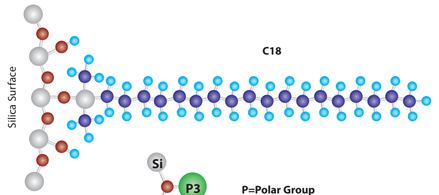
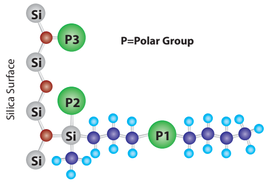
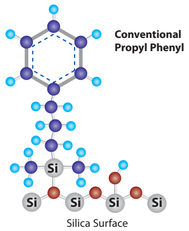
Stationary phase comparison.

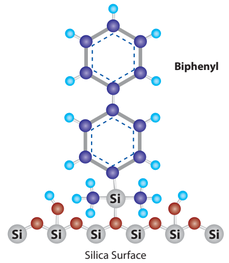


Alkyl phases (e.g. C18)
Alkyl-based stationary phases, such as C18, are best suited for analyzing hydrophobic molecules with a high carbon:heteroatom ratio.

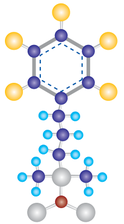


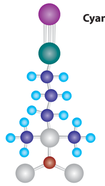
Alkyl phase with polar functional group
An alkyl-based stationary phase with either an embedded polar group (P1), a polar side chain (P2), or a polar end-cap (P3), has significantly greater interaction with polar compounds than a traditional alkyl phase.





Phenyl & Biphenyl phases
Phenyl stationary phases interact with compounds containing aromatic groups or unsaturated bonds through π-π interactions. The biphenyl stationary phase has even greater interaction due to the higher concentration of aromatic rings.





Cyano & Fluorinated phases
Fluorinated phases, such as the pentafluorophenyl propyl (PFP propyl), and cyano-based phases interact strongly with basic, nitrogen-containing and halogenated analytes.

Restek's Exclusive Trident Integral System

- Convenient and economical leak-free guard cartridge system, extremely easy to install.
- Versatile configuration protects against all levels of contamination.
- Integral design eliminates troublesome tubing connections.

Description	qty.	cat.#
XG-XF Fitting for 10mm Guard Cartridge	ea.	25026
XG-XF Fitting for 20mm Guard Cartridge	ea.	25062
Replacement XF Filter Fitting	ea.	25024
Replacement Cap Frits: 4mm, 2.0µm	5-pk.	25022
Replacement Cap Frits: 4mm, 0.5µm	5-pk.	25023
Replacement Cap Frits: 2mm, 2.0µm	5-pk.	25057

Column with Trident Integral Inlet Fitting (to order add "-700" to catalog number of column) and guard cartridge, XG-XF fitting, cap frit, and XF end fitting.

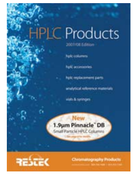
Remove the XF end fitting and install the guard cartridge in the end of the column.

Add the XG-XF fitting (order cat.# 25026 for 10mm guard cartidges, cat.# 25062 for 20mm guard cartridges).

Re-install the XF end fitting with cap frit.

The cap frit can be easily replaced if it becomes contaminated/plugged.

Please see Restek's Annual Chromatography Products Guide *(lit. cat.# 580205) for more HPLC columns and accessories.*



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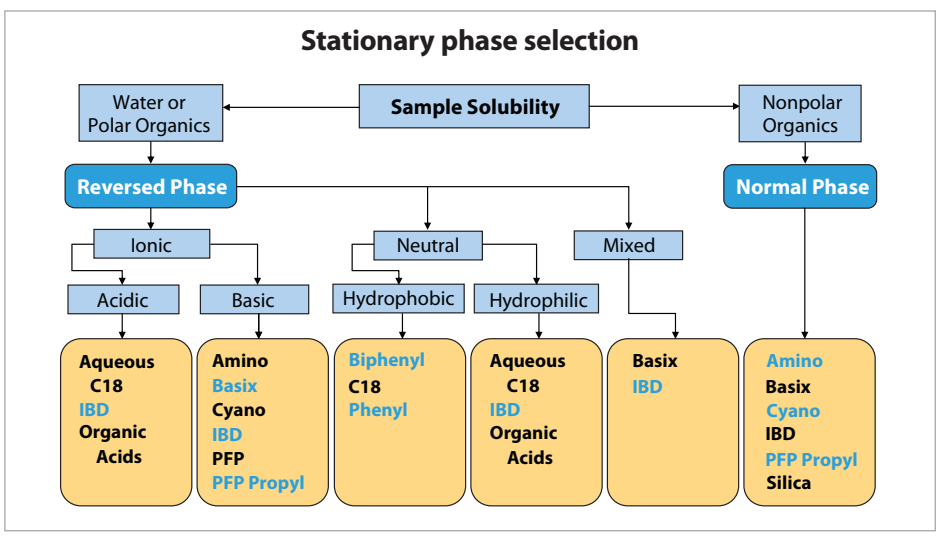
HPLC Column Selection Guide



Restek HPLC Column	End Cap?	Pore Size (Å)	Carbon load (%)	Applications	Chromatographic Properties	Similar Phases	USP Code
Pinnacle™ DB C18	Y	140	11	Hydrophobic C18 phase suitable for analyses of a wide range of compounds, from acidic through slightly basic.	Highly base-deactivated spherical silica manufactured by Restek. Monomeric C18 bonding.	Hypersil® BDS C18, Zorbax® Eclipse XDB-C18, Spherisorb® ODS	L1
Pinnacle™ DB Aqueous C18	—	140	6	Ideal for applications that require highly aqueous mobile phases, such as organic acids and water-soluble vitamins.	Highly selective phase for polar analytes. Compatible with highly aqueous (up to 100%) mobile phases. Silica manufactured by Restek.	Aquasil C18, AQUA® C18, Hypersil® Gold AQ, YMC® ODS-Aq	L1
Pinnacle™ DB C8	Y	140	6	Applications similar to Pinnacle™ DB C18, but with less hydrophobic retention. Less retention can be useful for shortening analysis time, if resolution is adequate.	Highly base-deactivated spherical silica manufactured by Restek. Monomeric C8 bonding. Similar to Pinnacle™ DB C18, but the shorter alkyl chain provides less hydrophobic retention.	Hypersil® BDS C8, Spherisorb® C8	L7
Pinnacle™ DB PFP Propyl	Y	140	6	Exhibits excellent peak shapes for a wide range of compounds, including nucleosides, nucleotides, and halogenated compounds.	Highly base-deactivated spherical silica manufactured by Restek. Unique pentafluorophenyl phase with a propyl spacer.	Discovery® HS F5	L43
Pinnacle™ DB Biphenyl	Y	140	8	Excellent choice for the analysis of steroids, tetracyclines, drug metabolites, and other compounds that contain some degree of unsaturation.	Highly base-deactivated spherical silica manufactured by Restek. Unique reversed phase material that displays both increased retention and selectivity for aromatic and/or unsaturated compounds when compared to conventional alkyl and phenyl phases.	**Unique**	L11
Pinnacle™ DB Cyano	Y	140	4	Suitable for a wide range of compounds, from acidic through slightly basic. Also useful for confirmation of analyses on a C18 or C8 column. Can be used in normal phase or reversed phase mode of separation.	Highly base-deactivated spherical silica manufactured by Restek. Cyano bonding.	Hypersil® BDS Cyano, Spherisorb® Cyano, Zorbax® Eclipse XDB-CN	L10
Pinnacle™ DB Phenyl	Y	140	5.3	Suitable for polar aromatic compounds, fatty acids, purines and pyrimidines.	Highly base-deactivated spherical silica manufactured by Restek. Phenyl bonding.	Hypersil® BDS Phenyl, Spherisorb® Phenyl Zorbax® Eclipse XDB-Phenyl	L11
Pinnacle™ DB Silica	—	140	—	Normal phase mode of separation.	Highly base-deactivated spherical silica manufactured by Restek.	—	L3
Pinnacle™ II C18	Y	110	13	Superior general purpose C18 for nonbasic analytes.	Intermediate carbon load and surface area, suitable for a wide range of neutral to acidic compounds. Silica manufactured by Restek.	Hypersil® ODS	L1
Pinnacle™ II PAH	Y	110	—	Maximum resolution of polycyclic aromatic hydrocarbons.	Proprietary stationary phase; resolves 16 PAHs in US EPA Method 610. Silica manufactured by Restek.	**Unique**	—
Pinnacle™ II C8	Y	110	7	Superior general purpose C8 for nonbasic analytes.	Provides shorter retention times for hydrophobic compounds than C18. Silica manufactured by Restek.	Hypersil® C8	L7
Pinnacle™ II Cyano	Y	110	4	Superior general purpose cyano for weakly basic analytes. Used in either normal or reversed phase analyses.	More rugged than bare silica for normal phase analyses. Silica manufactured by Restek.	Hypersil® CPS	L10
Pinnacle™ II Phenyl	Y	110	6	Superior general purpose phenyl for neutral analytes.	Offers unique selectivity versus traditional alkyl chain phases, especially for aromatic compounds. Silica manufactured by Restek.	Hypersil® Phenyl	L11
Pinnacle™ II Amino	N	110	2	Excellent general purpose amino phase. Excellent choice for carbohydrate analysis.	Silica manufactured by Restek.	Hypersil® APS 2 Amino, Spherisorb® Amino	L8
Pinnacle™ II Biphenyl	Y	110	—	Multiple aromatic ring structures; excellent for explosives.	Silica manufactured by Restek. Unique biphenyl phase.	**Unique**	L11
Pinnacle™ II Silica	—	110	—	Ideal for polar analytes.	Superior value phase for normal phase separation of polar analytes. Lower retention than Ultra C18. Silica manufactured by Restek.	Hypersil® Silica	L3
Allure® C18	Y	60	27	Ideal for MS and light-scattering detection of neutral to slightly polar solutes. Separates basic compounds, showing good deactivation; excellent for explosives or steroids.	Most retentive phase for hydrophobic and slightly polar analytes. Mobile phase containing higher percentage of organic modifier contributes to higher sensitivity in ESI-based LC/MS.	Ultracarb C18, BetaMax® Neutral, Discovery® C18	L1
Allure® Aqueous C18	N	60	—	Ideal for analyses that require >90% water in the mobile phase. Excellent for highly water soluble or poorly organic soluble compounds. Excellent for water-soluble vitamins and organic acids. More retention than Ultra Aqueous columns.	Highly retentive and selective for reversed phase separations of polar analytes. Highly base deactivated. Compatible with highly aqueous (up to 100%) mobile phases.	**Unique**	L1
Allure® AK	Y	60	—	Ideal for the analysis of aldehydes and ketones as DNPH derivatives.	Highly retentive, highly selective phase, developed specifically for the analysis of aldehydes and ketones as DNPH derivatives.	**Unique**	—
Allure® Basix	Y	60	12	Ideal for LC/MS of basic solutes. Excellent for basic pharmaceuticals or other amine-containing compounds.	Highly retentive phase for analytes containing amino functionality.	BetaMax® Base, Maxsil CN	L10
Allure® PFP Propyl	Y	60	17	Ideal for MS, ELSD, or NPD detection of nucleosides, nucleotides, purines, pyrimidines, or halogenated compounds.	A pentafluorophenyl phase with a propyl spacer. Highly retentive for basic analytes. Excellent for beta-blockers, halogenated compounds, nucleosides, nucleotides, pyridines, pyrimidines, tricyclic antidepressants.	Discovery® HS F5	L43
Allure® Organic Acids	N	60	—	Excellent resolution of challenging organic acids.	Single 30cm column performs equally to two C18 columns in series. (AOAC Method 986.13)	**Unique**	—
Allure® Biphenyl	Y	60	23	Multiple ring structure; excellent for aromatic and unsaturated compounds. Increased retention over traditional phenyl phases.	High purity, highly retentive phase for aromatic and unsaturated compounds.	**Unique**	L11
Allure® Silica	—	60	—	Highly retentive phase for normal phase separation.	High purity, highly retentive phase for normal phase separation of polar analytes. Very high surface area.	Maxsil Si	L3
Ultra C18	Y	100	20	Ideal for anilines, barbiturates, carbonyls, fat-soluble vitamins, fatty acids, glycerides, phthalates, PTH amino acids, steroids, other acids.	A very retentive, high-purity phase that exhibits excellent peak shape for a wide range of compounds. Recommended as a general purpose reversed phase column.	Discovery® C18, Symmetry® C18, Hypersil® Gold C18, Luna® C18, Zorbax® C18, Kromasil® C18, LiChrospher® RP-18, Inertsil® ODS-2, Develosil® C18	L1
Ultra Aqueous C18	N	100	15	Ideal for analyses that require >90% water in the mobile phase. Excellent for highly water soluble or poorly organic soluble compounds. Excellent for water-soluble vitamins and organic acids.	Highly retentive and selective for reversed phase separations of polar analytes. Highly base deactivated. Compatible with highly aqueous (up to 100%) mobile phases.	AQUA® C18, Aquasil C18, Hypersil® Gold AQ, YMC® ODS-Aq	L1
Ultra IBD	N	100	12	A polar group assists in deactivating surface silanols and contributes to unique separation selectivities for acids, bases, zwitterions, and other polar compounds.	One of a group of intrinsically base-deactivated (IBD) phases, with a polar group within, or intrinsic to, the alkyl bonded phase. Provides unique selectivity and high level of base deactivation while reducing or eliminating the need for mobile phase additives.	SymmetryShield, Discovery® ABZ & ABZ+, Prism™	—
Ultra C8	Y	100	12	Selectivity and peak shape similar to Ultra C18, but less hydrophobic retention.	Very retentive, high-purity, base-deactivated reversed phase packing that exhibits excellent peak shape for a wide range of compounds.	Luna® C8, Symmetry® C8, Hypersil® Gold C8	L7
Ultra C4	Y	100	9	Ideal for peptides and small proteins.	Exceptionally stable C4 packing, with high bonding coverage and silanol base-deactivation. Exhibits shorter retention than C18 or C8 phases.	Supelcosil Butyl (C4), Delta-Pak C4	L26
Ultra C1	—	100	5	Alternative selectivity to Ultra C18 or C8 columns, especially for polar analytes. Shortest chain alkyl phase available for reversed phase separations.	Exceptionally stable C1 packing resists hydrolysis, even under acidic mobile phase conditions. Least retentive reversed phase hydrocarbon packing.	Spherisorb® C1	L13
Ultra Cyano	Y	100	8	Excellent for basic pharmaceuticals, steroids (normal or reversed phase conditions), or other basic compounds.	High-purity cyano phase with reduced silanol activity. Often a better choice than C18 for basic pharmaceuticals. Cyano is the most stable bonded phase for normal phase mode.	Platinum CN, Develosil® Cyano, Luna® CN, Hypersil® Gold CN	L10
Ultra Phenyl	Y	100	10	Ideal for fatty acids, polycyclic aromatic hydrocarbons, purines and pyrimidines, and polar aromatics.	High-purity, highly retentive, base-deactivated phase with alternate selectivity to hydrocarbon phases, especially for aromatic analytes.	Platinum Phenyl, Supelcosil Phenyl, Betasil® Phenyl	L11
Ultra Amino	N	100	2	Superior general purpose amino phase. Ideal for carbohydrates.	Recommended for normal phase analyses of mono- and disaccharides and other similar compounds. Can also serve as a weak anion exchanger with aqueous buffers.	Platinum Amino, Develosil® NH2	L8
Ultra PFP	Y	100	7	Ideal for taxol and precursors, or halogenated compounds, amines, esters, or ketones.	A pentafluorophenyl phase. Unique selectivity by interaction with functional groups of organohalogens or other basic analytes.	Fluophase® PFP, Fluosep-RP Phenyl, Curosil PFP	L43
Ultra Silica	—	100	—	Ideal for normal phase applications.	High purity, high surface area.	—	L3
Ultra Carbamate	—	100	—	Rapid analysis of carbamates.	Proprietary stationary phase can process up to twice as many samples per hour, compared to a conventional C18 phase.	**Unique**	—
Ultra Quat	—	100	—	Proprietary phase for the analysis of paraquat and diquat and other quaternary amines.	High purity silica. Reversed phase packing optimized for the analysis of paraquat and diquat.	**Unique**	—
Viva Wide Pore C18	Y	300	9	Proteins and other higher molecular weight compounds.	Silica manufactured by Restek. Viva wide pore silica has the highest available surface area for large molecules of any commercially available 300Å packing.	BioBasic® 18, Symmetry® 300 C18, Jupiter® 300 C18, Zorbax® 300 OSB C18, Synchropak® C18, 208 TP C18	L1
Viva Wide Pore C8	Y	300	5	Proteins and other higher molecular weight compounds. Less retentive than C18 phase.	Silica manufactured by Restek. Similar to Viva C18 with less hydrophobic retention.	BioBasic® 8, Zorbax® 300 OSB C8, Synchropak® C8, 208 TP C8	L7
Viva Wide Pore C4	Y	300	3.5	Proteins and other higher molecular weight compounds. Less retentive than C18 and C8 phases.	Silica manufactured by Restek. Similar to Viva C18 and C8, with even less hydrophobic retention.	BioBasic® 4, Symmetry® 300 C4, Jupiter® 300 C4, Synchropak® C4, 208 TP C4	L26
Viva Wide Pore Biphenyl	Y	300	6.7	Exhibits excellent peak shape for a wide range of compounds; ideal for large molecules and biomolecules with aromatic rings or unsaturated character.	Silica manufactured by Restek. Unique biphenyl phase.	**Unique**	L11
Viva Wide Pore PFP Propyl	Y	300	5	Exhibits excellent peak shape for a wide range of compounds, including nucleosides, nucleotides, and halogenated compounds.	Silica manufactured by Restek. Fluorinated phase for enhanced retention of basic & halogenated compounds.	**Unique**	L43
Viva Wide Pore Silica	—	300	—	Normal phase applications for high molecular weight compounds.	Silica manufactured by Restek. Viva wide pore silica has the highest available surface area for large molecules of any commercially available 300Å packing.	—	L3
pHidelity® C18	—	140	—	Hydrophobic C18 phase suitable for analyzing a wide range of compounds; enhanced stability under highly basic conditions.	Excellent stability under extreme pH conditions. True C18 selectivity in a silica-based stationary phase.	**Unique**	—

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