

Comprehensive Agilent J&W Capillary GC Columns and Method Guide

In 2000, Agilent Technologies, the inventor of fused silica GC tubing, joined forces with J&W Scientific, the creator of the GC stationary phase made from cross-linked siloxane polymers, to become the world's leading provider of GC capillary columns.

Today, we're working harder than ever to provide you with columns that offer reliable qualitative and quantitative results, even for your most challenging compounds. With the tightest quality control specifications in the industry, you can be assured that your next Agilent column will perform like your last.

Polarity

Stationary phase polarity is determined by the polarity of the substituted groups and their relative amounts. This table lists a variety of stationary phases in order of their increasing polarity. Polarity is often erroneously used to select columns or to determine separation characteristics. Stationary phase polarity is only one of many factors that affect retention and separation.

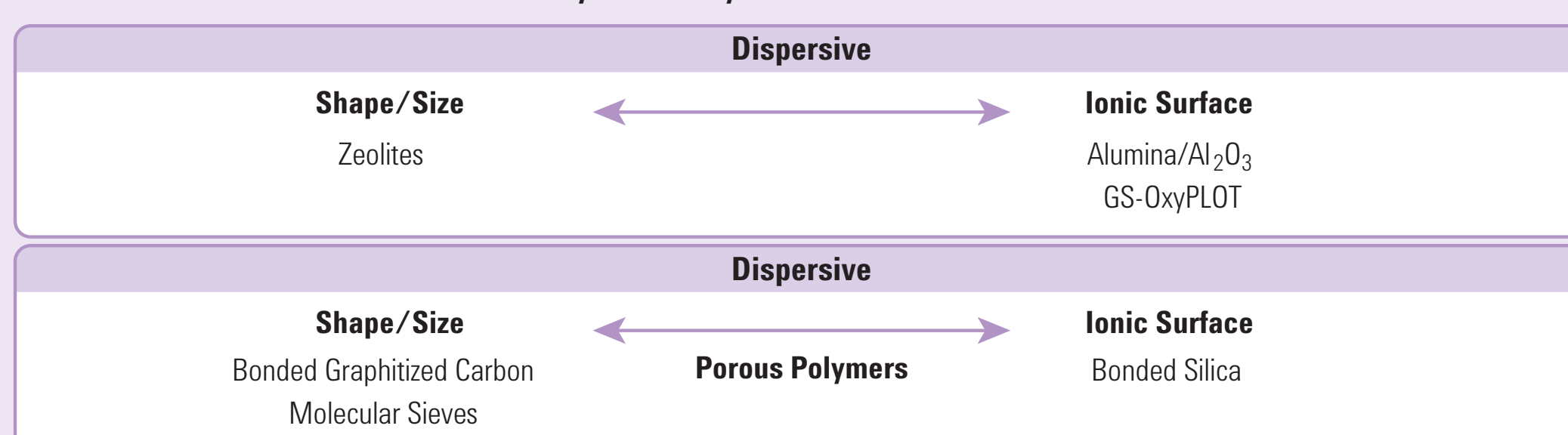
Non Polarity				Mid Polarity								High Polarity								
DB-1	DB-5	DB-XLB		DB-35	HP-Chiral 10β	DB-17	DB-TPH	DB-502.2	DB-VRX	DB-1301	DB-1701	DB-ALC2	DB-225	DB-ALC1	DB-Dioxin	DB-200	DB-210	DB-23	HP-88	DB-WAX
HP-1	HP-5			DB-35ms	HP-Chiral 20β	DB-17ms		HP-VOC		DB-624	DB-1701P		DB-225 ms							DB-WAXetr
DB-1ms	DB-5ms			HP-35		DB-608				HP-Fast Residual Solvent	CycloSil-β		HP Blood Alcohol							HP-INNOWax
HP-1ms	HP-5ms					HP-50+					Cyclodex-β									DB-FFAP
DB-2887	HP-5ms Semivol					DB-17ht														HP-FFAP
DB-Petro																				DB-WaxFF
DB-PONA	DB-5.625																			
DB-HT Sim Dis	DB-5ht																			
DB-1ht	Ultra 2																			
Ultra 1	HP-PASS																			
	DB-EVDX																			

Gas-Solid or PLOT Columns

PLOT (Porous Layer Open Tubular) columns are intended for the separation of very volatile solutes (primarily gases) without the need for cryogenic or sub-ambient cooling of the oven. Separations that would require column temperatures below 35°C, even with thick film liquid stationary phase can be obtained at temperatures above 35°C with PLOT columns.

Gas-solid or PLOT column stationary phases are physically different than polysiloxanes and polyethylene glycols. Gas-solid stationary phase are small, porous particles. The particles are stuck to the inner wall of the capillary tubing using a binder or similar means. Solutes are separated based on differences in their adsorption properties. Since the particles are porous, size and shape differentiation occurs also.

Primary Selectivity Interactions in PLOT Phases



PLOT Column Examples

Zeolite/Molesieve:	HP-PLOT Molesieve
Graphitized Bonded Carbon:	GS-CarbonPLOT
Porous Polymers:	HP-PLOT Q, HP-PLOT U
Bonded Silica:	GS-GasPro
Alumina/Al₂O₃:	GS-Alumina, GS-Alumina KCl, HP-PLOT Al ₂ O ₃ KCl, HP-PLOT Al ₂ O ₃ "S", HP-PLOT Al ₂ O ₃ "M"
Proprietary Phase:	GS-OxyPLOT

GC Columns Stationary Phase Applications Guide

Agilent Phase	Application	Composition	Approximate Temp Range (°C)
General Applications			
HP-1ms, DB-1ms, HP-1, DB-1	Amines, hydrocarbons, pesticides, PCBs, phenols, sulfur compounds, flavors and fragrances	100% Dimethylpolysiloxane	From -60 to 325/350
HP-5ms, DB-5, HP-5	Semivolatiles, alkaloids, drugs, FAMES, halogenated compounds, pesticides, herbicides	5% Phenyl 95% dimethylpolysiloxane	From -60 to 325/350
DB-5ms	Semivolatiles, alkaloids, drugs, FAMES, halogenated compounds, pesticides, herbicides	5% Phenyl 95% dimethyl arylene siloxane	From -60 to 325/350
DB-1301	Aroclors, alcohols, pesticides, VOCs	6% Cyanopropyl-phenyl 94% dimethyl polysiloxane	From -20 to 280/300
DB-35, HP-35	CLP-pesticides, aroclors, pharmaceuticals, drugs of abuse	35% Phenyl 65% dimethyl polysiloxane	From 40 to 300/320
DB-35ms	CLP-pesticides, aroclors, pharmaceuticals, drugs of abuse	35% Phenyl 65% dimethyl arylene siloxane	From 50 to 340/360
DB-1701, DB-1701P	Pesticides, herbicides, TMS sugars, aroclors	14% Cyanopropyl-phenyl 86% dimethyl polysiloxane	From -20 to 280/300
HP-50+, DB-17	Drugs, glycols, pesticides, steroids	50% Phenyl 50% dimethylpolysiloxane	From 40 to 280/300
DB-17ms	Drugs, glycols, pesticides, steroids	50% Phenyl 50% dimethyl arylene siloxane	From 40 to 320/340
DB-200	Residual solvents, pesticides, herbicides	35% Trifluoropropyl 65% dimethyl polysiloxane	From 30 to 300/320
DB-210	EPA Methods 8140 and 609	50% Trifluoropropyl 50% dimethyl polysiloxane	From 45 to 240/260
DB-225ms, DB-225	FAMES, alditol acetates, neutral sterols	50% Cyanopropyl-phenyl 50% dimethyl polysiloxane	From 40 to 220/240
HP-INNOWax	Alcohols, free organic acids, solvents, essential oils, flavors and fragrances	Polyethylene glycol	From 40 to 260/270
DB-WAX	Solvents, glycols, alcohols	Polyethylene glycol	From 20 to 250/260
CAM	Amines, basic compounds	Polyethylene glycol-base modified	From 60 to 220/240
HP-FFAP, DB-FFAP	Organic acids, alcohols, aldehydes, ketones, acrylates	Polyethylene glycol- acid modified	From 40 to 250
DB-23	FAMES (requiring cis/trans resolution)	50% Cyanopropyl 50% dimethyl polysiloxane	From 40 to 250/260
CycloSil-β	Chiral compounds (general purpose)	30%-heptakis (2,3-di-O-methyl-6-O-t-butyl dimethylsilyl)-β-cyclodextrin in DB-1701	From 35 to 260/280
HP-Chiral β	Chiral compounds (using a Nitrogen selective detector, NPD)	beta-Cyclodextrin in phenyl- based stationary phase	From 30 to 240/250

Agilent Phase	Application	Composition	Approximate Temp Range (°C)
PLOT Phases			
HP-PLOT Molesieve	Permanent and noble gases. Argon and oxygen separation at 35°C	5Å molecular sieve zeolite	From -60 to 300
HP-PLOT Al ₂ O ₃ KCl	C1-C6 hydrocarbons in natural gas, refinery gas, fuel gas, synthetic gas, dienes	Aluminum Oxide KCl deactivated	From -60 to 200
HP-PLOT Al ₂ O ₃ S	C1-C6 hydrocarbons in natural gas, refinery gas, fuel gas, synthetic gas, dienes	Aluminum Oxide "Sodium Sulfate" deactivated	From -60 to 200
GS-Alumina	C1-C6 hydrocarbons in natural gas, refinery gas, fuel gas, synthetic gas, dienes	Aluminum Oxide with proprietary deactivation	From -60 to 200
HP-PLOT Q	Hydrocarbons including isomers, CO ₂ , methane, air/CO, water, polar solvents, sulfur compounds	Polystyrene-divinylbenzene	From -60 to 270/290
HP-PLOT U	C1 to C7 hydrocarbons, CO ₂ , methane, air/CO, water, oxygenates, amines, solvents, alcohols, ketones, aldehydes	Divinylbenzene/ethylene glycol dimethacrylate	From -60 to 190
GS-GasPro	C1 to C12 hydrocarbons, CO ₂ , trace-level sulfurs, hydride gases, inorganic gases, halocarbons, SF ₆ , oxygen/nitrogen separation at -80°C	Proprietary, bonded silica-based	From -80 to 260/300
GS-OxyPLOT	Oxygenates	Proprietary phase, high selectivity	To 350
GS-CarbonPLOT	C1 to C5 hydrocarbons, CO ₂ , air/CO, trace acetylene in ethylene, methane	Bonded monolithic carbon layer	From 0 to 360
Specialty Phases - Environmental			
DB-624	Volatile priority pollutants, EPA Method 502.2	6% Cyanopropyl-phenyl, 94% dimethyl polysiloxane	From -20 to 260
DB-VRX	Volatile Organic Compounds using MSD, ELCD/PID	Proprietary phase	From -10 to 260
DB-35ms	CLP Pesticides, Chlorinated Herbicides, PCBs, 508.1 Pesticides	35% Phenyl, 65% dimethyl arylene siloxane	From 50 to 340/360
HP-5ms, DB-5, HP-5	Semivolatiles by EPA Method 8270	5% Phenyl, 95% dimethylpolysiloxane	From -60 to 325/350
DB-XLB (confirmation column)	PCB Congener Analysis (209 Congeners) CLP Pesticides, Chlorinated Herbicides, PCBs, 508.1 Pesticides	Proprietary phase	From 30 to 340/360
DB-TPH	Leaking Underground Fuel Tank (LUFT) testing	Proprietary phase	From -10 to 290
DB-MTBE	MTBE in Soil and Water	Proprietary phase	From 35 to 260/280
Specialty Phases - Other			
HP-Fast GC Residual Solvents	Residual Solvents	6% Cyanopropyl-phenyl, 94% dimethyl polysiloxane	From -20 to 260
DB-ALC1	Blood Alcohol Testing	Proprietary phase	From 20 to 260/280
DB-ALC2	Blood Alcohol Testing	Proprietary phase	From 20 to 260/280
HP-Blood Alcohol	Blood Alcohol Testing	Proprietary phase	From -60 to 270/290

