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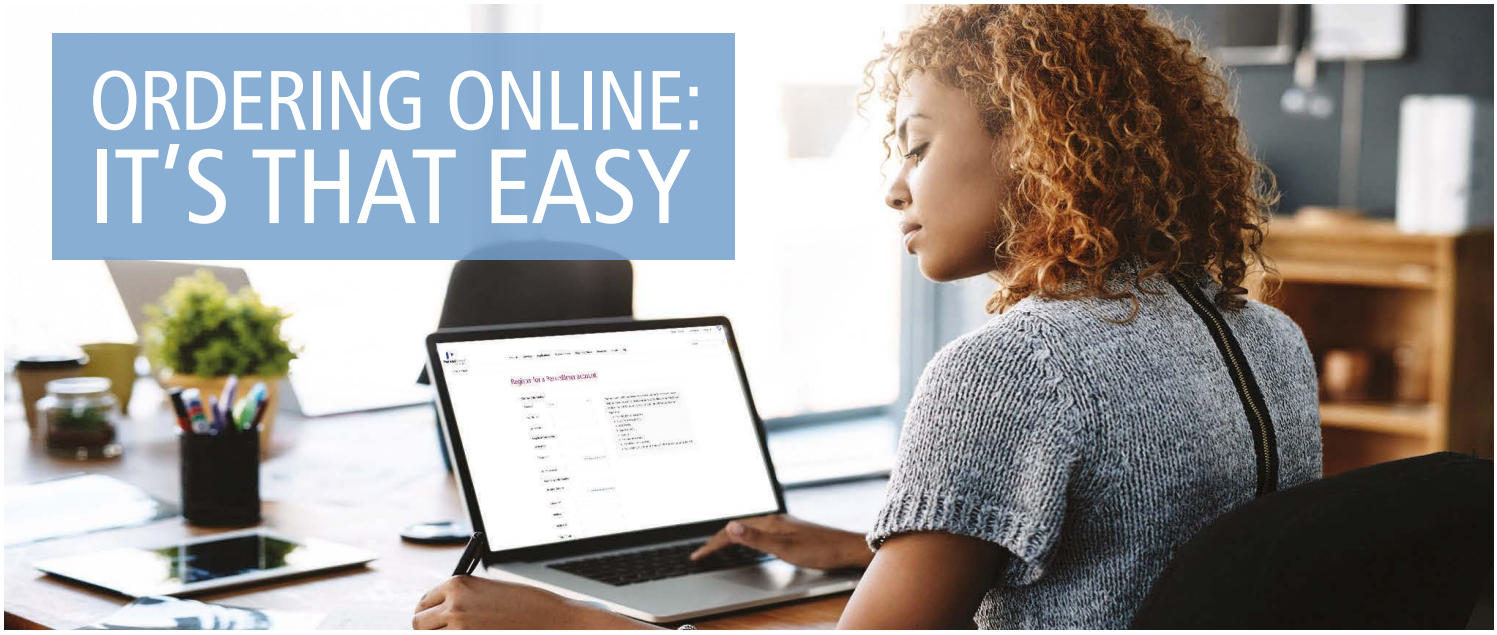

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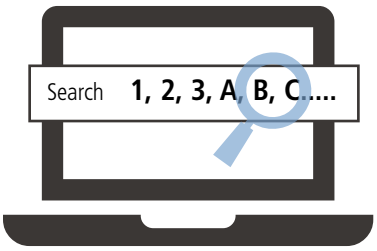

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Chromatography

Today's advanced and increasingly diverse Advanced Materials laboratories are facing new challenges on a daily basis – starting from raw materials right up to the finished product. PerkinElmer's comprehensive portfolio of analytical solutions is designed to give you the higher accuracy, sensitivity, and ease of use your laboratory demands for examining with confidence, the purity, composition, and performance of your compounds. What's more, a range of complementary services is available to keep your laboratory up and running, meeting the stringent requirements of a variety of environments and working practices.

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- The PerkinElmer part numbers of the items that you wish to return.
- Reason for return.

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LC Columns

We offer a wide selection of superior quality products designed to work with your PerkinElmer instruments.
Our precision designed products deliver the peace of mind that comes from knowing that you'll get the results you need.

Quick Reference Index

ChromegaChiral Chiral LC Columns

As a leader in chiral separations, we offer a broad range of ChromegaChiral innovative Chiral Stationary Phases (CSPs) for your analytical and preparative chromatography needs.

VIEW PAGE

Epic HPLC & UHPLC Columns

Our Epic LC column portfolio is the latest range of LC columns encompassing an extensive range of stationary phase chemistries, with innovative bonding chemistry, to enhance method development. It offers scalability from analytical to preparative using the same high-quality silica.

VIEW PAGE

MacroSep Wide Pore LC Columns

MacroSep BIO and MacroSep BIO-Gold are based on wide pore silica-based sorbent optimized for separating larger molecules such as proteins and peptides.

VIEW PAGE

GreenSep SFC Columns

GreenSep SFC Columns have been specifically engineered for SFC separations and features with a variety of selectivities offering orthogonality. Many of the GreenSep phases designed for basic and acidic compounds do NOT require mobile phase additives.

VIEW PAGE

LC Instruments

LC 300 HPLC and UHPLC

Whether you're looking for a high-end HPLC or powerful UHPLC platform, our LC 300 systems help your lab achieve fast, accurate results. The LC 300 system was designed for very low dispersion, increasing separation efficiency, and lowering detection limits. It's available with your choice of five high-sensitivity detectors (photodiode array, UV/Vis, multi-wavelength UV/Vis, fluorescence, and refractive index) to meet your diverse application needs.

Applications:

- Routine analysis
- Quality testing of raw materials
- Determine fraud/adulteration of products
- Ensure lot-to-lot consistency
- Research-based analysis for new products

QSight® LC/MS/MS

A versatile triple quad LC/MS/MS instrument with the accuracy, sensitivity and repeatability needed to ensure compliance. QSight includes StayClean™ technology, Laminar Flow Ion Guide™ and dual source ESI and APCI modes allow you to be more productive, with 15% more uptime and virtually no maintenance.

Applications:

- Testing for Pesticide Residues
- Analyzing for Mycotoxins
- Detecting Veterinary Drug Residues
- Detecting Acrylamide
- Testing for Hormones
- Analyzing for Vitamins
- Analyzing for Pharmaceutical and Personal Care Product Contaminants

QSight® LX50 Solvent Delivery Module

The QSight LX50 UHPLC system, paired with the industry's most flexible mass spectrometer, delivers all the sensitivity and specificity you need for a wide range applications. Featuring a high precision autosampler, advanced UHPLC solvent delivery module and a flexible column temperature module, the QSight LX50 UHPLC delivers the performance required for even the most demanding analyzes.

Applications:

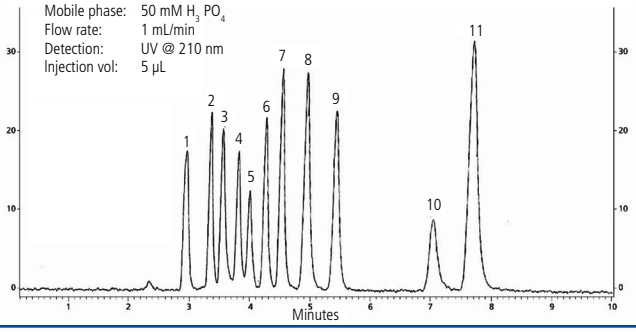
- Ideal for critical analyzes such as pesticide residues and nutritional component analyzes
- Suitable for difficult sample matrices often found in food, environmental and industrial applications

Food LC Applications

HPLC analysis of low molecular weight polar organic acids using Epic Polar, 250 x 4.6 mm, 5 µm.

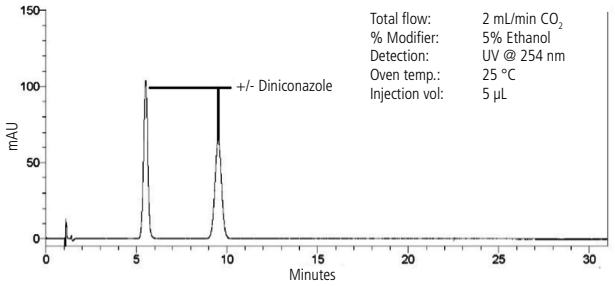
Peak Identification			
1. Glucuronic acid	500 µg/mL	6. Lactic acid	666 µg/mL
2. Tartaric acid	167 µg/mL	7. Acetic acid	656 µg/mL
3. Formic acid	333 µg/mL	8. Citric acid	420 µg/mL
4. Mallc acid	250 µg/mL	9. Succinic acid	833 µg/mL
5. Shikimik acid	6.7 µg/mL	10. Fumaric acid	3 µg/mL
		11. Propionic acid	1600 µg/mL

Mobile phase: 50 mM H_3PO_4
Flow rate: 1 mL/min
Detection: UV @ 210 nm
Injection vol: 5 µL

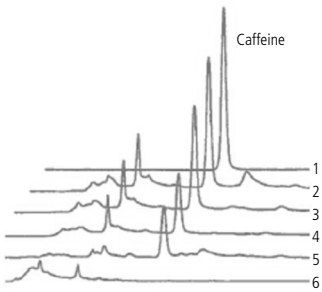


SFC analysis of diniconazole pesticide using ChromegaChiral CCS with 5% ethanol, 150 mm x 4.6 mm, 5 µm.

Total flow: 2 mL/min CO_2
% Modifier: 5% Ethanol
Detection: UV @ 254 nm
Oven temp.: 25 °C
Injection vol: 5 µL



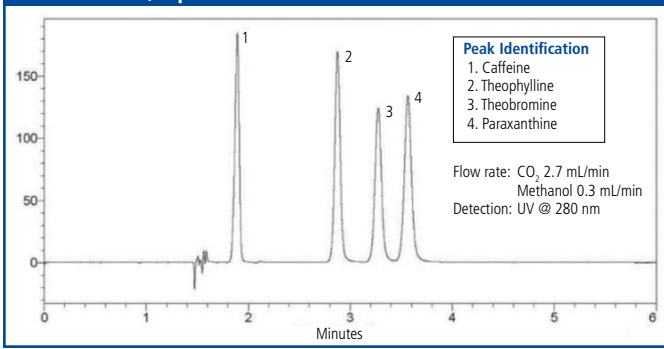
HPLC analysis of brewed teas using AquaSep, 150 mm x 4.6 mm, 5 µm.



Peak Identification
1. Caffeine Standard 400 µg/mL
2. Darjeeling loose tea
3. "Lipton"
4. Celestial Seasonings "Morning Thunder"
5. Bancha Eden "Green Tea"
6. Celestial Seasonings Herbal Tea "Red Zinger"

Brewed Tea (injected neat)
Eluent: 20:80 Acetonitrile: Water pH 3 Phospate buffer
Flow rate: 1 mL/min
Detection: UV @ 254 nm

SFC analysis of caffeine analogue mixture using GreenSep Basic, 250 x 4.6 mm, 5 µm.



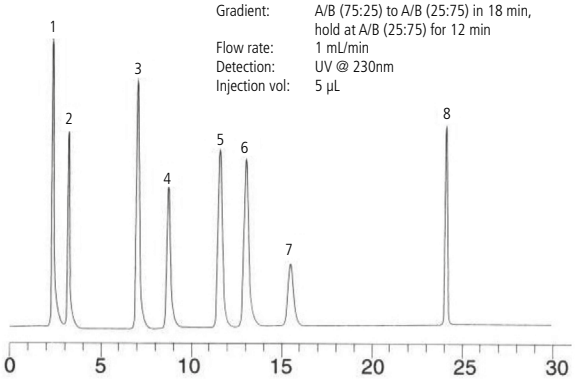
Peak Identification
1. Caffeine
2. Theophylline
3. Theobromine
4. Paraxanthine

Flow rate: CO_2 2.7 mL/min
Methanol 0.3 mL/min
Detection: UV @ 280 nm

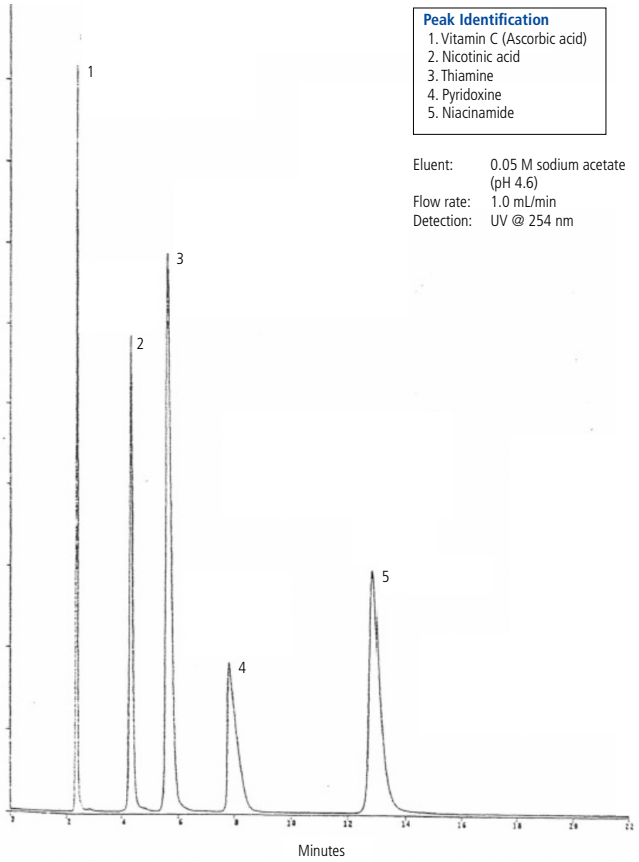
HPLC analysis of food additives using Epic Phenyl-Hexyl, 150 x 4.6 mm, 5 µm.

Peak Identification
1. Saccharin
2. p-Hydroxybenzoic acid
3. Sorbic acid
4. p-Hydroxybenzoic acid methyl ester
5. Dehydroacetic acid
6. p-Toluic acid
7. p-Hydroxybenzoic acid ethyl ester
8. n-Propyl p-hydroxybenzoate

Mobile phase: A: 50 mM KH_2PO_4 + 0.1% H_3PO_4
B: Acetonitrile
Gradient: A/B (75:25) to A/B (25:75) in 18 min, hold at A/B (25:75) for 12 min
Flow rate: 1 mL/min
Detection: UV @ 230nm
Injection vol: 5 µL



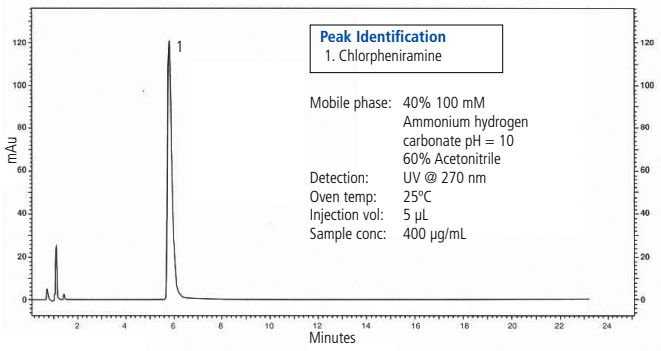
HPLC analysis of water-soluble vitamins using AquaSep, 150 mm x 4.6 mm, 5 µm.



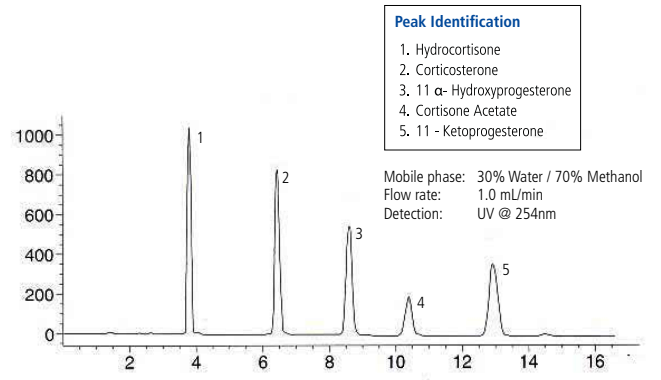
Peak Identification
1. Vitamin C (Ascorbic acid)
2. Nicotinic acid
3. Thiamine
4. Pyridoxine
5. Niacinamide

Eluent: 0.05 M sodium acetate (pH 4.6)
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm

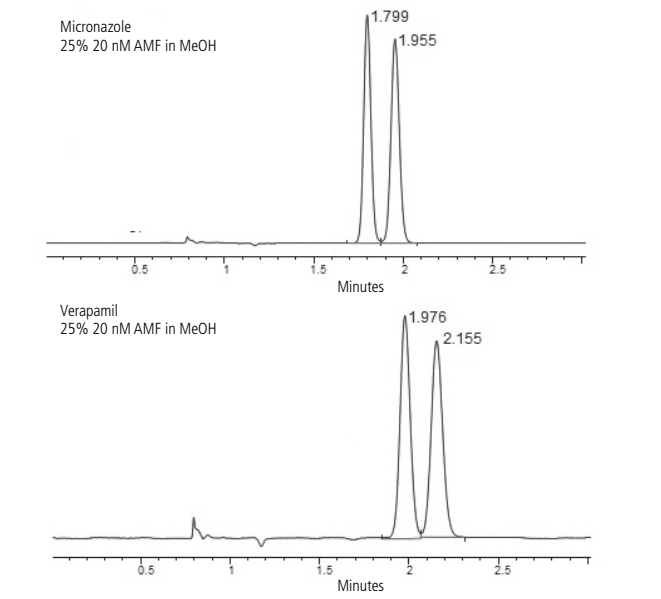
HPLC analysis of chlorpheniramine antihistamine at pH 10 using Epic C18, 150 x 4.6 mm, 5 µm.



HPLC analysis of steroids using Epic HILIC RP, 250 x 4.6 mm, 5 µm.

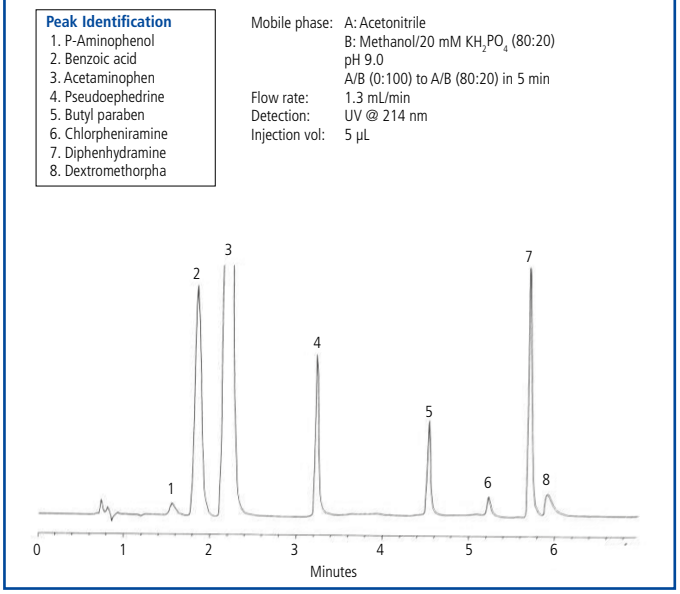


SFC analysis of miconazole and verapamil using ChromegaChiral CCO F4 T3, 250 mm x 4.6 mm, 5 µm.

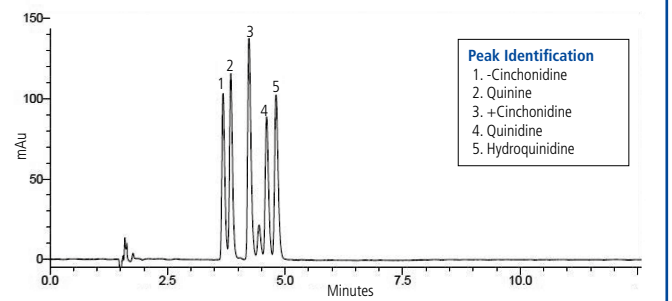


Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016.

HPLC analysis of polar pharmaceutical compounds using Epic Phenyl-Hexyl, 50 x 4.6 mm, 3 µm.



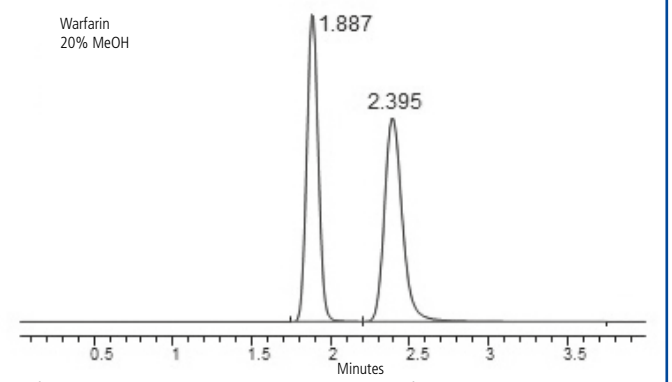
SFC analysis of structurally similar quinine derivatives using GreenSep Naphthyl, 150 x 4.6 mm, 3 µm.



Mobile phase: CO_2 / Methanol
Flow rate: 3 mL/min
Detection: UV @ 254 nm

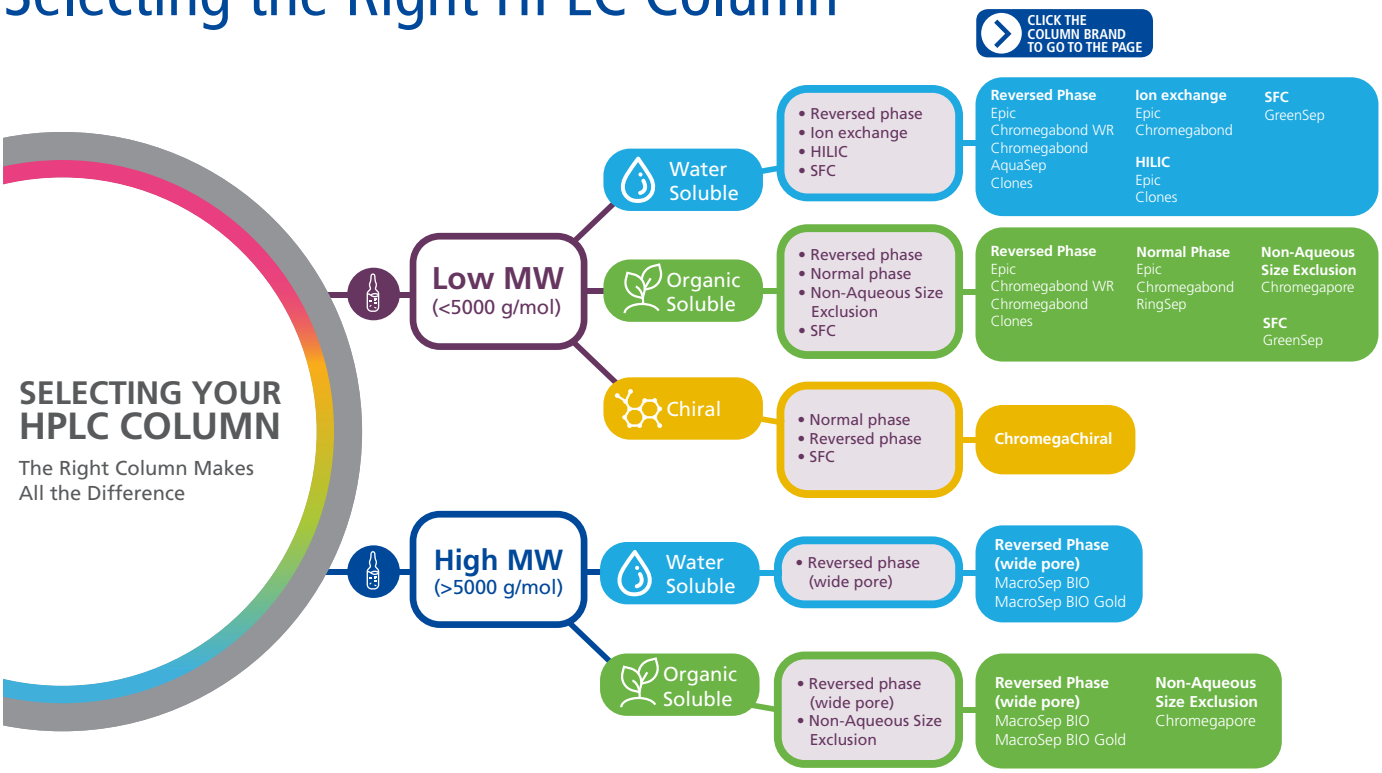
Time (min)	% Methanol (0.1% DEA)
0	12
1	12
6	17

SFC analysis of warfarin and using ChromegaChiral CCO F2, 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016.

Selecting the Right HPLC Column



Having the right stationary phase for your separation is the first step in selecting the appropriate column. This should be based on sample solubility, chemical differences among the analytes and similarity to the chemistry of the stationary phase. Selection of column type should first be considered by choosing the appropriate chromatographic separation mode; guided by the solute's molecular size and polarity. An outline of this is illustrated above for reference. For some analytes more than one technique may be appropriate.

ES Industries is now part of PerkinElmer, bringing customers new opportunities for full performance-boosting LC workflow solutions.

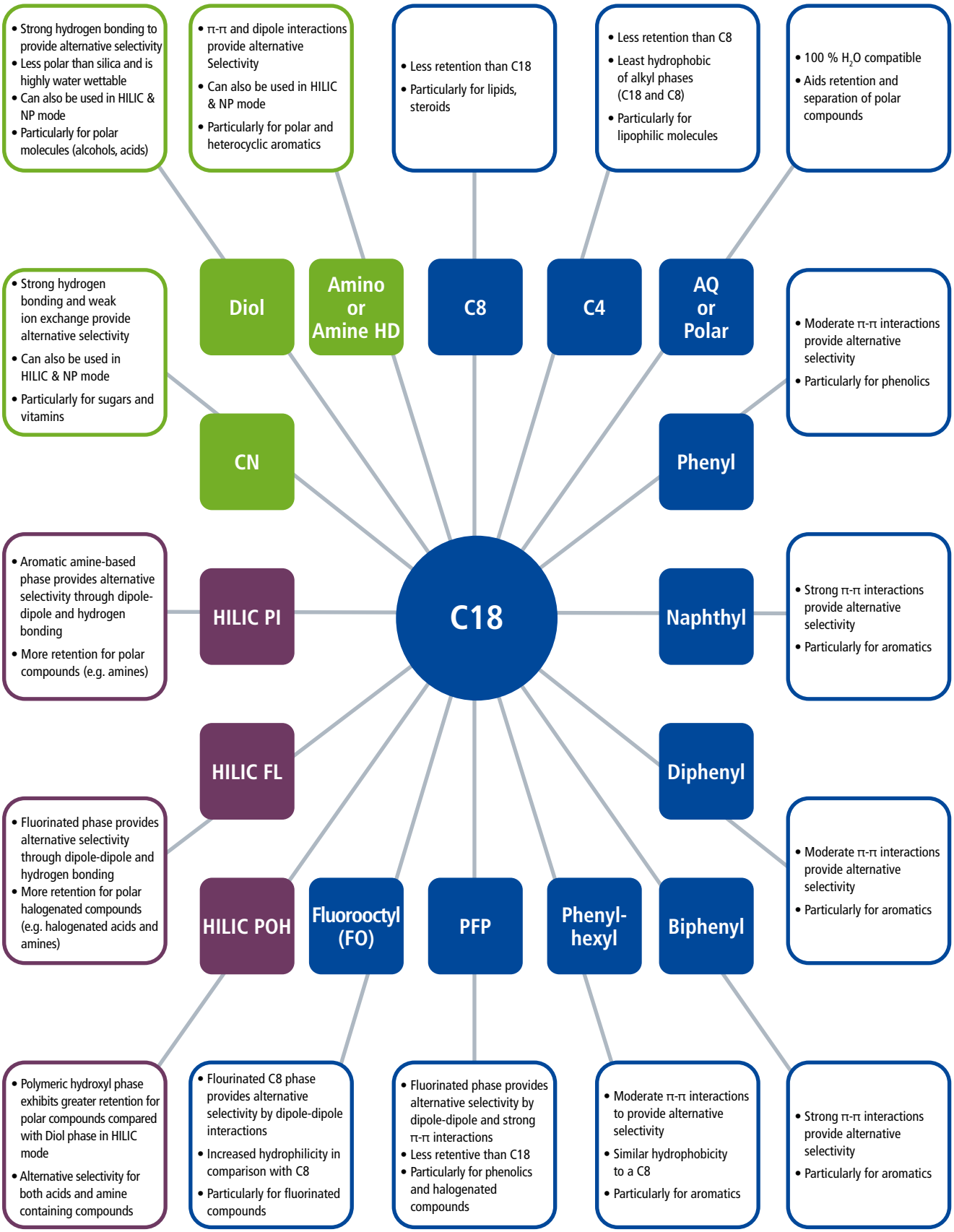
ES Industries is known for its innovative and highly efficient HPLC and supercritical fluid chromatography (SFC) column chemistries. The team has over 40 years of experience delivering columns with superior reliability, scalability, and reproducibility that are used routinely for method development processes, LC/MS analysis, quality control and preparative purification. They were the first to commercialize "AQ" chemistry (L1); now widely adopted in LC and LCMS, and first to commercialize the PFP phase (L43); now common-place in method development. The portfolio includes novel chiral and achiral fluorinated phases for pharma and environmental applications.

For technical queries regarding our columns, please contact: LCA.TechSupport@perkinelmer.com

Reversed Phase Separations

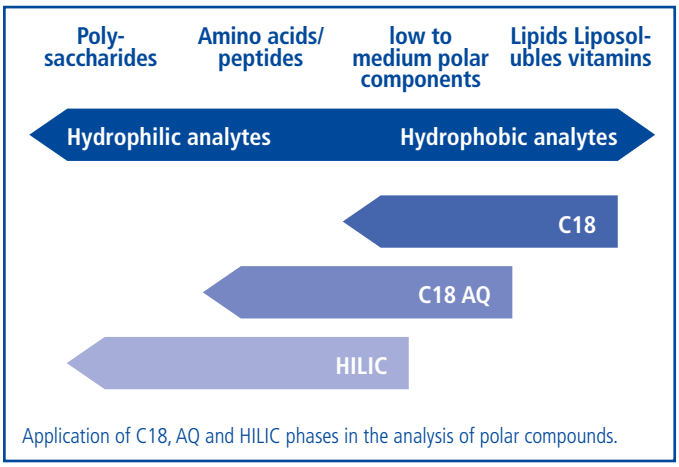
The majority of HPLC analyzes are still performed in reversed phase (RP) mode, due to the fact that the analytes of interest can be dissolved in water, or mixtures of water and a polar organic solvent such as methanol or acetonitrile. Today, there are a wealth of RP bonded phase chemistries that can be applied to your separation challenges, some of which are illustrated below. The scope of bonded phases available in RP has widened over the years and now incorporates not only the traditional C18 and C8 chemistries but includes "AQ type" columns to aid in the retention and resolution of more complex polar analytes. In addition, the development of phenyl phases, such as naphthyl, phenyl-hexyl, and penta fluoro phenyl (PFP) provide excellent aromatic selectivity. Our line of Epic HPLC columns provides a broad range of phase chemistries to facilitate alternative selectivities, through innovative bonding chemistry.

Choice in RP bonded phase chemistries for HPLC analysis

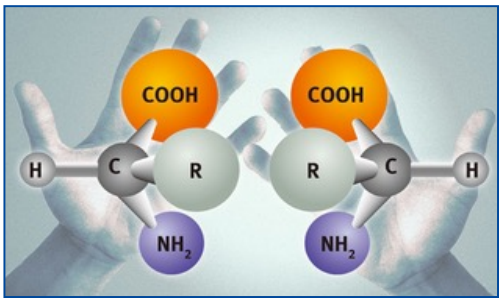


HILIC Separations

HILIC is a hybrid of normal phase (NP), reverse phase (RP) and ion chromatography techniques. The eluents of RP combined with the stationary phases of NP and charged analytes of ion chromatography yield the basis of HILIC. The mechanism of separation has been the subject of much discussion in the literature. However, it is generally agreed that a water-rich layer forms on the surface of the polar stationary phase vs. the water-deficient mobile phase, creating liquid/liquid partitioning. Moreover, the separation mechanism is more complex than partitioning alone, with dipole-dipole and electrostatic interactions also contributing to retention. The more polar compounds will have a stronger interaction with the stationary aqueous layer and are therefore retained longer than the less polar compounds. The elution order opposite to that is observed in reverse phase HPLC. Below is a useful guide for the application of C18, AQ and HILIC column phases in the analysis of polar compounds. Our line of Epic HPLC columns provides a broad range of HILIC phase chemistries to facilitate alternative selectivities for highly polar compounds. Epic HILIC POH is a new stationary phase for HILIC chromatography. It is composed of a polyhydroxylated polymer coated and bound to silica. This polymer coating enhances the behavior of the stationary phase under HILIC operating conditions. This composition provides hydroxyl levels that are well above conventional hydroxyl and diol type stationary phases.



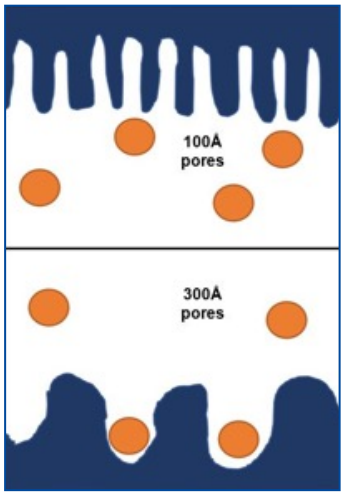
Application of C18, AQ and HILIC phases in the analysis of polar compounds.



Chiral Separations

Chirality has become critically important in the pharmaceutical, chemical, and agricultural industries. The subtle differences that make compounds chiral can produce dramatically different pharmacological effects in biological systems. As a result, the demand for stereoselective separation techniques and analytical assays to evaluate the enantiomeric purity of chiral compounds, has increased. Chiral chromatography in the forms of HPLC and SFC has become a necessary tool - not only for the analytical determination of enantiomeric purity, but also for the isolation and purification of enantiomers. As a leader in chiral separations, we offer a broad range of ChromegaChiral innovative Chiral Stationary Phases (CSPs) for your analytical and preparative chromatography needs.

Wide Pore Reverse Phase Separations



Representation of small pore particles (~ 100 Å) vs. wide pore particles (~300 Å). Smaller pores do not allow most proteins to enter the pores, which limits interaction.

RP-HPLC is an important tool in the separation of peptides and proteins. However, the use of small pore silicas (~100 Å), typically used in RP-HPLC, results in poor separations of large peptides and proteins due to their size. Larger analytes cannot enter small pores, resulting in limited interaction with only the very small exterior surface of the silica. Wide pore silicas (~ 300 Å and greater) provide much greater interaction between proteins and larger peptides, allowing them to enter the larger pores, resulting in greater resolution and enhanced peak shape. Small pore silicas can be used for separating small peptides (e.g. protein digests) as they are small enough to enter the pores. However, wide pore silicas may also be used and can result in different resolution and selectivity.

Our line of MacroSep® BIO and BIO-Gold wide pore columns provide the bioanalytical chromatographer with a superior tool for the analysis of proteins, peptides and other biomolecules.

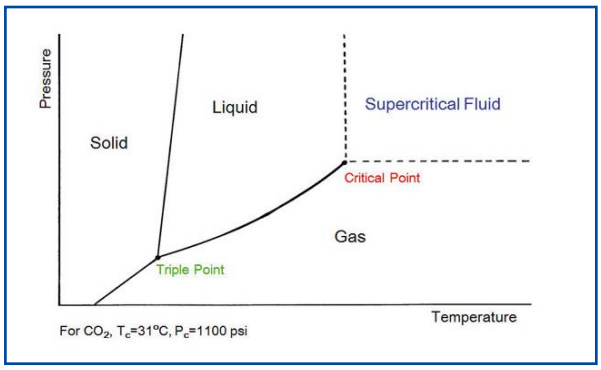
Size Exclusion Separations

Size exclusion chromatography (SEC) is a powerful technique for the separation of proteins and polymers. It separates these molecules according to their size, or hydrodynamic volume, with the largest molecules eluting first and interaction between stationary phase and analyte having minimal effect on the separation. Smaller molecules can diffuse into smaller pores, resulting in longer path lengths down the column. SEC is effective not only at separating proteins and polymers but also at characterising them, as it can effectively determine the molar mass distribution of groups of polymers. Our line of Chromegapore™ Molecular Size Exclusion (MSE) columns are available in three stationary phases, silica, Diol bonded silica and TMS bonded silica to ensure that both aqueous and organic soluble analytes can be effectively separated.

Supercritical Fluid Chromatography Separations

Supercritical fluid chromatography (SFC) is a "green" chromatographic technique where the main component of the mobile phase is CO_2 and is useful in the areas of preparative chromatography and rapid analysis chromatography for the separation of complex mixtures. The use of CO_2 based mobile phases enables the use of high-performance preparative columns (10 – 50 mm internal diameter) with a variety of particle sizes from 3 – 20 µm and results in the rapid separation and recovery for purified components. SFC is an excellent orthogonal technique to reversed-phase HPLC because of its robustness and its relationship to normal phase LC.

Many SFC separations have utilized "older normal phase HPLC types" of stationary phases such as unmodified silica, diol, amino and cyano. These phases are poorly adapted to SFC and present several limitations for SFC separation including low capacity, poor selectivity, and poor peak shape. Our line of GreenSep™ stationary phases, on the other hand, have been specifically engineered to deliver high performance SFC separations, paying close attention to bonding coverage, density and all factors leading to high capacity phases which exhibit excellent selectivity and peak shape.



Phase diagram for carbon dioxide.

Preparative Chromatography

Preparative (prep) chromatography is a powerful technique for the isolation and purification of a variety of chemicals including pharmaceutical compounds, natural products, and biological molecules. Scaling from an analytical HPLC column to a preparative separation can be a challenge. The use of an analytical column is the key step in developing any preparative HPLC separation. To develop and optimize a preparative HPLC separation a variety of analytical columns should be evaluated. The analytical column is essential in evaluating the chromatographic separation and developing a plan for scaling up to the preparative HPLC separation. Our product lines are fully scalable from analytical columns to preparative columns.

PerkinElmer LC Column Selection Overview

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
AquaSep	AQS	3, 5, 10	100	16	No	Organic acids, polar pharmaceuticals, water soluble vitamins, polar organics stable with 100% aqueous mobile phases	L7
AquaSep Prep	AQS	5, 10	100	16	No	Organic acids, polar pharmaceuticals, water soluble vitamins, polar organics stable with 100% aqueous mobile phases for preparative separations	L7
Aviator	C18	3, 5	100, 300	15.9	Yes	Equivalent to ACE C18, compatible with LC/MS mobile phases used pharmaceuticals, food and beverages, and cosmetics	L1
Chromega Z	C18	3, 5	80	12	No	Equivalent to Agilent Zorbax RX C18, pharmaceuticals, and basic chemicals	L1
Chromegabond	Amino Cyano	3, 5, 10	60, 100	–	No	A cyano and amine bonded to silica used for the analysis of petroleum products	L18
Chromegabond	C2	5, 10	60	–	No	Dimethyl group bonded to silica used for the analysis of pharmaceutical products	L16
Chromegabond	C6	3, 5	60	6	No	n-hexyl group bonded to silica used for the analysis of pharmaceutical products	L15
Chromegabond	MC18	3, 5, 10	60	18	Yes	Alternative selectivity to other C18 phases from the 60 Å silica. Analysis of pharmaceuticals, and enviromental.	L1
Chromegabond Prep	MC18	5, 10	60	18	Yes	Alternative selectivity to other C18 phases from the 60 Å silica. Preparative separation of pharmaceuticals.	L1
Chromegabond	DNAP II	5	100	–	No	Normal phase separation of petroleum for the analysis of aromatic content	–
Chromegabond	HC C18	3, 5, 7,10	100	22	Yes	Equivalent to Kromasil C18. High carbon ideal for LC/MS mobile phases used for Analysis of pharmaceuticals, and phenols	L1
Chromegabond Prep	HC C18	5, 7, 10	100	22	Yes	Equivalent to Kromasil C18. Preparative separation of pharmaceuticals and natural products	L1
Chromegabond	HC C8	3, 5, 7, 10	100	12	Yes	Equivalent to Kromasil C8. More hydrophilic than C18	L7
Chromegabond Prep	HC C8	5, 7, 10	100	12	Yes	Equivalent to Kromasil C8. Preparative separation of pharmaceuticals. More hydrophilic than C18	L7
Chromegabond	PFP/T	5	60	–	No	Analysis of natural Taxol	L43
Chromegabond	PSC C8/C18	3, 5	100	14	Yes	C8/C18 phase useful for the analysis of pharmaceuticals	L42
Chromegabond	RP-SCX/IPI	5, 10	60	–	No	An aromatic based strong cation exchanger with C8 alkyl chain used for the analysis of isonicotinic acid, pyrazinamide and isoniazid in tablets	L44
Chromegabond	Silver Silica	5	60	–	No	Analysis of alkenes in diesel fuel	–
Chromegabond Prep	Silver Silica	5	60	–	No	Preparative separation of alkenes in diesel fuel	–
Chromegabond	Ultra C18	3, 5	80	12	Yes	Equivalent to Beckman Ultra C18	L1
Chromegabond	Ultra C8	3, 5	80	8	Yes	Equivalent to Beckman Ultra C8	L7
Chromegabond WR	C18	1.8, 3, 5, 7, 10	120	16	Yes	Analysis of pharmaceuticals, environmental samples and natural products, More hydrophilic than Epic C18	L1
Chromegabond WR Prep	C18	5, 10	120	16	Yes	Preparative separation of pharmaceuticals, and natural products. More hydrophilic than Epic C18	L1
Chromegabond WR	C4	3, 5, 10	120	5	Yes	More stable with highly aqueous mobile phases than most C4 phases. Analysis of pharmaceuticals, and natural products. More hydrophilic than C8 and Epic C4-SD	L26
Chromegabond WR Prep	C4	5, 10	120	5	Yes	Preparative separation of pharmaceuticals, and natural products, pesticides. More hydrophilic than C8 and Epic C4-SD	L26
Chromegabond WR	C8	3, 5, 10	120	9	Yes	Analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides more hydrophilic than C18 and Epic C8	L7
Chromegabond WR Prep	C8	5,10	120	9	Yes	Preparative separation of pharmaceuticals, food additives, basic chemicals, natural products, pesticides. More hydrophilic than C18 and Epic C8	L7
Chromegabond WR	Cyano	3, 5,10	120	–	Yes	π-π interaction, polar interaction for the analysis of polar pharmaceuticals.	L10
Chromegabond WR	Phenyl	3, 5, 10	120	–	Yes	π-π interaction for the analysis of aromatic chemicals	L11
Chromegabond WR	Biphenyl	3, 5, 10	120	–	Yes	Strong π-π interaction for the analysis of aromatic based pharmaceuticals, flavors, natural products, and aromatic pesticides	L11
ChromegaChiral	CC2	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CC2	5, 10, 20	1000	–	No	Chiral separations, preparative	–

LC Column Selection Overview

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
ChromegaChiral	CC3	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CC3	5, 10,20	1000	–	No	Chiral separations, preparative	–
ChromegaChiral	CC4	3, 5, 10, 20	1000	–	No	First choice for chiral separations of halogenated containing compounds	–
ChromegaChiral Prep	CC4	5, 10, 20	1000	–	No	First choice for chiral separations of halogenated containing compounds, preparative	–
ChromegaChiral	CCA	3, 5, 10, 20	1000	–	No	First chioce overall for chiral separations	L51
ChromegaChiral Prep	CCA	5, 10, 20	1000	–	No	First choice overall for chiral separations, preparative	L51
ChromegaChiral	CCA F4	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CCA F4	5, 10, 20	1000	–	No	Chiral separations, preparative	–
ChromegaChiral	CCC	3, 5, 10, 20	1000	–	No	Second choice for chiral separations of halogenated containing compounds	–
ChromegaChiral Prep	CCC	5, 10, 20	1000	–	No	Second choice for chiral separations of halogenated containing compounds, preparative	–
ChromegaChiral	CCJ	3, 5, 10, 20	1000	–	No	Third choice overall for chiral separations	L80/L107
ChromegaChiral Prep	CCJ	5, 10, 20	1000	–	No	Third choice overall for chiral separations, preparative	L80/L107
ChromegaChiral	CCO	3, 5, 10, 20	1000	–	No	Second choice overall for chiral separations	L40/L93
ChromegaChiral Prep	CCO	5, 10, 20	1000	–	No	Second choice overall for chiral separations, preparative	L40/L93
ChromegaChiral	CCO F2	3, 5, 10 20	1000	–	No	Second choice for chiral separations of fluorine containing compounds	–
ChromegaChiral Prep	CCO F2	5, 10, 20	1000	–	No	Second choice for chiral separations of fluorine containing compounds, preparative	–
ChromegaChiral	CCO F4	3, 5, 10, 20	1000	–	No	First choice for chiral separations of fluorine containing compounds	–
ChromegaChiral Prep	CCO F4	5, 10, 20	1000	–	No	First choice for chiral separations of fluorine containing compounds, preparative	–
ChromegaChiral	CCO F4 T3	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CCO F4 T3	5, 10, 20	1000	–	No	Chiral separations preparative	–
ChromegaChiral	CCS	3, 5, 10, 20	1000	–	No	Fourth choice overall for chiral separations	L90
ChromegaChiral Prep	CCS	5, 10, 20	1000	–	No	Fourth choice overall for chiral separations, preparative	L90
ChromegaChiral	CCU	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CCU	5, 10, 20	1000	–	No	Chiral separations, preparative	–
ChromegaChiral	CCX	3, 5, 10, 20	1000	–	No	Chiral separations	–
ChromegaChiral Prep	CCX	5, 10, 20	1000	–	No	Chiral separations, preparative	–
Chromegapore MSE	Diol	5	60, 100, 300, 500, 1000	–	No	GPC of polymers using organic solvents	–
Chromegapore MSE	Silica	5	60, 100, 300, 500, 1000	0	No	GPC of polymers using organic solvents	–
Chromegapore MSE	TMS (C1)	5	60, 100, 300, 500, 1000	–	Yes	GPC of polymers using organic solvents	–
Chromegapore MSE Prep	TMS (C1)	5	60, 100, 300	–	Yes	GPC of polymers using organic solvents	–
Deactisil	ODS2	5, 10	150	18	Yes	Equivalent to Intertsil ODS2 for pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Deactisil	ODS3	3, 5	100	22	Yes	Equivalent to Intertsil ODS3 for pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Epic	Amine HD	1.8, 3, 5, 10	120	–	No	Can be used in normal and reversed phase, analysis of polar compounds including sugars	L8
Epic Prep	Amine HD	5, 10	120	–	No	Preparative separative of polar compounds including sugars	L8
Epic	Biphenyl	1.8, 3, 5, 10	120	25	Yes	Strong π-π interaction for the analysis of aormatic pharmaceuticals, flavor compounds, and aromatic natural products	L11
Epic Prep	Biphenyl	5, 10	120	25	Yes	Preparative separation based on strong π-π interaction used for aromatic pharmaceuticals, flavor compounds, and aromatic natural products	L11
Epic	C18	1.8, 3, 5, 10	120	18	Yes	Useful for pH 1-10. Base deactivated for the analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Epic Prep	C18	5, 10	120	18	Yes	Useful for pH 1-10. Preparative separation of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Epic	C18 Cannabinoid	3	120	18	No	Reversed phase analysis of Cannabinoids	L1

LC Column Selection Overview

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
Epic	C18 MS	1.8, 3, 5, 10	120	22	No	Optimized for the LC/MS analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Epic	C4 SD	1.8, 3, 5, 10	120	12	Yes	Analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides. More hydrophilic than C8	L26
Epic Prep	C4 SD	5, 10	120	12	Yes	Preparative separation of pharmaceuticals, food additives, basic chemicals, natural products, pesticides. More hydrophilic than C8	L26
Epic	C8	1.8, 3, 5, 10	120	10	Yes	Analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides. More hydrophilic than C18	L7
Epic Prep	C8	5, 10	120	10	Yes	Preparative separation of pharmaceuticals, food additives, basic chemicals, natural products, pesticides. More hydrophilic than C18	L7
Epic	Cyano	1.8, 3, 5, 10	120	–	No	Can be used in normal and reversed phase π-π interaction, polar interaction for the analysis of polar pharmaceuticals, and aromatic natural products	L10
Epic Prep	Cyano	5, 10	120	–	No	Can be used in normal and reversed phase. Preparative separation π-π interaction, polar interaction for polar pharmaceuticals and natural products	L10
Epic	Diol	1.8, 3, 5, 10	120	–	No	Can be used in normal and reversed phase, analysis of polar compounds	L20
Epic Prep	Diol	5, 10	120	–	No	Can be used in normal and reversed phase, preparative separation of polar compounds	L20
Epic	Diphenyl	1.8, 3, 5, 10	120	20	Yes	π-π interaction for the retention of aromatics. More hydrophilic than biphenyl or naphthyl	L11
Epic Prep	Diphenyl	5, 10	120	20	Yes	π-π interaction for the retention of aromatics for preparative separation. More hydrophilic than biphenyl or naphthyl	L11
Epic	FO LB	1.8, 3, 5, 10	120	–	Yes	Analysis of halogenated compounds including halogenated pharmaceuticals. and PFOS in environmental samplses. More hydrophilic than Alkyl C8	–
Epic Prep	FO LB	5, 10	120	–	Yes	Preparative separation of halogenated compounds including halogenated pharmaceuticals and PFOS in environmental samples. More hydrophilic than Alkyl C8	–
Epic	HILIC FL	1.8, 3, 5, 10	120	–	No	HILIC mode for the analysis of polar halogenated compounds including halogenated pharmaceuticals	–
Epic	HILIC RP	1.8, 3, 5, 10	120	–	No	HILIC mode for the analysis of samples containing non-polar and polar compounds including polar pharmaceuticals	–
Epic Prep	HILIC RP	5, 10	120	–	No	HILIC mode for the preparative separation of samples containing non-polar and polar compounds including polar pharmaceuticals	–
Epic	HILIC PI	1.8, 3, 5, 10	120	–	No	HILIC mode for the analysis of polar amine compounds including amine containing pharmaceuticals	–
Epic	HILIC POH	1.8, 3, 5, 10	120	–	No	HILIC mode for the analysis of polar compounds including polar pharmaceuticals. More deactivated than silica	–
Epic Prep	HILIC POH	5, 10	120	–	No	HILIC mode for the preparative separation of polar compounds including polar pharmaceuticals. More deactivated than silica	–
Epic	HILIC Silica	1.8, 3, 5, 10	120	0	No	HILIC mode for the analyis of polar compounds including polar pharmaceuticals	–
Epic	Naphthyl	1.8, 3, 5, 10	120	25	Yes	Strong π-π interaction when compared to biphenyl used for the analyis of neutral compounds including pharmaceuticals, food additives, and natural products	–
Epic Prep	Naphthyl	5, 10	120	25	Yes	Strong π-π interaction when compared to biphenyl used for the preparative separation of neutral compounds including pharmaceuticals, food additives and natural products	–
Epic	PFP LB	1.8, 3, 5, 10	120	–	Yes	Strong π-π interaction for the analysis of halogenated compounds including halogenated pharmaceuticals, halogenated basic chemicals, aromatic natural products, and halogenated pesticdes	L43
Epic Prep	PFP LB	5, 10	120	–	Yes	Strong π-π interaction for the preparative separation of halogenated compounds including halogenated pharmaceuticals, and aromatic natural products	L43
Epic	Phenyl	1.8, 3, 5, 10	120	16	Yes	π-π interaction for the analysis of neutral aromatic compounds. More hydrophilic than diphenyl	L11
Epic Prep	Phenyl	5, 10	120	16	Yes	π-π interaction for the preparative separation of neutral aromatic compounds. More hyophilic than diphenyl	L11
Epic	Phenyl-hexyl	1.8, 3, 5, 10	120	18	Yes	Combination of π-π and hydrophobic interaction for the analysis of neutral and aromatic compounds including pharmaceuticals	L11

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
Epic Prep	Phenyl-hexyl	5, 10	120	18	Yes	Combination of π-π and hydrophobic interaction for the preparative separation of neutral compounds including pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L11
Epic	Polar	1.8, 3, 5, 10	120	18	No	Organic acids, polar pharmaceuticals, water soluble vitamins, polar organics. Stable with 100% aqueous mobile phases	L1
Epic Prep	Polar	5, 10	120	18	No	Organic acids, polar pharmaceuticals, water soluble vitamins, polar organics. Stable with 100% aqueous mobile phases. For preparative separations	L1
Epic	Silica	1.8, 3, 5, 10	120	0	–	Can be used in normal phase analysis of polar compounds	L3
Epic Prep	Silica	5, 10	120	0	–	Can be used in normal phase preparative separation of polar compounds	L3
GreenSep	PYE4	1.8, 3, 5, 10	100	–	–	SFC of aromatic amines without mobile phase additives	–
GreenSep Prep	PYE4	5, 10	120	–	–	Preparative SFC of amines without mobile phase additives	–
GreenSep	PYE4-II	1.8, 3, 5, 10	120	–	–	SFC of aromatic amines and aromatic acids without mobile phase additives	–
GreenSep Prep	PYE4-II	5, 10	120	–	–	Preparative SFC of amines and acids without mobile phase additives	–
GreenSep	Amine	1.8, 3, 5, 10	120	–	–	SFC of polar compounds such as weak acids and amine containing compounds	–
GreenSep Prep	Amine	5, 10	120	–	–	Preparative SFC of polar compounds such as weak acids and amine containing compounds	–
GreenSep	Basic	1.8, 3, 5, 10	120	–	–	Second overall choice for the SFC of amines, amides and heterocyclic nitrogen compounds without mobile phase additives	–
GreenSep Prep	Basic	5, 10	120	–	–	Second overall choice for the preparative SFC separation of amines, amides and heterocyclic nitrogen compounds without mobile phase additives	–
GreenSep	Cyano	1.8, 3, 5, 10	120	–	–	π-π interaction, polar interaction for the SFC of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep Prep	Cyano	5, 10	120	–	–	π-π interaction, polar interaction for the preparative SFC of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep	DEAP	1.8, 3, 5, 10	120	–	–	SFC of alcohol containing compounds	–
GreenSep Prep	DEAP	5, 10	120	–	–	Preparative SFC of alcohol containing compounds	–
GreenSep	Diol	1.8, 3, 5, 10	120	–	–	Sixth overall choice for SFC separations of polar compounds such as weak acids and alcohol containing compounds	–
GreenSep Prep	Diol	5, 10	120	–	–	Sixth overall choice for the preparative SFC of polar compounds such as weak acids and alcohol containing compounds	–
GreenSep	PYE	1.8, 3, 5, 10	120	–	–	SFC of amines without mobile phase additives	–
GreenSep Prep	PYE	5, 10	120	–	–	Preparative SFC of amines without mobile phase additives	–
GreenSep	PYE-II	1.8, 3, 5, 10	120	–	–	Third overall choice SFC separation of amines and acids without mobile phase additives	–
GreenSep Prep	PYE-II	5, 10	120	–	–	Third overall choice for the preparative SFC of amines and acids without mobile phase additives	–
GreenSep	FluoroBasic	1.8, 3, 5, 10	120	–	–	SFC of amines, amides and heterocyclic nitrogen compounds containing halogenated without mobile phase additives	–
GreenSep Prep	FluoroBasic	5, 10	120	–	–	Preparative SFC of amines, amides and heterocyclic nitrogen compounds containing halogenated without mobile phase additives	–
GreenSep	Naphthyl	1.8, 3, 5, 10	120	–	–	Fifth overall choice for SFC separations with a strong π-π interaction useful for the separation of neutral compounds including pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep Prep	Naphthyl	5, 10	120	–	–	Fifth overall choice for preparative SFC separations with a strong π-π interaction useful for the separation of neutral compounds including pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep	Nitro	1.8, 3, 5, 10	120	–	–	Fourth overall choice for the SFC separation of geometrical aromatic isomers, and diastereomers	–
GreenSep Prep	Nitro	5, 10	120	–	–	Fourth overall choice for the preparative SFC separation of geometrical aromatic isomers, and diastereomers	–
GreenSep	NP-10	5, 10	–	–	–	Optimized for the SFC separation of cannabinoids, especially for the enhanced separation of THC and THCV	–
GreenSep Prep	NP-10	5, 10	–	–	–	Optimized for the preparative SFC separation of cannabinoids, especially for the enhanced separation of THC and THCV	–

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
GreenSep	NP-9	5, 10	–	–	–	Optimized for the SFC separation of cannabinoids especially for the separation of THC and CBD	–
GreenSep Prep	NP-9	5, 10	–	–	–	Optimized for the preparative SFC separation of cannabinoids especially for the separation of THC and CBD	–
GreenSep	NP-II	5, 10	–	–	–	Optimized for the SFC separation of cannabinoids especially for the separation of THC and THCV	–
GreenSep Prep	NP-II	5, 10	–	–	–	Optimized for the preparative SFC separation of cannabinoids especially for the separation of THC and THCV	–
GreenSep	NP-III	5, 10	–	–	–	Optimized for the SFC separation of cannabinoids especially for the separation of THCA and CBDA	–
GreenSep Prep	NP-III	5, 10	–	–	–	Optimized for the preparative SFC separation of cannabinoids especially for the separation of THCA and CBDA	–
GreenSep	PFP	1.8, 3, 5, 10	120	–	–	Strong π-π interaction for the SFC separation of halogenated compounds including pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep Prep	PFP	5, 10	120	–	–	Strong π-π interaction for the preparative SFC separation of halogenated compounds including pharmaceuticals, food additives, basic chemicals, natural products, pesticides	–
GreenSep	Pyridyl Amide	1.8, 3, 5, 10	120	–	–	First overall choice SFC separations in general particularly useful for alcohols, amides and hetercyclic nitrogen compounds without mobile phase additives	–
GreenSep Prep	Pyridyl Amide	5, 10	120	–	–	First overall choice SFC preparative separations in general particularly useful for alcohols, amides and hetercyclic nitrogen compounds without mobile phase additives	–
GreenSep	Silica	1.8, 3, 5, 10	120	–	–	SFC of diasteromeric polar compounds such as weak acids and alcohol containing compounds	–
GreenSep Prep	Silica	5, 10	120	–	–	Preparative SFC of diasteromeric polar compounds such as weak acids and alcohol containing compounds	–
Harmony	C18	3.5, 5, 10	100, 300	19	Yes	Equivalent to Waters Symmetry, pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
HarmonySecure	RP18	3.5, 5	100	–	Yes	Equivalent to Waters SymmetryShield, pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
HyperSelect	BDS C18	3, 5	120	15	Yes	Equivalent to Thermo Hypersil BDS C18, pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
HyperSelect	ODS (C18)	3, 5, 10	120	15	Yes	Equivalent to Thermo Hypersil ODS, pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
HyperSelect	ODS2	3, 5	80, 120	12	Yes	Equivalent to Thermo Hypersil ODS2, pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
MacroSep BIO	AQS	3, 5, 10	300	3	No	Biological samples such peptides and protein greater than 5000 molecular weight, stable with 100% aqueous mobile phases	L7
MacroSep BIO Prep	AQS	5, 10	300	3	No	Biological samples such peptides and protein greater than 5000 molecular weight, stable with 100% aqueous mobile phases, for preparative separations	L7
MacroSep BIO	C18	3, 5, 10	300	6	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight stable, most hydrophbic	L1
MacroSep BIO Prep	C18	5, 10	300	6	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight stable, most hydrophbic, for preparative separations	L1
MacroSep BIO	C4	3, 5, 10	300	1.5	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight less hydrophic than C8, high bonding density	L26
MacroSep BIO Prep	C4	5, 10	300	1.5	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight for preparative separations less hydrophic than C8, high bonding density	L26
MacroSep BIO	C8	3, 5, 10	300	3	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight less hydrophic than C18	L7
MacroSep BIO Prep	C8	5, 10	300	3	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight for preparative separations less hydrophic than C18	L7
MacroSep BIO	Cyano	3, 5, 10	300	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight π-π interaction	L10
MacroSep BIO	HPR	3, 5, 10	300	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight with lipophilic character for preparative separations	–

LC Column Selection Overview

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
MacroSep BIO Prep	HPR	5, 10	300	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight with lipophilic character for preparative separations	–
MacroSep BIO-Gold	Biphenyl	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction	L11
MacroSep BIO-Gold Prep	Biphenyl	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction for preparative separations	L11
MacroSep BIO-Gold	C18	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight stable, most hydrophobic	L1
MacroSep BIO-Gold Prep	C18	5, 10	400, 1200	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight stable, most hydrophobic, for preparative separations	L1
MacroSep BIO-Gold	C4	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight for less hydrophobic than C8, high bonding density	L26
MacroSep BIO-Gold Prep	C4	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight for preparative separations less hydrophobic than C8, high bonding density	L26
MacroSep BIO-Gold	C8	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight less hydrophic than C18	L7
MacroSep BIO-Gold Prep	C8	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight for preparative separations less hydrophic than C18	L7
MacroSep BIO-Gold	Diphenyl	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with π-π interaction	L11
MacroSep BIO-Gold Prep	Diphenyl	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with π-π interaction for preparative separations	L11
MacroSep BIO-Gold	HPR	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight with lipophlic character for analysis	–
MacroSep BIO-Gold Prep	HPR	5, 10	400, 1200	–	Yes	Biological samples such peptides and proteins greater than 5000 molecular weight with lipophilc character for preparative separations	–
MacroSep BIO-Gold	Naphthyl	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction	–
MacroSep BIO-Gold Prep	Naphthyl	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction for preparative separations	–
MacroSep BIO-Gold	PFP	1.9, 3, 5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction and halogen containing compounds	L43
MacroSep BIO-Gold Prep	PFP	5, 10	400, 1200	–	Yes	Biological samples such as peptides and proteins greater than 5000 molecular weight with strong π-π interaction and halogen containing compounds for preparative separations	L43
Micropak	C18	5, 10	125	10	Yes	Equivalent to Waters ubondapak C18. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Neptune	dC18	3, 5	100	12	Yes	Equivalent to Waters Atlantis dC18. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Partisep	ODS3	5, 10	85	18	Yes	Equivalent to Whatman Partisil ODS3. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
RingSep	Nitro aromatic	5, 10	60	–	No	Aromatic ring class analysis of petroleum	-
RingSep Prep	Nitro aromatic	5, 10	60	–	No	Aromatic ring class preparative separation of petroleum	–
Sonoma	C18(2)	3, 5, 10, 15	100	17.5	Yes	Equivalent to Phenomenex Luna C18/2 for the analysis of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Sonoma Prep	C18(2)	3, 5, 10, 15	100	17.5	Yes	Equivalent to Phenomenex Luna C18/2 for the preparative separation of pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Spherisep	ODS1	3, 5, 10	80	6	No	Equivalent to Waters Spherisorb ODS1. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
Spherisep	ODS2	3, 5, 10	80	12	yes	Equivalent to Waters Spherisorb ODS2. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
StarRise	C18	2.5, 3.5, 5, 10	100	16	Yes	Equivalent to Waters Sunfire C18. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1
StarRise Prep	C18	3.5, 5, 10	100	16	Yes	Equivalent to Waters Sunfire C18. Pharmaceuticals, food additives, basic chemicals, natural products, pesticides	L1

* Maximum pressure 9,000 psi for all columns. All particle sizes are 2.7 µm. **Not end-capped. All others end-capped.

USP Column Listing

USP L1

Octadecyl silane chemically bonded to porous or non-porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic rod.

Brand	Particle Size (µm)
Aviator C18	3, 5
Chromega Z C18	3, 5
Chromegabond MC18	3, 5, 10
Chromegabond HC C18	3, 5, 7, 10
Chromegabond HC C18 Prep	5, 10
Chromegabond Ultra C18	3, 5
Chromegabond WR C18	1.8, 3, 5, 7, 10
Chromegabond WR C18 Prep	5, 10
Deactisil ODS2	5, 10
Deactisil ODS3	3, 5
Epic C18	1.8, 3, 5, 10
Epic C18 Prep	5, 10
Epic C18 Cannabinoid	3
Epic C18 MS	1.8, 3, 5, 10
Epic Polar	1.8, 3, 5, 10
Epic Polar Prep	5, 10
Harmony C18	3.5, 5, 10
HarmonySecure RP18	3.5, 5
HyperSelect BDS C18	3, 5
HyperSelect ODS (C18)	3, 5, 10
HyperSelect ODS2	3, 5
MacroSep BIO C18	3, 5, 10
MacroSep BIO C18 Prep	5, 10
MacroSep BIO-Gold C18	1.9, 3, 5, 10
MacroSep BIO-Gold C18 Prep	5, 10
Micropak C18	5,10
Neptune dC18	3, 5
Partisep ODS3	5, 10
Sonoma C18(2)	3, 5, 10, 15
Sonoma C18(2) Prep	3, 5, 10, 15
Spherisep ODS1	3, 5, 10
Spherisep ODS2	3, 5, 10
StarRise C18	2.5, 3.5, 5, 10
StarRise C18 Prep	3.5, 5, 10

USP L3

Porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
Epic Silica	1.8, 3, 5, 10
Epic Silica Prep	5, 10
Epic HILIC Silica	1.8, 3, 5, 10

USP L7

Octylsilane chemically bonded to totally or superficially porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
AquaSep AQS	3, 5, 10
AquaSep AQS Prep	5, 10
Chromegabond HC C8	3, 5, 7, 10
Chromegabond HC C8 Prep	5, 10
Chromegabond Ultra C8	3, 5
Chromegabond WR C8	3, 5, 10
Chromegabond WR C8 Prep	5, 10
Epic C8	1.8, 3, 5, 10
Epic C8 Prep	5, 10
MacroSep BIO AQS	3, 5, 10
MacroSep BIO AQS Prep	5, 10
MacroSep BIO C8	3, 5, 10
MacroSep BIO C8 Prep	5, 10
MacroSep BIO-Gold C8	1.9, 3, 5, 10
MacroSep BIO-Gold C8 Prep	5, 10

USP L8

An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
Epic Amine HD	1.8, 3, 5, 10
Epic Amine HD Prep	5, 10

USP L10

Nitrile groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
Chromegabond WR Cyano	3, 5, 10
Epic Cyano	1.8, 3, 5, 10
Epic Cyano Prep	5, 10
MacroSep BIO Cyano	3, 5, 10

USP L11

Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
Chromegabond WR Phenyl	3, 5, 10
Chromegabond WR Biphenyl	3, 5, 10
Epic Biphenyl	1.8, 3, 5, 10
Epic Biphenyl Prep	5, 10
Epic Diphenyl	1.8, 3, 5, 10
Epic Diphenyl Prep	5, 10
Epic Phenyl	1.8, 3, 5, 10
Epic Phenyl Prep	5, 10
Epic Phenyl-hexyl	1.8, 3, 5, 10
Epic Phenyl-hexyl Prep	5, 10
MacroSep BIO-Gold Biphenyl	1.9, 3, 5, 10
MacroSep BIO-Gold Biphenyl Prep	5, 10
MacroSep BIO-Gold Diphenyl	1.9, 3, 5, 10
MacroSep BIO-Gold Diphenyl Prep	5, 10

USP L15

Hexylsilane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.

Brand	Particle Size (µm)
Chromegabond C6	3, 5

USP L16

Dimethylsilane chemically bonded to porous silica particles, 5 to 10 µm in diameter.

Brand	Particle Size (µm)
Chromegabond C2	5, 10

USP L18

Amino and cyano groups chemically bonded to porous silica particles, 3 to 10 µ in diameter.

Brand	Particle Size (µm)
Chromegabond Amino Cyano	3, 5, 10

USP L20

Dihydroxypropane groups chemically bonded to porous silica or hybrid particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.

Brand	Particle Size (µm)
Epic Diol	1.8, 3, 5, 10
Epic Diol Prep	5, 10

USP L26

Butyl silane chemically bonded to totally porous or superficially porous silica particles, 1.5 to 10 µm in diameter.

Brand	Particle Size (µm)
Chromegabond WR C4	3, 5, 10
Chromegabond WR C4 Prep	5, 10
Epic C4 SD	1.8, 3, 5, 10
Epic C4 SD Prep	5, 10
Epic Diol	1.8, 3, 5, 10
Epic Diol Prep	5, 10
MacroSep BIO C4	3, 5, 10
MacroSep BIO C4 Prep	5, 10
MacroSep BIO-Gold C4	1.9, 3, 5, 10
MacroSep BIO-Gold C4 Prep	5, 10

USP L40

Cellulose tris-3,5-dimethylphenylcarbamate coated porous silica particles, 3 µm to 20 µm in diameter.

Brand	Particle Size (µm)
ChromegaChiral CCO	3, 5, 10, 20
ChromegaChiral CCO Prep	5, 10, 20

USP L42

Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5 µm in diameter.

Brand	Particle Size (µm)
Chromegabond PSC C8/C18	3, 5

USP L43

Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 1.5 to 10 µm in diameter.

Brand	Particle Size (µm)
Chromegabond PFP/T	5
Epic PFP LB	1.8, 3, 5, 10
Epic PFP LB Prep	5, 10
MacroSep BIO-Gold PFP	1.9, 3, 5,10
MacroSep BIO-Gold PFP Prep	5, 10

USP L44

A multifunctional support, which consists of a high purity, 60 Å, spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a convention reversed phase C8 functionality.

Brand	Particle Size (µm)
Chromegabond RP-SCX/IPI	5, 10

USP L51

Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 3 to 10 µm in diameter.

Brand	Particle Size (µm)
ChromegaChiral CCA	3, 5, 10, 20
ChromegaChiral CCA Prep	5, 10, 20

USP L80

Cellulose tris(4-methylbenzoate) – coated, porous, spherical, silica particles, 5 to 20 µ in diameter.

Brand	Particle Size (µm)
ChromegaChiral CCJ	3, 5, 10, 20
ChromegaChiral CCJ Prep	5, 10, 20

USP L90

Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter.

Brand	Particle Size (µm)
ChromegaChiral CCS	3, 5, 10, 20
ChromegaChiral CCS Prep	5, 10, 20

USP L93

Cellulose tris (3,5-dimethylphenylcarbamate) reverse phase chiral stationary phase coated on 3 or 5 µm silica gel particles.

Brand	Particle Size (µm)
ChromegaChiral CCO	3, 5, 10, 20
ChromegaChiral CCO Prep	5, 10, 20

USP L107

Cellulose tris (4-methylbenzoate) – coated porous spherical particles, 3 to 5 µm in diameter, for use with reverse phase mobile phases.

Brand	Particle Size (µm)
ChromegaChiral CCJ	3, 5, 10, 20
ChromegaChiral CCJ Prep	5, 10, 20

LC Guard Column Cartridges

Guard column cartridges offer excellent protection for your analytical column. Adding a guard column to your HPLC system extends the life of your analytical column (up to 400%). Placed between the injector and the analytical column, the guard column traps components that would otherwise irreversibly contaminate the stationary phase of the analytical column. Guard columns also buffer against the effects of aggressive mobile phases.

Guard column cartridge packing should exactly match the analytical column. They add capacity to your system and ensure no adverse chemical influence on sensitive separations. Using a guard column packed with a stationary phase different from that in the analytical column will provide selective elimination of specific compounds.

Our guard column cartridges are packed by a high performance slurry method and will not reduce system performance. They are easy to use and can be changed in seconds. Guard cartridges are available in all phase chemistries, and are available in analytical, semi-prep and preparative sizes.

Guard Cartridge Holders

Description	For use with	Part No.
Analytical Guard Cartridge Holder with Integrated Coupler (Pkg. 1)	500101-XXX and 500103-XXX Analytical Guard Column Cartridges	**ES500100**
Semi-Preparative Guard Cartridge Holder (Pkg. 1)*	300121-XXX Semi-Preparative Guard Column Cartridge	**300120**
Preparative Guard Cartridge Holder (Pkg. 1)*	300141-XXX Preparative Guard Column Cartridge	**300140**

*Separate coupler assembly required, see table below.

Guard Cartridge Holder Column Couplers

Column couplers are required for the semi-preparative (P/N: **300120**) and preparative (P/N: **300140**) guard cartridge holders. The analytical guard cartridge holder comes with an integrated coupler.

Description	For use with	Part No.
Stainless steel high pressure pre-column/column coupler assembly, 5cm x 0.005" x 1/16" (Red Band)	3-10 mm ID HPLC and SFC column/guard	**300107**
Stainless Steel High Pressure Pre-Column/Column Coupler Assembly, 5cm x 0.007" x 1/16" (Black Band)	20 mm ID HPLC and SFC column/guard	**300108**
Stainless Steel High Pressure Pre-Column/Column Coupler Assembly, 5cm x 0.010" x 1/16" (Blue Band)	30 mm ID HPLC and SFC column/guard	**300109**
Stainless Steel High Pressure Pre-Column/Column Coupler Assembly, 5cm x 0.010" x 1/16" (Yellow Band)	50 mm ID HPLC and SFC column/guard	**300110**

Guard Cartridges

Description	For use with	Part No.
Analytical Guard Column Cartridges, 10 mm x 3.0 mm, Pkg. 5	4.0mmID and 4.6mmID standard-bore analytical columns Requires Holder (Part No. **ES500100**) for use	**500101-XXX (XXX - please specify packing material)**
Analytical Guard Column Cartridges, 10 mm x 2.0 mm, Pkg. 5	2.1mmID and 3.0mmID small-bore analytical columns Requires Holder (Part No. **ES500100**) for use	**500103-XXX (XXX - please specify packing material)**
Semi-Preparative Guard Column Cartridges, 10 mm x 10 mm, Pkg. 3	10mmID & 20mmID semi-preparative columns Requires Holder (Part No. **300120**) for use	**300121-XXX (XXX - please specify packing material)**
Preparative Guard Cartridges, 10 mm x 20 mm, Pkg. 3	30mmID and 50mmID preparative columns Requires Holder (Part No. **300140**) for use	**300141-XXX (XXX - please specify packing material)**

ChromegaChiral Chiral LC Columns

Chirality has become critically important in the pharmaceutical, chemical, and agricultural industries. The subtle differences that make compounds chiral can produce dramatically different pharmacological effects in biological systems. As a result, the demand for stereoselective separation techniques and analytical assays to evaluate the enantiomeric purity of chiral compounds, has increased. Chiral chromatography in the forms of HPLC and SFC has become a necessary tool - not only for the analytical determination of enantiomeric purity, but also for the isolation and purification of enantiomers.

As a leader in chiral separations we are able to offer you a broad range of ChromegaChiral™ Chiral Stationary Phases (CSPs) for your analytical and preparative chromatography needs. Existing chiral stationary phases can separate a wide variety of chiral mixtures, however there are still enantiomeric mixtures that are difficult to separate limiting their characterization. This provides our drive to develop new CSPs with differing chiral selectivities.

Features and Benefits

- Excellent selectivity range to enhance method development
- Superior resolution and efficiency
- High pressure limit for increased flexibility
- Fast optimization for increased throughput
- One column for both SFC and HPLC use

ChromegaChiral column selection process examples based on brand and sample type.

CHIRALPAK® AD	Use ChromegaChiral CCA
CHIRALCEL® OD	Use ChromegaChiral CCO
CHIRALCEL OZ-H	Use ChromegaChiral CC4
CHIRALCEL OJ-H	Use ChromegaChiral CCJ
CHIRALPAK AS-H	Use ChromegaChiral CCS
CHIRALPAK AY-H	Use ChromegaChiral CC3
Are compounds flourine rich?	Use ChromegaChiral CCA F4 or CCO F4
Can't separate isomers?	Use ChromegaChiral CCC

Note: CHIRALPAK and CHIRALCEL are registered trademarks of Daicel Corporation

Material Characteristics

Brand*	Phase	Chiral Selector	Amylose/Cellulose Base	Particle Size (µm)	Pore Size (Å)	USP Code
ChromegaChiral	CC2	Tris(3-chloro-4 methylphenylcarbamate)	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CC3	Tris(5-chloro-2-methylphenylcarbamate)	Amylose	3, 5, 10, 20	1000	–
ChromegaChiral	CC4	Tris(4-chloro-3-methylphenylcarbamate)	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CCA	Tris-(3,5-di-methylphenyl) carbamate	Amylose	3, 5, 10, 20	1000	L51
ChromegaChiral	CCA F4	Tris(4-Fluoro 3-methylphenylcarbamate)	Amylose	3, 5, 10, 20	1000	–
ChromegaChiral	CCC	3-chloro-4 methylphenylcarbamate and 3,5-dichlorophenylcarbamate	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CCJ	Tris(4-methylbenzoate)	Cellulose	3, 5, 10, 20	1000	L80/L107
ChromegaChiral	CCO	Tris-(3,5-dimethylphenyl) carbamate	Cellulose	3, 5, 10, 20	1000	L40/L93
ChromegaChiral	CCO F2	Tris(2-Fluoro 5-methylphenylcarbamate)	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CCO F4	Tris(4-Fluoro 3-methylphenylcarbamate)	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CCO F4 T3	Tris(4-Fluoro-3-(trifluoromethylphenylcarbamate)	Cellulose	3, 5, 10, 20	1000	–
ChromegaChiral	CCS	Tris [(S)-α-methylbenzylcarbamate]	Amylose	3, 5, 10, 20	1000	L90
ChromegaChiral	CCU	Methylbenzylcarbamate and 3-chloro-4 methylphenylcarbamate	Amylose	3, 5, 10, 20	1000	–
ChromegaChiral	CCX	Methylbenzylcarbamate and 3,5-dimethylphenylcarbamate	Amylose	3, 5, 10, 20	1000	–

*Preparative columns of these phases are also available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

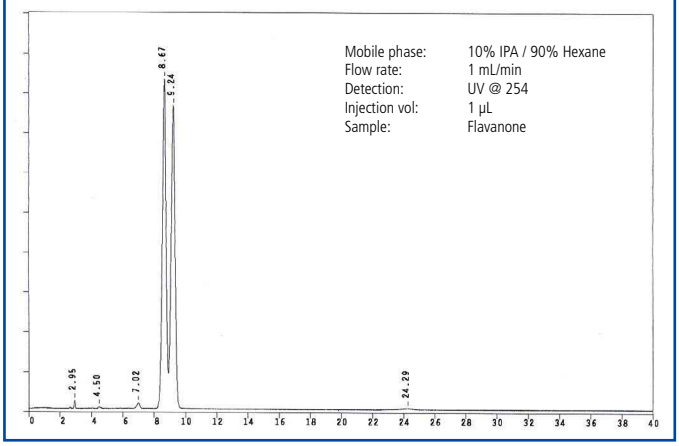
ChromegaChiral CC2

A modified cellulose including 3-chloro-4 methylphenylcarbamate bonding groups coated on high purity, high performance spherical silica particles. This combination of bonded groups stabilizes the solubility of coated phase making for a durable phase similar to other widely used coated phases and provides for similar separation behaviour to Phenomenex Lux® Cellulose-2.

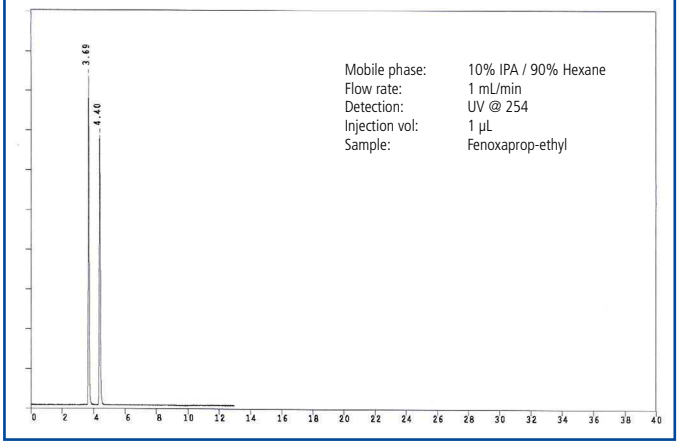
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CC2	100	2.1	3	**122151-CC2**
ChromegaChiral CC2	100	3.0	3	**123151-CC2**
ChromegaChiral CC2	100	3.0	5	**123251-CC2**
ChromegaChiral CC2	100	4.6	3	**125151-CC2**
ChromegaChiral CC2	100	4.6	5	**125251-CC2**
ChromegaChiral CC2	150	3.0	3	**133151-CC2**
ChromegaChiral CC2	150	3.0	5	**133251-CC2**
ChromegaChiral CC2	150	4.6	3	**135151-CC2**
ChromegaChiral CC2	150	4.6	5	**135251-CC2**
ChromegaChiral CC2	250	4.6	5	**155251-CC2**
ChromegaChiral CC2 Prep	150	20	5	**138251-CC2**
ChromegaChiral CC2 Prep	150	30	5	**13N251-CC2**
ChromegaChiral CC2 Prep	250	30	5	**158251-CC2**
ChromegaChiral CC2 Prep	250	30	5	**15N251-CC2**
ChromegaChiral CC2 Prep	250	50	5	**15F251-CC2**
ChromegaChiral CC2 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CC2**
ChromegaChiral CC2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CC2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

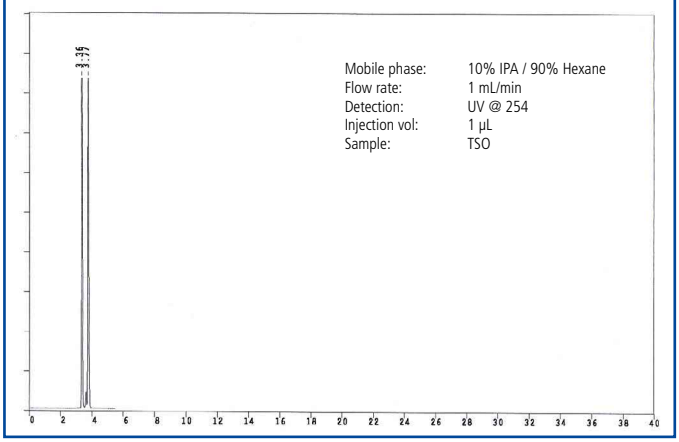
HPLC analysis of flavanone using ChromegaChiral CC2, 250 mm x 4.6 mm, 5 µm.



HPLC analysis of fenoxaprop-ethyl using ChromegaChiral CC2, 250 mm x 4.6 mm, 5 µm.



HPLC analysis of TSO using ChromegaChiral CC2, 250 mm x 4.6 mm, 5 µm.



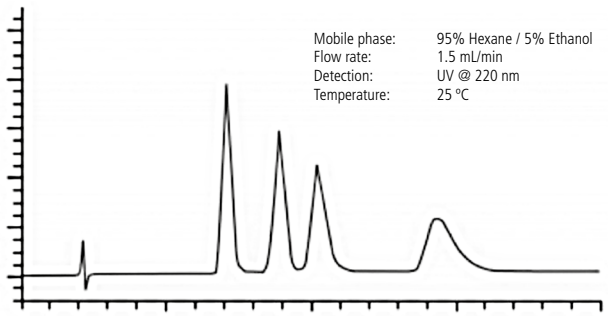
ChromegaChiral CC3

ChromegaChiral CC3 (amylose tris(5-chloro-2-methylphenylcarbamate)) is for high resolution chiral separations based on a new halogenated carbohydrate based chiral stationary phase. Similar in selectivity to CHIRALPAK® AY-H. ChromegaChiral CC3 can provide superior chiral separations, sample loading and superior peak shape performance.

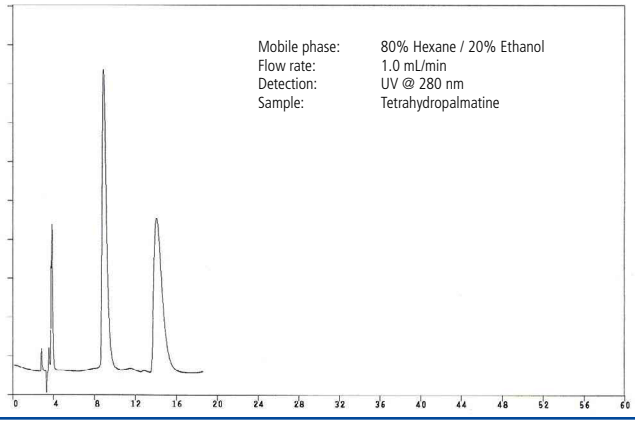
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CC3	100	3.0	3	**123151-CC3**
ChromegaChiral CC3	100	3.0	5	**123251-CC3**
ChromegaChiral CC3	100	4.6	3	**125151-CC3**
ChromegaChiral CC3	100	4.6	5	**125251-CC3**
ChromegaChiral CC3	150	3.0	3	**133151-CC3**
ChromegaChiral CC3	150	3.0	5	**133251-CC3**
ChromegaChiral CC3	150	4.6	3	**135151-CC3**
ChromegaChiral CC3	150	4.6	5	**135251-CC3**
ChromegaChiral CC3	250	4.6	10	**155351-CC3**
ChromegaChiral CC3	250	4.6	5	**155251-CC3**
ChromegaChiral CC3 Prep	150	20	5	**138251-CC3**
ChromegaChiral CC3 Prep	150	30	5	**13N251-CC3**
ChromegaChiral CC3 Prep	250	20	5	**158251-CC3**
ChromegaChiral CC3 Prep	250	30	5	**15N251-CC3**
ChromegaChiral CC3 Prep	250	50	5	**15F251-CC3**
ChromegaChiral CC3 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CC3**
ChromegaChiral CC3 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CC3**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

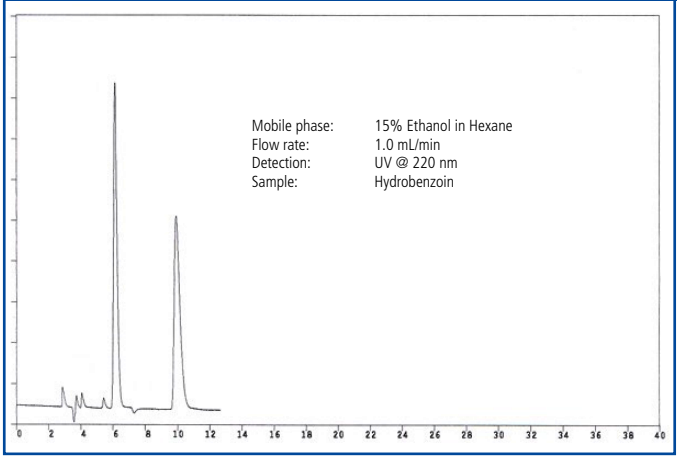
HPLC analysis of cyclandelate using ChromegaChiral CC3.



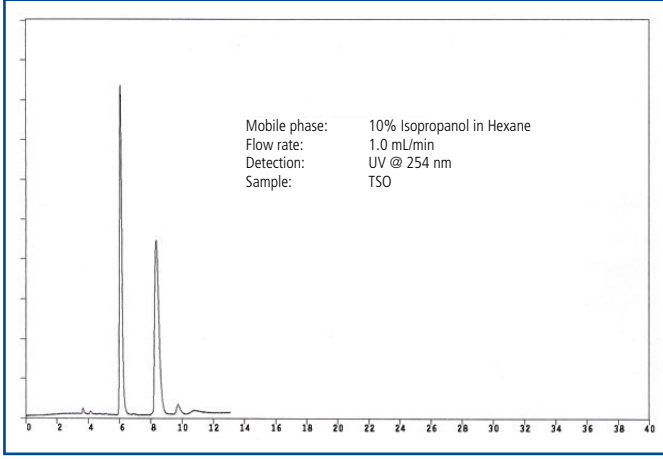
HPLC analysis of tetrahydropalmatine using ChromegaChiral CC3, 250 x 4.6 mm, 5 µm.



HPLC analysis of hydrobenzoin using ChromegaChiral CC3, 250 x 4.6 mm, 5 µm.



HPLC analysis of TSO using ChromegaChiral CC3, 250 x 4.6 mm, 5 µm.



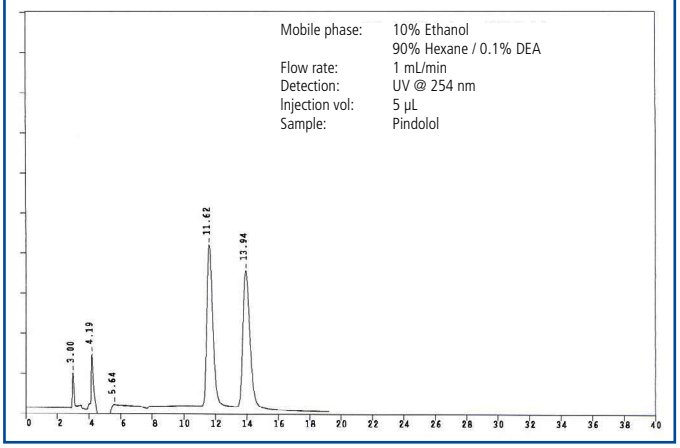
ChromegaChiral CC4

ChromegaChiral CC4 (cellulose tris(4-chloro-3-methylphenylcarbamate)) is another new product for high resolution chiral separations based on a new halogenated carbohydrate based chiral stationary phase. It is a modified cellulose coated on high purity, high performance spherical silica particles. The chemical modification includes the chemical bonding of 4-chloro-3 methylphenylcarbamate to cellulose. The use of cellulose modified with chlorinated phenyl groups provides a separation opportunity for many previously unresolved and poorly resolved chiral mixtures. Similar in selectivity to CHIRALCEL® OZ-H.

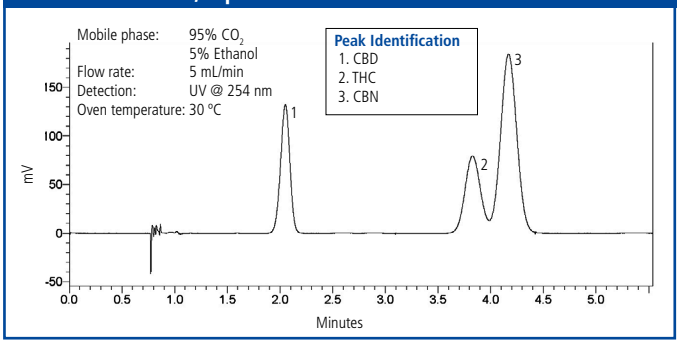
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CC4	50	4.6	3	**115151-CC4**
ChromegaChiral CC4	50	4.6	5	**115251-CC4**
ChromegaChiral CC4	100	2.1	3	**122151-CC4**
ChromegaChiral CC4	100	3.0	3	**123151-CC4**
ChromegaChiral CC4	100	3.0	5	**123251-CC4**
ChromegaChiral CC4	100	4.6	3	**125151-CC4**
ChromegaChiral CC4	100	4.6	5	**125251-CC4**
ChromegaChiral CC4	150	3.0	3	**133151-CC4**
ChromegaChiral CC4	150	3.0	5	**133251-CC4**
ChromegaChiral CC4	150	4.6	3	**135151-CC4**
ChromegaChiral CC4	150	4.6	5	**135251-CC4**
ChromegaChiral CC4	250	4.6	10	**155351-CC4**
ChromegaChiral CC4	250	4.6	5	**155251-CC4**
ChromegaChiral CC4 Prep	150	20	5	**138251-CC4**
ChromegaChiral CC4 Prep	150	30	5	**13N251-CC4**
ChromegaChiral CC4 Prep	250	10	5	**157251-CC4**
ChromegaChiral CC4 Prep	250	20	5	**158251-CC4**
ChromegaChiral CC4 Prep	250	30	10	**15N351-CC4**
ChromegaChiral CC4 Prep	250	30	5	**15N251-CC4**
ChromegaChiral CC4 Prep	250	50	5	**15F251-CC4**
ChromegaChiral CC4 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CC4**
ChromegaChiral CC4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CC4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

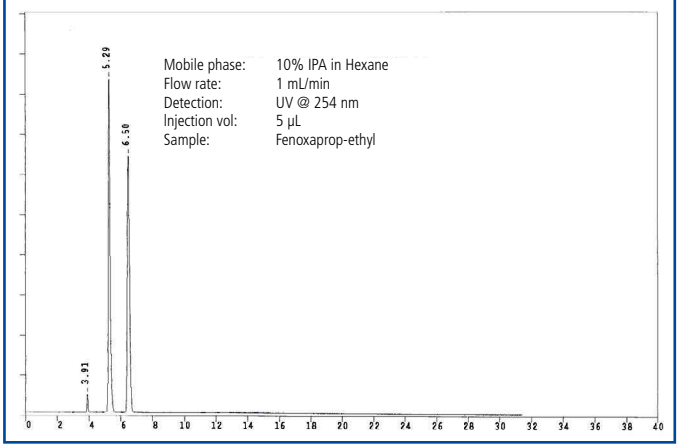
HPLC analysis of pindalol using ChromegaChiral CC4, 250 mm x 4.6 mm, 5 µm.



SFC analysis of cannabinoids using ChromegaChiral CC4, 250 mm x 4.6 mm, 5 µm.



HPLC analysis of fenoxaprop-ethyl using ChromegaChiral CC4, 250 mm x 4.6 mm, 5 µm.



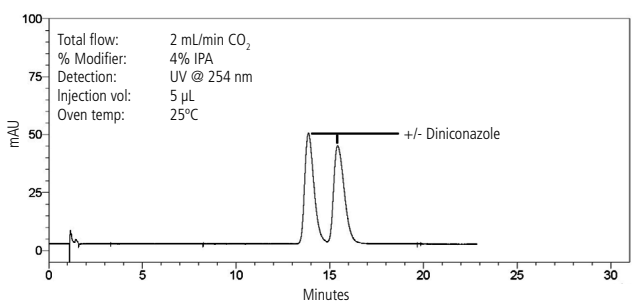
ChromegaChiral CCA

A polysaccharide coated chiral stationary phase and columns which are produced using a unique production process of coating the proven chiral selector, tris-(3,5-di-methylphenyl) carbamate amylose on high purity silica gel. ChromegaChiral CCA columns, similar in selectivity to ChiralPak® AD.

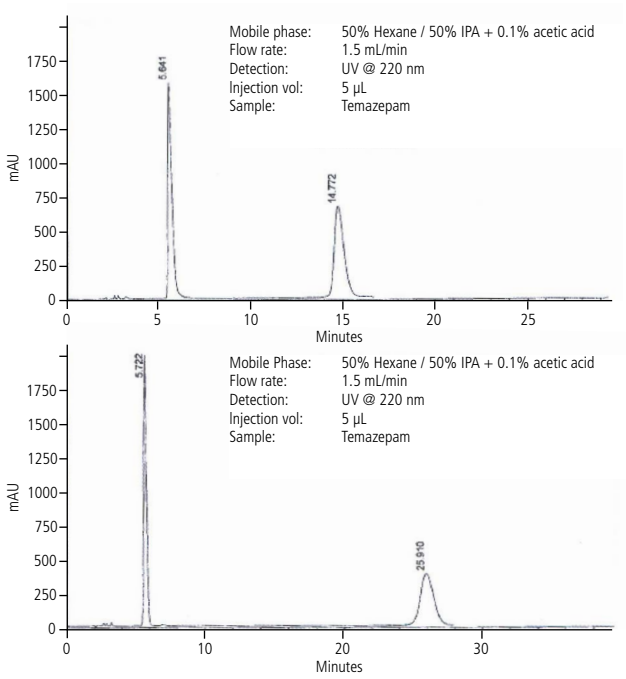
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCA	50	4.6	3	**115151-CCA**
ChromegaChiral CCA	100	3.0	3	**123151-CCA**
ChromegaChiral CCA	100	3.0	5	**123251-CCA**
ChromegaChiral CCA	100	4.6	3	**125151-CCA**
ChromegaChiral CCA	100	4.6	5	**125251-CCA**
ChromegaChiral CCA	150	3.0	3	**133151-CCA**
ChromegaChiral CCA	150	3.0	5	**133251-CCA**
ChromegaChiral CCA	150	4.6	3	**135151-CCA**
ChromegaChiral CCA	150	4.6	5	**135251-CCA**
ChromegaChiral CCA	250	4.6	10	**155351-CCA**
ChromegaChiral CCA	250	4.6	3	**155151-CCA**
ChromegaChiral CCA	250	4.6	5	**155251-CCA**
ChromegaChiral CCA Prep	150	20	5	**138251-CCA**
ChromegaChiral CCA Prep	150	30	5	**13N251-CCA**
ChromegaChiral CCA Prep	250	10	5	**157251-CCA**
ChromegaChiral CCA Prep	250	20	10	**158351-CCA**
ChromegaChiral CCA Prep	250	20	5	**158251-CCA**
ChromegaChiral CCA Prep	250	30	5	**15N251-CCA**
ChromegaChiral CCA Prep	250	50	5	**15F251-CCA**
ChromegaChiral CCA Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCA**
ChromegaChiral CCA Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCA**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

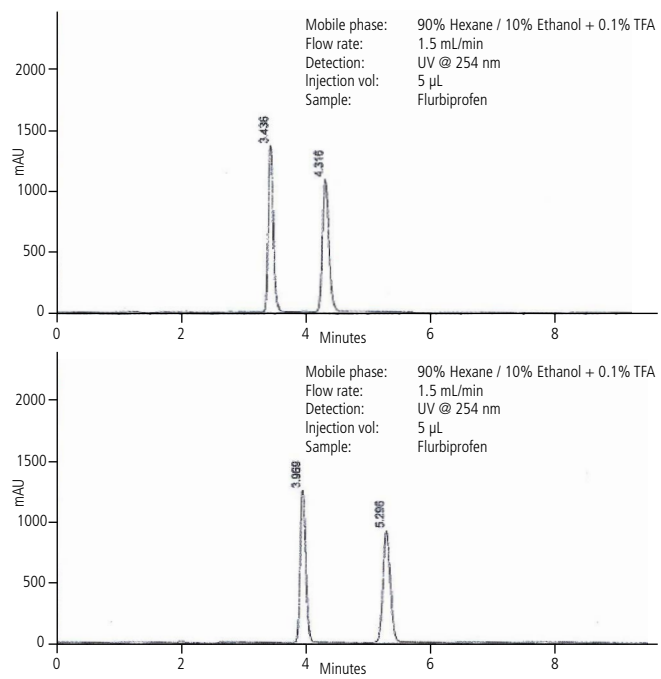
SFC analysis of diniconazole using ChromegaChiral CCA, 150 mm x 4.6 mm, 5 µm.



HPLC analysis of temazepam using ChromegaChiral CCA (top) and Daicel® CHIRALPAK® AD-H (bottom), 250 mm x 4.6 mm, 5 µm.



HPLC analysis of flurbiprofen using ChromegaChiral CCA (top) and Daicel® CHIRALPAK® AD-H (bottom), 250 mm x 4.6 mm, 5 µm.



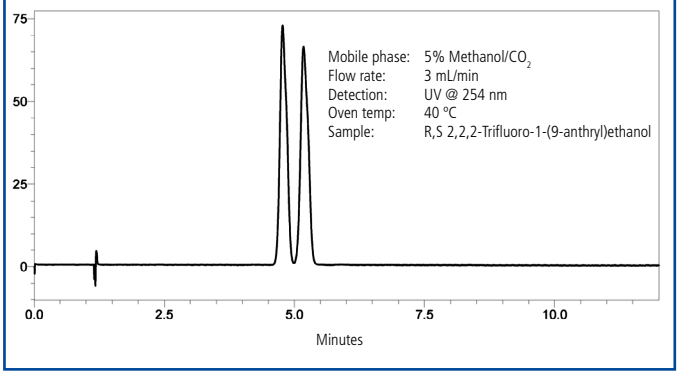
ChromegaChiral CCA F4

ChromegaChiral CCA F4 is a tris(4-Fluoro 3-methylphenylcarbamate) amylose phase which can be used in SFC or HPLC. ChromegaChiral CCA F4 incorporates a fluoro group in its structure. The addition of a fluorine atom into a phenyl carbamate amylose structure can be useful in promoting fluorophilic retention mechanism which can provide improved retention for fluorinated compounds. A fluorophilic retention mechanism can be particularly useful in medicinal chemistry and drug discovery, where more than a third of newly approved small molecule drugs contain fluorine.

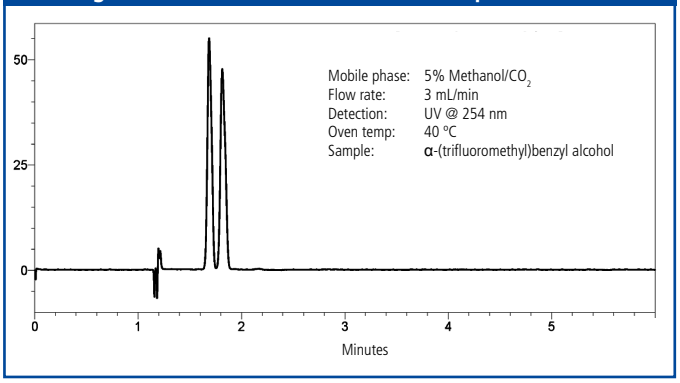
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCA F4	100	3.0	3	**123151-CCA-F4**
ChromegaChiral CCA F4	100	3.0	5	**123251-CCA-F4**
ChromegaChiral CCA F4	100	4.6	3	**125151-CCA-F4**
ChromegaChiral CCA F4	100	4.6	5	**125251-CCA-F4**
ChromegaChiral CCA F4	150	3.0	3	**133151-CCA-F4**
ChromegaChiral CCA F4	150	3.0	5	**133251-CCA-F4**
ChromegaChiral CCA F4	150	4.6	3	**135151-CCA-F4**
ChromegaChiral CCA F4	150	4.6	5	**135251-CCA-F4**
ChromegaChiral CCA F4	250	4.6	5	**155251-CCA-F4**
ChromegaChiral CCA F4 Prep	150	20	5	**138251-CCA-F4**
ChromegaChiral CCA F4 Prep	150	30	5	**13N251-CCA-F4**
ChromegaChiral CCA F4 Prep	250	20	5	**158251-CCA-F4**
ChromegaChiral CCA F4 Prep	250	30	5	**15N251-CCA-F4**
ChromegaChiral CCA F4 Prep	250	50	5	**15F251-CCA-F4**
ChromegaChiral CCA F4 Analytical Guard Cartridges (Pkg.5)	10	2.0	5	**500103-CCA-F4**
ChromegaChiral CCA F4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCA-F4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of R,S 2,2,2-Trifluoro-1-(9-anthryl)ethanol using ChromegaChiral CCA F4, 250 mm x 4.6 mm, 5 µm.



SFC analysis of α-(trifluoromethyl)benzyl alcohol using ChromegaChiral CCA F4, 250 mm x 4.6 mm, 5 µm.



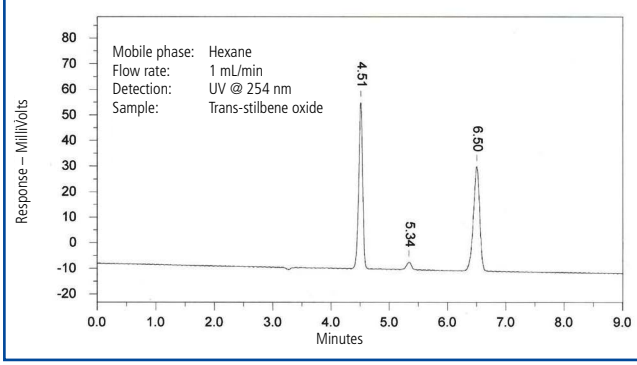
ChromegaChiral CCC

A modified cellulose including the combination of 3-chloro-4 methylphenylcarbamate and 3,5-dichlorophenylcarbamate bonding groups coated on high purity, high performance spherical silica particles. This combination of bonded groups stabilizes the solubility of coated phase making for a durable phase similar to other widely used coated phases. The use of cellulose modified with chlorinated phenyl groups provides for the separation for many previously unresolved/poorly resolved chiral mixtures by providing unique separation characteristics.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCC	50	4.6	3	**115151-CCC**
ChromegaChiral CCC	50	4.6	5	**115251-CCC**
ChromegaChiral CCC	100	3.0	3	**123151-CCC**
ChromegaChiral CCC	100	3.0	5	**123251-CCC**
ChromegaChiral CCC	100	4.6	3	**125151-CCC**
ChromegaChiral CCC	100	4.6	5	**125251-CCC**
ChromegaChiral CCC	150	3.0	3	**133151-CCC**
ChromegaChiral CCC	150	3.0	5	**133251-CCC**
ChromegaChiral CCC	150	4.6	3	**135151-CCC**
ChromegaChiral CCC	150	4.6	5	**135251-CCC**
ChromegaChiral CCC	250	4.6	3	**155151-CCC**
ChromegaChiral CCC	250	4.6	5	**155251-CCC**
ChromegaChiral CCC Prep	150	20	5	**138251-CCC**
ChromegaChiral CCC Prep	150	30	5	**13N251-CCC**
ChromegaChiral CCC Prep	250	20	5	**158251-CCC**
ChromegaChiral CCC Prep	250	30	5	**15N251-CCC**
ChromegaChiral CCC Prep	250	50	5	**15F251-CCC**
ChromegaChiral CCC Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCC**
ChromegaChiral CCC Analytical Guard Cartridges (Pkg.5)	10	3.0	5	**500101-CCC**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of trans-stilbene oxide using ChromegaChiral CCC, 250 mm x 4.6 mm, 5 µm.



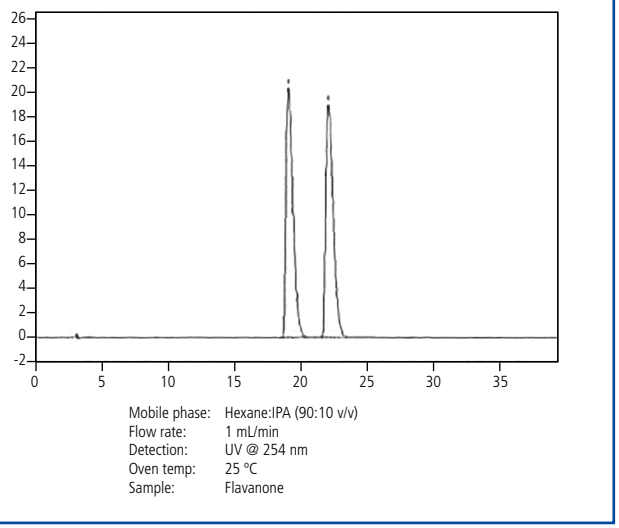
ChromegaChiral CCJ

ChromegaChiral CCJ (cellulose tris(4-methylbenzoate)) is a new product for high resolution chiral separations based on a new halogenated carbohydrate based chiral stationary phase. Similar in selectivity to CHIRALCEL® OJ-H.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCJ	50	4.6	3	**115151-CCJ**
ChromegaChiral CCJ	100	3.0	3	**123151-CCJ**
ChromegaChiral CCJ	100	3.0	5	**123251-CCJ**
ChromegaChiral CCJ	100	4.6	3	**125151-CCJ**
ChromegaChiral CCJ	100	4.6	5	**125251-CCJ**
ChromegaChiral CCJ	150	3.0	3	**133151-CCJ**
ChromegaChiral CCJ	150	3.0	5	**133251-CCJ**
ChromegaChiral CCJ	150	4.6	3	**135151-CCJ**
ChromegaChiral CCJ	150	4.6	5	**135251-CCJ**
ChromegaChiral CCJ	250	4.6	10	**155351-CCJ**
ChromegaChiral CCJ	250	4.6	5	**155251-CCJ**
ChromegaChiral CCJ Prep	150	20	5	**138251-CCJ**
ChromegaChiral CCJ Prep	150	30	5	**13N251-CCJ**
ChromegaChiral CCJ Prep	250	20	10	**158351-CCJ**
ChromegaChiral CCJ Prep	250	20	5	**158251-CCJ**
ChromegaChiral CCJ Prep	250	30	5	**15N251-CCJ**
ChromegaChiral CCJ Prep	250	50	5	**15F251-CCJ**
ChromegaChiral CCJ Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCJ**
ChromegaChiral CCJ Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCJ**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of flavanone using ChromegaChiral CCJ, 250 mm x 4.6 mm, 5 µm.



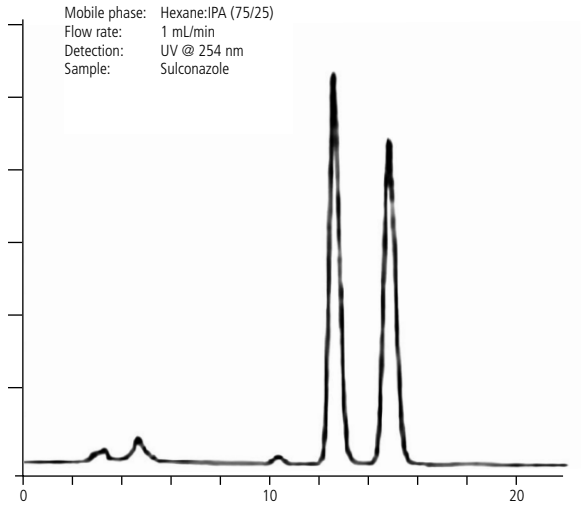
ChromegaChiral CCO

A polysaccharide coated chiral stationary phase and columns which are produced using a unique production process of coating the proven chiral selector, tris-(3,5-dimethylphenylcarbamate) cellulose on high purity, high performance silica. ChromegaChiral CCO columns are similar in selectivity to CHIRALCEL® OD.

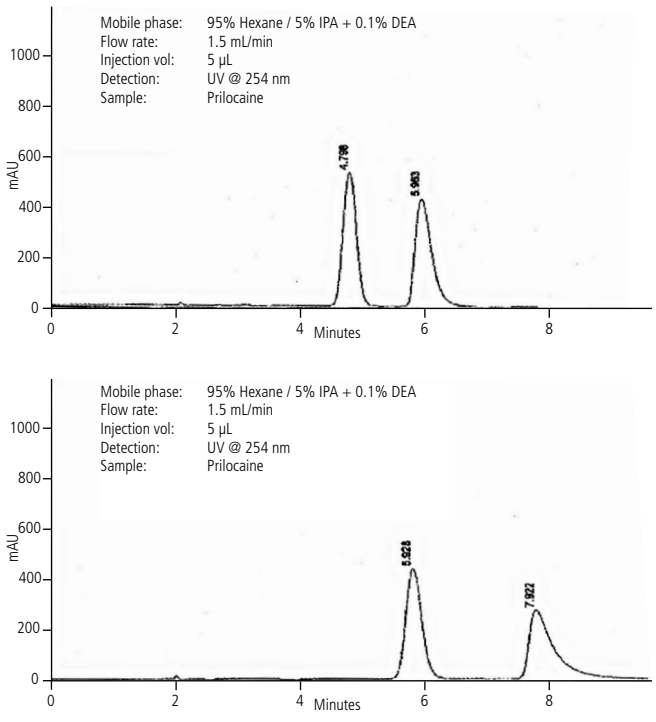
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCO	50	4.6	3	**115151-CCO**
ChromegaChiral CCO	100	3.0	3	**123151-CCO**
ChromegaChiral CCO	100	3.0	5	**123251-CCO**
ChromegaChiral CCO	100	4.6	3	**125151-CCO**
ChromegaChiral CCO	150	3.0	3	**133151-CCO**
ChromegaChiral CCO	150	3.0	5	**133251-CCO**
ChromegaChiral CCO	150	4.6	3	**135151-CCO**
ChromegaChiral CCO	150	4.6	5	**135251-CCO**
ChromegaChiral CCO	250	2.0	10	**152351-CCO**
ChromegaChiral CCO	250	4.6	10	**155351-CCO**
ChromegaChiral CCO	250	4.6	5	**155251-CCO**
ChromegaChiral CCO Prep	150	20	5	**138251-CCO**
ChromegaChiral CCO Prep	150	30	5	**13N251-CCO**
ChromegaChiral CCO Prep	250	20	5	**158251-CCO**
ChromegaChiral CCO Prep	250	30	10	**15N351-CCO**
ChromegaChiral CCO Prep	250	30	5	**15N251-CCO**
ChromegaChiral CCO Prep	250	50	5	**15F251-CCO**
ChromegaChiral CCO Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCO**
ChromegaChiral CCO Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCO**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of sulconazole using ChromegaChiral CCO, 250 mm x 4.6 mm, 5 µm.



HPLC analysis of prilocaine using ChromegaChiral CCO (top) and Daicel CHIRALCEL OD-H (bottom), 250 mm x 4.6 mm, 5 µm.



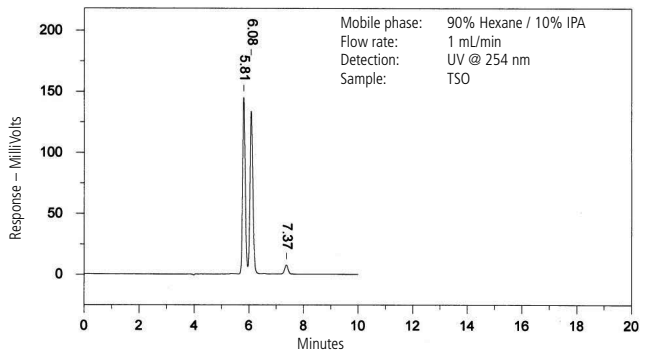
ChromegaChiral CCO F2

ChromegaChiral CCO F2 is a tris(2-Fluoro 5-methylphenylcarbamate) cellulose phase which can be used in SFC or HPLC. The addition of a fluorine atom into a phenyl carbamate cellulose structure can be useful in promoting a fluorophilic retention mechanism which can provide improved retention for fluorinated compounds. A fluorophilic retention mechanism can be particularly useful in medicinal chemistry and drug discovery, where more than a third of newly approved small molecule drugs contain fluorine.

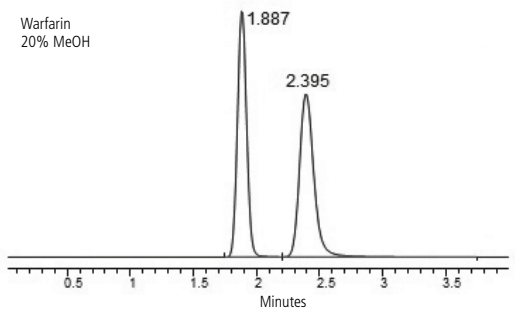
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCO F2	50	4.6	3	**115151-CCO-F2**
ChromegaChiral CCO F2	50	4.6	5	**115251-CCO-F2**
ChromegaChiral CCO F2	100	3.0	3	**123151-CCO-F2**
ChromegaChiral CCO F2	100	3.0	5	**123251-CCO-F2**
ChromegaChiral CCO F2	100	4.6	3	**125151-CCO-F2**
ChromegaChiral CCO F2	100	4.6	5	**125251-CCO-F2**
ChromegaChiral CCO F2	150	3.0	3	**133151-CCO-F2**
ChromegaChiral CCO F2	150	3.0	5	**133251-CCO-F2**
ChromegaChiral CCO F2	150	4.6	3	**135151-CCO-F2**
ChromegaChiral CCO F2	150	4.6	5	**135251-CCO-F2**
ChromegaChiral CCO F2	250	4.6	5	**155251-CCO-F2**
ChromegaChiral CCO F2 Prep	150	20	5	**138251-CCO-F2**
ChromegaChiral CCO F2 Prep	150	30	5	**13N251-CCO-F2**
ChromegaChiral CCO F2 Prep	250	20	5	**158251-CCO-F2**
ChromegaChiral CCO F2 Prep	250	30	5	**15N251-CCO-F2**
ChromegaChiral CCO F2 Prep	250	50	5	**15F251-CCO-F2**
ChromegaChiral CCO F2 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCO-F2**
ChromegaChiral CCO F2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCO-F2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of TSO using ChromegaChiral CCO F2, 250 mm x 4.6 mm, 5 µm.



SFC analysis of warfarin and using ChromegaChiral CCO F2, 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016.

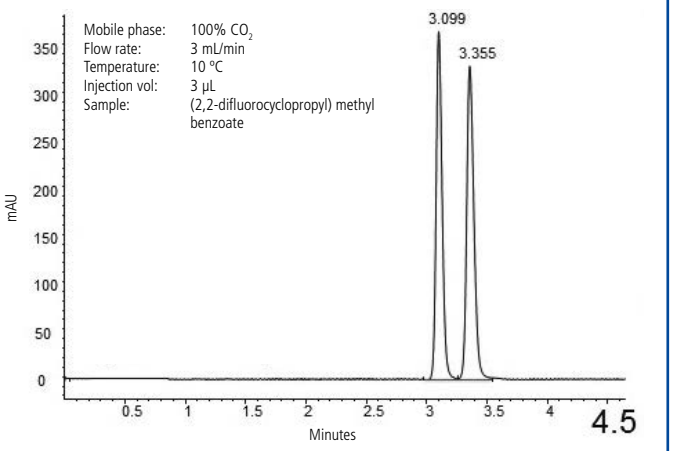
ChromegaChiral CCO F4

ChromegaChiral CCO F4 is a tris(4-Fluoro 3-methylphenylcarbamate) cellulose phase which can be used in SFC or HPLC. The addition of a fluorine atom into a phenyl carbamate cellulose structure is useful in promoting a fluorophilic retention mechanism which provides improved retention for fluorinated compounds. A fluorophilic retention mechanism is particularly useful in medicinal chemistry and drug discovery, where more than a third of newly approved small molecule drugs contain fluorine.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCO F4	50	4.6	3	**115151-CCO-F4**
ChromegaChiral CCO F4	100	3.0	3	**123151-CCO-F4**
ChromegaChiral CCO F4	100	3.0	5	**123251-CCO-F4**
ChromegaChiral CCO F4	100	4.6	3	**125151-CCO-F4**
ChromegaChiral CCO F4	100	4.6	5	**125251-CCO-F4**
ChromegaChiral CCO F4	150	3.0	3	**133151-CCO-F4**
ChromegaChiral CCO F4	150	3.0	5	**133251-CCO-F4**
ChromegaChiral CCO F4	150	4.6	3	**135151-CCO-F4**
ChromegaChiral CCO F4	150	4.6	5	**135251-CCO-F4**
ChromegaChiral CCO F4	250	4.6	5	**155251-CCO-F4**
ChromegaChiral CCO F4 Prep	150	20	5	**138251-CCO-F4**
ChromegaChiral CCO F4 Prep	150	30	5	**13N251-CCO-F4**
ChromegaChiral CCO F4 Prep	250	20	5	**158251-CCO-F4**
ChromegaChiral CCO F4 Prep	250	30	5	**15N251-CCO-F4**
ChromegaChiral CCO F4 Prep	250	50	5	**15F251-CCO-F4**
ChromegaChiral CCO F4 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCO-F4**
ChromegaChiral CCO F4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCO-F4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

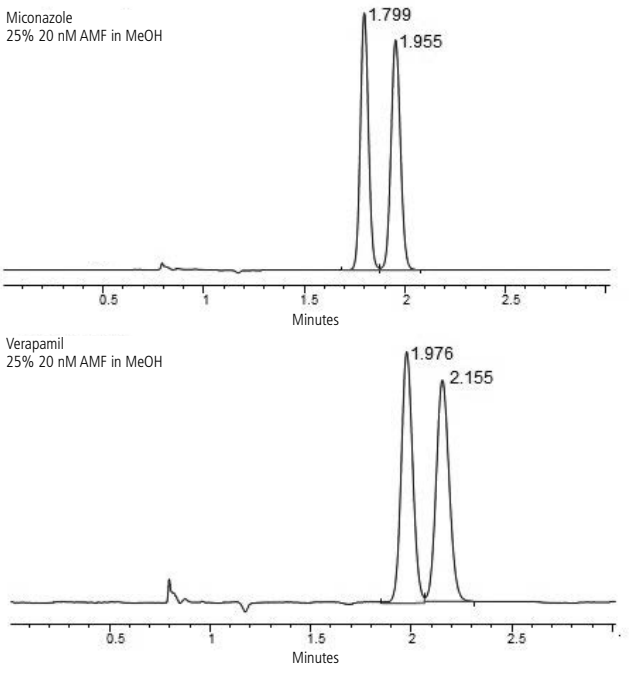
Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of (2,2-difluorocyclopropyl) methyl benzoate using ChromegaChiral CCO F4, 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016

SFC analysis of miconazole and verapamil using ChromegaChiral CCO F4, 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016

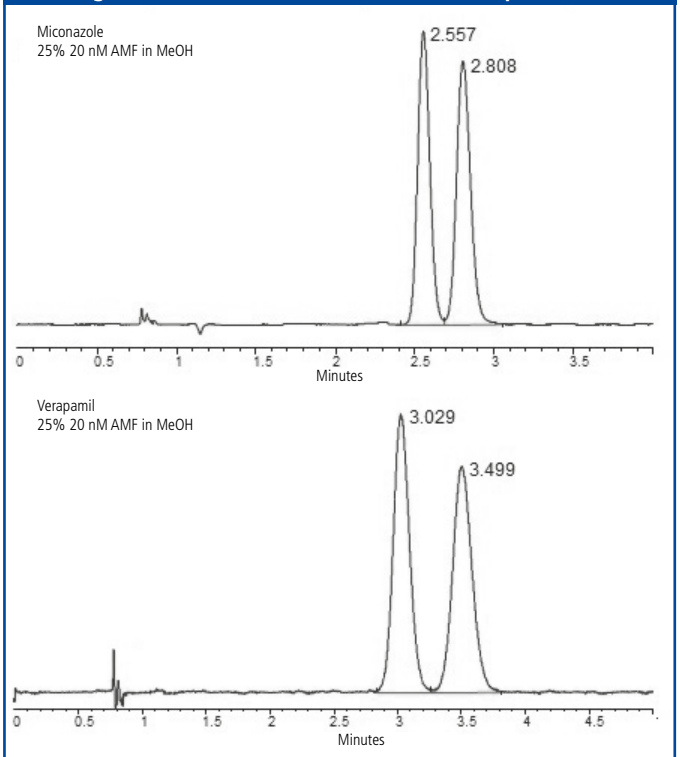
ChromegaChiral CCO F4 T3

ChromegaChiral CCO F4 T3 (tris(4-Fluoro-3-(trifluoromethylphenyl carbamate) cellulose) incorporates fluoro groups into its structure, and can be used in SFC or HPLC. The addition of a fluorine atom into a phenyl cellulose structure can be useful in promoting fluorophilic retention mechanism which can provide improved retention for fluorinated compounds. A fluorophilic retention mechanism can be particular useful in medicinal chemistry and drug discovery, where more than a third of newly approved small molecule drugs contain fluorine.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCO F4 T3	100	3.0	3	**123151-CCO-F4T3**
ChromegaChiral CCO F4 T3	100	3.0	5	**123251-CCO-F4T3**
ChromegaChiral CCO F4 T3	100	4.6	3	**125151-CCO-F4T3**
ChromegaChiral CCO F4 T3	150	3.0	3	**133151-CCO-F4T3**
ChromegaChiral CCO F4 T3	150	3.0	5	**133251-CCO-F4T3**
ChromegaChiral CCO F4 T3	150	4.6	3	**135151-CCO-F4T3**
ChromegaChiral CCO F4 T3	150	4.6	5	**135251-CCO-F4T3**
ChromegaChiral CCO F4 T3	250	4.6	5	**155251-CCO-F4T3**
ChromegaChiral CCO F4 T3 Prep	150	20	5	**138251-CCO-F4T3**
ChromegaChiral CCO F4 T3 Prep	150	30	5	**13N251-CCO-F4T3**
ChromegaChiral CCO F4 T3 Prep	250	20	5	**158251-CCO-F4T3**
ChromegaChiral CCO F4 T3 Prep	250	30	5	**15N251-CCO-F4T3**
ChromegaChiral CCO F4 T3 Prep	250	50	5	**15F251-CCO-F4T3**
ChromegaChiral F4 T3 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCO-F4-T3**
ChromegaChiral F4 T3 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCO-F4-T3**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

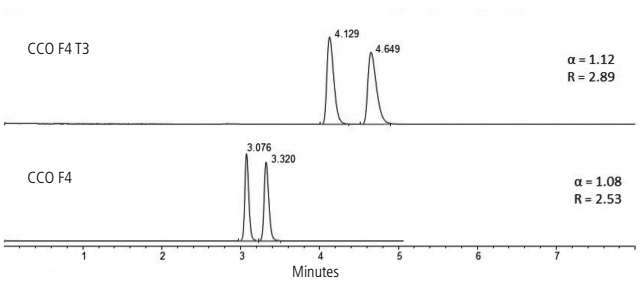
Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of miconazole and verapamil using ChromegaChiral CCO F4 T3, 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016

SFC analysis of (2,2-difluorocyclopropyl) methyl benzoate using ChromegaChiral CCO F4 T3 (top) and CCO F4 (bottom), 250 mm x 4.6 mm, 5 µm.



Reference: Resurgence in Fluorinated Chiral Polysaccharide Phases for Supercritical Fluid Chromatography, Chromatography Today, August/September 2016

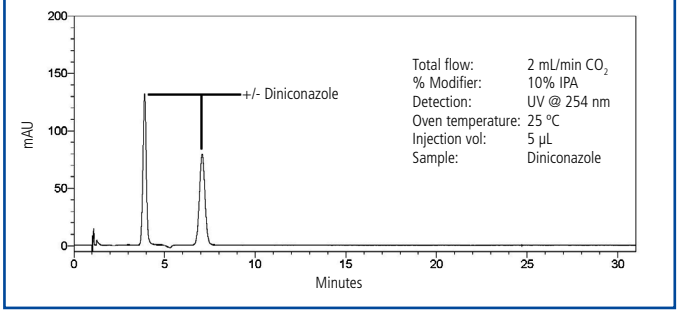
ChromegaChiral CCS

ChromegaChiral CCS (amylose tris [(S)-α-methylbenzylcarbamate]) permits the enantiomeric separation of 1-Indanol without the addition of DEA (Diethyl amine). Historically DEA has been commonly used to improve peak shape for chiral separations of compounds such as 1-Indanol. ChromegaChiral CCS separates the 1-Indanol enantiomers with sharp peaks without DEA, providing superior chiral separations, sample loading and peak shape performance. Similar in selectivity to CHIRALPAK® AS-H.

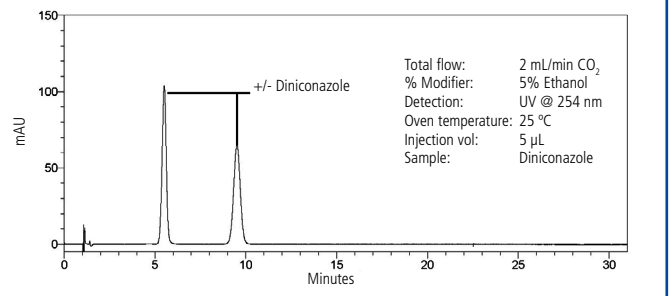
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCS	50	4.6	3	**115151-CCS**
ChromegaChiral CCS	50	4.6	5	**115251-CCS**
ChromegaChiral CCS	100	3.0	3	**123151-CCS**
ChromegaChiral CCS	100	3.0	5	**123251-CCS**
ChromegaChiral CCS	100	4.6	3	**125151-CCS**
ChromegaChiral CCS	100	4.6	5	**125251-CCS**
ChromegaChiral CCS	150	3.0	3	**133151-CCS**
ChromegaChiral CCS	150	3.0	5	**133251-CCS**
ChromegaChiral CCS	150	4.6	3	**135151-CCS**
ChromegaChiral CCS	150	4.6	5	**135251-CCS**
ChromegaChiral CCS	250	4.6	5	**155251-CCS**
ChromegaChiral CCS Prep	150	20	5	**138251-CCS**
ChromegaChiral CCS Prep	150	30	5	**13N251-CCS**
ChromegaChiral CCS Prep	250	20	5	**158251-CCS**
ChromegaChiral CCS Prep	250	30	5	**15N251-CCS**
ChromegaChiral CCS Prep	250	50	5	**15F251-CCS**
ChromegaChiral CCS Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCS**
ChromegaChiral CCS Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of diniconazole using ChromegaChiral CCS with 10% IPA, 150 mm x 4.6 mm, 5 µm.



SFC analysis of diniconazole using ChromegaChiral CCS with 5% ethanol , 150 mm x 4.6 mm, 5 µm.



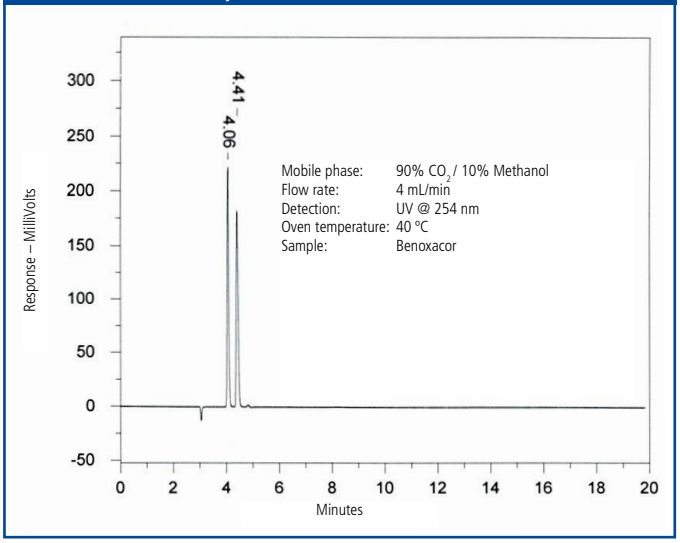
ChromegaChiral CCU

ChromegaChiral CCU is a modified amylose coated on high purity, high performance spherical silica particles. The chemical modification includes the combination of chemical bonding groups of methylbenzylcarbamate and 3-chloro-4 methylphenylcarbamate attached to amylose. This combination of bonded groups stabilizes the solubility of coated phase making for a durable phase similar to other widely used coated phases. The use of amylose modified with phenyl groups provides for the separation for many previously unresolved/poorly resolved chiral mixtures.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCU	100	3.0	3	**123151-CCU**
ChromegaChiral CCU	100	3.0	5	**123251-CCU**
ChromegaChiral CCU	100	4.6	3	**125151-CCU**
ChromegaChiral CCU	150	3.0	3	**133151-CCU**
ChromegaChiral CCU	150	3.0	5	**133251-CCU**
ChromegaChiral CCU	150	4.6	3	**135151-CCU**
ChromegaChiral CCU	150	4.6	5	**135251-CCU**
ChromegaChiral CCU	250	4.6	5	**155251-CCU**
ChromegaChiral CCU	50	4.6	3	**115151-CCU**
ChromegaChiral CCU Prep	150	20	5	**138251-CCU**
ChromegaChiral CCU Prep	150	30	5	**13N251-CCU**
ChromegaChiral CCU Prep	250	20	5	**158251-CCU**
ChromegaChiral CCU Prep	250	30	5	**15N251-CCU**
ChromegaChiral CCU Prep	250	50	5	**15F251-CCU**
ChromegaChiral CCU Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCU**
ChromegaChiral CCU Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCU**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of benoxacor (herbicide) using ChromegaChiral CCU, 250 mm x 4.6 mm, 5 µm.



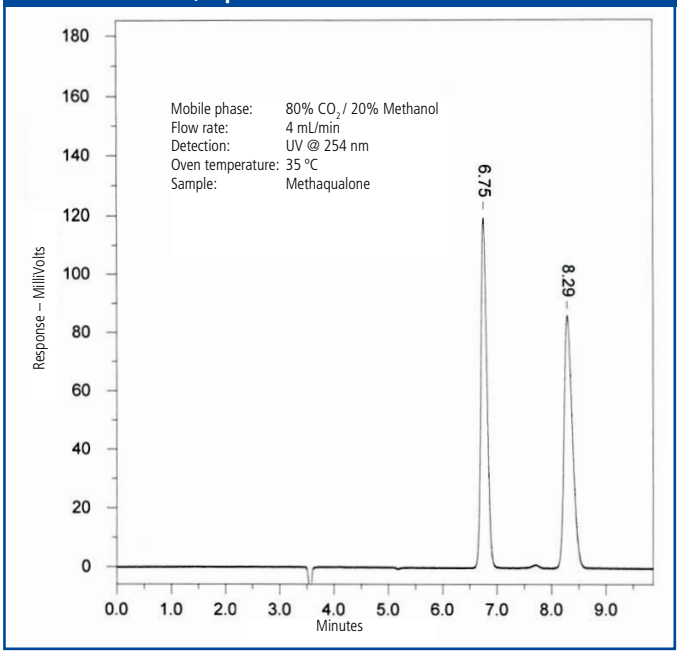
ChromegaChiral CCX

ChromegaChiral CCX is a modified amylose coated on high purity, high performance spherical silica particles. The chemical modification includes the combination of chemical bonding groups of methylbenzylcarbamate and 3,5-dimethylphenylcarbamate attached to amylose. This combination of bonded groups stabilizes the solubility of coated phase, making for a durable phase similar to other widely used coated phases. The use of amylose modified with phenyl groups moiety provides for the separation for many previously unresolved/poorly resolved chiral mixtures. This chemical modification provides for unique separation behaviour.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
ChromegaChiral CCX	50	4.6	3	**115151-CCX**
ChromegaChiral CCX	100	3.0	3	**123151-CCX**
ChromegaChiral CCX	100	3.0	5	**123251-CCX**
ChromegaChiral CCX	100	4.6	3	**125151-CCX**
ChromegaChiral CCX	150	3.0	3	**133151-CCX**
ChromegaChiral CCX	150	3.0	5	**133251-CCX**
ChromegaChiral CCX	150	4.6	3	**135151-CCX**
ChromegaChiral CCX	150	4.6	5	**135251-CCX**
ChromegaChiral CCX	250	4.6	5	**155251-CCX**
ChromegaChiral CCX Prep	150	20	5	**138251-CCX**
ChromegaChiral CCX Prep	150	30	5	**13N251-CCX**
ChromegaChiral CCX Prep	250	20	5	**158251-CCX**
ChromegaChiral CCX Prep	250	30	5	**15N251-CCX**
ChromegaChiral CCX Prep	250	50	5	**15F251-CCX**
ChromegaChiral CCX Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-CCX**
ChromegaChiral CCX Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-CCX**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of methaqualone using ChromegaChiral CCX, 250 mm x 4.6 mm, 5 µm.



Epic HPLC and UHPLC Columns

The Epic® line is our latest range of LC columns, based on high density monomerically bonded phases produced through a proprietary bonding process. Epic HPLC and UHPLC columns are compatible with a wide range of organic modifiers and buffers and stable over a wide pH range. All Epic products use an ultra-high purity metal free silica and undergo strict quality control testing. For flexibility, we offer a wide range of column sizes as well being fully scalable from analytical to preparative dimensions.

An extensive range of column chemistries are available, providing a broad range of selectivities to enhance method development. The Epic line offers reversed-phase C18 columns and shorter alkyl chain chemistries for general purpose separations. The groundbreaking AQ phase from ES Industries (AquaSep) which offers improved polar compound retention under RP conditions, has been further refined in the Epic Polar column and extensive selectivity options (e.g. phenyl-hexyl, naphthyl, biphenyl, fluorooctyl (FO), HILIC, and cyano) provide analysts with a method development tool kit ready to tackle any separation. As the first to commercialize fluorinated stationary phases, the continued development yielded Epic PFP LB and FO LB; truly unique low bleed stationary phases capable of performing many challenging separations.

Many of the commercially available HILIC stationary phases are converted normal phase columns which yield poor methods, poor separations and lack durability. Our line of HILIC columns, including the new Epic HILIC POH, are specifically designed for HILIC chromatography to achieve high performance separations, yield rugged methods and deliver long column lifetimes.

Whatever your separation need, we have a chemistry or dimension to fill it.

Features and Benefits

- Ultra-high purity silica for improved peak shape, especially for basic compounds
- Extensive range of stationary phase chemistries with innovative bonding chemistry to enhance method development
- High density bonding produces columns with better pH stability, increased sample loading and better lot-to-lot reproducibility
- Extended pH stability across commonly used mobile phase buffers
- Microbore to preparative dimensions available to allow flexibility and full scalability

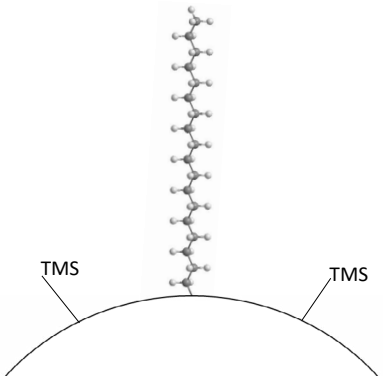
Material Characteristics

Brand	Phase*	Particle Size (µm)	Pore Size (Å)	Carbon %	End Cap	pH Range	USP Code
Epic	C18	1.8, 3, 5, 10	120	18	Yes	1-10	L1
Epic	C18 MS	1.8, 3, 5, 10	120	22	No	1-10	L1
Epic	C18 Cannabinoid	3	120	18	No	1-10	L1
Epic	C8	1.8, 3, 5, 10	120	10	Yes	1-10	L7
Epic	Polar	1.8, 3, 5, 10	120	18	No	1-10	L1
Epic	Amine HD	1.8, 3, 5, 10	120	–	No	1-10	L8
Epic	Cyano	1.8, 3, 5, 10	120	–	No	1-10	L10
Epic	C4 SD	1.8, 3, 5, 10	120	12	Yes	1-10	L26
Epic	Silica	1.8, 3, 5, 10	120	–	No	1-10	L3
Epic	HILIC Silica	1.8, 3, 5, 10	120	–	No	1-10	–
Epic	HILIC POH	1.8, 3, 5, 10	120	–	No	1-10	–
Epic	Diol	1.8, 3, 5, 10	120	–	No	1-10	L20
Epic	HILIC FL	1.8, 3, 5, 10	120	–	No	1-10	–
Epic	HILIC RP	1.8, 3, 5, 10	120	–	No	1-10	–
Epic	HILIC PI	1.8, 3, 5, 10	120	–	Yes	1-10	–
Epic	Naphthyl	1.8, 3, 5, 10	120	25	Yes	1-10	–
Epic	PFP LB	1.8, 3, 5, 10	120	–	Yes	1-10	L43
Epic	FO LB	1.8, 3, 5, 10	120	–	Yes	1-10	–
Epic	Phenyl	1.8, 3, 5, 10	120	16	Yes	1-10	L11
Epic	Diphenyl	1.8, 3, 5, 10	120	20	Yes	1-10	L11
Epic	Biphenyl	1.8, 3, 5, 10	120	25	Yes	1-10	L11
Epic	Phenyl-hexyl	1.8, 3, 5, 10	120	18	Yes	1-10	L11

*Preparative columns of these phases are also available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic C18

Epic C18 is a highly inert phase due to its superior base deactivation. As a result of the high-density bonding levels (> 4 µmol/m²), Epic C18 demonstrates superior peak shapes for the most demanding applications. This phase provides exceptional peak shape and selectivity over a wide range of compounds and pH and is the workhorse HPLC and UHPLC phase for RP small molecule analysis. It can be used with basic, neutral and acidic analytes.

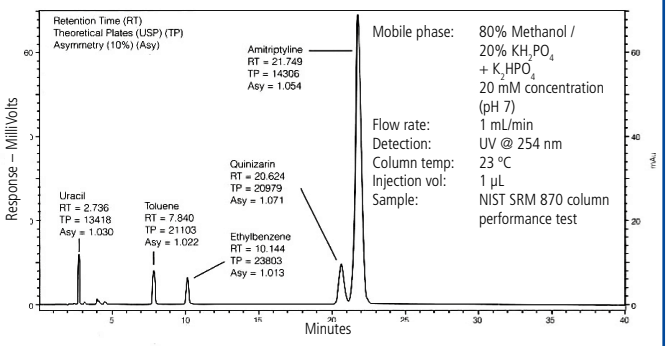


Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C18	50	2.1	1.8	**512A91-EC18**
Epic C18	50	2.1	3	**112191-EC18**
Epic C18	50	2.1	5	**112291-EC18**
Epic C18	50	3.0	1.8	**513A91-EC18**
Epic C18	50	4.6	3	**115191-EC18**
Epic C18	50	4.6	5	**115291-EC18**
Epic C18	75	4.6	3	**195191-EC18**
Epic C18	100	2.1	1.8	**522A91-EC18**
Epic C18	100	2.1	3	**122191-EC18**
Epic C18	100	2.1	5	**122291-EC18**
Epic C18	100	3.0	1.8	**523A91-EC18**
Epic C18	100	3.0	3	**123191-EC18**
Epic C18	100	4.6	3	**125191-EC18**
Epic C18	100	4.6	5	**125291-EC18**
Epic C18	125	4.6	5	**105291-EC18**
Epic C18	150	2.1	1.8	**532A91-EC18**
Epic C18	150	2.1	3	**132191-EC18**
Epic C18	150	2.1	5	**132291-EC18**
Epic C18	150	3.0	1.8	**533A91-EC18**
Epic C18	150	3.0	3	**133191-EC18**
Epic C18	150	3.9	5	**13e291-EC18**
Epic C18	150	4.0	3	**134191-EC18**
Epic C18	150	4.0	5	**134291-EC18**
Epic C18	150	4.6	3	**135191-EC18**
Epic C18	150	4.6	5	**135291-EC18**

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C18	200	4.6	5	**145291-EC18**
Epic C18	200	5.0	5	**146291-EC18**
Epic C18	250	4.0	10	**154391-EC18**
Epic C18	250	4.0	5	**154291-EC18**
Epic C18	250	4.6	10	**155391-EC18**
Epic C18	250	4.6	3	**155191-EC18**
Epic C18	250	4.6	5	**155291-EC18**
Epic C18	300	3.9	10	**16e391-EC18**
Epic C18	300	4.0	10	**164391-EC18**
Epic C18	300	4.0	5	**164291-EC18**
Epic C18	300	4.6	3	**165191-EC18**
Epic C18	300	4.6	5	**165291-EC18**
Epic C18 Prep	50	30	10	**11N391-EC18**
Epic C18 Prep	50	50	5	**11F291-EC18**
Epic C18 Prep	100	20	5	**128291-EC18**
Epic C18 Prep	150	10	5	**137291-EC18**
Epic C18 Prep	250	10	5	**157291-EC18**
Epic C18 Prep	250	20	5	**158291-EC18**
Epic C18 Prep	250	30	10	**15N391-EC18**
Epic C18 Prep	250	30	5	**15N291-EC18**
Epic C18 Analytical Guard Cartridges (Pkg. 5)	10	3	5	**500101-EC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

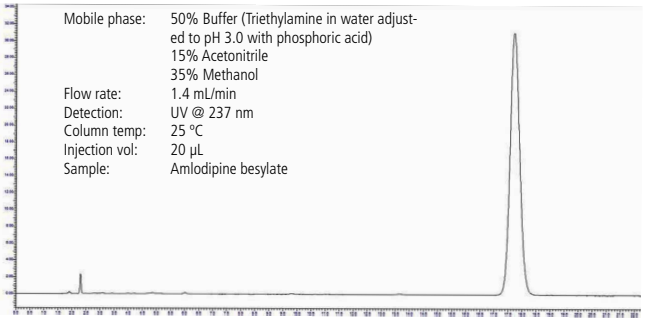
Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of NIST SRM 870 column performance test using Epic C18, 250 x 4.6 mm, 5 µm.



Mobile phase: 80% Methanol / 20% KH_2PO_4 + K_2HPO_4 20 mM concentration (pH 7)
Flow rate: 1 mL/min
Detection: UV @ 254 nm
Column temp: 23 °C
Injection vol: 1 µL
Sample: NIST SRM 870 column performance test

HPLC analysis of amlodipine besylate using Epic C18, 250 x 4.6 mm, 5 µm.



Mobile phase: 50% Buffer (Triethylamine in water adjusted to pH 3.0 with phosphoric acid)
15% Acetonitrile
35% Methanol
Flow rate: 1.4 mL/min
Detection: UV @ 237 nm
Column temp: 25 °C
Injection vol: 20 µL
Sample: Amlodipine besylate

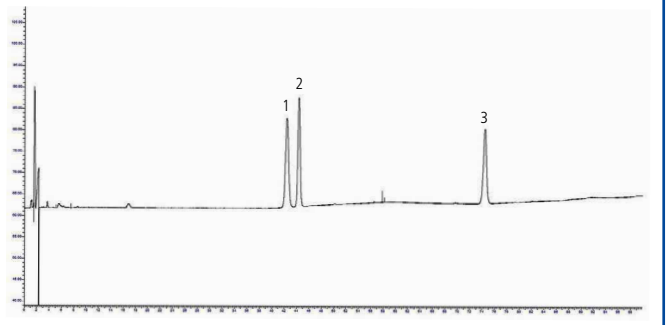
HPLC analysis of ginsenosides (Rg1, Re and Rb1) using Epic C18

Peak Identification
1. Ginsenoside Rg1
2. Ginsenoside Re
3. Ginsenoside Rb1

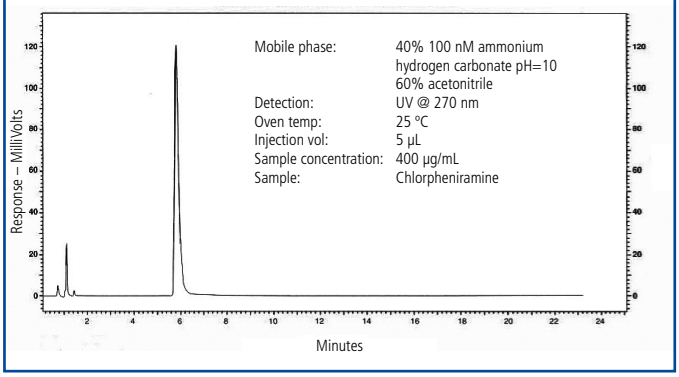
Solvent A: Acetonitrile
Solvent B: Water

Time (mins)	%B
0	81
35	81
55	71
70	71
100	60

Flow rate: 1 mL/min
Detection: UV @ 203 nm
Injection vol: 10 µL
Column temp: 25 °C

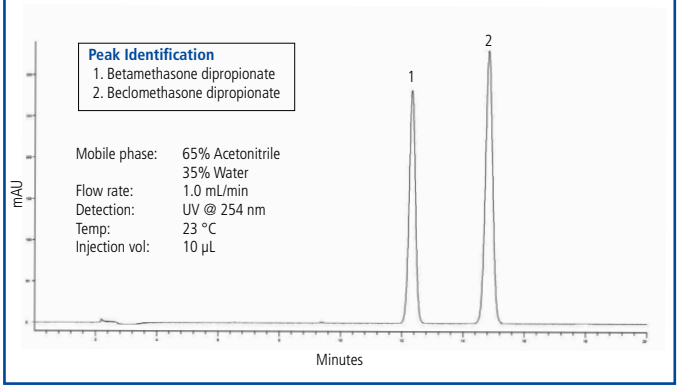


HPLC analysis of chlorpheniramine antihistamine at pH 10 using Epic C18, 150 x 4.6 mm, 5 µm.



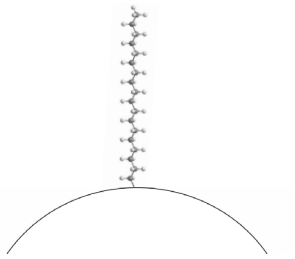
Mobile phase: 40% 100 nM ammonium hydrogen carbonate pH=10
60% acetonitrile
Detection: UV @ 270 nm
Oven temp: 25 °C
Injection vol: 5 µL
Sample concentration: 400 µg/mL
Sample: Chlorpheniramine

HPLC analysis of betamethasone dipropionate using Epic C18, 250 x 4.6 mm, 5 µm.



Mobile phase: 65% Acetonitrile
35% Water
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm
Temp: 23 °C
Injection vol: 10 µL

Epic C18 MS

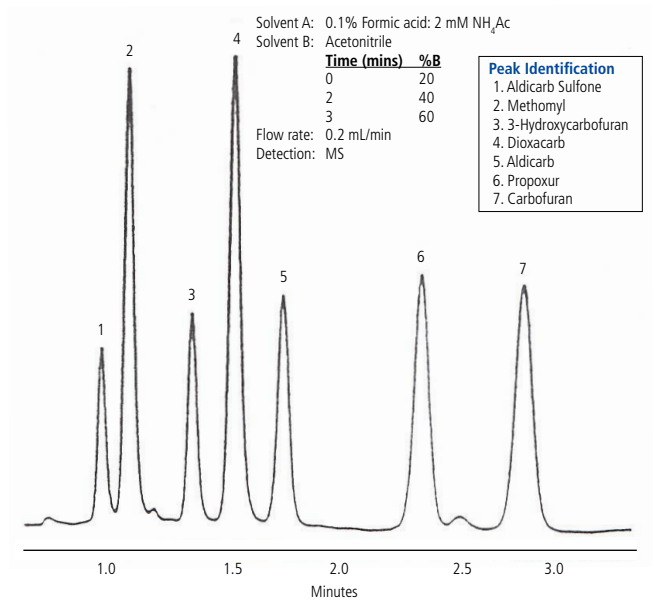


Epic C18 MS is specifically engineered for the demands of LC-MS and is a product of high bonding density, allowing maximum stationary phase interaction and providing a platform for flexible mobile phase compositions. It provides superior retention even at high organic levels. Many LC-MS applications rely on high level of organic modifier in the mobile phase, particularly for high performance trace analysis requiring high sensitivity and low-level detection; Epic C18 MS is ideally suited for these mobile phase conditions. This phase is compatible with all LC-MS mobile phases and buffer systems.

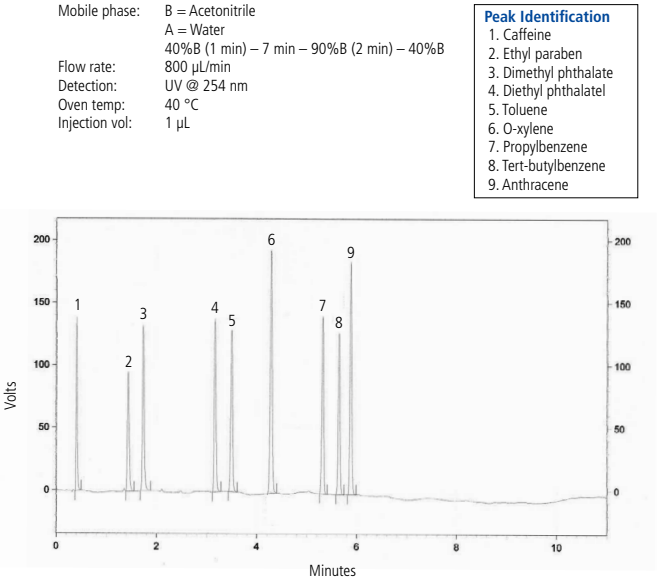
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C18 MS	50	2.1	1.8	**512A91-EC18-MS**
Epic C18 MS	50	2.1	3	**112191-EC18-MS**
Epic C18 MS	50	2.1	5	**112291-EC18-MS**
Epic C18 MS	50	4.6	3	**115191-EC18-MS**
Epic C18 MS	50	4.6	5	**115291-EC18-MS**
Epic C18 MS	100	2.1	1.8	**522A91-EC18-MS**
Epic C18 MS	100	2.1	3	**122191-EC18-MS**
Epic C18 MS	100	2.1	5	**122291-EC18-MS**
Epic C18 MS	100	3.0	1.8	**523A91-EC18-MS**
Epic C18 MS	100	4.6	3	**125191-EC18-MS**
Epic C18 MS	100	4.6	5	**125291-EC18-MS**
Epic C18 MS	150	2.1	3	**132191-EC18-MS**
Epic C18 MS	150	2.1	5	**132291-EC18-MS**
Epic C18 MS	150	4.0	5	**134291-EC18-MS**
Epic C18 MS	150	4.6	3	**135191-EC18-MS**
Epic C18 MS	150	4.6	5	**135291-EC18-MS**
Epic C18 MS	250	4.6	10	**155391-EC18-MS**
Epic C18 MS	250	4.6	5	**155291-EC18-MS**
Epic C18 MS Prep	250	20	5	**158291-EC18-MS**
Epic C18 MS Prep	250	30	5	**15N291-EC18-MS**
Epic C18 MS Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EC18-MS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of N-methyl carbamates using Epic C18 MS, 50 x 2.1 mm, 5 µm.

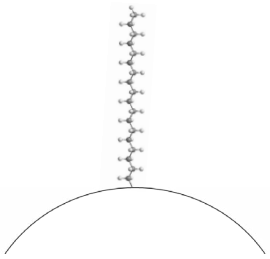


HPLC analysis of various compounds using Epic C18 MS, 100 x 2.1 mm, 1.8 µm.



Epic C18 Cannabinoid

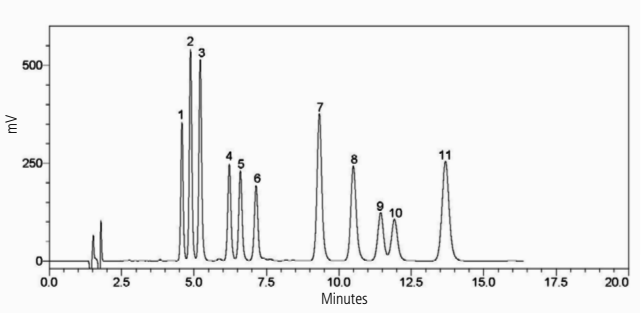
The Epic C18 Cannabinoid phase has been validated for the analysis of cannabinoids. The superior performance of Epic C18 Cannabinoid is a product of high-density bonding which is one of the most important factors in producing a robust stationary phase and robust HPLC column.



The LC-UV method shown demonstrates the Epic C18 Cannabinoid fully resolving 11 major and most frequently observed minor cannabinoids. All compounds are resolved in a fast 9-minute analysis, making this method suitable for high-throughput cannabis testing labs. In addition, this analysis uses a simple isocratic mobile phase which is more easily transferable between instruments and laboratories, compared to more complex methods that incorporate atypical mobile phase gradients or additives.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C18 Cannabinoid	150	4.6	3	**1351X1-EC18-CANNA**

HPLC analysis of 11 major and most frequently observed cannabinoids using Epic C18 Cannabinoid, 150 x 4.6 mm, 3 µm.

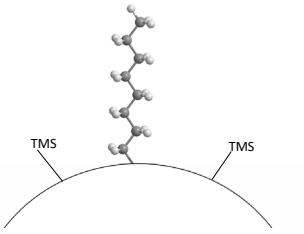


Mobile phase: 80% Acetonitrile / 20% Water
0.1% Formic acid
10 mM Ammonium formate
Flow rate: 1.0 mL/min
Detection: UV @ 230 nm
Oven temp: 35 °C

Peak Identification
1. Cannabivarin (CBDV)
2. Cannabidiolic acid (CBDA)
3. Cannabigerolic acid (CBGA)
4. Cannabigerol (CBG)
5. Cannabidiol (CBD)
6. Tetrahydrocannabivarin (THCV)
7. Cannabinol (CBN)
8. Tetrahydrocannabinolic acid (THCA)
9. Δ9-Tetrahydrocannabinal (Δ9-THC)
10. Δ8-Tetrahydrocannabinol (Δ8-THC)
11. Cannabichromene (CBC)

Epic C8

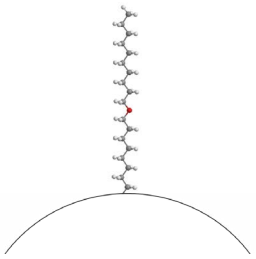
Epic C8 is a highly base deactivated phase that produces a highly inert phase. As a result of the high-density bonding levels (> 4µmol/m2), Epic C8 demonstrates superior peak shapes for the most demanding applications over a wide pH range. The C8 phase is less hydrophobic than the C18 phase and is, therefore, useful for separations which require less retention. It can be particularly useful for more hydrophobic compounds, both charged and neutral (e.g. lipids and steroids).



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C8	50	2.1	1.8	**512A91-EC8**
Epic C8	50	2.1	3	**112191-EC8**
Epic C8	50	2.1	5	**112291-EC8**
Epic C8	50	3.0	3	**113191-EC8**
Epic C8	50	4.6	5	**115291-EC8**
Epic C8	100	2.1	1.8	**522A91-EC8**
Epic C8	100	2.1	3	**122191-EC8**
Epic C8	100	2.1	5	**122291-EC8**
Epic C8	100	4.0	5	**124291-EC8**
Epic C8	100	4.6	3	**125191-EC8**
Epic C8	100	4.6	5	**125291-EC8**
Epic C8	125	4.0	5	**104291-EC8**
Epic C8	125	4.6	5	**105291-EC8**
Epic C8	150	2.1	3	**132191-EC8**
Epic C8	150	2.1	5	**132291-EC8**
Epic C8	150	4.6	3	**135191-EC8**
Epic C8	150	4.6	5	**135291-EC8**
Epic C8	250	4.0	5	**154291-EC8**
Epic C8	250	4.6	10	**155391-EC8**
Epic C8	250	4.6	5	**155291-EC8**
Epic C8	300	4.6	5	**165291-EC8**
Epic C8 Prep	250	20	5	**158291-EC8**
Epic C8 Prep	250	30	5	**15N291-EC8**
Epic C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EC8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic Polar



Epic Polar is a high density C18 packing specifically engineered for the retention of polar analytes and allows full interaction with the bonded hydrocarbon phase, even in 100% aqueous mobile phases. Under these highly aqueous conditions, our novel proprietary bonding chemistry allows the bonded chains to remain fully extended in the mobile phase. Epic Polar can retain highly water-soluble compounds such as small organic acids, water-soluble vitamins, purines and pyrimidines, catecholamines and other polar compounds.

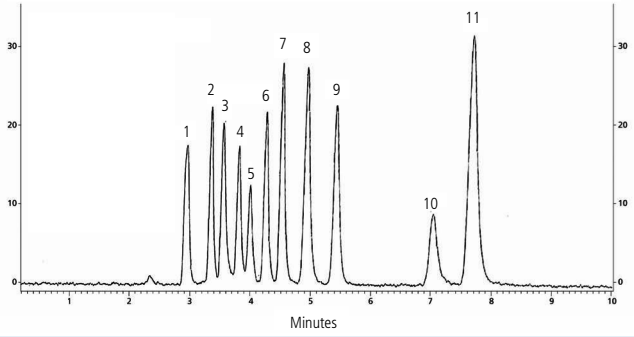
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Polar	50	2.1	1.8	**512A91-EPO**
Epic Polar	50	2.1	3	**112191-EPO**
Epic Polar	50	2.1	5	**112291-EPO**
Epic Polar	50	4.6	3	**115191-EPO**
Epic Polar	50	4.6	5	**115291-EPO**
Epic Polar	100	2.1	1.8	**522A91-EPO**
Epic Polar	100	2.1	3	**122191-EPO**
Epic Polar	100	2.1	5	**122291-EPO**
Epic Polar	100	3.0	1.8	**523A91-EPO**
Epic Polar	100	3.0	3	**123191-EPO**
Epic Polar	100	4.6	3	**125191-EPO**
Epic Polar	150	2.1	1.8	**532A91-EPO**
Epic Polar	150	2.1	3	**132191-EPO**
Epic Polar	150	2.1	5	**132291-EPO**
Epic Polar	150	3.0	3	**133191-EPO**
Epic Polar	150	4.6	3	**135191-EPO**
Epic Polar	150	4.6	5	**135291-EPO**
Epic Polar	200	4.6	3	**145191-EPO**
Epic Polar	250	2.1	5	**152291-EPO**
Epic Polar	250	4.0	5	**154291-EPO**
Epic Polar	250	4.6	10	**155391-EPO**
Epic Polar	250	4.6	3	**155191-EPO**
Epic Polar	250	4.6	5	**155291-EPO**
Epic Polar	300	3.9	10	**16e391-EPO**
Epic Polar	300	4.0	5	**164291-EPO**
Epic Polar Prep	250	10	5	**157291-EPO**
Epic Polar Prep	250	20	10	**158391-EPO**
Epic Polar Prep	250	20	5	**158291-EPO**
Epic Polar Prep	250	30	5	**15N291-EPO**
Epic Polar Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EPO**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of low molecular weight polar organic acids using Epic Polar, 250 x 4.6 mm, 5 µm.

Peak Identification	
1. Glucuronic acid	500 µg/mL
2. Tartaric acid	167 µg/mL
3. Formic acid	333 µg/mL
4. Malic acid	250 µg/mL
5. Shikimik acid	6.7 µg/mL
6. Lactic acid	666 µg/mL
7. Acetic acid	656 µg/mL
8. Citric Acid	420 µg/mL
9. Succinic acid	833 µg/mL
10. Fumaric acid	3 µg/mL
11. Propionic acid	1600 µg/mL

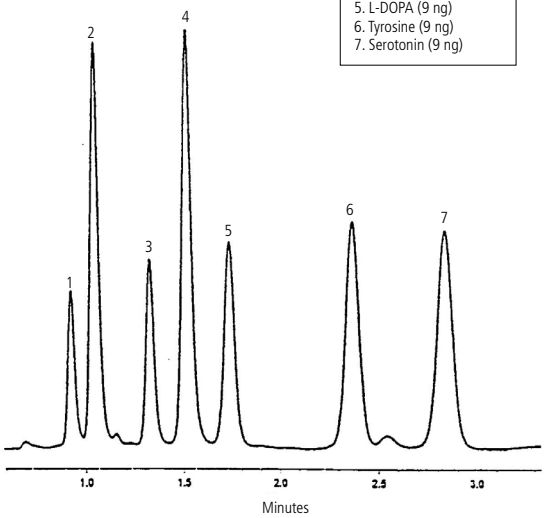
Mobile phase: 50 mM H_3PO_4
Flow rate: 1.0 mL/min
Injection vol: 5 µL
Detection: UV @ 210 nm



HPLC analysis of catecholamines and related compounds using Epic Polar, 100 x 4.6 mm, 3 µm.

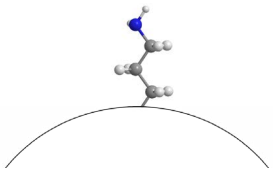
Mobile phase: 93% 50 mM phosphoric acid / 7% methanol
Flow rate: 1.3 mL/min
Injection vol: 5 µL
Detection: UV @ 225 nm

Peak Identification
1. Norepinephrine (8 ng)
2. Epinephrine (20ng)
3. 3-Hydroxylamine (8 ng)
4. Metanephrine (19 ng)
5. L-DOPA (9 ng)
6. Tyrosine (9 ng)
7. Serotonin (9 ng)



Epic Amine HD

Epic Amine HD (high density) is a polymeric amino phase bonded to silica. Applications include HILIC, weak acids, and sugars. The Epic bonding technology produces columns of superior performance and durability. These performance characteristics result from the high bonding density found in the Epic bonding process.

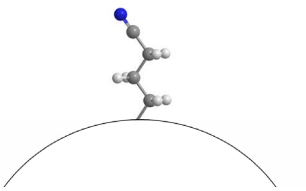


Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Amine HD	50	2.1	1.8	**512A91-E-A/HD**
Epic Amine HD	100	2.1	1.8	**522A91-E-A/HD**
Epic Amine HD	100	4.6	5	**125291-E-A/HD**
Epic Amine HD	150	2.1	1.8	**532A91-E-A/HD**
Epic Amine HD	150	4.6	5	**135291-E-A/HD**
Epic Amine HD	250	4.0	5	**154291-E-A/HD**
Epic Amine HD	250	4.6	5	**155291-E-A/HD**
Epic Amine HD	300	3.9	10	**16e391-E-A/HD**
Epic Amine HD	300	4.6	5	**165291-E-A/HD**
Epic Amine HD Prep	100	20	5	**128291-E-A/HD**
Epic Amine HD Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-E-A/HD**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic Cyano

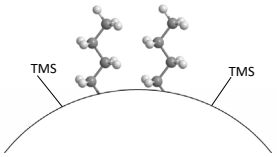
The Epic Cyano phase is a less hydrophobic phase than the alkyl C8 and C18 phases and provides excellent stability and reproducibility (lot-to-lot). The cyano functionality offers increased dipole interactions for alternative selectivity. It is suitable for RP (e.g. higher molecular weight compounds) and NP applications.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Cyano	50	2.1	1.8	**512A91-ECN**
Epic Cyano	50	4.6	5	**115291-ECN**
Epic Cyano	100	2.1	1.8	**522A91-ECN**
Epic Cyano	250	4.6	5	**155291-ECN**
Epic Cyano Prep	250	10	5	**157291-ECN**
Epic Cyano Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ECN**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic C4 SD

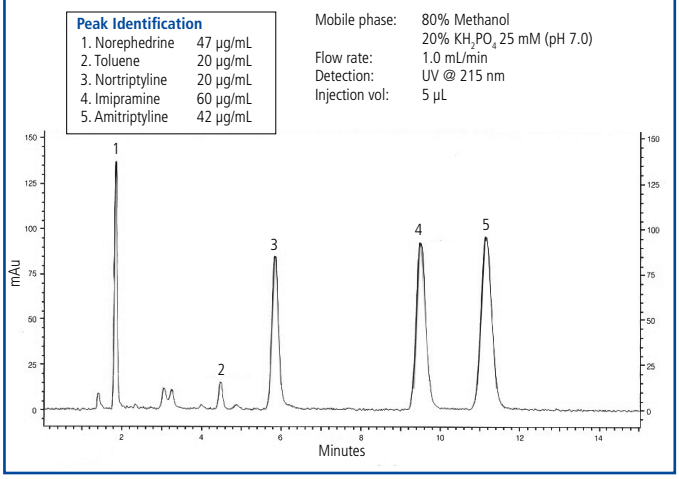


Epic C4 SD is a highly base deactivated high carbon super dense (SD) phase that is produced via a multiple step process. The first step involves the high density bonding of monomeric C4 reagent. The second step utilizes a proprietary multiple endcapping bonding process that produces highly base deactivated columns. The Epic C4 SD product, as a result of our special bonding treatment, is highly hydrophobic and exceptionally inert for the analysis of both acids and bases. The unique chemical structure provides for stable retention under high aqueous conditions, without exhibiting phase collapse. Epic C4 SD is the least hydrophobic of the alkyl phases (C18 and C8) and is useful for lipophilic molecules and applications which require less retention.

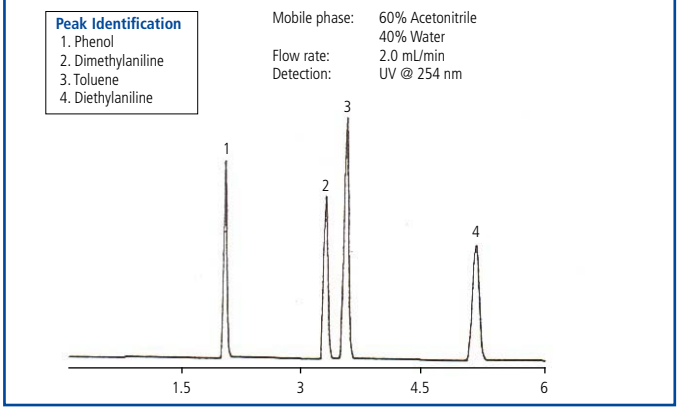
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic C4 SD	50	2.1	3	**112191-EC4-SD**
Epic C4 SD	50	2.1	5	**112291-EC4-SD**
Epic C4 SD	50	4.6	5	**115291-EC4-SD**
Epic C4 SD	100	2.1	3	**122191-EC4-SD**
Epic C4 SD	100	2.1	5	**122291-EC4-SD**
Epic C4 SD	100	3.0	3	**123191-EC4-SD**
Epic C4 SD	100	4.6	3	**125191-EC4-SD**
Epic C4 SD	125	2.1	3	**102191-EC4-SD**
Epic C4 SD	150	2.1	3	**132191-EC4-SD**
Epic C4 SD	150	2.1	5	**132291-EC4-SD**
Epic C4 SD	150	4.0	5	**134291-EC4-SD**
Epic C4 SD	150	4.6	3	**135191-EC4-SD**
Epic C4 SD	150	4.6	5	**135291-EC4-SD**
Epic C4 SD	250	4.6	5	**155291-EC4-SD**
Epic C4 SD Prep	250	20	5	**158291-EC4-SD**
Epic C4 SD Prep	250	30	10	**15N391-EC4-SD**
Epic C4 SD Prep	250	30	5	**15N291-EC4-SD**
Epic C4 SD Prep	250	50	10	**15F391-EC4-SD**
Epic C4 SD Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EC4-SD**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

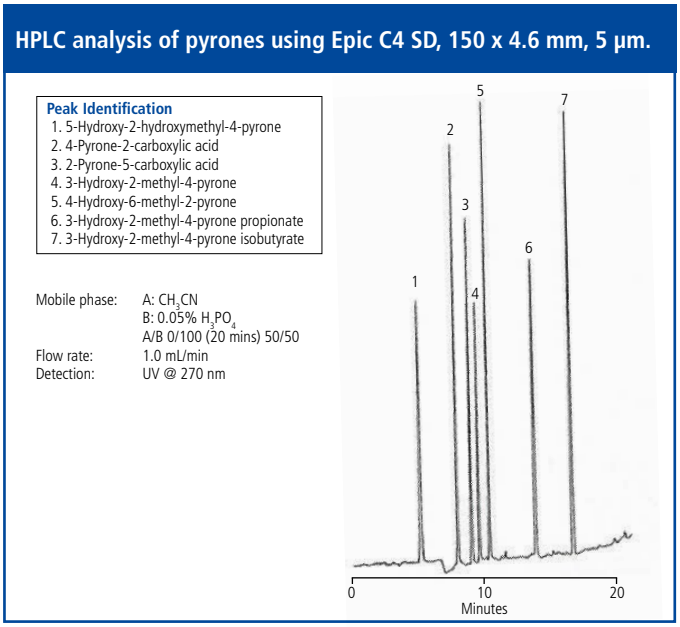
HPLC base deactivation test of tricyclic antidepressants using Epic C4 SD, 150 x 4.6 mm, 5 µm.



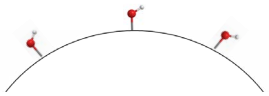
HPLC analysis of anilines using Epic C4 SD, 250 x 4.6 mm, 5 µm.



HPLC analysis of pyrones using Epic C4 SD, 150 x 4.6 mm, 5 µm.



Epic Silica

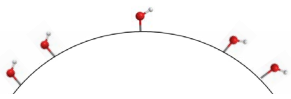


Epic Silica is the backbone for the Epic bonded product range and is a 120 Angstrom high purity metal free synthetic silica. The Epic Silica is the only Epic column designed for use in normal phase chromatography. The Epic Silica Prep columns are very effective in preparative chromatography as normal phase organic solvents are more easily removed than reversed phase solvents.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Silica	50	2.1	3	**112191-ESI**
Epic Silica	50	3.0	3	**113191-ESI**
Epic Silica	50	4.6	5	**115291-ESI**
Epic Silica	100	4.6	3	**125191-ESI**
Epic Silica	150	2.1	3	**132191-ESI**
Epic Silica	150	4.6	5	**135291-ESI**
Epic Silica	250	4.6	3	**155191-ESI**
Epic Silica	250	4.6	5	**155291-ESI**
Epic Silica Prep	50	50	5	**11F291-ESI**
Epic Silica Prep	250	10	5	**157291-ESI**
Epic Silica Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ESI**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic HILIC Silica

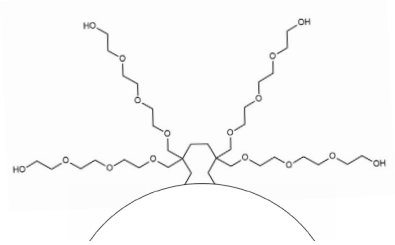


Epic HILIC Silica is based on ultrapure silica rigorously sized to produce highly efficient columns. Epic HILIC silica is pretreated to yield uniform distribution of silanol sites essential for reproducible HILIC chromatography. Epic HILIC silica is useful for the separation of polar bases which can ion exchange with silanols enabling the retention of these polar bases.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic HILIC Silica	100	3.0	3	**123191-EHIC-SI**
Epic HILIC Silica	100	3.0	5	**123291-EHIC-SI**
Epic HILIC Silica	100	4.6	3	**125191-EHIC-SI**
Epic HILIC Silica	150	3.0	1.8	**533A91-EHIC-SI**
Epic HILIC Silica	150	3.0	3	**133191-EHIC-SI**
Epic HILIC Silica	150	3.0	5	**133291-EHIC-SI**
Epic HILIC Silica	150	4.6	3	**135191-EHIC-SI**
Epic HILIC Silica	150	4.6	5	**135291-EHIC-SI**
Epic HILIC Silica	250	4.6	5	**155291-EHIC-SI**
Epic HILIC Silica Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EHIC-SI**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

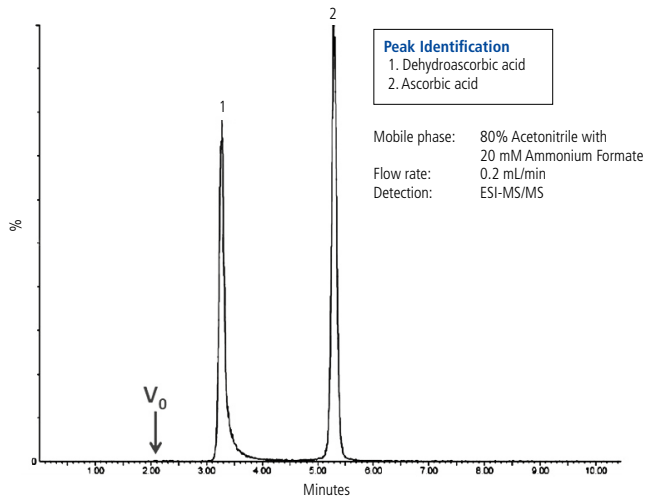
Epic HILIC POH



Epic HILIC POH (POH for polyhydroxylated) is a new stationary phase for HILIC chromatography. It is composed of a polyhydroxylated polymer coated and bound to silica. This polymer coating enhances the behavior of the stationary phase under HILIC operating conditions. This composition provides hydroxyl levels that are well above conventional hydroxyl and diol type stationary phases.

An example of the separation and retention of two highly polar compounds (dehydroascorbic acid and ascorbic acid) performed on Epic HILIC POH is shown. Measurement of dehydroascorbic acid and ascorbic acid is important in understanding the transport of ascorbic acid in human body fluids, as dehydroascorbic acid is the oxidation product of ascorbic acid. The Epic HILIC POH provides the most retention and separation of polar dehydroascorbic acid and ascorbic acid of any of the Epic HILIC phases.

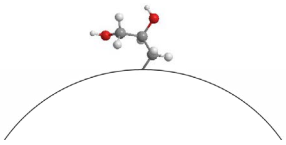
HPLC analysis of highly polar compounds – dehydroascorbic acid (DHAA) and ascorbic acid (AA) using Epic HILIC POH, 150 x 2.1 mm, 3µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic HILIC POH	100	2.1	1.8	**522A91-EHIC-POH**
Epic HILIC POH	100	3.0	3	**123191-EHIC-POH**
Epic HILIC POH	100	3.0	5	**123291-EHIC-POH**
Epic HILIC POH	100	4.6	3	**125191-EHIC-POH**
Epic HILIC POH	150	2.1	1.8	**532A91-EHIC-POH**
Epic HILIC POH	150	2.1	3	**132191-EHIC-POH**
Epic HILIC POH	150	3.0	3	**133191-EHIC-POH**
Epic HILIC POH	150	3.0	5	**133291-EHIC-POH**
Epic HILIC POH	150	4.6	3	**135191-EHIC-POH**
Epic HILIC POH	150	4.6	5	**135291-EHIC-POH**
Epic HILIC POH	250	4.6	5	**155291-EHIC-POH**
Epic HILIC POH Prep	250	10	5	**157291-EHIC-POH**
Epic HILIC POH Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EHIC-POH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic Diol



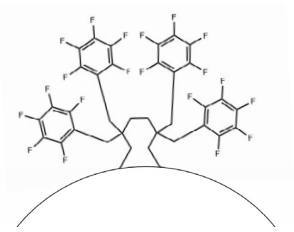
Epic Diol can be used for either reversed phase chromatography or normal phase chromatography. Epic Diol is less polar than silica and is highly water wettable. In addition, Epic Diol in many cases produces superior peak shape performance when compared to unbonded silica columns.

Epic Diol columns have been specifically developed for high performance chromatography. The combination of tight particle size control and our proprietary high-density bonding technology deliver superior performance for reversed phase or normal phase chromatography.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Diol	50	3.0	3	**113191-ED**
Epic Diol	50	4.6	3	**115191-ED**
Epic Diol	150	3.0	3	**133191-ED**
Epic Diol	150	4.6	5	**135291-ED**
Epic Diol	250	2.1	5	**152291-ED**
Epic Diol	250	4.6	5	**155291-ED**
Epic Diol Prep	150	20	5	**138291-ED**
Epic Diol Prep	150	30	5	**13N291-ED**
Epic Diol Prep	250	10	5	**157291-ED**
Epic Diol Prep	250	20	5	**158291-ED**
Epic Diol Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ED**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic HILIC FL

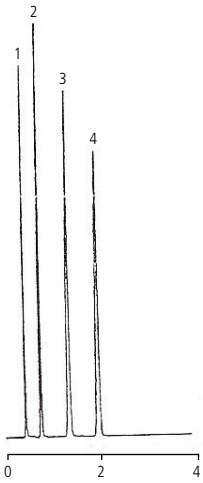


Epic HILIC FL is useful for retention and separation of polar and non-polar compounds that are not retained or separated on conventional reversed phase columns. It consists of a fluorinated based stationary phase bound to silica. This composition provides for excellent retention and peak shape for polar halogenated, polar amines and polar aromatic compounds. Epic HILIC FL is specifically designed for HILIC chromatography and can achieve high performance separations, yield rugged methods and deliver long column lifetimes.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic HILIC FL	50	2.1	1.8	**512A91-EHIC-FL**
Epic HILIC FL	50	2.1	3	**112191-EHIC-FL**
Epic HILIC FL	100	2.1	1.8	**522A91-EHIC-FL**
Epic HILIC FL	100	4.6	5	**125291-EHIC-FL**
Epic HILIC FL	150	2.1	3	**132191-EHIC-FL**
Epic HILIC FL Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EHIC-FL**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of amphetamines using Epic HILIC FL, 50 x 2.1 mm, 1.8 µm.

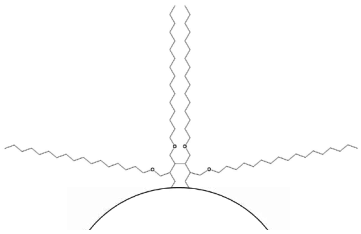


Peak Identification
1. MDA
2. Amphetamine
3. MDMA
4. Methamphetamine

Mobile phase: 10% 10 mM ammonium acetate in water
90% acetonitrile
Flow rate: 0.4 mL/min

Epic HILIC RP

Epic HILIC RP is a new stationary phase for a combination of HILIC and reverse phase chromatography. It is an excellent choice for samples containing polar and hydrophobic analytes.

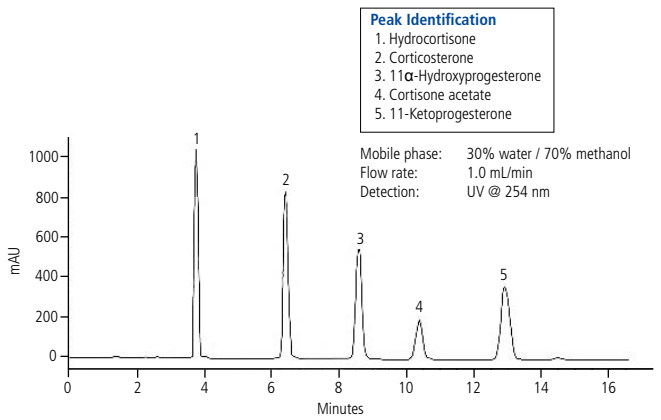


Epic HILIC RP is a combination of a polyhydroxylated polymer coated and bound to silica and C18 groups also bound to silica. This composition provides hydroxyl levels that are well above conventional hydroxyl and diol type stationary phases. Many of the commercial stationary phases used for HILIC chromatography are converted normal phase columns. These normal phase columns yield poor methods, poor separations and lack durability. Epic HILIC RP is specifically designed for HILIC chromatography and can achieve high performance separations, yield rugged methods and deliver long column lifetimes.

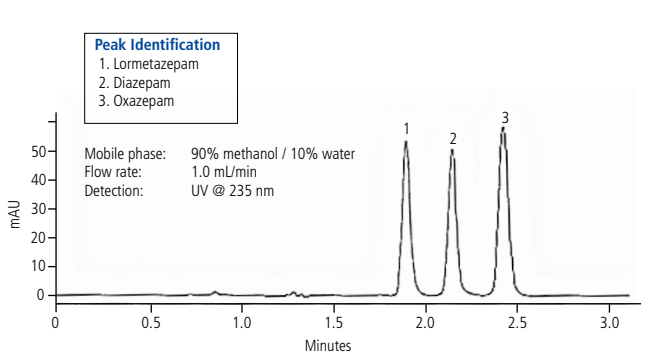
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic HILIC RP	50	2.1	3	**112191-EHRP**
Epic HILIC RP	100	2.1	3	**122191-EHRP**
Epic HILIC RP	100	3.0	3	**123191-EHRP**
Epic HILIC RP	100	3.0	5	**123291-EHRP**
Epic HILIC RP	100	4.6	3	**125191-EHRP**
Epic HILIC RP	150	2.1	3	**132191-EHRP**
Epic HILIC RP	150	3.0	3	**133191-EHRP**
Epic HILIC RP	150	3.0	5	**133291-EHRP**
Epic HILIC RP	150	4.6	3	**135191-EHRP**
Epic HILIC RP	150	4.6	5	**135291-EHRP**
Epic HILIC RP	200	4.6	3	**145191-EHRP**
Epic HILIC RP	250	4.6	5	**155291-EHRP**
Epic HILIC RP Prep	250	20	5	**158291-EHRP**
Epic HILIC RP Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EHRP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

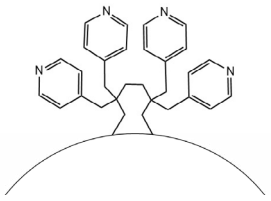
HPLC analysis of steroids using Epic HILIC RP, 250 x 4.6 mm, 5 µm.



HPLC analysis of benzodiazepines using Epic HILIC RP, 250 x 4.6 mm, 5 µm.



Epic HILIC PI

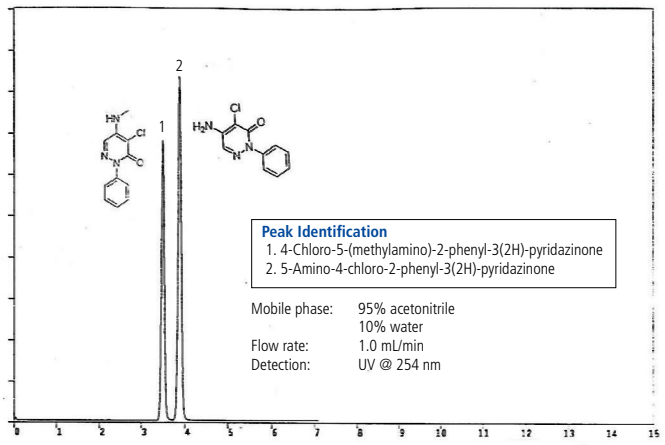


Epic HILIC PI is a new stationary phase for HILIC chromatography. It consists of an aromatic amine based stationary phase bound to silica. This composition provides for excellent retention and peak shape for polar amine compounds and superior retention of acids. Many of the commercially available HILIC stationary phases are converted normal phase columns. These normal phase columns yield poor methods, poor separations and lack durability. Epic HILIC PI is specifically designed for HILIC chromatography and can achieve high performance separations, yield rugged methods and deliver long column lifetimes.

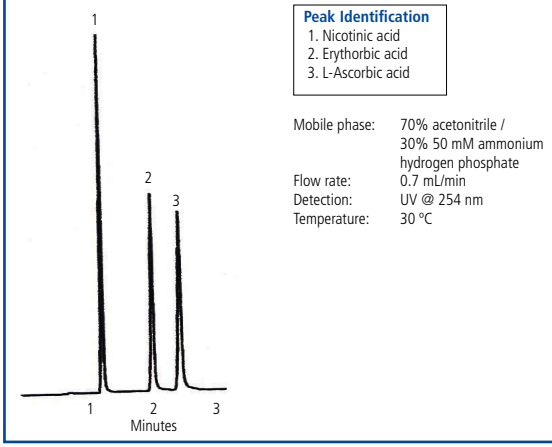
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic HILIC PI	50	2.1	1.8	**512A91-EHIC-PI**
Epic HILIC PI	50	2.1	3	**112191-EHIC-PI**
Epic HILIC PI	75	3.0	3	**19d191-EHIC-PI**
Epic HILIC PI	100	2.1	1.8	**522A91-EHIC-PI**
Epic HILIC PI	100	2.1	3	**122191-EHIC-PI**
Epic HILIC PI	100	4.6	5	**125291-EHIC-PI**
Epic HILIC PI	150	4.6	3	**135191-EHIC-PI**
Epic HILIC PI	250	4.6	5	**155291-EHIC-PI**
Epic HILIC PI Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EHIC-PI**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of amine containing heterocycles using Epic HILIC PI, 150 x 4.6 mm, 5 µm.

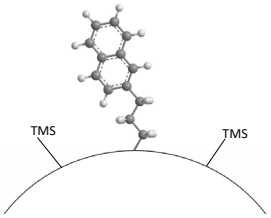


HPLC analysis of nicotinic acid, erythorbic acid and L-ascorbic acid using Epic HILIC PI, 50 x 2.1 mm, 1.8 µm.



Epic Naphthyl

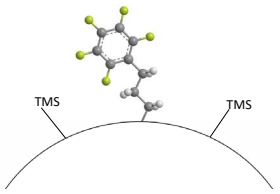
Epic Naphthyl is a naphthalene based material, with high bonding density and intrinsic base deactivation due to a rigid structure that also enables the shape selectivity needed for many diastereomeric separations. It exhibits strong π-π interaction and charge transfer interactions and performs well for diastereomer separations and non-polar compounds. The unique properties of Epic Naphthyl places its selectivity between graphitized carbon and alkyl type stationary phases.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Naphthyl	50	2.1	1.8	**512A91-ENAP**
Epic Naphthyl	50	2.1	3	**112191-ENAP**
Epic Naphthyl	50	2.1	5	**112291-ENAP**
Epic Naphthyl	50	3.0	1.8	**513A91-ENAP**
Epic Naphthyl	100	2.1	1.8	**522A91-ENAP**
Epic Naphthyl	100	2.1	3	**122191-ENAP**
Epic Naphthyl	100	2.1	5	**122291-ENAP**
Epic Naphthyl	100	4.6	3	**125191-ENAP**
Epic Naphthyl	150	2.1	3	**132191-ENAP**
Epic Naphthyl	150	2.1	5	**132291-ENAP**
Epic Naphthyl	150	4.6	3	**135191-ENAP**
Epic Naphthyl	150	4.6	5	**135291-ENAP**
Epic Naphthyl	250	4.6	5	**155291-ENAP**
Epic Naphthyl Prep	250	20	5	**158291-ENAP**
Epic Naphthyl prep	250	30	5	**15N291-ENAP**
Epic Naphthyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ENAP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic PFP LB

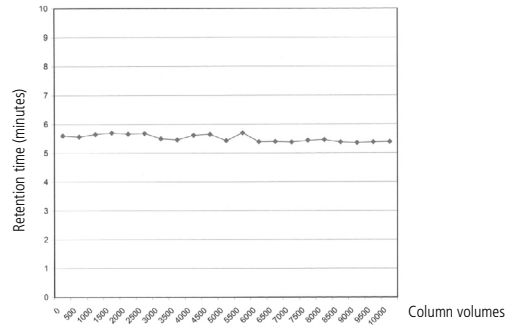


The Epic PFP LB (low bleed) is a pentafluorophenyl that has been baseline stabilized and is ready for high performance separations. The Epic PFP LB is a truly unique stationary phase with properties significantly different than C18 phases. This unique characteristic results from bonded pentafluorophenyl groups imparting a π-π electron interaction which produces an enhanced retention for many compounds, such as natural products, halogenated compounds, aromatics, conjugated compounds and trace impurities in complex matrices. Many of these high-performance separations were not possible with existing PFP columns especially in the area of trace impurities where baseline bleed levels were unacceptable. Epic PFP LB columns have been stabilized to provide low column bleed, increased lifetimes, better pH stability, and superior LC-MS performance.

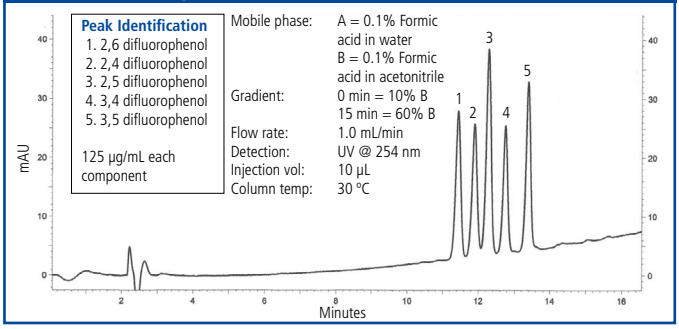
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic PFP LB	50	2.1	1.8	**512A91-EPFP-LB**
Epic PFP LB	50	2.1	3	**112191-EPFP-LB**
Epic PFP LB	50	2.1	5	**112291-EPFP-LB**
Epic PFP LB	50	4.6	5	**115291-EPFP-LB**
Epic PFP LB	100	2.1	1.8	**522A91-EPFP-LB**
Epic PFP LB	100	2.1	3	**122191-EPFP-LB**
Epic PFP LB	100	2.1	5	**122291-EPFP-LB**
Epic PFP LB	100	3.0	3	**123191-EPFP-LB**
Epic PFP LB	100	4.6	3	**125191-EPFP-LB**
Epic PFP LB	150	2.1	1.8	**532A91-EPFP-LB**
Epic PFP LB	150	2.1	3	**132191-EPFP-LB**
Epic PFP LB	150	2.1	5	**132291-EPFP-LB**
Epic PFP LB	150	4.6	3	**135191-EPFP-LB**
Epic PFP LB	150	4.6	5	**135291-EPFP-LB**
Epic PFP LB	250	4.6	5	**155291-EPFP-LB**
Epic PFP LB Prep	250	20	5	**158291-EPFP-LB**
Epic PFP LB Prep	250	30	5	**15N291-EPFP-LB**
Epic PFP LB Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EPFP-LB**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

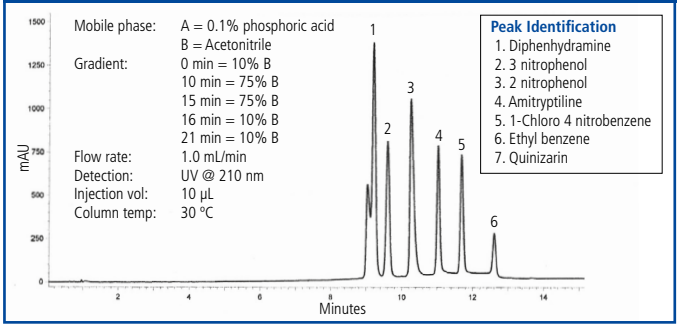
Column robustness studies of napthalene at pH 10 over 10,000 column volumes using Epic PFP LB, 250 x 4.6 mm, 5 µm.



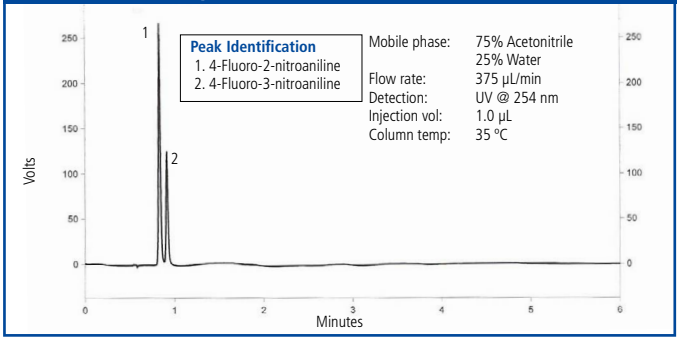
HPLC analysis of difluorophenols using Epic PFP LB, 150 x 4.6 mm, 5 µm.



HPLC analysis of aromatics using Epic PFP LB, 50 x 4.6 mm, 3 µm.

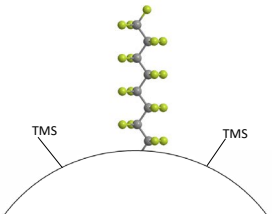


HPLC analysis of fluoro nitroanilines using Epic PFP LB, 100 x 2.1 mm, 1.8 µm.



Epic FO LB

The Epic FO LB is a baseline stabilized alkyl perfluorinated C8 (perfluorooctyl), with low bleed characteristics and is well suited to the separation of trace impurities, especially for halogenated analytes, lipophilic compounds and environmental samples.



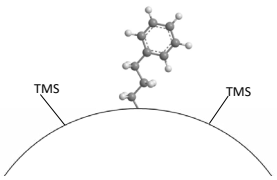
Fluorinated phases are able to perform many unique and difficult separations which cannot be performed on the best available C18 columns. Traditionally, fluorinated phases have suffered from poor column lifetimes, unstable baselines and column bleed, especially when used with mass spectrometry (MS). Epic FO LB has been stabilized to provide low column bleed, increased lifetimes, better pH stability, and superior LC-MS performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic FO LB	50	2.1	1.8	**512A91-EFO-LB**
Epic FO LB	50	2.1	3	**112191-EFO-LB**
Epic FO LB	100	2.1	1.8	**522A91-EFO-LB**
Epic FO LB	100	2.1	3	**122191-EFO-LB**
Epic FO LB	150	2.1	1.8	**532A91-EFO-LB**
Epic FO LB	150	2.1	3	**132191-EFO-LB**
Epic FO LB	150	3.0	3	**133191-EFO-LB**
Epic FO LB	150	4.6	3	**135191-EFO-LB**
Epic FO LB	150	4.6	5	**135291-EFO-LB**
Epic FO LB	250	4.6	5	**155291-EFO-LB**
Epic FO LB Prep	250	10	5	**157291-EFO-LB**
Epic FO LB Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EFO-LB**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic Phenyl

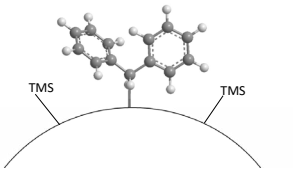
The Epic Phenyl phase is π-basic (electron donating) and is similar in overall retention to alkyl phases. The alternate selectivity exhibited by phenyl phases is explained by the π-π interactions available through the phenyl ring. Compounds that exhibit this alternate selectivity on the Epic Phenyl phase include antibiotics such as tetracycline, moderate bases such as anesthetics, some acidic compounds such as quinoline antibiotics and nucleosides. The Epic high-density bonding technology delivers superior performance, durability and enhanced lot-to-lot reproducibility. Epic Phenyl offers a truly superior phenyl-based interaction for enhanced chromatographic performance.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Phenyl	50	2.1	1.8	**512A91-EPH**
Epic Phenyl	50	2.1	3	**112191-EPH**
Epic Phenyl	50	2.1	5	**112291-EPH**
Epic Phenyl	100	2.1	1.8	**522A91-EPH**
Epic Phenyl	100	2.1	3	**122191-EPH**
Epic Phenyl	100	2.1	5	**122291-EPH**
Epic Phenyl	100	4.6	3	**125191-EPH**
Epic Phenyl	150	2.1	3	**132191-EPH**
Epic Phenyl	150	2.1	5	**132291-EPH**
Epic Phenyl	150	4.6	3	**135191-EPH**
Epic Phenyl	150	4.6	5	**135291-EPH**
Epic Phenyl	250	4.6	5	**155291-EPH**
Epic Phenyl Prep	250	20	5	**158291-EPH**
Epic Phenyl Prep	250	30	5	**15N291-EPH**
Epic Phenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Epic Diphenyl

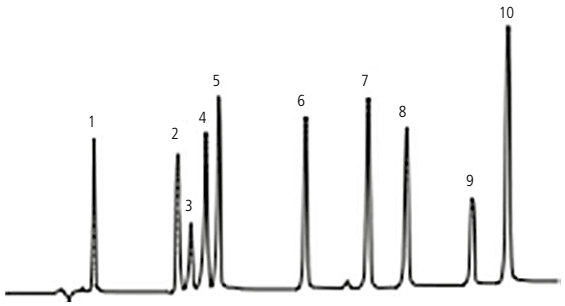


Epic Diphenyl bonded phase, with reduced hydrophobicity produces HPLC columns with novel selectivity, exhibiting increased speed and resolution, utilizes strong dipole-dipole hydrogen bonding and π-π mechanisms for different selectivity for compounds containing double bonds or aromatic functional groups. In addition, the diphenyl arrangement of the phase can also contribute to steric selectivity allowing for an additional chromatographic interaction. Epic Diphenyl is also highly selective for proteins with aromatic side chains. Epic Diphenyl utilizes our proprietary high-density bonding technology enabling superior performance, durability and enhanced lot-to-lot reproducibility.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Diphenyl	50	2.1	1.8	**512A91-EDPH**
Epic Diphenyl	50	2.1	3	**112191-EDPH**
Epic Diphenyl	50	2.1	5	**112291-EDPH**
Epic Diphenyl	100	2.1	1.8	**522A91-EDPH**
Epic Diphenyl	100	2.1	3	**122191-EDPH**
Epic Diphenyl	100	2.1	5	**122291-EDPH**
Epic Diphenyl	100	3.0	1.8	**513A91-EDPH**
Epic Diphenyl	100	4.6	3	**125191-EDPH**
Epic Diphenyl	150	2.1	3	**132191-EDPH**
Epic Diphenyl	150	2.1	5	**132291-EDPH**
Epic Diphenyl	150	4.6	3	**135191-EDPH**
Epic Diphenyl	150	4.6	5	**135291-EDPH**
Epic Diphenyl	250	4.6	5	**155291-EDPH**
Epic Diphenyl Prep	250	20	5	**158291-EDPH**
Epic Diphenyl Prep	250	30	5	**15N291-EDPH**
Epic Diphenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EDPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

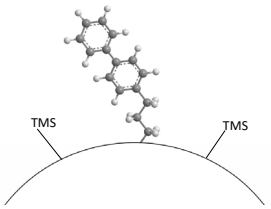
HPLC analysis of polar pharmaceutical compounds using Epic Diphenyl, 150 x 4.6 mm, 5 µm.



Peak Identification
1. Acetaminophen
2. Acetanilide
3. Salicylic acid
4. Acetylsalicylic acid
5. Phenacetin
6. Carbamazepine
7. Tolmetin
8. Naproxen
9. Ibuprofen
10. Diclofenac

Mobile phase: A: Water+0.1% HCOOH
B: MeCN+0.1% HCCOH
Gradient: 25-80% B in 20 min
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm
Column temp: 25 °C

Epic Biphenyl

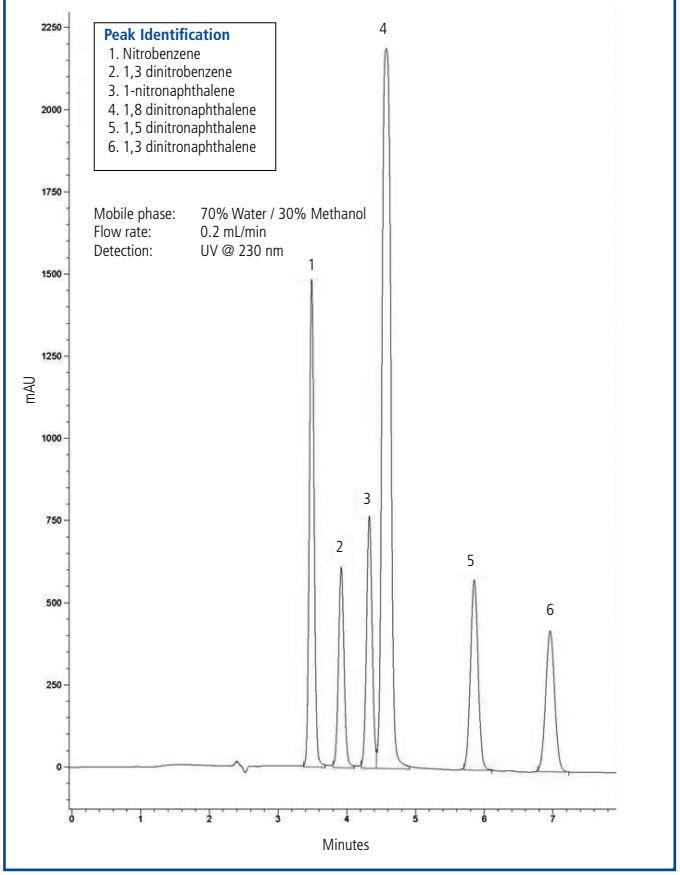


Epic Biphenyl is a truly unique stationary phase with properties significantly different than ODS phases. This unique character results from bonded biphenyl groups, covalently attached to high purity silica, imparting a π-π electron interaction which produces an enhanced retention for many compounds particularly those that contain polarizable electrons. Many classes of compounds contain polarizable electrons including halogenated compounds, aromatics, nitro aromatics and conjugated systems.

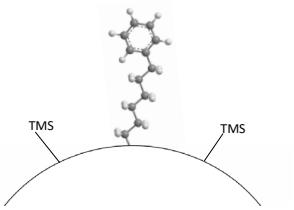
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Biphenyl	50	2.1	1.8	**512A91-EBPH**
Epic Biphenyl	50	2.1	3	**112191-EBPH**
Epic Biphenyl	50	2.1	5	**112291-EBPH**
Epic Biphenyl	50	3.0	1.8	**513A91-EBPH**
Epic Biphenyl	100	2.1	1.8	**522A91-EBPH**
Epic Biphenyl	100	2.1	3	**122191-EBPH**
Epic Biphenyl	100	2.1	5	**122291-EBPH**
Epic Biphenyl	100	4.6	3	**125191-EBPH**
Epic Biphenyl	150	2.1	1.8	**532A91-EBPH**
Epic Biphenyl	150	2.1	3	**132191-EBPH**
Epic Biphenyl	150	2.1	5	**132291-EBPH**
Epic Biphenyl	150	4.6	3	**135191-EBPH**
Epic Biphenyl	150	4.6	5	**135291-EBPH**
Epic Biphenyl	250	4.6	5	**155291-EBPH**
Epic Biphenyl Prep	150	30	5	**13N291-EBPH**
Epic Biphenyl Prep	250	20	5	**158291-EBPH**
Epic Biphenyl Prep	250	30	5	**15N291-EBPH**
Epic Biphenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EBPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of aromatic compounds using Epic Biphenyl, 100 x 2.1 mm, 1.8 µm.



Epic Phenyl-Hexyl

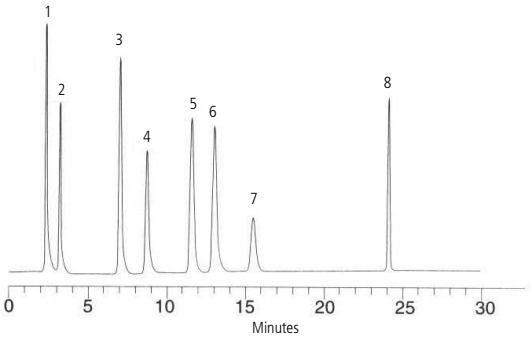


Epic Phenyl-Hexyl employs a 6-carbon (hexyl) linked phenyl phase bonded to high purity silica, where the hexyl alkyl chain delivers unique selectivity and increased hydrolytic stability when compared to propyl-linked phenyl phase chemistry. This retentive phase provides different selectivity to straight chain hydrocarbon phases like C6, C8 or C18, and it is especially useful for aromatic analytes, complex samples and polar pharmaceutical compounds. The Epic high-density bonding technology delivers to the chromatographer superior performance, durability, and enhanced lot-to-lot reproducibility. Epic Phenyl-Hexyl offers the chromatographer a truly superior phenyl-based interaction for enhanced chromatographic performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Epic Phenyl-Hexyl	50	2.1	1.8	**512A91-EPHX**
Epic Phenyl-Hexyl	50	2.1	3	**112191-EPHX**
Epic Phenyl-Hexyl	50	2.1	5	**112191-EPHX**
Epic Phenyl-Hexyl	50	4.0	3	**114191-EPHX**
Epic Phenyl-Hexyl	50	4.6	5	**115291-EPHX**
Epic Phenyl-Hexyl	75	2.1	3	**192191-EPHX**
Epic Phenyl-Hexyl	75	3.0	3	**193191-EPHX**
Epic Phenyl-Hexyl	75	4.6	3	**195191-EPHX**
Epic Phenyl-Hexyl	100	2.1	1.8	**522A91-EPHX**
Epic Phenyl-Hexyl	100	2.1	3	**122191-EPHX**
Epic Phenyl-Hexyl	100	2.1	5	**122291-EPHX**
Epic Phenyl-Hexyl	100	3.0	3	**123191-EPHX**
Epic Phenyl-Hexyl	100	4.6	3	**125191-EPHX**
Epic Phenyl-Hexyl	150	2.1	3	**132191-EPHX**
Epic Phenyl-Hexyl	150	2.1	5	**132291-EPHX**
Epic Phenyl-Hexyl	150	3	3	**133191-EPHX**
Epic Phenyl-Hexyl	150	4.6	3	**135191-EPHX**
Epic Phenyl-Hexyl	150	4.6	5	**135291-EPHX**
Epic Phenyl-Hexyl	250	4.0	5	**154291-EPHX**
Epic Phenyl-Hexyl	250	4.6	10	**155391-EPHX**
Epic Phenyl-Hexyl	250	4.6	3	**155191-EPHX**
Epic Phenyl-Hexyl	250	4.6	5	**155291-EPHX**
Epic Phenyl-Hexyl Prep	250	20	5	**158291-EPHX**
Epic Phenyl-Hexyl Prep	250	30	5	**15N291-EPHX**
Epic Phenyl-Hexyl Prep	250	20	10	**158391-EPHX**
Epic Phenyl-Hexyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-EPHX**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

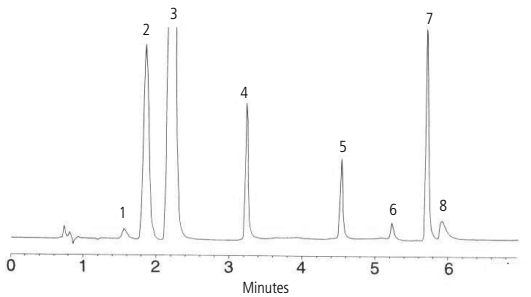
HPLC analysis of food additives using Epic Phenyl-Hexyl, 150 x 4.6 mm, 5 µm.



Peak Identification
1. Saccharin
2. p-Hydroxybenzoic acid
3. Soric acid
4. p-Hydroxybenzoic acid methyl ester
5. Dehydroacetic acid
6. p-Toluic acid
7. p-Hydroxybenzoic acid ethyl ester
8. n-Propyl p-hydroxybenzoate

Mobile phase: A: 50 mM KH_2PO_4 + 0.1% H_3PO_4
B: Acetonitrile
Gradient: A/B (75:25) to A/B (25:75) in 18min, hold at A/B (25:75) for 12min
Flow rate: 1.0 mL/min
Detection: UV @ 230 nm
Injection vol: 5 µL

HPLC analysis of polar pharmaceutical compounds using Epic Phenyl-Hexyl, 50 x 4.6 mm, 3 µm.



Peak Identification
1. P-Aminophenol
2. Benzoic acid
3. Acetaminophen
4. Pseudoephedrine
5. Butyl paraben
6. Chlorpheniramine
7. Diphenhydramine
8. Dextromethorpha

Mobile phase: A: Acetonitrile
B: Methanol/20 mM KH_2PO_4 (80:20)
A/B (0:100) to A/B (80:20) in 5min
Flow rate: 1.3 mL/min
Detection: UV @ 214 nm
Injection vol: 5 µL

Clone LC Columns

Legacy methods, by their very nature, often use older column technologies. These older phases can be accompanied by larger variations in batch to batch performance which can lead to inconsistent results and cause out of specification (OOS) occurrences. With routine analysis, often completed with compliant procedures, any unplanned down to investigate OOS instances can impact productivity. Our range of clone phases offer a cost-effective comparable alternative to many of the older leading brands, whilst ensuring consistency and stability in analysis.

Our product line is fully scalable from analytical to preparative columns, please enquire for more information.

Features and Benefits

- Cost effective and comparable alternative to older leading brands to support legacy methods
- Better lot-to-lot reproducibility due to more stable production methods, especially when compared to very old brands

Material Characteristics

Brand*	Phase**	Third Party Equivalent	Particle Size (µm)	USP Code
Aviator™	C18	Avantor ACE®	3, 5	L1
Chromega Z™	C18	Agilent Zorbax® RX	3, 5	L1
Chromegabond® HC	C18 C8	Nouryon Kromasil®	3, 5, 7, 10 3, 5, 7, 10	L1 L7
Chromegabond® Ultra	C18 C8	Beckman Ultrasphere®	3, 5 3, 5	L1 L7
DeactiSil™	ODS2 ODS3	GL Sciences Inertsil®	5, 10 3, 5	L1 L1
Harmony™	C18	Waters Symmetry®	3.5, 5, 10	L1
HarmonySecure™	RP18	Waters SymmetryShield™	3.5, 5	L1
HyperSelect™ BDS	C18	Thermo Hypersil®	3, 5	L1
HyperSelect™	ODS C18 ODS2 C18	Thermo Hypersil®	3, 5, 10 3, 5	L1 L1
Micropak™	C18	Waters µBondapak®	5, 10	L1
Neptune™	dC18	Waters Atlantis™	3, 5	L1
Partisep™	ODS3	Whatman Partisil™	5, 10	L1
Sonoma™	C18(2)	Phenomenex Luna®	3, 5, 10, 15	L1
Spherisep™	ODS1 ODS2	Waters Spherisorb®	3, 5, 10 3, 5, 10	L1 L1
StarRise™	C18	Waters SunFire™	2.5, 3.5, 5, 10	L1

*Other brand alternatives are also available including HyperSelect Gold (Hypersil Gold alternative) and HyperSelect HiPurity (Hypersil HyPurity alternative), etc. Please enquire for more details at LCA.TechSupport@perkinelmer.com

**Preparative columns of these phases are also available. Please enquire for more details at LCA.TechSupport@perkinelmer.com

Aviator C18 Columns

The Aviator line exhibits equivalent selectivity to Avantor ACE® HPLC columns. Aviator C18 provides a rugged, reproducible starting point for method development and applications with analytes differing in hydrophobicity, polar, moderately polar and non-polar analytes, uncharged acids and bases, ionized acids or bases using ion-pairing. Other Aviator phases are also available including AQ, C8, C4, Cyano and Phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part No.
Aviator C18	30	2.1	3	100	**182121-AVI-C18**
Aviator C18	30	4.6	3	300	**185131-AVI-C18**
Aviator C18	50	2.1	3	100	**112121-AVI-C18**
Aviator C18	50	2.1	5	100	**112221-AVI-C18**
Aviator C18	50	4.6	3	100	**115121-AVI-C18**
Aviator C18	75	3.0	3	100	**193121-AVI-C18**
Aviator C18	75	4.6	3	100	**195121-AVI-C18**
Aviator C18	100	4.6	3	100	**125121-AVI-C18**
Aviator C18	100	4.6	3	300	**125131-AVI-C18**
Aviator C18	100	4.6	5	100	**125221-AVI-C18**
Aviator C18	100	4.6	5	300	**125231-AVI-C18**
Aviator C18	150	2.1	5	100	**132221-AVI-C18**
Aviator C18	150	3.0	3	100	**133121-AVI-C18**
Aviator C18	150	3.0	5	300	**133231-AVI-C18**
Aviator C18	150	4.6	3	100	**135121-AVI-C18**
Aviator C18	150	4.6	3	300	**135131-AVI-C18**
Aviator C18	150	4.6	5	100	**135221-AVI-C18**
Aviator C18	150	4.6	5	300	**135231-AVI-C18**
Aviator C18	250	3.0	5	300	**153231-AVI-C18**
Aviator C18	250	4.0	5	100	**154221-AVI-C18**
Aviator C18	250	4.6	5	100	**155221-AVI-C18**
Aviator C18	250	4.6	5	300	**155231-AVI-C18**
Aviator C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	100	**500101-AVI-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromega Z C18 Columns

Chromega Z C18 HPLC Columns exhibit equivalent selectivity and peak symmetry to Agilent Zorbax RX C18 HPLC columns. Other Chromega Z phases are also available including C8 and Phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromega Z C18	50	4.6	3	**115171-ZC18**
Chromega Z C18	100	4.6	3	**125171-ZC18**
Chromega Z C18	100	4.6	5	**125271-ZC18**
Chromega Z C18	150	4.6	3	**135171-ZC18**
Chromega Z C18	150	4.6	5	**135271-ZC18**
Chromega Z C18	250	4.6	5	**155271-ZC18**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond HC C18 Columns

Chromegabond HC C18 is a non-end capped C18 stationary phase with 22% monomerically bonded carbon, producing a highly retentive column. The dense high carbon coverage forms a hydrophobic shield and prevent underlying silica support interactions with solutes. The Chromegabond HC phases are the commercial equivalent of Nouryon Kromasil®. Other Chromegabond HC phases are also available including C8 and Phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond HC C18	100	4.0	5	**124221-HC-C18**
Chromegabond HC C18	100	4.6	3	**125121-HC-C18**
Chromegabond HC C18	100	4.6	5	**125221-HC-C18**
Chromegabond HC C18	125	4.0	7	**104421-HC-C18**
Chromegabond HC C18	125	4.6	7	**105421-HC-C18**
Chromegabond HC C18	150	4.0	3	**134121-HC-C18**
Chromegabond HC C18	150	4.0	5	**134221-HC-C18**
Chromegabond HC C18	150	4.6	3	**135121-HC-C18**
Chromegabond HC C18	150	4.6	5	**135221-HC-C18**
Chromegabond HC C18	250	2.1	3	**152121-HC-C18**
Chromegabond HC C18	250	4.6	3	**155121-HC-C18**
Chromegabond HC C18	250	4.6	5	**155221-HC-C18**
Chromegabond HC C18	300	4.0	7	**164421-HC-C18**
Chromegabond HC C18 Prep	250	10	5	**157221-HC-C18**
Chromegabond HC C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-HC-C18**
Chromegabond HC C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HC-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond HC C8 Columns

Chromegabond HC C8 is a C8 stationary phase with high % bonded carbon. The Chromegabond HC phases are the commercial equivalent of Nouryon Kromasil®. Other Chromegabond HC phases are also available including C18 and Phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond HC C8	100	4.6	3	**125121-HC-C8**
Chromegabond HC C8	100	4.6	5	**125221-HC-C8**
Chromegabond HC C8	150	4.6	3	**135121-HC-C8**
Chromegabond HC C8	150	4.6	5	**135221-HC-C8**
Chromegabond HC C8	250	4.6	10	**155321-HC-C8**
Chromegabond HC C8	250	4.6	5	**155221-HC-C8**
Chromegabond HC C8 Prep	250	50	10	**15F321-HC-C8**
Chromegabond HC C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HC-C8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond Ultra C18 Columns

The Chromegabond Ultra™ line is an equivalent to the Beckman Ultrasphere® columns. The most popular material, Ultra C18, is a 12% carbon load material. Excellent efficiencies, peak shape and resolution are obtained for virtually all Ultrasphere® HPLC applications. Other Chromegabond Ultra phases are also available including C8, cyano and silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond Ultra C18	75	4.6	3	**195171-ULC18**
Chromegabond Ultra C18	100	4.6	3	**125171-ULC18**
Chromegabond Ultra C18	100	4.6	5	**125271-ULC18**
Chromegabond Ultra C18	150	2.1	5	**132271-ULC18**
Chromegabond Ultra C18	150	4.6	3	**135171-ULC18**
Chromegabond Ultra C18	150	4.6	5	**135271-ULC18**
Chromegabond Ultra C18	250	4.6	5	**155271-ULC18**
Chromegabond Ultra C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-ULC18**
Chromegabond Ultra C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ULC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond Ultra C8 Columns

The Chromegabond Ultra™ line is an equivalent to the Beckman Ultrasphere® columns. Chromegabond Ultra C8 is exhaustively endcapped. Excellent efficiencies, peak shape and resolution are obtained for virtually all Ultrasphere® HPLC applications. Other Chromegabond Ultra phases are also available including C18, cyano and silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond Ultra C8	75	4.6	3	**195171-ULC8**
Chromegabond Ultra C8	150	3.0	3	**133171-ULC8**
Chromegabond Ultra C8	150	4.6	5	**135271-ULC8**
Chromegabond Ultra C8	250	4.6	5	**155271-ULC8**
Chromegabond Ultra C8 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-ULC8**
Chromegabond Ultra C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-ULC8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

DeactiSil ODS2 Columns

DeactiSil™ is an equivalent selectivity to the GL Sciences Inertsil® HPLC column. Many chromatographers use DeactiSil when looking for an Inertsil® alternative. DeactiSil will offer long column lifetime and excellent reproducibility. DeactiSil is engineered to the tightest specification and is available in large scale bulk. DeactiSil phases are available in ODS3 (C18), ODS2 (C18), ODS (C18), C8, and phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
DeactiSil ODS2	150	3.0	5	**1332D1-DS-ODS2**
DeactiSil ODS2	150	4.0	10	**1343D1-DS-ODS2**
DeactiSil ODS2	150	4.6	5	**1352D1-DS-ODS2**
DeactiSil ODS2	250	4.6	5	**1552D1-DS-ODS2**
DeactiSil ODS2 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-DS-ODS2**
DeactiSil ODS2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-DS-ODS2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Deactisil ODS3 Columns

DeactiSil™ is an equivalent selectivity to the GL Sciences Inertsil® HPLC column. Many chromatographers use DeactiSil when looking for an Inertsil® alternative. DeactiSil will offer long column lifetime and excellent reproducibility. DeactiSil is engineered to the tightest specification and is available in large scale bulk. DeactiSil phases are available in ODS3 (C18), ODS2 (C18), ODS (C18), C8, and phenyl. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
DeactiSil ODS3	50	3.0	3	**113121-DS-ODS3**
DeactiSil ODS3	50	4.6	5	**115221-DS-ODS3**
DeactiSil ODS3	100	4.0	3	**124121-DS-ODS3**
DeactiSil ODS3	100	4.6	3	**125121-DS-ODS3**
DeactiSil ODS3	150	4.0	5	**134221-DS-ODS3**
DeactiSil ODS3	150	4.6	3	**135121-DS-ODS3**
DeactiSil ODS3	150	4.6	5	**135221-DS-ODS3**
DeactiSil ODS3	250	4.6	5	**155221-DS-ODS3**
DeactiSil ODS3 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-DS-ODS3**
DeactiSil ODS3 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-DS-ODS3**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

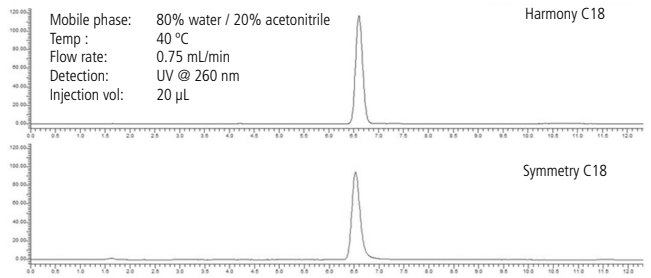
Harmony C18 Columns

Harmony™ C18 is an identical selectivity to the Waters Symmetry® C18 HPLC column. Many chromatographers use Harmony when looking for a Symmetry equivalent. Harmony will offer long column lifetime, provide excellent reproducibility, and is engineered to the tightest specifications. It is also available in large scale bulk. Other Harmony phases are also available including C8 and C4. Please enquire for more information.

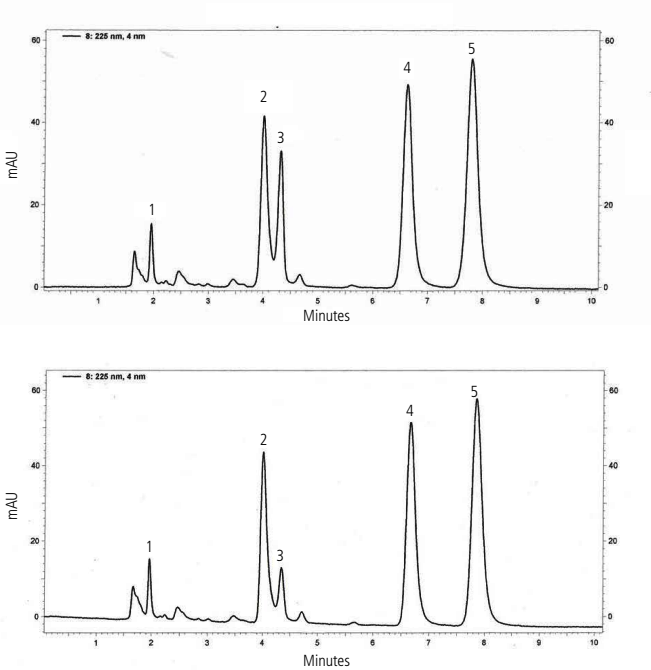
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part No.
Harmony C18	50	2.1	3.5	100	**112121-HRM-C18**
Harmony C18	50	4.0	3.5	100	**114121-HRM-C18**
Harmony C18	50	4.6	3.5	100	**115121-HRM-C18**
Harmony C18	50	4.6	5	300	**115231-HRM-C18**
Harmony C18	75	4.0	5	100	**194221-HRM-C18**
Harmony C18	75	4.6	3.5	100	**195121-HRM-C18**
Harmony C18	75	4.6	5	100	**195221-HRM-C18**
Harmony C18	100	3.0	3.5	100	**123121-HRM-C18**
Harmony C18	100	4.0	3.5	100	**124121-HRM-C18**
Harmony C18	100	4.6	3.5	100	**125121-HRM-C18**
Harmony C18	100	4.6	3.5	300	**125131-HRM-C18**
Harmony C18	100	4.6	5	100	**125221-HRM-C18**
Harmony C18	100	4.6	5	300	**125231-HRM-C18**
Harmony C18	150	2.1	3.5	300	**132131-HRM-C18**
Harmony C18	150	2.1	5	100	**132221-HRM-C18**
Harmony C18	150	3.0	3.5	100	**133121-HRM-C18**
Harmony C18	150	3.0	5	100	**133221-HRM-C18**
Harmony C18	150	3.9	5	100	**13e221-HRM-C18**
Harmony C18	150	4.0	5	100	**134221-HRM-C18**
Harmony C18	150	4.0	5	300	**134231-HRM-C18**
Harmony C18	150	4.6	3.5	100	**135121-HRM-C18**
Harmony C18	150	4.6	3.5	300	**135131-HRM-C18**
Harmony C18	150	4.6	5	100	**135221-HRM-C18**
Harmony C18	150	4.6	5	300	**135231-HRM-C18**
Harmony C18	250	2.1	5	300	**152231-HRM-C18**
Harmony C18	250	4.6	5	100	**155221-HRM-C18**
Harmony C18	250	4.6	5	300	**155231-HRM-C18**
Harmony C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	100	**500103-HRM-C18**
Harmony C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	100	**500101-HRM-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of fluconazole using Harmony C18 (top) and Symmetry C18 (bottom), 150 x 4.6 mm, 5 µm.



HPLC analysis of various compounds using Harmony C18 (top) and Symmetry C18 (bottom), 150 x 4.6 mm, 5 µm.



Peak Identification
1. Norepehederine
2. Nortriptyline
3. Toluene
4. Imipramine
5. Amitriptyline

HarmonySecure RP18 Columns

HarmonySecure™ is an equivalent to Waters SymmetryShield™ HPLC column. HarmonySecure RP18 utilizes polar embedded technology for superior HPLC analysis. The structure of polar embedded phases inherently incorporates a hydrophilic layer between the silica surface and the reversed-phase layer. The generated hydrophilic layer delivers outstanding peak shape performance and unique selectivity for many separations. Other HarmonySecure phases are also available including RP8. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
HarmonySecure RP18	50	2.1	3.5	**112121-HRS-RP18**
HarmonySecure RP18	50	2.1	5	**112221-HRS-RP18**
HarmonySecure RP18	50	4.6	3.5	**115121-HRS-RP18**
HarmonySecure RP18	50	4.6	5	**115221-HRS-RP18**
HarmonySecure RP18	75	4.6	3.5	**195121-HRS-RP18**
HarmonySecure RP18	100	2.1	3.5	**122121-HRS-RP18**
HarmonySecure RP18	100	4.6	3.5	**125121-HRS-RP18**
HarmonySecure RP18	150	2.1	3.5	**132121-HRS-RP18**
HarmonySecure RP18	150	2.1	5	**132221-HRS-RP18**
HarmonySecure RP18	150	3.0	3.5	**133121-HRS-RP18**
HarmonySecure RP18	150	3.0	5	**133221-HRS-RP18**
HarmonySecure RP18	150	3.9	5	**13e221-HRS-RP18**
HarmonySecure RP18	150	4.6	3.5	**135121-HRS-RP18**
HarmonySecure RP18	150	4.6	5	**135221-HRS-RP18**
HarmonySecure RP18	250	4.0	5	**154221-HRS-RP18**
HarmonySecure RP18	250	4.6	5	**155221-HRS-RP18**
HarmonySecure RP18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-HRS-RP18**
HarmonySecure RP18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HRS-RP18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HyperSelect ODS C18 Columns

The HyperSelect line is an equivalent to Thermo Fisher Hypersil™. Excellent efficiencies, peak shape and resolution are obtained for virtually all Hypersil HPLC applications from high quality HyperSelect HPLC columns. The Hyperselect ODS C18 is a non-endcapped octadecyl material.

In addition to the ODS C18, HyperSelect is available as BDS-C18, BDS-C8, endcapped C8, non-endcapped C8, endcapped phenyl, non- endcapped phenyl, silica, TMS, amino, non-endcapped cyano, endcapped cyano, SAX and SCX. Other brand alternatives are also available including HyperSelect Gold (Hypersil Gold alternative) and HyperSelect HiPurity (Hypersil HyPurity alternative). Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
HyperSelect ODS	75	4.0	5	**194291-HPC-ODS**
HyperSelect ODS	100	2.1	3	**122191-HPC-ODS**
HyperSelect ODS	100	2.1	5	**122291-HPC-ODS**
HyperSelect ODS	100	4.0	3	**124191-HPC-ODS**
HyperSelect ODS	100	4.0	5	**124291-HPC-ODS**
HyperSelect ODS	100	4.6	3	**125191-HPC-ODS**
HyperSelect ODS	100	4.6	5	**125291-HPC-ODS**
HyperSelect ODS	120	4.0	5	**1D4291-HPC-ODS**
HyperSelect ODS	125	4.0	5	**104291-HPC-ODS**
HyperSelect ODS	125	4.6	5	**105291-HPC-ODS**
HyperSelect ODS	150	2.1	3	**132191-HPC-ODS**
HyperSelect ODS	150	2.1	5	**132291-HPC-ODS**
HyperSelect ODS	150	3.9	5	**13e291-HPC-ODS**
HyperSelect ODS	150	4.0	5	**134291-HPC-ODS**
HyperSelect ODS	150	4.6	3	**135191-HPC-ODS**
HyperSelect ODS	150	4.6	5	**135291-HPC-ODS**
HyperSelect ODS	200	4.6	10	**145391-HPC-ODS**
HyperSelect ODS	200	4.6	5	**145291-HPC-ODS**
HyperSelect ODS	250	4.0	5	**154291-HPC-ODS**
HyperSelect ODS	250	4.6	3	**155191-HPC-ODS**
HyperSelect ODS	250	4.6	5	**155291-HPC-ODS**
HyperSelect ODS	300	3.9	5	**16e291-HPC-ODS**
HyperSelect ODS	300	4.0	10	**164391-HPC-ODS**
HyperSelect ODS	300	4.0	5	**164291-HPC-ODS**
HyperSelect ODS Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-HPC-ODS**
HyperSelect ODS Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HPC-ODS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HyperSelect ODS2 C18 Columns

The HyperSelect line is an equivalent to Thermo Fisher Hypersil. The Hyperselect ODS2 C18 is an endcapped octadecyl material. Excellent efficiencies, peak shape and resolution are obtained for virtually all Hypersil HPLC applications from high quality HyperSelect HPLC columns. Range of particle sizes offers versatility for capillary and LC/MS to prep and process scale applications.

In addition to the ODS2 C18, HyperSelect is available as ODS1 C18, BDS-C18, BDS-C8, endcapped C8, non-endcapped C8, endcapped phenyl, non- endcapped phenyl, silica, TMS, amino, non-endcapped cyano, endcapped cyano, SAX and SCX. Other brand alternatives are also available including HyperSelect Gold (Hypersil Gold alternative) and HyperSelect HiPurity (Hypersil HyPurity alternative). Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
HyperSelect ODS2	50	4.6	5	**115291-HPC-ODS2**
HyperSelect ODS2	100	4.6	5	**125291-HPC-ODS2**
HyperSelect ODS2	150	4.6	5	**135271-HPC-ODS2**
HyperSelect ODS2	150	4.6	5	**135271-HPC-ODS2**
HyperSelect ODS2	250	2.1	5	**152291-HPC-ODS2**
HyperSelect ODS2	250	4.6	3	**155171-HPC-ODS2**
HyperSelect ODS2	250	4.6	5	**155271-HPC-ODS2**
HyperSelect ODS2	250	4.6	5	**155271-HPC-ODS2**
HyperSelect ODS2 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-HPC-ODS2**
HyperSelect ODS2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HPC-ODS2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HyperSelect BDS C18 Columns

The HyperSelect line is an alternative to Thermo Fisher Hypersil. The Hyperselect BDS C18 is a base deactivated C18 material. Excellent efficiencies, peak shape and resolution are obtained for virtually all Hypersil HPLC applications from high quality HyperSelect HPLC columns.

In addition to the BDS C18, HyperSelect is available as ODS C18, ODS2 C18, BDS-C8, endcapped C8, non-endcapped C8, endcapped phenyl, non- endcapped phenyl, silica, TMS, amino, non-endcapped cyano, endcapped cyano, SAX and SCX. Other brand alternatives are also available including HyperSelect Gold (Hypersil Gold alternative) and HyperSelect HiPurity (Hypersil HyPurity alternative). Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
HyperSelect BDS C18	50	2.1	3	**112191-HPC-BDSC18**
HyperSelect BDS C18	50	4.6	3	**115191-HPC-BDSC18**
HyperSelect BDS C18	100	4.0	3	**124191-HPC-BDSC18**
HyperSelect BDS C18	100	4.6	3	**125191-HPC-BDSC18**
HyperSelect BDS C18	100	4.6	5	**125291-HPC-BDSC18**
HyperSelect BDS C18	150	2.1	3	**132191-HPC-BDSC18**
HyperSelect BDS C18	150	4.6	3	**135191-HPC-BDSC18**
HyperSelect BDS C18	150	4.6	5	**135291-HPC-BDSC18**
HyperSelect BDS C18	250	4.0	5	**154291-HPC-BDSC18**
HyperSelect BDS C18	250	4.6	3	**155191-HPC-BDSC18**
HyperSelect BDS C18	250	4.6	5	**155291-HPC-BDSC18**
HyperSelect BDS C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-HPC-BDSC18**
HyperSelect BDS C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-HPC-BDSC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Micropak C18 Columns

Micropak columns closely match the performance of Waters µBondapak columns with equivalent selectivity and peak symmetry. These materials are available in both the standard µBondapak 10µm particle size as well as a 5µm size for both shorter run times and higher efficiencies. Most methodologies on µBondapak HPLC columns can be transferred to these products without modification, including USP applications. Other Micropak phases are also available including C8, cyano, amino (NH2), phenyl and silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Micropak C18	100	8.0	5	**129291-MPK-C18**
Micropak C18	150	3.9	10	**134391-MPK-C18**
Micropak C18	150	3.9	5	**13e291-MPK-C18**
Micropak C18	150	4.0	5	**134291-MPK-C18**
Micropak C18	150	4.6	10	**135391-MPK-C18**
Micropak C18	150	4.6	5	**135291-MPK-C18**
Micropak C18	250	4.6	10	**155391-MPK-C18**
Micropak C18	250	4.6	5	**155291-MPK-C18**
Micropak C18	300	3.9	10	**16e391-MPK-C18**
Micropak C18	300	3.9	5	**16e291-MPK-C18**
Micropak C18	300	4.0	10	**164391-MPK-C18**
Micropak C18	300	4.0	5	**164291-MPK-C18**
Micropak C18	300	4.6	10	**165391-MPK-C18**
Micropak C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-MPK-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Neptune dC18 Columns

The Neptune™ line is an alternative to Waters Atlantis®. Neptune dC18 is an alternative to the Waters Atlantis® dC18 material for reverse phase chromatography. In many cases Neptune has shown better retention and a longer column lifetime than the Atlantis. Enhanced polar compounds will be retained with complete compatibility with aqueous mobile phases. Excellent for LC/MS and gradient research. Other Neptune phases are also available including T3 and HILIC Silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Neptune dC18	50	2.1	3	**112121-NPN-dC18**
Neptune dC18	75	4.6	5	**195221-NPN-dC18**
Neptune dC18	100	2.1	3	**122121-NPN-dC18**
Neptune dC18	100	4.6	5	**125221-NPN-dC18**
Neptune dC18	150	2.1	3	**132121-NPN-dC18**
Neptune dC18	150	2.1	5	**132221-NPN-dC18**
Neptune dC18	150	4.6	3	**135121-NPN-dC18**
Neptune dC18	150	4.6	5	**135221-NPN-dC18**
Neptune dC18	250	4.0	5	**154221-NPN-dC18**
Neptune dC18	250	4.6	5	**155221-NPN-dC18**
Neptune dC18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-NPN-dC18**
Neptune dC18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-NPN-dC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Partisep ODS3 Columns

Partisep columns closely match the selectivity and performance of GE Whatman Partisil® columns. Most methodologies on Partisil HPLC columns can be transferred to Partisep products without modification, including USP applications. Partisep ODS3 closely matches the selectivity and performance of Partisil ODS3 columns. Other Partisep phases are also available including ODS, ODS2, C8, PAC, SAX and silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Partisep ODS3	100	4.6	5	**125271-PSP-ODS3**
Partisep ODS3	150	4.6	5	**135271-PSP-ODS3**
Partisep ODS3	250	4.6	10	**155371-PSP-ODS3**
Partisep ODS3	250	4.6	5	**155271-PSP-ODS3**
Partisep ODS3 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-PSP-ODS3**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

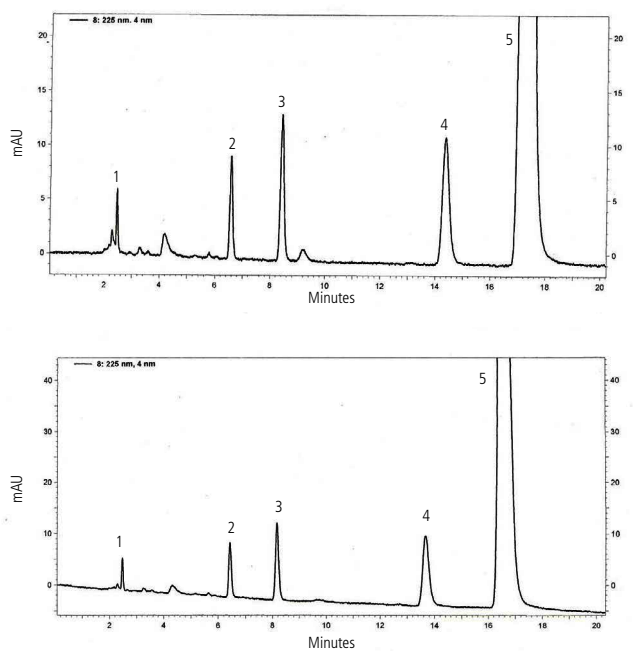
Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Sonoma C18(2) Columns

The Sonoma line is an equivalent to Phenomenex Luna™. Excellent efficiencies, peak shape and resolution are obtained for virtually all Luna™ HPLC applications from high quality Sonoma HPLC columns. A range of particle sizes offers versatility for capillary and LC/MS to prep and process scale applications. Sonoma C18(2), the most popular phase, is equivalent to Luna C18(2). Available in 3µm and 5µm particle sizes, with bulk and preparative material available. Other Sonoma phases are also available including C18, C5, C8, C8(2), Cyano, HILIC, NH2 (amino), PFP(2), Phenyl-Hexyl and Silica(2). Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Sonoma C18(2)	30	2.1	3	**182121-SMA-C18(2)**
Sonoma C18(2)	50	2.1	10	**112321-SMA-C18(2)**
Sonoma C18(2)	50	2.1	3	**112121-SMA-C18(2)**
Sonoma C18(2)	50	2.1	5	**112221-SMA-C18(2)**
Sonoma C18(2)	50	3.0	3	**113121-SMA-C18(2)**
Sonoma C18(2)	50	3.0	5	**113221-SMA-C18(2)**
Sonoma C18(2)	50	4.6	3	**115121-SMA-C18(2)**
Sonoma C18(2)	50	4.6	5	**115221-SMA-C18(2)**
Sonoma C18(2)	75	4.0	3	**194121-SMA-C18(2)**
Sonoma C18(2)	75	4.0	5	**194221-SMA-C18(2)**
Sonoma C18(2)	75	4.6	3	**195121-SMA-C18(2)**
Sonoma C18(2)	75	4.6	5	**195221-SMA-C18(2)**
Sonoma C18(2)	100	2.1	3	**122121-SMA-C18(2)**
Sonoma C18(2)	100	2.1	5	**122221-SMA-C18(2)**
Sonoma C18(2)	100	4.6	3	**125121-SMA-C18(2)**
Sonoma C18(2)	100	4.6	5	**125221-SMA-C18(2)**
Sonoma C18(2)	150	2.1	3	**132121-SMA-C18(2)**
Sonoma C18(2)	150	2.1	5	**132221-SMA-C18(2)**
Sonoma C18(2)	150	3.0	5	**133221-SMA-C18(2)**
Sonoma C18(2)	150	4.0	10	**134321-SMA-C18(2)**
Sonoma C18(2)	150	4.0	3	**134121-SMA-C18(2)**
Sonoma C18(2)	150	4.0	5	**134221-SMA-C18(2)**
Sonoma C18(2)	150	4.6	15	**135B21-SMA-C18(2)**
Sonoma C18(2)	150	4.6	3	**135121-SMA-C18(2)**
Sonoma C18(2)	150	4.6	5	**135221-SMA-C18(2)**
Sonoma C18(2)	200	4.6	5	**145221-SMA-C18(2)**
Sonoma C18(2)	250	2.1	10	**152321-SMA-C18(2)**
Sonoma C18(2)	250	2.1	5	**152221-SMA-C18(2)**
Sonoma C18(2)	250	4.0	10	**154321-SMA-C18(2)**
Sonoma C18(2)	250	4.0	5	**154221-SMA-C18(2)**
Sonoma C18(2)	250	4.6	10	**155321-SMA-C18(2)**

HPLC analysis of a test mix using Sonoma C18(2) (top) and Luna C18(2) (bottom), 250 x 4.6 mm, 5 µm.



Peak Identification
1. Uracil
2. Toluene
3. Ethyl Benzene
4. Quinizarin
5. Amitriptyline

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Sonoma C18(2)	250	4.6	15	**155B21-SMA-C18(2)**
Sonoma C18(2)	250	4.6	3	**155121-SMA-C18(2)**
Sonoma C18(2)	250	4.6	5	**155221-SMA-C18(2)**
Sonoma C18(2)	300	3.9	10	**16e321-SMA-C18(2)**
Sonoma C18(2)	300	4.0	10	**164321-SMA-C18(2)**
Sonoma C18(2)	300	4.0	15	**164B21-SMA-C18(2)**
Sonoma C18(2)	300	4.6	15	**165B21-SMA-C18(2)**
Sonoma C18(2) Prep	150	20	5	**138221-SMA-C18(2)**
Sonoma C18(2) Prep	250	10	10	**157321-SMA-C18(2)**
Sonoma C18(2) Prep	250	10	5	**157221-SMA-C18(2)**
Sonoma C18(2) Prep	250	20	5	**158221-SMA-C18(2)**
Sonoma C18(2) Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-SMA-C18(2)**
Sonoma C18(2) Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-SMA-C18(2)**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

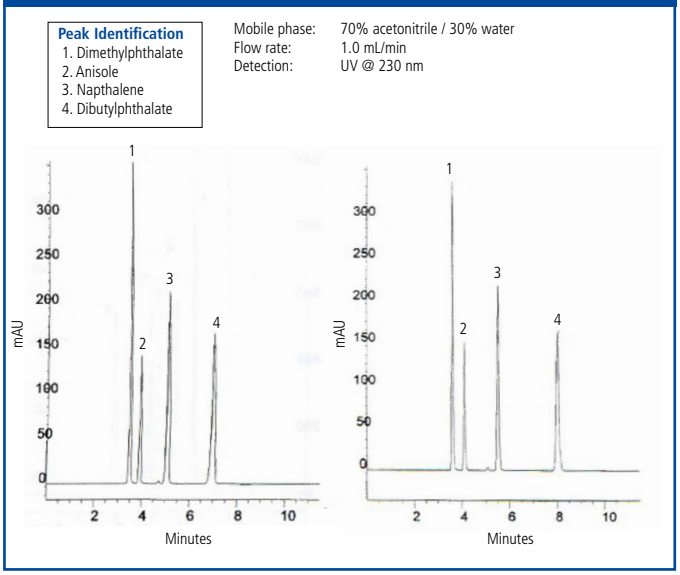
Spherisep ODS1 Columns

The Spherisep line is an equivalent to Waters Spherisorb®. The Spherisep ODS1 is an equivalent to Waters Spherisorb® ODS1. Excellent efficiencies, peak shape and resolution are obtained for virtually all Waters Spherisorb® HPLC applications from high quality Spherisep HPLC columns. Range of particle sizes offers versatility for capillary and LC/MS to prep and process scale applications. Other Spherisep phases are also available including C1, C6, C8, cyano, NH2, ODS2, ODSB, Phenyl, SAX and Silica. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Spherisep ODS1	100	4.6	5	**125271-SSP-ODS1**
Spherisep ODS1	125	4.0	3	**104171-SSP-ODS1**
Spherisep ODS1	125	4.6	5	**105271-SSP-ODS1**
Spherisep ODS1	150	4.0	5	**134271-SSP-ODS1**
Spherisep ODS1	150	4.6	3	**135171-SSP-ODS1**
Spherisep ODS1	150	4.6	5	**135271-SSP-ODS1**
Spherisep ODS1	200	4.6	10	**145371-SSP-ODS1**
Spherisep ODS1	250	3.0	4	**153871-SSP-ODS1**
Spherisep ODS1	250	4.0	10	**154371-SSP-ODS1**
Spherisep ODS1	250	4.0	5	**154271-SSP-ODS1**
Spherisep ODS1	250	4.6	5	**155271-SSP-ODS1**
Spherisep ODS1	300	4.0	5	**164271-SSP-ODS1**
Spherisep ODS1 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-SSP-ODS1**
Spherisep ODS1 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-SSP-ODS1**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of phthalates and other organics using Spherisep ODS1 (left) and Spherisorb ODS1 (right), 250 x 4.6 mm, 5 µm.



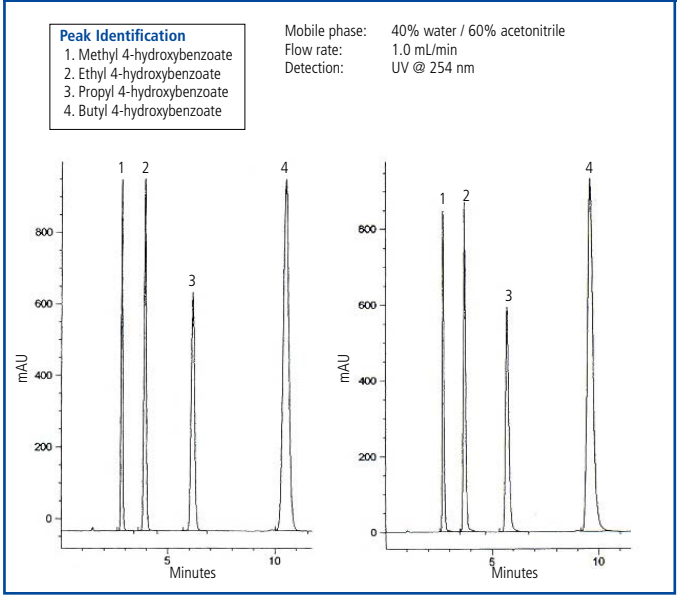
Spherisep ODS2 Columns

Our Spherisep™ line is an equivalent to Waters Spherisorb®. The most popular phase is the ODS2. PerkinElmer offer the Spherisep ODS2 column with equivalent selectivity in 3, 5 or 10 µm particles. Other Spherisep phases are also available including C1, C6, C8, cyano, NH2, ODS1, ODSB, Phenyl, SAX and Silica. Please enquire for more information.

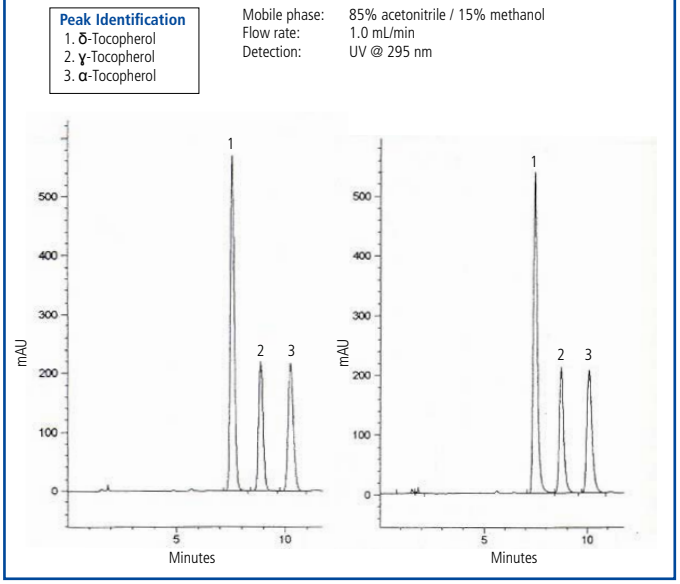
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Spherisep ODS2	30	4.6	5	**185271-SSP-ODS2**
Spherisep ODS2	50	4.6	3	**115171-SSP-ODS2**
Spherisep ODS2	50	4.6	5	**115271-SSP-ODS2**
Spherisep ODS2	100	2.1	3	**122171-SSP-ODS2**
Spherisep ODS2	100	4.0	10	**124371-SSP-ODS2**
Spherisep ODS2	100	4.6	3	**125171-SSP-ODS2**
Spherisep ODS2	100	4.6	5	**125271-SSP-ODS2**
Spherisep ODS2	120	4.6	3	**1D5171-SSP-ODS2**
Spherisep ODS2	125	3.0	3	**103171-SSP-ODS2**
Spherisep ODS2	125	4.0	5	**104271-SSP-ODS2**
Spherisep ODS2	125	4.6	3	**105171-SSP-ODS2**
Spherisep ODS2	150	4.0	3	**134171-SSP-ODS2**
Spherisep ODS2	150	4.0	5	**134271-SSP-ODS2**
Spherisep ODS2	150	4.6	3	**135171-SSP-ODS2**
Spherisep ODS2	150	4.6	5	**135271-SSP-ODS2**
Spherisep ODS2	250	4.0	5	**154271-SSP-ODS2**
Spherisep ODS2	250	4.6	10	**155371-SSP-ODS2**
Spherisep ODS2	250	4.6	3	**155171-SSP-ODS2**
Spherisep ODS2	250	4.6	5	**155271-SSP-ODS2**
Spherisep ODS2	300	3.9	5	**16e271-SSP-ODS2**
Spherisep ODS2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-SSP-ODS2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of 4-hydroxybenzoates using Spherisep ODS2 (left) and Spherisorb ODS2 (right), 150 x 4.6 mm, 5 µm.



HPLC analysis of tocopherols using Spherisep ODS2 (left) and Spherisorb ODS2 (right), 150 x 4.6 mm, 5 µm.



StarRise C18 Columns

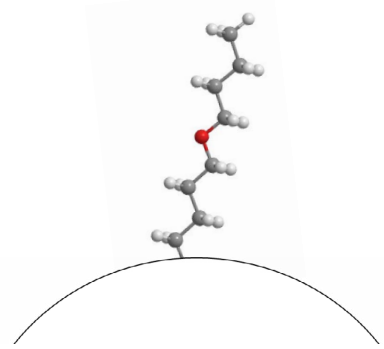
The StarRise™ line shows equivalent selectivity to the Waters SunFire™ and has a long column lifetime and excellent reproducibility. The StarRise C18 provides equivalent selectivity to the SunFire C18. StarRise columns provide symmetrical peaks for improved resolution and quantization of acidic neutral and basic compounds a low and intermediate pH range. It is available in many particle sizes as well as preparative bulk. Other StarRise phases are also available including C8. Please enquire for more information.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
StarRise C18	50	2.1	3.5	**112121-SNR-C18**
StarRise C18	50	2.1	5	**112221-SNR-C18**
StarRise C18	50	3.0	5	**113221-SNR-C18**
StarRise C18	50	4.6	3.5	**115121-SNR-C18**
StarRise C18	75	4.6	3.5	**195121-SNR-C18**
StarRise C18	100	2.0	2.5	**522H21-SNR-C18**
StarRise C18	100	2.1	3.5	**122121-SNR-C18**
StarRise C18	100	4.6	3.5	**125121-SNR-C18**
StarRise C18	100	4.6	5	**125221-SNR-C18**
StarRise C18	150	2.1	3.5	**132121-SNR-C18**
StarRise C18	150	3.0	3.5	**133121-SNR-C18**
StarRise C18	150	4.0	3.5	**134121-SNR-C18**
StarRise C18	150	4.0	5	**134221-SNR-C18**
StarRise C18	150	4.6	3.5	**135121-SNR-C18**
StarRise C18	150	4.6	5	**135221-SNR-C18**
StarRise C18	250	4.6	5	**155221-SNR-C18**
StarRise C18 Prep	150	20	3.5	**138121-SNR-C18**
StarRise C18 Prep	150	30	5	**13N221-SNR-C18**
StarRise C18 Prep	250	10	5	**157221-SNR-C18**
StarRise C18 Prep	250	20	5	**158221-SNR-C18**
StarRise C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-SNR-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other phases, column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

AquaSep Columns

AquaSep™ is designed for difficult separation challenges such as polar compounds, compounds requiring a highly aqueous mobile phase, or difficult to retain compounds. The AquaSep phase has been specially developed using patented technology for use with highly aqueous mobile phases, including 100% aqueous. The unique patented approach provides a complete solution to ensure that AquaSep is totally resistant to 'phase collapse' under all mobile phase conditions. In order to obtain high aqueous stability and maximum hydrophobic interaction, AquaSep contains an ether linkage near the point of attachment to the silica base. This allows water to penetrate and hydrate the surface, preventing 'phase collapse'.



Features and Benefits

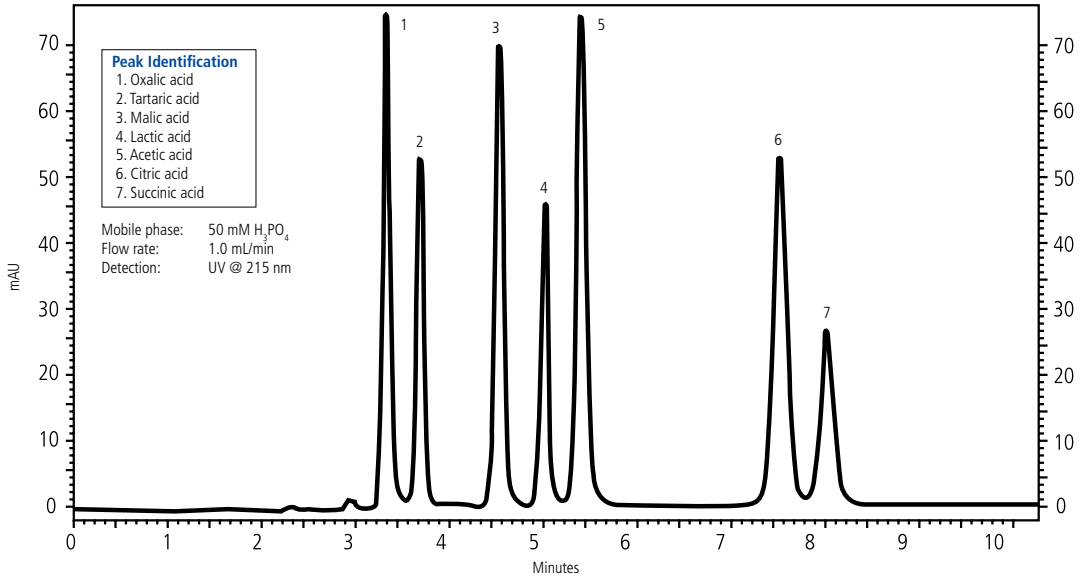
- Rapid re-equilibration with gradients (0-100%) for fast throughput
- No ion-pairing reagents required for highly polar compounds, simplifying methods
- Patented single step bonding approach results in a phase which is totally resistant to phase collapse and can separate polar compounds with 100% aqueous eluents

Material Characteristics

Brand	Phase*	Particle Size (µm)	Pore Size (Å)	Carbon %	End Cap	pH Range	USP Code
AquaSep	AQS (ether linked C8)	3, 5, 10	100	16	No	2-8	L7

*Preparative columns of this phase are also available. Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of organic acids using AquaSep, 250 mm x 4.6 mm, 5 µm.

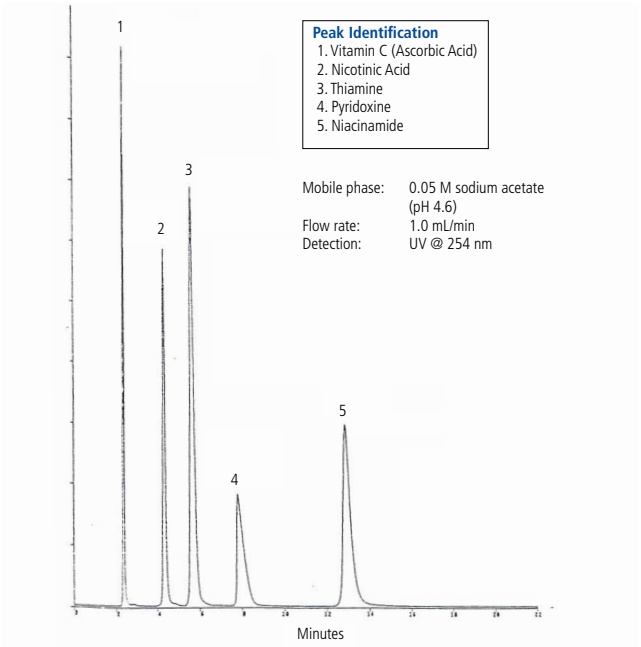


AquaSep Columns

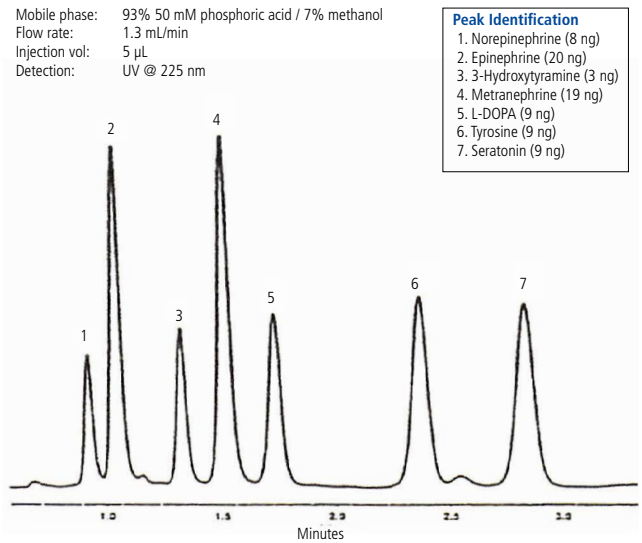
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
AquaSep	50	2.1	3	**112121-AQS**
AquaSep	50	2.1	5	**112221-AQS**
AquaSep	50	4.6	3	**115121-AQS**
AquaSep	100	4.6	3	**125121-AQS**
AquaSep	100	4.6	5	**125221-AQS**
AquaSep	150	2.1	3	**132121-AQS**
AquaSep	150	2.1	5	**132221-AQS**
AquaSep	150	3.9	5	**13e221-AQS**
AquaSep	150	4.0	3	**134121-AQS**
AquaSep	150	4.0	5	**134221-AQS**
AquaSep	150	4.6	3	**135121-AQS**
AquaSep	150	4.6	5	**135221-AQS**
AquaSep	250	4.0	5	**154221-AQS**
AquaSep	250	4.6	3	**155121-AQS**
AquaSep	250	4.6	5	**155221-AQS**
AquaSep Prep	50	10	5	**117221-AQS**
AquaSep Prep	250	10	5	**157291-AQS**
AquaSep Prep	250	20	5	**158221-AQS**
AquaSep Prep	250	20	5	**158221-AQS**
AquaSep Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-AQS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of water soluble vitamins using AquaSep, 150 mm x 4.6 mm, 5 µm.



HPLC analysis of catecholamines and related compounds using AquaSep, 100 mm x 4.6 mm, 3 µm.



Chromegabond WR LC Columns

Chromegabond WR is a highly base deactivated phase that is produced via a two-step process. The first step involves bonding monomerically C18, C8, C4, Phenyl, Cyano or Biphenyl ligands to an ultra-high purity synthetically produced spherical silica. The second step utilizes a proprietary multiple endcapping bonding process that produces highly base deactivated columns. This state-of-the-art bonding procedure uses mixtures of short chain alkyl silanes to react with residual silanol groups.

Chromegabond WR is particularly useful for amines and acids and can provide alternative selectivity to the Epic line of LC columns. In comparison with Epic, Chromegabond WR uses a different silica with a lower surface area. In many cases, different silica can provide differences in retention and selectivity.

Features and Benefits

- Highly base deactivated using proprietary endcapping technology to provide an exceptionally inert phase for the analysis of both acids and bases
- Range of stationary phase chemistries to enhance method development
- Preparative dimensions available to allow flexibility and full scalability

Material Characteristics

Brand	Phase*	Particle Size (µm)	Pore Size (Å)	Carbon %	End Cap	pH Range	USP Code
Chromegabond WR	C18	1.8, 3, 5, 7, 10	120	16	Yes	2-8	L1
Chromegabond WR	C8	3, 5, 10	120	9	Yes	2-8	L7
Chromegabond WR	C4	3, 5, 10	120	5	Yes	2-8	L26
Chromegabond WR	Cyano	3, 5,10	120	–	Yes	2-8	L10
Chromegabond WR	Phenyl	3, 5, 10	120	–	Yes	2-8	L11
Chromegabond WR	Biphenyl	3, 5, 10	120	–	Yes	2-8	L11

Preparative columns are also available. Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond WR C18

Chromegabond WR-C18 is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding C18 groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. This state-of-the-art bonding procedure uses mixtures of short chain alkyl silanes to react with residual silanol groups. Chromegabond WR-C18, as a result of our special bonding treatment, is highly hydrophobic and exceptionally inert for the analysis of both acids and bases. It is useful for the separation of molecules that contain polar groups along with hydrophobic groups.

In comparison with Epic C18, Chromegabond WR-C18 uses a different silica with a lower surface area. In many cases, different silica can provide differences in retention and selectivity. WR-C18 is the second C18 column of choice after Epic C18 and can be useful for a wider range of samples. WR-C18 is particularly useful for amines and acids.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR C18	50	2.1	1.8	**512A91-WR-C18**
Chromegabond WR C18	50	2.1	3	**112191-WR-C18**
Chromegabond WR C18	50	2.1	5	**112291-WR-C18**
Chromegabond WR C18	50	3.0	3	**113191-WR-C18**
Chromegabond WR C18	50	3.0	5	**113291-WR-C18**
Chromegabond WR C18	50	4.6	10	**115391-WR-C18**
Chromegabond WR C18	50	4.6	3	**115191-WR-C18**
Chromegabond WR C18	50	4.6	5	**115291-WR-C18**
Chromegabond WR C18	100	2.1	3	**122191-WR-C18**
Chromegabond WR C18	100	2.1	5	**122291-WR-C18**
Chromegabond WR C18	100	3.0	3	**123191-WR-C18**
Chromegabond WR C18	100	4.0	3	**124191-WR-C18**
Chromegabond WR C18	100	4.0	5	**124291-WR-C18**
Chromegabond WR C18	100	4.6	10	**125391-WR-C18**
Chromegabond WR C18	100	4.6	3	**125191-WR-C18**
Chromegabond WR C18	100	4.6	5	**125291-WR-C18**
Chromegabond WR C18	120	4.6	5	**1D5291-WR-C18**
Chromegabond WR C18	125	3.0	5	**103291-WR-C18**
Chromegabond WR C18	12	4.0	5	**104291-WR-C18**
Chromegabond WR C18	125	4.0	7	**104491-WR-C18**
Chromegabond WR C18	125	4.6	3	**105191-WR-C18**
Chromegabond WR C18	125	4.6	5	**105291-WR-C18**
Chromegabond WR C18	125	4.6	7	**105491-WR-C18**
Chromegabond WR C18	150	2.1	3	**132191-WR-C18**
Chromegabond WR C18	150	2.1	5	**132291-WR-C18**
Chromegabond WR C18	150	3.9	10	**13e391-WR-C18**
Chromegabond WR C18	150	3.9	5	**13e291-WR-C18**
Chromegabond WR C18	150	4.0	5	**134291-WR-C18**
Chromegabond WR C18	150	4.6	10	**135391-WR-C18**
Chromegabond WR C18	150	4.6	3	**135191-WR-C18**
Chromegabond WR C18	150	4.6	5	**135291-WR-C18**
Chromegabond WR C18	200	4.0	7	**144491-WR-C18**
Chromegabond WR C18	250	3.0	5	**153291-WR-C18**
Chromegabond WR C18	250	4.0	5	**154291-WR-C18**
Chromegabond WR C18	250	4.6	10	**155391-WR-C18**
Chromegabond WR C18	250	4.6	3	**155191-WR-C18**
Chromegabond WR C18	250	4.6	5	**155291-WR-C18**
Chromegabond WR C18	300	3.9	10	**16e391-WR-C18**
Chromegabond WR C18	300	3.9	5	**16e291-WR-C18**
Chromegabond WR C18	300	4.0	10	**164391-WR-C18**
Chromegabond WR C18	300	4.0	5	**164291-WR-C18**
Chromegabond WR C18	300	4.6	10	**165391-WR-C18**
Chromegabond WR C18	300	4.6	5	**165291-WR-C18**
Chromegabond WR C18	300	4.6	7	**164491-WR-C18**
Chromegabond WR C18 Prep	150	30	10	**13N391-WR-C18**
Chromegabond WR C18 Prep	150	50	5	**13F291-WR-C18**
Chromegabond WR C18 Prep	250	10	10	**157391-WR-C18**
Chromegabond WR C18 Prep	250	10	5	**157291-WR-C18**
Chromegabond WR C18 Prep	250	20	10	**158391-WR-C18**
Chromegabond WR C18 Prep	250	20	5	**158291-WR-C18**
Chromegabond WR C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-WR-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

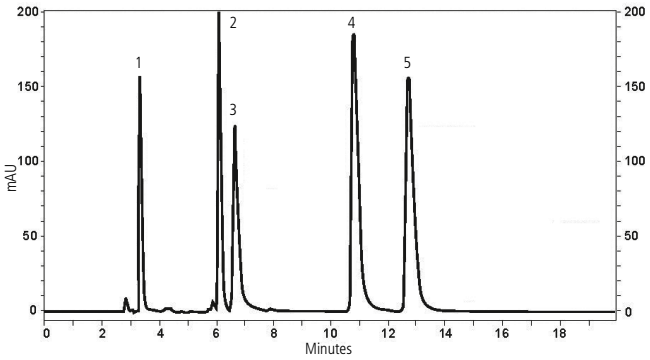
Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of a tricylic antidepressants using Chromegabond WR C18, 250 x 4.6 mm, 5 µm

Peak Identification

1. Norephedrine	47 µg/mL
2. Toluene	133 µg/mL
3. Nortriptyline	20 µg/mL
4. Imipramine	60 µg/mL
5. Amitriptyline	42 µg/mL

Mobile phase: 80% methanol
20% KH_2PO_4 25 mM
pH = 6.8
Flow rate: 1.0 mL/min
Detection: UV @ 215 nm
Injection vol: 5 µL

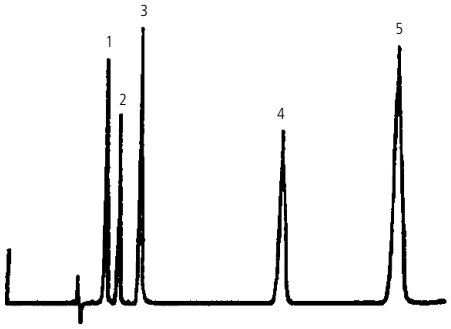


HPLC analysis of drug related molecules using Chromegabond WR C18, 250 x 4.6 mm, 5 µm.

Peak Identification

1. Acetylsalicylic acid
2. p-Acetophenetidide
3. Salicyclic acid
4. Phenylbutazone
5. Indomethacin

Mobile phase: 70% Methanol
30% 4 mM KH_2PO_4
pH = 3
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm

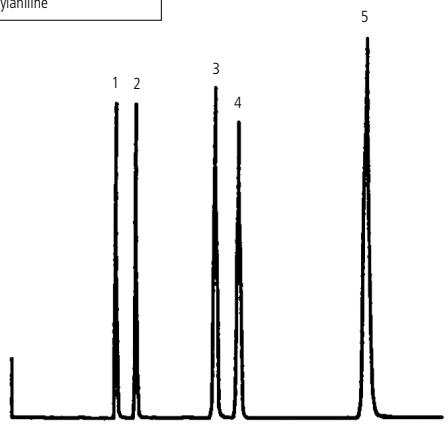


HPLC analysis of anilines and neutrals using Chromegabond WR C18, 250 x 4.6 mm, 5 µm.

Peak Identification

1. Aniline
2. Dimethyl Phthalate
3. Dimethylaniline
4. Toluene
5. Diethylaniline

Mobile phase: 65% Acetonitrile
35% Water
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm

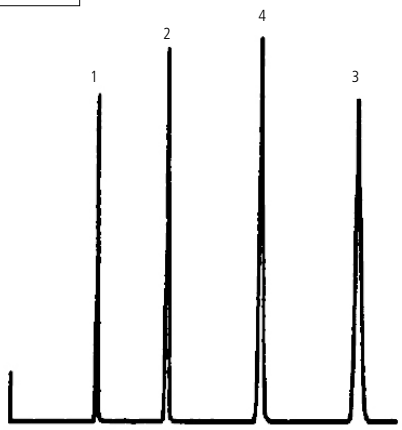


HPLC analysis of a substituted anilines and phenol using Chromegabond WR C18, 250 x 4.6 mm, 5 µm.

Peak Identification

1. Phenol
2. Dimethylaniline
3. Diethylaniline
4. Di-N-Butyl Phthalate

Mobile phase: 70% Acetonitrile
30% Water
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm



Chromegabond WR C8

Chromegabond WR-C8 is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding C8 groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. The C8 phase is less hydrophobic than the C18 phase and is, therefore, useful for separations which require less retention. It can be particularly useful for more hydrophobic compounds, both charged and neutral (e.g. lipids and steroids).

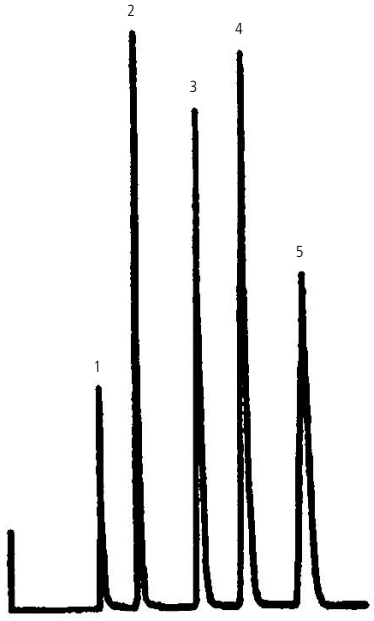
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR C8	50	2.1	3	**112191-WR-C8**
Chromegabond WR C8	50	2.1	5	**112291-WR-C8**
Chromegabond WR C8	50	4.6	3	**115191-WR-C8**
Chromegabond WR C8	100	2.1	3	**122191-WR-C8**
Chromegabond WR C8	100	2.1	5	**122291-WR-C8**
Chromegabond WR C8	100	4.6	3	**125191-WR-C8**
Chromegabond WR C8	100	4.6	5	**125291-WR-C8**
Chromegabond WR C8	125	4.6	5	**105291-WR-C8**
Chromegabond WR C8	150	2.1	3	**132191-WR-C8**
Chromegabond WR C8	150	2.1	5	**132291-WR-C8**
Chromegabond WR C8	150	3.0	3	**133191-WR-C8**
Chromegabond WR C8	150	4.0	5	**134291-WR-C8**
Chromegabond WR C8	150	4.6	10	**135391-WR-C8**
Chromegabond WR C8	150	4.6	3	**135191-WR-C8**
Chromegabond WR C8	150	4.6	5	**135291-WR-C8**
Chromegabond WR C8	250	3.0	5	**183291-WR-C8**
Chromegabond WR C8	250	4.0	10	**154391-WR-C8**
Chromegabond WR C8	250	4.0	5	**154291-WR-C8**
Chromegabond WR C8	250	4.6	5	**155291-WR-C8**
Chromegabond WR C8 Prep	250	10	5	**157291-WR-C8**
Chromegabond WR C8 Prep	250	20	5	**158291-WR-C8**
Chromegabond WR C8 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-WR-C8**
Chromegabond WR C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-WR-C8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of a basic drug mixture using Chromegabond WR C8, 250 x 4.6 mm, 5 µm

Peak Identification
1. Unretained peak
2. Chlorpheniramine
3. Procainamide
4. Amiloride
5. N-acetylprocainamide

Mobile phase: 10% Acetonitrile 90% 50 mM KH_2PO_4
Flow rate: 1.0 mL/min
Detection: UV @ 254 nm



Chromegabond WR C4

Chromegabond WR-C4 is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding C4 groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. Chromegabond WR C4 is the least hydrophobic of the alkyl phases (C18 and C8) and is useful for lipophilic molecules and applications which require less retention.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR C4	50	2.1	3	**112191-WR-C4**
Chromegabond WR C4	50	2.1	5	**112291-WR-C4**
Chromegabond WR C4	50	4.6	3	**115191-WR-C4**
Chromegabond WR C4	100	2.1	3	**122191-WR-C4**
Chromegabond WR C4	100	2.1	5	**122291-WR-C4**
Chromegabond WR C4	100	4.6	3	**125191-WR-C4**
Chromegabond WR C4	100	4.6	5	**125291-WR-C4**
Chromegabond WR C4	150	2.1	3	**132191-WR-C4**
Chromegabond WR C4	150	2.1	5	**132291-WR-C4**
Chromegabond WR C4	150	4.6	3	**135191-WR-C4**
Chromegabond WR C4	150	4.6	5	**135291-WR-C4**
Chromegabond WR C4	250	4.6	5	**155291-WR-C4**
Chromegabond WR C4	300	4.0	5	**164291-WR-C4**
Chromegabond WR C4	300	4.6	5	**165291-WR-C4**
Chromegabond WR C4 Prep	150	50	5	**13F291-WR-C4**
Chromegabond WR C4 Prep	250	10	5	**157291-WR-C4**
Chromegabond WR C4 Prep	250	20	5	**158291-WR-C4**
Chromegabond WR C4 Prep	250	30	5	**15N291-WR-C4**
Chromegabond WR C4 Prep	50	20	5	**118291-WR-C4**
Chromegabond WR C4 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-WR-C4**
Chromegabond WR C4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-WR-C4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond WR Cyano

Chromegabond WR Cyano is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding cyano groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. The Chromegabond WR Cyano phase is a less hydrophobic phase than the alkyl C8 and C18 phases. The cyano functionality offers increased dipole interactions for alternative selectivity. It is suitable for RP (e.g. higher molecular weight compounds) and NP applications. Unlike Epic Cyano (non-endcapped), Chromegabond WR Cyano is endcapped which may provide a selectivity difference between the two products.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR Cyano	150	4.6	5	**135291-WR-CN**
Chromegabond WR Cyano	250	4.6	10	**155391-WR-CN**
Chromegabond WR Cyano	250	4.6	5	**155291-WR-CN**
Chromegabond WR Cyano	300	3.9	5	**16e291-WR-CN**
Chromegabond WR Cyano Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-WR-CN**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond WR Phenyl

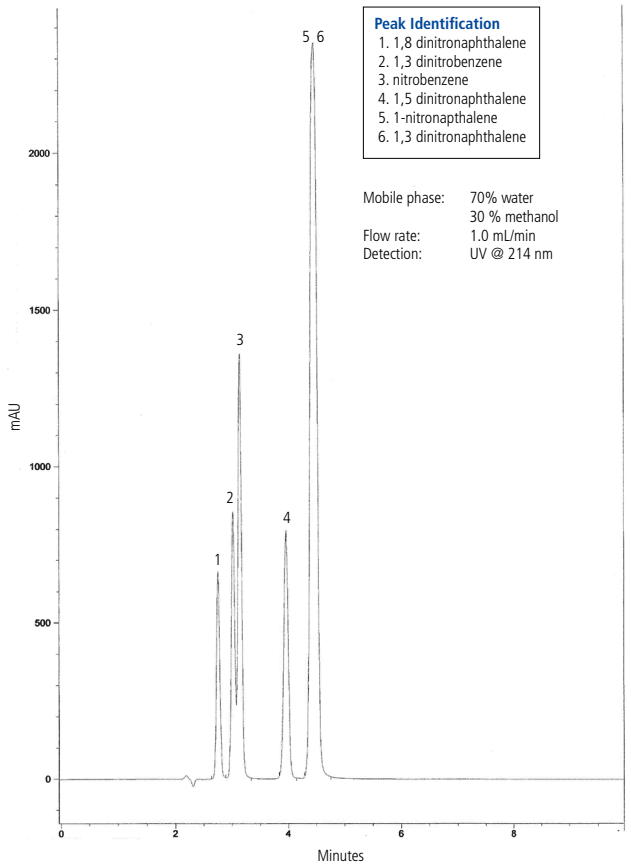
Chromegabond WR Phenyl is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding phenyl groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. In comparison with Epic Phenyl, Chromegabond WR Phenyl uses a different silica with a lower surface area. In many cases, different silica can provide differences in retention and selectivity.

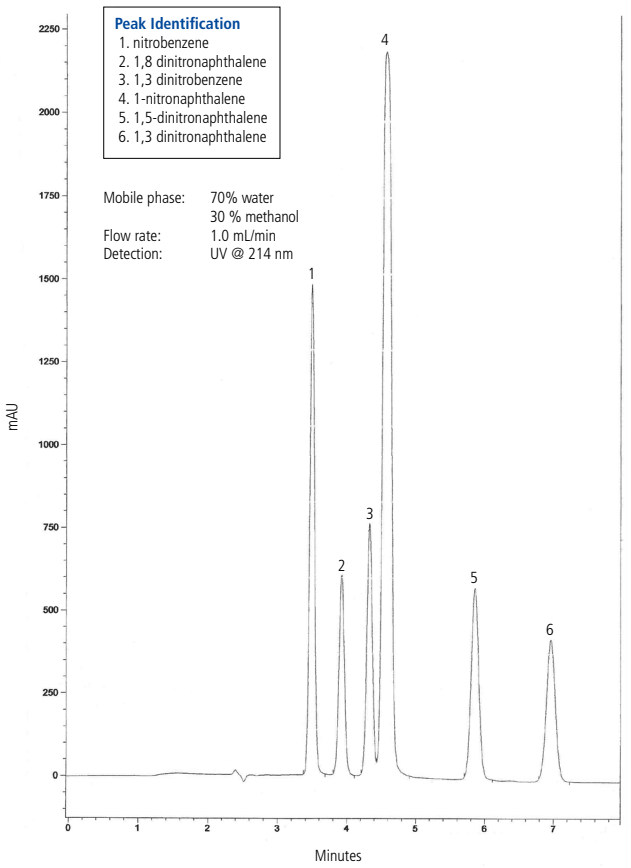
The Chromegabond WR Phenyl phase is π-basic (electron donating) and is similar in overall retention to alkyl phases. The alternate selectivity exhibited by phenyl phases is explained by the π-π interactions available through the phenyl ring. Applications include antibiotics, moderate bases such as anesthetics, and some acidic compounds such as phenols and aromatic acids.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR Phenyl	150	3.0	3	**133191-WR-PH**
Chromegabond WR Phenyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-WR-PH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of nitroaromatic compounds using Chromegabond WR C18 (left) and Chromegabond WR Phenyl (right), 150 x 4.6 mm, 5 µm.





Chromegabond WR Biphenyl

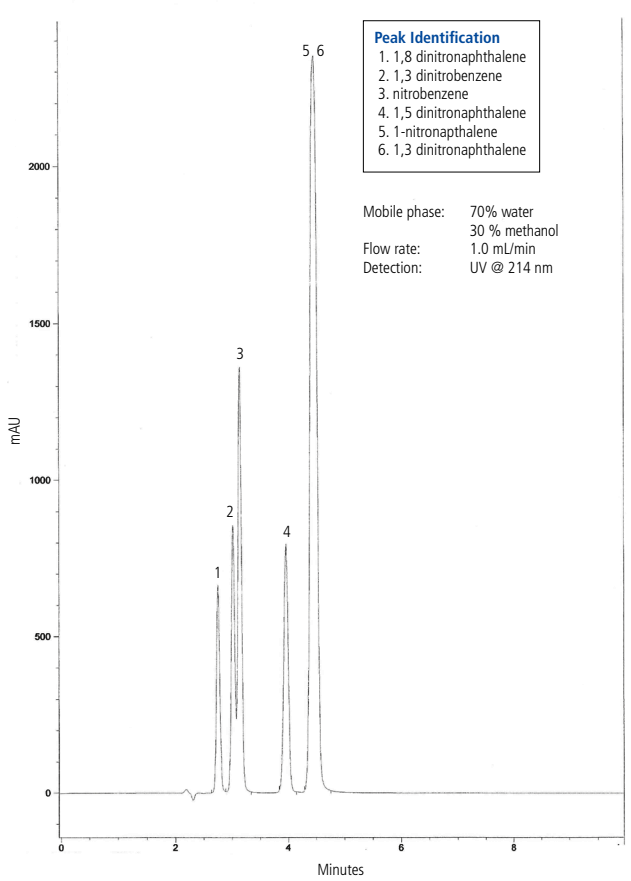
Chromegabond WR Biphenyl is highly base deactivated phase that is produced via a multi-step process. The first step involves bonding phenyl groups to an ultra-high purity synthetically produced spherical silica. The next steps utilize a proprietary multiple endcapping bonding process that produces highly base deactivated columns. In comparison with Epic Biphenyl, Chromegabond WR Biphenyl uses a different silica with a lower surface area. In many cases, different silica can provide differences in retention and selectivity.

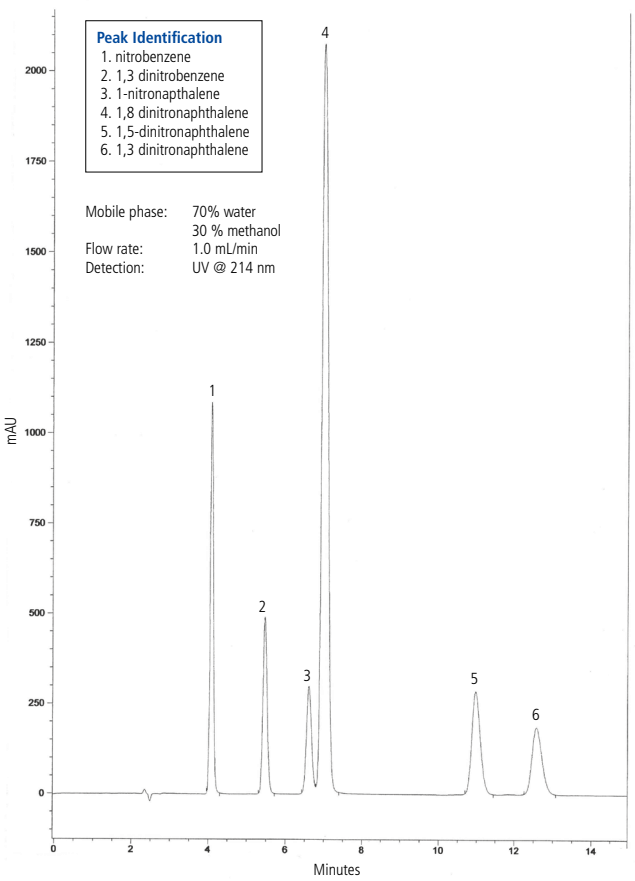
Chromegabond WR-Biphenyl is a truly unique stationary phase with properties significantly different than ODS phases. The unique character results from bonded biphenyl group imparting a π-π electron interaction which produces an enhanced retention for many compounds, particularly those that contain polarizable electrons. Many classes of compounds contain polarizable electrons including halogenated compounds, aromatics, nitro aromatics and conjugated systems. In many cases, Chromegabond WR-Biphenyl provides alternative selectivity to pentafluorophenyl stationary phases.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond WR-Biphenyl	50	2.1	5	**112291-WR-BPH**
Chromegabond WR-Biphenyl	100	2.1	5	**122291-WR-BPH**
Chromegabond WR-Biphenyl	150	2.1	5	**132291-WR-BPH**
Chromegabond WR-Biphenyl	150	4.6	5	**135291-WR-BPH**
Chromegabond WR Biphenyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-WR-BPH**
Chromegabond WR Biphenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-WR-BPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of nitroaromatic compounds using Chromegabond WR C18 (left) and Chromegabond WR Biphenyl (right), 150 x 4.6 mm, 5 µm.





Chromegabond LC Columns

We have developed a wide range of Chromegabond® phase columns to provide the means of separating a broad range of compounds. These phases are manufactured using established procedures and have been produced for a number of years to provide the chromatographer/QC chemist with continuous stream of highly reproducible columns. Many of these columns are useful for older USP designated methods, including Chromegabond Amino/Cyano, C2 and C6. The Chromegabond MC18 can provide alternative selectivity to other C18 columns due to the smaller 60 Å pore size. Additionally, the RP-SCX/IPI is an aromatic based strong cation exchanger with C8 alkyl chains, for ion exchange applications.

Features and Benefits

- Range of stationary phase chemistries to enhance method development
- Unique phases available, such as DNAP, Silver Silica, Amino/Cyano for the analysis of petroleum products
- Many phases are useful for older USP designated methods
- Preparative dimensions available to allow flexibility and full scalability

Material Characteristics

Brand	Phase*	Particle Size (µm)	Pore Size (Å)	Carbon %	End Cap	pH Range	USP Code
Chromegabond	MC18	3, 5, 10	60	18	Yes	2-8	L1
Chromegabond	PSC C8/C18	3, 5	100	14	Yes	2-8	L42
Chromegabond	DNAP II	5	100	–	No	2-8	–
Chromegabond	PFP/T	5	60	–	No	2-8	L43
Chromegabond	RP-SCX/IPI	5, 10	60	–	No	2-8	L44
Chromegabond	Amino/Cyano	3, 5, 10	60, 100	–	No	2-8	L18
Chromegabond	C2	5, 10	60	–	No	2-8	L16
Chromegabond	C6	3, 5	60	6	No	2-8	L15
Chromegabond	Silver Silica	5	60	–	No	–	–

Preparative columns of these phases are also available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond MC18

Chromegabond® MC18 columns are based on octadecyl bonding and provide reproducible separations with good peak symmetry. This phase is useful for hydrophobic and polar low molecular weight molecules. The Chromegabond MC18 can provide alternative selectivity to other C18 columns due to the smaller 60 Å pore size.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond MC18	50	2.1	5	**112211-MC18**
Chromegabond MC18	50	3.0	3	**113123-MC18**
Chromegabond MC18	100	2.1	3	**122171-MC18**
Chromegabond MC18	100	2.1	5	**122211-MC18**
Chromegabond MC18	100	4.0	10	**124311-MC18**
Chromegabond MC18	100	4.0	3	**124111-MC18**
Chromegabond MC18	100	4.6	5	**125211-MC18**
Chromegabond MC18	150	2.1	5	**132211-MC18**
Chromegabond MC18	150	3.9	5	**13e211-MC18**
Chromegabond MC18	150	4.0	10	**134311-MC18**
Chromegabond MC18	150	4.0	5	**134211-MC18**
Chromegabond MC18	150	4.6	5	**135211-MC18**
Chromegabond MC18	250	4.0	5	**154221-MC18**
Chromegabond MC18	250	4.6	10	**155311-MC18**
Chromegabond MC18	250	4.6	5	**155211-MC18**
Chromegabond MC18	300	4.0	10	**164311-MC18**
Chromegabond MC18	300	4.0	5	**164221-MC18**
Chromegabond MC18	300	4.6	10	**165311-MC18**
Chromegabond MC18 Prep	250	10	5	**157211-MC18**
Chromegabond MC18 Prep	250	20	5	**158211-MC18**
Chromegabond MC18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-MC18**
Chromegabond MC18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-MC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

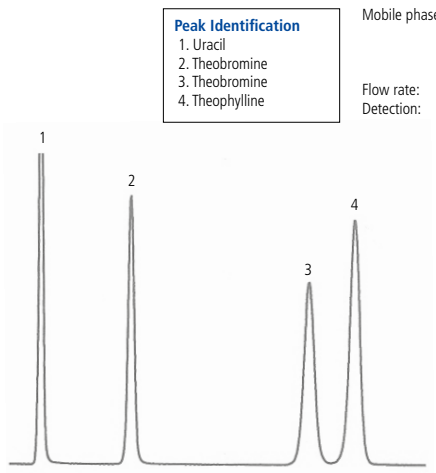
Chromegabond PSC C8/C18

Chromegabond® PSC (pharmaceutical separation column) is a unique C8/C18 combination stationary phase and is versatile for many pharmaceutical applications. This phase is prepared using a mixture of C8 and C18 groups. In addition to this unique bonding arrangement, PSC columns incorporate technology to produce PSC columns with a tightly controlled number of residual silanol groups. These columns are able to retain both highly polar and hydrophobic compounds. The Chromegabond PSC is a versatile column that can be used for applications requiring either a C8 or C18.

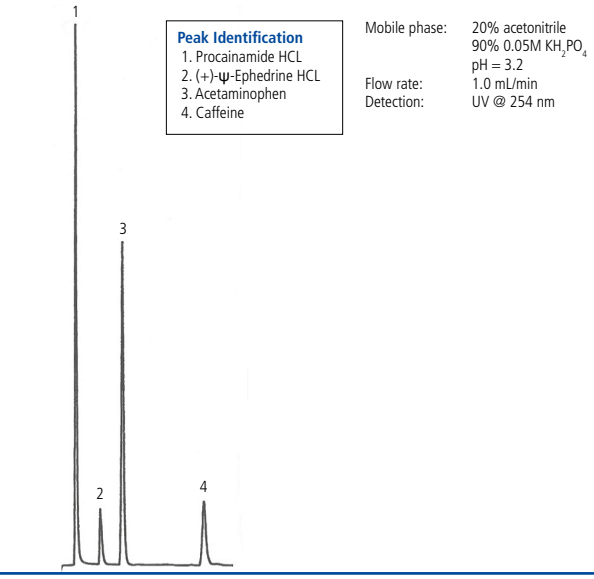
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond PSC C8/C18	50	2.1	3	**112121-PSC**
Chromegabond PSC C8/C18	50	2.1	5	**112221-PSC**
Chromegabond PSC C8/C18	100	2.1	3	**122121-PSC**
Chromegabond PSC C8/C18	100	2.1	5	**122221-PSC**
Chromegabond PSC C8/C18	100	3.0	5	**123221-PSC**
Chromegabond PSC C8/C18	100	4.6	3	**125121-PSC**
Chromegabond PSC C8/C18	100	4.6	5	**125221-PSC**
Chromegabond PSC C8/C18	150	2.1	3	**132121-PSC**
Chromegabond PSC C8/C18	150	2.1	5	**132221-PSC**
Chromegabond PSC C8/C18	150	4.6	3	**135121-PSC**
Chromegabond PSC C8/C18	150	4.6	5	**135221-PSC**
Chromegabond PSC C8/C18	250	4.0	5	**154221-PSC**
Chromegabond PSC C8/C18	250	4.6	5	**155221-PSC**
Chromegabond PSC C8/C18 Prep	250	10	5	**157221-PSC**
Chromegabond PSC C8/C18 Prep	250	20	5	**158221-PSC**
Chromegabond PSC C8/C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-PSC**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

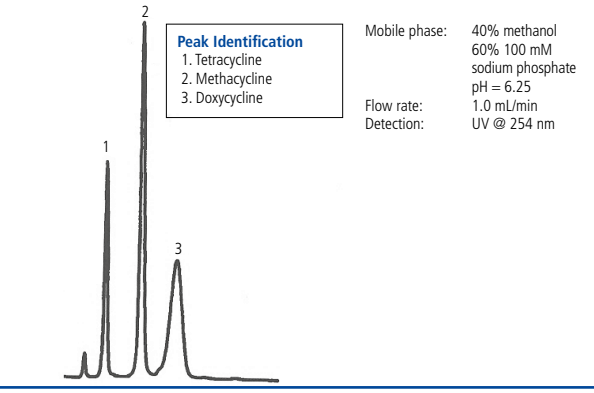
HPLC analysis of stimulants using Chromegabond PSC, 150 x 4.6 mm, 5 µm.



HPLC analysis of pharmaceuticals using Chromegabond PSC, 150 x 4.6 mm, 5 µm.



HPLC analysis of antibiotics using Chromegabond PSC, 150 x 4.6 mm, 5 µm.



Chromegabond DNAP II

Chromegabond® DNAP II (dinitroanilino propyl) columns, due to the electron deficient character of the aromatic ring, have a particularly strong affinity for aromatic solutes differing in the number of aromatic rings. Chromegabond DNAP II columns are designed specifically to handle complex petroleum samples and separate based on aromatic ring class, even for alky substituted aromatics which are normally more difficult to separate.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond DNAP II	100	4.6	5	**125221-DNAP-II**
Chromegabond DNAP II	150	4.6	5	**135221-DNAP-II**
Chromegabond DNAP II	250	4.6	5	**155221-DNAP-II**
Chromegabond DNAP II Prep	250	10	5	**157221-DNAP-II**
Chromegabond DNAP II Prep	250	20	5	**158221-DNAP-II**
Chromegabond DNAP II Analytical Guard Cartridges (Pkg. 5)	10	3	5	**500101-DNAP-II**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

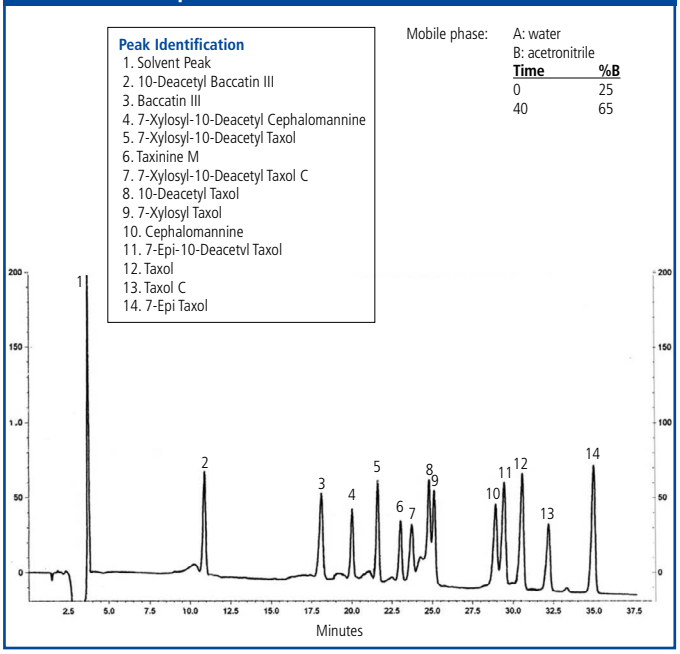
Chromegabond PFP/T

Chromegabond® PFP/T is specifically designed for the separation of Taxol mixtures. It is based on perfluorinated phenyl chemistry bonded to specially treated silica, yielding one of the finest analytical columns for the analysis of Taxol mixtures and Taxol related mixtures. The separation of a Taxol mixture is shown below.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond PFP/T	150	4.6	5	**135211-PFP/T**
Chromegabond PFP/T	250	4.0	5	**154211-PFP/T**
Chromegabond PFP/T	250	4.6	5	**155211-PFP/T**
Chromegabond PFP/T Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-PFP/T**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of a taxol mixture using Chromegabond PFP/T, 250 x 4.6 mm, 5 µm.



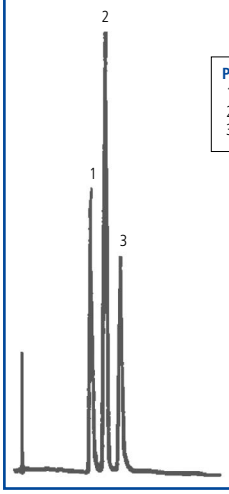
Chromegabond RP-SCX/IPI

Ion exchange is ideal for difficult to separate ionic compounds. As opposed to typical SCX phases, the Chromegabond® RP-SCX/IPI is a highly reproducible phase due to the robust bonding chemistry. The Chromegabond RP-SCX/IPI is an aromatic based strong cation exchanger with C8 alkyl chain used particularly for the analysis of isonicotinic acid, pyrazinamide and isoniazid in tablets. Chromatographers in the field have also used this column to produce a silver ion-exchange column for the separation of triglycerides.

Phase	Length (mm)	ID (mm)	Particle Size (µm)
Chromegabond RP SCX/IPI	250	4.6	5
Chromegabond RP SCX/IPI	250	4.6	10
Chromegabond RP SCX/IPI	300	4.6	5
Chromegabond RP SCX/IPI	300	4.6	10

Please enquire for more details at LCA.TechSupport@perkinelmer.com

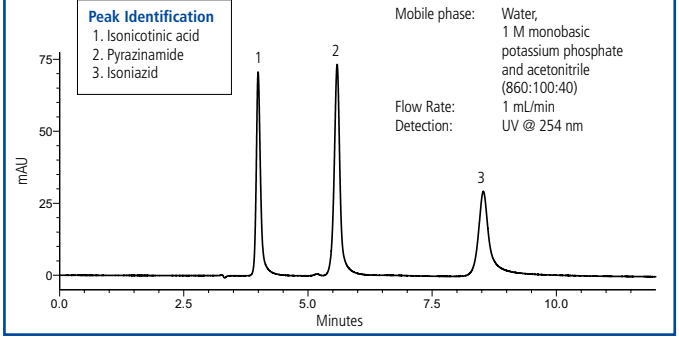
HPLC analysis of a phenylenediamine isomers using Chromegabond RP-SCX/IPI, 150 x 4.6 mm, 5 µm.



Peak Identification
1. p-Phenylenediamine
2. m-Phenylenediamine
3. o-Phenylenediamine

Mobile phase: 90/10 A/B
A: 1 M H_3PO_4 adjusted to pH 3.2 with NH_4OH
B: CH_3OH
Flow rate: 1 mL/min
Detection: UV @ 254 nm

HPLC analysis of anti-tuberculosis drugs isoniazid and pyrazinamide using Chromegabond RP-SCX/IPI, 300 x 4.6 mm, 10 µm.



Peak Identification
1. Isonicotinic acid
2. Pyrazinamide
3. Isoniazid

Mobile phase: Water, 1 M monobasic potassium phosphate and acetonitrile (860:100:40)
Flow Rate: 1 mL/min
Detection: UV @ 254 nm

Chromegabond Amino/Cyano

Chromegabond Amino/Cyano columns are based on aminopropyl/cyanopropyl bonding. This phase can be used to separate polar compounds in both reverse phase and normal phase chromatography. Chromegabond Amino/Cyano can be used to determine nitrogen containing compounds in crude oil using normal phase chromatography.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond Amino Cyano	50	2.1	3	**112111-A/CN**
Chromegabond Amino Cyano	50	4.6	10	**115311-A/CN**
Chromegabond Amino Cyano	50	2.1	5	**112211-A/CN**
Chromegabond Amino Cyano	100	2.1	3	**122111-A/CN**
Chromegabond Amino Cyano	100	2.1	5	**122211-A/CN**
Chromegabond Amino Cyano	100	4.6	3	**125111-A/CN**
Chromegabond Amino Cyano	100	4.6	5	**125211-A/CN**
Chromegabond Amino Cyano	150	2.1	3	**132111-A/CN**
Chromegabond Amino Cyano	150	2.1	5	**132211-A/CN**
Chromegabond Amino Cyano	150	4.6	3	**135111-A/CN**
Chromegabond Amino Cyano	150	4.6	5	**135211-A/CN**
Chromegabond Amino Cyano	250	2.1	5	**152211-A/CN**
Chromegabond Amino Cyano	250	4.6	5	**155211-A/CN**
Chromegabond Amino Cyano	250	4.6	10	**155311-A/CN**
Chromegabond Amino Cyano Prep	250	10	5	**157211-A/CN**
Chromegabond Amino Cyano Prep	250	20	5	**158211-A/CN**
Chromegabond Amino Cyano Analytical Guard Cartridges (Pkg. 5)	10	3	5	**500101-A/CN**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond C2

Chromegabond® C2 columns (USP L16) are based on dimethyl bonding. Chromegabond C2 can be used for any USP assay that specifies an L16 column, and in many cases is used as an alternative to the Altmann Analytik LiChrosorb® RP-2. The dimethyl group is bonded to spherical silica to produce high performance packed columns. Chromegabond C2 can be used as the USP L16 column for analysis of temazepam capsules (treatment of insomnia), as well as cyclosporine injection and oral solution (an immunosuppressant drug).

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond C2	50	2.1	5	**112211-C2**
Chromegabond C2	100	2.1	5	**122211-C2**
Chromegabond C2	100	4.6	5	**125211-C2**
Chromegabond C2	150	2.1	5	**132211-C2**
Chromegabond C2	150	4.0	5	**134211-C2**
Chromegabond C2	150	4.6	5	**135211-C2**
Chromegabond C2	250	4.0	5	**154211-C2**
Chromegabond C2	250	4.6	5	**155211-C2**
Chromegabond C2	250	4.6	10	**155311-C2**
Chromegabond C2	300	4.6	5	**165211-C2**
Chromegabond C2	300	4.6	10	**165311-C2**
Chromegabond C2 Prep	250	10	5	**157211-C2**
Chromegabond C2 Prep	250	20	5	**158211-C2**
Chromegabond C2 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-C2**
Chromegabond C2 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-C2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond C6

Chromegabond® C6 Columns (USP L15) are based on hexyl bonding and are not end capped. Chromegabond C6 can be used as the USP L15 column for USP assay of Topiramate and Topiramate related compounds, for example.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond C6	50	2.1	5	**112211-C6**
Chromegabond C6	100	2.1	5	**122211-C6**
Chromegabond C6	100	4.6	5	**125211-C6**
Chromegabond C6	150	2.1	5	**132211-C6**
Chromegabond C6	150	4.0	3	**134111-C6**
Chromegabond C6	150	4.0	5	**134211-C6**
Chromegabond C6	150	4.6	5	**135211-C6**
Chromegabond C6	250	4.6	5	**155211-C6**
Chromegabond C6 Prep	250	20	5	**158211-C6**
Chromegabond C6 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-C6**
Chromegabond C6 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-C6**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegabond Silver Silica

Chromegabond Silver Silica is a silica which is impregnated with silver. It is used primarily with SFC or with hexane in normal phase chromatography. Chromegabond Silver Silica is used to separate alkenes from aromatics in petroleum products and is used in ASTM Method D6550 – SFC Characterization of Olefins in Diesel Fuel.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
Chromegabond Silver Silica	50	4.6	5	**115211-AG/SI**
Chromegabond Silver Silica	100	3.0	5	**123211-AG/SI**
Chromegabond Silver Silica	100	4.6	5	**125211-AG/SI**
Chromegabond Silver Silica	150	4.6	5	**135211-AG/SI**
Chromegabond Silver Silica	250	2.1	5	**152211-AG/SI**
Chromegabond Silver Silica	250	4.0	5	**154211-AG/SI**
Chromegabond Silver Silica	250	4.6	5	**155211-AG/SI**
Chromegabond Silver Silica Prep	250	20	5	**158211-AG/SI**
Chromegabond Silver Silica Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-SI/AG**
Chromegabond Silver Silica Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-SI/AG**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

RingSep HPLC Columns

One of the most exciting breakthroughs in HPLC columns for petroleum analysis was the development of the RingSep column. The RingSep HPLC column was developed specifically for the separation of aromatic compounds by ring number and has been optimized to ensure the accurate analysis of aromatic ring distribution.

The RingSep column is particularly useful in several areas including petroleum refining and petrochemical production.

Features and Benefits

- Specifically developed for petroleum product applications
- Ensure accurate analysis of aromatic ring distribution

Material Characteristics

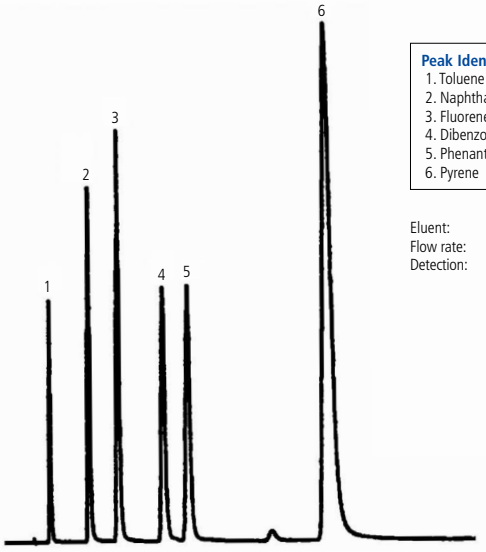
Brand	Phase	Particle Size (µm)	Pore Size (Å)	End Cap
RingSep	Nitro aromatic	5, 10	60	No

Preparative columns of this phase are also available.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part No.
RingSep	50	4.6	5	**115211-RS**
RingSep	100	4.6	5	**125211-RS**
RingSep	150	2.1	5	**132211-RS**
RingSep	150	4.6	5	**135211-RS**
RingSep	250	2.1	5	**152211-RS**
RingSep	250	4.6	5	**155211-RS**
RingSep	250	9.6	5	**157211-RS**
RingSep Prep	250	20	5	**158211-RS**
RingSep Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-RS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of petroleum compounds using RingSep, 150 mm x 4.6 mm, 5 µm.



MacroSep BIO and BIO-Gold Wide Pore Columns

We have developed a line of wide pore columns to provide the bioanalytical chromatographer with a highly efficient state-of-the-art base deactivated wide pore HPLC column. The MacroSep® BIO line is based upon ultra-high purity metal free silica containing highly controlled pores of 300 Å diameter. This column technology is a superior tool for the analysis of proteins, peptides, and other biomolecules.

The latest line of reversed phase column for analysis of biological compounds is MacroSep BIO-Gold. MacroSep Bio-Gold packings are based on ultra-high purity spherical silica, state-of-the-art high-density bonding and full end capping for the separation or purification of high molecular weight bio compounds such as proteins and peptides. Significant improvements in acidic and alkaline resistance has been achieved with MacroSep BIO-Gold.

MacroSep BIO-Gold columns are manufactured utilizing tight process control of the silica, bonding and column packing processes. The reproducible column packing method control provides exceptional efficiency, symmetry, and reproducibility. MacroSep Bio-Gold is available in 1.9 µm, 3 µm, 5 µm and 10 µm particle sizes for analytical and preparative chromatography. For your convenience all these materials are available in either 400 Å or 1200 Å pore diameters.

Features and Benefits

- Wide pore surface for the analysis of proteins and peptides
- Ultra-high purity metal free silica for improved peak shape, especially for basic compounds
- State-of-the-art base deactivation to ensure superior recoveries of proteins and peptides

Material Characteristics

Brand	Phase	Particle Size (µm)	Pore Size (Å)	End Cap	pH Range	USP Code
MacroSep BIO	AQS (ether linked C8)	3, 5, 10	300	No	2-8	L7
MacroSep BIO	C18	3, 5, 10	300	Yes	2-8	L1
MacroSep BIO	C4	3, 5, 10	300	Yes	2-8	L26
MacroSep BIO	C8	3, 5, 10	300	Yes	2-8	L7
MacroSep BIO	Cyano	3, 5, 10	300	Yes	2-8	L10
MacroSep BIO	HPR	3, 5, 10	300	Yes	2-8	–
MacroSep BIO-Gold	Biphenyl	1.9, 3, 5, 10	400, 1200	Yes	2-9	L11
MacroSep BIO-Gold	C18	1.9, 3, 5, 10	400, 1200	Yes	2-9	L1
MacroSep BIO-Gold	C4	1.9, 3, 5, 10	400, 1200	Yes	2-9	L26
MacroSep BIO-Gold	C8	1.9, 3, 5, 10	400, 1200	Yes	2-9	L7
MacroSep BIO-Gold	Diphenyl	1.9, 3, 5, 10	400, 1200	Yes	2-9	L11
MacroSep BIO-Gold	HPR	1.9, 3, 5, 10	400, 1200	Yes	2-9	–
MacroSep BIO-Gold	Naphthyl	1.9, 3, 5, 10	400, 1200	Yes	2-9	–
MacroSep BIO-Gold	PFP	1.9, 3, 5, 10	400, 1200	Yes	2-9	L43

Preparative columns of these phases are also available. Please enquire for more details at LCA.TechSupport@perkinelmer.com

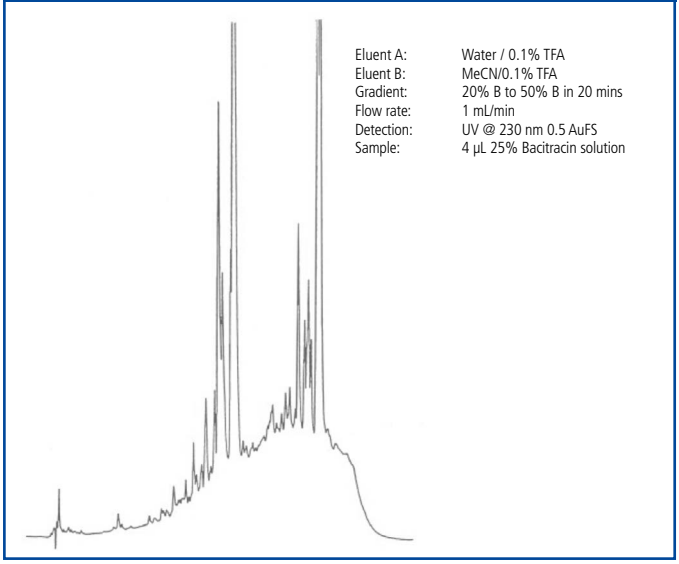
MacroSep BIO AquaSep (AQS)

MacroSep BIO AQS consists of ether linked aliphatic groups bonded to the surface of 300 Å pore diameter ultra-high purity silica. MacroSep AQS is phase collapse resistant with highly aqueous mobile phases. MacroSep AQS can be used to separate glycoproteins, peptides, tryptic digests and hemoglobin variants.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO AQS	50	2.1	3	300	**112131-MSP-AQS**
MacroSep BIO AQS	100	2.1	3	300	**122131-MSP-AQS**
MacroSep BIO AQS	100	2.1	5	300	**122231-MSP-AQS**
MacroSep BIO AQS	100	4.6	3	300	**125131-MSP-AQS**
MacroSep BIO AQS	100	4.6	5	300	**125231-MSP-AQS**
MacroSep BIO AQS	150	2.1	3	300	**132131-MSP-AQS**
MacroSep BIO AQS	150	2.1	5	300	**132231-MSP-AQS**
MacroSep BIO AQS	150	4.6	3	300	**135131-MSP-AQS**
MacroSep BIO AQS	150	4.6	5	300	**135231-MSP-AQS**
MacroSep BIO AQS	250	2.1	5	300	**112231-MSP-AQS**
MacroSep BIO AQS	250	4.6	5	300	**155231-MSP-AQS**
MacroSep BIO AQS Prep	250	20	5	300	**158231-MSP-AQS**
MacroSep BIO AQS Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	300	**500103-MSP-AQS**
MacroSep BIO AQS Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSP-AQS**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of bacitracin using MacroSep BIO AQS, 250 x 4.6 mm, 5 µm.



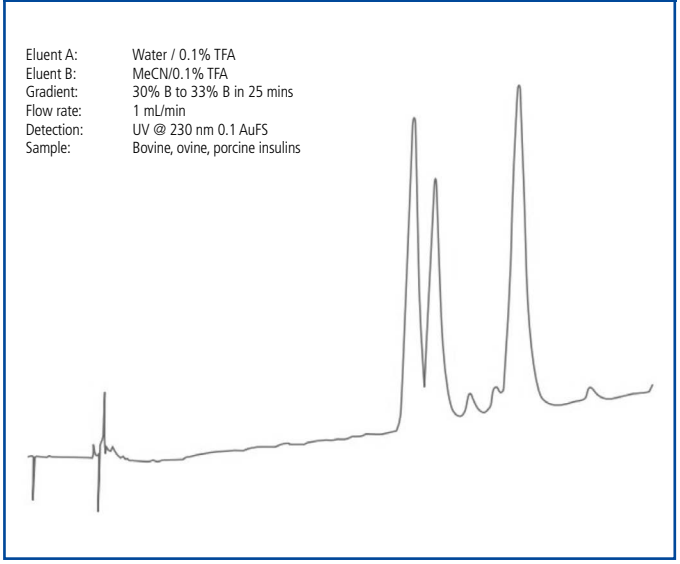
MacroSep BIO C18

MacroSep BIO C18 consists of n-octadecyl aliphatic groups bonded to the surface of 300 Å pore diameter ultra-high purity silica. MacroSep BIO C18 can be used to separate small polypeptides, tryptic digests, synthetic peptides and natural peptides.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO C18	50	2.1	3	300	**112131-MSP-C18**
MacroSep BIO C18	50	2.1	5	300	**112231-MSP-C18**
MacroSep Bio C18	75	2.1	3	300	**192131-MSP-C18**
MacroSep BIO C18	100	2.1	3	300	**122131-MSP-C18**
MacroSep BIO C18	100	2.1	5	300	**122231-MSP-C18**
MacroSep BIO C18	100	4.6	3	300	**125131-MSP-C18**
MacroSep BIO C18	100	4.6	5	300	**125231-MSP-C18**
MacroSep BIO C18	150	2.1	3	300	**132131-MSP-C18**
MacroSep BIO C18	150	2.1	5	300	**132231-MSP-C18**
MacroSep BIO C18	150	4.6	3	300	**135131-MSP-C18**
MacroSep BIO C18	150	4.6	5	300	**135231-MSP-C18**
MacroSep BIO C18	250	4.6	5	300	**155231-MSP-C18**
MacroSep Bio C18 Prep	250	20	5	300	**158231-MSP-C18**
MacroSep Bio C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	300	**300103-MSP-C18**
MacroSep Bio C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSP-C18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of insulins using MacroSep BIO C18, 250 x 4.6 mm, 5 µm.



MacroSep BIO C4

MacroSep BIO C4 consists of butyl aliphatic groups bonded to the surface of 300Å pore diameter ultra-high purity silica. MacroSep BIO C4 can be used to separate glycoproteins, hemoglobin variants, human growth hormone and membrane proteins.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep Bio C4	50	2.1	3	300	**112131-MSP-C4**
MacroSep Bio C4	50	2.1	5	300	**112231-MSP-C4**
MacroSep Bio C4	50	4.6	5	300	**115231-MSP-C4**
MacroSep Bio C4	100	2.1	3	300	**122131-MSP-C4**
MacroSep Bio C4	100	2.1	5	300	**122231-MSP-C4**
MacroSep Bio C4	100	4.6	3	300	**125131-MSP-C4**
MacroSep Bio C4	100	4.6	5	300	**125231-MSP-C4**
MacroSep Bio C4	150	2.1	3	300	**132131-MSP-C4**
MacroSep Bio C4	150	2.1	5	300	**132231-MSP-C4**
MacroSep Bio C4	150	4.6	3	300	**135131-MSP-C4**
MacroSep Bio C4	150	4.6	5	300	**135231-MSP-C4**
MacroSep Bio C4	250	2.1	5	300	**152231-MSP-C4**
MacroSep Bio C4	250	4.6	5	300	**155231-MSP-C4**
MacroSep Bio C4 Prep	250	20	5	300	**158231-MSP-C4**
MacroSep Bio C4 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	300	**500103-MSP-C4**
MacroSep Bio C4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSP-C4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

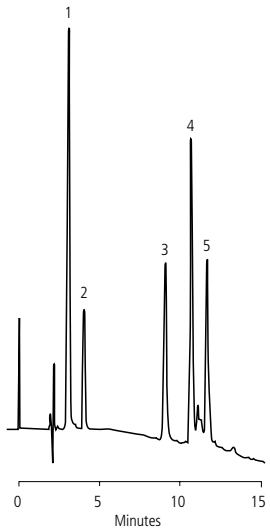
MacroSep BIO C8

MacroSep BIO C8 consists of n-octyl aliphatic groups bonded to the surface of 300Å pore diameter ultra-high purity silica. MacroSep BIO C8 can be used to separate peptides and enzymatic digest fragments.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep Bio C8	250	4.6	5	300	**155231-MSP-C8**
MacroSep Bio C8	50	2.1	3	300	**112131-MSP-C8**
MacroSep Bio C8	50	2.1	5	300	**112231-MSP-C8**
MacroSep Bio C8	100	2.1	3	300	**122131-MSP-C8**
MacroSep Bio C8	100	2.1	5	300	**122231-MSP-C8**
MacroSep Bio C8	100	4.6	3	300	**125131-MSP-C8**
MacroSep Bio C8	100	4.6	5	300	**125231-MSP-C8**
MacroSep Bio C8	150	2.1	3	300	**132131-MSP-C8**
MacroSep Bio C8	150	2.1	5	300	**132231-MSP-C8**
MacroSep Bio C8	150	4.6	3	300	**135131-MSP-C8**
MacroSep Bio C8	150	4.6	5	300	**135231-MSP-C8**
MacroSep Bio C8	250	4.6	10	300	**155331-MSP-C8**
MacroSep Bio C8 Prep	250	20	5	300	**158231-MSP-C8**
MacroSep Bio C8 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	300	**500103-MSP-C8**
MacroSep Bio C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSP-C8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of peptides using MacroSep BIO C4, 150 x 4.6 mm, 5 µm.



Peak Identification
1. Bradykinin
2. Leucine Enkephalin
3. Renin Substrate Tetradecapeptide
4. Insulin
5. Insulin chain B

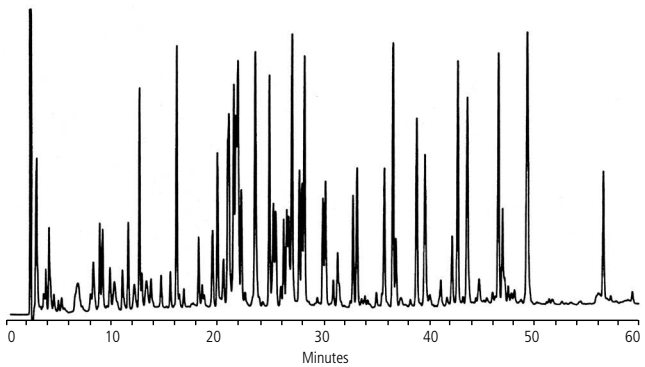
Mobile phase: A - 0.1% TFA
B - 90/10 CH_3CN/H_2O, 0.1% TFA

Time (min)	%A	%B
0	75	5
20	50	50
25	75	25

Flow rate: 1 mL/min
Detection: UV @ 210 nm x 1.0 AuF
Temperature: 23 °C
Injection vol: 20 µL

HPLC analysis of tryptic digest fragments using MacroSep BIO C8, 150 x 4.6 mm, 5 µm.

Mobile phase: A: 0.1% TFA in water
B: 0.1% TFA in 805 acetonitrile / 205 water
Linear gradient, 2-62% B in 70 min
Flow rate: 1 mL/min
Temperature: 50 °C
Sample: 50 pmol of BSA digest in 4M urea



MacroSep BIO Cyano

MacroSep BIO Cyano is based upon ultra-high purity metal free silica containing highly controlled pores of 300Å pore diameter. This column technology is a superior tool for the analysis of proteins, peptides and other biomolecules.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep Bio Cyano	100	2.1	3	300	**122131-MSP-CN**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

MacroSep BIO High Protein Recovery (HPR)

MacroSep BIO HPR consists of specially produced perfluorinated aliphatic groups bonded to the surface of 300Å pore diameter ultra-high purity silica. MacroSep HPR is specially engineered for analysis of hydrophobic proteins. It can be used to separate large hydrophobic proteins, lipid peptides, polypeptide with aliphatic side chains and membrane-spanning peptides.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO HPR	50	2.1	3	300	**112131-MSP-HPR**
MacroSep BIO HPR	50	2.1	5	300	**112231-MSP-HPR**
MacroSep BIO HPR	100	2.1	3	300	**122131-MSP-HPR**
MacroSep BIO HPR	100	2.1	5	300	**122231-MSP-HPR**
MacroSep BIO HPR	100	4.6	3	300	**125131-MSP-HPR**
MacroSep BIO HPR	100	4.6	5	300	**125231-MSP-HPR**
MacroSep BIO HPR	150	2.1	3	300	**132131-MSP-HPR**
MacroSep BIO HPR	150	2.1	5	300	**132231-MSP-HPR**
MacroSep BIO HPR	150	4.6	3	300	**135131-MSP-HPR**
MacroSep BIO HPR	150	4.6	5	300	**135231-MSP-HPR**
MacroSep BIO HPR	250	4.6	5	300	**155231-MSP-HPR**
MacroSep Bio HPR Prep	250	20	5	300	**158231-MSP-HPR**
MacroSep Bio HPR Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSP-HPR**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

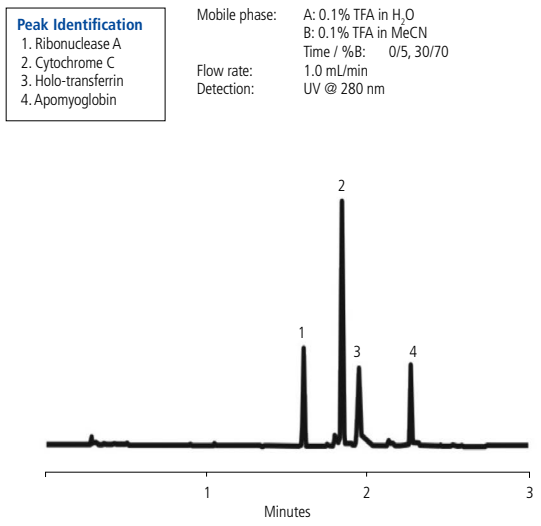
MacroSep BIO-Gold C18

MacroSep BIO-Gold C18 takes bio selectivity to the next level of selective separation performance by utilizing ultra-high purity silica and state-of-the-art bonding technology. This hydrophobic phase is designed for bio–pharmaceutical and bio-chemical applications and is ideal for the separation of proteins, high molecular weight peptides and oligonucleic acids. It is specifically engineered to deliver high recoveries and excellent peak shapes for even the most difficult separations. .

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold C18	50	2.1	3	400	**1121G1-MSP-GLC18**
MacroSep BIO-Gold C18	50	2.1	5	1200	**1122H1-MSP-GLC18**
MacroSep BIO-Gold C18	50	2.1	5	400	**1122G1-MSP-GLC18**
MacroSep BIO-Gold C18	100	2.1	3	400	**1221G1-MSP-GLC18**
MacroSep BIO-Gold C18	100	2.1	5	1200	**1222H1-MSP-GLC18**
MacroSep BIO-Gold C18	100	2.1	5	400	**1222G1-MSP-GLC18**
MacroSep BIO-Gold C18	100	4.6	3	1200	**1251H1-MSP-GLC18**
MacroSep BIO-Gold C18	100	4.6	3	400	**1251G1-MSP-GLC18**
MacroSep BIO-Gold C18	100	4.6	5	1200	**1252H1-MSP-GLC18**
MacroSep BIO-Gold C18	100	4.6	5	400	**1252G1-MSP-GLC18**
MacroSep BIO-Gold C18	150	2.1	3	400	**1321G1-MSP-GLC18**
MacroSep BIO-Gold C18	150	2.1	5	1200	**1322H1-MSP-GLC18**
MacroSep BIO-Gold C18	150	2.1	5	400	**1322G1-MSP-GLC18**
MacroSep BIO-Gold C18	150	4.6	3	1200	**1351H1-MSP-GLC18**
MacroSep BIO-Gold C18	150	4.6	3	400	**1351G1-MSP-GLC18**
MacroSep BIO-Gold C18	150	4.6	5	1200	**1352H1-MSP-GLC18**
MacroSep BIO-Gold C18	150	4.6	5	400	**1352G1-MSP-GLC18**
MacroSep BIO-Gold C18	250	4.6	5	1200	**1552H1-MSP-GLC18**
MacroSep BIO-Gold C18	250	4.6	5	400	**1552G1-MSP-GLC18**
MacroSep BIO-Gold C18	250	20	5	1200	**1582H1-MSP-GLC18**
MacroSep BIO-Gold C18 Prep	250	20	5	400	**1582G1-MSP-GLC18**
MacroSep BIO-Gold C18 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLC18**
MacroSep BIO-Gold C18 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLC18**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of biomolecules using MacroSep BIO-Gold C18, 250 x 4.6 mm, 5 µm.



MacroSep BIO-Gold C8

MacroSep BIO-Gold C8 is less hydrophobic and may yield faster separations when compared to C18. It is used to separate many classes of compounds including bio-pharmaceuticals and biologicals and is ideal for the separation of hydrophobic proteins and high molecular weight peptides. As with MacroSep BIO-Gold C18 columns, MacroSep BIO-Gold C8 columns are specifically engineered to deliver high recoveries and excellent peak shapes for even the most difficult separations and for a variety of biological molecules.

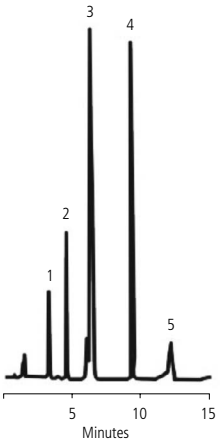
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold C8	50	2.1	3	400	**1121G1-MSP-GLC8**
MacroSep BIO-Gold C8	50	2.1	5	1200	**1122H1-MSP-GLC8**
MacroSep BIO-Gold C8	50	2.1	5	400	**1122G1-MSP-GLC8**
MacroSep BIO-Gold C8	100	2.1	3	400	**1221G1-MSP-GLC8**
MacroSep BIO-Gold C8	100	2.1	5	1200	**1222H1-MSP-GLC8**
MacroSep BIO-Gold C8	100	2.1	5	400	**1222G1-MSP-GLC8**
MacroSep BIO-Gold C8	100	4.6	3	1200	**1251H1-MSP-GLC8**
MacroSep BIO-Gold C8	100	4.6	3	400	**1251G1-MSP-GLC8**
MacroSep BIO-Gold C8	100	4.6	5	1200	**1252H1-MSP-GLC8**
MacroSep BIO-Gold C8	100	4.6	5	400	**1252G1-MSP-GLC8**
MacroSep BIO-Gold C8	150	2.1	3	400	**1321G1-MSP-GLC8**
MacroSep BIO-Gold C8	150	2.1	5	1200	**1322H1-MSP-GLC8**
MacroSep BIO-Gold C8	150	2.1	5	400	**1322G1-MSP-GLC8**
MacroSep BIO-Gold C8	150	4.6	3	1200	**1351H1-MSP-GLC8**
MacroSep BIO-Gold C8	150	4.6	3	400	**1351G1-MSP-GLC8**
MacroSep BIO-Gold C8	150	4.6	5	1200	**1352H1-MSP-GLC8**
MacroSep BIO-Gold C8	150	4.6	5	400	**1352G1-MSP-GLC8**
MacroSep BIO-Gold C8	250	4.6	5	1200	**1552H1-MSP-GLC8**
MacroSep BIO-Gold C8	250	4.6	5	400	**1552G1-MSP-GLC8**
MacroSep BIO-Gold C8 Prep	250	20	5	1200	**1582H1-MSP-GLC8**
MacroSep BIO-Gold C8 Prep	250	20	5	400	**1582G1-MSP-GLC8**
MacroSep BIO-Gold C8 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLC8**
MacroSep BIO-Gold C8 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLC8**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of biomolecules using MacroSep BIO-Gold C8, 250 mm x 4.6 mm, 5 µm.

Peak Identification
1. Ribonuclease A
2. Insulin
3. Lysozyme
4. Myoglobin
5. Ovalbumin

Mobile phase: A: 0.1% TFA in H_2O
B: 0.1% TFA in ACN
Gradient (time:%B): 0 mins:25% to 30 mins:100%
Flow rate: 1.5 mL/min
Detection: UV @ 254 nm



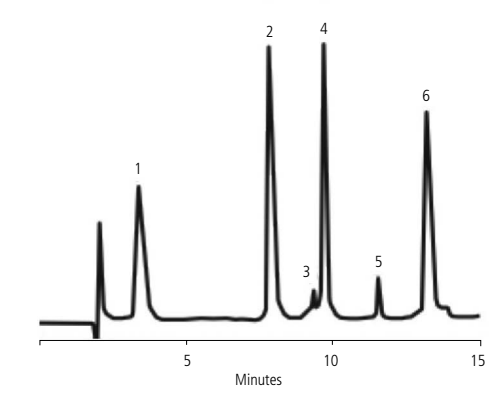
MacroSep BIO-Gold C4

MacroSep BIO-Gold C4 is the least hydrophobic of all the alkyl MacroSep BIO phases (C18 & C8) and can be used with highly aqueous mobile phases. These columns are designed for bio–pharmaceutical and bio-chemical applications. They are ideal for the separation of high molecular weight peptides, may be used to reduce analysis times, and provide enhanced stability under high aqueous mobile phase conditions.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold C4	50	2.1	3	400	**1121G1-MSP-GLC4**
MacroSep BIO-Gold C4	50	2.1	5	1200	**1122H1-MSP-GLC4**
MacroSep BIO-Gold C4	50	2.1	5	400	**1122G1-MSP-GLC4**
MacroSep BIO-Gold C4	100	2.1	3	400	**1221G1-MSP-GLC4**
MacroSep BIO-Gold C4	100	2.1	5	1200	**1222H1-MSP-GLC4**
MacroSep BIO-Gold C4	100	2.1	5	400	**1222G1-MSP-GLC4**
MacroSep BIO-Gold C4	100	4.6	3	1200	**1251H1-MSP-GLC4**
MacroSep BIO-Gold C4	100	4.6	3	400	**1251G1-MSP-GLC4**
MacroSep BIO-Gold C4	100	4.6	5	1200	**1252H1-MSP-GLC4**
MacroSep BIO-Gold C4	100	4.6	5	400	**1252G1-MSP-GLC4**
MacroSep BIO-Gold C4	150	2.1	3	400	**1321G1-MSP-GLC4**
MacroSep BIO-Gold C4	150	2.1	5	1200	**1322H1-MSP-GLC4**
MacroSep BIO-Gold C4	150	2.1	5	400	**1322G1-MSP-GLC4**
MacroSep BIO-Gold C4	150	4.6	3	1200	**1351H1-MSP-GLC4**
MacroSep BIO-Gold C4	150	4.6	3	400	**1351G1-MSP-GLC4**
MacroSep BIO-Gold C4	150	4.6	5	1200	**1352H1-MSP-GLC4**
MacroSep BIO-Gold C4	150	4.6	5	400	**1352G1-MSP-GLC4**
MacroSep BIO-Gold C4	250	4.6	5	1200	**1552H1-MSP-GLC4**
MacroSep BIO-Gold C4	250	4.6	5	400	**1552G1-MSP-GLC4**
MacroSep BIO-Gold C4 Prep	250	20	5	1200	**1582H1-MSP-GLC4**
MacroSep BIO-Gold C4 Prep	250	20	5	400	**1582G1-MSP-GLC4**
MacroSep BIO-Gold C4 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLC4**
MacroSep BIO-Gold C4 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLC4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of biomolecules using MacroSep BIO- Gold C4, 150 mm x 4.6 mm, 5 µm.

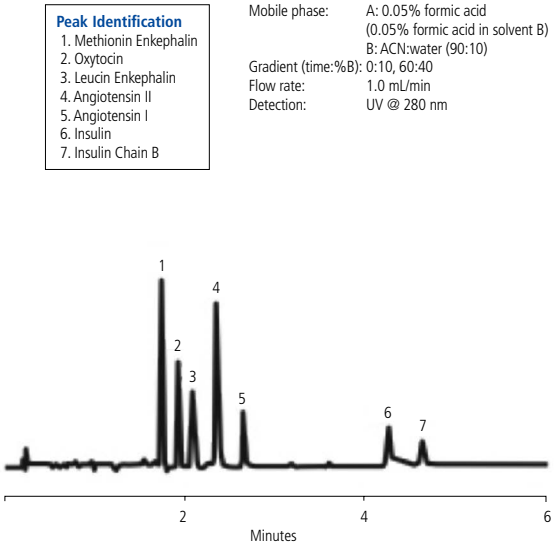


MacroSep BIO-Gold Naphthyl

MacroSep BIO-Gold Naphthyl is based upon bonded planar naphthalene groups and has the highest bonding density and surface coverage of all the MacroSep Bio-Gold phases, providing maximum hydrophobic interaction and superior inertness. It is suitable for variety of solute interactions including π-π and hydrophobic. Ideal for the separation of high MW peptides and oligonucleic acids.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Naphthyl	50	2.1	3	400	**1121G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	50	2.1	5	1200	**1122H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	50	2.1	5	400	**1122G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	2.1	3	400	**1221G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	2.1	5	1200	**1222H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	2.1	5	400	**1222G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	4.6	3	1200	**1251H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	4.6	3	400	**1251G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	4.6	5	1200	**1252H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	100	4.6	5	400	**1252G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	2.1	3	400	**1321G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	2.1	5	1200	**1322H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	2.1	5	400	**1322G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	4.6	3	1200	**1351H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	4.6	3	400	**1351G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	4.6	5	1200	**1352H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	150	4.6	5	400	**1352G1-MSP-GLNAP**

HPLC analysis of biomolecules using MacroSep BIO- Gold Naphthyl, 250 mm x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Naphthyl	250	4.6	5	1200	**1552H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl	250	4.6	5	400	**1552G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl Prep	250	20	5	1200	**1582H1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl Prep	250	20	5	400	**1582G1-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLNAP**
MacroSep BIO-Gold Naphthyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLNAP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

MacroSep BIO-Gold Biphenyl

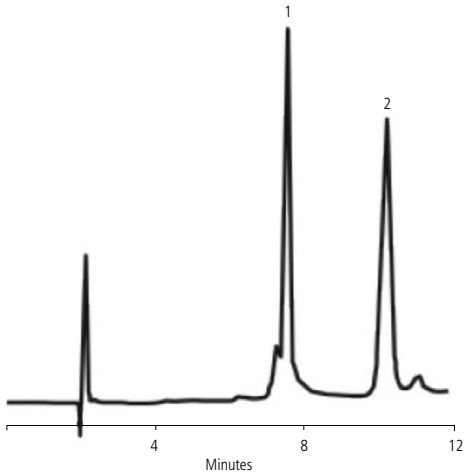
MacroSep BIO-Gold Biphenyl is based upon bonded biphenyl groups with a high bonding density and is suitable for variety of solute interactions including π-π and hydrophobic. It is less hydrophobic than the BIO-Gold Naphthyl. MacroSep BIO-Gold Biphenyl is designed for bio-pharmaceutical and bio-chemical applications.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Biphenyl	50	2.1	3	400	**1121G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	50	2.1	5	1200	**1122H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	50	2.1	5	400	**1122G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	2.1	3	400	**1221G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	2.1	5	1200	**1222H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	2.1	5	400	**1222G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	4.6	3	1200	**1251H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	4.6	3	400	**1251G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	4.6	5	1200	**1252H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	100	4.6	5	400	**1252G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	2.1	3	400	**1321G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	2.1	5	1200	**1322H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	2.1	5	400	**1322G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	4.6	3	1200	**1351H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	4.6	3	400	**1351G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	4.6	5	1200	**1352H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	150	4.6	5	400	**1352G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl	250	4.6	5	1200	**1552H1-MSP-GLBPH**

HPLC analysis of D-chymotrypsinogen and carbonic anhydrase using MacroSep BIO-Gold Biphenyl, 150 mm x 4.6 mm, 5 µm.

Peak Identification
1. D-Chymotrypsinogen
2. Carbonic anhydrase

Mobile phase: A: 0.15% TFA in H_2O
B: 0.13% TFA in ACN
Gradient (time:%B): 0:40, 15:55
Flow rate: 1.0 mL/min
Detection: UV @ 220 nm



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Biphenyl	250	4.6	5	400	**1552G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl Prep	250	20	5	1200	**1582H1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl Prep	250	20	5	400	**1582G1-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLBPH**
MacroSep BIO-Gold Biphenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLBPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

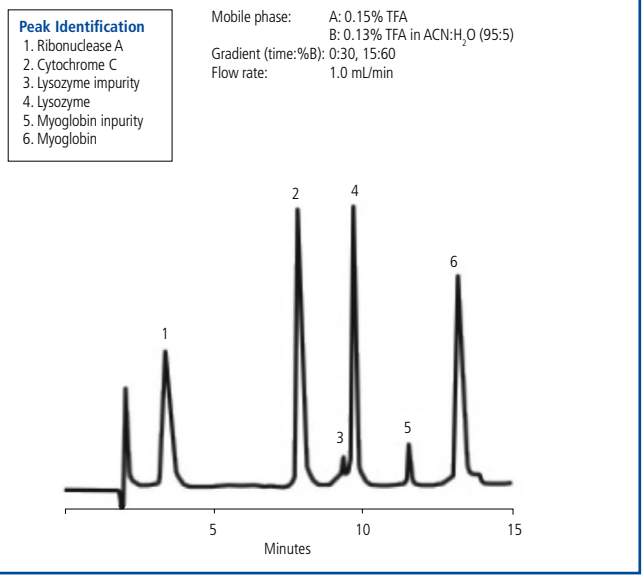
MacroSep BIO-Gold Diphenyl

The MacroSep BIO-Gold Diphenyl has the lowest bonding density and one of the lowest hydrophobicities of any BIO-Gold phenyl phases. It provides some site-specific phenyl interactions dependant on the molecular configuration of the target and can resolve many classes of proteins and bio-polymers.

The MacroSep Bio-Gold has a unique phenyl ring configuration and may provide some site-specific interactions and a variety of solute interactions including π-π and hydrophobic going well beyond the simple hydrophobic interaction of MacroSep BIO-Gold alkyl phases. BIO-Gold Diphenyl is designed for bio-pharmaceutical and bio-chemical applications.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Diphenyl	50	2.1	3	400	**1121G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	50	2.1	5	1200	**1122H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	50	2.1	5	400	**1122G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	2.1	3	400	**1221G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	2.1	5	1200	**1222H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	2.1	5	400	**1222G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	4.6	3	1200	**1251H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	4.6	3	400	**1251G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	4.6	5	1200	**1252H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	100	4.6	5	400	**1252G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	2.1	3	400	**1321G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	2.1	5	1200	**1322H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	2.1	5	400	**1322G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	4.6	3	1200	**1351H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	4.6	3	400	**1351G1-MSP-GLDPH**

HPLC analysis of biomolecules using MacroSep BIO-Gold Diphenyl, 150 x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold Diphenyl	150	4.6	5	1200	**1352H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	150	4.6	5	400	**1352G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	250	4.6	5	1200	**1552H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl	250	4.6	5	400	**1552G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl Prep	250	20	5	1200	**1582H1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl Prep	250	20	5	400	**1582G1-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLDPH**
MacroSep BIO-Gold Diphenyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLDPH**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

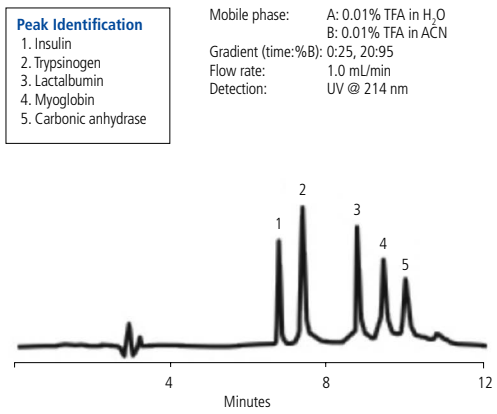
MacroSep BIO-Gold HPR

MacroSep BIO-Gold HPR significantly reduces the hydrophobic interaction of the stationary phase. This reduced interaction can yield less retention of hydrophobic biological molecules, yielding better recoveries and quicker separations. HPR is the most hydrophilic of the MacroSep BIO-Gold phases.

MacroSep BIO-Gold HPR consists of unique perfluorinated aliphatic bonded groups which are highly hydrophilic and reduce the hydrophobic interaction of the stationary phase resulting in less retention of hydrophobic biological molecules with better recoveries and faster separations. Specially engineered for analysis of hydrophobic proteins, lipid peptides, polypeptides with aliphatic side chains and membrane-spanning peptides. In addition, HPR may be useful for fluorine modified biologics based upon a fluorophilicity interaction.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold HPR	50	2.1	3	400	**1121G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	50	2.1	5	1200	**1122H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	50	2.1	5	400	**1122G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	2.1	3	400	**1221G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	2.1	5	1200	**1222H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	2.1	5	400	**1222G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	4.6	3	1200	**1251H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	4.6	3	400	**1251G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	4.6	5	1200	**1252H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	100	4.6	5	400	**1252G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	2.1	3	400	**1321G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	2.1	5	1200	**1322H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	2.1	5	400	**1322G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	4.6	3	1200	**1351H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	4.6	3	400	**1351G1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	4.6	5	1200	**1352H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	150	4.6	5	400	**1352G1-MSP-GLHPR**

HPLC analysis of biomolecules using MacroSep BIO-Gold HPR, 250 x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold HPR	250	4.6	5	1200	**1552H1-MSP-GLHPR**
MacroSep BIO-Gold HPR	250	4.6	5	400	**1552G1-MSP-GLHPR**
MacroSep BIO-Gold HPR Prep	250	20	5	1200	**1582H1-MSP-GLHPR**
MacroSep BIO-Gold HPR Prep	250	20	5	400	**1582G1-MSP-GLHPR**
MacroSep BIO-Gold HPR Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLHPR**
MacroSep BIO-Gold HPR Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLHPR**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

MacroSep BIO-Gold PFP

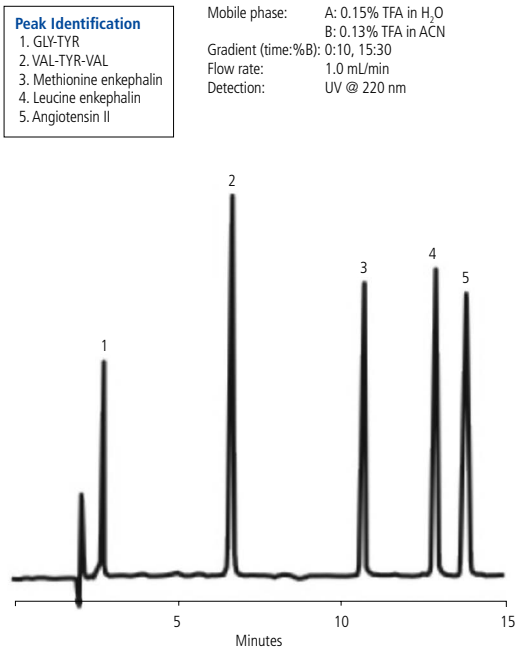
MacroSep BIO-Gold PFP exhibits the strongest π-π interaction of all the BIO-Gold phases. The most hydrophilic of the BIO-Gold phenyl phases and may be used for fluorine modified biologics based upon a fluorophilicity interaction.

Fluorinated phases such as pentafluorophenyl (PFP) with the highest π-π interaction of any the MacroSep BIO series stationary phases are of great importance in HPLC because their selectivity is orthogonal to the selectivity of traditional alkyl phases (C18, C8, C4 etc.). In addition, it may be useful for fluorine modified biologics based upon a fluorophilicity interaction. Notably in the separation of closely related compounds such as natural compounds and their metabolites in biological matrices, where separation is often difficult or not possible at all on C18 phases.

The alternative retention mechanism PFP phases exhibit are therefore increasingly important for method development in bio-pharmaceuticals and the analysis of natural compounds.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold PFP	50	2.1	3	400	**1121G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	50	2.1	5	1200	**1122H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	50	2.1	5	400	**1122G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	2.1	3	400	**1221G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	2.1	5	1200	**1222H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	2.1	5	400	**1222G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	4.6	3	1200	**1251H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	4.6	3	400	**1251G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	4.6	5	1200	**1252H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	100	4.6	5	400	**1252G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	2.1	3	400	**1321G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	2.1	5	1200	**1322H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	2.1	5	400	**1322G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	4.6	3	1200	**1351H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	4.6	3	400	**1351G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	4.6	5	1200	**1352H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	150	4.6	5	400	**1352G1-MSP-GLPFP**
MacroSep BIO-Gold PFP	250	4.6	5	1200	**1552H1-MSP-GLPFP**
MacroSep BIO-Gold PFP	250	4.6	5	400	**1552G1-MSP-GLPFP**
MacroSep BIO-Gold PFP Prep	250	20	5	1200	**1582H1-MSP-GLPFP**

HPLC analysis of various peptides using MacroSep BIO-Gold PFP, 150 x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
MacroSep BIO-Gold PFP Prep	250	20	5	400	**1582G1-MSP-GLPFP**
MacroSep BIO-Gold PFP Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	1200	**500103-MSP-GLPFP**
MacroSep BIO-Gold PFP Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	1200	**500101-MSP-GLPFP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions, particle sizes, and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

Chromegapore Molecular Size Exclusion (MSE) Columns

Size Exclusion chromatography separates molecules based on their size. We are pleased to offer a series of Chromegapore molecular size exclusion (MSE) columns available in a wide variety of particle and pore sizes. Chromegapore columns are available in Silica, TMS bonded to silica, and Diol bonded to silica. Silica and TMS Chromegapore columns are recommended for the analysis of polymers that are organic soluble. Chromegapore Diol columns are recommended for samples that are water soluble, such as proteins, peptides, and water-soluble synthetic polymers. Chromegapore packings can be packed into columns of various dimensions and are available in a variety of pore sizes (60 - 1000 Å).

Features and Benefits

- Five pore sizes (60, 100, 300, 500, and 1000 Å) to allow separation of molecules of different size
- Three phases (Diol, Silica, and TMS) to accommodate both aqueous and organic soluble samples

Material Characteristics

Brand	Phase	Particle Size (µm)	Pore Size (Å)	End Cap	pH Range
Chromegapore MSE	Diol	5	60, 100, 300, 500, 1000	No	2-8
Chromegapore MSE	Silica	5	60, 100, 300, 500, 1000	No	2-8
Chromegapore MSE	TMS (C1)	5	60, 100, 300, 500, 1000	Yes	2-8

Preparative columns of these phases are also available. Please enquire for more details at LCA.TechSupport@perkinelmer.com

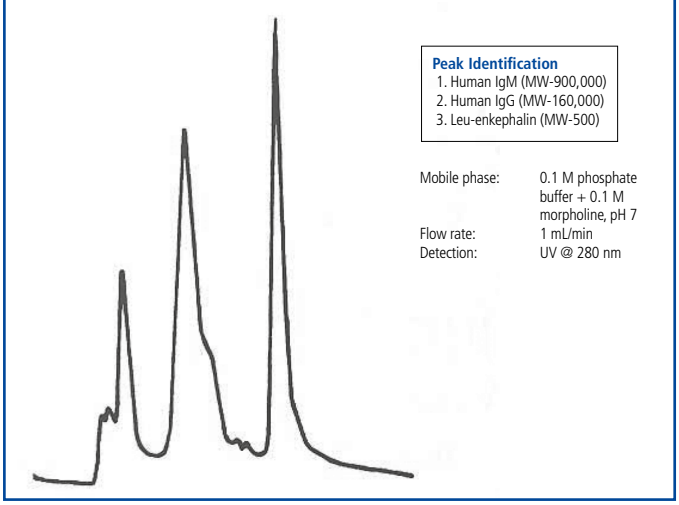
Chromegapore MSE Diol Columns

Chromegapore size exclusion columns are available in a wide variety of particle and pore sizes. Chromegapore MSE Diol columns are recommended for samples that are water soluble such as proteins, peptides and water-soluble synthetic polymers.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
Chromegapore MSE Diol	300	4.6	5	300	**165231-MSED**
Chromegapore MSE Diol	300	7.8	5	100	**169221-MSED**
Chromegapore MSE Diol	300	7.8	5	500	**169241-MSED**
Chromegapore MSE Diol	300	7.8	5	1000	**169251-MSED**
Chromegapore MSE Diol Guard Cartridges (Pkg. 5)	10	3.0	5	100	**500101-MSED**
Chromegapore MSE Diol Guard Cartridges (Pkg. 5)	10	3.0	5	300	**500101-MSED300**
Chromegapore MSE Diol Guard Cartridges (Pkg. 5)	10	3.0	5	500	**500101-MSED500**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of a serum proteins using Chromegapore Diol, 250 x 7.8 mm, 5 µm (300 Å).



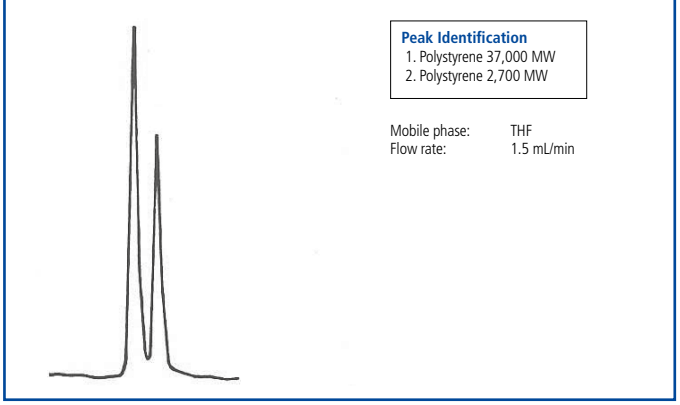
Chromegapore MSE Silica Columns

Chromegapore size exclusion columns are available in a wide variety of particle and pore sizes. Chromegapore MSE Silica columns are recommended for samples that are organic soluble.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
Chromegapore MSE Silica	300	4.6	5	100	**165221-MSE**
Chromegapore MSE Silica	300	4.6	5	300	**165231-MSE**
Chromegapore MSE Silica	300	7.8	5	100	**169221-MSE**
Chromegapore MSE Silica	300	7.8	5	500	**169241-MSE**
Chromegapore MSE Silica	300	7.8	5	1000	**169251-MSE**
Chromegapore MSE Silica Guard Cartridges (Pkg. 5)	10	3.0	5	100	**500101-MSE**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

HPLC analysis of polymers using Chromegapore MSE Silica, 300 x 4.6 mm, 5 µm.



Chromegapore MSE TMS Columns

Chromegapore size exclusion columns are available in a wide variety of particle and pore sizes. Chromegapore MSE TMS columns are recommended for samples that are organic soluble.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Pore Size (Å)	Part Number
Chromegapore MSE TMS (C1)	300	7.8	5	100	**169221-MSET**
Chromegapore MSE TMS (C1) Prep	300	20	5	60	**168211-MSET**
Chromegapore MSE TMS (C1) Prep	300	20	5	100	**168221-MSET**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

GreenSep Supercritical Fluid Chromatography (SFC) Columns

Many SFC separations have utilized "older normal phase HPLC types" of stationary phases such as unmodified silica, diol, amino and cyano. These phases are poorly adapted to SFC and present a number of limitations for SFC separations including low capacity, poor selectivity and poor peak shape.

GreenSep™ stationary phases, on the other hand, have been specifically engineered for SFC separations, paying close attention to bonding coverage, density and all factors leading to high capacity phases which exhibit excellent selectivity and peak shape. Many of the GreenSep phases designed for basic and acidic compounds do NOT require mobile phase additives that are commonly required with other brands of phases. The GreenSep range features a variety of selectivities offering orthogonality. All of these materials are available in analytical and also semi-preparative (10 mm), and preparative (20 mm, 30 mm and 50 mm i.d.) dimensions. Additionally, comprehensive technical and method development assistance is offered.

Shown below is a column selection guide for the development of a SFC separation with the GreenSep Pyridyl Amide being the go-to column of choice, followed by the other columns.

Features and Benefits

- Specifically designed for high performance SFC separations resulting in superior separation, selectivity, peak shape, and loading capacity compared to conventional normal-phase HPLC materials adapted for SFC
- Highly efficient columns with superior reproducibility produced from our rigorous bonding procedures
- Directly scalable from analytical to preparative on the same media to streamline purification and maximise operational efficiency
- Many phases have been specifically engineered using functional group chemistry that don't require mobile phase additives such as triethyl amine

Material Characteristics

Brand	Phase	Particle Size (µm)	Pore Size (Å)	pH Range
GreenSep	Pyridyl Amide	1.8, 3, 5, 10	120	2-10
GreenSep	Basic	1.8, 3, 5, 10	120	2-10
GreenSep	Ethyl Pyridine (PYE)	1.8, 3, 5, 10	120	2-10
GreenSep	Ethyl Pyridine II (PYE-II)	1.8, 3, 5, 10	120	2-10
GreenSep	Nitro	1.8, 3, 5, 10	120	2-10
GreenSep	Naphthyl	1.8, 3, 5, 10	120	2-10
GreenSep	Diol	1.8, 3, 5, 10	120	2-10
GreenSep	FluoroBasic	1.8, 3, 5, 10	120	2-10
GreenSep	4-Ethyl Pyridine (PYE4)	1.8, 3, 5, 10	120	2-10
GreenSep	4-Ethyl Pyridine II (PYE4-II)	1.8, 3, 5, 10	120	2-10
GreenSep	NP-9	5, 10	–	2-10
GreenSep	NP-10	5, 10	–	2-10
GreenSep	NP-II	5, 10	–	2-10
GreenSep	NP-III	5, 10	–	2-10
GreenSep	PFP	1.8, 3, 5, 10	120	2-10
GreenSep	Cyano	1.8, 3, 5, 10	120	2-10
GreenSep	DEAP	1.8, 3, 5, 10	120	2-10
GreenSep	Amine	1.8, 3, 5, 10	120	2-10
GreenSep	Silica	1.8, 3, 5, 10	120	2-10

Preparative columns of these phases are also available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

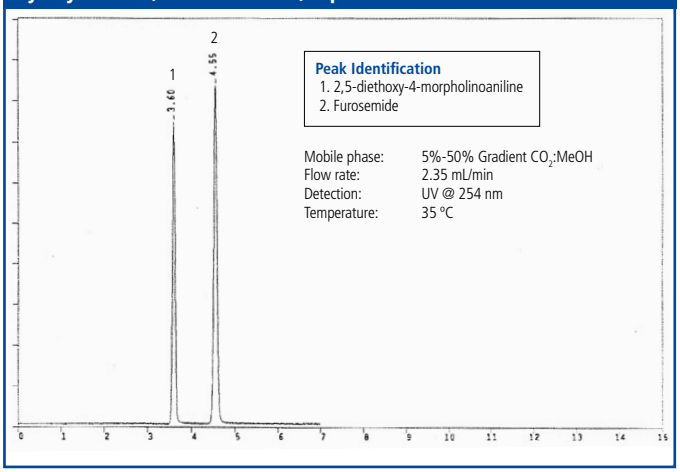
Column selection guide for the development of an SFC Separation.
GreenSep Pyridyl Amide is the go-to column of choice, followed by the other columns.

GreenSep Pyridyl Amide	GreenSep Basic	GreenSep Ethyl Pyridine II	GreenSep Nitro	GreenSep Naphthyl	GreenSep Diol
Good overall for the separation of acids, amines and neutrals without additives	Imidazole based, best peak shape for amines without additives	Good overall selectivity and excellent for acid mixtures without additives	Nitro aromatic based, unique selectivity	Naphthalene based, ridged structure, good for diastereomers separation and non-polar compounds, π-π interaction	The selectivity of silica without reactivity of silica

GreenSep Pyridyl Amide

GreenSep Pyridyl Amide stationary phase is the first column of choice when developing an SFC separation and is excellent overall for the separation of acids, amines and neutrals without additives. The type of chemicals separated on conventional stationary phases (silica, cyano, diol) would normally require the addition of TFA or an amine to the mobile phase as a peak shape modifier. However, GreenSep Pyridyl Amide does not require this addition. It is ideal for chemicals that contain both basic amine and acidic groups. GreenSep Pyridyl Amide provides flexibility for the SFC chromatographer with mobile phase composition and fraction collection being greatly simplified without the use of amino additives.

SFC analysis, without mobile phase additives, of compounds containing amine bases and acidic groups using GreenSep Pyridyl Amide, 150 x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Pyridyl Amide	50	2.1	1.8	**512A91-GS-PYA**
GreenSep Pyridyl Amide	50	3.0	1.8	**513A91-GS-PYA**
GreenSep Pyridyl Amide	50	3.0	3	**113191-GS-PYA**
GreenSep Pyridyl Amide	50	4.6	3	**115191-GS-PYA**
GreenSep Pyridyl Amide	100	2.1	1.8	**522A91-GS-PYA**
GreenSep Pyridyl Amide	100	2.1	3	**122191-GS-PYA**
GreenSep Pyridyl Amide	100	3.0	1.8	**523A91-GS-PYA**
GreenSep Pyridyl Amide	100	3.0	3	**123191-GS-PYA**
GreenSep Pyridyl Amide	100	3.0	5	**123291-GS-PYA**
GreenSep Pyridyl Amide	100	4.6	5	**125291-GS-PYA**
GreenSep Pyridyl Amide	150	2.1	1.8	**532A91-GS-PYA**
GreenSep Pyridyl Amide	150	3.0	1.8	**533A91-GS-PYA**
GreenSep Pyridyl Amide	150	3.0	3	**133191-GS-PYA**
GreenSep Pyridyl Amide	150	3.0	5	**133291-GS-PYA**
GreenSep Pyridyl Amide	150	4.6	3	**135191-GS-PYA**
GreenSep Pyridyl Amide	150	4.6	5	**135291-GS-PYA**
GreenSep Pyridyl Amide Prep	150	20	5	**138291-GS-PYA**
GreenSep Pyridyl Amide Prep	150	30	5	**13N291-GS-PYA**
GreenSep Pyridyl Amide Prep	150	50	5	**13F291-GS-PYA**
GreenSep Pyridyl Amide Prep	250	10	5	**157291-GS-PYA**
GreenSep Pyridyl Amide Prep	250	20	10	**158391-GS-PYA**
GreenSep Pyridyl Amide Prep	250	20	5	**158291-GS-PYA**
GreenSep Pyridyl Amide Prep	250	30	5	**15N291-GS-PYA**
GreenSep Pyridyl Amide Prep	250	50	5	**15F291-GS-PYA**
GreenSep Pyridyl Amide Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PYA**
GreenSep Pyridyl Amide Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PYA**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

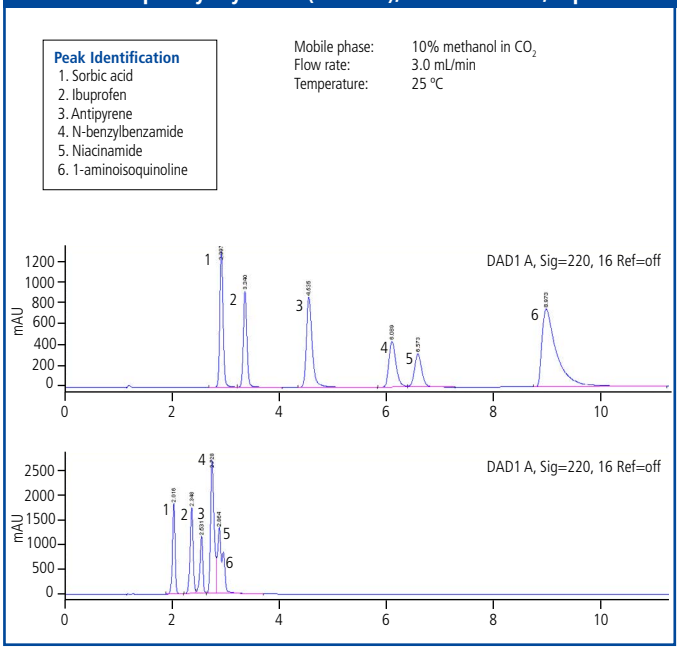
GreenSep Basic

GreenSep Basic is based on imidazole chemistry providing a highly basic character for this stationary phase. GreenSep Basic offers the chromatographer greater flexibility in developing separations and is the SFC column ideally suited for the retention and rapid separation of chemicals containing amine groups. GreenSep Basic is the primary column of choice for the retention and rapid separation of compounds containing strong amine groups, without use of additives. GreenSep Basic can easily replace conventional stationary phases used in SFC and deliver superior performance.

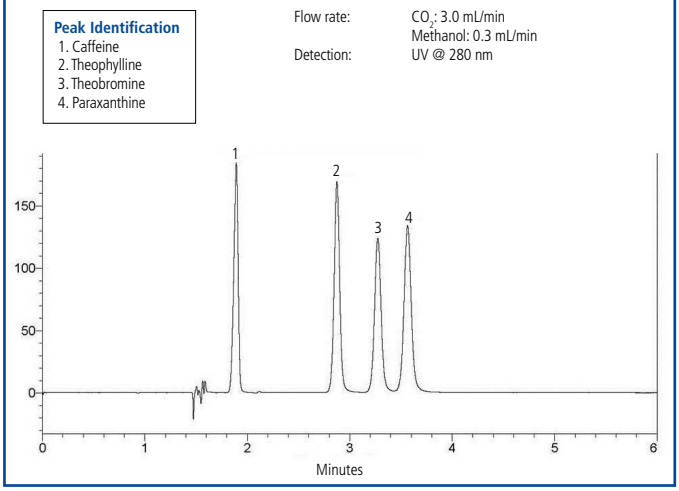
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Basic	50	2.1	1.8	**512A91-GS-BC**
GreenSep Basic	50	3.0	1.8	**513A91-GS-BC**
GreenSep Basic	50	3.0	3	**113191-GS-BC**
GreenSep Basic	50	4.6	3	**115191-GS-BC**
GreenSep Basic	150	3.0	5	**133291-GS-BC**
GreenSep Basic	150	4.6	3	**135191-GS-BC**
GreenSep Basic	100	2.1	3	**122191-GS-BC**
GreenSep Basic	100	3.0	1.8	**523A91-GS-BC**
GreenSep Basic	100	3.0	3	**123191-GS-BC**
GreenSep Basic	100	3.0	5	**123291-GS-BC**
GreenSep Basic	100	4.6	3	**125191-GS-BC**
GreenSep Basic	100	4.6	5	**125291-GS-BC**
GreenSep Basic	150	2.1	3	**132191-GS-BC**
GreenSep Basic	150	2.1	5	**132291-GS-BC**
GreenSep Basic	150	3.0	1.8	**533A91-GS-BC**
GreenSep Basic	150	3.0	3	**133191-GS-BC**
GreenSep Basic	150	4.6	5	**135291-GS-BC**
GreenSep Basic	250	4.6	10	**155391-GS-BC**
GreenSep Basic	250	4.6	5	**155291-GS-BC**
GreenSep Basic Prep	50	50	5	**11F291-GS-BC**
GreenSep Basic Prep	100	20	5	**128291-GS-BC**
GreenSep Basic Prep	100	30	3	**12N191-GS-BC**
GreenSep Basic Prep	100	50	5	**12F291-GS-BC**
GreenSep Basic Prep	150	20	5	**138291-GS-BC**
GreenSep Basic Prep	150	30	5	**13N291-GS-BC**
GreenSep Basic Prep	150	50	5	**13F291-GS-BC**
GreenSep Basic Prep	250	20	5	**158291-GS-BC**
GreenSep Basic Prep	250	30	10	**15N391-GS-BC**
GreenSep Basic Prep	250	30	5	**15N291-GS-BC**
GreenSep Basic Prep	250	50	5	**15F291-GS-BC**
GreenSep Basic Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-BC**
GreenSep Basic Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-BC**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of amines using GreenSep Basic (top) and GreenSep Ethyl Pyridine (bottom), 250 x 4.6 mm, 5 µm.



SFC analysis of caffeine analogue mixture using GreenSep Basic, 250 x 4.6 mm, 5 µm.

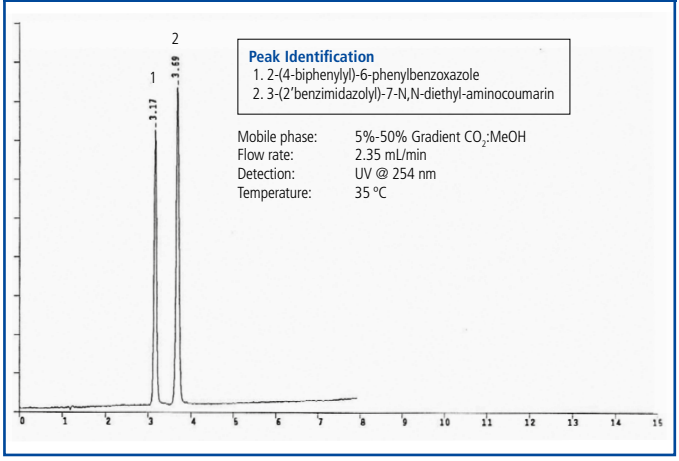


GreenSep Ethyl Pyridine

GreenSep Ethyl Pyridine is an endcapped phase and has proven superior to conventional stationary phases (such as diol, cyano etc...) in the areas of separation selectivity, peak shape and loading capacity.

The chromatogram shown (right) is a prime example of the superior peak shape performance obtainable with the GreenSep Ethyl Pyridine column with SFC. The type of chemicals separated in this chromatogram (functionalized with amine groups) would normally require the addition of an amine to the mobile phase. However, Ethyl Pyridine does not require the addition of these peak shape modifiers. Mobile phase composition and fraction collection is greatly simplified without the use of amino additives. GreenSep Ethyl Pyridine provides better separation for amines in comparison with the GreenSep Ethyl Pyridine II.

SFC analysis of amine containing compounds using GreenSep Ethyl Pyridine, 250 x 4.6 mm, 5 µm.



Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Ethyl Pyridine	50	2.1	1.8	**512A91-GS-PYE**
GreenSep Ethyl Pyridine	50	3.0	1.8	**513A91-GS-PYE**
GreenSep Ethyl Pyridine	50	3.0	3	**113191-GS-PYE**
GreenSep Ethyl Pyridine	50	3.0	5	**113291-GS-PYE**
GreenSep Ethyl Pyridine	50	4.6	5	**115291-GS-PYE**
GreenSep Ethyl Pyridine	150	3.0	5	**133291-GS-PYE**
GreenSep Ethyl Pyridine	150	4.6	3	**135191-GS-PYE**
GreenSep Ethyl Pyridine	100	2.1	1.8	**522A91-GS-PYE**
GreenSep Ethyl Pyridine	100	3.0	1.8	**523A91-GS-PYE**
GreenSep Ethyl Pyridine	100	3.0	3	**123191-GS-PYE**
GreenSep Ethyl Pyridine	100	3.0	5	**123291-GS-PYE**
GreenSep Ethyl Pyridine	100	4.6	3	**125191-GS-PYE**
GreenSep Ethyl Pyridine	100	4.6	5	**125291-GS-PYE**
GreenSep Ethyl Pyridine	150	2.1	3	**132191-GS-PYE**
GreenSep Ethyl Pyridine	150	3.0	1.8	**533A91-GS-PYE**
GreenSep Ethyl Pyridine	150	3	3	**133191-GS-PYE**
GreenSep Ethyl Pyridine	150	4.6	5	**135291-GS-PYE**
GreenSep Ethyl Pyridine	250	4.6	5	**155291-GS-PYE**

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Ethyl Pyridine Prep	50	10	3	**117191-GS-PYE**
GreenSep Ethyl Pyridine Prep	100	30	5	**12N291-GS-PYE**
GreenSep Ethyl Pyridine Prep	150	20	5	**138291-GS-PYE**
GreenSep Ethyl Pyridine Prep	150	30	10	**13N391-GS-PYE**
GreenSep Ethyl Pyridine Prep	150	30	5	**13N291-GS-PYE**
GreenSep Ethyl Pyridine Prep	250	10	3	**157191-GS-PYE**
GreenSep Ethyl Pyridine Prep	250	10	5	**157291-GS-PYE**
GreenSep Ethyl Pyridine Prep	250	20	5	**158291-GS-PYE**
GreenSep Ethyl Pyridine Prep	250	30	5	**15N291-GS-PYE**
GreenSep Ethyl Pyridine Prep	250	50	5	**15F291-GS-PYE**
GreenSep Ethyl Pyridine Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PYE**
GreenSep Ethyl Pyridine Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PYE**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

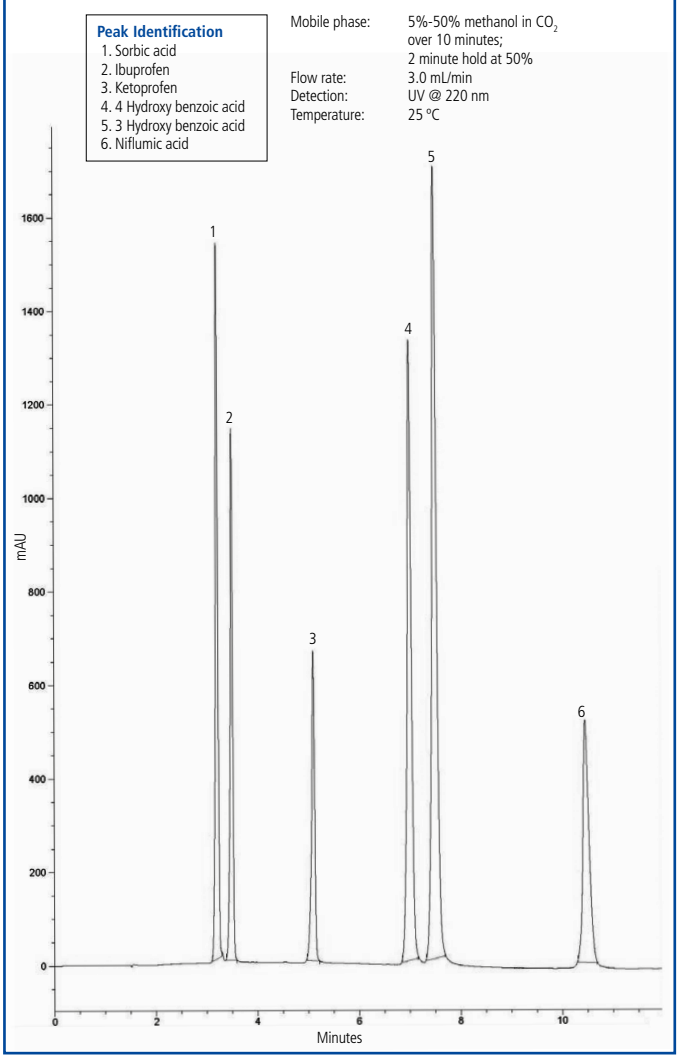
GreenSep Ethyl Pyridine II

GreenSep Ethyl Pyridine II is based on ethyl pyridine chemistry, providing a unique character for this stationary phase. GreenSep Ethyl Pyridine II is ideally suited for the retention and rapid separation of chemicals containing acid groups without additives. This phase is non-endcapped and provides superior separation of acids in comparison with the GreenSep Ethyl Pyridine. GreenSep Ethyl Pyridine II can easily replace conventional stationary phases used in SFC and deliver excellent performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Ethyl Pyridine II	150	3.0	3	**133191-GS-PYE-II**
GreenSep Ethyl Pyridine II	150	3.0	5	**133291-GS-PYE-II**
GreenSep Ethyl Pyridine II	150	4.6	3	**135191-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	3.0	1.8	**523A91-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	3.0	3	**123191-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	3.0	5	**123291-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	4.6	3	**125191-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	4.6	5	**125291-GS-PYE-II**
GreenSep Ethyl Pyridine II	150	2.1	3	**132191-GS-PYE-II**
GreenSep Ethyl Pyridine II	150	4.6	5	**135291-GS-PYE-II**
GreenSep Ethyl Pyridine II	250	4.6	5	**155291-GS-PYE-II**
GreenSep Ethyl Pyridine II	50	50	5	**11F291-GS-PYE-II**
GreenSep Ethyl Pyridine II	100	50	5	**12F291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	150	10	5	**137291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	150	20	5	**138291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	150	30	5	**13N291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	250	20	10	**158391-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	250	20	5	**158291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	250	30	5	**15N291-GS-PYE-II**
GreenSep Ethyl Pyridine II Prep	250	50	5	**15F291-GS-PYE-II**
GreenSep Ethyl Pyridine II Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PYE-II**
GreenSep Ethyl Pyridine II Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PYE-II**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of acidic pharmaceutical compounds using GreenSep Ethyl Pyridine II, 250 x 4.6 mm, 5 µm



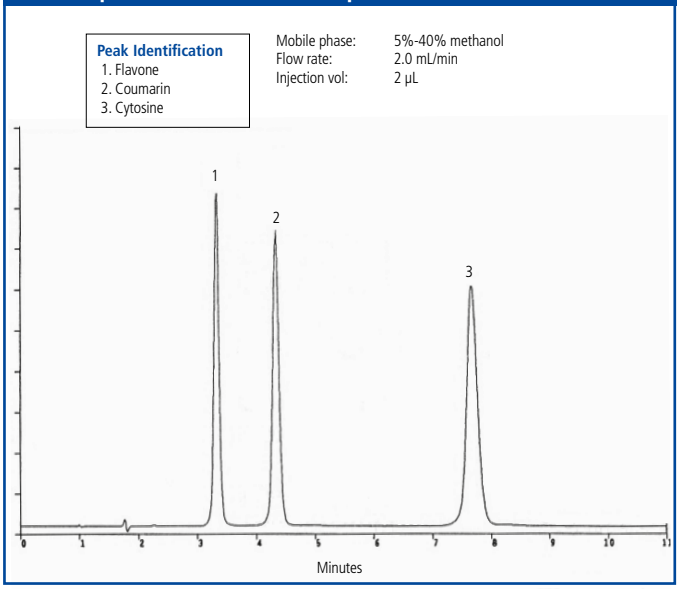
GreenSep Nitro

GreenSep Nitro SFC stationary phase is nitro aromatic based and has proven superior to conventional stationary phases (such as diol, cyano etc...) in the areas of separation selectivity and loading capacity. GreenSep Nitro provides unique selectivity and is specifically designed for the separation of geometrical isomers as well as diastereomers. It is the column of choice in separating compounds that contain an aromatic group, polarizable electrons, halogenated groups and conjugate systems.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Nitro	50	3.0	1.8	**513A91-GS-NO2**
GreenSep Nitro	50	3.0	3	**113191-GS-NO2**
GreenSep Nitro	50	3.0	5	**113291-GS-NO2**
GreenSep Nitro	50	4.6	3	**115191-GS-NO2**
GreenSep Nitro	50	4.6	5	**115291-GS-NO2**
GreenSep Nitro	100	2.1	1.8	**522A91-GS-NO2**
GreenSep Nitro	100	2.1	3	**122191-GS-NO2**
GreenSep Nitro	100	3.0	1.8	**523A91-GS-NO2**
GreenSep Nitro	100	3.0	3	**123191-GS-NO2**
GreenSep Nitro	100	3.0	5	**123291-GS-NO2**
GreenSep Nitro	100	4.6	3	**125191-GS-NO2**
GreenSep Nitro	100	4.6	5	**125291-GS-NO2**
GreenSep Nitro	150	2.1	3	**132191-GS-NO2**
GreenSep Nitro	150	3.0	3	**133191-GS-NO2**
GreenSep Nitro	150	3.0	5	**133291-GS-NO2**
GreenSep Nitro	150	4.6	3	**135191-GS-NO2**
GreenSep Nitro Prep	100	20	5	**128291-GS-NO2**
GreenSep Nitro Prep	100	30	5	**12N291-GS-NO2**
GreenSep Nitro Prep	150	10	5	**137291-GS-NO2**
GreenSep Nitro Prep	150	20	5	**138291-GS-NO2**
GreenSep Nitro Prep	150	30	5	**13N291-GS-NO2**
GreenSep Nitro Prep	250	20	5	**158291-GS-NO2**
GreenSep Nitro Prep	250	30	5	**15N291-GS-NO2**
GreenSep Nitro Prep	250	50	5	**15F291-GS-NO2**
GreenSep Nitro Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-NO2**
GreenSep Nitro Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-NO2**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of flavone, coumarin and cytosine using GreenSep Nitro, 250 x 4.6 mm, 5 µm.



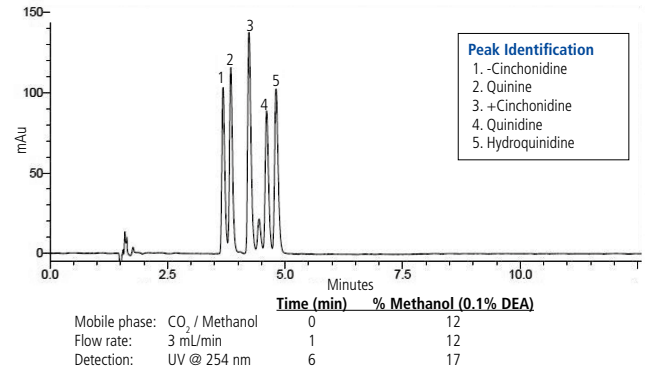
GreenSep Naphthyl

GreenSep Naphthyl is a naphthalene based SFC material, with high bonding density and intrinsic base deactivation due to a rigid structure that also enables the shape selectivity needed for many diastereomeric separations. It exhibits strong π-π interaction and charge transfer interactions, performing well for diastereomer separations and non-polar compounds. The unique properties of GreenSep Naphthyl place its selectivity between graphitized carbon and alkyl type stationary phases.

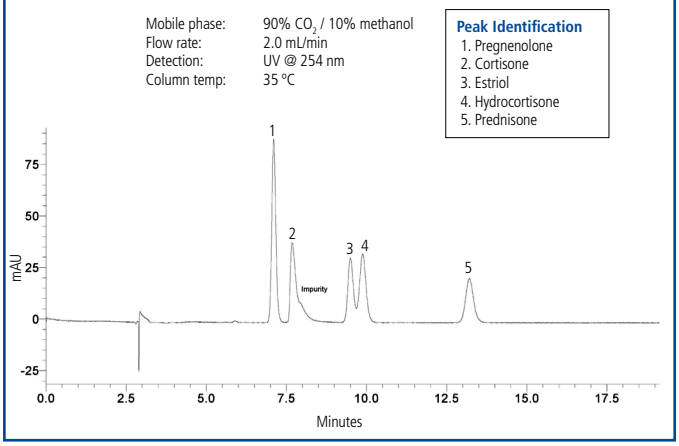
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Naphthyl	50	3.0	3	**113191-GS-NAP**
GreenSep Naphthyl	150	3.0	5	**133291-GS-NAP**
GreenSep Naphthyl	150	4.6	3	**135191-GS-NAP**
GreenSep Naphthyl	100	3.0	1.8	**523A91-GS-NAP**
GreenSep Naphthyl	100	3.0	3	**123191-GS-NAP**
GreenSep Naphthyl	100	3.0	5	**123291-GS-NAP**
GreenSep Naphthyl	100	4.6	3	**125191-GS-NAP**
GreenSep Naphthyl	100	4.6	5	**125291-GS-NAP**
GreenSep Naphthyl	150	3.0	3	**133191-GS-NAP**
GreenSep Naphthyl	150	4.6	5	**135291-GS-NAP**
GreenSep Naphthyl	250	4.6	5	**155291-GS-NAP**
GreenSep Naphthyl Prep	150	10	5	**137291-GS-NAP**
GreenSep Naphthyl Prep	150	20	5	**138291-GS-NAP**
GreenSep Naphthyl Prep	150	30	5	**13N291-GS-NAP**
GreenSep Naphthyl Prep	250	20	5	**158291-GS-NAP**
GreenSep Naphthyl Prep	250	30	5	**15N291-GS-NAP**
GreenSep Naphthyl Prep	250	50	5	**15F291-GS-NAP**
GreenSep Naphthyl Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-NAP**
GreenSep Naphthyl Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-NAP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, partilce sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of structurally similar quinine derivatives using GreenSep Naphthyl, 150 x 4.6 mm, 3 µm.



SFC analysis of structurally similar steroids using GreenSep Naphthyl, 250 x 4.6 mm, 5 µm.



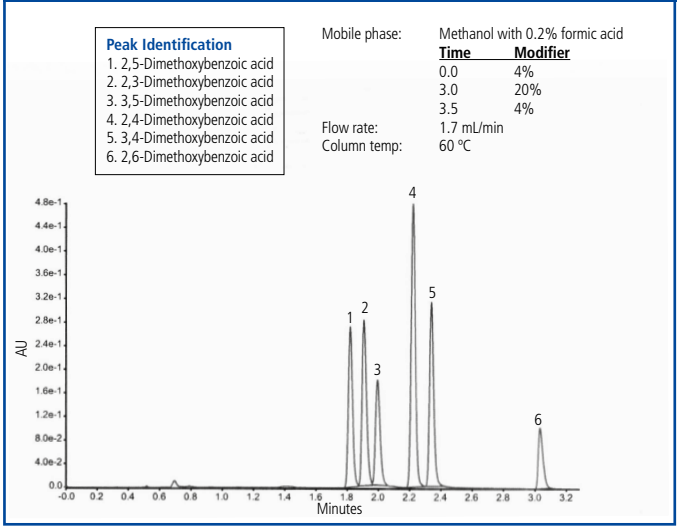
GreenSep Diol

GreenSep Diol is designed specifically for SFC with a high-density diol surface coverage which ensures separations are better and more reproducible than conventional unbonded silica. GreenSep Diol is particularly suitable for acidic and basic analytes. This phase provides the selectivity of silica, without its reactivity.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Diol	50	2.1	1.8	**512A91-GS-D**
GreenSep Diol	50	3.0	1.8	**513A91-GS-D**
GreenSep Diol	50	3.0	3	**113191-GS-D**
GreenSep Diol	100	3.0	1.8	**523A91-GS-D**
GreenSep Diol	100	3.0	3	**123191-GS-D**
GreenSep Diol	100	3.0	5	**123291-GS-D**
GreenSep Diol	150	3.0	1.8	**533A91-GS-D**
GreenSep Diol	150	3.0	3	**133191-GS-D**
GreenSep Diol	150	3.0	5	**133291-GS-D**
GreenSep Diol	150	4.6	3	**13d191-GS-D**
GreenSep Diol	150	4.6	5	**135291-GS-D**
GreenSep Diol	250	4.6	5	**155291-GS-D**
GreenSep Diol Prep	150	20	5	**138291-GS-D**
GreenSep Diol Prep	150	30	5	**13N291-GS-D**
GreenSep Diol Prep	250	10	10	**157391-GS-D**
GreenSep Diol Prep	250	20	5	**158291-GS-D**
GreenSep Diol Prep	250	30	5	**15N291-GS-D**
GreenSep Diol Prep	250	50	5	**15F291-GS-D**
GreenSep Diol Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-D**
GreenSep Diol Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-D**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of dimethoxybenzoic acids using GreenSep Diol, 100 x 3.0 mm, 3 µm.



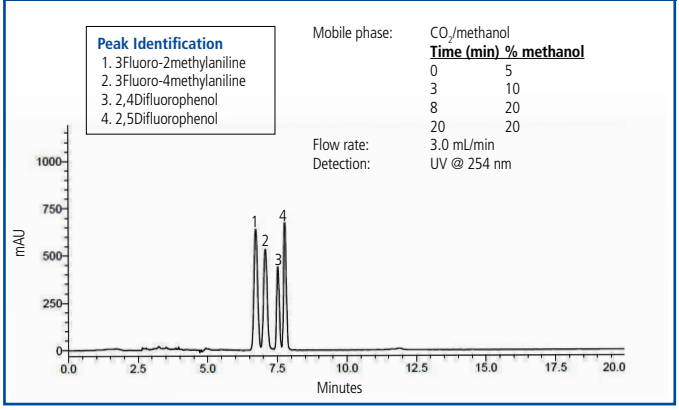
GreenSep FluoroBasic

GreenSep FluoroBasic is based on fluorinated imidazole chemistry, providing a highly basic and fluorinated character for this stationary phase. The addition of a fluorine groups into this stationary phase can be useful in promoting fluorophilic retention mechanisms which can provide improved retention for fluorinated compounds. A fluorophilic retention mechanism can be particular useful in medicinal chemistry and drug discovery, where more than a third of newly approved small molecule drugs contain fluorine. GreenSep FluoroBasic is ideally suited for the retention and rapid separation of chemicals containing amine and acidic groups. GreenSep FluoroBasic can easily replace conventional stationary phases used in SFC and deliver superior performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep FluoroBasic	100	3.0	3	**123191-GS-FLBC**
GreenSep FluoroBasic	100	3.0	5	**123291-GS-FLBC**
GreenSep FluoroBasic	150	3.0	3	**133191-GS-FLBC**
GreenSep FluoroBasic	150	3.0	5	**133291-GS-FLBC**
GreenSep FluoroBasic	150	4.6	3	**135191-GS-FLBC**
GreenSep FluoroBasic	150	4.6	5	**135291-GS-FLBC**
GreenSep FluoroBasic	250	4.6	5	**155291-GS-FLBC**
GreenSep FluoroBasic Prep	150	20	5	**138291-GS-FLBC**
GreenSep FluoroBasic Prep	150	30	5	**13N291-GS-FLBC**
GreenSep FluoroBasic Prep	250	20	5	**158291-GS-FLBC**
GreenSep FluoroBasic Prep	250	30	5	**15N291-GS-FLBC**
GreenSep FluoroBasic Prep	250	50	5	**15F291-GS-FLBC**
GreenSep FluoroBasic Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-FLBC**
GreenSep FluoroBasic Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-FLBC**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of fluorinated compounds (functionalized aniline (basic) and phenolic (acidic) compounds), with no additives using GreenSep FluoroBasic, 250 x 4.6 mm, 5 µm.



GreenSep 4-Ethyl Pyridine

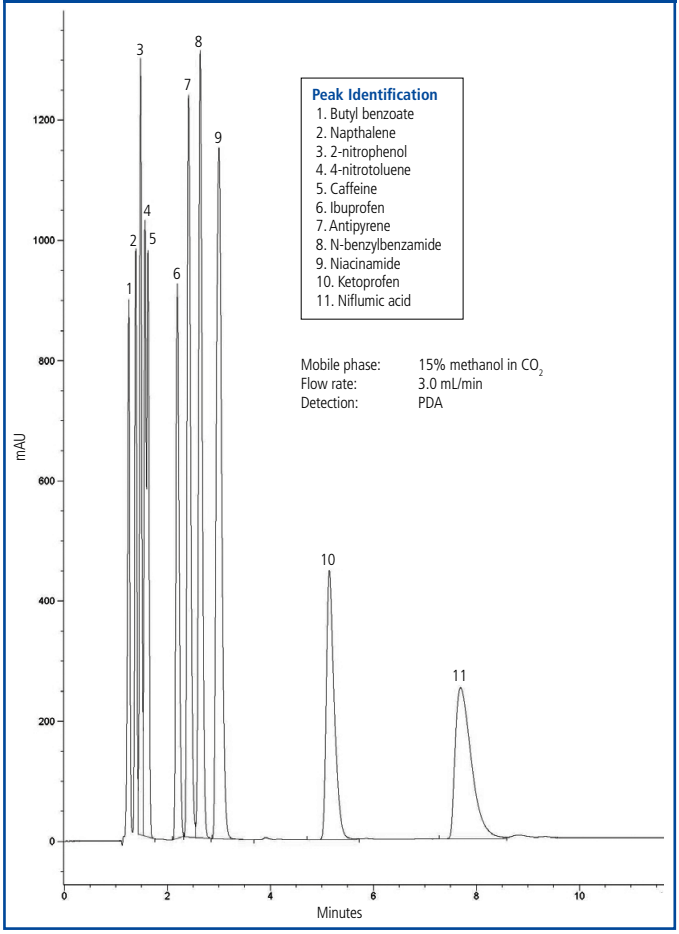
GreenSep 4-Ethyl Pyridine is an alternative to and provides different selectivity to GreenSep Ethyl Pyridine (2-ethyl pyridine). This endcapped stationary phase has proven superior to conventional stationary phases (such as diol and cyano phases) in the areas of separation selectivity, peak shape and loading capacity. GreenSep 4-Ethyl Pyridine can easily replace conventional stationary phases used in SFC while delivering superior performance.

GreenSep 4-Ethyl Pyridine provides better separations for amines in comparison with the 4-Ethyl Pyridine II.

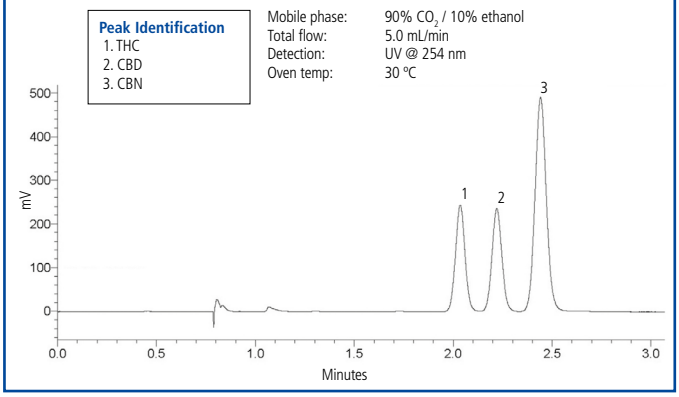
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep 4-Ethyl Pyridine	50	3.0	3	**113191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	50	4.6	3	**115191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	100	3.0	3	**123191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	100	3.0	5	**123291-GS-PYE4**
GreenSep 4-Ethyl Pyridine	100	4.6	3	**125191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	100	4.6	5	**125291-GS-PYE4**
GreenSep 4-Ethyl Pyridine	150	3.0	5	**133291-GS-PYE4**
GreenSep 4-Ethyl Pyridine	150	4.6	3	**135191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	150	3.0	3	**133191-GS-PYE4**
GreenSep 4-Ethyl Pyridine	150	4.6	5	**135291-GS-PYE4**
GreenSep 4-Ethyl Pyridine	250	4.6	5	**155291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	150	20	5	**138291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	150	30	5	**13N291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	250	20	5	**158291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	250	30	5	**15N291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	250	50	10	**15F391-GS-PYE4**
GreenSep 4-Ethyl Pyridine Prep	250	50	5	**15F291-GS-PYE4**
GreenSep 4-Ethyl Pyridine Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PYE4**
GreenSep 4-Ethyl Pyridine Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PYE4**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of pharmaceutical compounds, including ibuprofen, ketoprofen and niflumic acid, using GreenSep 4-Ethyl Pyridine, 250 x 4.6 mm, 5 µm



SFC analysis of cannabinoids using GreenSep 4-Ethyl Pyridine, 250 x 4.6 mm, 10 µm.



GreenSep 4-Ethyl Pyridine II

GreenSep 4-Ethyl Pyridine II is based on ethyl pyridine chemistry and is non-endcapped, providing a unique character for this stationary phase. GreenSep 4-Ethyl Pyridine II is the SFC column ideally suited for the retention and rapid separation of chemicals containing acid groups. GreenSep 4-Ethyl Pyridine II can easily replace conventional stationary phases used in SFC and deliver superior performance. This phase provides alternative selectivity to the GreenSep Ethyl Pyridine II.

This phase is non-endcapped and provides superior separation of acids in comparison with the GreenSep 4-Ethyl Pyridine.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep 4-Ethyl Pyridine II	100	3.0	5	**123191-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	100	3.0	5	**123291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	150	3.0	3	**133191-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	150	3.0	5	**133291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	150	4.6	3	**135191-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	150	4.6	5	**135291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II	250	4.6	5	**155291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Prep	150	20	5	**138291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Prep	150	30	5	**13N291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Prep	250	20	5	**158291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Prep	250	30	5	**15N291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Prep	250	50	5	**15F291-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PYE4-II**
GreenSep 4-Ethyl Pyridine II Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PYE4-II**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

GreenSep NP-9

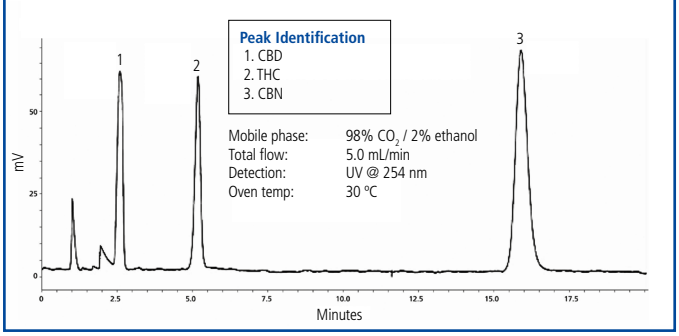
GreenSep NP-9 is the product of column research efforts to develop products that are specifically designed to tackle the separation of complex natural product samples. GreenSep NP-9 has been specifically optimized for the separation and isolation of THC and CBD from cannabis. The chromatogram shown (right) highlights the optimized separation of THC-Delta 9, CBD and CBN using only 2% ethanol. With a low amount of ethanol in the mobile phase it is possible to rapidly recover CBD, THC and CBN isolates collected from chromatography. GreenSep NP-9 is optimised to deliver the maximum separation alpha between CBD and THC and is best for the removal of THC.

GreenSep NP-9 has a quicker cycle time for the separation of CBD and THC. However, if higher resolution is required, the GreenSep NP-10 should be used. Additionally, GreenSep NP-10 has a higher loading capacity than the GreenSep NP-9.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep NP-9	100	3.0	5	**1232X1-GSNP-9**
GreenSep NP-9	150	3.0	5	**1332X1-GSNP-9**
GreenSep NP-9	150	4.6	5	**1352X1-GSNP-9**
GreenSep NP-9	250	4.6	10	**1553X1-GSNP-9**
GreenSep NP-9	250	4.6	5	**1552X1-GSNP-9**
GreenSep NP-9 Prep	150	20	5	**1382X1-GSNP-9**
GreenSep NP-9 Prep	150	30	5	**13N2X1-GSNP-9**
GreenSep NP-9 Prep	250	10	10	**1573X1-GSNP-9**
GreenSep NP-9 Prep	250	20	5	**1582X1-GSNP-9**
GreenSep NP-9 Prep	250	30	10	**15N3X1-GSNP-9**
GreenSep NP-9 Prep	250	30	5	**15N2X1-GSNP-9**
GreenSep NP-9 Prep	250	50	10	**15F3X1-GSNP-9**
GreenSep NP-9 Prep	250	50	5	**15F2X1-GSNP-9**
GreenSep NP-9 Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GSNP-9**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of CBD, THC and CBN, with 2% ethanol, using GreenSep NP-9, 250 x 4.6 mm, 5 µm.



GreenSep NP-10

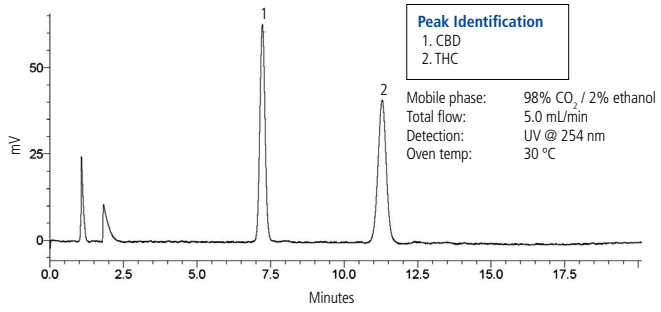
GreenSep NP-10 is the product of column research efforts to develop products that are specifically designed to tackle the separation of complex natural product samples. GreenSep NP-10 has been specifically optimized for the separation and isolation of THC and CBD from cannabis. The chromatogram shown below highlights the optimized separation of THC-Delta 9 and CBD using only 2% ethanol. With a low amount of ethanol in the mobile phase it is possible to rapidly recover CBD and THC isolates collected from chromatography.

GreenSep NP-9 has a quicker cycle time for the separation of CBD and THC. However, if higher resolution is required, the GreenSep NP-10 should be used. Additionally, GreenSep NP-10 has a higher loading capacity than the GreenSep NP-9.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep NP-10	100	3.0	5	**1232X1-GSNP-10**
GreenSep NP-10	150	3.0	5	**1332X1-GSNP-10**
GreenSep NP-10	150	4.6	5	**1352X1-GSNP-10**
GreenSep NP-10	250	4.6	5	**1552X1-GSNP-10**
GreenSep NP-10 Prep	150	20	5	**1382X1-GSNP-10**
GreenSep NP-10 Prep	150	30	5	**13N2X1-GSNP-10**
GreenSep NP-10 Prep	250	20	5	**1582X1-GSNP-10**
GreenSep NP-10 Prep	250	30	5	**15N2X1-GSNP-10**
GreenSep NP-10 Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500101-GSNP-10**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of CBD and THC using GreenSep NP-10, 250 x 4.6 mm, 5 µm.



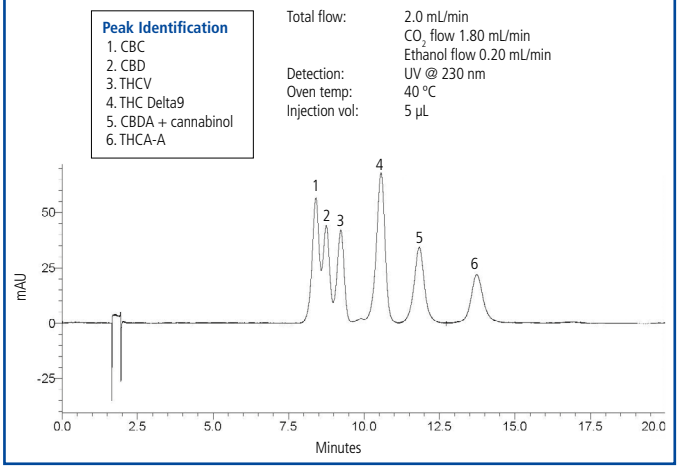
GreenSep NP-II

GreenSep NP-II is the product of column research efforts to develop products that are specifically designed to tackle the separation of complex natural product samples. GreenSep NP-II has been specifically optimized for the separation and isolation of THC and THCV from cannabis. It is also useful for THC and THCA removal with a quick cycle time.

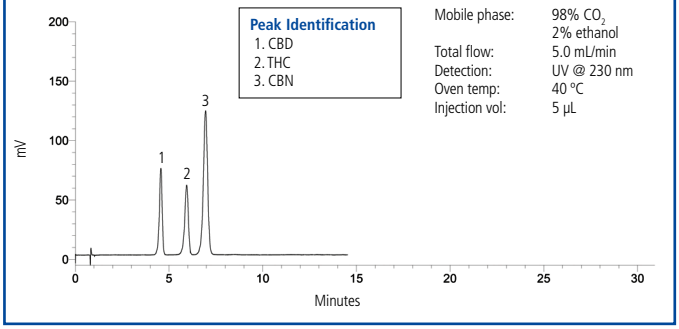
Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep NP-II	100	3.0	5	**123291-GSNP-II**
GreenSep NP-II	100	4.6	10	**1253X1-GSNP-II**
GreenSep NP-II	150	3.0	5	**133291-GSNP-II**
GreenSep NP-II	150	4.6	5	**135291-GSNP-II**
GreenSep NP-II	250	4.6	10	**1553X1-GSNP-II**
GreenSep NP-II	250	4.6	5	**1552X1-GSNP-II**
GreenSep NP-II Prep	150	20	5	**1382X1-GSNP-II**
GreenSep NP-II Prep	150	30	5	**13N2X1-GSNP-II**
GreenSep NP-II Prep	250	10	10	**1573X1-GSNP-II**
GreenSep NP-II Prep	250	20	10	**1583X1-GSNP-II**
GreenSep NP-II Prep	250	20	5	**1582X1-GSNP-II**
GreenSep NP-II Prep	250	30	5	**15N2X1-GSNP-II**
GreenSep NP-II Prep	250	50	5	**15F291-GSNP-II**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of cannabinoids using GreenSep NP-II, 250 x 4.6 mm, 10 µm.



SFC analysis of cannabinoids using GreenSep NP-II, 250 x 4.6 mm, 5 µm.



GreenSep NP-III

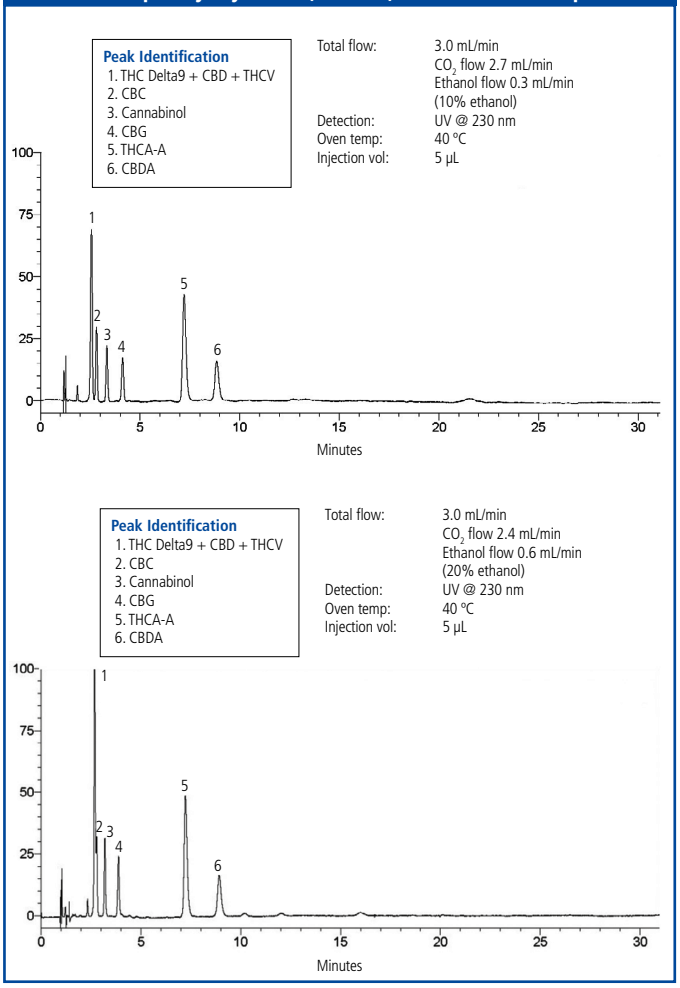
GreenSep NP-III is the product of column research efforts to develop products that are specifically designed to tackle the separation of complex natural product samples. GreenSep NP-III has been specifically optimized for the rapid separation and isolation of CBDA and THCA from cannabis. It has similar separation characteristics to 2-Ethyl pyridine, a stationary phase and column traditionally used for separation and isolation of THCA and CBDA. However, GreenSep NP-III is able to rapidly separate both THCA and CBDA using minimal amount of ethanol as modifier solvent for CO_2 mobile phase used in SFC.

Traditional 2-ethyl pyridine columns (GreenSep Ethyl Pyridine) require high levels of ethanol to obtain similar separations to the new GreenSep NP-III column. The GreenSep NP-III column produces a better separation for the cannabinoids mixture with only 10% ethanol modifier and elutes CBDA in less than 9 minutes (shown right). The traditional ethyl pyridine phase produces a lower quality separation with 20% ethanol and CBDA is eluted in 9 minutes. In addition, the removal of 10% ethanol is quick and easy allowing for the rapid purification of both THCA and CDBA, providing both time and cost savings.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep NP-III	100	3.0	5	**123291-GSNP-III**
GreenSep NP-III	150	3.0	5	**133291-GSNP-III**
GreenSep NP-III	150	4.6	5	**135291-GSNP-III**
GreenSep NP-III	250	4.6	5	**1552X1-GSNP-III**
GreenSep NP-III Prep	150	20	5	**1382X1-GSNP-III**
GreenSep NP-III Prep	150	30	5	**13N2X1-GSNP-III**
GreenSep NP-III Prep	250	20	5	**1582X1-GSNP-III**
GreenSep NP-III Prep	250	30	5	**15N2X1-GSNP-III**
GreenSep NP-III Prep	250	50	5	**15F291-GSNP-III**

Other column dimensions and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of cannabinoids using GreenSep NP-III (top) and GreenSep Ethyl Pyridine (bottom), 250 x 4.6 mm, 5 µm.



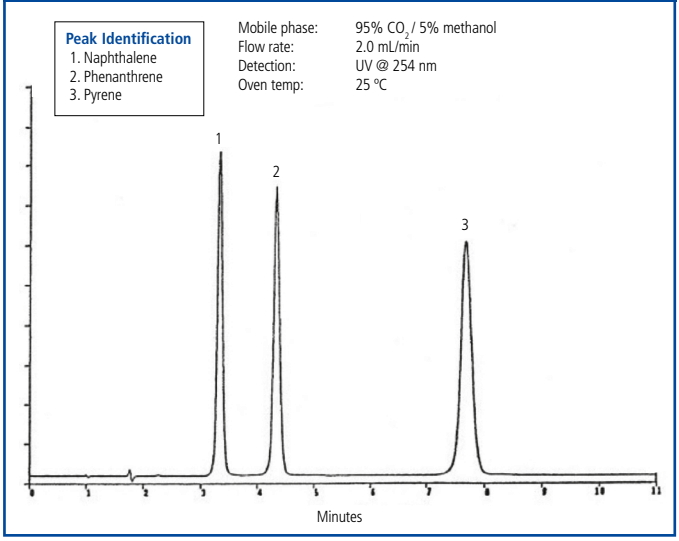
GreenSep PFP

GreenSep PFP is a fluorinated aromatic stationary phase providing a highly selective character for SFC separations. It is specifically designed for the separation of geometrical isomers as well as diastereomers. GreenSep PFP is the column of choice in separating compounds that contain aromatic groups, polarizable electrons and conjugate systems. In addition, it is useful for the separation of halogenated compounds. In many cases GreenSep PFP provides orthogonal separations when compared to GreenSep Nitro. GreenSep PFP can easily replace conventional stationary phases used in SFC and deliver superior performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep PFP	50	3.0	1.8	**513A91-GS-PFP**
GreenSep PFP	50	4.6	3	**115191-GS-PFP**
GreenSep PFP	100	2.1	1.8	**522A91-GS-PFP**
GreenSep PFP	100	3.0	3	**123191-GS-PFP**
GreenSep PFP	100	3.0	5	**123291-GS-PFP**
GreenSep PFP	100	4.6	3	**125191-GS-PFP**
GreenSep PFP	100	4.6	5	**125291-GS-PFP**
GreenSep PFP	150	3.0	3	**133191-GS-PFP**
GreenSep PFP	150	3.0	5	**133291-GS-PFP**
GreenSep PFP	150	4.6	3	**135191-GS-PFP**
GreenSep PFP	150	4.6	5	**135291-GS-PFP**
GreenSep PFP	250	4.6	5	**155291-GS-PFP**
GreenSep PFP Prep	50	10	5	**117291-GS-PFP**
GreenSep PFP Prep	150	20	5	**138291-GS-PFP**
GreenSep PFP Prep	150	30	5	**13N291-GS-PFP**
GreenSep PFP Prep	250	20	5	**158291-GS-PFP**
GreenSep PFP Prep	250	30	5	**15N291-GS-PFP**
GreenSep PFP Prep	250	50	5	**15F291-GS-PFP**
GreenSep PFP Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-PFP**
GreenSep PFP Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-PFP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of aromatic compounds using GreenSep PFP, 250 x 4.6 mm, 5 µm.



GreenSep Cyano

GreenSep Cyano is a high surface area cyano bonded material designed for SFC resulting in a higher surface area loading, in comparison with conventional cyano phases that are used for HPLC. The cyano functionality offers increased dipole interactions for alternative selectivity.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Cyano	50	3.0	1.8	**513A91-GS-CN**
GreenSep Cyano	100	3.0	3	**123191-GS-CN**
GreenSep Cyano	100	3.0	5	**123291-GS-CN**
GreenSep Cyano	150	3.0	3	**133191-GS-CN**
GreenSep Cyano	150	3.0	5	**133291-GS-CN**
GreenSep Cyano	150	4.6	3	**135191-GS-CN**
GreenSep Cyano	150	3.0	1.8	**533A91-GS-CN**
GreenSep Cyano	150	4.6	5	**135291-GS-CN**
GreenSep Cyano	250	4.6	5	**155291-GS-CN**
GreenSep Cyano Prep	150	20	5	**138291-GS-CN**
GreenSep Cyano Prep	150	30	5	**13N291-GS-CN**
GreenSep Cyano Prep	250	20	5	**158291-GS-CN**
GreenSep Cyano Prep	250	30	5	**15N291-GS-CN**
GreenSep Cyano Prep	250	50	5	**15F291-GS-CN**
GreenSep Cyano Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-CN**
GreenSep Cyano Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-CN**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

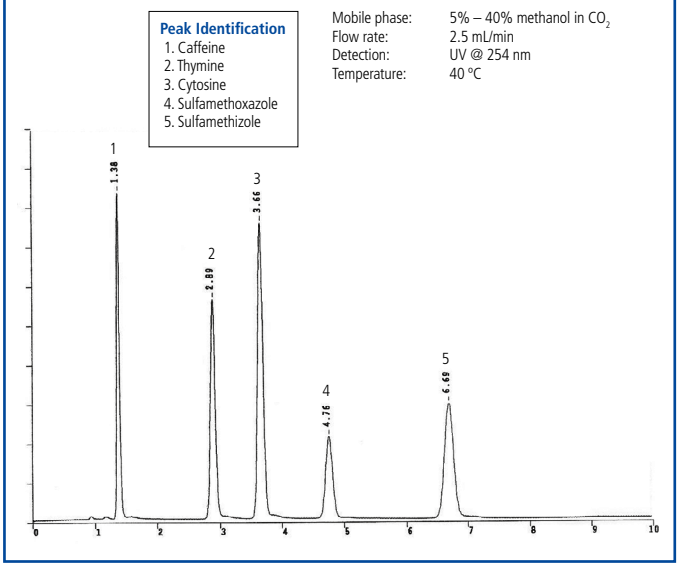
GreenSep DEAP

GreenSep DEAP is a diethyl amino propyl stationary phase with greater selectivity and superior peak shapes to conventional amino phases. GreenSep DEAP can enable the chromatographer to use simple mobile phases, reducing the need for additives and leading to easier fraction collection. It is particularly useful for alcohols and amides. GreenSep DEAP can easily replace conventional stationary phases used in SFC and deliver superior performance.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep DEAP	50	2.1	1.8	**512A91-GS-DEAP**
GreenSep DEAP	50	3.0	1.8	**513A91-GS-DEAP**
GreenSep DEAP	50	3.0	3	**113191-GS-DEAP**
GreenSep DEAP	50	4.6	3	**115191-GS-DEAP**
GreenSep DEAP	50	4.6	5	**115291-GS-DEAP**
GreenSep DEAP	100	3.0	5	**123291-GS-DEAP**
GreenSep DEAP	150	3.0	3	**133191-GS-DEAP**
GreenSep DEAP	150	3.0	5	**133291-GS-DEAP**
GreenSep DEAP	150	4.6	3	**135191-GS-DEAP**
GreenSep DEAP	100	2.1	1.8	**522A91-GS-DEAP**
GreenSep DEAP	100	3.0	1.8	**523A91-GS-DEAP**
GreenSep DEAP	100	3.0	3	**123191-GS-DEAP**
GreenSep DEAP	100	4.6	3	**125191-GS-DEAP**
GreenSep DEAP	100	4.6	5	**125291-GS-DEAP**
GreenSep DEAP	150	4.6	5	**135291-GS-DEAP**
GreenSep DEAP	250	2.1	5	**152291-GS-DEAP**
GreenSep DEAP	250	4.6	5	**155291-GS-DEAP**
GreenSep DEAP Prep	100	20	5	**128291-GS-DEAP**
GreenSep DEAP Prep	100	30	5	**12N291-GS-DEAP**
GreenSep DEAP Prep	150	20	5	**138291-GS-DEAP**
GreenSep DEAP Prep	150	30	5	**13N291-GS-DEAP**
GreenSep DEAP Prep	250	20	5	**158291-GS-DEAP**
GreenSep DEAP Prep	250	30	5	**15N291-GS-DEAP**
GreenSep DEAP Prep	250	50	5	**15F291-GS-DEAP**
GreenSep DEAP Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-DEAP**
GreenSep DEAP Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-DEAP**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

SFC analysis of various compounds using GreenSep Basic, 150 x 4.6 mm, 5 µm.



GreenSep Amine

GreenSep Amine is a high density NH_2 bonded material designed specifically for SFC which offers higher loading for preparative uses. This phase finds uses with compounds containing both alcohols and amines.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Amine	50	3.0	1.8	**513A91-GS-A**
GreenSep Amine	50	3.0	10	**113391-GS-A**
GreenSep Amine	100	3.0	3	**123191-GS-A**
GreenSep Amine	100	3.0	5	**123291-GS-A**
GreenSep Amine	150	3.0	5	**133291-GS-A**
GreenSep Amine	150	3.0	3	**133191-GS-A**
GreenSep Amine	150	4.6	3	**135191-GS-A**
GreenSep Amine	150	4.6	5	**135291-GS-A**
GreenSep Amine	250	4.6	5	**155291-GS-A**
GreenSep Amine Prep	150	20	5	**138291-GS-A**
GreenSep Amine Prep	150	30	5	**13N291-GS-A**
GreenSep Amine Prep	250	20	5	**158291-GS-A**
GreenSep Amine Prep	250	30	5	**15N291-GS-A**
GreenSep Amine Prep	250	50	5	**15F291-GS-A**
GreenSep Amine Analytical Guard Cartridges (Pkg. 5)	100	2.0	5	**500103-GS-A**
GreenSep Amine Analytical Guard Cartridges (Pkg. 5)	100	3.0	5	**500101-GS-A**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

GreenSep Silica

GreenSep Silica has been developed specifically for SFC use. GreenSep Silica is metal free ultra-high purity chromatographic media that is pressure stable and specifically engineered for high performance SFC separations. The surface is treated to produce maximum SFC separation interactions and loading capacity while maintaining superior peak shape performance for many pharmaceutical compounds. GreenSep Silica can perform separation of chemicals with superior peak shapes than typical HPLC silica columns.

Phase	Length (mm)	ID (mm)	Particle Size (µm)	Part Number
GreenSep Silica	50	3.0	5	**113291-GS-SI**
GreenSep Silica	100	3.0	3	**123191-GS-SI**
GreenSep Silica	100	3.0	5	**123291-GS-SI**
GreenSep Silica	150	3.0	3	**133191-GS-SI**
GreenSep Silica	150	3.0	5	**133291-GS-SI**
GreenSep Silica	150	4.6	3	**135191-GS-SI**
GreenSep Silica	100	4.6	3	**125191-GS-SI**
GreenSep Silica	150	4.6	5	**135291-GS-SI**
GreenSep Silica	250	2.1	10	**152391-GS-SI**
GreenSep Silica	250	4.6	5	**155291-GS-SI**
GreenSep Silica Prep	50	10	5	**117291-GS-SI**
GreenSep Silica Prep	50	20	5	**118291-GS-SI**
GreenSep Silica Prep	150	20	5	**138291-GS-SI**
GreenSep Silica Prep	150	30	5	**13N291-GS-SI**
GreenSep Silica Prep	250	20	10	**158391-GS-SI**
GreenSep Silica Prep	250	20	5	**158291-GS-SI**
GreenSep Silica Prep	250	30	5	**15N291-GS-SI**
GreenSep Silica Prep	250	50	5	**15F291-GS-SI**
GreenSep Silica Analytical Guard Cartridges (Pkg. 5)	10	2.0	5	**500103-GS-SI**
GreenSep Silica Analytical Guard Cartridges (Pkg. 5)	10	3.0	5	**500101-GS-SI**
Analytical Guard Cartridge Holder with integrated coupler	–	–	–	**ES500100**

Other column dimensions, particle sizes and guard cartridges are available.
Please enquire for more details at LCA.TechSupport@perkinelmer.com

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TAIWAN Taipei	886 2 87912589	886 2 87919085	www.perkinelmer.com/category/consumables
TAIWAN Kaohsiung	886 7 5521030	886 7 5543402	www.perkinelmer.com/category/consumables
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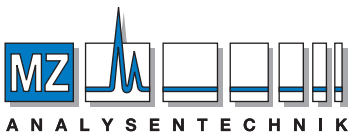

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