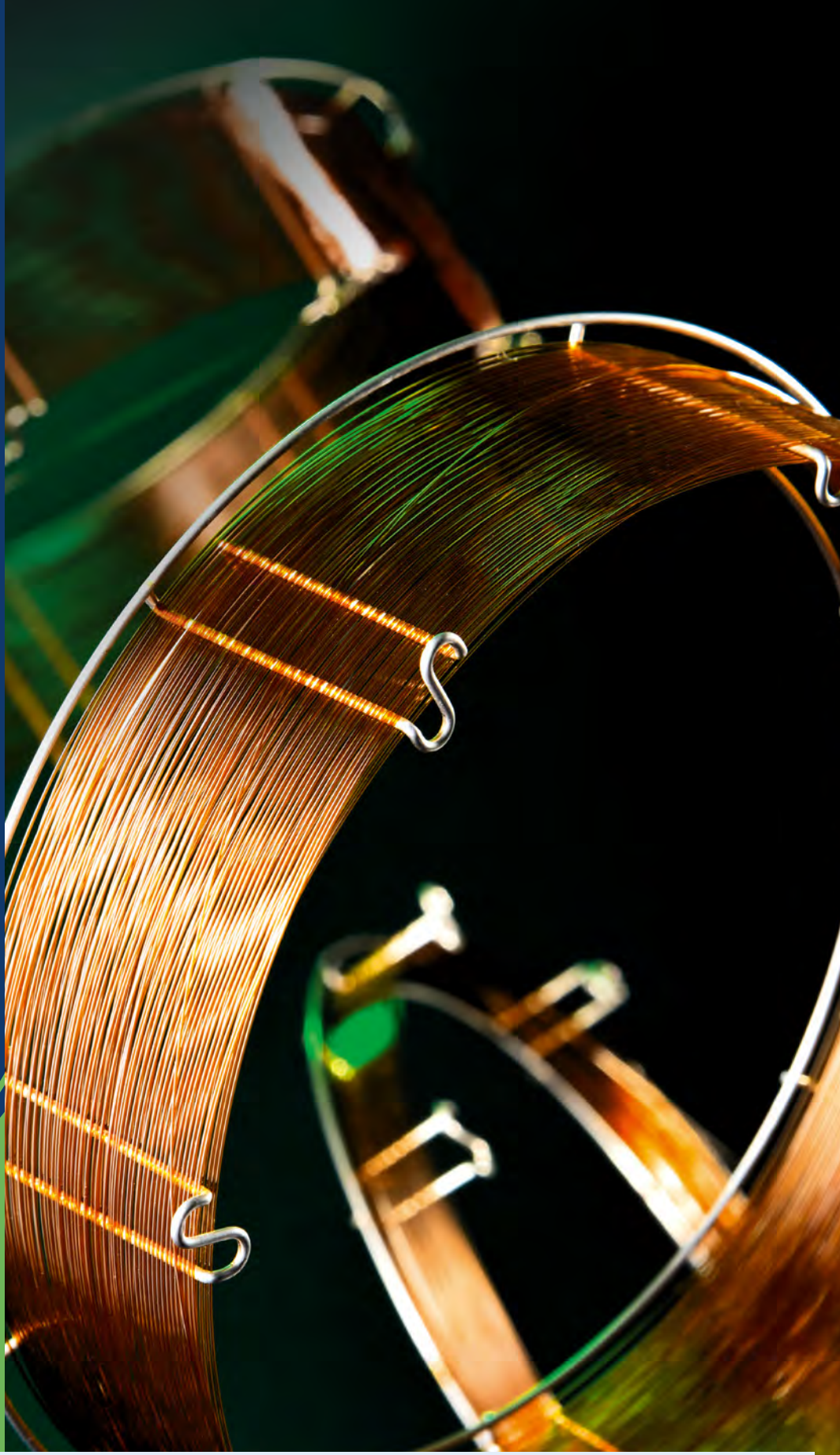
GC · GC/MS Columns

General Catalog



CHROMATOGRAPHIC SPECIALTIES INC.

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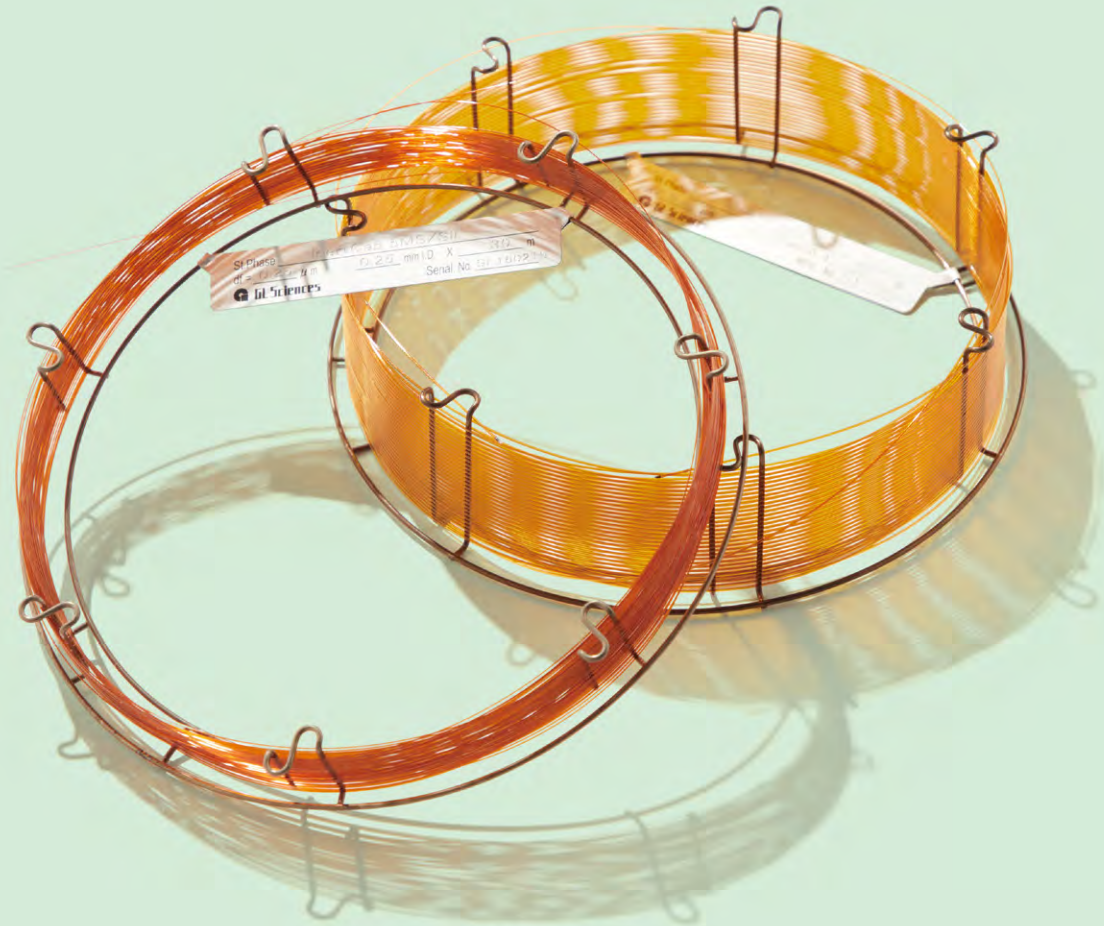
High Inertness & Ultra-low Bleed Delivery from Japan.

GC·GC/MS Capillary Columns

InertCap



Introduce

InertCap Series

Consumables

Applications

Troubleshooting Guide

GC Related Products

Features

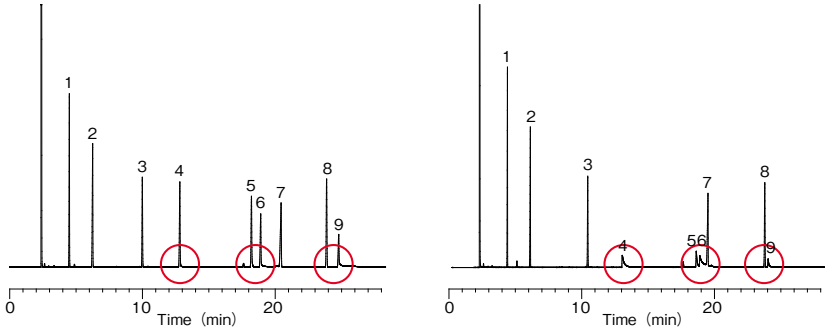
High Inertness

Inertness is one of the most difficult attributes to achieve in an analytical column. GL Sciences' proprietary inert processing technology completely eliminates residues of metal, halide and silanol which are in the column's inner surface. It is possible to obtain excellent symmetry peaks for polar, basic, acidic compounds and metal ligands.

Comparison of High-Adsorptive Samples

System : GC/FID
Column : 0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 60 ˚C - 4 ˚C/min - 250 ˚C
Injection : 250 ˚C
Detection : 250 ˚C
Sample Size : 0.1 mg/mL in methanol 0.2 µL

1. *n*-Undecane
2. *n*-Dodecane
3. 4.6-Dimethylpyrimidine
4. 1-Aminooctane
5. *N,N*-Dicyclohexylamie
6. 1-Aminodecane
7. *n*-Heptadecane
8. 2.6-Dimethylaniline
9. 1-Aminododecane



InertCap Pure-WAX

Brand A

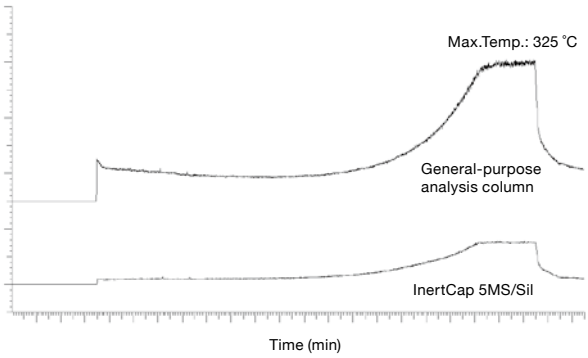
Ultra-Low Bleed

In GC/MS analysis, it is important to select a low bleed column that has little baseline rise to improve the S/N ratio and detection limit, also to prevent contamination in the MS detector.

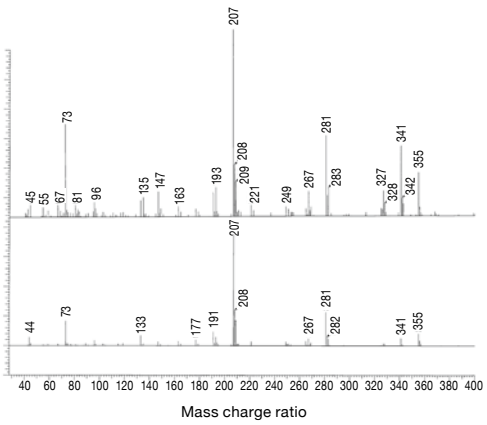
The increased baseline is caused when the siloxane (Si-O) liquid phase is decomposed by high temperature into cyclic siloxane; which can be seen in the MS spectrum as *m/z* 207.

Based on superior technologies for cross-linking of stationary phases and surface deactivation of fused silica InertCap columns for GC/MS analysis offers technologies, with ultra-low bleed.

Column Bleed Comparison



Spectrum Intensity Comparison



Quality Assurance

InertCap Capillary columns are manufactured and shipped under strict quality control at the GL Science factory, Japan, in accordance with ISO9001 quality certification. InertCap is tested by standard samples which are includes high adsorption compounds.

Inspection Report

To achieve the highest quality assurance standards, all columns are tested for quality. The inspection report includes theoretical plate number (N) and coating efficiency (CE), to ensure optimal separation and stable quality.

Also, to guarantee the specific performance of some products, a test chromatogram reporting the separation and adsorption of related standard components is included.

Operation Information of GC Capillary Columns

Column Installation Procedure

1. Uncoil the ends of the column long enough to reach the injector and detector.
2. Slide the nut and ferrule onto the inlet end of the column and cut 1 cm from the end of the column using a recommended cutters such as a capillary fine cutter or ceramic tube cutter. To cut a column clean and square is extremely important because cracked column walls or column blockage result in poor chromatography.
3. Refer to the GC Capillary instruction manual for the insertion length of the inlet end into the injection port.
4. Set the pressure of carrier gas and make sure that the flow rate is proper and there is no leak. Linear carrier gas velocity is approx. 30 cm/sec (He). For setting the head pressure, refer to the table below (internal injection port pressure). The column head pressure differs depending on the type of GC and carrier gas.

Relationship Between Column and Head Pressure

Length / I.D.	0.18 mm I.D.	0.25 mm I.D.	0.32 mm I.D.	0.53 mm I.D.
20 m	150 kPa (1.5 bar, 21.8 psi)	–	–	–
30 m	–	100 kPa (1.0 bar, 14.5 psi)	70 kPa (0.7 bar, 10.2 psi)	20 kPa (0.2 bar, 2.9 psi)
60 m	–	200 kPa (2.0 bar, 29.0 psi)	140 kPa (1.4 bar, 20.3 psi)	50 kPa (0.5 bar, 7.2 psi)

5. The installation procedure of the outlet end is the same as for the inlet end. Slide the nut and ferrule onto the outlet end of the column and cut 1 cm from the end of column using a cutter. Connect the end as described in instruction manual. When conditioning the column, disconnect the outlet end from the detector to prevent contamination.

   To check for gas leaks, use the leak detector LD239 (Cat. No. 2702-19340). Do not use soap solution such as snoop for high sensitivity analysis as it may cause contamination of the entire system.

Column Conditioning

1. Verify the carrier gas is at the rate you intend. Replace the gas purification tube (moisture, oxygen and for organic matter removal) as necessary.
2. Don't connect the capillary column to the detector.
3. Purge the column with carrier gas for more than 20 minutes at room temperature and set a temperature programing rate of 5 to 10 ˚C/minute varying with stationary phase described below. Be aware that it may result in unwilling performance if the column is heated with insufficient purge.
4. Program the oven either to 10 ˚C higher than the final temperature required in the analysis or to the isothermal Max. Temperature whichever is lower. After the oven temperature reaches the final set point, hold this temperature for 1 to 2 hours varying with stationary phase described below.

On Silicone Stationary Phase
Temperature programing rate: 10 ˚C/minute
Holding Time at the Final Temperature: 2 hours

On Wax Stationary Phase
Temperature programing rate: 5 ˚C/minute
Holding Time at 100 ˚C 30 minutes (For dehydration)
Holding Time at the Final Temperature: 2 hours

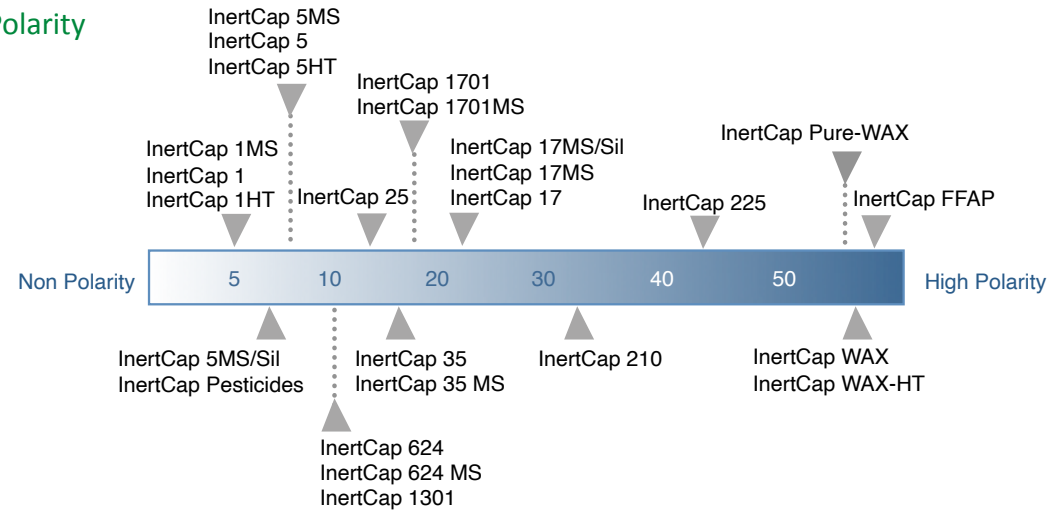
5. After the conditioning completed, connect the column to the detector. After resetting to the analysis initial temperature, the baseline gradually decreases for approx. 10 minutes. Then the baseline stabilizes, and the analysis can be started.

Lineup

InertCap Product Line

Phase	Phase Composition	USP Code	Polarity	Application
InertCap 1MS	100 % Dimethylpolysiloxane	G1, G2, G38	None	General purpose, Hydrocarbons, PCBs, High Volatile solvents, Phenols
InertCap 1	100 % Dimethylpolysiloxane	G1, G2, G38	None	General purpose, Hydrocarbons, PCBs, High Volatile solvents, Phenols
InertCap 1HT	100 % Dimethylpolysiloxane	G1, G2, G38	None	High Boiling Petroleum Products, Diesel Fuel, Long-chained Hydrocarbons, Motor Oils, Polymers
InertCap 5MS/Sil	5 % Diphenyl (equiv.) - Dimethylpolysilphenylene siloxane	G27, G36	Low	General purpose, Halogenated compounds, Phenols, Pesticides, FAME
InertCap 5MS	5 % Diphenyl 95 % Dimethylpolysiloxane	G27, G36	Low	General purpose, Halogenated compounds, Phenols, Pesticides, FAME
InertCap 5	5 % Diphenyl 95 % Dimethylpolysiloxane	G27, G36	Low	General purpose, Halogenated compounds, Phenols, Pesticides, FAME
InertCap 5HT	5 % Diphenyl (equiv.) - Dimethylpolysilphenylene siloxane	G27, G36	Low	High Boiling Petroleum Products, Diesel Fuel, Long-chained Hydrocarbons, Motor Oils, Polymers
InertCap 624MS	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	G43	Medium	Residual solvents of Pharmaceuticals, VOCs, Alcohols
InertCap 624	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	G43	Medium	VOCs, Alcohols
InertCap 1301	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	G43	Medium	Pesticides, PCBs, Alcohols, VOCs
InertCap 25	25 % Diphenyl 75 % Dimethylpolysiloxane	G28	Medium	Pesticides, PCBs, Alcohols, VOCs
InertCap 35MS	35 % Diphenyl 65 % Dimethylpolysiloxane	G42	Medium	Pesticides, Pharmaceuticals, Polycyclic aromatics
InertCap 35	35 % Diphenyl 65 % Dimethylpolysiloxane	G42	Medium	Pesticides, Pharmaceuticals
InertCap 1701MS	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	G46	Medium	Pesticides, Sugar, TMS derivatives, Drugs, Alcohols. Steroids
InertCap 1701	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	G46	Medium	Pesticides, Sugar, TMS derivatives, Drugs, Alcohols. Steroids
InertCap 17MS/Sil	50 % Diphenyl(equiv.) - 50 % Dimethylsilphenylene Siloxane	G3	Medium	Pesticides
InertCap 17MS	50 % Diphenyl 50 % Dimethylpolysiloxane	G3	Medium	Steroids, Drugs, Pesticides
InertCap 17	50 % Diphenyl 50 % Dimethylpolysiloxane	G3	Medium	Steroids, Drugs, Pesticides
InertCap 210	50 % Trifluoropropyl 50 % Methylpolysiloxane	G6	Medium	Organophosphorus acids
InertCap 225	50 % Cyanopropylmethyl 50 % Phenylmethylpolysiloxane	G7, G19	Medium to high	FAME
InertCap Pure-WAX	Polyethylene Glycol	G14, G15, G16, G20, G39, G47	High	General purpose, Esters, Perfumes, Alcohols, Aromatic hydrocarbons, FAME
InertCap WAX	Polyethylene Glycol	G14, G15, G16, G20, G39, G47	High	General purpose, Esters, Perfumes, Alcohols, Aromatic hydrocarbons, FAME
InertCap WAX-HT	Polyethylene Glycol	G14, G15, G16, G20, G39, G47	High	General purpose, Esters, Perfumes, Alcohols, Aromatic hydrocarbons, FAME
InertCap FFAP	Nitroterephthalic acid modified Polyethylene Glycol	G25, G35	High	FAME, Free fatty acids, Organic acids, Alcohols, Aldehydes

Columns Polarity



Column Cross Reference

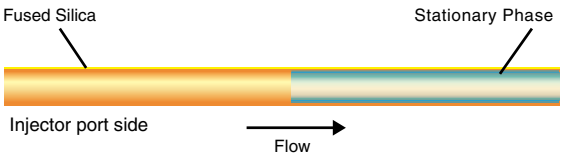
Phase	Phase Composition	Agilent	Agilent (Varian)	Agilent (Chrompack)	Restek	Merck (Supelco)
InertCap 1MS	100 % Dimethylpolysiloxane	DB-1ms, DB-1ms UI HP-1ms, HP-1ms UI	VF-1 ms	CP-Sil 5 CB Low Bleed/MS	Rxi-1MS	Equity-1
InertCap 1	100 % Dimethylpolysiloxane	DB-1, HP-1 ULTRA-1	–	CP-Sil 5 CB	Rtx-1	SPB-1
InertCap 1HT	100 % Dimethylpolysiloxane	DB-1ht	–	–	Rxi-1HT	–
InertCap 5MS/Sil	5 % Diphenyl (equiv.) - Dimethylpolysilphenylene siloxane	DB-5ms, DB-5ms UI	VF-5 ms	CP-Sil 8 CB Low Bleed/MS	Rxi-5Sil MS	SLB-5 ms
InertCap 5MS	5 % Diphenyl 95 % Dimethylpolysiloxane	HP-5ms, HP-5ms UI	–	–	Rxi-5MS Rtx-5MS	Equity-5
InertCap 5	5 % Diphenyl 95 % Dimethylpolysiloxane	DB-5, HP-5 ULTRA-2	–	CP-Sil 8 CB	Rtx-5	SPB-5
InertCap 5HT	5 % Diphenyl (equiv.) - Dimethylpolysilphenylene siloxane	DB-5ht, HP-5ht	VF-5ht	CP-SimDist	Rxi-5HT	–
InertCap 624MS	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	DB-624 UI	VF-624 ms	–	Rxi-624Sil MS	–
InertCap 624	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	DB-624 HP-VOC	-	CP-Select 624 CB	Rtx-624	–
InertCap 1301	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	DB-1301 HP-1301	VF-1301 ms	CP-1301	Rtx-1301	SPB-1301
InertCap 25	25 % Diphenyl 75 % Dimethylpolysiloxane	–	–	–	–	–
InertCap 35MS	35 % Diphenyl(equiv.) 65 % Dimethylpolysiloxane	DB-35ms, DB-35ms UI	VF-35 ms	–	Rxi-35Sil MS	–
InertCap 35	35 % Diphenyl 65 % Dimethylpolysiloxane	DB-35 HP-35	–	–	Rtx-35	SPB-35
InertCap 1701MS	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	–	VF-1701 ms	–	–	–
InertCap 1701	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	DB-1701	–	CP-Sil 19 CB	Rtx-1701	SPB-1701
InertCap 17MS/Sil	50 % Diphenyl(equiv.) - 50 % Dimethylsilphenylene Siloxane	DB-17 ms	VF-17 ms	–	Rxi-17Sil MS	–
InertCap 17MS	50 % Diphenyl 50 % Dimethylpolysiloxane	DB-17 ms	VF-17 ms	CP-Sil 24 CB Low Bleed/MS	Rxi-17Sil MS	–
InertCap 17	50 % Diphenyl 50 % Dimethylpolysiloxane	DB-17 HP-50+	–	CP-Sil 24 CB	Rxi-17 Rtx-50	SPB-50
InertCap 210	50 % Trifluoropropyl 50 % Methylpolysiloxane	DB-210 DB-200	VF-200 ms	–	Rtx-200	–
InertCap 225	50 % Cyanopropylmethyl 50 % Phenylmethylpolysiloxane	DB-225	–	CP-Sil 43 CB	Rtx-225	–
InertCap Pure-WAX	Polyethylene Glycol (PEG)	DB-WAX UI, DB-WAX UI HP-INNOWAX	–	CP-WAX 52 CB	Rtx-Wax Stabilwax	SUPELCOWAX-10
InertCap WAX	Polyethylene Glycol (PEG)	DB-WAX HP-INNOWax	–	CP-WAX 52 CB	Rtx-Wax Stabilwax	SUPELCOWAX-10
InertCap WAX-HT	Polyethylene Glycol (PEG)	DB-WAXetr	VF-WAXms	CP-WAX 52 CB	–	SUPELCOWAX-10
InertCap FFAP	Nitroterephthalic acid modified Polyethylene Glycol	DB-FFAP HP-FFAP	–	CP-WAX 58 CB	–	Stabilwax-DA
InertCap Pesticides	5 % Diphenyl (equiv.) - Dimethylpolysilphenylene siloxane	–	–	–	–	–
InertCap AQUATIC	25 % Diphenyl 75 % Dimethylpolysiloxane	–	–	–	–	–
InertCap AQUATIC-2	25 % Diphenyl 75 % Dimethylpolysiloxane	–	–	–	–	–
InertCap for Amines	GL Sciences Original	–	–	–	–	–
InertCap CHIRAMIX	GL Sciences Original	–	–	–	–	–

Application Specific Columns

Phase	Phase Composition	USP Code	Polarity	Application
InertCap Pesticides	5 % Diphenyl (equiv.) - Dimethylpolysiphenylene siloxane	G27	Low	Multi component screening of pesticides
InertCap for Amines	GL Sciences original	–	–	Amines, Alcohols
InertCap CHIRAMIX	GL Sciences original	–	–	Optical isomers
InertCap AQUATIC	25 % Phenyl 75 % Methylpolysiloxane	G28	Medium	VOCs, 1,4-dioxane, Organic solvents
InertCap AQUATIC-2	25 % Phenyl 75 % Methylpolysiloxane	G28	Medium	VOCs, Organic solvents

InertCap ProGuard - Build-in Guard Column

Guard columns and retention gaps are used widely in gas chromatography. Both are short (1-10 m) piece of uncoated deactivated fused silica tubing which are placed in-line between the GC injection port and the analytical capillary column. Guard column is to protect the analytical column from contamination, not allowing nonvolatile materials to reach the analytical column. Retention gap is to help focus the compounds in large volume injected from the inlet to a small band at the head of the analytical column. InertCap ProGuard is a “guard column built-in” analytical capillary column without the connection for such purposes. For this reason, now there is no need to worry about leakage and compounds adsorption.

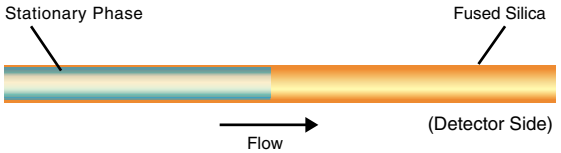


InertCap ProGuard

Phase (column)	I.D.	Length	Thickness	Guard column Length	Max. Temperature	Cat.No.
InertCap 1MS	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-12172
				5 m		1010-12173
				10 m		1010-12174
InertCap 1	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-11172
				5 m		1010-11173
				10 m		1010-11174
InertCap 1HT	0.25 mm	30 m	0.25 µm	5 m	prog.400 °C	1010-90902
	0.32 mm					1010-90907
InertCap 5MS/Sil	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15172
				5 m		1010-15173
				10 m		1010-15174
InertCap 5MS	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-18941
				5 m		1010-18942
				10 m		1010-18943
InertCap 5	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-18172
				5 m		1010-18173
				10 m		1010-18174
InertCap 5HT	0.25 mm	15m	0.25 µm	5 m	iso380-prog.400 °C	1010-90924
		30m				1010-90926
	0.32 mm	15m	0.1 µm			1010-90932
		30m				1010-90935
InertCap Pesticides	0.25 mm	30 m	0.2 µm	2 m	iso.325-prog.350 °C	1010-15175
				5 m		1010-15176
				10 m		1010-15177
InertCap Pure-WAX	0.25 mm	30 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68490
				5 m		1010-68491
				10 m		1010-68494

InertCap T.L. - Built-in Transfer Line

Transfer lines are widely used for connecting interface of GC chromatography and MS. InertCap T.L. is a “transfer line built-in” analytical capillary column without connectors. Transfer line prevents degradation of stationary phase and keeps it low bleed. Additionally, transfer line is inert to transfer samples with no adsorption. Therefore there is no need to worry about leakage and compound adsorption.



InertCap T.L.

Phase (column)	I.D.	Length	Thickness	Transfer Line Length	Max. Temperature	Cat.No.
InertCap 1MS	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-12192
InertCap 5MS/Sil	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15192
InertCap Pesticides	0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15191
InertCap Pure-WAX	0.25 mm	30 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68492
	0.25 mm	60 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68493

Japanese Pharmacopeia

Target Compounds	Phase	Column Dimension	Recommend Column Cat.No.
Acetohexamide	InertCap 1	0.53 mm I.D. x 30 m df = 1.50 µm	1010-11446
Ethanol Dehydrated Ethanol Ethanol for Disinfection	InertCap 624 Note: If necessary, identify suitable analysis conditions with stationary phase which is different from polarity of benzene.	0.32 mm I.D. x 30 m df = 1.80 µm	1010-14747
Epirubicin Hydrochloride	InertCap WAX InertCap Pure-WAX	0.53 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-67445 1010-68445
Glycerol Concentrated Glycerin	InertCap 1701	0.32 mm I.D. x 30 m df = 1.00 µm	1010-61245
Wood Creosote Purity test of Coal Creosote	InertCap 5 InertCap 5MS InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142 1010-18642 1010-15142
Wood Creosote Purity test of Acenaphthene	InertCap 1	0.25 mm I.D. x 60 m df = 0.25 µm 0.25 mm I.D. x 60 m df = 0.40 µm	1010-11162 1010-11163
Colchicine	InertCap Pure-WAX	0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445
Magnesium Stearate	InertCap WAX-HT InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 0.50 µm	1010-68644 1010-68244 1010-67244
Sevoflurane	InertCap 624	0.32 mm I.D. x 30 m df = 1.80 µm	1010-14747
Teceleukin (Gene Recombination)	G-300	1.20 mm I.D. x 40 m df = 1.00 µm	On request
Panipenem	G-950	1.20 mm I.D. x 40 m df = 25 µm	On request
Benzyl Alcohol	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 0.50 µm	1010-68244 1010-67244
Labetalol Hydrochloride	InertCap 1	0.53 mm I.D. x 30 m df = 5.00 µm	1010-11449
Iohexol (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 5	0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142
Clomiophene Citrate (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 1	0.25 mm I.D. x 15 m df = 0.10 µm	1010-11120
Anhydrous Lactose (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 5 Medium polar deactivated fused silica tube	0.25 mm I.D. x 15 m df = 0.25 µm 0.53 mm I.D. x 2 m	1010-18122 1010-36782
Bupivacaine Hydrochloride Hydrate (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 5	0.32 mm I.D. x 30 m df = 0.25 µm	1010-18242
Lenograstim (Gene Recombination) (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm	1010-61142

5.01 Crude Drugs Test

Description (Japanese Pharmacopoeia,16th Edition)	Application Column	Dimension	Cat.No.
Polygala root, polygala root powder, Licorice, Licorice powder, Chinese Cinnamon, Chinese Cinnamon powder, Red Ginseng, Asiasarum Root, Cornus Fruit, Senna Leaf, Senna Leaf Powder, Perilla Herb, Jujube, Citrus Unshiu Peel, Carrot, Carrot Powder, Eriobotryae Folium, Moutan Bark, Moutan Bark Powder.	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-61242 1010-61244 1010-61245

Japanese Pharmacopeia

9.41 Reagents and Test Solutions

Description (Japanese Pharmacopoeia, 16th Edition)	Phase	Column Dimensions	Cat.No.
α-BHC (α-hexachlorocyclohexane)	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-61242 1010-61244 1010-61245
P,P'-DDD(2,2-bis (4-chlorophenyl)-1, 1-dichloroethane)	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-61242 1010-61244 1010-61245
Guaiacol, for quantitative determination	InertCap 1	0.25 mm I.D. x 60 m df = 0.25 µm 0.25 mm I.D. x 60 m df = 0.40 µm	1010-11162 1010-11163
Diethyl Ether, for purity test of Crude Drugs	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-61242 1010-61244 1010-61245
Dibenz[a,h] anthracene	InertCap 5 InertCap 5MS InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142 1010-18642 1010-15142
N,N-dimethylacetamide	InertCap Pure-WAX InertCap WAX	0.25 mm I.D. x 30 m df = 0.50 µm 0.25 mm I.D. x 30 m df = 0.50 µm	1010-68144 1010-67144
Cilastatinammonium, for quantitative determination	InertCap 5	0.53 mm I.D. x 30 m df = 5.00 µm	1010-18449
1-vinyl-2-Pyrrolidone	InertCap Pure-WAX InertCap WAX InertCap WAX-HT	0.53 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445 1010-67445 1010-68745
Hexane, for purity test of Crude Drugs	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.50 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-61242 1010-61244 1010-61245
Benz[a] anthracene	InertCap 5 InertCap 5MS InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142 1010-18642 1010-15142
Benzo[a] Pyrene	InertCap 5 InertCap 5MS InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142 1010-18642 1010-15142
2-methoxy-4- methylphenol	InertCap 1	0.25 mm I.D. x 60 m df = 0.25 µm 0.25 mm I.D. x 60 m df = 0.40 µm	1010-11162 1010-11163
3-chloro-1, 2-propanediol (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap 5	0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142
Ethyl formate (Supplement I to the Japanese Pharmacopoeia,16th Edition)	InertCap Pure-WAX InertCap WAX InertCap WAX-HT	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-68142 1010-67142 1010-68542

United States Pharmacopeia (USP) GC Phases

USP	Phase Composition	GL Phase		
G1	Dimethylpolysiloxane oil	InertCap 1MS	InertCap 1	
G2	Dimethylpolysiloxane gum	InertCap 1MS	InertCap 1	
G3	50 % Phenyl - 50 % methylpolysiloxane	InertCap 17MS/Sil	InertCap 17MS	InertCap 17
G6	Trifluoropropylmethyl polysiloxane	InertCap 210		
G7	50 % 3-Cyanopropyl - 50 % phenylmethylsilicone	InertCap 225		
G14	Polyethylene glycol(av.mot.wt.of 950 to 1050)	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT
G15	Polyethylene glycol(av.mot.wt.of 3000 to 3700)	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT
G16	Polyethylene glycol compound(av.mot.wt.about 15,000). A high molecular weight compound of with a diepoxide linker Polyethylene glycol	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT
G19	25 % Phenyl - 25 % cyanopropyl - 50 % methylsilicone	InertCap 225		
G20	Polyethylene glycol(av.mot.wt.of 380 to 420)	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT
G25	Polyethylene glycol compound TPA. A high molecular weight compound of polyethylene glycol and diepoxide that is esterified with terephtharic acid. Available commercially as Carbowax 20M-TPA from suppliers of chromatographic reagents.	InertCap FFAP		
G27	5 % Phenyl - 95 % methylpolysiloxane	InertCap 5MS/Sil	InertCap 5MS	InertCap 5
G28	25 % Phenyl - 75 % methylpolysiloxane	InertCap 25	InertCap AQUATIC	InertCap AQUATIC-2
G35	A high molecular weight compound of a polyethylene glycol and a diepoxide that is eaterified with nitroterephthalic acid.	InertCap FFAP		
G36	1 % Vinyl - 5 % phenylmethylpolysiloxane	InertCap 5MS/Sil	InertCap 5MS	InertCap 5
G38	Phase G1 containing a small percentage of a tailing inhibitor	InertCap 1MS	InertCap 1	
G39	Polyethylene glycol(av.mol.wt.of about 1500)	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT
G42	35 % phenyl-65 % dimethylpolysiloxane(percentage refer to molar substitution)	InertCap 35MS	InertCap 35	
G43	6 % cyanopropylphenyl-94 % dimethylpolysiloxane	InertCap 624	InertCap 1301	
G46	14 % Cyanopropylphenyl - 86 % methylpolysiloxane	InertCap 1701MS	InertCap 1701	
G47	Polyethylene glycol(av.mol.wt.of about 8000)	InertCap Pure-WAX	InertCap WAX	InertCap WAX-HT

EPA Method

Method	Applications	Phase	Column Dimensions	Cat.No.
501.3	Measurement of trihalomethanes in drinking water	InertCap 624	0.53 mm I.D. x 30 m df = 3.00 µm	1010-14948
502.2	Volatile organic compounds(VOC) in water	InertCap 624	0.53 mm I.D. x 30 m df = 3.00 µm	1010-14948
504.1	1,2-Dibromoethane (EDB), 1,2-Dibromo-3-chloropropane (DBCP),and 1,2,3-Trichloropropane (123TCP)	InertCap 1	0.32 mm I.D. x 30 m df = 1.00 µm	1010-11245
505	Organohalide pesticides	InertCap 1 InertCap 5	0.32 mm I.D. x 30 m df = 1.00 µm 0.25 mm I.D. x 30 m df = 1.00 µm	1010-11245 1010-18145
506	Determination of phthalate and adipate esters	InertCap 1 InertCap 5	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.25 µm	1010-11242 1010-18242
507	Determination of nitrogen- and phosphorus-containing pesticides in water	InertCap 5MS/Sil InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-15142 1010-61445
508.1	Organochlorine pesticides and PCBs	InertCap 5MS/Sil InertCap 5 InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142 1010-18142 1010-61142
515	Determination of chlorinated acids in water	InertCap 5	0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142
515.2	Determination of chlorinated acids in water	InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm	1010-61142
515.3	Determination of chlorinated acids in drinking water by liquid-liquid extraction, derivatization and gas chromatography with electron capture detection	InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm	1010-61142
515.4	Determination of chlorinated acids in water by liquid-liquid microextraction, derivatization, and fast gas chromatography with electron capture detection	InertCap 1701	0.32 mm I.D. x 30 m df = 0.25 µm	1010-61242
524.2	Measurement of purgeable organic compounds in water by capillary column gas chromatography/mass spectrometry (GC/MS)	InertCap 624	0.53 mm I.D. x 30 m df = 3.00 µm 0.53 mm I.D. x 75 m df = 3.00 µm	1010-14948 1010-14978
525.2	Determination of organic compounds in drinking water	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
526	Determination of selected semivolatile organic compounds in drinking water by solid phase extraction and capillary column gas chromatography/ mass spectrometry (GC/MS)	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
527	Determination of selected pesticides and flame retardants in drinking water by solid phase extraction and capillary column gas chromatography/ mass spectrometry (GC/MS)	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
528	Determination of phenols in drinking water by solid phase extraction and capillary column gas chromatography/mass spectrometry (GC/MS)	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
529	Determination of phenols in drinking water by solid phase extraction and capillary column gas chromatography/mass spectrometry (GC/MS)	InertCap 5MS/Sil	0.25 mm I.D. x 15 m df = 0.25 µm	1010-15122
551	Determination of chlorination disinfection byproducts, chlorinated solvents, and halogenated pesticides, herbicides in drinking water	InertCap 5	0.25 mm I.D. x 30 m df = 1.00 µm	1010-18145
551.1	Chlorinated solvents & disinfection by-products	InertCap 1MS InertCap 1301	0.25 mm I.D. x 30 m df = 1.00 µm 0.25 mm I.D. x 30 m df = 1.00 µm	1010-12145 1010-60145
552	Haloacetic acids	InertCap 5 InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 30 m df = 0.25 µm	1010-18142 1010-61142
556	Determination of carbonyl compounds in drinking water by pentafluorobenzylhydroxylamine derivatization and capillary gas chromatography with electron capture detection	InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm	1010-61142
556.1	Determination of carbonyl compounds in drinking water by fast gas chromatography	InertCap 5MS/Sil	0.10 mm I.D. x 10 m df = 0.10 µm	Contact Us
		InertCap 1701	0.10 mm I.D. x 10 m df = 0.10 µm	Contact Us
601	Purgeable halocarbons	InertCap 624	0.53 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 3.00 µm	Contact Us 1010-14948
602	Purgeable aromatics	InertCap 624	0.53 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 3.00 µm	Contact Us 1010-14948
603	Acrolein and acrylonitrile	InertCap 624	0.25 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 3.00 µm	Contact Us 1010-14948
604/605	Phenols & benzidines	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
606	Phthalate esters	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
607	Nitrosamines	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.50 µm	1010-15144

EPA Method

Method	Applications	Phase	Column Dimensions	Cat.No.
609	Nitroaromatics and isophorone	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.50 µm	1010-15144
610	Polycyclic aromatic hydrocarbons	InertCap 5MS/Sil	0.32 mm I.D. x 30 m df = 0.10 µm 0.32 mm I.D. x 30 m df = 0.25 µm	1010-15240 1010-15242
611	Haloethers	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.50 µm	1010-15144
612	Chlorinated hydrocarbons	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.10 µm 0.25 mm I.D. x 60 m df = 0.10 µm 0.32 mm I.D. x 30 m df = 1.00 µm	1010-15140 1010-15160 1010-15245
615	Chlorinated pesticides	InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-61142 1010-61445
619	Triazine herbicides	InertCap 17	0.25 mm I.D. x 30 m df = 0.50 µm 0.53 mm I.D. x 30 m df = 1.00 µm	Contact Us 1010-65445
624	Purgeables	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm 0.53 mm I.D. x 30 m df = 3.00 µm	1010-14646 1010-14948
625	Semi volatile organic compounds	InertCap 5MS/Sil	0.32 mm I.D. x 30 m df = 0.25 µm	1010-15242
680	Pesticides and PCBs in water and soil/sediment	InertCap 1MS InertCap 5MS/Sil	0.32 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.25 µm	1010-12242 1010-15242
1624	Volatile organic compounds by isotope dilution GC/MS	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm 0.53 mm I.D. x 30 m df = 3.00 µm	1010-14646 1010-14948
1625	Semivolatile organic compounds by isotope dilution	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
1653	Chlorinated phenols in waste water by in-situ MS acylation and GC low bleed/MS	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.32 mm I.D. x 30 m df = 0.25 µm	1010-15142 1010-15242
8010	Halogenated volatile organics	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm	1010-14646
8011	1,2-dibromoethane and 1,2-dibromo-3-chloropropane	InertCap 1	0.32 mm I.D. x 30 m df = 0.25 µm	1010-11242
8015	Non-halogenated volatile organics	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm 0.53 mm I.D. x 30 m df = 3.00 µm	1010-14646 1010-14948
8021	Aromatic volatile organics	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm 0.53 mm I.D. x 30 m df = 3.00 µm	1010-14646 1010-14948
8030/8031	Acrolein, acrylonitrile, acetonitrile	InertCap 624	0.25 mm I.D. x 30 m df = 1.40 µm 0.53 mm I.D. x 30 m df = 3.00 µm	1010-14646 1010-14948
8040/8041	Phenols	InertCap 5	0.25 mm I.D. x 30 m df = 0.25 µm 0.53 mm I.D. x 30 m df = 1.50 µm	1010-18142 1010-18446
8061	Determination of phthalate and adipate esters	InertCap 5 InertCap 1701	0.53 mm I.D. x 30 m df = 1.50 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-18446 1010-61445
8080	Organochlorine pesticides and PCBs	InertCap 1 InertCap 5MS/Sil	0.53 mm I.D. x 30 m df = 1.50 µm 0.25 mm I.D. x 30 m df = 0.50 µm	1010-11446 1010-15144
8081/8082	Organochlorine pesticides and PCBs as Arochlor	InertCap 5 InertCap 1701	0.53 mm I.D. x 30 m df = 1.50 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-18446 1010-61445
8090/8091	Nitroaromatics and cyclic ketones	InertCap 5MS/Sil InertCap 5	0.25 mm I.D. x 30 m df = 0.50 µm 0.53 mm I.D. x 30 m df = 1.50 µm	1010-15144 1010-18446
8100	Polynuclear aromatic hydrocarbons	InertCap 5MS/Sil	0.32 mm I.D. x 30 m df = 0.25 µm	1010-15242
8120/8121	Chlorinated hydrocarbons	InertCap 1MS	0.32 mm I.D. x 30 m df = 1.00 µm	1010-12245
8140	Organophosphorus pesticides	InertCap 1MS InertCap 1 InertCap 1701	0.25 mm I.D. x 30 m df = 0.25 µm 0.53 mm I.D. x 30 m df = 1.50 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-12142 1010-11446 1010-61445
8141	Organophosphorus compounds	InertCap 5MS/Sil InertCap 5	0.25 mm I.D. x 15 m df = 0.25 µm 0.53 mm I.D. x 15 m df = 1.50 µm	1010-15122 1010-18426
8150/8151	Chlorinated herbicides	InertCap 5MS/Sil InertCap 1701	0.25 mm I.D. x 30 m df = 0.50 µm 0.53 mm I.D. x 30 m df = 1.00 µm	1010-15144 1010-61445
8240	Volatile organic compounds	InertCap 624	0.25 mm I.D. x 30 m df = 1.00 µm 0.53 mm I.D. x 30 m df = 3.00 µm	Contact Us 1010-14948
8250	Semi-volatile organic compounds	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.50 µm	1010-15144
8260	Volatile organic compounds	InertCap 624	0.32 mm I.D. x 60 m df = 1.80 µm 0.53 mm I.D. x 75 m df = 3.00 µm	1010-14767 1010-14978
8270	Semi volatile organic compounds(SVOC)	InertCap 5	0.25 mm I.D. x 30 m df = 1.00 µm	1010-18145
8280	Analysis of polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm 0.25 mm I.D. x 60 m df = 0.10 µm	1010-15142 1010-15160

EPA Method

Method	Applications	Phase	Column Dimensions	Cat.No.
D 1983	Fatty acid	InertCap Pure-WAX InertCap WAX	0.25 mm I.D. x 30 m df = 0.25 µm	1010-68142 1010-67142
D 2268	Analysis of n-heptane and iso-octane (high purity)	InertCap 1	0.25 mm I.D. x 60 m df = 0.50 µm	1010-11164
D 2306	Xylene isomer	InertCap Pure-WAX InertCap WAX	0.25 mm I.D. x 60 m df = 0.25 µm	1010-68162 1010-67162
D 2426	Butadiene and styrene in butadiene concentrates	InertCap 1	0.53 mm I.D. x 30 m df = 5.00 µm	1010-11449
D 2427	C2-C5 hydrocarbons in gasolines	InertCap 1	0.53 mm I.D. x 30 m df = 5.00 µm	1010-11449
D 2580	Phenols in water	InertCap 5MS/Sil	0.32 mm I.D. x 25 m df = 0.40 µm	Contact Us
D 2804	Purity of methyl ethyl ketone	InertCap Pure-WAX InertCap WAX	0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445 1010-67445
D 2908	Volatile organics compounds(VOC) in water	InertCap 624 InertCap Pure-WAX	0.32 mm I.D. x 30 m df = 1.80 µm 0.32 mm I.D. x 30 m df = 0.50 µm	1010-14747 1010-68244
D 2998	Polyhydric alcohols	InertCap 1	0.32 mm I.D. x 30 m df = 1.00 µm	1010-11245
D 2999	Monopentaerythritol in commercial pentaerythritol	InertCap 1	0.53 mm I.D. x 30 m df = 1.50 µm	1010-11446
D 3009	Composition of turpentine	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 30 m df = 0.50 µm	1010-68244 1010-67244
D 3168	Polymers in emulsion paints	InertCap 1	0.32 mm I.D. x 30 m df = 1.00 µm	1010-11245
D 3257	Aromatics in mineral spirits	InertCap 624	0.53 mm I.D. x 30 m df = 3.00 µm	1010-14948
D 3329	Purity of methyl isobutyl ketone	InertCap Pure-WAX InertCap WAX	0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445 1010-67445
D 3432	Toluene diisocyanates in urethane prepolymers	InertCap 1	0.32 mm I.D. x 30 m df = 1.00 µm	1010-11245
D 3447	Purity of halogenated organic solvents	InertCap 1	0.53 mm I.D. x 60 m df = 5.00 µm	1010-11469
D 3452	Identification of rubber	InertCap 1	0.53 mm I.D. x 30 m df = 1.50 µm	1010-11446
D 3606	Benzene and toluene in gasoline	InertCap 1	0.25 mm I.D. x 15 m df = 0.10 µm	1010-11120
D 3687	Volatile organic compounds vapors(VOC)	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 30 m df = 0.50 µm	1010-68244 1010-67244
D 3695	Volatile alcohols in water	InertCap Pure-WAX InertCap WAX	0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445 1010-67445
D 3725	Fatty acids in drying oils	InertCap FFAP	0.53 mm I.D. x 30 m df = 1.00 µm	1010-28945
D 3760	Analysis of cumene	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 60 m df = 0.25 µm	1010-68262 1010-67262
D 3797	Analysis of *o*-xylene	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 60 m df = 0.50 µm	1010-68264 1010-67264
D 3798	Analysis of *p*-xylene impurities	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 60 m df = 0.50 µm	1010-68264 1010-67264

EPA Method

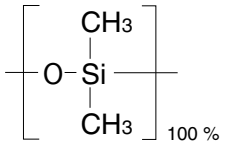
Method	Applications	Phase	Column Dimensions	Cat.No.
D 3876	Methoxyl and hydroxypropyl substitution in cellulose ether products	InertCap 1	0.32 mm I.D. x 30 m df = 1.00 µm	1010-11245
D 3962	Impurities in styrene	InertCap FFAP	0.53 mm I.D. x 30 m df = 1.00 µm	1010-28945
D 4367	Benzene in hydrocarbon solvent	InertCap 1	0.25 mm I.D. x 15 m df = 0.10 µm	1010-11120
D 4420	Aromatics compounds in gasoline	InertCap 1	0.25 mm I.D. x 15 m df = 0.10 µm	1010-11120
D 4735	Thiophene impurities in benzene	InertCap FFAP	0.53 mm I.D. x 30 m df = 1.00 µm	1010-28945
D 4768	Phenol and cresol inhibitors in insulating oils	InertCap FFAP	0.53 mm I.D. x 30 m df = 1.00 µm	1010-28945
D 4864	Methanol in propylene concentrates	InertCap Pure-WAX InertCap WAX	0.53 mm I.D. x 30 m df = 1.00 µm	1010-68445 1010-67445
D 4947	Chlordane and heptachlor residues in indoor air	InertCap 5	0.53 mm I.D. x 30 m df = 1.50 µm	1010-18446
D 5060	Impurities in ethylbenzene	InertCap Pure-WAX InertCap FFAP	0.32 mm I.D. x 60 m df = 0.50 µm	1010-68264 1010-28764
D 5075	Nicotine and 3-ethenylpyridine in indoor air	InertCap 5	0.53 mm I.D. x 30 m df = 1.50 µm	1010-18446
D 5135-35	Analysis of styrene	InertCap Pure-WAX InertCap WAX	0.32 mm I.D. x 60 m df = 0.50 µm	1010-68264 1010-67264
D 5310	Tar acid composition	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
D 5320	Determination of 1,1,1-trichloroethane and methylene chloride content in stabilized trichloroethylene and tetrachloroethylene	InertCap 1	0.53 mm I.D. x 30 m df = 3.00 µm	1010-11448
D 5442	Analysis of petroleum waxes	InertCap 1	0.32 mm I.D. x 30 m df = 0.25 µm	1010-11242
D 5580	Aromatics in finished gasoline	InertCap 1	0.53 mm I.D. x 30 m df = 5.00 µm	1010-11449
D 5599	Determination of oxygenates in gasoline	InertCap 1	0.25 mm I.D. x 60 m df = 1.00 µm	1010-11165
D 5769	Determination of benzene, toluene, and total aromatics in finished gasolines	InertCap 1	0.25 mm I.D. x 60 m df = 1.00 µm	1010-11165
D 5812	Determination of organochlorine pesticides in water	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142
D 6160	Determination of polychlorinated biphenyls (PCBs) in waste materials	InertCap 5MS/Sil	0.25 mm I.D. x 30 m df = 0.25 µm	1010-15142

InertCap 1MS

InertCap 1MS

- 100 % Dimethylpolysiloxane
- USP Phase G2
- Non-Polarity
- Cross-Linked
- Ultra Low Bleed
- Equivalents : DB-1ms, HP-1ms, Rxi-1ms, VF-1ms, Equity-1

Structure

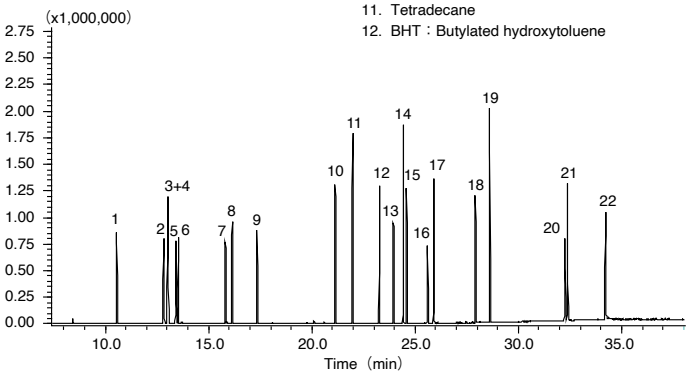


InertCap 1MS is a non-polar column bonded with 100 % Dimethylpolysiloxane. Samples elute in order of low boiling points. Designed for GC/MS, InertCap 1MS realizes the world highest inertness and ultra low bleed.

Automobile Interior Material Analysis

System : GC/MS Thermal Desorption
Column : InertCap 1MS
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) - 10 °C/min - 280 °C (21 min hold)
Carrier Gas : He 1 mL/min (constant flow)
Injection : Thermal Desorption 270 °C
Split 1:5
Detection : MS Scan
Sample Size : 100 µg/mL in Ethanol
1 µL

1. Toluene
2. Ethylbenzene
3. *m*-Xylene
4. *p*-Xylene
5. Styrene
6. *o*-Xylene
7. *p*-Dichlorobenzene
8. 2-Ethyl-1-hexanol
9. Nonanal
10. D6 : Hexamethylcyclotrisiloxane
11. Tetradecane
12. BHT : Butylated hydroxytoluene
13. DEP : Diethyl phthalate
14. C16 : *n*-Hexadecane
15. TBP : Tributyl phosphate
16. TCEP : Tris (2-chloroethyl) phosphate
17. DBA : Di-*n*-butyl adipate
18. DBP : Di-*n*-butyl phthalate
19. C20 : *n*-Eicosane
20. TPP : Triphenyl phosphate
21. DOA : Di (2-ethylhexyl) adipate
22. DOP : Di (2-ethylhexyl) phthalate



InertCap 1MS

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.325-prog.350 °C	1010-12122
	30 m	0.10 µm	iso.325-prog.350 °C	1010-12140
		0.25 µm	iso.325-prog.350 °C	1010-12142
		1.00 µm	iso.300-prog.320 °C	1010-12145
	60 m	0.25 µm	iso.325-prog.350 °C	1010-12162
		1.00 µm	iso.300-prog.320 °C	1010-12165
0.32 mm	15 m	0.25 µm	iso.325-prog.350 °C	1010-12222
	30 m	0.25 µm	iso.325-prog.350 °C	1010-12242
		1.00 µm	iso.300-prog.320 °C	1010-12245
	60 m	0.25 µm	iso.325-prog.350 °C	1010-12262
		1.00 µm	iso.300-prog.320 °C	1010-12265

InertCap 1MS ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-12172
			5 m	iso.325-prog.350 °C	1010-12173
			10 m	iso.325-prog.350 °C	1010-12174

InertCap 1MS T.L. (Built-in Transfer Line)

I.D.	Length	Thickness	Transfer Line Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-12192

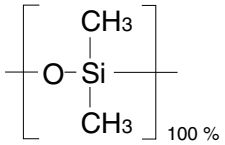
InertCap 1MS Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-12031

InertCap 1

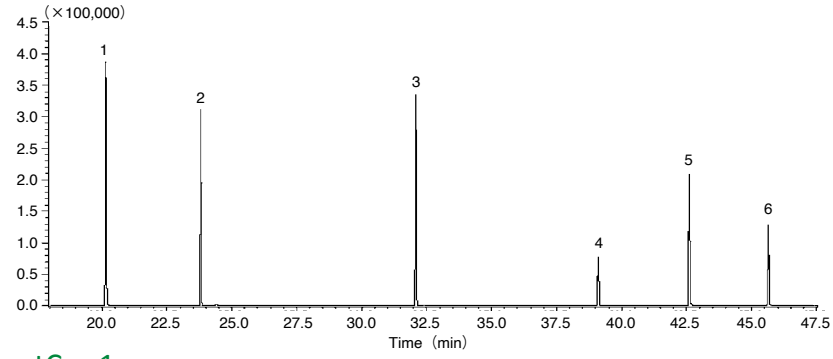
- 100 % Dimethylpolysiloxane
- USP Phase G2
- Non-Polarity
- Cross-Linked
- Equivalents : DB-1, HP-1, Rtx-1, CP-Sil 5CB, SPB-1, BP-1

Structure



InertCap 1 is a non-polar column bonded with 100 % dimethylpolysiloxane. Compounds elute in order of increasing boiling point. InertCap 1 has broad utility and can be used for a variety of general analyses.

Phthalate



System : GC/MS
Column : InertCap 1
0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 60 °C (3 min hold) - 5 °C/min - 280 °C (3 min hold)
Injection : Splitless
280 °C
Detection : MS SIM
Sample Size : 1 µL

1. Dimethylphthalate
2. Diethylphthalate
3. Di-*n*-butylphthalate
4. Butylbenzylphthalate
5. Di(2-ethylhexyl)phthalate
6. Dioctylphthalate

InertCap 1

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.10 µm	iso.325-prog.350 °C	1010-11120
		0.25 µm	iso.325-prog.350 °C	1010-11122
		0.40 µm	iso.325-prog.350 °C	1010-11123
		0.50 µm	iso.325-prog.350 °C	1010-11124
		5.00 µm	iso.260-prog.300 °C	1010-11129
	30 m	0.10 µm	iso.325-prog.350 °C	1010-11140
		0.25 µm	iso.325-prog.350 °C	1010-11142
		0.40 µm	iso.325-prog.350 °C	1010-11143
		0.50 µm	iso.325-prog.350 °C	1010-11144
		1.00 µm	iso.300-prog.320 °C	1010-11145
		1.50 µm	iso.300-prog.320 °C	1010-11146
		5.00 µm	iso.260-prog.300 °C	1010-11149
	60 m	0.25 µm	iso.325-prog.350 °C	1010-11162
		0.40 µm	iso.325-prog.350 °C	1010-11163
		0.50 µm	iso.325-prog.350 °C	1010-11164
		1.00 µm	iso.300-prog.320 °C	1010-11165
		1.50 µm	iso.300-prog.320 °C	1010-11166
0.32 mm	15 m	0.25 µm	iso.325-prog.350 °C	1010-11222
		0.40 µm	iso.325-prog.350 °C	1010-11223
		5.00 µm	iso.260-prog.300 °C	1010-11229

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	30 m	0.25 µm	iso.325-prog.350 °C	1010-11242
		0.40 µm	iso.325-prog.350 °C	1010-11243
		0.50 µm	iso.325-prog.350 °C	1010-11244
		1.00 µm	iso.300-prog.320 °C	1010-11245
		5.00 µm	iso.260-prog.300 °C	1010-11249
	60 m	0.25 µm	iso.325-prog.350 °C	1010-11262
		0.40 µm	iso.325-prog.350 °C	1010-11263
		0.50 µm	iso.325-prog.350 °C	1010-11264
		1.00 µm	iso.300-prog.320 °C	1010-11265
		5.00 µm	iso.260-prog.300 °C	1010-11269
0.53 mm	15 m	1.00 µm	iso.300-prog.320 °C	1010-11425
		1.50 µm	iso.300-prog.320 °C	1010-11426
		2.00 µm	iso.300-prog.320 °C	1010-11427
		3.00 µm	iso.260-prog.280 °C	1010-11428
		5.00 µm	iso.260-prog.280 °C	1010-11429
	30 m	1.00 µm	iso.300-prog.320 °C	1010-11445
		1.50 µm	iso.300-prog.320 °C	1010-11446
		2.00 µm	iso.300-prog.320 °C	1010-11447
		3.00 µm	iso.260-prog.280 °C	1010-11448
		5.00 µm	iso.260-prog.280 °C	1010-11449
	60 m	2.00 µm	iso.300-prog.320 °C	1010-11467
		5.00 µm	iso.260-prog.280 °C	1010-11469

InertCap 1 ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-11172
			5 m	iso.325-prog.350 °C	1010-11173
			10 m	iso.325-prog.350 °C	1010-11174

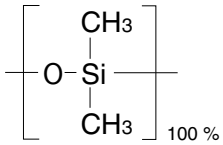
InertCap 1 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	15 m	0.18 µm	iso.325-prog.350 °C	1010-11021
		0.28 µm	iso.325-prog.350 °C	1010-11022
	20 m	0.18 µm	iso.325-prog.350 °C	1010-11031
		0.28 µm	iso.325-prog.350 °C	1010-11032

InertCap 1HT

- 100 % Dimethylpolysiloxane
- USP Phase G2
- Non-Polarity
- Cross-Linked
- Maximum temperature is 400°C
- Equivalents : DB-1hs, HP-1ht, Rxi-1HT, ZB-1HT

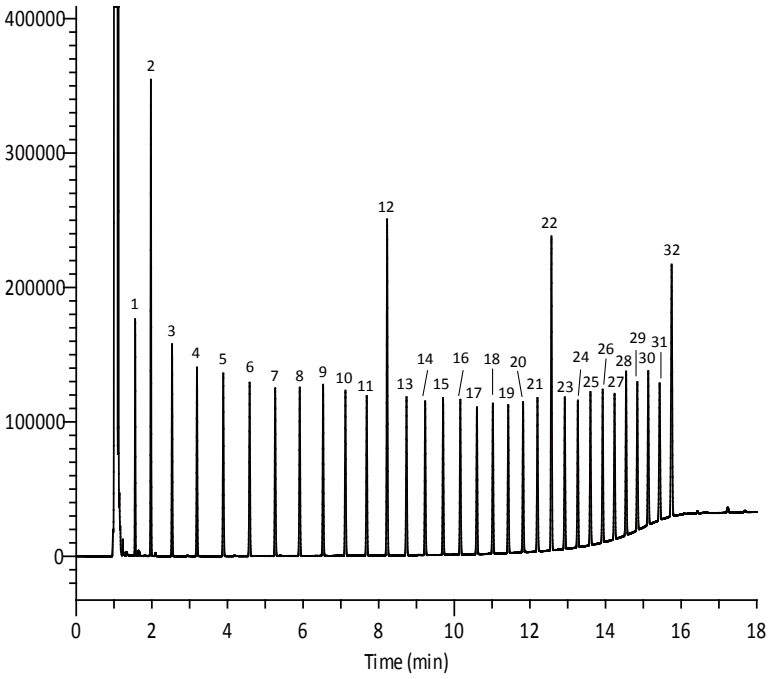
Structure



InertCap 1HT is a non-polar high-temperature column bonded with 100% dimethlypolysiloxane. Compounds elute in order of increasing boiling point. InertCap 1HT is specially processed for operation up to 400 °C with a high temperature polyimide coated fused silica tubing.

Hydrocarbons C9-C40

System : GC/FID
Column : InertCap 1HT
0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 100 °C (1 min hold) - 20 °C/min - 380 °C (7 min hold)
Carrier Gas : N_2 1 mL/min, 200 kPa
Injection : S plit 1:4, 350 °C
Sample Size : 1 µL, 50 µg/mL in Hexane



1. n-Nonane
2. n-Decane
3. n-Undecane
4. n-Dodecane
5. n-Tridecane
6. n-Tetradecane
7. n-Pentadecane
8. n-Hexadecane
9. n-Heptadecane
10. n-Octadecane
11. n-Nonadecane
12. n-Eicosane
13. n-Heneicosane
14. n-Docosane
15. n-Tricosane
16. n-Tetracosane
17. n-Pentacosane
18. n-Hexacosane
19. n-Heptacosane
20. n-Octacosane
21. n-Nonacosane
22. n-Triacontane
23. n-Hentriacontane
24. n-Dotriacontane
25. n-Tritriacontane
26. n-Tetratriacontane
27. n-Pentatriacontane
28. n-Hexatriacontane
29. n-Heptatriacontane
30. n-Octatriacontane
31. n-Nonatriacontane
32. n-Tetracontane

InertCap 1HT

InertCap 1HT

I.D.	Length	Film Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.10 µm	iso.380-prog.400 °C	1010-90901
	30 m	0.10 µm	iso.380-prog.400 °C	1010-01140
		0.25 µm	iso.380-prog.400 °C	1010-01142
0.32 mm	15 m	0.10 µm	iso.380-prog.400 °C	1010-01220
	5 m	0.25 µm	iso.380-prog.400 °C	1010-90905
	15 m	0.25 µm	iso.380-prog.400 °C	1010-90906
	30 m	0.10 µm	iso.380-prog.400 °C	1010-01240
		0.25 µm	iso.380-prog.400 °C	1010-90904

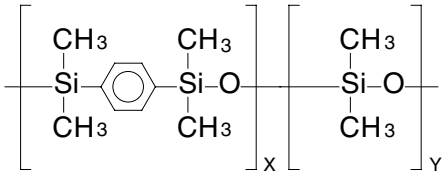
InertCap 1HT ProGuard (Built-in Guard Column)

I.D.	Length	Film Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	5 m	iso.380-prog.400 °C	1010-90902
0.32 mm			5 m	iso.380-prog.400 °C	1010-90907

InertCap 5MS/Sil

- 5 % Diphenyl (equiv.) – Dimethylpolysilphenylene Siloxane
- USP Phase G27
- Low Polarity
- Cross-Linked
- Ultra Low Bleed
- Equivalents : DB-5ms, Rxi-5Sil MS, VF-5ms, SLB-5, BPX-5

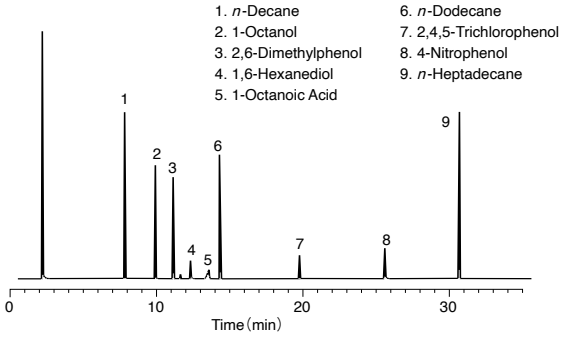
Structure



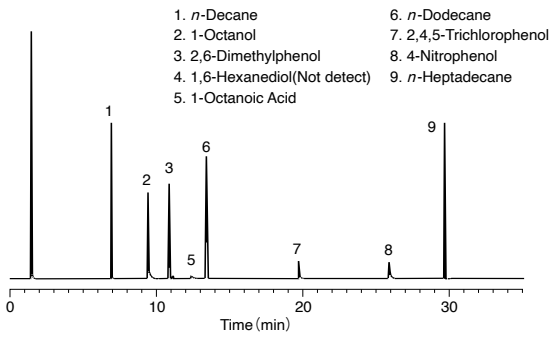
InertCap 5MS/Sil is a low polar column bonded with 5 % diphenyl (equiv.) – 95 % dimethylpolysilphenylene siloxane. Designed for GC/MS, InertCap 5MS/Sil achieves the higher heat resistance and lower bleeding by arylene technology. In addition to our basic performance and quality inspection, pesticide mixture sample is analyzed for the further rigorous inspection for each lot to guarantee the product reliability.

Comparison with Other Brands

Acidic Compounds

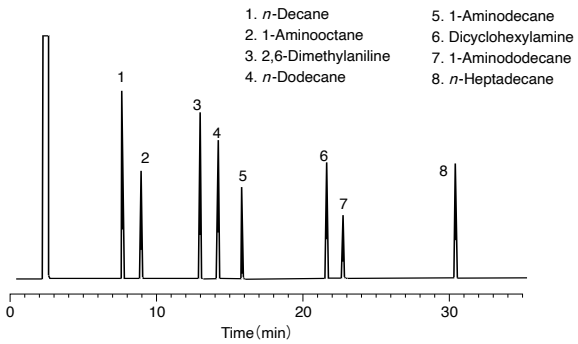


InertCap 5MS/Sil

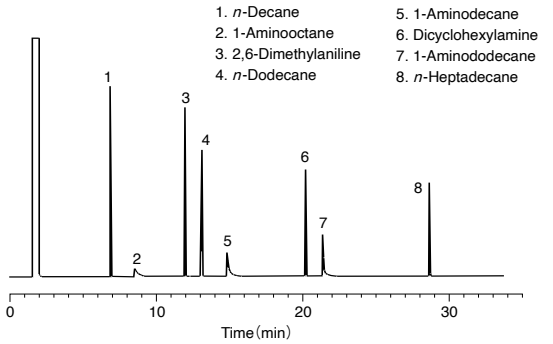


ZB - 5MS

Basic Compounds



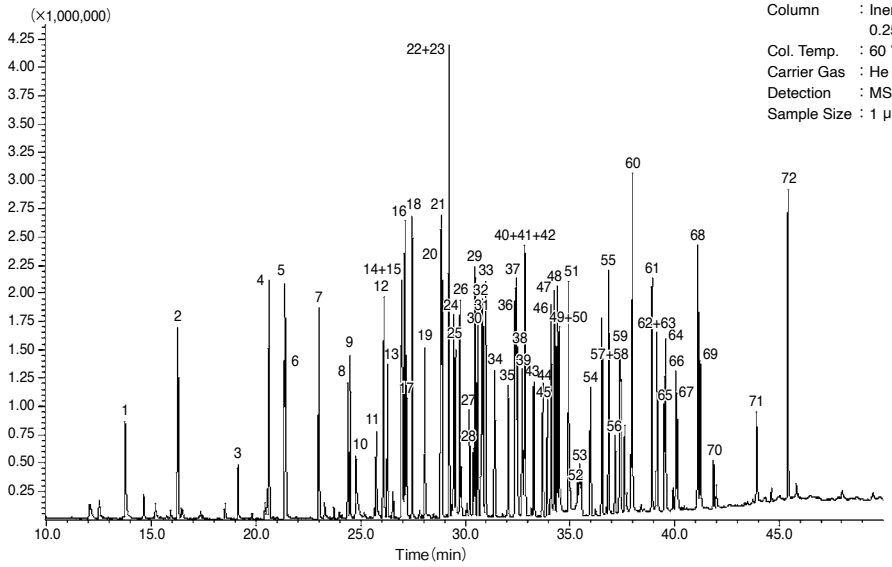
InertCap 5MS/Sil



ZB - 5MS

InertCap 5MS/Sil

Pesticides



System : GC/MS
Column : InertCap 5MS/Sil
0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 60 °C (1 min hold) - 5 °C/min - 280 °C
Carrier Gas : He 35 cm/sec.
Detection : MS
Sample Size : 1 µL

1. dichlorvos (DDVP)
2. dichlobenil
3. etridiazole
4. chloroneb
5. Isoprocarb
6. molinate
7. fenobucarb
8. trifluralin
9. benfluralin
10. pencycuron
11. dimethoate
12. simazine
13. atrazine
14. propyzamide
15. pyroquilon
16. diazinon
17. chlorothalonil
18. disulfoton
19. iprobenfos
20. terbucarb
21. bromobutide
22. alachlor
23. tolclophosmethyl
24. simetryn
25. metalaxyl
26. dithiopyr
27. fenitrothion
28. probenazole
29. esprocarb
30. malathion
31. chlorpyrifos
32. benthiocarb
33. fenthion
34. fthalide
35. pendimethalin
36. dimethametryn
37. isofenphos
38. methyl dymron
39. phenthoate
40. procymidone
41. captan
42. dimepiperate
43. methidathion
44. α-Endosulfan
45. butamifos
46. napropamide
47. flutranil
48. pretilachlor
49. isoprothiolane
50. tricyclazole
51. buprofezin
52. isoxathion
53. carpropamid
54. β-Endosulfan
55. mepronil
56. chlornitrofen
57. propiconazole
58. edifenphos
59. endosulfan sulfate
60. thenylchlor
61. pyributicarb
62. pyridaphenthion
63. iprodione
64. EPN
65. piperophos
66. anilofos
67. bifenox
68. pyriproxyfen
69. mefenacet
70. benfuracarb
71. cafenstrole
72. ethofenprox

InertCap 5MS/Sil

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.36 µm	iso.325-prog.350 °C	1010-15033
0.25 mm	15 m	0.10 µm	iso.325-prog.350 °C	1010-15120
		0.25 µm	iso.325-prog.350 °C	1010-15122
		0.50 µm	iso.325-prog.350 °C	1010-15124
	30 m	0.10 µm	iso.325-prog.350 °C	1010-15140
		0.25 µm	iso.325-prog.350 °C	1010-15142
		0.50 µm	iso.325-prog.350 °C	1010-15144
		1.00 µm	iso.325-prog.350 °C	1010-15145
	60 m	0.10 µm	iso.325-prog.350 °C	1010-15160
		0.25 µm	iso.325-prog.350 °C	1010-15162
0.32 mm	15 m	0.10 µm	iso.325-prog.350 °C	1010-15220
		0.25 µm	iso.325-prog.350 °C	1010-15222
		0.50 µm	iso.325-prog.350 °C	1010-15224
	30 m	0.10 µm	iso.325-prog.350 °C	1010-15240
		0.25 µm	iso.325-prog.350 °C	1010-15242
		0.50 µm	iso.325-prog.350 °C	1010-15244
		1.00 µm	iso.325-prog.350 °C	1010-15245
	60 m	0.10 µm	iso.325-prog.350 °C	1010-15260
		0.25 µm	iso.325-prog.350 °C	1010-15262

InertCap 5MS/Sil ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15172
			5 m	iso.325-prog.350 °C	1010-15173
			10 m	iso.325-prog.350 °C	1010-15174

InertCap 5MS/Sil T.L. (Built-in Transfer Line)

I.D.	Length	Thickness	Transfer Line Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15192

InertCap 5MS/Sil Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-15031
	40 m	0.18 µm	iso.325-prog.350 °C	1010-15051

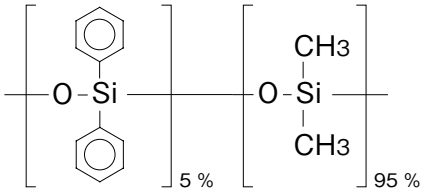
InertCap 5MS

InertCap 5MS

*This Product's name was changed from InertCap 5MS/NP in April 2023

- 5 % Diphenyl – 95 % Dimethylpolysiloxane
- USP Phase G27
- Low Polarity
- Cross-Linked
- Ultra Low Bleed
- Equivalents:HP-5ms, Rxi-5ms, Equity-5, SPB-5

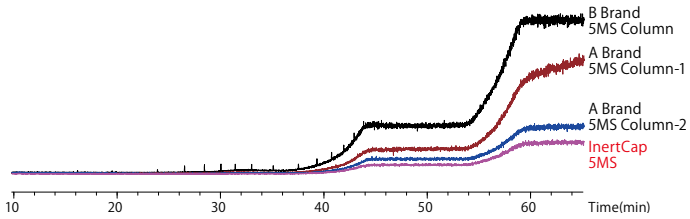
Structure



InertCap 5MS, in which liquid phase chemically bonded with 5% diphenyl-95% dimethylpolysiloxane, is a low-polarity column designed for GC/MS analysis with top level of inertness and low bleed.

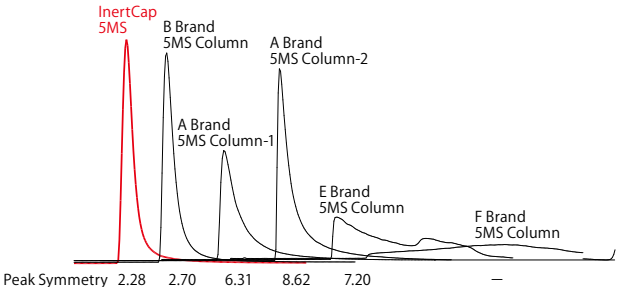
Comparison of Bleeding

System : GC-MS
Column : 0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp : 40 ℃(5 min hold) - 10 ℃/min - 150 ℃(5 min hold)
- 10 ℃/min - 250 ℃(5 min hold) - 10 ℃/min
- 325 ℃(10 min hold) - 10 ℃/min - 350 ℃(10 min hold)



Comparison of Inertness

sample: n- octylamine



InertCap 5MS

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.10 µm	iso.325-prog.350 °C	1010-18620
		0.25 µm	iso.325-prog.350 °C	1010-18622
		0.50 µm	iso.325-prog.350 °C	1010-18624
	30 m	0.10 µm	iso.325-prog.350 °C	1010-18640
		0.25 µm	iso.325-prog.350 °C	1010-18642
		0.50 µm	iso.325-prog.350 °C	1010-18644
		1.00 µm	iso.325-prog.350 °C	1010-18645
	60 m	0.10 µm	iso.325-prog.350 °C	1010-18660
		0.25 µm	iso.325-prog.350 °C	1010-18662
0.32 mm	15 m	0.10 µm	iso.325-prog.350 °C	1010-18720
		0.25 µm	iso.325-prog.350 °C	1010-18722
		0.50 µm	iso.325-prog.350 °C	1010-18724
	30 m	0.10 µm	iso.325-prog.350 °C	1010-18740
		0.25 µm	iso.325-prog.350 °C	1010-18742
		0.50 µm	iso.325-prog.350 °C	1010-18744
		1.00 µm	iso.325-prog.350 °C	1010-18745
	60 m	0.10 µm	iso.325-prog.350 °C	1010-18760
		0.25 µm	iso.325-prog.350 °C	1010-18762

InertCap 5MS ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-18941
			5 m	iso.325-prog.350 °C	1010-18942
			10 m	iso.325-prog.350 °C	1010-18943

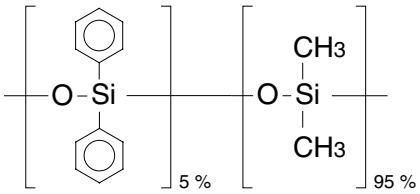
InertCap 5MS Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-18531

InertCap 5

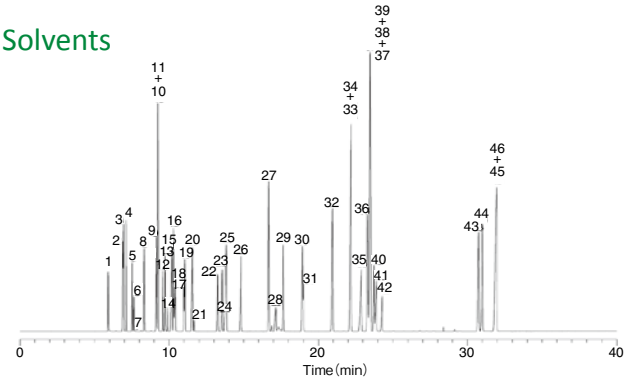
- 5 % Diphenyl – 95 % Dimethylpolysiloxane
- USP Phase G27
- Low Polarity
- Cross-Linked
- Equivalents:DB-5, HP-5, Rtx-5, CP-Sil 8CB, SPB-5

Structure



InertCap 5 is a low polar column bonded with 5 % diphenyl – 95 % dimethylpolysiloxane. InertCap 5 is an optimal first choice column for a variety of general analyses such as pesticides and volatile compounds etc.

Organic Solvents



System : GC/FID
Column : InertCap 5
0.25 mm I.D. x 60 m df = 0.40 µm
Col. Temp. : 40 °C (5 min hold) - 4 °C/min - 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly 1 µL

1. Methanol
2. Acetone
3. i-Propanol
4. Ethyl ether
5. Methyl acetate
6. Dichloromethane
7. Carbon disulfide
8. *trans*-1,2-Dichloroethylene
9. Methyl ethyl ketone
10. 2-Butanol
11. *n*-Hexane
12. *cis*-1,2-Dichloroethylene
13. Ethyl acetate
14. Chloroform
15. i-Butanol
16. Tetrahydrofuran
17. Methyl cellosolve
18. 1,1,1-Trichloroethane
19. 1,2-Dichloroethane
20. *n*-Butanol
21. Carbon tetrachloride
22. Trichloroethylene
23. 1,4-Dioxane
24. Ethyl cellosolve
25. *n*-Propyl acetate
26. i-Amyl alchol
27. Toluene
28. *N,N*-Dimethyl formamide
29. Methyl-n-butyl ketone
30. *n*-Butyl acetate
31. Tetrachloroethylene
32. Chlorobenzene
33. *m*-Xylene
34. *p*-Xylene
35. Cyclohexanol
36. Styrene
37. Cyclohexanone
38. 1-Methylcyclohexanol
39. *o*-Xylene
40. Cellosolve acetate
41. Butyl cellosolve
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *m*-Cresol
46. *p*-Cresol

InertCap 5

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.325-prog.350 °C	1010-18122
		0.40 µm	iso.325-prog.350 °C	1010-18123
		0.50 µm	iso.325-prog.350 °C	1010-18124
	30 m	0.10 µm	iso.325-prog.350 °C	1010-18140
		0.25 µm	iso.325-prog.350 °C	1010-18142
		0.40 µm	iso.325-prog.350 °C	1010-18143
		0.50 µm	iso.325-prog.350 °C	1010-18144
		1.00 µm	iso.300-prog.320 °C	1010-18145
		1.50 µm	iso.300-prog.320 °C	1010-18146
	60 m	0.25 µm	iso.325-prog.350 °C	1010-18162
		0.40 µm	iso.325-prog.350 °C	1010-18163
		0.50 µm	iso.325-prog.350 °C	1010-18164
		1.00 µm	iso.300-prog.320 °C	1010-18165
		1.50 µm	iso.300-prog.320 °C	1010-18166
0.32 mm	15 m	0.25 µm	iso.325-prog.350 °C	1010-18222
		0.40 µm	iso.325-prog.350 °C	1010-18223

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	30 m	0.25 µm	iso.325-prog.350 °C	1010-18242
		0.40 µm	iso.325-prog.350 °C	1010-18243
		0.50 µm	iso.325-prog.350 °C	1010-18244
		1.00 µm	iso.300-prog.320 °C	1010-18245
	60 m	0.25 µm	iso.325-prog.350 °C	1010-18262
		0.40 µm	iso.325-prog.350 °C	1010-18263
		0.50 µm	iso.325-prog.350 °C	1010-18264
0.53 mm	15 m	1.00 µm	iso.300-prog.320 °C	1010-18425
		1.50 µm	iso.300-prog.320 °C	1010-18426
		2.00 µm	iso.300-prog.320 °C	1010-18427
		3.00 µm	iso.260-prog.280 °C	1010-18428
		5.00 µm	iso.260-prog.280 °C	1010-18429
	30 m	1.00 µm	iso.300-prog.320 °C	1010-18445
		1.50 µm	iso.300-prog.320 °C	1010-18446
		2.00 µm	iso.300-prog.320 °C	1010-18447
		3.00 µm	iso.260-prog.280 °C	1010-18448
		5.00 µm	iso.260-prog.280 °C	1010-18449
	50 m	5.00 µm	iso.260-prog.280 °C	1010-18459
	60 m	2.00 µm	iso.300-prog.320 °C	1010-18467

InertCap 5 ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-18172
			5 m	iso.325-prog.350 °C	1010-18173
			10 m	iso.325-prog.350 °C	1010-18174

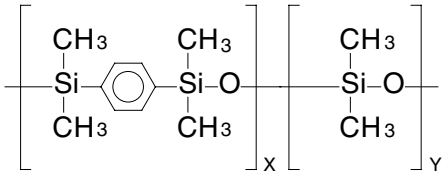
InertCap 5 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	15 m	0.18 µm	iso.325-prog.350 °C	1010-18021
		0.28 µm	iso.325-prog.350 °C	1010-18022
	20 m	0.18 µm	iso.325-prog.350 °C	1010-18031
		0.28 µm	iso.325-prog.350 °C	1010-18032

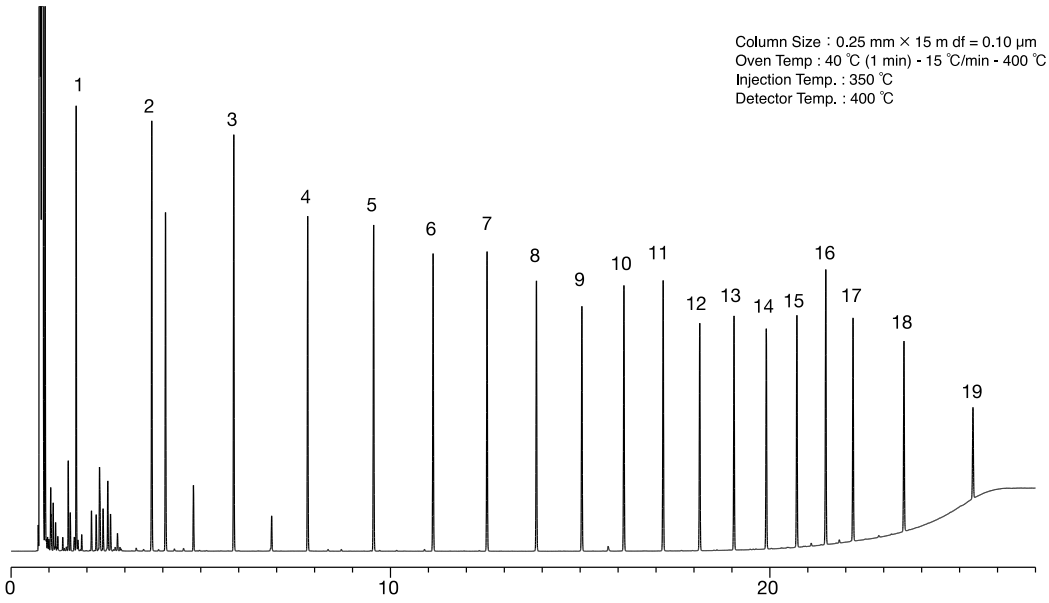
InertCap 5HT

- 5 % Diphenyl (equiv.) – Dimethylpolysilphenylene siloxane
- USP Phase G27
- Low-Polarity
- Cross-Linked
- Maximum temperature is 400°C
- Equivalents : DB-5ht, HP-5ht, VF-5ht, Rxi-5HT, ZB-5HT

Structure



InertCap 5HT is a low-polarity, high-temperature column bonded with 5% Diphenyl (equiv.) – Dimethylpolysilphenylene siloxane. It is specially treated for operation up to 400 °C using high-temperature polyimide-coated fused silica tubing, allowing for the elution of high-boiling-point compounds and achieving excellent peaks.



Hydrocarbon
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
18. C44
19. C50

InertCap 5HT

InertCap 5HT

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25mm	15 m	0.1 µm	prog.400 °C	1010-90921
	15 m	0.25 µm	prog.400 °C	1010-90923
	30 m	0.1 µm	prog.400 °C	1010-90922
	30 m	0.25 µm	prog.400 °C	1010-90925
0.32mm	10 m	0.1 µm	prog.400 °C	1010-90930
	15 m	0.1 µm	prog.400 °C	1010-90931
	15 m	0.25 µm	prog.400 °C	1010-90933
	30 m	0.1 µm	prog.400 °C	1010-90928
	30 m	0.25 µm	prog.400 °C	1010-90929

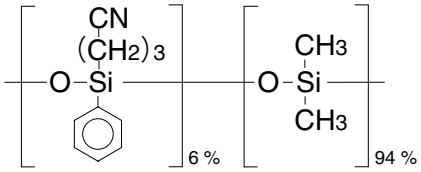
InertCap 5HT ProGuard

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25mm	15 m	0.25 µm	iso380-prog.400 °C	1010-90924
	30 m	0.25 µm	iso380-prog.400 °C	1010-90926
0.32mm	15 m	0.1 µm	iso380-prog.400 °C	1010-90932
	30 m	0.1 µm	iso380-prog.400 °C	1010-90935

InertCap 624MS

- 6 % Cyanopropylphenyl – 94 % Dimethylpolysiloxane
- USP Phase G43
- Medium Polarity
- Cross-Linked
- Equivalents: DB-624, HP-VOC, Rtx-624, Rxi-624Sil MS, VF-624MS

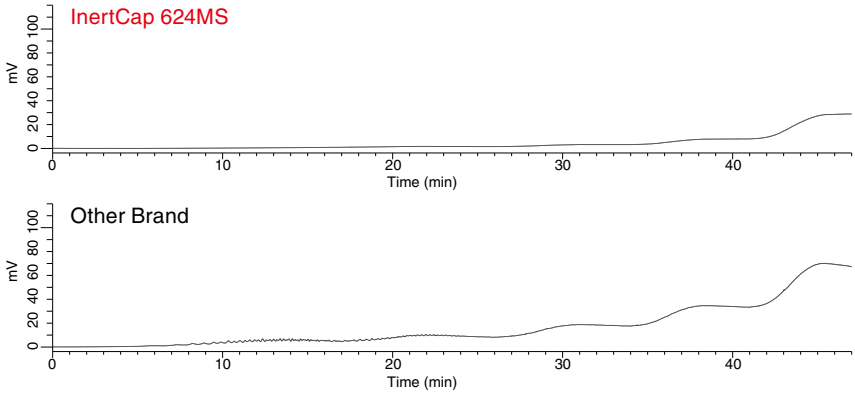
Structure



InertCap 624MS is medium polar column bonded with 6 % cyanopropylphenyl and 94 % dimethylpolysiloxane. The structure is the same as InertCap 624, designed for low bleed, stable batch control and highest inertness.

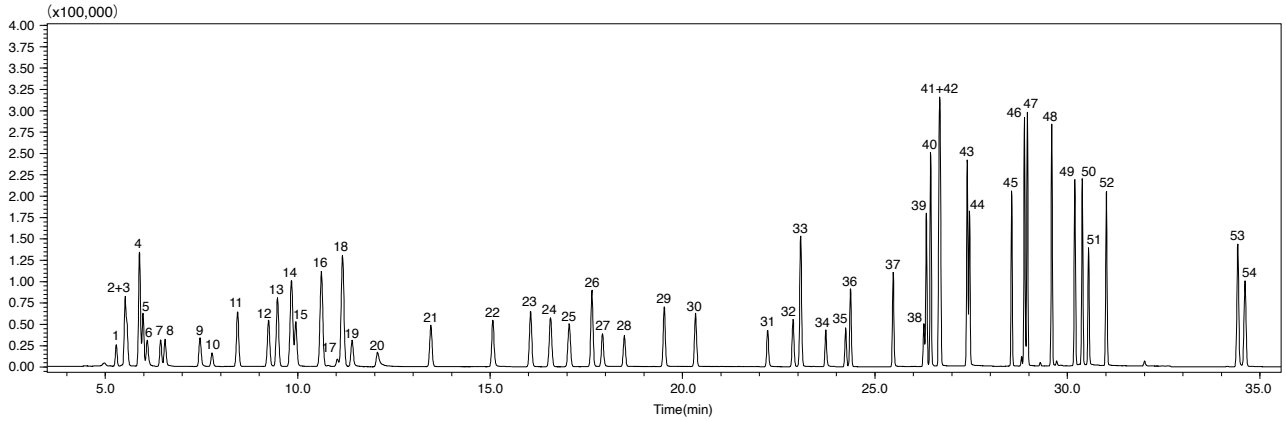
Comparison of Bleeding

Oven Temp. : 50 ℃ - 10 ℃/min - 250 ℃(5 min) - 10 ℃ /min - 280 ℃(5 min) - 10 ℃/min- 300 ℃(5 min) - 10 ℃/min - 320 ℃(5 min)



Analysis of Volatile Organic Compounds in Air.

Column : InertCap 624MS 0.25 mm I.D. x 60 m df = 1.40 µm
Col. Temp. : 40 ℃(5 min) - 3.5 ℃/min - 80 ℃(0 min hold) - 6 ℃/min - 120 ℃ - 15 ℃/min - 200 ℃(11 min hold)
Detection : MS SIM
Sample : 51 Compounds VOC 500 ppt(v/v) + Internal Standard(I.S.) 3 Compounds 500 ppt(v/v)

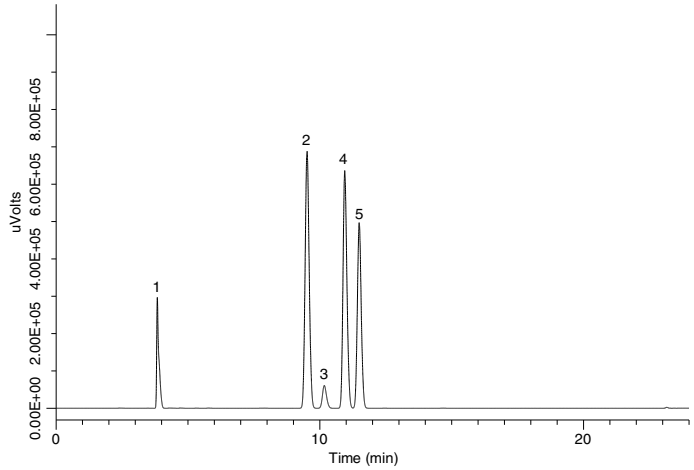


No.		No.		No.		No.	
1.	HFC-134a	14.	CFC-113	27.	1,2-Dichloroethane	40.	Ethylbenzene
2.	CFC-12	15.	1,1-Dichloroethylene	28.	Fluorobenzene(I.S.)	41+42.	*m, p*-Xylene
3.	HCFC-22	16.	HCFC-225ca	29.	Trichloroethylene	43.	*o*-Xylene
4.	CFC-114	17.	3-Chloro-1-propene	30.	1,2-Dichloropropane	44.	Styrene
5.	HCFC-142b	18.	HCFC-225cb	31.	*cis*-1,3-Dichloropropene	45.	1,1,2,2-Tetrachloroethane
6.	Chloromethane	19.	Dichloromethane	32.	Toluene-d8(I.S.)	46.	4-Ethyltoluene
7.	Vinyl chloride	20.	Acrylonitrile	33.	Toluene	47.	1,3,5-Trimethylbenzene
8.	1,3-Butadiene	21.	1,1-Dichloroethane	34.	*trans*-1,3-Dichloropropene	48.	1,2,4-Trimethylbenzene
9.	Bromomethane	22.	*cis*-1,2-Dichloroethylene	35.	1,1,2-Trichloroethane	49.	1,3-Dichlorobenzene
10.	Ethyl chloride	23.	Chloroform	36.	Tetrachloroethylene	50.	1,4-Dichlorobenzene
11.	CFC-11	24.	1,1,1-Trichloroethane	37.	1,2-Dibromoethane	51.	Benzylchloride
12.	Dichlorofluoroethane	25.	Tetrachloromethane	38.	Chlorobenzene-d5(I.S.)	52.	1,2-Dichlorobenzene
13.	HCFC-123	26.	Benzene	39.	Monochlorobenzene	53.	1,2,4-Trichlorobenzene
						54.	Hexachloro-1,3-butadiene

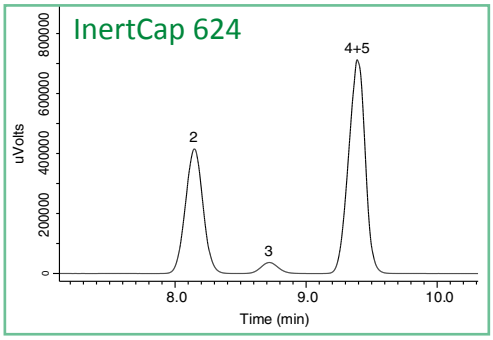
InertCap 624MS

System : GC/FID
Column : InertCap 624MS
0.32 mm I.D. x 30 m df = 1.80 µm
Col. Temp. : 40 °C (20 min hold) - 10 °C/min - 240 °C (20 min hold)
Carrier Gas : He 2.2 mL/min
Injection : Split flow 44 mL/min
140 °C
Detection : FID Auto Range
250 °C
Sample Size : 1.0 µL
Analyte in Dimethyl sulfoxide

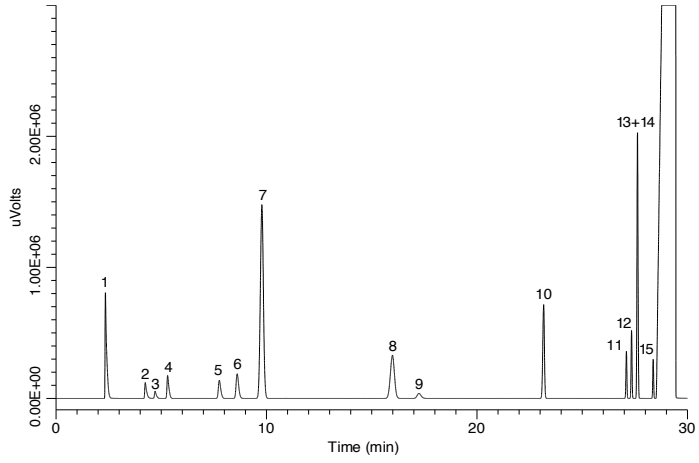
Organic Solvent-1



1. 1,1-Dichloroethene (40 mg/mL)
2. 1,1,1-Trichloroethan (50 mg/mL)
3. Carbon tetrachloride (20 mg/mL)
4. Benzene (10 mg/mL)
5. 1,2-Dichloroethane (25 mg/mL)



Organic Solvent-2



1. Methanol (15.0 mg/mL)
2. Acetonitrile (2.05 mg/mL)
3. Dichloromethane (3.00 mg/mL)
4. *trans*-1,2-Dichloroethylene (4.70 mg/mL)
5. *cis*-1,2-Dichloroethylene (4.70 mg/mL)
6. Tetrahydrofuran (3.45 mg/mL)
7. Cyclohexane (19.4 mg/mL)
8. Methylcyclohexane (5.90 mg/mL)
9. 1,4-Dioxane (1.90 mg/mL)
10. Toluene (4.45 mg/mL)
11. Chlorobenzene (1.80 mg/mL)
12. Ethylbenzene (1.84 mg/mL)
13. *m*-Xylene (6.51 mg/mL)
14. *p*-Xylene (1.52 mg/mL)
15. *o*-Xylene (0.98 mg/mL)

InertCap 624MS

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	1.00 µm	iso.300-prog.320 °C	1010-64535
0.25 mm	30 m	1.40 µm	iso.300-prog.320 °C	1010-64646
	60 m		iso.300-prog.320 °C	1010-64666
0.32 mm	30 m	1.80 µm	iso.300-prog.320 °C	1010-64747
	60 m		iso.300-prog.320 °C	1010-64767
0.53 mm	30 m	3.00 µm	iso.280-prog.300 °C	1010-64948
	60 m		iso.280-prog.300 °C	1010-64968

InertCap 624MS Fast GC

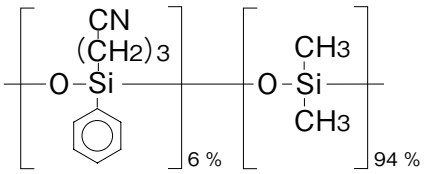
I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	1.00 µm	iso.300-prog.320 °C	1010-64535

InertCap 624

InertCap 624

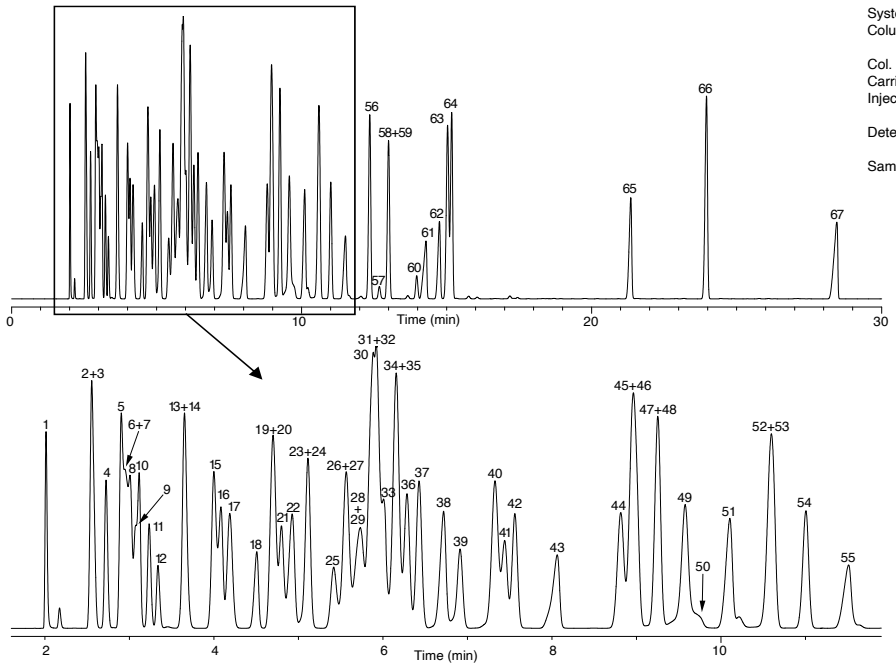
- 6 % Cyanopropylphenyl - 94 % Dimethylpolysiloxane
- USP Phase G43
- Medium Polarity
- Cross-Linked
- Equivalents:DB-624, HP-VOC, Rtx-624, VF-624ms

Structure



InertCap 624 is a medium polar column bonded with 6 % cyanopropylphenyl and 94 % dimethylpolysiloxane designed for VOC analysis. InertCap 624 is optimal for the analysis of “acetaldehyde and methanol in ethanol” defined in the Japanese Pharmacopeia Fifteenth Edition.

Residual Solvents in Pharmaceuticals



System : GC/FID
Column : InertCap 624
0.53 mm I.D. x 30 m df = 3.00 µm
Col. Temp. : 40 °C - 5 °C/min - 230 °C
Carrier Gas : He 20 kPa
Injection : Split flow 25 mL/min
240 °C
Detection : FID Range 10^2
240 °C
Sample Size : Mixed evenly
0.5 µL

1. Methanol
2. Ethanol
3. *n*-Pentane
4. Diethyl ether
5. Acetone
6. 1,1-Dichloroethylene
7. 1,1-Dimethoxymethane
8. 2-Propanol (Isopropyl alcohol)
9. Ethyl formate
10. Acetonitrile
11. Methyl acetate
12. Dichloromethane
13. *trans*-1,2-Dichloroethylene
14. *tert*-Butyl methyl ether
15. *n*-Hexane
16. 1-Propanol
17. Diisopropyl ether
18. Nitromethane
19. 2-Butanone(MEK)
20. *cis*-1,2-Dichloroethylene
21. Ethyl acetate
22. 2-Butanol
23. Tetrahydrofuran
24. Chloroform
25. 1,1,1-Trichloroethane
26. Cyclohexane
27. 2,2-Dimethoxypropane
28. Carbon tetrachloride
29. 2-Methyl-1-propanol (Isobutyl alcohol)
30. 1,2-Dimethoxyethane
31. 1,2-Dichloroethane
32. Benzene
33. Isopropyl acetate
34. 2,2,4-Trimethylpentane
35. 2-Methyltetrahydrofuran
36. Methyl isopropyl ketone
37. *n*-Heptane
38. 1-Butanol
39. Trichloroethylene
40. Methylcyclohexane
41. 1,4-Dioxane
42. *n*-Propyl acetate
43. 2-Ethoxyethanol
44. 4-Methyl-2-pentanone(MIBK)
45. Pyridine
46. 3-Methyl-1-butanol (Isoamyl alcohol)
47. Toluene
48. Ethylene glycol
49. Isobutyl acetate
50. Formamide
51. 1-Pentanol(Amyl alcohol)
52. Propionaldehyde diethyl acetal
53. 2-Hexanone(MBK)
54. *n*-Butyl acetate
55. *N,N*-Dimethylformamide
56. Chlorobenzene
57. Ethylbenzene
58. *m*-Xylene
59. *p*-Xylene
60. *o*-Xylene
61. Dimethyl sulfoxide(DMSO)
62. *N,N*-Dimethylacetamide
63. Cumene
64. Anisole
65. N-methyl-2-pyrrolidone
66. 1,2,3,4-Tetrahydronaphthalene
67. Sulfolane

Xylene mixture (*m*-Xylene, *p*-Xylene, *o*-Xylene, Ethylbenzene) was used.

InertCap 624

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	1.40 µm	iso.260-prog.260 °C	1010-14646
	60 m	1.40 µm	iso.260-prog.260 °C	1010-14666
0.32 mm	30 m	1.80 µm	iso.260-prog.260 °C	1010-14747
		3.00 µm	iso.260-prog.260 °C	1010-14748
	60 m	1.80 µm	iso.260-prog.260 °C	1010-14767
0.53 mm	30 m	3.00 µm	iso.260-prog.260 °C	1010-14948
	75 m	3.00 µm	iso.260-prog.260 °C	1010-14978

InertCap 624 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	1.00 µm	iso.260-prog.260 °C	1010-14535
	40 m	1.00 µm	iso.260-prog.260 °C	1010-14555

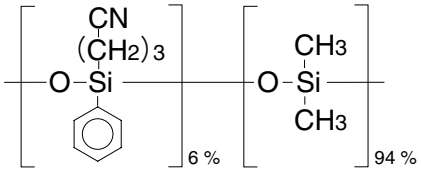
InertCap 624 for Ethanol

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	30 m	1.80 µm	iso.260-prog.260 °C	1010-14750

InertCap 1301

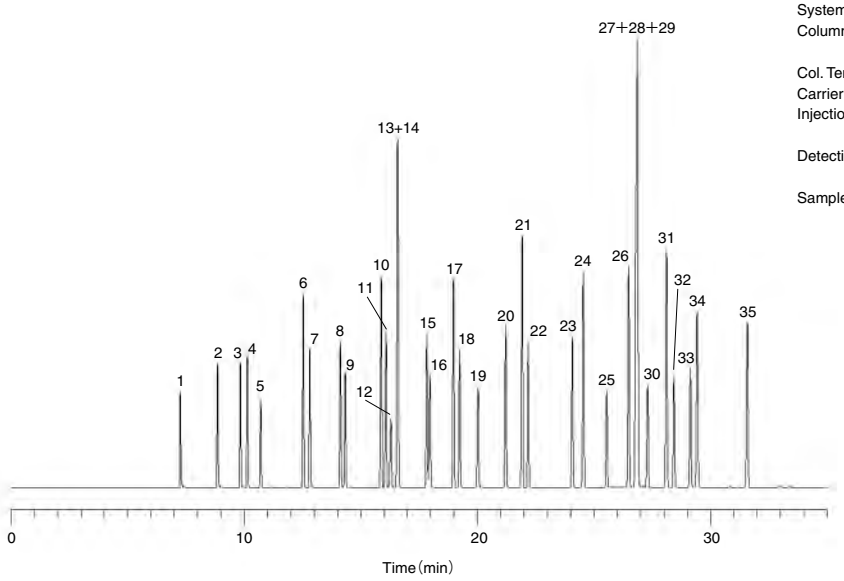
- 6 % Cyanopropylphenyl - 94 % Dimethylpolysiloxane
- USP Phase G43
- Medium Polarity
- Cross-Linked
- Equivalents:DB-1301, HP-1301, Rtx-1301, VF-1301ms

Structure



InertCap 1301 is a medium polar column bonded with 6 % cyanopropylphenyl and 94 % dimethylpolysiloxane. Compared to InertCap 25, polarity of InertCap 1301 is slightly lower. Cyano groups contained in the stationaly phase offer unique selectivities.

Packaging Material Related Solvents



System : GC/FID
Column : InertCap 1301
0.25 mm I.D. x 60 m df = 1.00 µm
Col. Temp. : 40 °C (5 min hold) - 5 °C/min - 200 °C
Carrier Gas : He 160 kPa
Injection : Split flow 100 mL/min
200 °C
Detection : FID Range 10^1
200 °C
Sample Size : Mixed evenly
0.2 µL

1. Methanol
2. Ethanol
3. Acetone
4. 2-Propanol(Isopropyl alcohol)
5. Methyl acetate
6. *n*-Hexane
7. 1-Propanol
8. 2-Butanone(MEK)
9. Ethyl acetate
10. Cyclohexane
11. 2-Methyl-1-propanol(Isobutyl alcohol)
12. 2-Methoxyethanol(Methyl cellosolve)
13. Benzene
14. Isopropyl acetate
15. 1-Butanol
16. 1-Methoxy-2-propanol (Propylene glycol monomethyl ether)
17. Methylcyclohexane
18. *n*-Propyl acetate
19. 2-Ethoxyethanol(Cellosolve)
20. 4-Methyl-2-pentanone(MIBK)
21. Toluene
22. Isobutyl acetate
23. *n*-Butyl acetate
24. Ethylcyclohexane
25. 2-Methoxyethyl acetate (Methyl cellosolve acetate)
26. Ethylbenzene
27. 1-Methoxy-2-propyl acetate (Propylene glycol monomethyl ether acetate)
28. *m*-Xylene
29. *p*-Xylene
30. Diacetone alcohol
31. *o*-Xylene
32. 2-Ethoxyethyl acetate(Cellosolve acetate)
33. 2-Butoxyethanol(Butyl cellosolve)
34. Cyclohexanone
35. 2-Methylcyclohexanone

InertCap 1301

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-60122
		0.50 µm	iso.280-prog.300 °C	1010-60124
		1.00 µm	iso.260-prog.280 °C	1010-60125
	30 m	0.25 µm	iso.280-prog.300 °C	1010-60142
		0.50 µm	iso.280-prog.300 °C	1010-60144
		1.00 µm	iso.260-prog.280 °C	1010-60145
	60 m	0.25 µm	iso.280-prog.300 °C	1010-60162
		0.50 µm	iso.280-prog.300 °C	1010-60164
		1.00 µm	iso.260-prog.280 °C	1010-60165

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-60222
		0.50 µm	iso.280-prog.300 °C	1010-60224
		1.00 µm	iso.260-prog.280 °C	1010-60225
	30 m	0.25 µm	iso.280-prog.300 °C	1010-60242
		0.50 µm	iso.280-prog.300 °C	1010-60244
		1.00 µm	iso.260-prog.280 °C	1010-60245
	60 m	0.25 µm	iso.280-prog.300 °C	1010-60262
		0.50 µm	iso.280-prog.300 °C	1010-60264
		1.00 µm	iso.260-prog.280 °C	1010-60265
0.53 mm	15 m	1.00 µm	iso.260-prog.280 °C	1010-60425
	30 m	1.00 µm	iso.260-prog.280 °C	1010-60445

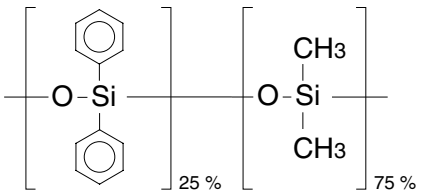
InertCap 1301 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.280-prog.300 °C	1010-60031

InertCap 25

- 25 % Diphenyl - 75 % Dimethylpolysiloxane
- USP Phase G28
- Medium Polarity
- Cross-Linked
- No Equivalent

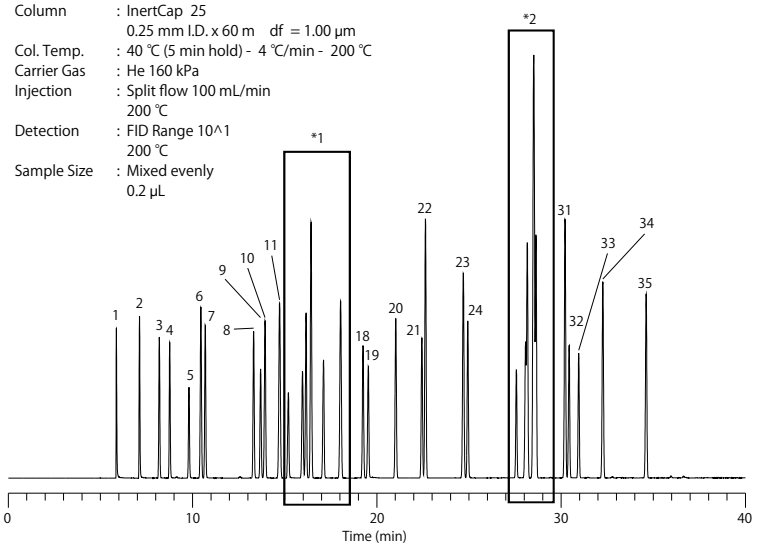
Structure

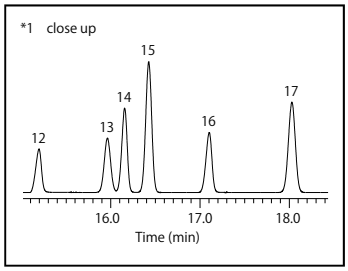


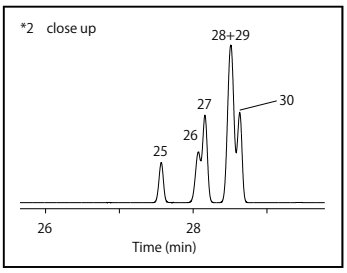
InertCap 25 is a medium polar column bonded with 25 % diphenyl - 75 % dimethylpolysiloxane. With different selectivities from the other medium polar columns, InertCap 25 is useful to identify and quantify in a variety of analyses.

Packaging Material Related Solvents

System : GC/FID
Column : InertCap 25
0.25 mm I.D. x 60 m df = 1.00 µm
Col. Temp. : 40 ℃ (5 min hold) - 4 ℃/min - 200 ℃
Carrier Gas : He 160 kPa
Injection : Split flow 100 mL/min
200 ℃
Detection : FID Range 10^1
200 ℃
Sample Size : Mixed evenly
0.2 µL







1. Methanol
2. Ethanol
3. 2-Propanol(Isopropyl alcohol)
4. Acetone
5. Methyl acetate
6. *n*-Hexane
7. 1-Propanol
8. 2-Butanone(MEK)
9. Ethyl acetate
10. 2-Methyl-1-propanol(Isobutyl alcohol)
11. Cyclohexane
12. 2-Methoxyethanol(Methyl cellosolve)
13. Isopropyl acetate
14. 1-Butanol
15. Benzene
16. 1-Methoxy-2-propanol (Propylene glycol monomethyl ether)
17. Methylcyclohexane
18. *n*Propyl acetate
19. 2-Ethoxyethanol(Cellosolve)
20. 4-Methyl-2-pentanone(MIBK)
21. Isobutyl acetate
22. Toluene
23. Ethylcyclohexane
24. *n*-Butyl acetate
25. 2-Methoxyethyl acetate (Methyl cellosolve acetate)
26. Diacetone alcohol
27. Ethylbenzene
28. *m*Xylene
29. *p*Xylene
30. 1-Methoxy-2-propyl acetate (Propylene glycol monomethyl ether acetate)
31. *o*Xylene
32. 2-Butoxyethanol(Butyl cellosolve)
33. 2-Ethoxyethyl acetate(Cellosolve acetate)
34. Cyclohexanone
35. 2-Methylcyclohexanone

InertCap 25

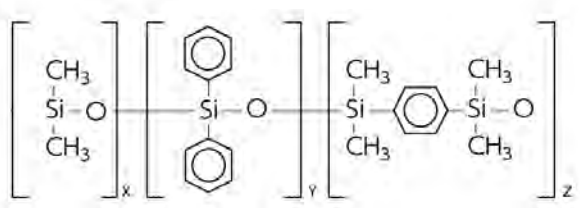
I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-62122
		0.50 µm	iso.280-prog.300 °C	1010-62124
		1.00 µm	iso.260-prog.280 °C	1010-62125
	30 m	0.25 µm	iso.280-prog.300 °C	1010-62142
		0.50 µm	iso.280-prog.300 °C	1010-62144
		1.00 µm	iso.260-prog.280 °C	1010-62145
	60 m	0.25 µm	iso.280-prog.300 °C	1010-62162
		0.50 µm	iso.280-prog.300 °C	1010-62164
		1.00 µm	iso.260-prog.280 °C	1010-62165

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-62222
		0.50 µm	iso.280-prog.300 °C	1010-62224
		1.00 µm	iso.260-prog.280 °C	1010-62225
	30 m	0.25 µm	iso.280-prog.300 °C	1010-62242
		0.50 µm	iso.280-prog.300 °C	1010-62244
		1.00 µm	iso.260-prog.280 °C	1010-62245
	60 m	0.25 µm	iso.280-prog.300 °C	1010-62262
		0.50 µm	iso.280-prog.300 °C	1010-62264
		1.00 µm	iso.260-prog.280 °C	1010-62265
0.53 mm	15 m	1.00 µm	iso.260-prog.280 °C	1010-62425
	30 m	1.00 µm	iso.260-prog.280 °C	1010-62445

InertCap 35MS

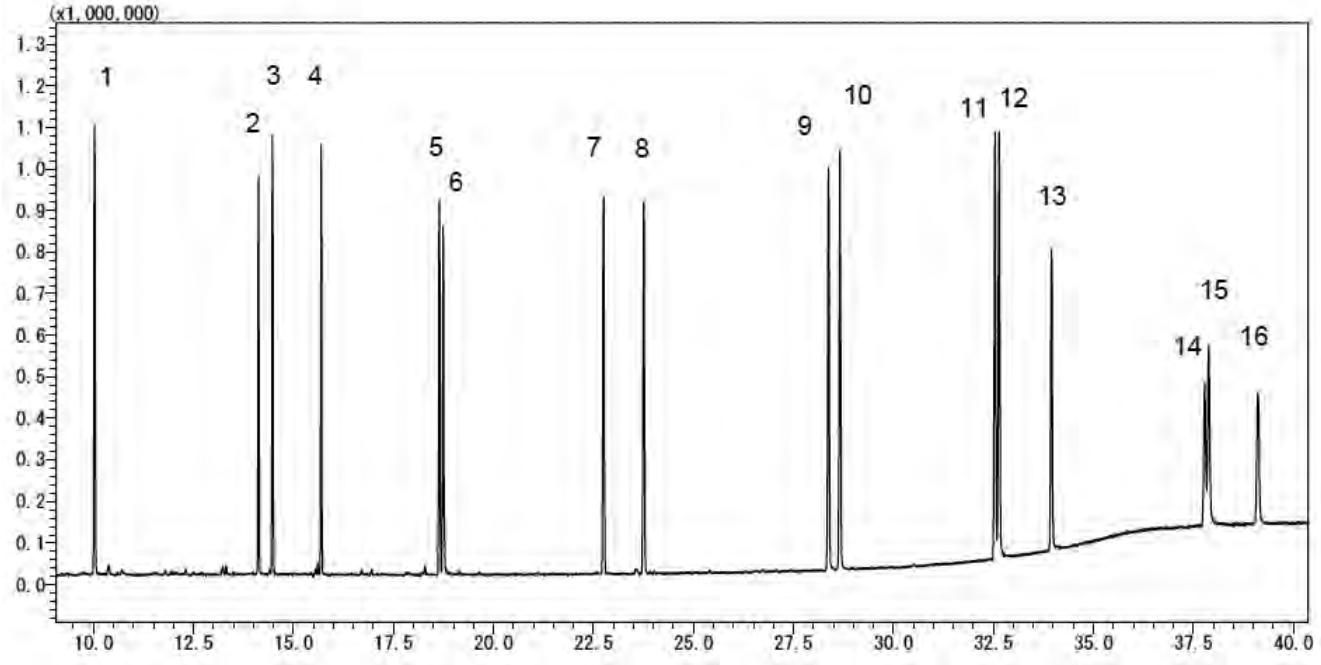
- 35 % Diphenyl(equiv.)-65 % Dimethylpolysiloxane
- Equivalent to USP Phase G42
- Medium Polarity
- Cross-Linked
- Suitable for pesticides and polyaromatic analysis
- Equivalents : DB-35ms UI, VF-35ms, Rxi-35sil MS

Structure



InertCap 35 is a medium polar column bonded with 35 % diphenyl - 65 % dimethylpolysiloxane. With a stronger polarity than InertCap 25, InertCap 35 also shows high separation efficiency for the analyses of semi volatile compounds and solvents. By increasing the heat resistance of the liquid phase, the maximum operating temperature of 360 ˚C can be achieved.

Analysis of Polycyclic Aromatics



System : GC/MS
Column : InertCap 35MS
(0.25 mm x 30 m df = 0.25 µm)
Col. Temp. : 55 °C (1 min) -10 °C/min -200 °C-
6 °C/min-320 °C (10 min)
Carriier Gas : He, 40 cm/sec constant
Injection : Splitless
300 °C
Detection : MS TIC (70-400 m/z), SIM
Detector Temp : 300 °C
Sample : TIC : 16 PAHs 1 ppm
in (Dichloromethane/Benzene = 1/1), 1 µL

1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benz[a]anthracene
10. Chrysene
11. Benzo[b]fluoranthene
12. Benzo[k]fluoranthene
13. Benzo[a]pyrene
14. Indeno(1,2,3-C,D)pyrene
15. Dibenz[a,h]anthracene
16. Benzo[ghi]perylene

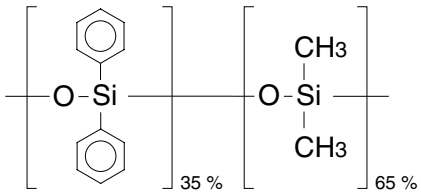
InertCap 35MS

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.340-prog.360 °C	1010-63531
0.25 mm	15 m	0.25 µm	iso.340-prog.360 °C	1010-63622
	30 m	0.25 µm	iso.340-prog.360 °C	1010-63642
	60 m	0.25 µm	iso.340-prog.360 °C	1010-63662
0.32 mm	15 m	0.25 µm	iso.340-prog.360 °C	1010-63722
	30 m	0.25 µm	iso.340-prog.360 °C	1010-63742
	60 m	0.25 µm	iso.340-prog.360 °C	1010-63762

InertCap 35

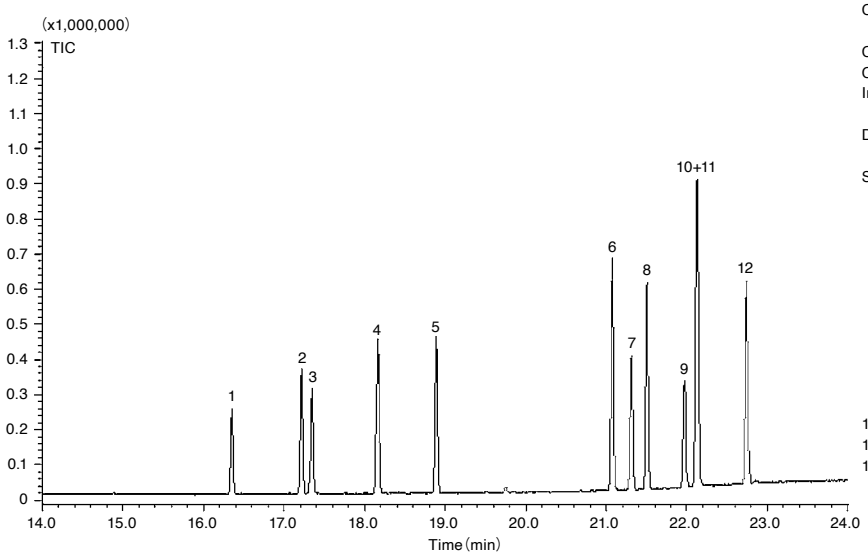
- 35 % Diphenyl - 65 % Dimethylpolysiloxane
- USP Phase G42
- Medium Polarity
- Cross-Linked
- Equivalents:DB-35ms, DB-35, HP-35ms, HP-35, Rtx-35, VF-35ms

Structure



InertCap 35 is a medium polar column bonded with 35 % diphenyl - 65 % dimethylpolysiloxane. With a stronger polarity than InertCap 25, InertCap 35 also shows high separation efficiency for the analyses of semi volatile compounds and solvents.

Pesticides



System : GC/MS
Column : InertCap 35
0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 60 ℃ - 10 ℃/min - 290 ℃ (7 min hold)
Carrier Gas : He 35 cm/sec
Injection : Split 1:30
250 ℃
Detection : MS Scan (45 - 500 m/z)
Interface Temp. 280 ℃
Sample Size : 10 µg/mL in Isooctane
1 µL

1. α-BHC
2. γ-BHC
3. β-BHC
4. Heptachlor
5. Aldrin
6. *p,p'*-DDE
7. Dieldrin
8. *o,p'*-DDD
9. Endrin
10. *p,p'*-DDD
11. *o,p'*-DDT
12. *p,p'*-DDT

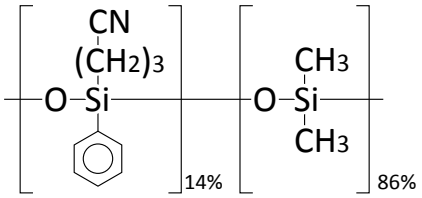
InertCap 35

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-63122
		0.50 µm	iso.280-prog.300 °C	1010-63124
		1.00 µm	iso.260-prog.280 °C	1010-63125
	30 m	0.25 µm	iso.280-prog.300 °C	1010-63142
		0.50 µm	iso.280-prog.300 °C	1010-63144
		1.00 µm	iso.260-prog.280 °C	1010-63145
	60 m	0.25 µm	iso.280-prog.300 °C	1010-63162
		0.50 µm	iso.280-prog.300 °C	1010-63164
		1.00 µm	iso.260-prog.280 °C	1010-63165
0.32 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-63222
		0.50 µm	iso.280-prog.300 °C	1010-63224
		1.00 µm	iso.260-prog.280 °C	1010-63225
	30 m	0.25 µm	iso.280-prog.300 °C	1010-63242
		0.50 µm	iso.280-prog.300 °C	1010-63244
		1.00 µm	iso.260-prog.280 °C	1010-63245
	60 m	0.25 µm	iso.280-prog.300 °C	1010-63262
		0.50 µm	iso.280-prog.300 °C	1010-63264
		1.00 µm	iso.260-prog.280 °C	1010-63265
0.53 mm	15 m	1.00 µm	iso.260-prog.280 °C	1010-63425
	30 m	0.50 µm	iso.280-prog.300 °C	1010-63444
		1.00 µm	iso.260-prog.280 °C	1010-63445

InertCap 1701MS

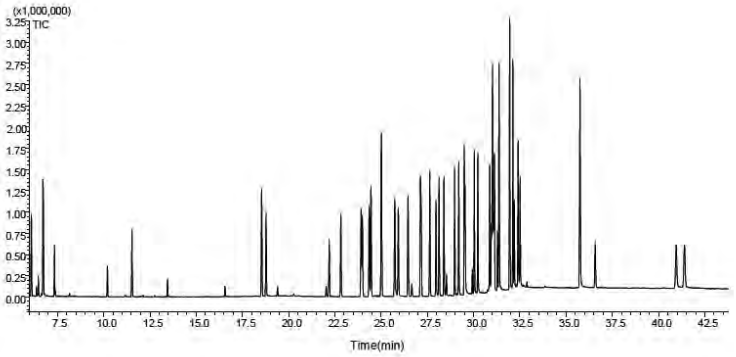
- 14 % Cyanopropylphenyl - 86 % Dimethysiloxane
- USP Phase G46
- Medium Polarity
- Cross-Linked
- Suitable for pesticides, sugars, TMS derivatives, drugs and steroids
- Equivalent : VF-1701ms

Structure



InertCap 1701MS is a medium polar column incorporating with 14 % cyanopropylphenyl and 86 % dimethylpolysiloxane, designed for GC/MS. Containing cyano groups as InertCap 1301, InertCap 1701MS has a stronger polarity than InertCap 25. It is suitable for pesticides screening analyses.

System : GC/MS
Column : 0.25 mm I.D x 30 m df = 0.25 µm
Col. Temp. : 40 ˚C (1 min) - 30 ˚C/min - 120 ˚C - 5 ˚C/min - 240 ˚C - 12/min - 300 ˚C(20 min)
Carrier Gas : He 1.0 mL/min (constant flow)
Injection : Splitless
250 ˚C
Detection : MS TIC(*m/z* 45-600)
Sample Size : 1 µL
Sample : 45 Pesticides



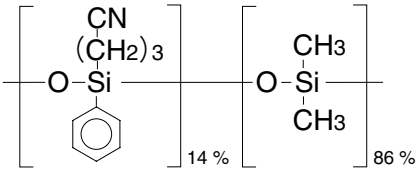
Compounds	Retention Time	Compounds	Retention Time
Alidochlor	11.532	Paclobutrazol	29.538
Diphenylamine	18.542	Chlorobenzilate	30.038
Propachlor	18.781	Flusilazole	30.226
Simazine	22.195	Bioresmethrin	30.866
Iprobenfos	22.826	Cyproconazole	30.986
Acetochlor	23.919	Benalaxyl	31.021
Dimethenamid	23.987	Fenoxanil	31.081
Esprocarb	24.357	Carfentrazone ethyl	31.122
Prometryn	24.455	Propiconazole	31.285
Terbutryn	25.026	Mepronil	31.366
Metalaxyl	25.026	Thenylchlor	31.937
Terbacil	25.739	Tebufenpyrad	31.949
Metolachlor	25.739	Etoxazole	32.12
Diethofencarb	25.931	Etoxazole metab	32.194
Cyprodinil	26.456	Tebuconazole	32.399
Dimethametryn	27.126	Fenoxycarb	32.507
Dimepiperate	27.166	Etobenzanid	35.749
Diphenamid	27.635	Etofenprox	35.745
Tetraconazole	27.968	Butafenacil	36.572
Butachlor	28.134	Flumioxazin	40.951
Fenothiocarb	28.398	Indoxacarb	41.401
Pretilachlor	28.974	Metomistrobin (E)	29.493
Napropamide	29.197		

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.280-prog.300 ˚C	1010-61622
		0.50 µm		1010-61624
		1.00 µm		1010-61625
	30 m	0.25 µm		1010-61642
		0.50 µm		1010-61644
		1.00 µm		1010-61645
	60 m	0.25 µm		1010-61662
		0.50 µm		1010-61664
		1.00 µm		1010-61665
0.32 mm	15 m	0.25 µm		1010-61722
		0.50 µm		1010-61724
		1.00 µm		1010-61725
	30 m	0.25 µm		1010-61742
		0.50 µm		1010-61744
		1.00 µm		1010-61745
	60 m	0.25 µm		1010-61762
		0.50 µm		1010-61764
		1.00 µm		1010-61765

InertCap 1701

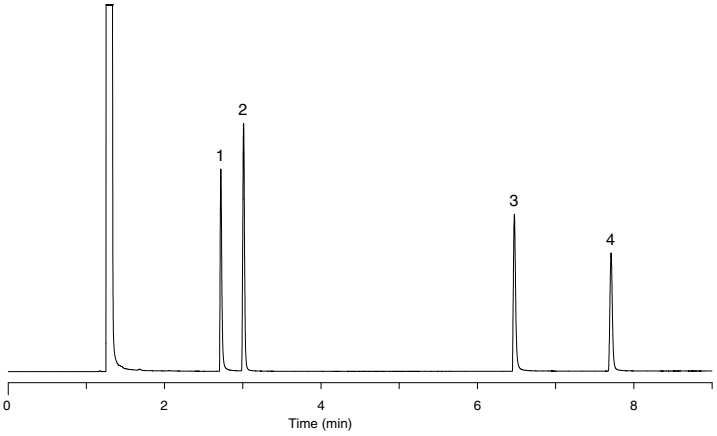
- 14 % Cyanopropylphenyl - 86 % Dimethylpolysiloxane
- USP Phase G46
- Medium Polarity
- Cross-Linked
- Equivalents:DB-1701, HP-1701, Rtx-1701, VF-1701ms, SPB-1701

Structure



InertCap 1701 is a medium polar column bonded with 14 % cyanopropylphenyl and 86 % dimethylpolysiloxane. Containing cyano groups as InertCap 1301 InertCap 1701 has a stronger polarity than InertCap 25, InertCap 1701 is suitable for pesticides screening analyses.

Glycols and Glycerine



System : GC/FID
Column : InertCap 1701
0.32 mm I.D. x 30 m df= 1.00 µm
Col. Temp. : 100 ˚C (5 min hold) - 7.5 ˚C/min - 220 ˚C
Carrier Gas : He 100 kPa
Injection : Split flow 53.6 mL/min
220 ˚C
Detection : FID Range 10^0
250 ˚C
Sample Size : 500 µg/mL in Methanol
1 µL
Data Source : GC InertSearch No.GA100

Analyte : 1. Ethylene glycol
2. Propylene glycol
3. Diethylene glycol
4. Glycerine

InertCap 1701

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-61122
		0.50 µm	iso.280-prog.300 °C	1010-61124
		1.00 µm	iso.260-prog.280 °C	1010-61125
	30 m	0.25 µm	iso.280-prog.300 °C	1010-61142
		0.50 µm	iso.280-prog.300 °C	1010-61144
		1.00 µm	iso.260-prog.280 °C	1010-61145
	60 m	0.25 µm	iso.280-prog.300 °C	1010-61162
		0.50 µm	iso.280-prog.300 °C	1010-61164
		1.00 µm	iso.260-prog.280 °C	1010-61165
0.32 mm	15 m	0.25 µm	iso.280-prog.300 °C	1010-61222
		0.50 µm	iso.280-prog.300 °C	1010-61224
		1.00 µm	iso.260-prog.280 °C	1010-61225
	30 m	0.25 µm	iso.280-prog.300 °C	1010-61242
		0.50 µm	iso.280-prog.300 °C	1010-61244
		1.00 µm	iso.260-prog.280 °C	1010-61245
	60 m	0.25 µm	iso.280-prog.300 °C	1010-61262
		0.50 µm	iso.280-prog.300 °C	1010-61264
		1.00 µm	iso.260-prog.280 °C	1010-61265
0.53 mm	15 m	1.00 µm	iso.260-prog.280 °C	1010-61425
	30 m	1.00 µm	iso.260-prog.280 °C	1010-61445

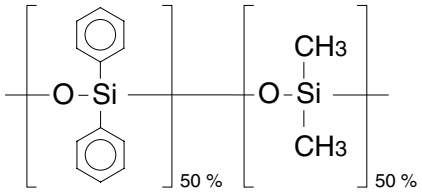
InertCap 1701 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.280-prog.300 °C	1010-61031

InertCap 17MS

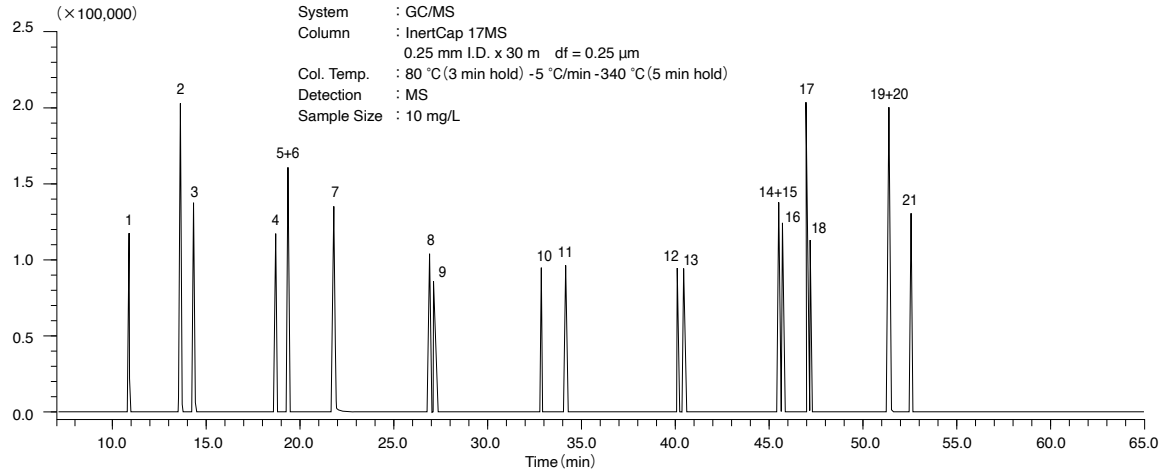
- 50 % Diphenyl - 50 % Dimethylpolysiloxane
- USP Phase G3
- Medium Polarity
- Cross-Linked
- Ultra Low Bleed
- Equivalents:DB-17ms, Rxi-17, VF-17ms, SPB-17

Structure



InertCap 17MS is a medium polar column bonded with 50 % diphenyl - 50 % dimethylpolysiloxane, designed for GC/MS. InertCap 17MS achieves one of the world highest inertness and lowest bleed, and is suitable for microanalyses such as pesticides analyses.

21 Aromatic Hydrocarbons



1. Naphthalene
2. 2-Methylnaphthalene
3. 1-Methylnaphthalene
4. Acenaphthylene
5. Acenaphthene
6. Biphenyl
7. Fluorene
8. Phenanthrene
9. Anthracene
10. Fluoranthene
11. Pyrene
12. Chrysene
13. Benzo[*a*]anthracene
14. Benzo[*b*]fluoranthene
15. Benzo[*k*]fluoranthene
16. Benzo[*e*]pyrene
17. Benzo[*a*]pyrene
18. Benzo[*j*]fluoranthene
19. Dibenz[*a,h*]anthracene
20. Benzo[*g,h,i*]perylene
21. Indeno[1,2,3-*cd*]pyrene

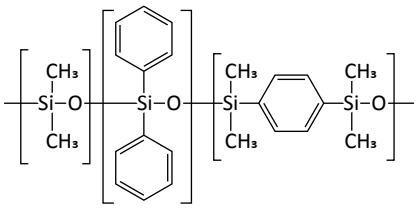
InertCap 17MS

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.320-prog.340 °C	1010-20122
	30 m	0.25 µm	iso.320-prog.340 °C	1010-20142
	60 m	0.25 µm	iso.320-prog.340 °C	1010-20162
0.32 mm	15 m	0.25 µm	iso.320-prog.340 °C	1010-20222
	30 m	0.25 µm	iso.320-prog.340 °C	1010-20242
	60 m	0.25 µm	iso.320-prog.340 °C	1010-20262

InertCap 17MS/Sil

- 50 % Diphenyl(equiv.) - 50 % Dimethylsilphenylene Siloxane
- USP Phase G3
- Medium Polarity
- Cross-Linked
- Equivalents: DB-17MS, VF-17ms, Rxi-17sil MS

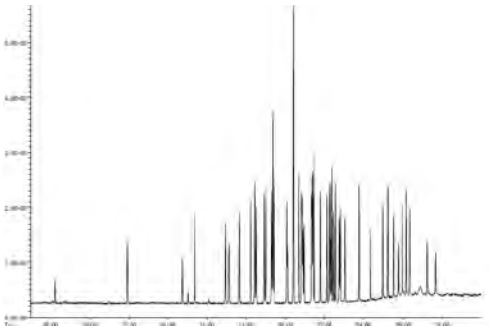
Structure



InertCap 17MS/Sil exhibits high thermal stability and low bleed because of silphenylenes in the stationary phase. Optimization of the surface processing has improved the inertness. This column is suitable for analysis of pesticides and polycyclic aromatic compounds.

Analysis of Pesticides

System : GC/MS
Column : InertCap 17MS/Sil
Col.Size : 0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 50 ˚C (1 min hold) - 10 ˚C/min - 300 ˚C (4 min hold)
Carrier Gas : 1.0 mL/min
Injection : 250 ˚C
MSD I.F.Temp. : 300 ˚C
I.S. Temp. : 200 ˚C
Sample Size : 1 µL



1. 0:11:56 Dichlorvos
2. 0:14:45 Mevinphos
3. 0:15:23 Methacrifos
4. 0:16:56 Ethoprophos
5. 0:17:08 Cadusafos
6. 0:17:39 Phorate
7. 0:18:14 Terbufos
8. 0:18:27 Diazinon
9. 0:18:31 Salithion
10. 0:18:55 Fonofos
11. 0:19:00 Etrimfos
12. 0:19:18 Cyanophos
13. 0:19:22 Dichlofenthion + Dimethoate
14. 0:19:26 Isazophos
15. 0:20:05 Chlorpyriphos methyl
16. 0:20:07 Phosphamidon
17. 0:20:25 Parathion methyl + Pirimiphos methyl + Tolclofos methyl
18. 0:20:42 Chlorpyriphos
19. 0:20:50 Malathion
20. 0:20:51 Dimethylvinphos(E or Z)
21. 0:20:54 Fenitrothion
22. 0:20:57 Parathion
23. 0:21:20 Dimethylvinphos(E or Z)
24. 0:21:22 Chlorfenvinphos(E or Z)
25. 0:21:24 Fenthion
26. 0:21:29 Isofenphos
27. 0:21:47 Chlorfenvinphos(E or Z)
28. 0:22:07 Quinalphos
29. 0:22:15 Propaphos + Fosthiazate
30. 0:22:19 Phenthoate
31. 0:22:23 Prothiofos
32. 0:22:28 Butamifos
33. 0:22:33 Tetrachlorvinphos
34. 0:22:46 Fenamiphos
35. 0:22:49 Profenophos
36. 0:23:02 Methidathion
37. 0:23:46 Ethion
38. 0:24:21 Fensulfothion
39. 0:24:59 Triazophos
40. 0:25:15 Edifenphos
41. 0:25:31 Piperophos
42. 0:25:47 EPN
43. 0:25:58 Pyridaphenthion
44. 0:26:10 Anilofos
45. 0:26:20 Phosalone
46. 0:27:15 Pyraclofos
47. 0:27:41 Azinphos methyl

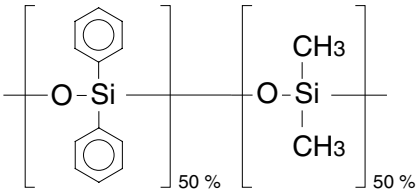
InertCap 17MS/Sil

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.340 °C-prog.360 °C	1010-20531
	30 m	0.18 µm	iso.340 °C-prog.360 °C	1010-20541
0.25 mm	15 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20622
	30 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20642
	60 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20662
0.32 mm	15 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20722
	30 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20742
	60 m	0.25 µm	iso.340 °C-prog.360 °C	1010-20762

InertCap 17

- 50 % Diphenyl - 50 % Dimethylpolysiloxane
- USP Phase G3
- Medium Polarity
- Cross-Linked
- Equivalents:DB-17, HP-50, Rtx-50, CP-Sil 24CB, SPB-50

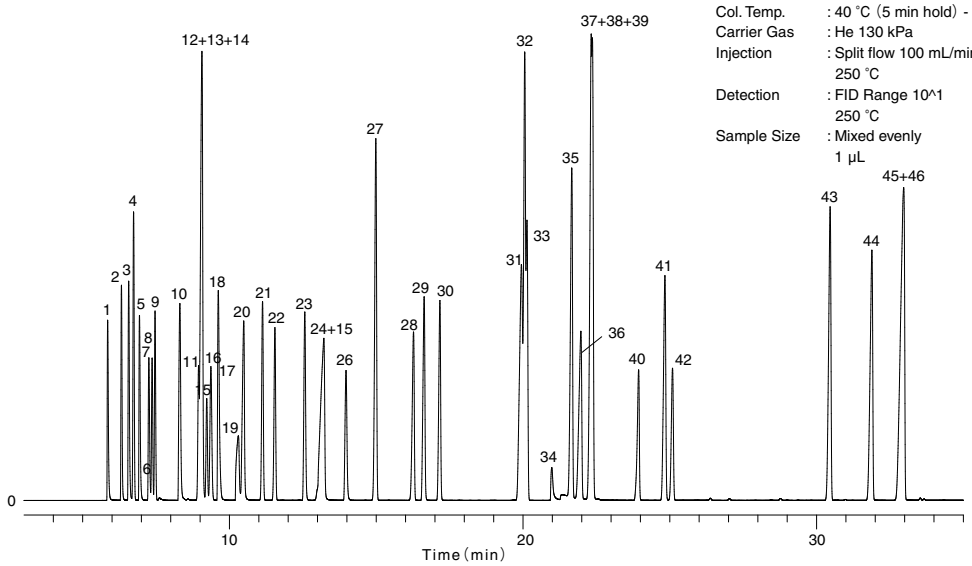
Structure



InertCap 17 is a medium polar column bonded with 50 % diphenyl - 50 % dimethylpolysiloxane. With stronger polarity than InertCap 35, InertCap 17 also shows high separation efficiency for general and pesticides analyses.

46 Organic Solvents

System : GC/FID
Column : InertCap 17
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) - 4 °C/min - 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL



1. Methanol
2. Ethyl ether
3. i-Propanol
4. *n*-Hexane
5. Acetone
6. Carbon disulfide
7. Methyl acetate
8. Dichloromethane
9. *trans*-1,2-Dichloroethylene
10. 2-Butanol
11. *cis*-1,2-Dichloroethylene
12. Methyl ethyl ketone
13. i-Butanol
14. Ethyl acetate
15. Chloroform
16. 1,1,1-Trichloroethane
17. Carbon tetrachloride
18. Tetrahydrofuran
19. Methylcellosolve
20. *n*-Butanol
21. 1,2-Dichloroethane
22. Trichloroethylene
23. *n*-Propyl acetate
24. i-Amyl alchol
25. Ethyl cellosolve
26. 1,4-Dioxane
27. Toluene
28. Tetrachloroethylene
29. Methyl-n-butyl ketone
30. *n*-Butyl acetate
31. *p*-Xylene
32. *m*-Xylene
33. Chlorobenzene
34. *N,N*-Dimethyl formamide
35. *o*-Xylene
36. 1-Methylcyclohexanol
37. Cyclohexanol
38. Butyl cellosolve
39. Styrene
40. Cellosolve acetate
41. Cyclohexanone
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol

InertCap 17

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.320-prog.340 °C	1010-65122
	30 m	0.15 µm	iso.320-prog.340 °C	1010-65141
		0.25 µm	iso.320-prog.340 °C	1010-65142
	60 m	0.25 µm	iso.320-prog.340 °C	1010-65162
0.32 mm	30 m	0.25 µm	iso.320-prog.340 °C	1010-65242
	60 m	0.25 µm	iso.320-prog.340 °C	1010-65262
0.53 mm	15 m	1.00 µm	iso.300-prog.320 °C	1010-65425
	30 m	1.00 µm	iso.300-prog.320 °C	1010-65445

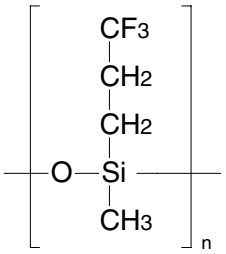
InertCap 17 Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.320-prog.340 °C	1010-65031

InertCap 210

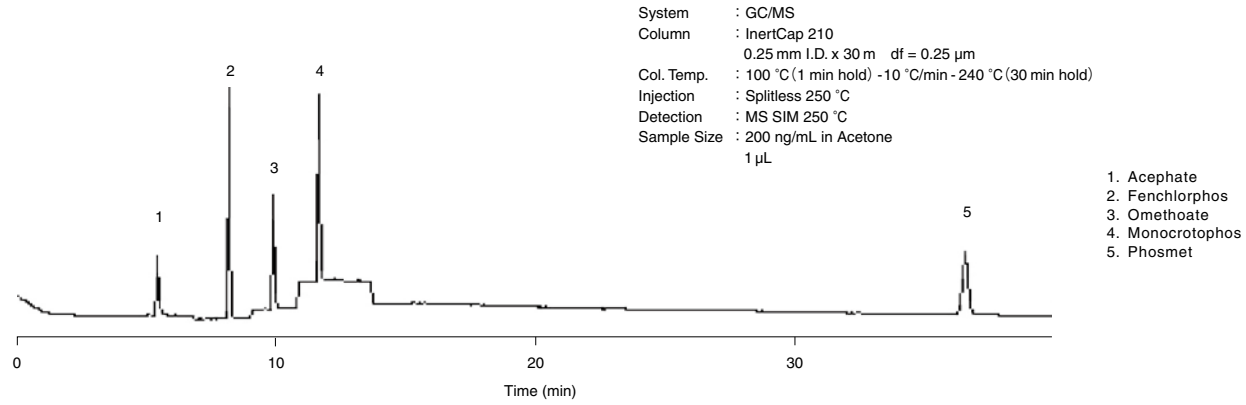
- 50 % Trifluoropropyl - 50 % Methylpolysiloxane
- USP Phase G6
- Medium Polarity
- Cross-Linked
- Excellent Separation for Organophosphorous Pesticides
- Equivalents:DB-210, Rtx-200, VF-200ms

Structure



InertCap 210 is a medium polar column bonded with 50 % trifluoropropyl and 50 % methylpolysiloxane. With a unique selectivity against polar compounds, InertCap 210 is suitable for analyses of such compounds containing phosphorous-nitrogen.

Organophosphorous Pesticides



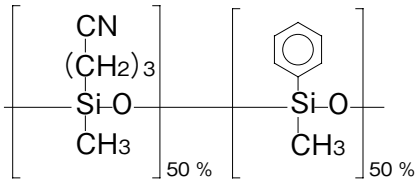
InertCap 210

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	iso.240-prog.260 °C	1010-66142
0.32 mm	30 m	0.25 µm	iso.240-prog.260 °C	1010-66242
0.53 mm	15 m	1.00 µm	iso.220-prog.240 °C	1010-66425
	30 m	1.00 µm	iso.220-prog.240 °C	1010-66445

InertCap 225

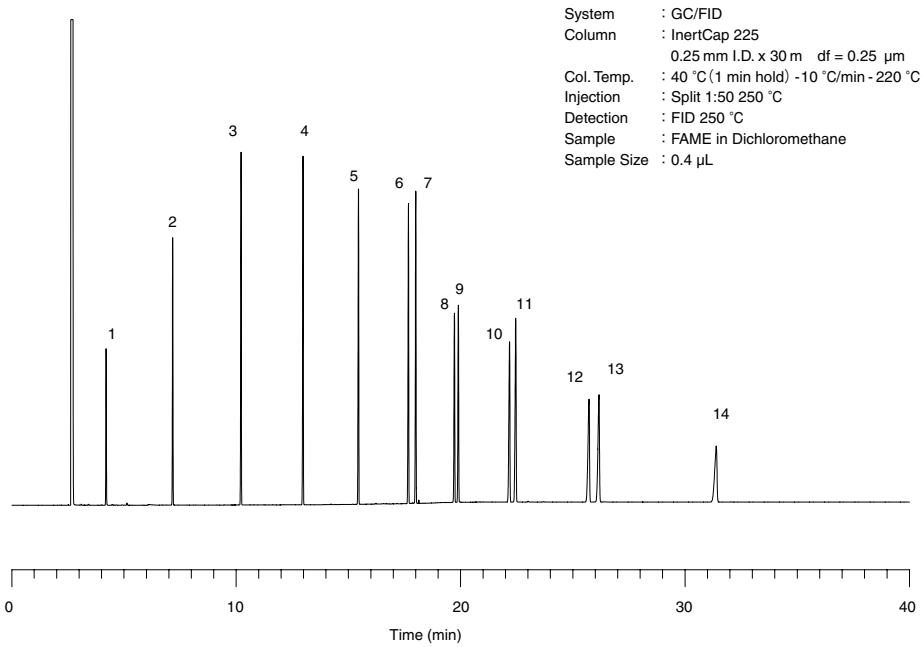
- 50 % Cyanopropylmethyl - 50 % Phenylmethylpolysiloxane
- USP Phase G19
- Medium Polarity
- Cross-Linked
- Excellent Separation for FAME
- Equivalents:DB-225, HP-225, Rtx-225, CP-Sil 43CB

Structure



InertCap 225 is a medium polar column bonded with 50 % cyanopropylmethyl and 50 % phenylmethylpolysiloxane. Cyano group in the stationary phase includes triple bond and retains compounds stronger in accordance with the increase of the number of unsaturated bond by their dipole/dipole interactions. For that reasons InertCap 225 shows high separation efficiency for analyses of geometrical isomers.

FAME (Fatty Acid Methyl Esters)



1. Methyl Butanoate
2. Methyl Hexanoate
3. Methyl Octanoate
4. Methyl Decanoate
5. Methyl Dodecanoate
6. Methyl Tetradecanoate
7. Methyl Myristoleate
8. Methyl Hexadecanoate
9. Methyl Palmitelaidate
10. Methyl Octadecanoate
11. Methyl Oleate
12. Methyl Eicosanoate
13. Methyl-*cis*-11-Eicoseate
14. Methyl Docosanoate

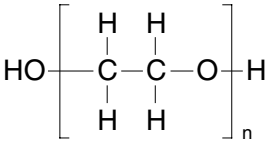
InertCap 225

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	iso.220-prog.240 °C	1010-66642
0.32 mm	30 m	0.25 µm	iso.220-prog.240 °C	1010-66742
0.53 mm	30 m	0.50 µm	iso.220-prog.240 °C	1010-66844

InertCap Pure-WAX

- Polyethylene Glycol (PEG)
- USP Phase G16
- High Polarity
- Cross-Linked
- Equivalents:DB-WAX, HP-INNOWax, Rtx-Wax, Stabilwax

Structure



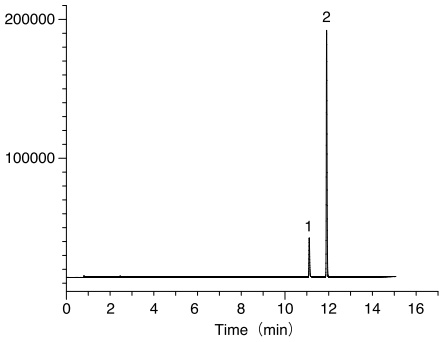
InertCap Pure-WAX is a high polar column bonded polyethylene glycol. Based on newly developed inner treatment technology, InertCap Pure-WAX achieves the highest inertness among the market available columns. InertCap Pure-WAX is a optimal column for analyses of acidic compounds and basic compounds that commercially available WAX columns were not capable of analyzing.

Comparison

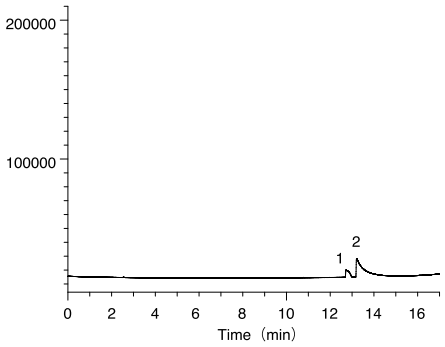
Acidic Compounds

System : GC/FID
Column : 0.25 mm I.D. x 30 m df = 0.25 µm
Col.Temp. : 90 ˚C (5min hold) - 10 ˚C/min - 240 ˚C
Carrier Gas : He 100 kPa
Injection : Split flow 100 mL/min
240 ˚C
Detection : FID Range 10^0
240 ˚C
Sample Size : 5 mg/mL 0.4 µL

1. Acrylic acid
2. Methacrylic acid



InertCap Pure-WAX

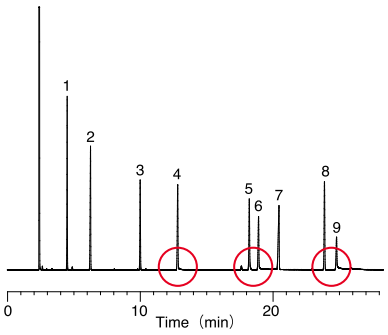


Brand A

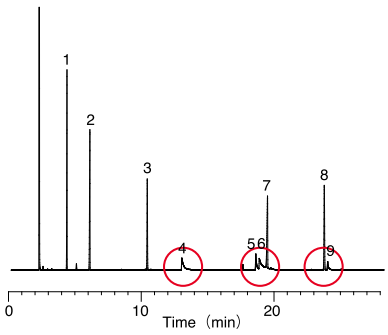
Basic Compounds

System : GC/FID
Column : 0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 60 ˚C - 4 ˚C/min - 250 ˚C
Injection : 250 ˚C
Detection : 250 ˚C
Sample Size : 0.1 mg/mL in Methanol 0.2 µL

1. *n*-Undecane
2. *n*-Dodecane
3. 4.6-Dimethylpyrimidine
4. 1-Aminooctane
5. *N,N*-Dicyclohexylamine
6. 1-Aminodecane
7. *n*-Heptadecane
8. 2.6-Dimethylaniline
9. 1-Aminododecane



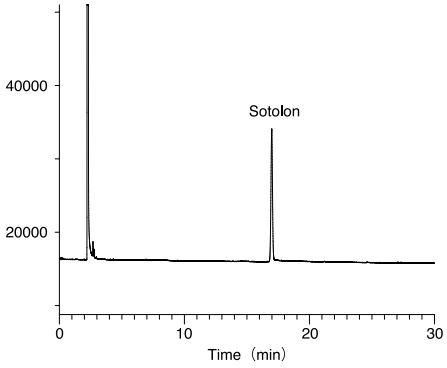
InertCap Pure-WAX



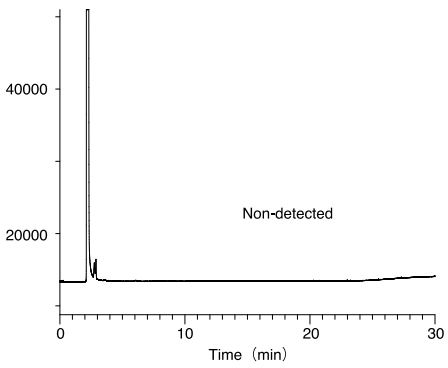
Brand A

Chelating Compounds

System : GC/FID
Column : 0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 160 ˚C Isothermal
Carrier Gas : He 100 kPa
Injection : Split flow 50 mL/min
240 ˚C
Detection : FID Range 10^0
240 ˚C
Sample Size : 1 mg/mL in Ethanol
1 µL



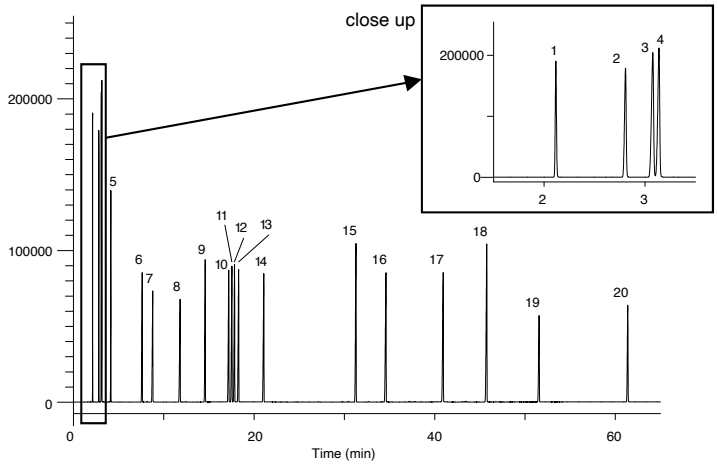
InertCap Pure-WAX



Brand A

InertCap Pure-WAX

Flavor



System : GC/FID
Column : InertCap Pure-WAX
0.25 mm I.D. x 30 m df = 0.25 µm
Col. Temp. : 40 ℃(5 min hold) - 3 ℃/min - 250 ℃
Carrier Gas : He 100 kPa
Injection : Split flow 150 mL/min
260 ℃
Detection : FID Range 10^1
260 ℃
Sample Size : Mixed evenly
0.3 µL

1. Propionaldehyde
2. Ethyl acetate
3. 2-Methylbutyraldehyde
4. Isovaleraldehyde
5. *n*-Valeraldehyde
6. 3-Methyl-2-butanol
7. 2-Pentanol
8. Isoamyl propionate
9. 2-Methylpyrazine
10. 2,5-Dimethylpyrazine
11. 2,6-Dimethylpyrazine
12. 2-Ethylpyrazine
13. 2,3-Dimethylpyrazine
14. 2-Ethyl-3-methylpyrazine
15. Acetophenone (Acetylbenzene)
16. 5,6,7,8-Tetrahydroquinoxaline
17. Isobutyl phenyl acetate
18. 6-Methylquinoline
19. Piperonal
20. Vanillin

InertCap Pure-WAX

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	iso.260-prog.260 °C	1010-68142
		0.50 µm	iso.260-prog.260 °C	1010-68144
	60 m	0.25 µm	iso.260-prog.260 °C	1010-68162
		0.50 µm	iso.260-prog.260 °C	1010-68164
0.32 mm	30 m	0.25 µm	iso.260-prog.260 °C	1010-68242
		0.50 µm	iso.260-prog.260 °C	1010-68244
	60 m	0.25 µm	iso.260-prog.260 °C	1010-68262
		0.50 µm	iso.260-prog.260 °C	1010-68264
0.53 mm	15 m	1.00 µm	iso.240-prog.240 °C	1010-68425
	30 m	1.00 µm	iso.240-prog.240 °C	1010-68445
	60 m	1.00 µm	iso.240-prog.240 °C	1010-68465

InertCap Pure-WAX ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68490
			5 m	iso.260-prog.260 °C	1010-68491
			10 m	iso.260-prog.260 °C	1010-68494

InertCap Pure-WAX T.L. (Built-in Transfer Line)

I.D.	Length	Thickness	Transfer Line Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68492
	60 m	0.25 µm	2 m	iso.260-prog.260 °C	1010-68493

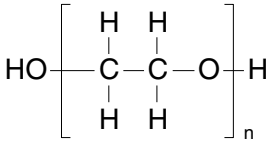
InertCap Pure-WAX Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.260-prog.260 °C	1010-68031
	40 m	0.18 µm	iso.260-prog.260 °C	1010-68051

InertCap WAX

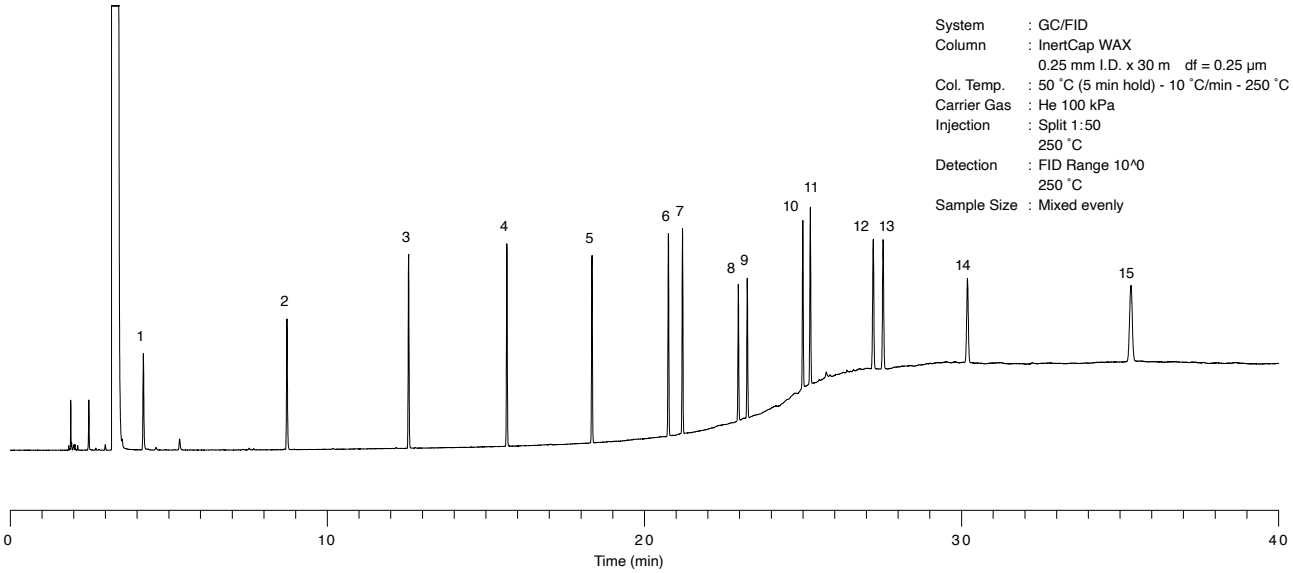
- Polyethylene Glycol (PEG)
- USP Phase G16
- High Polarity
- Cross-Linked
- Equivalents:DB-WAX, HP-INNOWax, Rtx-Wax, Stabilwax

Structure



InertCap WAX is a high polar column bonded with polyethylene glycol. With a slightly higher polarity than InertCap Pure-WAX, InertCap WAX demonstrates high separations. It is optimal for analyses of high polar samples such as solvents.

Fatty Acid Methyl Esters (FAME)



1. Methyl butanoate
2. Methyl hexanoate
3. Methyl octanoate
4. Methyl decanoate
5. Methyl dodecanoate
6. Methyl tetradecanoate
7. Methyl myristoleate
8. Methyl hexadecanoate
9. Methyl palmitoleate
10. Methyl octadecanoate
11. Methyl oleate
12. Methyl eicosanoate
13. Methyl *cis*-11-eicosenoate
14. Methyl docosanoate
15. Methyl tetracosanoate

InertCap WAX

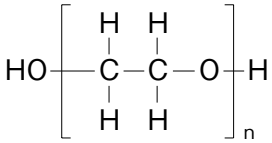
I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.250-prog.260 °C	1010-67122
	30 m	0.25 µm	iso.250-prog.260 °C	1010-67142
		0.50 µm	iso.250-prog.260 °C	1010-67144
	60 m	0.25 µm	iso.250-prog.260 °C	1010-67162
		0.50 µm	iso.250-prog.260 °C	1010-67164

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	15 m	0.25 µm	iso.250-prog.260 °C	1010-67222
	30 m	0.25 µm	iso.250-prog.260 °C	1010-67242
		0.50 µm	iso.250-prog.260 °C	1010-67244
	60 m	0.25 µm	iso.250-prog.260 °C	1010-67262
		0.50 µm	iso.250-prog.260 °C	1010-67264
		1.00 µm	iso.230-prog.240 °C	1010-67265
0.53 mm	15 m	1.00 µm	iso.230-prog.240 °C	1010-67425
		2.00 µm	iso.230-prog.240 °C	1010-67427
	30 m	1.00 µm	iso.230-prog.240 °C	1010-67445
		2.00 µm	iso.230-prog.240 °C	1010-67447
		3.00 µm	iso.230-prog.240 °C	1010-67449
	60 m	1.00 µm	iso.230-prog.240 °C	1010-67465

InertCap WAX-HT

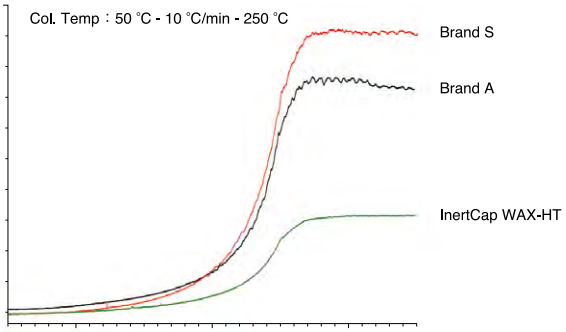
- Polyethylene Glycol (PEG)
- USP Phase G16
- High Polarity
- Cross-Linked
- Equivalents:DB-WAXetr, SolGel-WAX

Structure



InertCap WAX-HT is a strong polar column bonded polyethylene glycol. By increasing the heat resistance of stationary phase, InertCap WAX-HT achieves the practical use of the maximum temperature 280 ˚C. Being optimal for the analyses of polar samples such as solvents, InertCap WAX-HT also available for the analyses of high-boiling compounds.

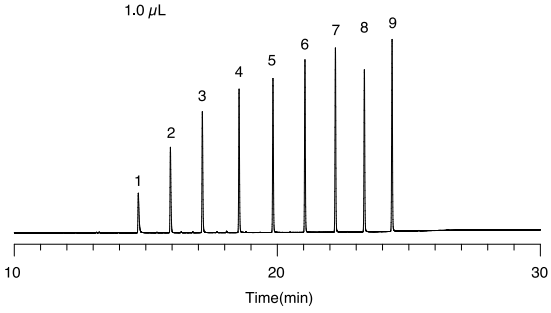
Comparison of Column Bleeding



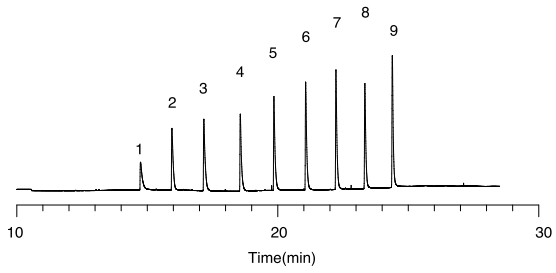
Short-chain Fatty Acids

System : GC/FID
Column : InertCap WAX-HT 0.25 mm I.D. x 30 m df = 0.25 μm
Col. Temp. : 40 ˚C (5min hold) -10 ˚C/min-240 ˚C
Carrier Gas : He 100 kPa
Injection : Split flow 50 mL/min 240 ˚C
Detection : FID Range 10^0 240 ˚C
Sample Size : 1000 μg/mL in Acetone
1.0 μL

1. Acetic Acid
2. Propionic Acid
3. Butyric Acid
4. Valeric Acid
5. Caproic Acid
6. Heptyric Acid
7. Caprylic Acid
8. Pelargonic Acid
9. Capric Acid



InertCap WAX-HT



Brand S

InertCap WAX-HT

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 μm	iso.270-prog.280 °C	1010-68542
		0.50 μm	iso.260-prog.270 °C	1010-68544
	60 m	0.25 μm	iso.270-prog.280 °C	1010-68562
		0.50 μm	iso.260-prog.270 °C	1010-68564

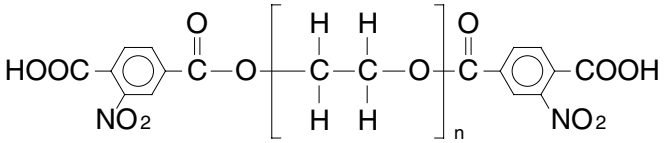
I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	30 m	0.25 μm	iso.270-prog.280 °C	1010-68642
		0.50 μm	iso.260-prog.270 °C	1010-68644
	60 m	0.25 μm	iso.270-prog.280 °C	1010-68662
		0.50 μm	iso.260-prog.270 °C	1010-68664
0.53 mm	15 m	1.00 μm	iso.250-prog.260 °C	1010-68725
	30 m	1.00 μm	iso.250-prog.260 °C	1010-68745
	60 m	1.00 μm	iso.250-prog.260 °C	1010-68765

InertCap FFAP

InertCap FFAP

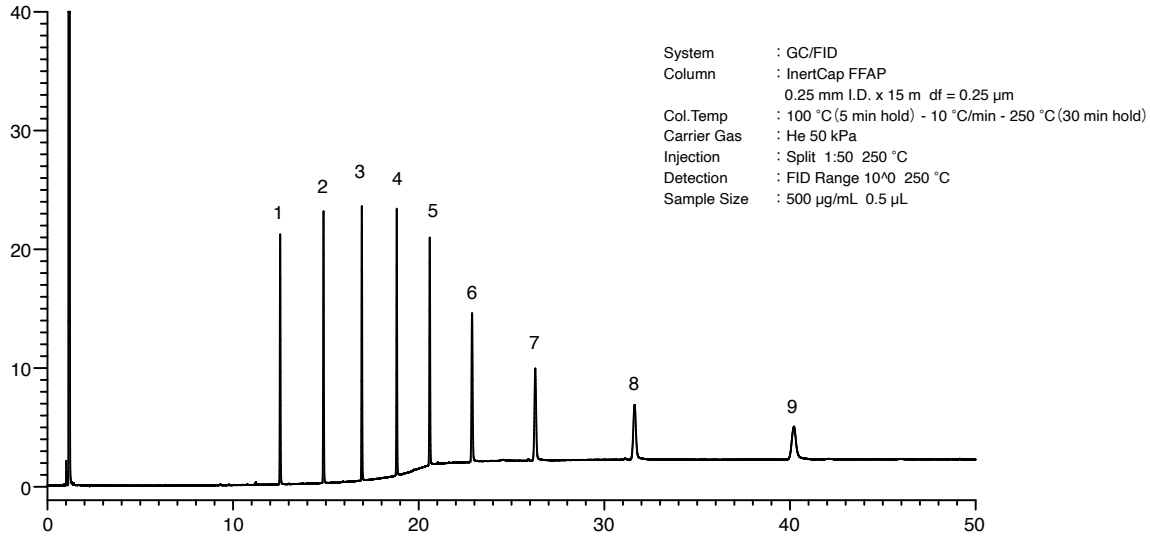
- Nitroterephthalic Acid Modified Polyethylene Glycol
- USP Phase G35
- High Polarity
- Cross-Linked
- Equivalents:DB-FFAP, HP-FFAP, CP-WAX 58 (FFAP) CB

Structure



InertCap FFAP is a high polar column bonded nitroterephthalic acid modified polyethylene glycol. As the liquid phase shows acidity, it is possible to analyze volatile fatty acids without a derivatization. InertCap FFAP is optimal for the analyses of acidic compounds.

Odd Free Fatty Acids



1. C7 Heptanoic acid
2. C9 Nonanoic acid
3. C11 Undecanoic acid
4. C13 Tridecanoic acid
5. C15 Pentadecanoic acid
6. C17 Heptadecanoic acid
7. C19 Nonadecanoic acid
8. C21 Heneicosanoic acid
9. C23 Tricosanoic acid

InertCap FFAP

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	15 m	0.25 µm	iso.240-prog.250 °C	1010-28622
	30 m	0.25 µm	iso.240-prog.250 °C	1010-28642
		0.50 µm	iso.240-prog.250 °C	1010-28644
	60 m	0.25 µm	iso.240-prog.250 °C	1010-28662
		0.50 µm	iso.240-prog.250 °C	1010-28664
0.32 mm	15 m	0.25 µm	iso.240-prog.250 °C	1010-28722
	30 m	0.25 µm	iso.240-prog.250 °C	1010-28742
		0.50 µm	iso.240-prog.250 °C	1010-28744
		1.00 µm	iso.230-prog.240 °C	1010-28745
	60 m	0.25 µm	iso.240-prog.250 °C	1010-28762
		0.50 µm	iso.240-prog.250 °C	1010-28764
		1.00 µm	iso.230-prog.240 °C	1010-28765
0.53 mm	15 m	0.50 µm	iso.240-prog.250 °C	1010-28924
		1.00 µm	iso.230-prog.240 °C	1010-28925
	30 m	0.25 µm	iso.240-prog.250 °C	1010-28942
		0.50 µm	iso.240-prog.250 °C	1010-28944
		1.00 µm	iso.230-prog.240 °C	1010-28945

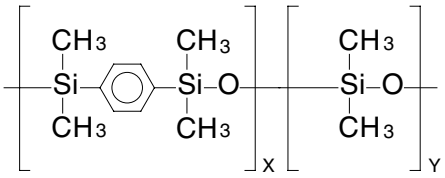
InertCap FFAP Fast GC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.18 mm	20 m	0.18 µm	iso.240-prog.250 °C	1010-28531
	40 m	0.18 µm	iso.240-prog.250 °C	1010-28551

InertCap Pesticides

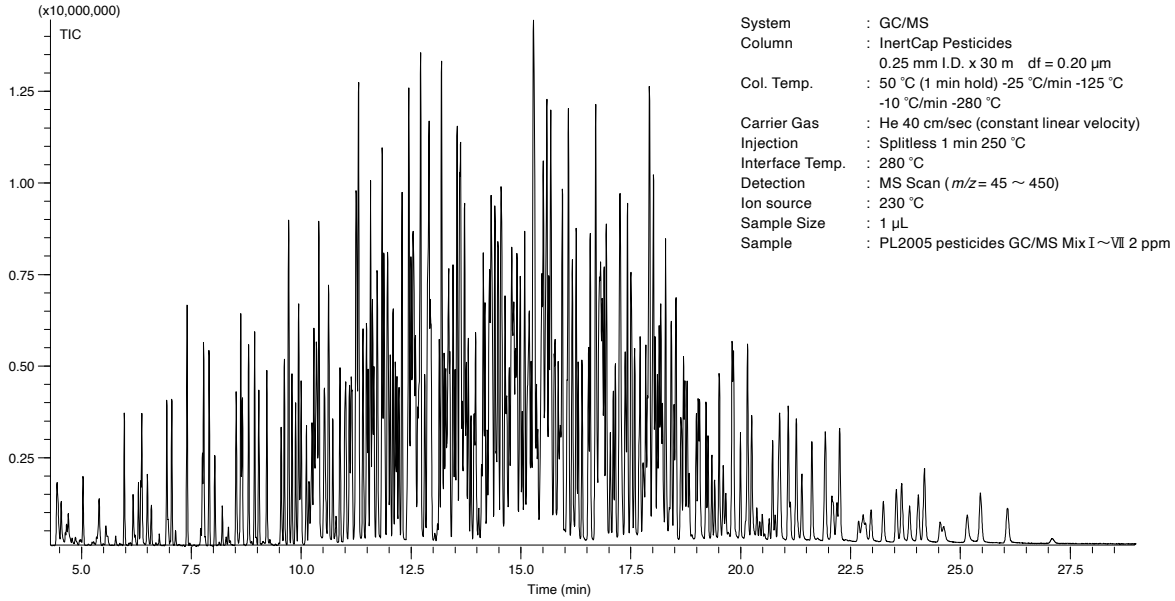
- 5 % Diphenyl (equiv.) – 95 % Dimethylpolysilphenylene Siloxane
- USP Phase G27
- Low Polarity
- Cross-Linked
- Ultra Low Bleed
- No equivalent

Structure



InertCap Pesticides is specially designed for simultaneous analyses of pesticides with GC/MS. Heat decomposition of pesticides in column and influence by matrix can be eliminated.

Pesticides



Note: About the sample details please see “GC Technical Note No.6” on our website.

InertCap Pesticides

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.20 µm	iso.325-prog.350 °C	1010-15141

InertCap Pesticides ProGuard (Built-in Guard Column)

I.D.	Length	Thickness	Guard Column Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.20 µm	2 m	iso.325-prog.350 °C	1010-15175
			5 m	iso.325-prog.350 °C	1010-15176
			10 m	iso.325-prog.350 °C	1010-15177

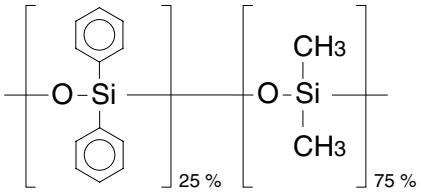
InertCap Pesticides T.L. (Built-in Transfer Line)

I.D.	Length	Thickness	Transfer Line Length	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	2 m	iso.325-prog.350 °C	1010-15191

InertCap AQUATIC

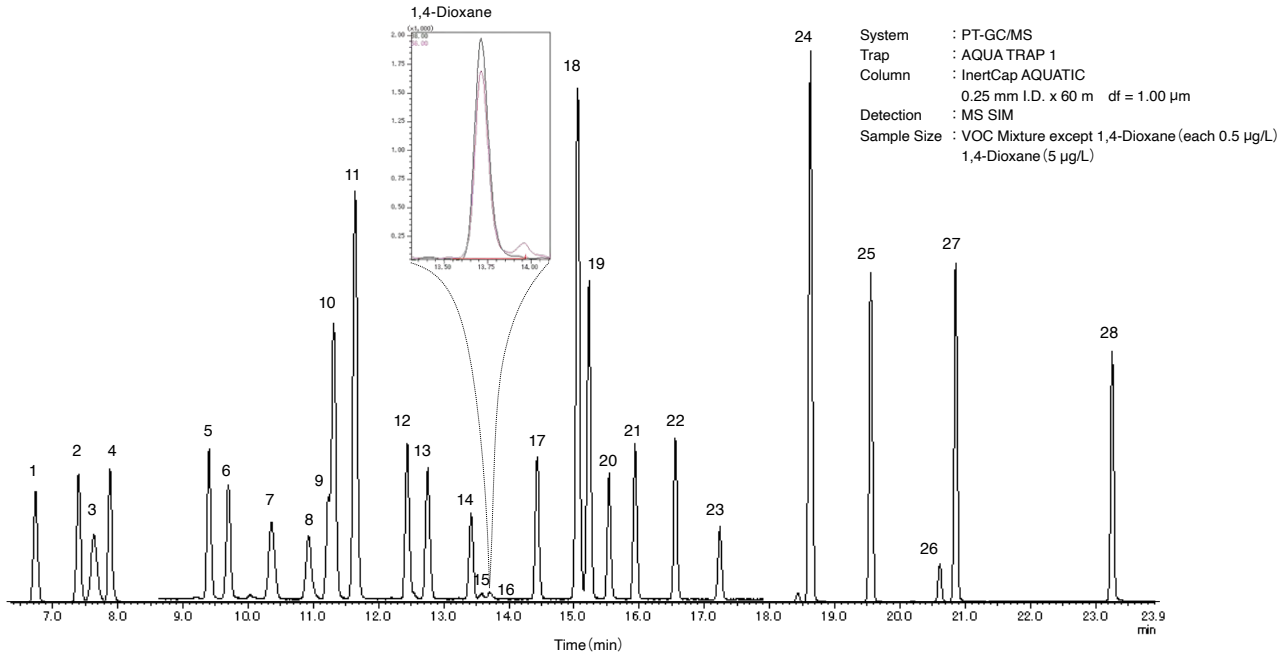
- 25 % Diphenyl – 75 % Dimethylpolysiloxane
- USP Phase G28
- Medium Polarity
- Cross-Linked
- No Equivalent

Structure



AQUATIC is a medium polar column bonded with 25 % diphenyl – 75 % dimethylpolysiloxane, especially designed for the analyses of volatile organic compounds in water.
As the column polarity is optimized, AQUATIC enables high separations. Column performance report with analysis of 33 compounds is attached to every column which guarantee its significant separation efficiency and reproducibility. AQUATIC is suitable for VOCs simultaneous analyses by purge and trap.

Volatile Organic Compounds in Water



1. 1,1-Dichloroethene
2. Dichloromethane
3. MTBE
4. *trans* -1,2- Dichloroethene
5. *cis* -1,2- Dichloroethene
6. Chloroform
7. 1,1,1-Trichloroethane
8. Carbon tetrachloride
9. 1,2- Dichloroethene
10. Benzene
11. Fluorobenzene
12. Trichloroethene
13. 1,2-Dichloropropane
14. Bromodichloromethane
15. 1,4-Dioxane-d8
16. 1,4-Dioxane
17. *cis*-1,3-Dichloropropene
18. Toluene-d8
19. Toluene
20. *trans*-1,3-Dichloropropene
21. 1,1,2-Trichloroethane
22. Tetrachloroethylene
23. Dibromochloromethane
24. *m,p*-Xylene
25. *o*-Xylene
26. Bromoform
27. *p*-Bromofluorobenzene
28. 1,4-Dichlorobenzene

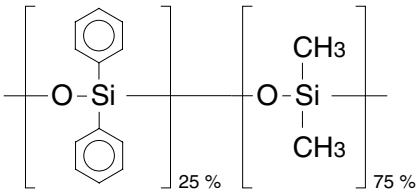
InertCap AQUATIC

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	1.00 µm	iso.200-prog.220 °C	1010-29145
	60 m	1.00 µm	iso.200-prog.220 °C	1010-29165
0.32 mm	60 m	1.40 µm	iso.200-prog.220 °C	1010-29266
0.53 mm	75 m	2.00 µm	iso.200-prog.220 °C	1010-29477

InertCap AQUATIC-2

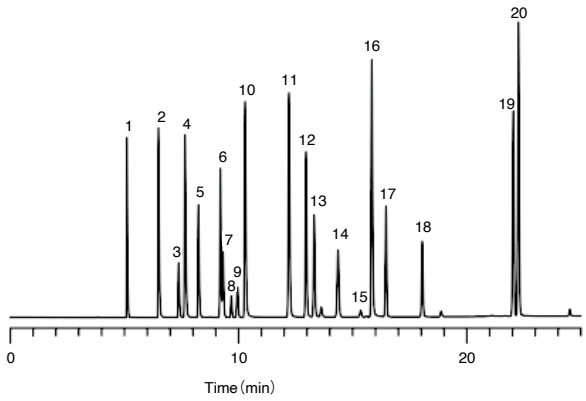
- 25 % Diphenyl – 75 % Dimethylpolysiloxane
- USP Phase G28
- Medium Polarity
- Cross-Liked
- No Equivalent

Structure



AQUATIC-2 can be used up to 260 °C. Separation pattern is almost the same as AQUATIC. Selectivity to a few types of compounds may be slightly different from the AQUATIC.

20 Organic Solvents



System : GC/FID
Column : AQUATIC-2
0.25 mm I.D. x 60 m df = 1.4 μm
Col. Temp. : 40 °C (5 min hold) - 4 °C/min - 120 °C - 10 °C/min - 250 °C
Carrier Gas : He 200 kPa
Injection : Split 1:80
Detection : FID
Sample Size : 1 μL

1. Methanol
2. Ethanol
3. Diethylether
4. 2-Propanol
5. Acetone
6. Acetonitrile
7. Methylacetate
8. Dichloromethane
9. *n*-Hexane
10. *n*-Propanol
11. 2-Butanol
12. MEK
13. Ethylacetate
14. Cyclohexane
15. Carbontetrachloride
16. 1-Butanol
17. 1,2-Dichloroethane
18. Trichloroethylene
19. Isobutylacetate
20. Toluene

InertCap AQUATIC-2

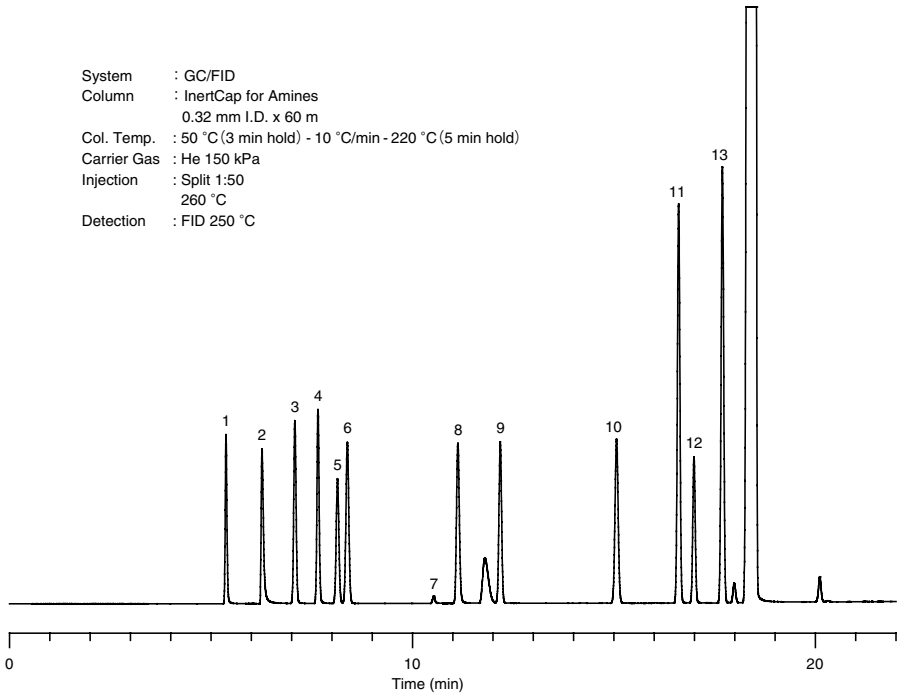
I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	1.40 µm	iso.260-prog.260 °C	1010-19146
	60 m	1.40 µm	iso.260-prog.260 °C	1010-19166
0.32 mm	30 m	1.80 µm	iso.260-prog.260 °C	1010-19247
	60 m	1.80 µm	iso.260-prog.260 °C	1010-19267
0.53 mm	30 m	3.00 µm	iso.260-prog.260 °C	1010-19448
	75 m	3.00 µm	iso.260-prog.260 °C	1010-19478

InertCap for Amines

- Cross-Linked
- Optimized Performance for Analysis of Amines from C2 to C10
- Ideal for the simultaneous analyses of mixed sample such as alcohol etc.
- No Equivalent

InertCap for Amines shows excellent inertness and separation performances for analysis of amines from C2 to C10. Basic compounds can be perfectly eluted without adsorption from the column. Unlike other manufacturer's columns, InertCap for Amines can simultaneous analyze the other polar compounds such as alcohols due to our state-of-art inner column deactivation treatment techniques.

Solvent and Amine Mixture Analyses



InertCap for Amines

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.32 mm	15 m	–	iso.265-prog.300 °C	1010-69229
	30 m	–	iso.265-prog.300 °C	1010-69249
	60 m	–	iso.265-prog.300 °C	1010-69269

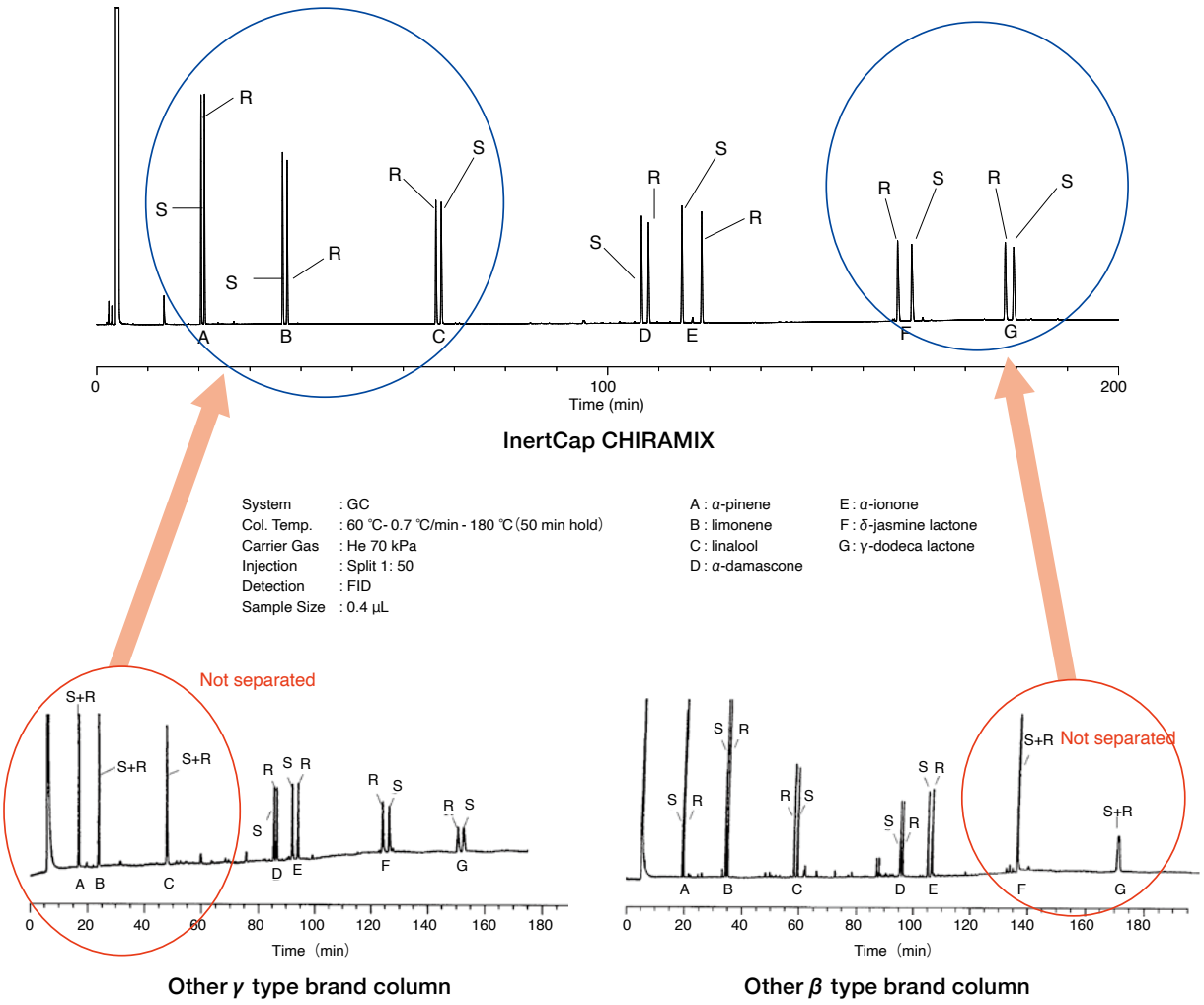
InertCap CHIRAMIX

- Designed for excellent performance in separating enantiomers
- 2 or more cyclodextrin derivatives are used in the liquid phase
- Separating the targeted sample with a sharp peak
- GL Sciences' original, No equivalent

When analyzing enantiomers, it is basic to use several types of columns depending on the sample matrix. InertCap CHIRAMIX has an Optimized performance for separation of enantiomers coated with a mixture of cyclodextrin derivatives. Compared to the other commercially available columns which are coated with single cyclodextrin, InertCap CHIRAMIX can effectively separates a variety of enantiomers in a short time as the 1st choice column. To expedite the analysis, it is important to divide the enantiomers as much as possible in the first analytical column. InertCap CHIRAMIX can divide a wide range of enantiomers and is the best "first choice" column.

Note) InertCap CHIRAMIX was jointly developed with T. HASEGAWA CO., LTD.
Note) CHIRAMIX is a brand name of T. HASEGAWA CO., LTD.

Enantiomer Analysis



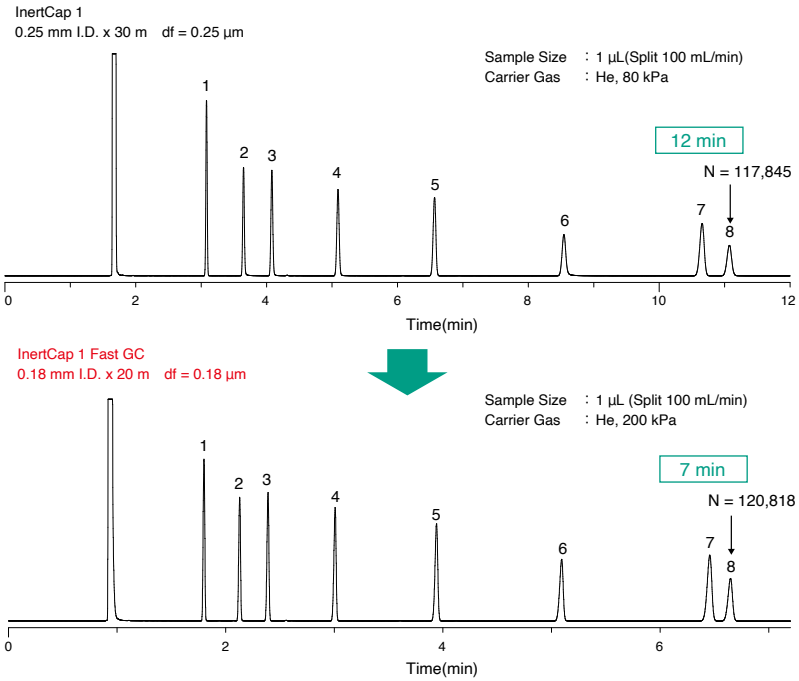
InertCap CHIRAMIX

I.D.	Length	Thickness	Max. Temperature	Cat.No.
0.25 mm	30 m	0.25 µm	iso.180-prog.200 °C	1010-69142

InertCap Fast GC Columns

InertCap Fast GC is a column of I.D. 0.18 mm. Maintaining separation ability, InertCap Fast GC achieves fast analyses and best productivity with your existing GC instruments.

Shorten Analysis Time



1. *n*-Decane
2. *n*-Octanol
3. 2,6-Dimethylphenol
4. 2,6-Dimethylaniline
5. *n*-Dodecane
6. 1-Decanol
7. *n*-Tridecane
8. Methyl-*n*-Decanoate

Downsizing Example

0.25 mm I.D. x 30 m df = 0.25 µm

↓

0.18 mm I.D. x 20 m df = 0.18 µm

0.25 mm I.D. x 30 m df = 0.40 µm

↓

0.18 mm I.D. x 20 m df = 0.28 µm

InertCap Fast GC

Phase	I.D.	Length	Thickness	Max. Temperature	Cat.No.
InertCap 1MS	0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-12031
InertCap 1	0.18 mm	15 m	0.18 µm	iso.325-prog.350 °C	1010-11021
			0.28 µm		1010-11022
		20 m	0.18 µm	iso.325-prog.350 °C	1010-11031
			0.28 µm		1010-11032
InertCap 5MS/Sil	0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-15031
		40 m	0.18 µm	iso.325-prog.350 °C	1010-15051
InertCap 5MS	0.18 mm	20 m	0.18 µm	iso.325-prog.350 °C	1010-18531
InertCap 5	0.18 mm	15 m	0.18 µm	iso.325-prog.350 °C	1010-18021
			0.28 µm		1010-18022
		20 m	0.18 µm	iso.325-prog.350 °C	1010-18031
			0.28 µm		1010-18032
InertCap 17	0.18 mm	20 m	0.18 µm	iso.320-prog.340 °C	1010-65031
InertCap 1301	0.18 mm	20 m	0.18 µm	iso.280-prog.300 °C	1010-60031
InertCap 624	0.18 mm	20 m	1.00 µm	iso.260-prog.260 °C	1010-14535
		40 m	1.00 µm	iso.260-prog.260 °C	1010-14555
InertCap 1701	0.18 mm	20 m	0.18 µm	iso.280-prog.300 °C	1010-61031
InertCap Pure-WAX	0.18 mm	20 m	0.18 µm	iso.260-prog.260 °C	1010-68031
		40 m	0.18 µm	iso.260-prog.260 °C	1010-68051
InertCap FFAP	0.18 mm	20 m	0.18 µm	iso.240-prog.250 °C	1010-28531
		40 m	0.18 µm	iso.240-prog.250 °C	1010-28551

Fused Silica Capillary Tubing

Guard Columns

Injecting samples with contaminants or nonvolatile compounds to a column causes active sites and/or degradation of the stationary phase. With the use of on-column and splitless injections, and even with split injection, contamination and degradation of the columns are unavoidable problem.

To protect a analytical column from such damages, it is effective to connect a 2 m fused silica deactivated capillary tubing to the inlet of the column and replace the tubing as the contaminants gets accumulated.

Retention Gap Columns

Retention gap is to help focus the compounds in large volume injected from the inlet to a tight band at the head of the analytical column in order to reduce peak broadening.

Transfer Line

A transfer line can be used for GC/MS, LC/MS, GC/FTIR, LC/GC, Multi-Dimensional GC, or sniffer adaptors.

Deactivated Fused Silica Capillary Tubing

I.D.	O.D.	10 m	25 m	50 m
		Cat.No.	Cat.No.	Cat.No.
0.005 mm	0.15 mm	1010-35102	1010-35105	–
	0.375 mm	1010-35142	1010-35145	–
0.01 mm	0.15 mm	1010-35202	1010-35205	–
	0.375 mm	1010-35242	1010-35245	–
0.015 mm	0.15 mm	1010-35302	1010-35305	–
	0.375 mm	1010-35342	1010-35345	–
0.02 mm	0.15 mm	1010-35402	1010-35405	–
	0.375 mm	1010-35442	1010-35445	–
0.025 mm	0.15 mm	1010-35502	1010-35505	–
	0.375 mm	1010-35542	1010-35545	–
0.03 mm	0.15 mm	1010-35602	1010-35605	–
	0.375 mm	1010-35642	1010-35645	–
0.04 mm	0.15 mm	1010-35702	1010-35705	–
	0.375 mm	1010-35742	1010-35745	–
0.05 mm	0.15 mm	1010-35802	1010-35805	–
	0.375 mm	1010-35842	1010-35845	–
0.075 mm	0.15 mm	1010-35902	1010-35905	–
	0.375 mm	1010-35942	1010-35945	–
0.10 mm	0.20 mm	1010-36012	1010-36015	1010-36017
	0.375 mm	1010-36042	1010-36045	1010-36047
0.15 mm	0.375 mm	1010-36132	1010-36135	1010-36137
0.18 mm	0.35 mm	1010-36172	1010-36175	1010-36177
0.20 mm	0.35 mm	1010-36222	1010-36225	1010-36227
0.25 mm	0.35 mm	1010-36322	1010-36325	1010-36327
0.32 mm	0.45 mm	1010-36452	1010-36455	1010-36457
0.53 mm	0.66 mm	1010-36682	1010-36685	–

GC Inlet Septa

GC Premium Septa

BTO (Bleed and Temperature Optimized)

- Ultra Low-bleed
- Preconditioned
- Ideal for demanding GC & GC-MS applications

Diameter	Thickness	Max. Temperature	Qty.	Cat.No.
Plug Type	–	400°C	25pcs	3007-16128
	–	400°C	50pcs	3007-16129
11mm	3mm	400°C	25pcs	3007-41002
		400°C	50pcs	3007-41003
17mm	3mm	330°C (350°C available for short time)	25pcs	3007-41008
			50pcs	3007-41009

Advanced Green 3 Septa

- Low-bleed
- General analysis

Diameter	Thickness	Max. Temperature	Qty.	Cat.No.
Plug Type	–	350°C	25pcs	3007-16126
	–	350°C	50pcs	3007-16127
11mm	3mm	350°C	25pcs	3007-41000
		350°C	50pcs	3007-41001
17mm	3mm	300°C	25pcs	3007-41006
		300°C	50pcs	3007-41007

Marathon Long Life Septa

- Low-bleed
- Long Life
- Softer than the others, ideal for autosampler injection

Diameter	Thickness	Max. Temperature	Qty.	Cat.No.
Plug Type	–	350°C	25pcs	3007-16130
	–	350°C	50pcs	3007-16131
11mm	3mm	350°C	25pcs	3007-41004
		350°C	50pcs	3007-41005
17mm	3mm	300°C	25pcs	3007-41010
		300°C	50pcs	3007-41011

GC Ferrules

GVL

GF

GVS

Ferrule for Agilent GC

Description	P/N	Applicable Column's I.D.	Remark	Qty.	Cat.No.
15% Graphite / 85% Vespel Ferrule	GVS-0.4	0.10~0.25mm	GC Injection Port, Detector	10pcs	3007-41140
	GVS-0.5	0.32mm		10pcs	3007-41150
	GVS-0.8	0.53mm		10pcs	3007-41180
15% Graphite / 85% Vespel Ferrule	GVL-0.4	0.10~0.25mm	Connect to GC/MS Interface	10pcs	3007-31144
	GVL-0.5	0.32mm		10pcs	3007-31145
	GVL-0.8	0.53mm		10pcs	3007-31148
Graphite Ferrule	GF-0.5	0.1~0.32mm	GC Injection Port, Detector	10pcs	3007-31305
	GF-0.8	0.53mm		10pcs	3007-31308
Super Graphite Ferrule	SGF-0.5	0.1~0.32mm	One-ring Ferrule	6pcs	3007-31405

Ferrule for Shimadzu GC

Description	P/N	Applicable Column's I.D.	Remark	Qty.	Cat.No.
15% Graphite / 85% Vespel Ferrule	GVL-0.4	0.10~0.25mm	GCMS Injection Port·MS Interface	10pcs	3007-31144
15% Graphite / 85% Vespel Ferrule	GVL-0.5	0.32mm		10pcs	3007-31145
15% Graphite / 85% Vespel Ferrule	GVL-0.8	0.53mm		10pcs	3007-31148
Graphite Ferrule	G-0.5	0.1~0.32mm	GC Injection, Detector	10pcs	3007-14005*
Graphite Ferrule	G-0.8	0.53mm		10pcs	3007-14008*
Super Graphite Ferrule	SG-0.5	0.1~0.32mm	Specific Design for 0.1~0.32mmI.D. Columns	6pcs	3007-14055

*It is not in blister pack.

Vespel Ferrule Remover

Vespel ferrules stuck to the nut can be easily removed.

Description	Cat.No.
GL Remover	3001-12745

GC Inlet Liners

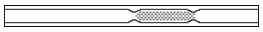
Inlet Liners for Shimadzu GC

Injection Mode	Liner Geometry	Descriptions	Inertness Treatment	Reference P/N	Qty.	Cat.No.
Split	 Length : 99 mm	GC14A/14B	–	221-37574-01	1	3001-16318
		GC-17A/2010/2014	–	221-41444-01	1	3001-16138*
		GC-17A/2010/2014	–	221-41444	1	3001-16320*
				221-41444-84	5	3001-16312*
	 Length : 99 mm	SPL-14	–	221-32544-01	1	3001-16120*
Splitless		GC-17A/2010/2014	–	221-48335-01	1	3001-16139*
				–	5	3001-16140*
				–	25	3001-16141*
		GC-17A/2010/2014	○	221-48876-05	5	3001-16327
		GC-17A/2010/2014	○	221-48876-03	5	3001-16329
		GC-17A/2010/2014	–	221-41544	1	3001-16321*
				221-41544-84	5	3001-16315*
	 Length : 99 mm	SPL-14	–	221-32544	1	3001-16121*
Split / Splitless		GC-17A/2010/2014	○	20955	1	3001-16400*
				20956	5	3001-16401*
				20957	25	3001-16402*
Direct		GC-17A	–	221-41599	1	3001-16319*
	Length : 139 mm	GC-9A/12A/15A/16A (WBC Attachment)	–	221-38107	1	3001-16129*
		GC-2010/2014 CONNECTITE LINER	○	–	5	3001-16404
FocusLiner		GC-17A	○	–	5	3001-16322
		GC-2010	○	–	1	3001-16325
				–	5	3001-16324
				–	25	3001-16326
Taperd FocusLiner		GC-2010	○	–	5	3001-16406

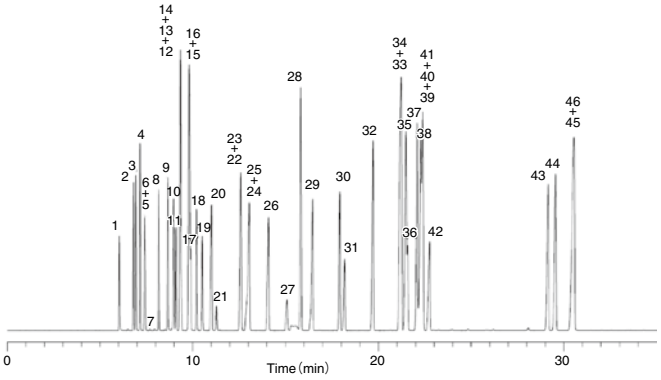
*It is not in blister pack.

Inlet Liners for Agilent GC

All of these Inlet liners undergo high-temperature inert treatment and offer reliability in routine analysis or trace analysis. Every surface of the inlet liner, including the wool, is fully deactivated, ensuring excellent analytical results even with trace pesticides. The tapered FocusLiner demonstrates improved performance compared to a competitor's premium liners.

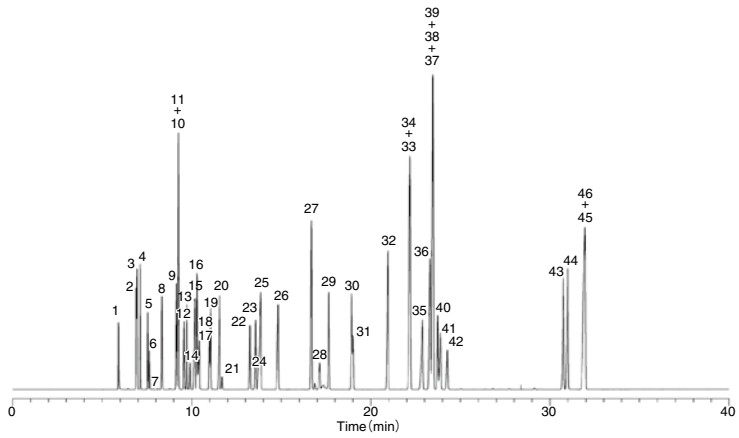
Injection Mode	Liner Geometry	Descriptions	Inertness Treatment	Reference P/N	Qty.	Cat.No.
Split		Taper / Gooseneck FocusLiner	○	5183-4712	5	3001-41237
				5183-4713	25	3001-41257
		Straight	○	5183-4691	5	3001-41229
				5183-4692	25	3001-41233
Splitless		Taper / Gooseneck	○	5183-4693	5	3001-41260
				5183-4694	25	3001-41261
		Taper / Gooseneck	○	5183-4695	5	3001-41248
				5183-4696	25	3001-41258
FocusLiner		FocusLiner	○	210-4004-5	5	3001-41235
				–	25	3001-41236

46 Organic Solvents



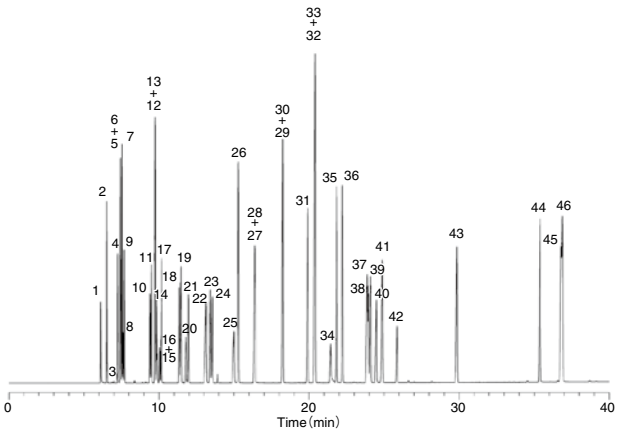
System : GC/FID
Column : InertCap 1
0.25 mm I.D. x 60 m df = 0.40 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min
– 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL

1. Methanol
2. Acetone
3. Isopropanol
4. Ethyl ether
5. Dichloromethane
6. Methyl acetate
7. Carbon disulfide
8. *trans*-1,2-Dichloroethylene
9. Methyl ethyl keton
10. 2-Butanol
11. *cis*-1,2-Dichloroethylene
12. Ethyl acetate
13. *n*-Hexane
14. Chloroform
15. Tetrahydrofuran
16. Isobutanol
17. Methyl cellosolve
18. 1,2-Dichloroethane
19. 1,1,1-Trichloroethane
20. *n*-Butanol
21. Carbon Tetrachloride
22. 1,4-Dioxane
23. Trichloroethylene
24. Ethyl cellosolve
25. *n*-Propyl acetate
26. Isoamyl alchol
27. *N,N*-Dimethyl formamide
28. Toluene
29. Methyl-*n*-butyl ketone
30. *n*-Butyl acetate
31. Tetrachloroethylene
32. Chlorobenzene
33. *m*-Xylene
34. *p*-Xylene
35. Cyclohexanone
36. Cyclohexanol
37. Styrene
38. 1-Methylcyclohexanol
39. *o*-Xylene
40. 1,1,2,2-Tetrachloroethane
41. Cellosolve acetate
42. Butyl cellosolve
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol



System : GC/FID
Column : InertCap 5
0.25 mm I.D. x 60 m df = 0.40 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min
– 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL

1. Methanol
2. Acetone
3. Isopropanol
4. Ethyl ether
5. Methyl acetate
6. Dichloromethane
7. Carbon disulfide
8. *trans*-1,2-Dichloroethylene
9. Methyl ethyl keton
10. 2-Butanol
11. *n*-Hexane
12. *cis*-1,2-Dichloroethylene
13. Ethyl acetate
14. Chloroform
15. Isobutanol
16. Tetrahydrofuran
17. Methyl cellosolve
18. 1,1,1-Trichloroethane
19. 1,2-Dichloroethane
20. *n*-Butanol
21. Carbon Tetrachloride
22. Trichloroethylene
23. 1,4-Dioxane
24. Ethyl cellosolve
25 *n*-Propyl acetate
26. Isoamyl alchol
27. Toluene
28. *N,N*-Dimethyl formamide
29. Methyl-*n*-butyl ketone
30. *n*-Butyl acetate
31. Tetrachloroethylene
32. Chlorobenzene
33. *m*-Xylene
34. *p*-Xylene
35. Cyclohexanol
36. Styrene
37. Cyclohexanone
38. 1-Methylcyclohexanol
39. *o*-Xylene
40. Cellosolve acetate
41. Butyl cellosolve
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol



System : GC/FID
Column : InertCap 1701
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min
– 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL

1. Methanol
2. Ethyl ether
3. Carbon disulfide
4. Acetone
5. Isopropanol
6. Methyl acetate
7. *n*-Hexane
8. Dichloromethane
9. *trans*-1,2-Dichloroethylene
10. *cis*-1,2-Dichloroethylene
11. Ethyl acetate
12. Tetrahydrofuran
13. Methyl ethyl keton
14. 1,1,1-Trichloroethane
15. Carbon Tetrachloride
16. Chloroform
17. 2-Butanol
18. 1,2-Dichloroethane
19. Isobutanol
20. Methyl cellosolve
21. Trichloroethylene
22. *n*-Butanol
23. *n*-Propyl acetate
24. 1,4-Dioxane
25. Ethyl cellosolve
26. Toluene
27. Tetrachloroethylene
28. Isoamyl alchol
29. Methyl-*n*-butyl ketone
30. *n*-Butyl acetate
31. Chlorobenzene
32. *m*-Xylene
33. *p*-Xylene
34. *N,N*-Dimethyl formamide
35. *o*-Xylene
36. Styrene
37. 1-Methylcyclohexanol
38. Cellosolve acetate
39. Cyclohexanol
40. Butyl cellosolve
41. Cyclohexanone
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol

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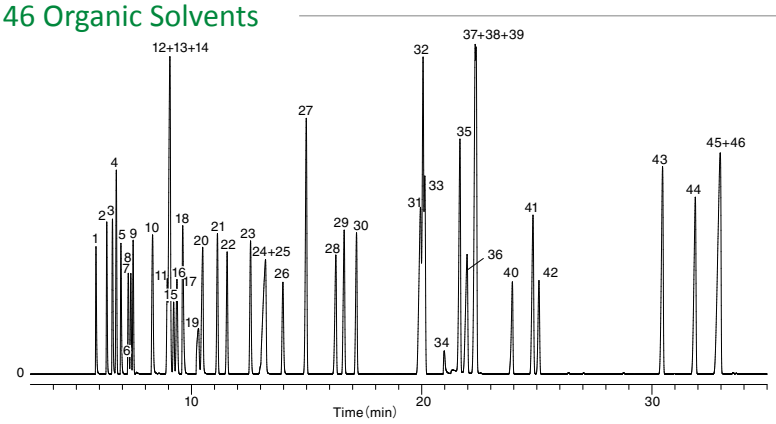
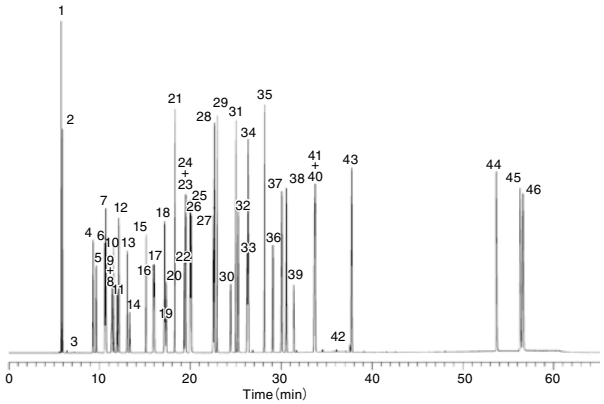


System : GC/FID
Column : InertCap 17
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min
– 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL

1. Methanol
2. Ethyl ether
3. Isopropanol
4. *n*-Hexane
5. Acetone
6. Carbon disulfide
7. Methyl acetate
8. Dichloromethane
9. *trans*-1,2-Dichloroethylene
10. 2-Butanol
11. *cis*-1,2-Dichloroethylene
12. Methyl ethyl keton
13. Isobutanol
14. Ethyl acetate
15. Chloroform
16. 1,1,1-Trichloroethane
17. Carbon Tetrachloride
18. Tetrahydrofuran
19. Methylcellosolve
20. *n*-Butanol
21. 1,2-Dichloroethane
22. Trichloroethylene
23. *n*-Propyl acetate
24. Isoamyl alchol
25. Ethyl cellosolve
26. 1,4-Dioxane
27. Toluene
28. Tetrachloroethylene
29. Methyl-*n*-butyl ketone
30. *n*-Butyl acetate
31. *p*-Xylene
32. *m*-Xylene
33. Chlorobenzene
34. *N,N*-Dimethyl formamide
35. *o*-Xylene
36. 1-Methylcyclohexanol
37. Cyclohexanol
38. Butyl cellosolve
39. Styrene
40. Cellosolve acetate
41. Cyclohexanone
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol



System : GC/FID
Column : InertCap WAX
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min
– 230 °C (5 min hold)
Carrier Gas : He 130 kPa
Injection : Split flow 100 mL/min
250 °C
Detection : FID Range 10^1
250 °C
Sample Size : Mixed evenly
1 µL

1. *n*-Hexane
2. Ethyl ether
3. Carbon disulfide
4. Acetone
5. Methyl acetate
6. *trans*-1,2-Dichloroethylene
7. Tetrahydrofuran
8. Carbon Tetrachloride
9. 1,1,1-Trichloroethane
10. Ethyl acetate
11. Methanol
12. Methyl ethyl keton
13. Isopropanol
14. Dichloromethane
15. *n*-Propyl acetate
16. *cis*-1,2-Dichloroethylene
17. Trichloroethylene
18. 2-Butanol
19. Chloroform
20. Tetrachloroethylene
21. Toluene
22. 1,4-Dioxane
23. *n*-Butyl acetate
24. 1,2-Dichloroethane
25. Methyl-*n*-butyl ketone
26. Isobutanol
27. *n*-Butanol
28. *p*-Xylene
29. *m*-Xylene
30. Methyl cellosolve
31. *o*-Xylene
32. Isoamyl alcohol
33. Ethyl cellosolve
34. Chlorobenzene
35. Styrene
36. Cellosolve acetate
37. Cyclohexanone
38. 1-Methylcyclohexanol
39. *N,N*-Dimethyl formamide
40. Butyl cellosolve
41. Cyclohexanol
42. 1,1,2,2-Tetrachloroethane
43. *o*-Dichlorobenzene
44. *o*-Cresol
45. *p*-Cresol
46. *m*-Cresol

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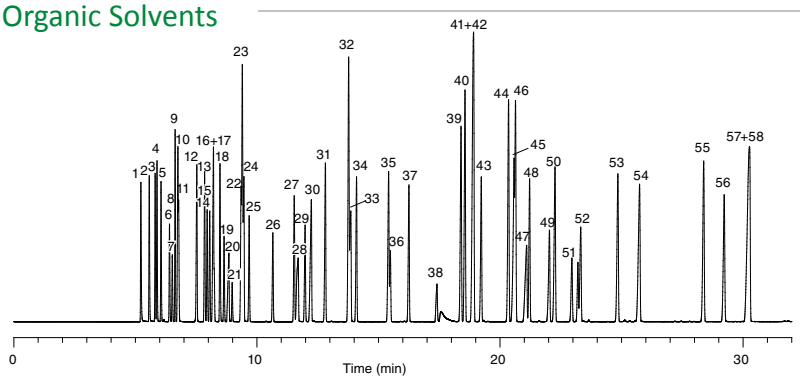

System : GC/FID
Column : InertCap 25
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 °C (5 min hold) – 4 °C/min – 230 °C
Carrier Gas : He
Injection : Split
Detection : FID
Sample : Mixed evenly

1. Methanol
2. Ethanol
3. Ethyl ether
4. Isopropanol
5. Acetone
6. Methyl acetate
7. Dichloromethane
8. Carbon disulfide
9. Hexane
10. *n*-Propanol
11. *trans*-1,2-Dichloroethylene
12. 2-Butanol
13. Methyl ethyl ketone
14. Ethyl acetate
15. *cis*-1,2-Dichloroethylene
16. Chloroform
17. Isobutanol
18. Tetrahydrofuran
19. 1,1,1-Trichloroethane
20. Methyl cellosolve
21. Carbon Tetrachloride
22. Isopropyl acetate
23. Benzene
24. *n*-Butanol
25. 1,2-Dichloroethane
26. Trichloroethylene
27. *n*-Propyl acetate
28. Ethyl cellosolve
29. 1,4-Dioxane
30. Isoamyl alcohol
31. Methyl Isobutyl ketone
32. Toluene
33. *n*-Amyl alcohol
34. Isobutyl acetate
35. Methyl *n*-butyl ketone
36. Tetrachloroethylene
37. *n*-Butyl acetate
38. *N,N*-Dimethylformamide
39. Chlorobenzene
40. Ethylbenzene
41. *m*-Xylene
42. *p*-Xylene
43. Isoamyl acetate
44. *o*-Xylene
45. Cyclohexanol
46. Styrene
47. Butyl cellosolve
48. *n*-Amyl acetate
49. Cellosolve acetate
50. Cyclohexanone
51. 1,1,2,2-tetrachloroethane
52. Methylcyclohexanol
53. Methylcyclohexanone
54. Phenol
55. *o*-Dichlorobenzene
56. *o*-Cresol
57. *p*-Cresol
58. *m*-Cresol

InertSearch https://www.glsciences.com/technique/app/inert_search.html

"InertSearch" is GL Sciences' onsite search engine for chromatographic data. A large number of chromatographic results of various analyses are available.

Retention Index Data – 61 Organic Solvent

System : GC/FID
Column : InertCap 1, InertCap 5, InertCap 1301, InertCap 25, InertCap 1701, InertCap 17, InertCap Pure-WAX, InertCap WAX
0.25 mm I.D. x 60 m df = 0.25 µm
Col. Temp. : 40 ℃ - 5 ℃/min - 220 ℃
Carrier Gas : He 160 kPa
Injection : Split flow 150 mL/min (192 mL/min for InertCap 5) 240 ℃
Detection : FID Range 10^0 240 ℃
Sample Size : Mixed evenly
0.2 µL

Description	InertCap 1	InertCap 5	InertCap 1301	InertCap 25	InertCap 1701	InertCap 17	InertCap Pure-WAX	InertCap WAX
Acetone	460	487	525	548	581	617	808	820
Acetonitrile	445	484	540	580	620	658	996	1016
Benzene	645	659	679	714	714	768	936	949
1-Butanol	639	656	712	712	769	764	1126	1142
2-Butanol	579	600	639	639	699	693	1011	1025
tert-Butanol	506	517	560	556	614	607	888	903
2-Butanone (MEK)	567	596	629	654	685	720	895	908
2-Butoxyethanol (Butyl cellosolve)	886	906	949	966	1009	1030	1388	1394
n-Butyl acetate	795	756	838	867	879	919	1064	1078
Carbon disulfide	527	598	542	590	562	633	727	735
Carbon tetrachloride	651	660	668	703	691	740	874	885
Chlorobenzene	829	848	871	916	917	987	1207	1219
Chloroform	601	615	646	672	695	725	1013	1027
m-Cresol	1047	1072	1186	1165	1303	1277	2065	2121
o-Cresol	1026	1052	1156	1141	1265	1252	1977	2029
p-Cresol	1046	1071	1184	1164	1301	1276	2057	2112
Cyclohexanol	862	885	934	958	1002	1033	1387	1395
Cyclohexanone	861	897	945	995	1021	1089	1286	1301
1,2-Dichlorobenzene	1016	1042	1072	1118	1128	1216	1483	1503
1,2-Dichloroethane	622	644	678	721	729	785	1055	1077
cis-1,2-Dichloroethylene	589	607	630	661	672	717	983	1000
trans-1,2-Dichloroethylene	546	557	576	609	607	644	849	861
Dichloromethane	512	526	555	594	604	635	921	935
Diethyl ether	497	504	511	523	523	550	616	616
N,N-Dimethylacetamide	826	872	944	981	1039	1100	1389	1406
N,N-Dimethylformamide	735	782	853	895	952	1012	1313	1333
1,4-Dioxane	683	708	732	779	783	855	1051	1072
Ethanol	426	440	500	498	548	541	920	935
2-Ethoxyethanol (Cellosolve)	691	711	752	769	815	835	1207	1219
2-Ethoxyethyl acetate (Cellosolve acetate)	877	905	939	984	997	1063	1281	1289
Ethyl acetate	595	612	633	662	674	719	879	893
Ethylbenzene	848	864	882	918	917	977	1121	1135
n-Hexane	600	599	600	600	599	600	603	599
2-Hexanone(MBK)	763	787	827	851	881	912	1071	1089
Isobutyl acetate	739	813	799	822	836	870	982	1018
Isopentyl acetate (Isoamyl acetate)	857	875	902	927	941	978	1115	1126
Isopropyl acetate	639	657	684	709	720	753	893	903
Methanol	357	380	421	418	481	466	882	902
2-Methoxyethanol (Methyl cellosolve)	610	629	676	697	740	762	1160	1179
Methyl acetate	509	522	547	581	595	634	820	831
3-Methyl-1-butanol (Isoamyl alcohol)	715	730	783	781	841	832	1191	1201
1-Methylcyclohexanol	926	897	939	960	997	1025	1311	1321
4-Methylcyclohexanone	927	960	1010	1051	1079	1143	1333	1349
4-Methyl-2-pentanone (MIBK)	717	736	775	798	826	849	1003	1014
2-Methyl-1-propanol (Isobutyl alcohol)	608	622	672	667	730	719	1073	1093
1-Pentanol (Amyl alcohol)	745	763	815	818	874	871	1233	1243
n-Pentyl acetate	894	912	939	968	980	1022	1164	1173
Phenol	952	976	1098	1059	1214	1167	1980	2036
1-Propanol	532	549	606	605	660	655	1022	1039
2-Propanol (Isopropyl alcohol)	471	491	532	530	593	585	914	927
n-Propyl acetate	695	712	736	764	777	820	967	979
Styrene	875	894	918	960	963	1034	1249	1263
1,1,2,2-Tetrachloroethane	879	913	966	1007	1038	1092	1492	1502
Tetrachloroethylene	802	813	819	855	842	906	1016	1029
Tetrahydrofuran	611	627	645	683	687	742	855	866
Toluene	752	767	786	820	820	877	1034	1050
1,1,1-Trichloroethane	630	643	658	691	689	730	876	888
Trichloroethylene	685	701	715	746	743	799	987	1001
m-Xylene	857	871	890	925	925	983	1135	1149
o-Xylene	880	897	917	955	955	1019	1178	1190
p-Xylene	858	872	891	924	924	981	1128	1143

Retention Index Data – Food Pesticide Residue

System : GC/MS
Column : InertCap 5MS/Sil, InertCap 5MS
0.25 mm I.D. x 30 m df = 0.25 µm
InertCap Pesticides
0.25 mm I.D. x 30 m df = 0.20 µm
Col. Temp. : 50 ℃(1 min hold) - 25 ℃/min - 125 ℃
- 10 ℃/min - 280 ℃
Carrier Gas : He 40 cm/sec (constant linear velocity)
Injection : Splitless 1 min
250 ℃
Liner : Splitless(Cat.No. 3001-16329)
Interface Temp. : 280 ℃
Detection : MS Scan (m/z = 45–450)
Ion source : 230 ℃
Inj. Vol. : 1 µL
Sample : PL2005 pesticide GC/MS Mix I–VII each 2 ppm

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
α-BHC	V	1718	1711	1706
β-BHC	V	1767	1776	1771
γ- BHC (Lindane)	V	1782	1776	1771
δ- BHC	V	1825	1830	1825
DCIP	IV	1057	1054	–
EPN	I	2491	2483	2477
EPTC	VI	1364	1361	1359
MCPA thioethyl	V	1835	1834	1831
MCPB ethyl	VI	1863	1860	1858
TCMTB	VII	2166	2176	2168
XMC	VII	1568	1568	1566
Acrinathrin	II	2638	2613	2617
Azaconazole	II	2228	2219	2215
Azamethiphos	VI	2337	2336	2329
Azinphosethyl	VI	2658	2654	2646
Azinphosmethyl	I	2576	2578	2571
Acetamiprid	VII	2475	2470	2462
Acetochlor	IV	1903	1882	1881
Acenaphthene - *d*10	I.S.	1499	1499	1496
Azoxystrobin	II	3109	3090	3090
Atrazine	II	1758	1756	1756
Anilofos	I	2534	2517	2512
Amitraz	VI	2606	2599	2595
Ametrine	V	1921	1918	1916
Alachlor	II	1923	1901	1899
Allidochlor	IV	1295	1289	1288
Allethrin -1	III	2081	2064	2064
Allethrin -2	III	2083	2066	2067
Allethrin -3 (Bioallethrin)	III	2088	2074	2075
Allethrin -4 (Bioallethrin)	III	2090	2077	2077
Anthracene –*d*10	I.S.	1809	1809	1809
Isazophos	I	1837	1817	1816
Isocarbophos	III	2018	2007	2005
Isoxadifen-ethyl	VII	2336	2336	2332
Isoxathion	III	2241	2234	2232
Isofenphos	I	2090	2065	2065
Isofenphos oxon	VII	2017	1999	1997
Isoprocarb	VII	1547	1542	1540
Isoprothiolane	II	2185	2179	2177
Iprodione	V	2461	2457	2454
Iprodione metabolite	V	2550	2541	2537
Iprobenfos	IV	1855	1843	1842
Imazamethabenz-methyl	VII	2163	2158	2151
Imibenconazole		–	2162	2156
Imibenconazole desbenzyl type	VII	3188	3186	3182
	VII	2216	2219	2212
Indanofan	VI	2528	2521	2512
Indoxacarb	IV	3063	3036	3038
Uniconazole (Uniconazole P)	III	2200	2194	2190
EsprocarbEthy	IV	1971	1966	1964
Ethalfluralin	III	1669	1648	1650
Ethion	I	2301	2282	2279
Ethylchlozate	VI	2071	2077	2072
Edifenphos	I	2360	2354	2348
Etoxazole	IV	2512	2492	2491
Etoxazole metabolite	VII	2541	2513	2515
Ethofenprox	I	2880	2873	2871

∗ :Group name about PL2005 Pesticide GC/MS Mix (I–VII)

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
Ethofumesate	VII	1966	1956	1953
Ethoprophos	I	1644	1640	1639
Etobenzanide	IV	2779	2771	2766
Etridiazole	III	1466	1456	1455
Etrimfos	I	1841	1825	1825
Epoxyconazole	VII	2445	2434	2427
α-Endosulfan	II	2157	2149	2142
β-Endosulfan	II	2279	2278	2270
Endosulfansulfate	VII	2373	2365	2354
Oxadiazon	III	2207	2188	2188
Oxadixyl	V	2299	2285	2279
Oxabetrinil	V	1851	1848	1846
Oxyfluorfen	III	2217	2199	2199
Oxpoconazole	VI	2723	2694	2686
Oxpoconazole Formyl decomposition product	VI	1892	1892	1888
Omethoate	III	1600	1598	1596
Oryzalin	VII	2698	2675	2673
Orthophenyl phenol	VI	1528	1532	1527
Cadusafos	I	1699	1690	1689
Cafenstrole	II	2793	2772	2768
Captafol	V	2424	2426	2416
Carfentrazone-ethyl	IV	2351	2330	2330
Carbethamide	VI	2005	2010	2008
Carboxin	VII	2216	2219	2212
Carbophenothion	III	2350	2344	2340
Carbofuran	VII	1751	1747	1745
Quizalofop-ethyl (Quizalofop-*P*-ethyl)	VI	2860	2856	2850
Xylylcarb	VI	1606	1606	1603
Quinalphos	I	2096	2085	2082
Quinoxyfen	III	2362	2356	2351
Quinoclamin	II	1975	1980	1974
Quinomethionate	V	2126	2129	2120
Captan	V	2091	2094	2087
Quintozene	III	1792	1765	1761
Chrycene -*d*12	I.S.	2492	2492	2484
Crimidin	VI	1528	1518	1514
Kresoxim-methyl	II	2227	2208	2208
Chlozolinate	VII	2080	2065	2062
Clothianidin	VI	1501	1480	1477
Clofentezine decomposition product	V	1181	1180	1177
Clomazone	VII	1767	1765	1761
Chlomethoxyfen (Chlomethoxynil)	VI	2464	2457	2450
Clomeprop	II	2537	2531	2527
Chloridazon	VI	2373	2380	2371
Chlorethoxyphos	VII	1635	1622	1619
Chlorthal-dimethyl	III	2017	1991	1989
Chlorthiophos -1	VI	2308	2240	2236
Chlorthiophos -2	VI	2263	2262	2257
Chlorthiophos -3	VI	2281	2290	2285
Chlornitrofen	V	2345	2341	2335
Chlorpyrifos	I	2006	1980	1979
Chlorpyrifos-Methyl	I	1907	1887	1885
Chlorfenapyr	II	2255	2223	2222
Chlorfenson	II	2170	2173	2169
(E)-Chlorfenvinphos	I	2064	2047	2046
(Z)-Chlorfenvinphos	I	2089	2069	2068
Chlorbufam	VII	1753	1759	1757
Chlorpropham	II	1658	1662	1662
Chlorbenside	VII	2115	2123	2115
Chlorobenzilate	IV	2271	2263	2260
Chlormephos	VI	1449	1445	1442
Chlorothalonil	V	1837	1808	1803
Chloroneb	VII	1519	1513	1511
Chloropropylate	V	2272	2263	2259
Cyanazine	II	1999	1992	1991
Cyanofenphos	III	2358	2349	2345

Note: This retention index is obtained under heating conditions, use as a reference for GC under similar conditions.
Refer to the GC technical note on the website for details.

Retention Index Data – Food Pesticide Residue

∗ :Group name about PL2005 Pesticide GC/MS Mix (I–VII)

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
CYANOFOS	I	1788	1785	1782
Dialifos	VI	2672	2659	2652
Diethofencarb	IV	1988	1983	1984
Dioxation	VI	2760	2735	2729
Dioxation decomposition product	VI	1781	1775	1771
Dioxabenzofos (Salithion)	I	1682	1680	1677
Diclocymet-1	V	2094	2083	2079
Diclocymet-2	V	2129	2117	2113
Dicrotophos	III	1677	1668	1668
Dichlofenthion	I	1888	1874	1872
Diclobutrazol	II	2228	2214	2209
Dichlofluanid	V	1980	1966	1962
Dichlofluanid metabolite	V	1665	1668	1665
Dichlobenil	III	1357	1349	1347
Diclofop-methyl	VII	2408	2401	2397
Dicloran	II	1738	1736	1732
Dichlorvos	I	1251	1244	1244
1,1-Dichloro-2,2-bis (4-ethylphenyl)ethane	VII	2255	2248	2243
2,6-Dichlorobenzamide	VI	1678	1676	1672
Disulfoton	III	1823	1815	1813
Disulfoton sulfone	VII	2146	2139	2134
Ditalimfos	VI	2161	2154	2147
Dithiopyr	II	1954	1923	1924
Diniconazole	VI	2287	2277	2270
Cinidon-ethyl	VII	3216	3204	3201
Cyhalothrin-1	III	2592	2573	2573
Cyhalothrin-2	III	2617	2595	2596
Cyhalofop butyl	II	2591	2584	2583
Diphenamide	IV	2042	2030	2027
Diphenyl	V	1394	1397	1394
Diphenylamine	IV	1633	1636	1633
Difenoconazole-1	II	3024	3018	3016
Difenoconazole-2	II	3034	3026	3025
Cyfluthrin-1	II	2795	2779	2778
Cyfluthrin-2	II	2807	2794	2794
Cyfluthrin-3	II	2818	2802	2802
Cyfluthrin-4	II	2822	2808	2808
Cyflufenamid	II	2247	2224	2225
Diflufenican	III	2411	2399	2399
Cyproconazole	IV	2251	2237	2232
		–	2241	2236
Cyprodinil	IV	2057	2052	2050
Cypermethrin-1	III	2837	2825	2824
Cypermethrin-2	III	2850	2839	2839
Cypermethrin-3	III	2862	2847	2846
Cypermethrin-4	III	2866	2853	2853
Simazine	IV	1748	1749	1748
Simeconazole	II	1914	1899	1897
Dimethametryn	IV	2068	2062	2061
Dimethipin	II	1756	1765	1762
(E)-Dimethylvinfos	I	1973	1958	1957
(Z)-Dimethylvinfos	I	2001	1986	1984
Dimethenamide (Dimethenamide P)	IV	1893	1876	1873
Dimethoate	I	1739	1737	1734
Dimethomorph-1	VI	3115	3105	3102
Dimethomorph-2	VI	3154	3148	3145
Simetryn	V	1911	1911	1909
Dimepiperate	IV	2097	2094	2090
Silafluofen	V	2903	2892	2890
Cinmethylin	VI	1932	1922	1918
Swep	V	1756	1758	1756
Spiroxamine-1	VII	1906	1897	1894
Spiroxamine-2	VII	1961	1950	1947
Spirodiclofen	VI	2723	2694	2686
Sulprofos	III	2328	2320	2316
Sulfotep	VI	1696	1677	1676
Zoxamide	VII	2442	2433	2428

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
Zoxamide decomposition product	VII	2080	2065	2062
Turbacil	IV	1824	1821	1820
Diazinon	I	1811	1791	1792
Diallate-1	VII	1706	1699	1696
Diallate-2	VII	1723	1716	1713
Thiabendazole	VII	2081	2097	2089
Thiamethoxam decomposition product	VI	2040	2047	2041
Thiocyclam	V	1509	1516	1511
Thiobencarb	III	1984	1985	1982
Thiomethon	III	1727	1724	1722
Thifluzamide	III	2228	2189	2189
Tecnazene	III	1620	1599	1596
Desmedipham decomposition product	IV	1721	1729	1729
Tetrachlorvinphos	I	2146	2126	2124
Tetraconazole	IV	2020	2000	2000
Tetradifon	III	2553	2548	2542
Tetramethrin-1	V	2474	2464	2462
Tetramethrin-2	V	2489	2483	2481
Thenylchlor	IV	2408	2389	2384
Tebuconazole	IV	2406	2399	2394
Tebupirimfos	VI	1853	1839	1837
Tebufenpyrad	IV	2515	2509	2507
Tefluthrin	III	1832	1815	1818
Demeton-S-methyl (Methyl Demeton)	III	1630	1628	1627
Decamethrin (Tralomethrin decomposition product)	II	3071	3059	3059
Terbucarb	VI	1904	1879	1877
Terbutryn	IV	1955	1948	1947
Terbufos	I	1791	1781	1779
Triadimenol-1	III	2097	2091	2088
Triadimenol-2	III	2111	2106	2104
Triadimefon	III	2012	2003	2001
Triazophos	I	2326	2319	2317
Triallate	II	1840	1829	1827
Trichlamide	V	2138	2128	2124
Tricyclazole	VII	2195	2195	2185
Tribufos	II	2199	2196	2194
Trifluralin	III	1685	1663	1666
Trifloxystrobine	III	2367	2340	2342
Tolylfluanid	V	2084	2070	2066
Tolylfluanid metabolite	V	1772	1775	1772
Tolclofos-methyl	I	1917	1903	1900
Tolfenpyrad	VI	3124	3126	3123
Naphthalin-*d*8	I.S.	1198	1198	1198
2-(1-Napthyl)acetamide	VII	1949	1953	1947
Napropamide	IV	2176	2163	2159
Naled	III	1670	1662	1659
Nitralin	V	2439	2415	2413
Nitrothal-isopropyl	III	2020	2009	2010
Nitrofen	V	2248	2249	2243
Nereistoxin	VI	1283	1290	1285
Norflurazon	VII	2362	2349	2343
Paclobutrazol	IV	2138	2131	2127
Parathion	I	2007	1998	1996
Parathion-methyl	I	1906	1902	1899
Halfenprox	II	2847	2834	2833
Picolinafen	VII	2493	2485	2480
Bitertanol-1	V	2707	2703	2698
Bitertanol-2	V	2720	2717	2712
Bifenazate	V	2493	2492	2489
Bifenox	II	2527	2521	2517
Bifenthrin	II	2491	2470	2470
Piperonyl butoxide	V	2421	2413	2412
Piperophos	I	2501	2483	2480
Hymexazol	VI	1193	1201	1199
Pyraclostrobin	VI	2973	2973	2968
Pyraclofos	I	2666	2666	2664
Pyrazoxyfen	V	3045	3031	3028

Note: This retention index is obtained under heating conditions, use as a reference for GC under similar conditions.
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Retention Index Data – Food Pesticide Residue

∗ :Group name about PL2005 Pesticide GC/MS Mix (I–VII)

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
Pyrazophos	II	2649	2623	2623
Pyraflufen-ethyl	VI	2377	2361	2360
Pyridaphenthion	I	2473	2457	2453
Pyridaben	III	2736	2732	2727
(E)-Pyrifenox	III	2135	2124	2121
(Z)-Pyrifenox	III	2080	2070	2067
Pyributicarb	III	2457	2441	2438
Pyriproxyfen	V	2582	2584	2579
Pyrimidifen	III	2941	2925	2924
(E)-Pyriminobac methyl	III	2383	2354	2354
(Z)-Pyriminobac methyl	III	2288	2259	2258
Pirimiphos-methyl	I	1964	1943	1942
Pyrimethanil	VI	1805	1806	1802
Pyrene-*d*10	I.S.	2141	2141	2137
Pyroquilone	V	1796	1800	1795
Vinclozolin	III	1906	1894	1892
Famoxadone	V	3112	3116	3114
Fipronil	II	2089	2052	2053
Fenamiphos	I	2167	2157	2156
Fenarimol	II	2642	2633	2627
Fenitrothion	I	1961	1951	1949
Fenoxanil	IV	2260	2241	2238
		–	2243	2240
Fenoxaprop-ethyl (Fenoxaprop-*P*-ethyl)	V	2677	2675	2672
Phenoxycarb	IV	2482	2490	2488
Phenothiocarb	IV	2135	2139	2137
Phenothrin-1	VI	2541	2533	2529
Phenothrin-2	VI	2553	2548	2544
Ferimzone	VI	2107	2104	2102
Fenamidone	VII	2518	2508	2502
Fenchlorphos	II	1937	1921	1919
Fensulfothion	I	2278	2272	2268
Fenthion	I	2000	1992	1990
Phenthoate	I	2097	2083	2081
Fenvalerate-1	II	2968	2952	2951
Fenvalerate-2 (Esfenvalerate)	II	2998	2982	2981
Fenvalerate-2 (Esfenvalerate)	VI	2998	2985	2981
Fenbuconazole	V	2798	2785	2779
Fenpropathrin	II	2506	2498	2496
Fenpropimorph	VI	2004	1994	1991
Phenmedipham decomposition product	VI	1645	1656	1653
Fthalide	II	2039	2022	2016
Butachlor	IV	2156	2130	2129
Butafenacil	IV	2764	2746	2747
Butamifos	I	2173	2149	2146
Butilate	VI	1438	1432	1430
BUPIRIMATE	III	2226	2203	2203
Buprofezin	II	2223	2206	2203
Flufenprop-methyl	VII	2217	2197	2194
Furametpyr	V	2553	2530	2526
Furametpyr metabolite	V	2610	2592	2588
Furilazole	VII	1752	1745	1742
Fluacrypyrim	III	2323	2292	2295
Fluquinconazole	II	2746	2729	2724
Fludioxonil	V	2189	2174	2171
Flucythrinate-1	II	2868	2847	2847
Flucythrinate-2	II	2896	2876	2876
Flusilazole	IV	2222	2203	2201
Flusilazole metabolite	IV	1671	1667	1666
Fluthiacet-methyl	VI	3234	3235	3231
Fluthiacet-methyl	II	2176	2164	2163
Flutriafol	VII	2164	2160	2154
Fluvalinate-1	II	2998	2964	2965
Fluvalinate-2	II	3005	2975	2975
Flufenpyr-ethyl	VII	2271	2256	2255
Flumioxazin	IV	2967	2954	2953
Flumiclorac pentyl	VII	3095	3083	3081
Fluridone	VII	2924	2908	2904
Pretalachlor	IV	2199	2174	2172

Description	∗	InertCap 5MS	InertCap 5MS/Sil	InertCap Pesticides
Procymidone	III	2109	2090	2088
Prothiofos	I	2188	2174	2170
Propachlor	IV	1624	1613	1612
Propazine	VII	1767	1763	1761
Propanil	V	1883	1881	1878
Propaphos	I	2124	2118	2118
Propargite-1	V	2412	2400	2397
Propargite-2	V	2414	2403	2400
Propiconazole-1	IV	2364	2349	2346
Propiconazole-2	IV	2379	2363	2360
Propyzamide	III	1794	1788	1787
Prohydrojasmon-1	VI	1821	1815	1813
Prohydrojasmon-2	VI	1850	1845	1843
Profenofos	I	2192	2184	2180
Propoxur	VII	1620	1614	1613
Bromacil	V	1963	1961	1959
Bromoconazole-1	V	2480	2472	2465
Bromoconazole-2	V	2537	2526	2518
Prometryn	IV	1928	1922	1921
Bromobutide	II	1896	1886	1883
Bromopropylate	II	2490	2483	2478
Bromophos	II	2043	2027	2024
Bromophos-ethyl	VII	2132	2113	2109
Hexaconazole	V	2180	2173	2168
Hexazinone	VII	2394	2385	2378
Benalaxyl	IV	2356	2336	2332
Benoxacor	VII	1864	1856	1851
Permethrin-1	III	2716	2708	2706
Permethrin-2	III	2732	2725	2723
Penconazole	III	2074	2062	2059
Benzo[a]pyrene-*d*12	I.S.	2892	2892	2883
Pendimethalin	III	2072	2048	2046
Pentoxazone	V	2569	2555	2551
Benfluralin	II	1689	1669	1671
Benfuresate	VI	1880	1877	1872
Phosalone	I	2575	2561	2555
Fosthiazate-1	I	2039	2033	2029
Fosthiazate-2	I	2044	2037	2034
Phosphamidon-1	I	1813	1794	1793
Phosphamidon-2	I	1886	1870	1869
Phosmet	III	2484	2481	2474
Fonofos	I	1798	1791	1788
Folpet	V	2105	2107	2100
Formothion	III	1861	1860	1857
Phorate	I	1707	1699	1697
Malathion	I	1981	1967	1967
Myclobutanil	II	2215	2200	2198
Mecarbam	III	2090	2074	2073
Methacrifos	I	1510	1500	1501
Metalaxyl (Mefenoxam)	IV	1932	1915	1914
Methidathion	I	2126	2117	2113
Methoxychlor	VII	2504	2497	2491
Methoprene	V	2104	2097	2098
(E) -Metominostrobin	IV	2189	2174	2171
(Z) -Metominostrobin	VII	2234	2216	2212
Metolachlor (S- Metolachlor)	IV	1998	1976	1974
Metribuzin	V	1890	1890	1887
Mevinphos	I	1433	1424	1424
		–	1427	1427
Mefenacet	V	2600	2598	2590
Mefepyrdiethyl	VII	2449	2433	2430
Mepronil	IV	2316	2314	2312
Monocrotophos	III	1686	1685	1686
Molinate	II	1548	1552	1549
Resmethrin-1	VII	2414	2406	2403
Resmethrin-2 (Bioresmethrin)	IV	2426	2418	2418
Resmethrin-2 (Bioresmethrin)	VII	2426	2421	2418
Lenacil	VI	2365	2370	2362
Leptophos	VI	2583	2566	2557

Note: This retention index is obtained under heating conditions, use as a reference for GC under similar conditions.
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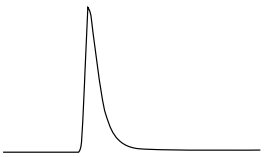
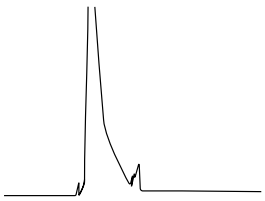
Abnormal Peaks

Tailing peak (Analyte)



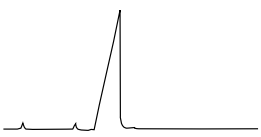
Main cause	Solution
Column installation position in the injection port and/or the detector is incorrect.	Check the insertion length of the column and ensure it is in the correct position as specified in the instruction manual for each instrument. Make sure that the column is positioned just below the flame tip (FID) or near the point of detection.
Contamination of the liner by matrix, septa or graphite. Liner temperature too low.	Replace the liner or replace wool. Be carefull as wool can break and cause activity;Increase liner temperature.
Contamination or activity in the column.	Cut-off about 50 cm from the injection port side of the column. If still not OK, cut another 50 cm. If not OK, connect detector side to injector and recondition the column for several hours at its maximum operation temperature. If not OK, replace column.
Split ratio is too low.	Increase the split ratio.
Dead volume present.	Check column position in inlet and outlet. If coupling is used check that column ends are correctly cut using the wafer cutting device supplied with the column.
A very polar, basic or acidic component.	When the component has high polarity, it may show adsorption. If possible, Increase initial oven temperature and use a higher programming rate. Try using a thicker film and/or derivatize the component.
The tailing peak elutes just before a big solvent peak.	Reduce sample size by smaller injection volume or increase split ratio. Choose a thicker film or a stationary phase where the solvent peak elutes later or earlier then the tailing peak.
Overloaded peak on a PLOT column.	Reduce sample size by smaller injection volume or increase split ratio. Use a PLOT column with thicker layer or larger diameter.

Tailing peak (Solvent)

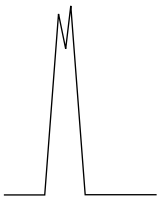


Main cause	Solution
Injection volume too big.	Reduce injection volume. Increase split ratio.
Liner diameter to small.	Use a larger diameter liner.
O-ring in liner is not sealing.	Replace O-ring.
Column inlet position too low in injection port.	Check required length for your instrument and adjust. To secure position especially when a new ferrule is used, slide the column inlet first through a used septum, then put the nut and ferrule on the column, cut 1 cm from the inlet using the ceramic wafer and use the septum to secure the correct insertion depth.
Injector temperature to low.	Increase injection port temperature.

Leading peak

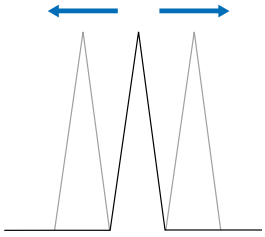


Main cause	Solution
The amount of analyte injected exceeds the column loading capacity (liquid phase). Retention time increases.	Reduce the injection volume and/or increase the split ratio so that it does not exceed the loading capacity of the column. Dilute the sample. Use a column with a thicker film or a wider diameter to increase the sample loading capacity.
The polarity of the analyte is not compatible with the stationary phase.	Use a stationary phase with better solvability for this component. (For polar compounds, use a polar stationary phase, like InertCap PureWax. For non polar compounds, use a non-polar stationary phase (like InertCap1 or 5).



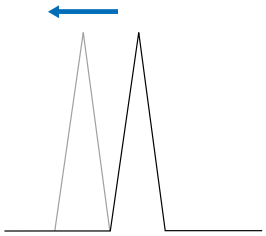
Split peak

Main cause	Solution
Injection conditions are incorrect.	When making a manually injection, the injection speed is unsuitable and/ or the syringe is faulty. Replace the syringe or use an autosampler.
The column is not correctly connected to the injection port.	Check the insertion length of the column as recommended in the instruction manual for your GC.
The injection solvent (the sample) is a mixed solvent.	This occurs when using splitless injection and on-column injection. Change to a single solvent.
Mismatch polarity of stationary phase and solvent of sample. With splitless injection, multiple injection bands may be formed due to droplet formation.	Change either the stationary phase that is compatible with the solvent or use a sufficiently long retention gap to make sure all solvent (droplets) are evaporated in the retention gap.



Fluctuation in retention time

Main cause	Solution
Leak of carrier gas.	Check for leaks (use digital leak detection device), around the injection port and column connections. When the inlet septum leaks, replace it. Check how many injections(xx) are required before a serious leak of septum develops. Then replace septa after xx injections before the leak developes.
Different initial oven temperature.	Check initial oven temperature.
Mixing of carrier gases via leaking gas selection valve.	Replace the gas selection valve.
Restriction built-up in detector flame tip (FID).	Replace or clean flame tip.
Restriction built-up in the tubing, malfunction of the flow control device. Clogging of the split line filter.	When the split vent line becomes blocked, wash or replace it. When the flow control device malfunctions it should be replaced. Replace split line filter. Make this routine maintenance.
The carrier gas supply is too low.	Verify the supply pressure to the GC is correct.
Alumina or Molsieve PLOT column not sufficiently conditioned. Retention depends on residue adsorbed water and CO_2.	Condition the column for several hours at maximum temperature to remove all water and CO_2.



Retention times decrease

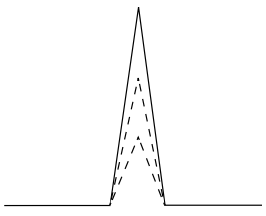
Main cause	Solution
Column looses stationary phase (bleed is high) because air/water is entering the system.	Check for leaks at column connections and carrier gas tubing connections. Check gas filtration systems, replace filters.
Column operated at too high temperature.	Decrease final programmed oven temperature; Use flow programming. Use a more temperature stable phase.
Water is adsorbed on a Alumina or Molsieve PLOT column.	Remove water from the sample. Replace moisture filter for carrier gas. Remove water after each analysis by heating the column to Tmax for 10 minutes. Use a precolumn that retains the water and can be backflushed.
Column becomes shorter after maintenance.	Adjust integration windows. Adjust the flow to get the same retention time. Replace the section that was cut-off with a similar section from a second column or use deactivated fused silica by using a suitable coupling.

Peaks not detected

Main cause	Solution
Blocked syringe needle.	Replace the needle or the syringe.
The column is not correctly connected to the injection port and/ or detector.	Check the insertion length of the column as recommended in the instruction manual for your GC.
Column flow blocked (by septum particles, graphite or pieces of wool).	Replace liner. Cut a 2 cm section from inlet, connect column at injector, set flow and check that the column has flow by dipping the column end in a vial with some acetone. Connect detector side and inject methane or a solvent to verify linear gas velocity.
Carrier gas leak and/or inadequate supply.	Check that there is a pressure in the injection port; Check for (big)leaks around the injection port and column connections. Also check that septum cap is sufficiently tightened. When there is a leak from the injection port septum, replace the septum. Check the flow rate is correct at the detector outlet and the column outlet.
Faulty detector.	Check the condition of the detector. Check for broken wire filaments with MS and TCD and check that the FID flame is lit. Check the cable connection between the detector and data acquisition system.
Detector temperature too low.	Detector temperature must be set at least 20 degrees higher then final temperature of the oven temperature program.

All peaks are too small

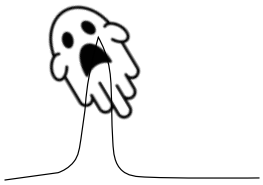
Main cause	Solution
Partial blockage of the syringe.	Wash and/or replace the syringe.
Wash and/or replace the syringe.	Check column position. Column inlet must be 4-8 mm above the bottom of the liner.
There is a leak at the injection port.	Check for leaks around the injection port. If the injection port septum is leaking, replace the septum.
The split ratio is too large.	Reduce the split ratio.
Leaking column coupling.	Replace column coupling.
The injection time is too short(When using splitless injection).	Check the splitless injection parameters and optimize the injection time. Typically injection times are 60-80 seconds.
There is an abnormality in the sample.	Check the sample concentration and stability etc. make sure the sample preparation and storage conditions are suitable.
The injection port temperature is too low (especially when analyzing high boiling point samples).	Check the injection port temperature and optimize it.
The detector is unsuitable for the component being analyzed.	Check whether the detector is compatible for detecting the analyte at required levels.
The detector sensitivity is to low (not optimized / contamination).	FID: Check the flows for H_2, air and make-up gas. Verify and adjust detector temperature. Clean detector according to manufacturers procedures.
Setting parameter error in the detector and/or integrator.	Check that the sensitivity setting of the detector is correct. Check that the attenuation setting is correct for the integration system used.



Poor repeatability of peak area and response

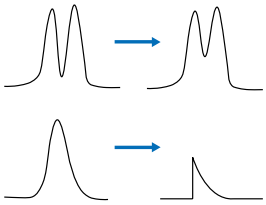
Main cause	Solution
Carrier gas leak and/or defective supply.	Check for leaks around the injection port. If the injection port septum is leaking, replace the septum. Check that the supply pressure is correct.
Discrimination, injection conditions are incorrect.	Select a liner and injection volume suitable for the injection method. If injecting manually, pay attention to discrimination. Consider to use a liner with some wool for best results. Check column position in the liner.
Faulty syringe, incorrect autosampler parameter setting.	The amount of sample picked up is not correct. Wash and/or replace the syringe. If the sample viscosity is high; reduce the syringe suction speed.
Contamination and/or deterioration of the liner.	Replace the liner. Depending on the type of sample and injection technique, select an appropriate liner with or without wool and type of wool material.
Split ratio is unstable.	If the split ratio is too small the split will not stabilize; adjust the split ratio to be suitable for the column and the GC. If short 0.53 mm columns are used, add a few meters of 0.25 mm I.D. deactivated fused silica as restriction tubing.
Faulty detector.	Check the detector is working correctly.

Ghost peaks: a peak appears where you do not expect a peak



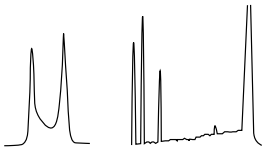
Main cause	Solution
Not all peaks have eluted from previous run.	Wait until all peaks from previous run have eluted. To speed up, you may increase the oven temperature and/or flow.
Contamination of carrier gas.	Install or replace filtration system.
Trapped bleed products from septum. Siloxanes, phthalates from septa and septa particles deposited in the liner.	Replace liner; Use high temperature septa with a center guide; Use septum purge; Reduce injection port temperature. Consider a Merlin Seal septum.
The ghost peak is formed by a reaction in the liner.	Use liner without wool; Reduce liner temperature. Use PTV or on-column injection.
O-ring can produce siloxanes and triphenyl phosphine oxide (m/z = 277).	Replace O-ring; condition the liner for 16 hours at 300°C.
Contamination of sample by: sealing septum, micropipette tips, gloves or syringe.	If the syringe is contaminated, wash or replace it. If continually analyzing from the same vial, it is possible that sample will become contaminated by material that is stuck on the outside of the needle while moving through the seal. Work with larger volume in the vial which will dilute the contamination. When shaking vial, make sure that the liquid does not contact the seal of the vial. Micropipette tips can release eurucylamide.
Contamination of the injection port by sample matrix.	Replace the liner. Inject smaller amounts or dilute the sample.Consider using splitted injection.
Built up of matrix residues in the split line that diffuse back in the injection port during maintenance.	Disconnect the split line and rinse it with some solvents similar to what is used for the samples or replace the splitline.
There is a backflash: Injection volume is too large, so part of the sample is pushed back in the carrier gas line.	The injection volume, liner size, septum purge flow rate and injection port temperature may cause sample overflow from the liner and result in carryover (ghost peaks are teh same peaks as you analyze, but now are causing a bias). Select more suitable injection parameters. Check system cleanliness by running a blanc (only temperature programming, no injection).
part of the column in the (hot) detection port liner. Compound can react with the stationary phase creating a ghost peak. For example O_2 on a porous polymer PLOT column.	Without flow, hydrogen and air will be entering the column end creating high activity. Make sure that your column is always under positive flow. Only stop the flow when the detector is cooled down. To reduce or check impact, decrease the detector temperature. At lower temerature the ghost peak area should decrease.

Decrease in column performance: peak broadening / peak tailing



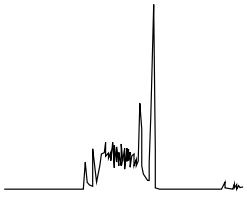
Main cause	Solution
Carrier gas purity is not sufficient. (Oxygen and moisture present in the carrier gas).	The column (liquid phase) will deteriorate rapidly with the presence of water and oxygen and with increased temperature. Install a moisture removal filter and an oxygen removal filter in the carrier gas line. Position the filtration device as close as possible to the GC. It filters are already installed, replace the filters.
There is a leak in the system where air can enter the carrier gas.	Do leak test with digital leak detection device. Check all connections including the septum.
Contamination of column inlet.	Cut-off about 50 cm from the injection port side of the column. If still not OK, cut another 50 cm. If not OK, connect detector side to injector and recondition the column for several hours at its maximum operation temperature. If not OK, replace the column. If the decrease in performance happens too fast, consider to do more sample cleanup or use guard- or precolumns.
A sample which causes chemical damage to the column has been injected.	Avoid injecting samples which contain inorganic bases (KOH, NaOH etc.), inorganic acids (HCl, HNO_3, and HF etc.), perfluoro acetic acid (CF_3COOH, C_2F_5COOH etc.) and salt. These classes of compounds cause chemical damage to the column and the liner.
Insufficient sample cleanup.	If the sample contains a matrix which may adversely affect the column's liquid phase, more or better sample pretreatment should be done before injection.
The column has been subjected to temperatures above the recommended maximum operation temperature.	Pay close attention to the final temperature of the column oven program and do not exceed the maximum temperature of the column.
The column has been subjected to higher temperatures without carrier gas flow.	Check flow settings. Make sure there is sufficient carrier gas available.
Peakbroadening due to depolymerization of the stationary phase at the inlet side.	Cut-off about 50 cm from the injection port side of the column. If still not OK, cut another 50 cm. If not OK, connect detector side to injector and recondition the column for several hours at its maximum operation temperature. If not OK, replace the column. If the decrease in performance happens too fast, consider to do more sample cleanup or use guard- or precolumns.

"Batman" peaks or "low-slope" leading peaks



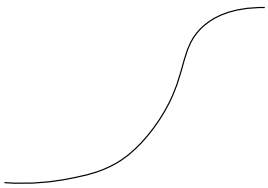
Main cause	Solution
Component decomposes, changes configuration (cis to trans or trans to cis) or reacts while moving through the column. New product formed has a different retention time.	Reduce elution temperature by using higher flow rate or flow programming. Use slower temperature programming. Use shorter columns, larger ID. Thinnest possible film. Choose phases with lowest retention or a combination of these actions.

A cluster of peaks elute before the main component



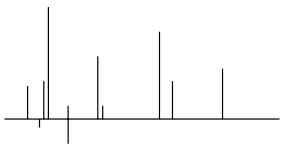
Main cause	Solution
Formation of multiple injection bands during splitless injection caused by mismatch of polarity of solvent and stationary phase. As a result droplets are formed which move into the column and form multiple injection bands.	Choose splitted injection. Choose matching solvent with phase(polar solvent, polar phase, non-polar solvent, non-polar phase). Use correct polarity retention gap. Add a co-solvent to reduce droplet formation (toluene). Use a longer retention gap and make sure that the droplets do not reach the analytical column. Start at a higher oventemperature.

Abnormal baseline



Column bleeding or backgrounds is very high

Main cause	Solution
Column conditioning is too short.	Perform column conditioning using the procedure detailed in the instruction manual supplied with the capillary column, or condition the column for several hours 20 degrees higher then used for your application. Do not exceed the maximum temperature.
Carrier gas contains traces of air (water and/or oxygen) causing stationary phase to degrade.	Check gas purity, filtration and check all fittings and septum for leaks.
Normal ageing of the column by running applications.	Injecting smaller amounts will slow down bleed formation and will increase life time.
Sample contains small amounts of high boiling material which is not eluting during the application.	Best way is to reverse the column and connect detectorside to Inlet. Connect inlet site to detector and condition the column at its maximum temperature to clean it. Keep the column at this temerature until the baseline is horizontal. Now reinstall the column again in original configuration. This procedure can be repeated periodically, but depends how much high boiling material is injected.
Contamination in the detector.	Clean the detector. Consult your instrument manual.
High bleed by using thick-film columns.	Bleed is a direct function of the film thickness. If retention of components allows, you can choose for a thinner film; Also the flow can be increased for late eluters to make components elute at lower temperatures and the final temperature of the oven program can be reduced. Roughly a 4 times higher flow results in approximate 30 degrees lower elution temperature. As for most GC liquid phases, the column bleed is not depending on the flow, 30 degrees lower elution temperature results in about 4 times lower bleed.
Liner is contaminated.	Replace liner.
Splitline is contaminated.	Clean or replace splitline. Don't forget to replace the splitline filter.
Septum is bleeding too much.	Choose better septum. Check for leaks. Use septum purge. Consider using a Merlin seal.



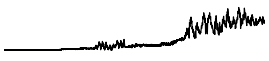
Spikes

Main cause	Solution
Column connection (detector side) is incorrect.	A spike may occur when the column is inserted too far into the detection port liner. Check the insertion length of the column as recommended in the GC instruction manual.
Contamination of the detector by silicium oxide.	Clean the detector. For FID, replace flame tip.
Faulty signal cable.	Check the cable is securely connected and the insulation is intact. Replace if necessary.
Abnormality in the power source cable and/or power supply.	Ensure the power supply is stable.
Particle elution from a PLOT column.	Use a particle trap. Connect the PLOT column with a 1-2 m length of silicone coated capillary. The particles with be cought by the silicone coating.

Noise

Main cause	Solution
High background caused by contamination in the detector.	Clean the detector. Set detector temperature 20°C higher then final oventemepature used for the application.
High backgrounds caused by contamination on the column.	Cut-off about 50 cm from the injection port side of the column. If still not OK, cut another 50 cm. If not OK, connect detector side to injector and recondition the column for several hours at its maximum operation temperature. If not OK, replace the column. If the decrease in performance happens too fast, consider to do more sample cleanup or use guard- or pre-columns.
Contamination of the injection port.	Due to contamination in the liner by residual material and/or sample on the injection port septum. Replace the liner. Replace the injection port septum.
Column connection (detector side) is incorrect.	Check for leaks. Check the insertion length of the column as recommended in the GC instruction manual.
High bleed caused by too high oventemperature for the column used or by presence of water / oxygen in the carrier gas.	Reduce final oven temperature. Use a column with a thinner film; Use a column with higher temperature stability. Check filtration system, replace filters.
A leak of the carrier gas (MS, FID, TCD, PDD and ECD).	Check for a leak and fix it.
Detector gases are not clean enough.	Check gas filtration for all gases used for the detector. Use charcoal filters.
Detector cable not correctly connected.	Check connection. replace cable.
Faulty detector.	Faulty filament, electron multiplier, amplifier or baseplate etc. Repair or replace the faulty component.
Electronic noise picked up from other instrument (or vacuum cleaner).	Check if noise is happening in certain times of the day. If so, check impact systematically by turning off instruments close to the GC.

Instability / oscillation of baseline / many ghost peaks at same distance



Main cause	Solution
Column conditioning is insufficient.	Perform the column conditioning procedure.
Contamination is present in the whole column.	Perform the column conditioning procedure. Cut-off about 50 cm from the injection port side of the column. If still not OK, cut another 50 cm. If not OK, connect detector side to injector and recondition the column for several hours at its maximum operation temperature. If not OK, replace the column. If the decrease in performance happens too fast, consider to do more sample cleanup or use guard- or pre-columns.
Contamination of the injection port.	Contamination in the liner, the carrier gas line or the split line with residual material and/or sample on the injection port septum. Wash or exchange the liner. Clean the gas lines. Replace the injection port septum.
Condensation of stationary phase bleed products on one side of the column during oven cooling down. Typical phenomena with high bleed phases.	Use negative cooling down program for the oven, -10 or -20 ℃/min until a temperature where the column bleed is low, then cooling down can be done faster.
The detector temperature is unstable.	This may occur when using a TCD. Check the temperature stability.
The flow rate regulation of the detector gases are unstable.	Check the flow rates.
The temperature environment around the instrument is not suitable.	Check the temperature environment and make sure it is within the recommended specification for the instrument.

OPTIC-4 MultiMode Inlet for any Gas Chromatograph

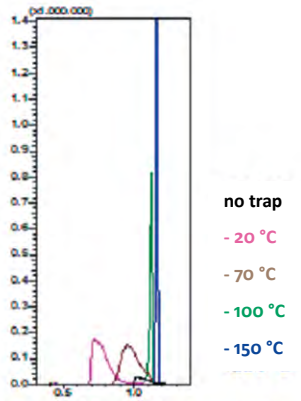
OPTIC is a highly advanced Gas Chromatograph multi mode inlet system with sophisticated temperature and gas flow control that can be used for the most demanding Gas Chromatograph analyses. The OPTIC has a long history starting from 1992. The current version OPTIC-4 can be used for hot injections, cold injections, large volume, on-column injections, in liner derivatisation, thermal desorption, pyrolysis and more.

- Cold Injections
- Large Volume Injections (Solvent Vent)
- Thermal Desorption
- Pyrolysis (liquid and solid)
- In-injector Thermochemolysis
- Cryogenic trap
- On-column injections
- Deans' Switch control
- GCxGC Modulation control
- Gas Control is compatible with Ethyl Acetate, THF and Acetone
- Compatible with PAL SPME-Arrow

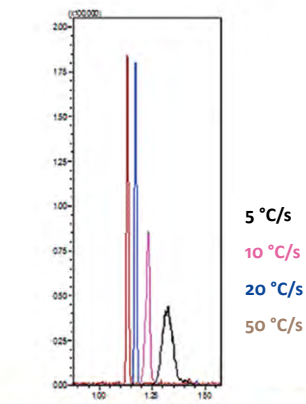
CryoFocus-4

Cryogenic cold trapping is frequently used for narrowing the chromatographic band and improving the detection limit in Gas Chromatography. The cryotrap uses LN2 or CO_2 for cooling, due to our low thermal mass the cooling is really fast.
The CryoFocus has direct heating of the cooling chamber, resulting in amazingly fast heating of the trap. After trapping the analytes must be released from the cryotrap using a highly accurate and extremely fast heating ensuring that they are introduced onto the column in a very sharp band. With a fast-heating cryo-trap better detection limit and better resolution can be seen on the detector.

- Can be used on any GC or GC-MS
- Stand alone or integrated in OPTIC-4
- Operating using direct LN2 or CO_2
- New from January 2023 is our silent LN2 valve
- Temperature range: -150 °C to 350 °C
- Temperature stability at low temperature: ±3 °C
- Heating ramp rate: 1 to 60 °C/sec
- Cool down time: 2-3 minutes
- Compatible with any GC
- Software controlled by Evolution Workstation
- Software compatible with Chronos Mastersoftware
- Free software updates



Influence of Cryotrap low temperature for Vinylchloride (M/Z = 62)
Headspace out of Water



Influence of Cryotrap heating rate for Vinylchloride (M/Z = 62)
Headspace out of Water

The figure above shows the importance of the low GC cryo-trap temperature as well as the importance of a fast heating cold trap. Sample is Vinylchloride injected by PAL system with headspace tool.

The manufacturer of OPTIC-4 and Cryofocus-4 is GL Sciences B.V. in the Netherland.
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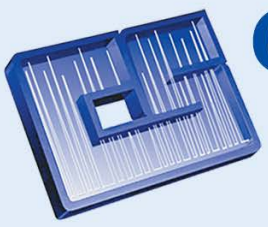
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