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GC Column Selection Guide



POLARITY	COMPOSITION	APPLICATIONS	RECOMMENDED USE	
5	ZB-1 Non-polar phase suited for boiling point separations	100 % Dimethylpolysiloxane	Ethanol, Hydrocarbons, Mercaptans, MTBE, Natural Gas Odorants, Oxygenates and GROs, Solvent Impurities, Light Sulfur Compounds	<ul style="list-style-type: none"> Excellent resolving power of critical pairs in complex petrochemical samples Used for "fingerprinting" and routine quality control analyses (e.g., citrus oils)
5	ZB-DHA-PONA Separation of paraffins, iso-paraffins, olefins, naphthenes, aromatics and polar compounds up to 430 °C for non-polar compounds	100 % Dimethylpolysiloxane	DHA, PONA, PIONA, PIANO, and ASTM Methods (D5134, D5441, D5501, D6729, D6730, D6733)	<ul style="list-style-type: none"> Temperature stability and flexibility Extensive Engineered Self Cross-linking (ESC) provides lowest bleed, excellent separation of Paraffins, Iso-paraffins, Olefins, Naphthenes, Aromatics and polar compounds
5	ZB-1PLUS™ Low bleed phase for non-polar compounds	100 % Dimethylpolysiloxane	Acids, Amines, Diesel Fuel, Drugs, Flavors and Fragrances, PCBs (EPA Method 1668), Pesticides, Essential Oils	<ul style="list-style-type: none"> Especially suited to high sensitivity GC-MS Improved signal-to-noise ratio for better sensitivity and mass spectral integrity Extremely inert for active compounds
5	ZB-1HT Inferno™ High temperature stability up to 430 °C for non-polar compounds	100 % Dimethylpolysiloxane	Diesel Fuel, High Boiling Petroleum Products, High Molecular Weight Waxes, Long-chained Hydrocarbons, Motor Oils, Polymers/Plastics, Simulated Distillation	<ul style="list-style-type: none"> Rugged, high temperature stable (430 °C) Robust performance for high temperature bakeouts True boiling point separation for hydrocarbon distillation methods Recommended for high boilers, contaminants, or carryovers
5	ZB-1XT SimDist Glass Infusion™ metal column technology for efficient, reproducible separations	100 % Dimethylpolysiloxane	ASTM Methods (D2887, D2887X, D3710, D6352, D7169), Crude Oil, Gasoline Fractions, Petroleum Distillates, Petroleum Fractions, Simulated Distillation, Vacuum Distillates	<ul style="list-style-type: none"> Uniform Glass Infusion coating for sharp peaks and high efficiency Individually tested for improved reproducibility 45 – 70 % higher efficiency than other manufacturers Improved resolution of C50/C52 hour after hour
8	ZB-5 Low polarity phase for general purpose use	5 % Phenyl 95 % Dimethylpolysiloxane	Alkaloids, Dioxins, Drugs, Essential Oils/Flavors, FAMES, Halo-hydrocarbons, PCBs/Aroclors, Pesticides/Herbicides, Phenols, Residual Solvents	<ul style="list-style-type: none"> Versatile column recommended for a wide range of applications Great column for unknown samples Resilient to dirty samples – long column life
8	ZB-5ms General purpose 5 % phenyl-arylene phase with enhanced selectivity for aromatics	5 % Phenyl-Arylene 95 % Dimethylpolysiloxane	Acids, Alkaloids, Amines, Dioxins, Drugs, EPA Methods, Essential Oils/Flavors, FAMES, Halo-hydrocarbons, PCBs/Aroclors, Pesticides/Herbicides, Phenols, Residual Solvents, Semi-volatiles, Solvent Impurities	<ul style="list-style-type: none"> Most popular starting column for method developers Arylene Matrix Technology™ (AMT) provides a highly stable arylene phase for enhanced resolution of PAHs and multi-ring aromatic compounds Suited to high sensitivity work using GC/MS
8	ZB-5PLUS™ Low bleed 5% phenyl selectivity	5 % Phenyl 95 % Dimethylpolysiloxane	Barbiturates, Benzodiazepines, Drugs of Abuse, EPA Methods, FAMES, Nitrosamines, Pesticides, Phenols, THC Metabolites	<ul style="list-style-type: none"> Highly inert for improved peak shape of acidic/basic compounds, drugs of abuse, and pesticides Maximum sensitivity and improved column-to-column performance
8	ZB-5MSPLUS™ Versatile, low bleed, inert 5 % Phenyl-Arylene phase for multi-use applications	5 % Phenyl-Arylene 95 % Dimethylpolysiloxane	Acids, Alkaloids, Amines, Drugs, Ethanolamines, Essential Oils/Flavors, Halo-hydrocarbons, Pesticides/Herbicides, Phenols, Residual Solvents, Solvent Impurities	<ul style="list-style-type: none"> Specialized deactivation for versatile selectivity with improved sensitivity Low bleed and well-suited to high sensitivity GC-MS and GC-MS/MS work
8	ZB-5HT Inferno	5 % Phenyl 95 % Dimethylpolysiloxane	Diesel Fuels, High Boiling Petroleum Products, High Molecular Weight Waxes, Long-chained Hydrocarbons, Motor Oils, Polymers/Plastics, Simulated Distillation, Surfactants, Triglycerides	<ul style="list-style-type: none"> Rugged, high temperature stable (430 °C) Robust performance for high temperature bakeouts True boiling point separation for hydrocarbon distillation methods Recommended for high boilers, contaminants, or carryovers
8	ZB-SemiVolatiles 5 % phenyl-arylene phase specifically for improved inertness of acids and amines with Enviro-Inert™ Technology	5 % Phenyl-Arylene 95 % Dimethylpolysiloxane	Semi-volatiles (SVOCs), PAHs, PBDEs, EPA Methods (525, 610, 625, 8100, 8270D)	<ul style="list-style-type: none"> Popular choice for semi-volatiles, PAHs, and PBDEs Inert, rugged performance for 5% phenyl-arylene selectivity with Enviro-Inert Technology Supreme inertness for acids, amines, and other notoriously active compounds Detect down to ultra-low levels (0.2 ng on-column) and improve critical pair resolution
9	ZB-XLB Low polarity si-arylene phase with extra low bleed for sensitive analyses	Proprietary	Herbicides/Insecticides, PCBs, Pesticides, Unknown Samples	<ul style="list-style-type: none"> Low polarity si-arylene column for MS detectors Alternative selectivity to standard 5-type phases Used for confirmation of pesticide, PCB, or other environmental samples Suited for unknown sample screening and identification
9	ZB-XLB-HT Inferno High temperature stability up to 400 °C with extra Low Bleed	Proprietary	Herbicides/Insecticides, PCBs, Pesticides, Unknown Samples	<ul style="list-style-type: none"> Non-metal si-arylene low bleed phase stable to 400 °C Provides alternate selectivity to 5% phenyl phases Often used for confirmation of pesticides, PCB, or other environmental samples Robust column performance for high temperature bakeouts
11	ZB-MultiResidue™ -1 Novel phase designed for pesticides, herbicides, and insecticides	Proprietary	Aroclors/PCBs, Haloacetic Acids, Insecticides, Multi-Pesticide Screening, Nitrogen Containing Pesticides, Organochlorine Pesticides, Organophosphorous Pesticides	<ul style="list-style-type: none"> Specifically designed for optimized pesticide screening and confirmation by GC/ECD Resolve common isomers with optimized selectivity Decreased breakdown of sensitive pesticides such as DDT Exceed EPA Method 8081 specifications when used with ZB-MultiResidue-2 Our most popular phase for pesticide testing by GC/MS
13	ZB-624 Optimized for volatile organic compounds (VOCs) and organic volatile impurities (OVIs)	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	Pharmaceuticals, Residual Solvents, Volatile Organic Compounds (VOCs), EPA Methods (501.3, 502.2, 503.1, 524.2, 601, 602, 624, 8010, 8015, 8020, 8021, 8240, 8260)	<ul style="list-style-type: none"> Increased temperature limit speeds run times and re-equilibration Popular for residual solvent testing (USP Monograph <467>) Widely used to separate volatile organic flavor and fragrance additives and residual solvents in industrial or pharmaceutical products (OVIs)
13	ZB-624PLUS™ Next generation of inertness. Increased sensitivity for high boiling solvents	Proprietary	Cannabis, Terpenes, Residual Solvents, Volatile Amines, EPA Method 8260, EPA Method 524, EPA Method 624, Food, Flavors and Fragrances, Solvent Purity, Alcohols	<ul style="list-style-type: none"> Enhanced peak shape with superior deactivation Increased sensitivity for high boiling solvent Extremely low bleed for GC-MS High temperature stability (300/320 °C)
15	ZB-MultiResidue-2 Novel phase designed for pesticides, herbicides, and insecticides	Proprietary	Aroclors/PCBs, Haloacetic Acids, Insecticides, Multi-Pesticide Screening, Nitrogen Containing Pesticides, Organochlorine Pesticides, Organophosphorous Pesticides	<ul style="list-style-type: none"> Specifically designed for optimized pesticide screening and confirmation by GC/ECD, GC/NPD, and GC/MS Resolve common isomers with optimized selectivity Decreased breakdown of sensitive pesticides such as DDT Exceed EPA Method 8081 specifications when used with ZB-MultiResidue-1

* Polarity scale is based on the McReynolds value, which provides a systematic approach to ranking GC stationary phases by polarity.



GC Column Selection Guide (cont'd)



POLARITY	COMPOSITION*	APPLICATIONS	RECOMMENDED USE	
18	ZB-35 Intermediate polarity for high molecular weight samples and method development screening	35 % Phenyl 65 % Dimethylpolysiloxane	Amines, Aroclors, Drugs, EPA Methods (508, 608, 8081, 8141, 8151), Pesticides, Pharmaceuticals	<ul style="list-style-type: none"> Intermediate polarity for high molecular weight analysis Minimized analyte adsorption, improved reproducibility More rugged (longer column life) than other polar phases Excellent for trace analysis with bleed-sensitive detectors (MS, FID, ECD, NPD)
18	ZB-35HT Inferno Intermediate polarity with high temperature stability up to 400 °C	35 % Phenyl 65 % Dimethylpolysiloxane	Amines, Aroclors, Chemicals, Drugs, EPA Methods (508, 608, 8081, 8141, 8151), Pesticides, Pharmaceuticals, Steroids	<ul style="list-style-type: none"> Rugged, high temperature stable (400 °C) Robust performance for high temperature bakeouts True boiling point separation for hydrocarbon distillation methods Recommended for high boilers, contaminants, or carry-overs
19	ZB-1701 Alternate selectivity to phenyl phases, with similar polarity	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	Alcohols, Amines, Aromatic Hydrocarbons, Drugs, Esters, PAHs, PCBs, Pharmaceutical Intermediates, Phenols, Solvents, Steroids, TMS Sugars, Tranquilizers	<ul style="list-style-type: none"> Fast run and re-equilibration times for enhanced sample throughput and productivity Provides alternate selectivity to phenyl phases with similar polarity
19	ZB-1701P Specifically designed for improved DDT and Endrin response	14 % Cyanopropylphenyl 86 % Dimethylpolysiloxane	Aroclors, Nitrogen Containing Pesticides, Organochlorine Pesticides, Organophosphorous Pesticides	<ul style="list-style-type: none"> Specially tested to ensure response of DDT, Endrin, Endrin Aldehyde, and Endrin Ketone Guaranteed column for pesticide analysis EPA Method 8081 Certified
24	ZB-50 High polarity phase with stability for high temperature bakeouts	50 % Phenyl 50 % Dimethylpolysiloxane	Antidepressants, Aroclors, Cholesterol, Drugs of Abuse, EPA Methods (508, 608, 8081, 8141, 8151), Glycols, Pesticides/Herbicides, Steroids, Triglycerides	<ul style="list-style-type: none"> High polarity column capable of high temperature bakeout to remove contaminants Inert to minimize analyte adsorption, improve efficiency, and reproducibility More rugged (longer column life) than other polar phases Great for toxicology and environmental compounds
52	ZB-WAXPLUS™ 100 % aqueous stability with high retention of alcohols and chlorinated solvents	100 % Polyethylene Glycol (PEG)	Alcohols, Aldehydes, Aromatics, Essential Oils, Flavors & Fragrances, Free Fatty Acids, Glycols, OVIs, Pharmaceuticals, Solvents / Residual Solvents, Styrene, Xylene Isomers	<ul style="list-style-type: none"> Exceptional stability to repeated injections Extremely inert for acidic compounds Enhanced selectivity for low boiling solvents; high retention of alcohols and chlorinated solvents Increased efficiency at 20 °C
57	ZB-WAX Bonded, solvent rinseable phase excellent for complex polar samples	100 % Polyethylene Glycol (PEG)	Alcohols, Aldehydes, Aromatics, Basic Compounds, Essential Oils, Flavors & Fragrances, Glycols, Pharmaceuticals, Solvents, Styrene, Xylene Isomers	<ul style="list-style-type: none"> Low activity for amines Excellent separations of polar complex mixtures; widely used for profiling and "fingerprinting"
58	ZB-FFAP Excellent peak shape for underivatized acids, organic acids, free fatty acids, and alcohols	100 % Nitroterephthalic Modified Polyethylene Glycol	Acrylates, Alcohols, Aldehydes, Free Fatty Acids, Ketones, Organic Acids, Phenols, Volatile Free Acids	<ul style="list-style-type: none"> Popular choice for food industry method development High polarity with excellent thermal and chemical stability Improve peak shape for underivatized acids, organic acids, free fatty acids, and alcohols Bonded, solvent rinseable nitroterephthalic acid phase
PROPRIETARY	ZB-BAC-1 & 2 More accurate results for blood alcohols and post-mortem samples	Proprietary	Abused Inhalant Anesthetics, Blood Alcohol Analysis	<ul style="list-style-type: none"> Enhance resolution of ethanol and acetone peaks Resolve t-butanol and n-propanol for greater selection of internal standards 2 min run time with baseline resolution of key components Dual-column confirmation with two elution order changes
	ZB-Bioethanol Fast and accurate bioethanol separations	Proprietary	Alcohols, Ethanol Testing, Fuel Alcohols	<ul style="list-style-type: none"> Meet ASTM D5501 requirements – resolve methanol and ethanol from all other denaturant peaks Great resolution of fuel alcohols Allows for quick bakeout between runs to eliminate contaminants
	ZB-CLPesticides-1 & 2 Optimized chlorinated pesticide phases for dual-column methods on one column set	Proprietary	Dual-column chlorinated pesticide EPA Methods (8081 and 8081 extended, 8082, 8151, 504, 505, 508, 552)	<ul style="list-style-type: none"> Guaranteed alternative to Restek Rtx-CLPesticides Optimized, versatile selectivity for chlorinated pesticides and herbicides Well-suited for dual-column configurations using GC/ECD Run EPA Methods 8081 and 8081 extended, 8082, 8151, 504, 505, 508, and 552 on without changing columns – save time
	ZB-Drug-1 Optimized for drugs of abuse separations with resolution of target analytes and interferences	Proprietary	Drug Screening (6-MAM, Amphetamines, Barbiturates, Benzodiazepines, Opiates, PCP, THC)	<ul style="list-style-type: none"> Specially deactivated to improve inertness, peak shape, and quantitation for drug compounds Improve resolution of analytes from matrix interferences Run amphetamines in under 6 minutes and opiates in under 5 minutes
	ZB-FAME Analysis of Fatty Acid Methyl Esters (FAMES)	Proprietary	Fatty acid methyl esters (FAMES), cis/trans FAME isomers, Omega 3 and Omega 6 FAMES	<ul style="list-style-type: none"> Faster FAME GC Analysis. Reduced run times up to 75 % Separate cis/trans FAME isomers with Rs ≥ 1.0 High-cyanopropyl selectivity acceptable for use with AOCS, AOAC, and IOC methods
	ZB-PAH-EU Rapid analysis of PAHs	Proprietary	Analysis of 15+1 EU-regulated and EPA regulated PAHs in environmental, food testing, and consumer products	<ul style="list-style-type: none"> Up to 70 % Faster PAH Analysis Elevated Temperature Stability (340/360 °C) Great Resolution of Critical Isomers, e.g. Benzo[b,j,k]fluoranthene
	ZB-PAH-CT Rapid analysis of PAHs (Enhanced Resolution for Chrysene and Triphenylene)	Proprietary	Analysis of 15+1 EU-regulated and EPA regulated PAHs, Chrysene, and Triphenylene separation in environmental, food testing, and consumer products	<ul style="list-style-type: none"> Up to 70 % Faster PAH Analysis Elevated Temperature Stability (320/340 °C) Great Resolution of Critical Isomers, e.g. Benzo[b,j,k]fluoranthene, Chrysene and Triphenylene
	ZB-Dioxin Simplified Dioxin analysis	Proprietary	Dioxin in food and environment, Persistent Organic Pollutants (POPs) in food	<ul style="list-style-type: none"> Improved lab productivity by 50% Enhanced resolution of TCDD & TCDF Improved column lifetime with integrated column option

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➔ More tools for GC column selection starting on page 407.

➔ GC Accessories Ordering Information, see page 365.

