene glycol (MW = 15000)	GC-20M
G19	25%phenyl-25%cyanopropylmethylsiloxane	GC-225
G20	Polyethylene glycol (MW = 400-420)	GC-MEGOWAX
G25	Polyethylene glycol TPA	GC-FFAP
G27	5%phenyl-95%methylpolysiloxane	GC-5, GC-5ms, GC-X5ms
G28	25%phenyl-75%-dimethylpolysiloxane	GC-20
G32	20%phenylmethyl-80%-dimethylpolysiloxane	GC-20
G35	Polyethylene glycol with Nitroterephthalic acid	GC-FFAP
G36	1 %vinyl-5%phenylmethylpolysiloxane	GC-5, GC-5ms, GC-X5ms
G39	Polyethylene glycol (MW=1500)	GC-20M
G42	35%diphenyl-65%dimethylpolysiloxane	GC-35
G43	6%cyanopropylphenyl-94%dimethylpolysiloxane	GC-624, GC-1301, GC-G43
G46	14%cyanopropylphenyl-86%dimethylpolysiloxane	GC-1701

EPA DRINKING WATER TEST METHODS

EPA Method	Application	Recommended Greyhound Chromatography Q-Cap Capillary Column		Part No.
501.3	Trihalomethanes by GC/MS and SIM	GC-624 GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm	10-200851 10-200853 10-200854
502.1/502.2	Volatile halogenated Organics in Water by Purge & Trap GC/PID/ELCD	GC-624	30 m x 0.53 mm x 3.0 µm	10-200851
503.1	Volatile Aromatics & Unsaturated Organics by Purge & Trap GC	GC-624	30 m x 0.25 mm x 1.4 µm	10-200831
504.1	1,2-dibromoethane (EDB), 1,2-dibromo-3- chloropropane (DBCP) and 1,2,3-Trichloropropane (123TCP) in water by GC	GC-1 GC-624 GC-624	30 m x 0.32 mm x 0.25 µm 30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200082 10-200851 10-200831
505	Organohalide Pesticides and Arochlors by GC/ECD	GC-1 GC-50 GC-50	30 m x 0.32 mm x 1.0 µm 30 m x 0.32 mm x 0.5 µm 30 m x 0.25 mm x 0.25 µm	10-200084 10-201215 10-201194
507	Nitrogen & Phosphorus containing Pesticides in Water by GC/NPD	GC-5 GC-5ms GC-1701	30 m x 0.25 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm	10-200349 10-200504 10-201045
508	Chlorinated Pesticides in Water by GC/MS	GC-5 GC-5ms GC-1701	30 m x 0.25 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm	10-200349 10-200504 10-201045
513	2,3,7,8-Tetrachlorodibenzo-p-dioxin by GC/MS	GC-5ms	60 m x 0.25 mm x 0.10 µm	10-200508
515.2	Determination of chlorinated acids in water using liquid-solid extraction & GC/ECD	GC-1 GC-5 GC-1701 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm	10-200082 10-200381 10-201075 10-200526
524.2	Measurement of purgeable organic compounds in water by Purge & Trap capillary column GC/MS	GC-624 GC-624 GC-624 GC-624	30 m x 0.25 mm x 1.4 µm 30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 60 m x 0.32 mm x 1.8 µm	10-200831 10-200851 10-200853 10-200842
525	Organic compounds in drinking water by liquid-solid extraction & capillary column GC/MS	GC-5 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm	10-200381 10-200504

Q Cap

EPA DRINKING WATER TEST METHODS

EPA Method	Application	Recommended Greyhound Chromatography Q-Cap Capillary Column		Part No.
601	Purgeable halocarbons	GC-624 GC-624 GC-624 GC-1301	30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.0 µm	10-200851 10-200853 10-200854 10-200796
602	Purgeable aromatics	GC-624 GC-624 GC-1301	30 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.0 µm	10-200851 10-200854 10-200796
603	Acrolein & acrylonitrile	GC-624 GC-1301	30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.0 µm	10-200851 10-200796
604/605	Phenols & benzidines	GC-5ms GC-5ms	30 m x 0.53 mm x 1.4 µm 30 m x 0.25 mm x 0.25 µm	10-200545 10-200504
606	Phthalate esters	GC-5 GC-5ms	15 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.25 µm	10-200413 10-200504
607	Nitrosamines	GC-5 GC-5ms	30 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.50 µm	10-200425 10-200505
608	Organochlorine pesticides & PCBs	GC-5 GC-5ms	50 m x 0.53 mm x 1.0 µm 50 m x 0.25 mm x 0.12 µm	10-200431 10-200507
609	Nitroaromatics & isophorone	GC-5 GC-5ms	30 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.5 µm	10-200425 10-200505
610	Polycyclic Aromatic Hydrocarbons	GC-5 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.10 µm	10-200381 10-200525
611	Haloethers	GC-5 GC-5ms	15 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.50 µm	10-200413 10-200505
612	Chlorinated hydrocarbons	GC-5 GC-5ms	30 m x 0.32 mm x 1.0 µm 30 m x 0.25 mm x 1.0 µm	10-200383 10-200506
613	2,3,7,8-tetrachlorodibenzo-p-dioxin	GC-5ms	60 m x 0.25 mm x 0.10 µm	10-200508
615	Chlorinated herbicides	GC-1701 GC-1701	30 m x 0.53 mm x 1.0 µm 30 m x 0.25 mm x 0.25 µm	10-201096 10-201045
619	Triazine herbicides	GC-50 GC-50	30 m x 0.53 mm x 1.0 µm 30 m x 0.25 mm x 0.50 µm	10-201233 10-201195
624	Purgeables	GC-624 GC-624 GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200851 10-200853 10-200854 10-200831
625	Base neutrals & acids	GC-5ms GC-1ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm	10-200526 10-200204
680	Pesticides & PCBs in water and soil/sediment	GC-5 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm	10-200381 10-200526
1624	Volatile organic compounds by isotope dilution GC/MS	GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200851 10-200831
1625	Semivolatile organic compounds by isotope dilution	GC-5 GC-5ms	30 m x 0.25 mm x 0.25 µm 30 m x 0.25 mm x 0.25 µm	10-200349 10-200504
1653	Chlorinated phenols in waste water by in-situ MS acylation & GC low bleed/MS	GC-5 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm	10-200381 10-200526

EPA DRINKING WATER TEST METHODS

EPA Method	Application	Recommended Greyhound Chromatography Q-Cap Capillary Column		Part No.
8010	Halogenated volatile organics	GC-624 GC-624	75 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200853 10-200831
8015	Non-Halogenated volatile organics	GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200851 10-200831
8020/8021	Aromatic volatile organics	GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200851 10-200831
8030/8031	Acrolein, acrylonitrile, acetonitrile	GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 30 m x 0.25 mm x 1.4 µm	10-200851 10-200831
8040/8041	Phenols	GC-5 GC-5ms	30 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.25 µm	10-200425 10-200504
8060/8061	Phthalate esters	GC-1 GC-1ms	15 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.4 µm	10-200108 10-200205
8080	Organochlorine pesticides & PCBs	GC-5 GC-5ms	30 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.5 µm	10-200425 10-200505
8081/8082	Organochlorine pesticides & PCBs as Arochlor	GC-5 GC-1701	30 m x 0.53 mm x 1.5 µm 30 m x 0.53 mm x 1.0 µm	10-200425 10-201096
8090/8091	Nitroaromatics & cyclics ketones	GC-5 GC-5ms	30 m x 0.53 mm x 1.5 µm 30 m x 0.25 mm x 0.5 µm	10-200425 10-200505
8100	Polynuclear aromatic hydrocarbons	GC-5 GC-5ms	30 m x 0.32 mm x 0.25 µm 30 m x 0.32 mm x 0.25 µm	10-200381 10-200526
8120	Chlorinated hydrocarbons	GC-1 GC-1ms	30 m x 0.32 mm x 1.0 µm 30 m x 0.32 mm x 1.0 µm	10-200084 10-200228
8140	Organophosphorus pesticides	GC-1 GC-1701 GC-1	30 m x 0.32 mm x 1.5 µm 30 m x 0.53 mm x 1.0 µm 30 m x 0.25 mm x 0.25 µm	10-200085 10-201096 10-200049
8141	Organophosphorus pesticides	GC-5 GC-5ms	15 m x 0.53 mm x 1.5 µm 15 m x 0.25 mm x 0.25 µm	10-200413 10-200501
8150/8151	Chlorinated herbicides	GC-5 GC-1701 GC-5ms	25 m x 0.53 mm x 1.0 µm 30 m x 0.53 mm x 1.0 µm 15 m x 0.25 mm x 0.25 µm	10-200418 10-201096 10-200501
8240	GC/MS for volatile organics	GC-624 GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm	10-200851 10-200853 10-200854
8250	GC/MS for semi-volatile organics	GC-5ms	30 m x 0.25 mm x 0.5 µm	10-200505
8260 GC/MS	method for volatile organics capillary techniques	GC-624 GC-624 GC-624	30 m x 0.53 mm x 3.0 µm 75 m x 0.53 mm x 3.0 µm 105 m x 0.53 mm x 3.0 µm	10-200851 10-200853 10-200854
8270	GC/MS method for semi-volatile organics capillary techniques	GC-5 GC-5ms	30 m x 0.25 mm x 1.0 µm 30 m x 0.25 mm x 1.0 µm	10-200351 10-200506
8280	Analysis of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans	GC-5 GC-5ms	30 m x 0.25 mm x 0.25 µm 60 m x 0.25 mm x 0.25 µm	10-200349 10-200509

ASTM METHODS

Method	Phase Recommendation	Sample	Cat. No.
D1945	GC-PLOT MoleSieve 15 m x 0.53 mm x 50 µm GC-PLOT Q 15 m x 0.53 mm x 30 µm	Natural Gas	10-202036 10-202055
D1946	GC-PLOT MoleSieve 15 m x 0.53 mm x 50 µm	Reformed Gas	10-202036
D1983	GC-2340 50 m x 0.25 mm x 0.2 µm	FAME analysis	10-201662
D2163	GC-PLOT AL203/KCL 50 m x 0.53 mm x 15 µm	Liquified petroleum gases and propylene concentrations	10-202006
D2245	GC-2340 50 m x 0.25 mm x 0.2 µm	Oils and oil acids in solvent-reducible paints	10-201662
D2267	GC-TCEP 50 m x 0.25 mm x 0.40 µm	Aromatics in light naphthas and aviation gasolines	10-201781
D2268	GC-Squalane 100 m x 0.25 mm x 0.2 µm	Analysis of n-heptane and iso-octane (high purity)	*ENQUIRE*
D2306	GC-WAX 60 m x 0.25 mm x 0.25 µm	Xylene isomers	10-201608
D2360	GC-WAX 60 m x 0.32 mm x 0.25 µm	Trace impurities in monocyclic aromatic hydrocarbons and total aromatic determination	10-201616
D2426	GC-1 30 m x 0.53 mm x 1.5 µm	Butadiene and styrene in butadiene concentrates	10-200120
D2427	GC-PLOT AL203/KCL 50 m x 0.53 mm x 15 µm	C2-C5 hydrocarbons in gasolines	10-202006
D2456	GC-WAX 30 m x 0.53 mm x 1.0 µm	Polyhydric alcohols in alkyd resins	*ENQUIRE*
D2504	GC-PLOT MoleSieve 30 m x 0.53 mm x 25 µm	Non-condensable gases in C1-C3 hydrocarbons	10-202037
D2505	GC-1 30 m x 0.53 mm x 5 µm	Ethylene, other hydrocarbons and carbon dioxide in high-purity ethylene	10-200123
D2580	GC-5 ms 25 m x 0.32 mm x 0.5 µm	Phenols in water	10-200524
D2597	30% SE-30 on Chromosorb PAW 80/100 - Molecular Sieve 13X 45/60	Analysis of demethanized hydrocarbon liquid matures containing nitrogen and carbon dioxide	PC
D2580	GC-X5MS 25 m x 0.32 mm x 0.4 µm GC-FFAP 30 m x 0.53 mm x 1.0 µm	Phenols in water	10-200754 10-201514
D2593	GC-PLOT 50 m x 0.32 mm x 8 µm	Butadiene purity and hydrocarbon impurity	10-202002
D2600	GC-TCEP 50 m x 0.25 mm x 0.40 µm GC-20M 25 m x 0.32 mm x 1.2 µm	Aromatic traces in light saturated hydrocarbons	10-201781 10-201433
D2743	GC-2340 50 m x 0.25 mm x 0.2 µm	Oil and oil acids	10-201662
D2800	GC-2340 60 m x 0.25 mm x 0.2 µm	FAME analysis	10-201663
D2804	GC-20M 30 m x 0.53 mm x 1.0 µm GC-210 15 m x 0.53 mm x 1.0 µm	Purity of methyl ethyl ketone	10-201464 10-201280
D2820	GC-PLOT 30 m x 0.53 mm x 15 µm	C1-C5 Hydrocarbons in the atmosphere	10-202005
D2887 Extended	GC-1 10 m x 0.53 mm x 2.65 µm GC-1 5 m x 0.53 mm x 0.88 µm	Boiling range distribution of petroleum	10-200103 10-200100
D2908	GC-624 30 m x 0.32 mm x 1.8 µm GC-624 30 m x 0.53 mm x 3.0 µm GC-20M 30 m x 0.32 mm x 0.5 µm GC-20M 30 m x 0.53 mm x 1.0 µm	Volatile organics in water	10-200841 10-200851 10-201437 10-201464

ASTM METHODS

Method	Phase Recommendation	Sample	Cat. No.
D2998	GC-1 30 m x 0.32 mm x 1.0 µm	Polyhydric alcohols in alkyd resins	10-200084
D2999	GC-1 30m x 0.53 mm x 1.5 µm	Monopentaerythritol in commercial pentaerythritol	10-200120
D3009	GC-20M 30 m x 0.32 mm x 0.5 µm GC-20M 30 m x 0.53 mm x 1.0 µm	Composition of turpentine	10-201437 10-201464
D3054	GC-Squalane 100 m x 0.25 mm x 0.2 µm GC-1 50 m x 0.32 mm x 0.5 µm	Purity and benzene content of cyclohexane Impurities in cyclohexane	*ENQUIRE* 10-200089
D3086	GC-5 50 m x 0.25 mm x 0.12 µm	Organochlorine pesticides in water	10-200353
D3168	GC-1 30 m x 0.32 mm x 1.0 µm GC-1 30 m x 0.53 mm x 1.5 µm	Polymers in emulsion paints	10-200084 10-200120
D3257	25% Bis-(2-cyanoethyl)formamide on Chromosorb PAW	Aromatics in mineral spirits	PC
D3271	GC-20M 30 m x 0.53 mm x 1.0 µm	Solvent analysis in paints	10-201464
D3304	GC-5 50 m x 0.25 mm x 0.12 µm	PCBs in environmental materials	10-200353
D3328	GC-1 30 m x 0.32 mm x 3.0 µm GC-1 30 m x 0.53 mm x 3.0 µm	Comparison of waterbome petroleum oils	10-200086 10-200122
D3329	GC-20M 60 m x 0.53 mm x 1.0 µm	Purity of methyl isobutyl ketone spirits	10-201468
D3416	GC-PLOT Q 15 m x 0.32 mm x 15 µm GC-PLOT Q 15 m x 0.53 mm x 30 µm	Total hydrocarbons, methane and CO in air	10-202050 10-202055
D3432	GC-1 30 m x 0.32 mm x 1.0 µm GC-1 30 m x 0.53 mm x 1.5 µm	Toluene diisocyanates in urethane prepolymers	10-200084 10-200120
D3447	GC-1 50 m x 0.53 mm x 5.0 µm	Purity of trichlorotrifluoroethane (CFC-113)	10-200129
D3452	GC-1 30 m x 0.53 mm x 1.5 µm	Identification of rubber	10-200120
D3457	GC-2340 60 m x 0.25 mm x 0.2 µm	FAME analysis	10-201663
D3465	GC-1 25 m x 0.32 mm x 0.52 µm GC-1 30 m x 0.53 mm x 1.5 µm	Purity of monomeric plasticizers	10-200078 10-200120
D3524	GC-1 10 m x 0.53 mm x 0.88 µm 10% OV-101 on Chromosorb WAW 80/100	Diesel fuel diluent in used diesel engine oils	PC
D3525	10% Dexsil 300 on Chromosorb WAW 80/100	Gasoline diluent in used gasoline engine oils	PC
D3534	GC-5 50 m x 0.25 mm x 0.25 µm	PCBs in water	10-200354
D3606	GC-1ms 15 m x 0.25 mm x 0.1 µm GC-TCEP 60 m x 0.25 mm x 0.4 µm	Benzene and toluene in gasoline	10-200200 10-201782
D3687	GC-20M 30 m x 0.32 mm x 0.5 µm GC-20M 30 m x 0.53 mm x 1.0 µm	Volatile organic compounds	10-201437 10-201464
D3710	GC-1 7.5 m x 0.53 mm x 5.0 µm	Boiling range distribution of gasoline and gasoline fractions	10-200101
D3725	GC-FFAP 30 m x 0.53 mm x 1.0 µm	Fatty acids in drying oils	10-201514
D3760	GC-20M 60 m x 0.32 mm x 0.25 µm GC-1 60 m x 0.32 mm x 0.50 µm	Analysis of isopropylbenzene (cumene)	10-201440 10-200094

ASTM METHODS

Method	Phase Recommendation	Sample	Cat. No.
D3797	GC-20M 60 m x 0.32 mm x 0.5 µm	Analysis of o-Xylene	10-201441
D3798	GC-20M 60 m x 0.32 mm x 0.5 µm GC-20M 60 m x 0.32 mm x 0.25 µm	Analysis of p-Xylene	10-201441 10-201440
D3876	GC-1 30 m x 0.32 mm x 1.0 µm GC-1 30 m x 0.53 mm x 1.5 µm	Methoxyl and hydroxypropyl substitution in cellulose ether products	10-200084 10-200120
D3962	GC-FFAP 30 m x 0.53 mm x 1.0 µm	Impurities in styrene	10-201514
D4059	GC-5 50 m x 0.25 mm x 0.25 µm	PCBs in insulating liquids	10-200354
D4275	GC-1 30 m x 0.32 mm x 3.0 µm GC-1 30 m x 0.53 mm x 3.0 µm	Butylated hydroxy toluene in ethylene and ethylenevinylacetate polymers	10-200086 10-200122
D4367	10% SE-30 on Chromosorb WAW 80/100 25% TCEP on Chromosorb PAW 80/100 GC-1ms 15 m x 0.25 mm x 0.1 µm GC-TCEP 50 m x 0.25 mm x 0.4 µm	Benzene in hydrocarbon solvents	10-200200 10-201781
D4415	GC-FFAP 30 m x 0.32 mm x 0.25 µm	Determination of dimer and acrylic acid	10-201502
D4420	GC-1ms 15 m x 0.25 mm x 0.1 µm GC-TCEP 60 m x 0.25 mm x 0.4 µm	Aromatics in gasoline	10-200200 10-201782
D4424	GC-PLOT AL203/S 30 m x 0.53 mm x 15 µm	Butylene analysis	10-202015
D4492	GC-TCEP 50 m x 0.25 mm x 0.4 µm GC-WAX 60 m x 0.32 mm x 0.25 µm	Analysis of benzene	10-201781 10-201616
D4534	GC-TCEP 60 m x 0.25 mm x 0.4 µm	Benzene content of cyclic products	10-201782
D4735	GC-FFAP 30 m x 0.53 mm x 1.0 µm	Trace thiophene in refined benzene	10-201514
D4768	GC-FFAP 30 m x 0.53 mm x 1.0 µm	Phenol and cresol inhibitors in insulating oils	10-201514
D4815	GC-1 30 m x 0.53 mm x 5.0 pm + TCEP precolumn (56cm)	MTBE, ETBE, TAME, DIPE, tert-amyl alcohol, C1-C4 alcohols in gasoline	10-200123 + TCEP precolumn
D4864	GC-5 15 m x 0.53 mm x 1.5 µm	Traces of methanol in propylene	10-200413
D5008	TRB-1 10 m x 0.53 mm x 5.0 µm GC 30 m x 0.32 mm x 0.25 µm GC20m	Ethyl methyl pentanol content and purity of 2-ethylhexanol	10-200105
D5060	GC-20M 60 m x 0.32 mm x 0.5 µm	Impurities in high-purity ethylbenzene	10-201441
D5134	GC-1 PONA 50 m x 0.20 mm x 0.5 µm	Petroleum naphthas through n-nonane	10-200280
D5135	GC-20M 60 m x 0.32 mm x 0.5 µm	Analysis of styrene	10-201441
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	PC PC PC

ASTM METHODS

Method	Phase Recommendation	Sample	Cat. No.
D5310	GC-5 30 m x 0.25 mm x 0.25 µm GC-225 25 m x 0.20 mm x 0.20 µm D5399 TRB-1 10 m x 0.53 mm x 3.0 µm	Tar acid composition Boiling point distribution of hydrocarbon solvents	10-200349 10-201131
D5441	GC-Petrol 100 m x 0.25 mm x 0.5 µm GC-1PONA 50 m x 0.20 mm x 0.5 µm	Analysis of MTBE	10-200260 10-200280
D5442	GC-1 30 m x 0.25 mm x 0.25 µm GC-5 30 m x 0.25 mm x 0.25 µm	Analysis of petroleum waxes	10-200049 10-200349
D5480	GC-1 60 m x 0.53 mm x 5.0 µm	Engine oil volatility by GC	10-200134
D5501	GC-Petrol 100 m x 0.25 mm x 0.5 µm	Ethanol content of denatured fuel ethanol	10-200260
D5504	GC-SULFUR 30 m x 0.32 mm x 4.0 µm	Sulfur compounds in natural gas and gaseous fuels by GC and SCD	10-200250
D5580	GC-1ms 15 m x 0.25 mm x 0.1 µm GC-TCEP 50 m x 0.25 mm x 0.4 µm GC-1 30 m x 0.53 mm x 5.0 pm + TCEP pre-column (56 cm)	Aromatics in finished gasoline	10-200200 10-201781 10-200123 + TCEP PRE-COLUMN
D5599	GC-1 10 m x 0.53 mm x 3.0 µm	Oxygenates in gasoline by GC and oxygen selective flame ionization detector	10-200104
D5623	GC-1 30 m x 0.32 mm x 4.0 µm	Sulfur compounds in light petroleum liquids by GC and sulfur selective detection	*ENQUIRE*
D5713	GC-1 PONA 50 m x 0.20 mm x 0.5 µm	Analysis of high-purity benzene for cyclohexane feedstock by capillary GC	10-200280
D5769	GC-1 60 m x 0.25 mm x 1.0 µm GC-1 60 m x 0.32 mm x 5.0 µm	Determination of benzene, toluene and total aromatics in finished gasoline by GC/MS	10-200060 10-200097
D5917	GC-20M 60 m x 0.32 mm x 0.25 µm	Trace impurities in monocyclic aromatic hydrocarbons by GC and external calibration	10-201440
D6144	GC-1 60 m x 0.25 mm x 1.0 µm	alpha-Methylstyrene by capillary GC	10-200060
D6159	GC-1 30 m x 0.53 mm x 5.0 µm	Hydrocarbon impurities in ethylene	10-200123
E0202	GC-MWAX 25 m x 0.25 mm x 0.2 µm	Analysis of glycols	10-201603
E1100	GC-WAX 30 m x 0.53 mm x 0.50 µm	Analysis of denaturated ethanol	10-201632

NIOSH REGULATORY

Method	Method Name	GC Columns	Cat. No.
1000	Allyl chloride	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1001	Methyl chloride	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1002	Chloroprene	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1003	Halogenated hydrocarbons	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1004	sym-Dichloroethyl ether	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1005	Methylene chloride	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1006	Trichlorofluoromethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1007	Vinyl chloride	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1008	Ethylene dibromide	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1009	Vinyl bromide	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1010	Epichlorohydrin	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1011	Ethyl bromide	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1012	Dibromodifluoromethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1013	1,2-Dichloropropane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1014	Methyl iodide	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1015	Vinylidine chloride	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1016	1,1 ,1,2-Tetrachloro-2,2-difluoroethane and 1,1,2,2-Tetrachloro-1,2-difluoroethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1017	Bromotrifluoromethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1018	Dichlorodifluoromethane and 1,2-Dichlorotetrafluoroethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1019	1,1,2,2-Tetrachloroethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1020	1,1,2-Trichloro-1,2,2-trifluoroethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1022	Trichloroethylene	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
1300	Ketones 1	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1301	Ketones 2	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1400	Alcohols 1	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1401	Alcohols 2	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1402	Alcohols 3	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1403	Alcohols 4	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1450	Esters 1	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
1500	Hydrocarbons, BP 36-126°C	GC-1 30 m x 0.25 mm I.D., 0.25 µm	10-200049
1501	Hydrocarbons, aromatic	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
1550	Naphthas	GC-1 60 m x 0.25 mm I.D., 0.25 µm	10-200058
1551	Turpentine	GC-1 60 m x 0.25 mm I.D., 0.25 µm	10-200058
1602	Dioxane	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1603	Acetic acid	GC-FFAP 15 m x 0.25 mm I.D., 0.25 µm	10-201490
1604	Acrylonitrile	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1606	Acetonitrile	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361

NIOSH REGULATORY

Method	Method Name	GC Columns	Cat. No.
1608	Glycidol	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1609	Tetrahydrofuran	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
1610	Ethyl ether	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1611	Methylal	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1612	Propylene oxide	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1613	Pyridine	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1614	Ethylene oxide	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
1615	Methyl-tert-butyl ether	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2000	Methanol	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2001	Cresol, all isomers	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.25 µm	10-201362
2002	Amines, aromatic	GC-X5MS 30 m x 0.25 mm I.D., 1.0 µm	10-200737
2003	1,1,2,2-Tetrabromoethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
2004	Dimethylacetamide and dimethylformamide	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2005	Nitrobenzenes	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2007	Aminoethanol compounds	GC-1 15 m x 0.25 mm I.D., 1.0 µm	10-200043
2500	2-Butanone	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2501	Acrolein	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2503	Acrolein	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
2504	Tetraethyl pyrophosphate	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
2505	Furfuryl alcohol	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2506	Acetone cyanohydrin	GC-1 15 m x 0.25 mm I.D., 1.0 µm	10-200043
2507	Nitroglycerine and ethylene glycol dinitrate	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2508	Isophorone	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
2510	1-Octanethiol	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
2513	Ethylene chlorohydrin	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2515	Diazomethane	GC-1 15 m x 0.32 mm I.D., 0.25 µm	10-200071
2516	Dichlorofluoromethane	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
2517	Pentachloroethane	GC-X5MS 30 m x 0.25 mm I.D., 0.5 µm	10-200736
2518	Hexachloro-1,3-cyclopentadiene	GC-624 30 m x 0.25 mm I.D., 1.4 µm	10-200831
2519	Ethyl chloride	GC-624 30 m x 0.32 mm I.D., 1.8 µm	10-200841
2520	Methyl bromide	GC-624 30 m x 0.32 mm I.D., 1.8 µm	10-200841
2521	Methylcyclohexanone	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
2522	Nitrosamines	GC-X5MS 30 m x 0.25 mm I.D., 0.5 µm	10-200736
2523	1,3-Cyclopentadiene	GC-1 15 m x 0.32 mm I.D., 1.0 µm	10-200073
2524	Dimethylsulfate	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2525	1-Butanethiol	GC-1 15 m x 0.32 mm I.D., 1.0 µm	10-200073
2526	Nitroethane	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2527	Nitromethane	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
2528	2-Nitropropane	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
2529	Furural	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363

NIOSH REGULATORY

Method	Method Name	GC Columns	Cat. No.
2530	Biphenyl	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
2531	Gluteraldehyde	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
2533	Tetraethyl lead (as Pb)	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
2534	Tetramethyl lead (as Pb)	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
2536	Valeraldehyde	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2537	Methylmethacrylate	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
2538	Acetaldehyde	GC-1301 15 m x 0.32 mm I.D., 1.0 µm	10-200801
2539	Aldehydes, Screening	GC-1 30 m x 0.32 mm I.D., 0.25 µm	10-200082
2541	Formaldehyde	GC-1701 30 m x 0.25 mm I.D., 0.25 µm	10-201045
3502	Phenol	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
3700	Benzene	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
3702	Ethylene oxide	GC-CHROMAWAX-10 30 m x 0.32 mm I.D., 0.5 µm	10-201363
4000	Toluene	GC-5 30 m x 0.25 mm I.D., 0.25 µm	10-200349
5012	EPN, malathion, and parathion	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5014	Chlorinated terphenyl (60% chlorine)	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5017	Dibutyl phosphate	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5019	Azelaic acid	GC-1 15 m x 0.32 mm I.D., 0.25 µm	10-200071
5020	Dibutyl phthalate and Di (2-ethylhexyl) phthalate	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5021	o-Terphenyl	GC-1 30 m x 0.25 mm I.D., 0.25 µm	10-200049
5025	Chlorinated diphenyl ether	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5029	4,4-Dimethylenedianiline	GC-5 15 m x 0.25 mm I.D., 0.25 µm	10-200341
5500	Ethylene glycol	GC-CHROMAWAX-10 15 m x 0.32 mm I.D., 0.5 µm	10-201361
5502	Aldrin and lindane	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5503	Polychlorobiphenyls	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5506	Polynuclear aromatic hydrocarbons	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5509	Benzidine and 3,3-dichlorobenzidine	GC-5 15 m x 0.53 mm I.D., 1.5 µm	10-200413
5510	Chlordane	GC-X5MS 15 m x 0.25 mm I.D., 0.25 µm	10-200731
5514	Demeton	GC-5 15 m x 0.25 mm I.D., 0.25 µm	10-200341
5515	Polynuclear aromatic hydrocarbons (in the presence of isocyanates)	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5516	2,4- and 2,6-Toluenediamine	GC-5 30 m x 0.25 mm I.D., 0.25 µm	10-200349
5517	Polychlorobenzenes	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
5518	Naphthylamines	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5519	Endrin	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5515	Polynuclear aromatic hydrocarbons (in the presence of isocyanates)	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5516	2,4- and 2,6-Toluenediamine	GC-5 30 m x 0.25 mm I.D., 0.25 µm	10-200349
5517	Polychlorobenzenes	GC-1 15 m x 0.25 mm I.D., 0.25 µm	10-200041
5518	Naphthylamines	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735
5519	Endrin	GC-X5MS 30 m x 0.25 mm I.D., 0.25 µm	10-200735

CAPILLARY COLUMN CONNECTIONS

Universal Quartz Glass Fused Silica Connectors

Our quartz connectors will join columns from 0.1 to 0.53mmID. To make a connection, cut the capillary column with a ceramic column scribe, be sure the end is cut squarely. Insert the column into the appropriate leg of the connector to make a snug fit. Heat in the GC oven under carrier gas flow for one hour at 250°C, to fuse the column's polyimide coating to the wall of the union. For a stronger physical attachment, we recommend using polyimide sealing resin.

Used to:

- Join columns from 0.1mm to 0.53mm ID
- Connect a guard column to an analytical column
- Connect a capillary column to a transfer line
- Repair a broken capillary column

Cat. No.	Description	Unit
11-100000	Universal Quartz Fused Silica Connector	Pk/5
11-100002	Universal Quartz Fused Silica Y Connector	Pk/1

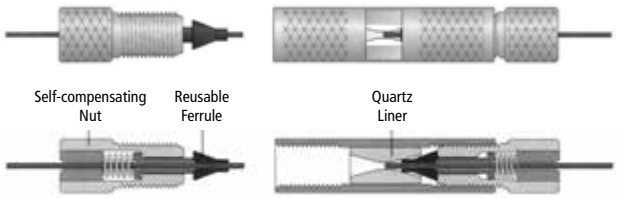
Universal Straight Connector

Universal Y Splitter

Fused Silica Visi-Union, Quartz Lined - Valco

The Visi-Union may be used at temperatures up to 400°C. It has a quartz liner and self-Compensating nuts for correct sealing force as temperature varies. Ferrules may be re-used and must be purchased separately.

Cat. No.	Description	Unit
FSKZU1	Fused Silica Union	Ea
FSQ1	Replacement Liner	Ea
FSZN1	Replacement Nut	Ea
	Ferrules for Fused Silica Visi-Union	
FS1.35-R10	Visi-Union Ferrules for 0.25mm ID Columns	pk/10
FS1.45-R10	Visi-Union Ferrules for 0.32mm ID Columns	pk/10
FS1.75-R10 V	isi-Union Ferrules for 0.53mm ID Columns	pk/10



1/32" Ultra Low Mass External Unions - Valco

For capillary tubing 0.1 to 0.32mm ID. It has very low mass and can be hand-tightened to seal. Use only with 1/32" fused silica adapters; metal ferrules cannot be used

Cat. No.	Description	Tubing OD	Unit
EU.5	1/32" Union, Bore 0.25mm		Ea
EU.5L	1/32" Union, Bore 0.50mm		Ea
EU.5T	1/32" Union, Bore 1/32"		Ea
FS.25	1/32" Fused Silica Tubing Adapter	<0.25mm	Ea
FS.4	1/32" Fused Silica Tubing Adapter	<0.25 - 4mm	Ea
FS.5	1/32" Fused Silica Tubing Adapter	<0.55mm	Ea

FID Flame Jets - Agilent Technologies

Description Instrument	Temp (°C)	Length (mm)	Tube ID (mm)	Tip Dimension (mm)	Part No
Glass Lined Flame Jets					
5890	400	61.3	0.9	0.35	103474
6890	400	42.3	0.9	0.35	103475
High Temperature Flame Jets					
5890	450	61.3	1.1	0.43	103479
6890	450	42.3	1.1	0.43	103477

5890 FID Flame Jet
Part No. 103474 & 103479

6890 FID Flame Jet
Part No. 103475 & 103477

FID Flame Jets - Varian and Antek

Instrument	Part No
Varian 3300, 3400, 3500, 3600 & 3800	103469
Antek	103470

FID Flame Jet for Varian
Part No. 103469

FID Flame Jet for Antek
Part No. 103470

Mini Unions

For fused silica capillary columns. Glass lined for inertness. Low thermal mass.

1st Column ID	2nd Column ID	Pack Contents	Cat. No.
0.05 - 0.1mm	0.05-0.1mm	1 union & 5 V/G Ferrules (0.05-0.1mmID)	103430
0.1-0.25mm	0.1-0.53mm	1 union & 5 V/G Ferrules (0.1-0.25mmID)	103431
0.32mm	0.32 - 0.53mm	1 union & 5 V/G Ferrules (0.32mmID)	103432
0.45 - 0.53mm	0.45 - 0.53mm	1 union & 5 V/G Ferrules (0.45-0.53mmID)	103433
Replacement Mini Union Nuts		Pk/5	103400

Ferrules for Mini Unions (Supplied in packs of 10)

Ferrule Style	Column ID	Part No.
100% Graphite for use with Mini Unions	0.32mm	072630
	0.53mm	072629
85% Vespel / 15% Graphite for use with Mini Unions	0.05-0.1mm	072695
	0.1-0.25mm	072696
	0.32mm	072697
	0.53mm	072698
	1/16" hole	072693
	Blank (No hole)	072694
SilTite Metal for use with SilTite Mini Unions	0.25mm	073470
	0.32mm	073471
	0.53mm	073472
	1/32"	073473

CAPILLARY COLUMN CONNECTIONS

SilTite Mini Unions

For fused silica capillary columns. Glass lined for inertness. Low thermal mass.

Why choose SilTite Unions?

SilTite unions use a unique metal ferrule specifically designed for connecting fused silica GC columns and tubing to mass spectrometer interfaces and injectors. Once fitted, SilTite ferrules provide a continuous leak free connection without the need to re-tighten the nut after a few temperature cycles.

Their performance and cost effectiveness also makes them ideal for connecting GC columns to injectors and atmospheric detectors.

- Eliminate leaks
- Never need re–tightening, even after temperature cycling
- Ferrule remains permanently fixed to the column but does not adhere to the SilTite nut
- No contamination from Vespel or Graphite materials – 100% metal
- Ideal for high pressure applications
- Also available for injector interfaces
- >500°C maximum temperature

1st Column ID	2nd Column ID	Pack Contents	Cat. No.
0.1-0.25mm	0.1-0.53mm	1 union, 2 nuts & 5 Ferrules (0.1-0.25mmID)	073550
0.32mm	0.32-0.53mm	1 union, 2 nuts & 5 Ferrules (0.32mmID)	073551
0.45-0.53mm	0.45-0.53mm	1 union, 2 nuts & 5 Ferrules (0.45-0.53mmID)	073552
Replacement SilTite Mini Union Nuts *		Pk/5	073553

**SilTite nuts must be used with SilTite ferrules*

CAPILLARY COLUMN FERRULES

Vespel Ferrules

• 100% high-temperature polyimide • Stable to 350°C • Precision-drilled ID • Durable, leak-tight

Capillary Column Ferrules	For Capillary Size	Part No.
1/16" to 0.3 mm	0.10 - 0.18 mm ID	50-100104
1/16" to 0.4 mm	0.25 mm ID	50-100106
1/16" to 0.5 mm	0.32 mm ID	50-100108
1/16" to 0.8 mm	0.53 mm ID	50-100109
1/16" to 1.0 mm	0.65 mm ID	50-100110
1/16" to 1.2 mm	0.75 mm ID	50-100111
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	50-100105
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	50-100107
1/16" to 1/16"		50-100112

Short ferrule for Agilent inlet systems; 4890, 5890 and 6890

1/16" to 0.4 mm	0.25 mm ID	50-100100
1/16" to 0.5 mm	0.32 mm ID	50-100101
1/16" to 0.8 mm	0.53 mm ID	50-100102

Graphite Ferrules

• High-purity Graphite, preferred quality for capillary GC use • Stable to 450°C
• Precision formed, superior finish to conventional graphite ferrules
• Reusable if not over tightened

Capillary Column Ferrules	For Capillary Size	Part No.
1/16" to 0.4 mm	0.25 mm ID	50-100010
1/16" to 0.5 mm	0.32 mm ID	50-100012
1/16" to 0.8 mm	0.53 mm ID	50-100013
1/16" to 1.0 mm	0.65 mm ID	50-100014
1/16" to 1.2 mm	0.75 mm ID	50-100015
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	50-100009
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	50-100011
1/16" to 1/16"		50-100052

Short ferrule for Agilent inlet systems; 4890, 5890 and 6890

1/16" to 0.4 mm	0.18 mm ID	50-100000
1/16" to 0.5 mm	0.25-0.32 mm ID	50-100002
1/1e to 0.8 mm	0.53 mm ID	50-100004
1/16" to 1.0 mm	0.53-0.65 mm ID	50-100006
1/16" to 1/16"		50-100008

Speciality Ferrules

0.5 mm ID (M8 nut), for Thermo Finnigan (formerly CE) 10/pk	50-100003
0.8 mm ID (M8 nut), for Thermo Finnigan (formerly CE) 10/pk	50-100005
Cup Ferrule for Thermo, 0.25 mm ID (M4 nut), 10/pk	50-100040
Cup Ferrule for Thermo, 0.35 mm ID (M4 nut), 10/pk	50-100041
Cup Ferrule for Thermo, 0.45 mm ID (M4 nut), 10/pk	50-100042
Cup Ferrule for Thermo, 0.8 mm ID (M4 nut), 10/pk	50-100043

CAPILLARY COLUMN FERRULES

Vespel / Graphite Ferrules

- 60% / 40% Vespel/Graphite blend - provides good sealing properties and ease of use
- Stable to 400°C.
- Recommended for GC/MS interface applications
- Reusable, preferred for high pressure and vacuum applications

Capillary Column Ferrules	For Capillary Size	Part No.
1/16" to 0.3 mm		50-100145
1/16" to 0.4 mm	0.25 mm ID	50-100147
1/16" to 0.5 mm	0.32 mm ID	50-100149
1/16" to 0.8 mm	0.53 mm ID	50-100150
1/16" to 1.0 mm	0.65 mm ID	50-100151
1/16" to 1.2 mm	0.75 mm ID	50-100171
1/16", 2-hole, 0.4 mm ea	0.25 mm ID	50-100146
1/16", 2-hole, 0.5 mm ea	0.32 mm ID	50-100148
1/16" to 1/16"		50-100152

Short ferrule for Agilent inlet systems; 4890, 5890 and 6890

1/16" to 0.3 mm	0.10 mm	ID 50-100140
1/16" to 0.4 mm	0.25 mm	ID 50-100141
1/16" to 0.5 mm	0.32 mm	ID 50-100142
1/16" to 0.8 mm	0.53 mm	ID 50-100143

CAPILLARY COLUMN NUTS

Capillary Column Nuts for Agilent 5890 / 6890 GCs

Description	Similar to Agilent Part #	Qty	Part No.
For use with Agilent "short" style ferrules			
Stainless Steel Capillary Column Nut	5181-8830	Pk/2	11-100010
Brass Capillary Column Nut	5181-8830	Pk/2	11-100012
For use with standard 1/16" ferrules			
Stainless Steel Capillary Column Nut	05921-21170	Pk/2	11-100014
Brass Capillary Column Nut	05921-21170	Pk/2	11-100016

Capillary Column Nuts for Agilent 6850 GCs

Description	Similar to Agilent Part #	Qty	Part No.
Capillary Column Nuts for Agilent 6850 GCs	5183-4732	Pk/2	11-100018

ACCESSORIES

Capillary Column Washing Reservoir

Description	Pack Size	Part No.
Washing Reservoir - 10ml	1	0625026
Replacement Parts		
TCS Pre-drilled Septa (4mm)	5	0418490
PTFE 1/16" Sealing Ring	20	072650

Capillary Column Washing Reservoir

- Removes column contamination through solvent washing
- Used to regenerate a contaminated column

Soap Bubble Flow Meters

Simple to use just measure the time it takes a soap film to travel between two calibration marks with a stopwatch. Soap Bubble Flow Meters are made from borosilicate glass. All are graduated in milliliters, except the 50mL flow Meter, which has marks at 0,25 and 50 mL, and the Triple Stage Flow Meter. Flow Meters are supplied with a rubber bulb for the soap solution, rubber tubing, and an instruction sheet. Snoop® liquid leak detector can be used as the bubble solution (not included).

Triple Stage Flow Meter - this uses three different volume regions (1 mL - 10 mL - 100 mL) that allow measurement of gas flow rates from 0.5 to 500 mL/min. It comes

Description	Part No.
1 mL Soap Bubble Flow Meter	16-100020
10 mL Soap Bubble Flow Meter	16-100021
25 mL Soap Bubble Flow Meter	16-100022
50 mL Soap Bubble Flow Meter	16-100023
Triple Stage Flow Meter	16-100024
Ring Stand	16-100025
Large Clamp	16-100026
Replacement Bulb, for 1 or 10 mL	16-100027
Replacement Bulb, for 25 mL	16-100028
Replacement Bulb, for 50 mL	16-100029
Magnetic Holder (not for 1 mL size), 2/pk	16-100030
Snoop Leak Detector	16-100031
Stopwatch, Digital	16-100032

16-100022

Triple Stage Flow Meter 16-100024

ACCESSORIES

Capillary Care Kit

Convenient kit specifically designed to help install and maintain capillary columns.

Each kit includes :

- Nylon Brushes - 1/8", 3/16" and 1/4" for cleaning injection port liners
- Magnifier with built-in light
- Steel ruler - 15cm
- 3 Column Scribes - for cleanly-cut columns
- 2 Universal Unions - for joining broken capillary columns or connecting guard columns
- Single ended pin-vice - for holding drill bits
- 3 Drill bits - 0.4mm, 0.5mm, and 0.8mm
- Pipe cleaners - 5 each, 1/8" and 1/4" OD
- Open-end wrench - 1/4" & 5/16"
- Slide-Lok tweezers - for holding small items, 'spacing' the column proper distances into the injection port etc.
- High temperature string - (400°C.) 25ft
- Ferrule Remover

Cat. No.	Description	Unit
11-100008	Capillary Care Kit	Ea

Column Scribe

Cat. No.	Description	Unit
11-100006	Column Scribe	Pk/10

Polyimide Sealing Resin

Permanently seal fused silica columns to capillary column connectors to eliminate leaks or premature separation of the column.

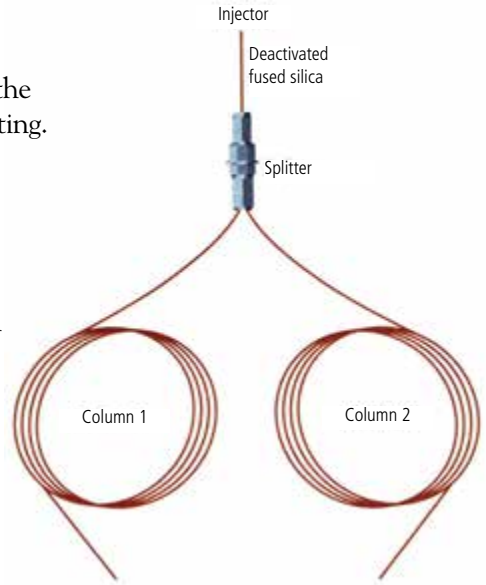
Also useful as a high temperature glue.
Maximum operating temperature is 300°C.

Cat. No.	Description	Unit
11-100004	Polyimide Sealing Resin	10gm

CAPILLARY COLUMN SPLITTERS

Fixed Inlet Splitter for Capillary Columns

When using the fixed inlet splitter for splitting from the injector to two columns, the capillary columns must have the same length and ID to achieve equal sample splitting. There are 3 kits available to suit 0.25, 0.32 and 0.45-0.53mm ID capillary columns, which are supplied with all unions and ferrules needed for installation.



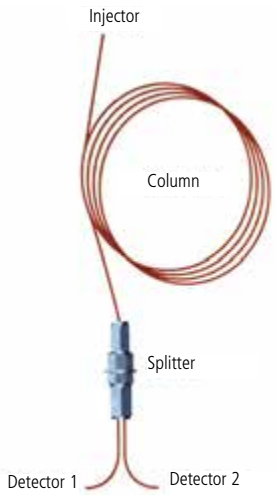
- splits an injection between two capillary columns
- fixed split ratio
- splitter is supplied complete with tubing, ferrules and nuts required for installation
- excellent for confirmation of retention data (e.g. pesticide analysis)
- inert glass lined tubing (GLT) flow path
- low dead volume
- can be used for all capillary columns (0.1-0.53mm ID)

When using the fixed inlet splitter for splitting from the injector to two columns, the capillary columns must have the same length and ID to achieve equal sample splitting. There are 3 kits available to suit 0.25, 0.32 and 0.45-0.53mm ID capillary columns, which are supplied with all unions and ferrules needed for installation.

Description	Column ID	Pack Size	Part No.
Inlet Capillary Column Splitter	0 1-0.25mm	1	123632
	0.32mm	1	123633
	0.45-0.53mm	1	123634
Replacement Ferrules	0.1-0.25mm (2-hole ferrule)	10	072662
	0.32mm (2-hole ferrule)	10	072664
	0.45-0.53mm (1-hole ferrule)	10	072655

Fixed Outlet Splitter for Capillary Columns

- designed for splitting the flow from one capillary column to two detectors.
- glass lined tubing (GLT) splitter union for inertness
- splitter is supplied complete with tubing, ferrules and nuts required for installation
- can be used for 0.1-0.32mm ID capillary columns
- for an outlet splitter for 0.53mm ID columns,



Description	Column ID	Pack Size	Part No.
Outlet Capillary Column Splitter	User-determined Spilt Ratios*	1	123630
	1:1**	1	1861460
	1:5**	1	1861461
	1:10**	1	1861462
Replacement Tubing	1:1**	2	18614600
	1:5**	2	18614610
	1:10**	2	18614620
Replacement 2-Hole Ferrules	0.1-0.25mm ID Column	10	072662
	0.32mm ID Column	10	072664

*Includes 5 meter length of 0.22mm ID deactivated fused silica tubing.

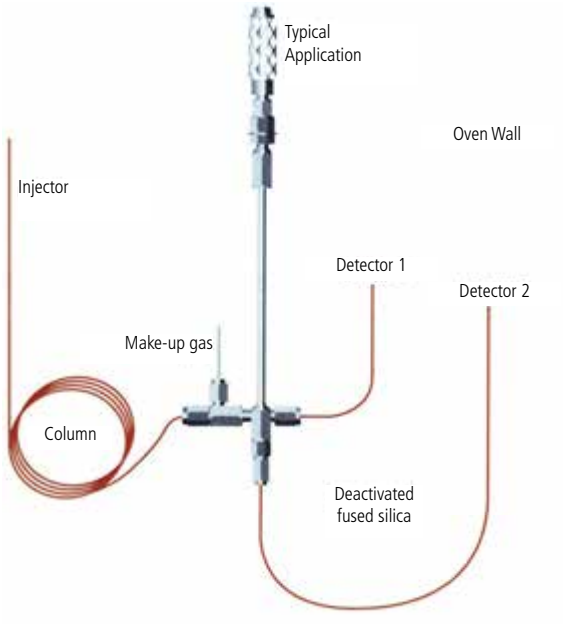
**Includes fused silica tubing pre-fused into a 2-hole ferrule for preset split ratios.

CAPILLARY COLUMN SPLITTERS

Variable Outlet Splitter for Capillary Columns

- regulates flow from one capillary column to two detectors
- make up gas tee piece built into the valve to increase flow velocity thus eliminating potential dead volume problems
- detector sensitivity is maintained
- valve control is located outside the GC oven while all parts of the flow path are inside the oven eliminating condensation problems

Description	Part No.
Capillary Variable Outlet Splitter	1236291

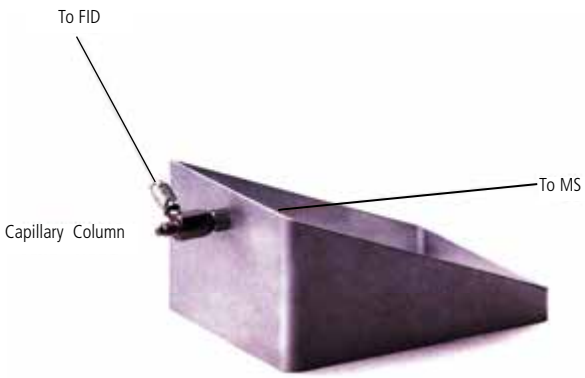


MS / FID Splitter Kit

MS / FID Splitter Kit Advantages

- splitter kit is specifically designed for splitting the flow between MS and FID detectors
- kit is supplied with a complete set of restrictors, nuts, ferrules, support bracket and pre-cut fused silica tubing
- extremely low dead volume
- inert glass lined tubing (GLT) tee piece
- can be used for all capillary columns (0.7-0.53mm ID)
- 1:1 split ratio

Description	Part No.
MS / FID Splitter	123710



Q Cap

NOTES:

Greyhound

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This Issue updated February 2014