

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

	Page
➤ Brownlee Aquapore Columns	51
➤ Brownlee Aquapore Prep-10 Cartridge Columns	51
➤ Brownlee Pecosphere Cartridge Columns	53
➤ Brownlee Polypore Cartridge Columns	54
➤ Brownlee Spheri-5 and Spheri-10 Columns	52
➤ Brownlee SPP Columns	55
➤ Cartridge Holders for MPLC Cartridges	57
➤ LC Column Selection Overview	35
➤ NewGuard Cartridges	57
➤ Quasar HPLC and UHPLC Columns	37
➤ Quasar C18 Method Validation Kits	45
➤ Quasar SPP Columns	46
➤ Selecting the Right Column	34
➤ USP Column Listing	36

➤ CLICK THE ARROWS
TO VIEW EACH PAGE

Quasar HPLC & UHPLC Columns

Whether it's food, water, or pharmaceutical testing, our Quasar LC column portfolio allows you to achieve rugged and reproducible results - batch to batch and column to column – with an all-encompassing, flexible solution that meets the diverse, changing needs of analysis.



➤ [VIEW PAGE](#)

Quasar SPP Columns

Our next-generation superficially porous particle (SPP) phases promise productivity with shorter run times and less solvent. Just as robust as traditional silica phases, with excellent ligand stability and solid packed bed results in robust, reliable columns.

➤ [VIEW PAGE](#)

Brownlee Spheri Columns

The Brownlee Spheri line of columns is based on a small-pore (80 Å) silica-based sorbent (5 µm and 10 µm) optimized for separating small molecules.

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Meet the triple quad that surpasses expectations

Our QSiht® triple quad LC/MS/MS family is known for robust, reliable performance. But now there's something new – something better: the QSiht 400 series. Our ready-to-implement solution has the highest sensitivity and throughput in the industry and the capability to take on the most challenging samples – adulterants in the food supply, mycotoxins and pesticides in cannabis, and environmental contaminants in soil and water. The QSiht 400 series: The triple quad you know just got even better.

Learn more at www.perkinelmer.com/QSiht

LC Instruments



Flexar™ Liquid HPLC and UHPLC

Our rugged, reliable Flexar HPLC system provides robust, trouble free-operation and is perfect for routine analyzes, while the Flexar UHPLC gives you the highest sensitivity and resolution, with faster results for more demanding applications.

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

Selecting The Right Column

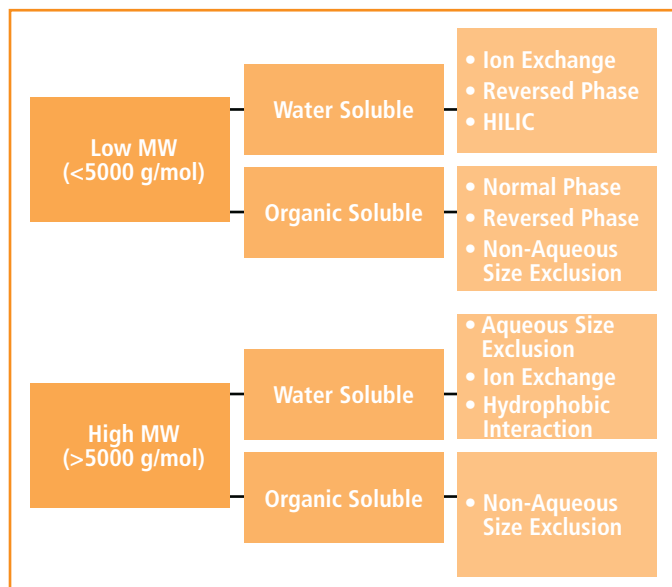
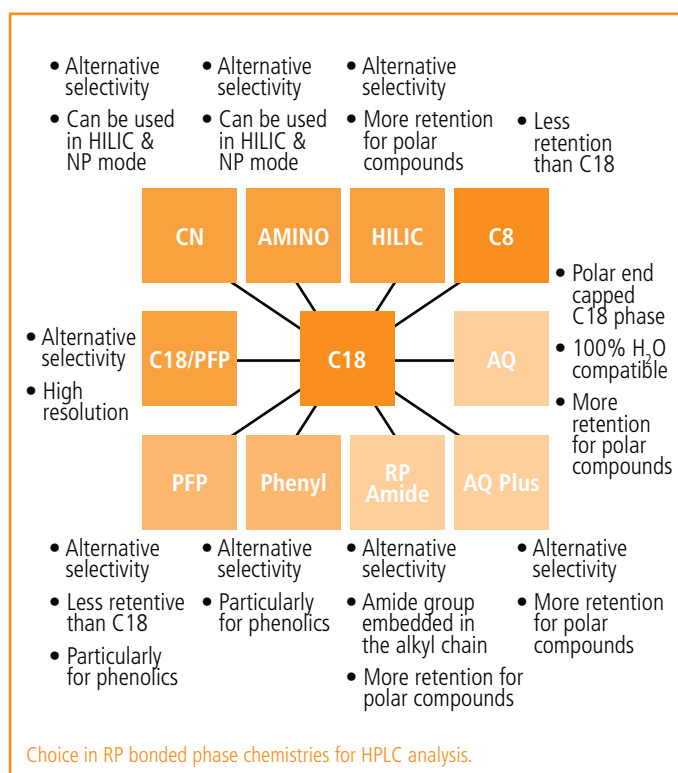
Having the right stationary phase for your separation is the first step in selecting the appropriate column. This should be based on sample solubility, chemical differences among the analytes and similarity to the chemistry of the stationary phase.

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 on the right for reference. For some analytes more than one technique may be appropriate.

Reversed Phase Separations

The majority of HPLC analytes are still performed in reversed-phase 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.

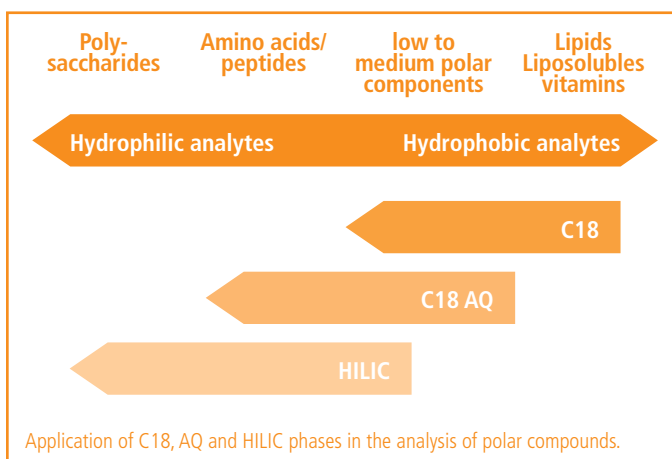
The scope of bonded phases available in RP has widened over the years and now incorporates not only the traditional C18 and C8 chemistries but includes "AQ type" columns to aid in the retention and resolution of more complex polar analytes. There are two general approaches to the bonded phase chemistry of AQ columns; to either employ a polar or hydrophilic endcapping or embed a polar entity, such as an amide, within the alkyl chain. Both offer the potential to alter selectivity compared to alkyl phases.



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.



PerkinElmer LC Column Selection Overview

Brand	Phase	Particle Size (µm)	Pore size (Å)	Carbon %	End Cap	Application	USP Code
Aquapore	ODS (C18)	7, 20	300	10	Yes	Suitable for the separation of large biomolecules such as peptides and proteins	L1
Pecosphere	C18	3,5	80	11	Yes	RP column for fast separation of small compounds	L1
Pecosphere	RA C18	3,5	80	12	Yes	RP sorbent geared towards the fast separation of basic compounds/pharmaceuticals	L1
Pecosphere	RA C8	3,5	80	5	Yes	RP sorbent geared towards the fast separation for increasingly basic compounds	L7
Pecosphere	C18 scavenger	10	80	11	Yes		L1
Polypore	CA	10	microporous	–	–	For the analysis of sugars and organic acids	L19
Polypore	H	10	microporous	–	–	For the analysis of sugars and organic acids	L17
Quasar	C18	1.7, 3, 5	100	17	Yes	Workhorse HPLC and UHPLC phase for RP small molecule analysis, basic, neutral and acidic analytes	L1
Quasar	C8	1.7, 3, 5	100	13	Yes	General purpose C8 for separations that require less retention, both charged and neutral	L7
Quasar	AQ	1.7, 3, 5	100	18	Polar end capping	Improved retention for more hydrophilic compounds that are not well retained on C18 or C8 columns. Increased retention of polar compounds without the addition of IP reagents	L1
Quasar	AQ Plus	1.7, 3, 5	100	18	Yes	Provides resolution of analyte species which standard C18 stationary phases may struggle to resolve. Ideal for increasing retention for polar compounds. Offers improved separations with polar, acidic, basic and phenolic compounds	L1
Quasar	HILIC	1.7, 3, 5	100	4	Yes	Retention of very polar, hydrophilic compounds in RP, including herbicides, nucleotides, alkaloids and peptides	L20
Quasar	Biphenyl	1.7, 3, 5	100	13	Yes	Alternative selectivity for aromatic containing analytes; metabolite analysis and isomer separations	L11
Quasar	Cyano	3, 5	100	7	Yes	Suitable for RP (higher weight compounds) and NP applications	L10
Quasar	Amino	3, 5	100	5	No	RP and NP applications, sugars and steroids	L8
Quasar	Silica	3, 5	100	n/a	No	Traditionally used for NP applications, but can also be used in the HILIC mode	L3
Quasar SPP	C18	2.6, 5	80	10	Yes	Workhorse phase for small molecule analysis; basic, neutral and acidic analytes	L1
Quasar SPP	C18/PFP	2.6, 5	80	8	Yes	Alternative selectivity to improve separations which are problematic on C18. Ideal for closely related species and metabolites.	L1
Quasar SPP	HILIC	2.6, 5	80	n/a	No	HILIC separation mode for increased retention of very polar compounds under RP conditions	L3
Quasar SPP	Biphenyl	2.6, 5	80	7	Yes	Alternative selectivity for aromatic containing analytes and separation of structurally similar analytes	L11
Quasar SPP	RP Amide	2.6, 5	80	9	Yes	Ideal method development starting point due to wide analyte applicability with both hydrophobic and dipolar phase interactions	L60
Quasar SPP	PFP	2.6, 5	80	6	Yes	Alternative selectivity to hydrophobic phases, metabolite analysis and isomer separations	L43
Spheri-5	ODS	5	80	14	Yes	Polyfunctional phase which provides slight differences in selectivity	L1
Spheri-5, -10	RP-18	5, 10	80	11	Yes	Monofunctional bonded phase for general purpose RP small molecule applications	L1
Spheri-5, -10	RP-8	5, 10	80	6	Yes	Monofunctional bonded phase RP for more basic small molecule applications	L7
Spheri-5	Cyano	5	80	4	No	Offering alternative selectivity in RP to alkyl phases	L10
Spheri-5	Amino	5	80	–	No	For NP and RP applications, sugars and carbohydrates	L8
Brownlee SPP	C18	2.7	90	8	Yes	High purity general Purpose C18 phase for RP separations	L1
Brownlee SPP	C8	2.7	90	–	Yes	Less retentive high purity C8 phase for RP separations	L7
Brownlee SPP	HILIC	2.7	90	–	No	High purity silica column for NP and HILIC applications	L3
Brownlee SPP	Peptide ES C18	2.7	160	–	No	Sterically protected ligand provides greater stability at low pH where most peptide separations are performed	L1
Brownlee SPP	PhenylHexyl 2.7	2.7	90	–	Yes	Alternative selectivity to alkyl bonded phases, recommended for aromatic groups. Compatible with highly aqueous eluents	L11
Brownlee SPP	RP-Amide	2.7	90	–	Yes	Shows significant increased retention and selectivity for acids. Excellent peak shape for bases, zwitterions and other polar compounds	L60

* 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

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)
Aquapore ODS	7, 20
Brownlee SPP	2.7
Brownlee SPP Peptide ES C18	2.7
Spheri ODS	5
Spheri RP18	5, 10
Brownlee SPP	2.6
Pecosphere C18	3, 5
Pecosphere RA C18	3, 5
Pecosphere C18 Scavenger	10
Quasar AQ	1.7, 3, 5
Quasar AQ Plus	1.7, 3, 5
Quasar C18	1.7, 3, 5
Quasar SPP C18	2.6, 5
Quasar SPP C18/PFP	2.6, 5

L3

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

Brand	Particle Size (µm)
Brownlee SPP HILIC	2.6
Quasar Silica	3, 5
Quasar SPP HILIC	2.6, 5

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)
Aquapore RP 300 (C8)	7
Brownlee SPP C8	2.7
Pecosphere RA C8	3, 5
Spheri RP8	5, 10
Quasar C8	1.7, 3, 5

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)
Spheri Amino	5
Quasar Amino	3, 5

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)
Spheri Cyano	5
Quasar CN	3, 5

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)
Brownlee SPP Phenyl-hexyl	2.6
Quasar Biphenyl	1.7, 3, 5
Quasar SPP Biphenyl	2.6, 5

L14

Silica gel having a chemically bonded strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.

Brand	Particle Size (µm)
Aquapore AX 300	7

L17

Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 6 to 12 µm in diameter.

Brand	Particle Size (µm)
Polypore® H	10

L19

Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 5 to 15 µm in diameter.

Brand	Particle Size (µm)
Polypore® CA	10

L20

Dihydroxypropane groups chemically bonded to porous silica particles, 3 to 10 µm in diameter.

Brand	Particle Size (µm)
Quasar HILIC	1.7, 3, 5

L43

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

Brand	Particle Size (µm)
Quasar SPP PFP	2.6, 5

L60

Spherical, porous silica 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and endcapped.

Brand	Particle Size (µm)
Brownlee SPP RP Amide	2.7
Quasar SPP RP Amide	2.6, 5

Quasar HPLC & UHPLC Columns

Whatever your separation challenge, your choice of liquid chromatography (LC) column can make all the difference. Our Quasar™ portfolio of LC columns allows you to achieve rugged and reproducible results – batch to batch and column to column – with an all-encompassing, flexible solution that meets the diverse, changing needs of analysis.

Ultrapure silica-based Quasar columns deliver a comprehensive range of chemistries, together with state-of-the-art, optimized bonding technology to give you a versatile, high-performing analytical solution for your increasingly complex samples.

For flexibility, we provide a wide range of column sizes, including shorter columns packed with smaller particle sizes for shorter run times and better productivity. Plus, our scalable columns facilitate easy method transfer between HPLC and UHPLC technology platforms – and the smaller particle sizes means optimized sensitivity for those applications. Whatever your separation need, we have a chemistry or dimension to fill it.

Visit www.perkinelmer.com/quasarl to browse some application details.

Features and Benefits

- High sensitivity for mass spectrometry (MS) applications
- High efficiency for complex separations
- Supports both high- and low-throughput environments
- Increases productivity and reduce run times
- Excellent pH stability across commonly used mobile phase buffers
- High-sample loading capacity



Material Characteristics

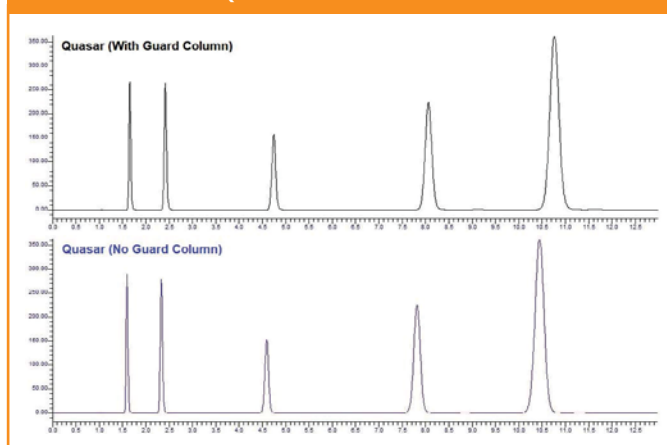
Brand	Phase	Particle Size (um)	Pore Size (Å)	Carbon %	End Cap	pH Stability	USP Code
Quasar	C18	1.7, 3, 5	100	17	Yes	1-10	L1
Quasar	C8	1.7, 3, 5	100	13	Yes	1-10	L7
Quasar	AQ	1.7, 3, 5	100	18	Yes	2-9	L1
Quasar	AQ Plus	1.7, 3, 5	100	18	Yes	2-9	L1
Quasar	HILIC	1.7, 3, 5	100	4	Yes	2-8	L20
Quasar	Biphenyl	1.7, 3, 5	100	13	Yes	2-8	L11
Quasar	Cyano	3, 5	100	7	Yes	2-9	L10
Quasar	Amino	3, 5	100	5	TBC	2-8	L8
Quasar	Silica	3, 5	100	-	No	2-8	L3

Guard Cartridges

Quasar guard cartridges help to protect your analytical column from strongly bound sample components, prolonging column lifetime. Directly coupled to the analytical column, there is no loss in separation efficiency. Available in all phase chemistries that come in a convenient 3-pack.



Guard vs. No Guard Quasar.



Comparison of Fully Porous C18 LC Columns

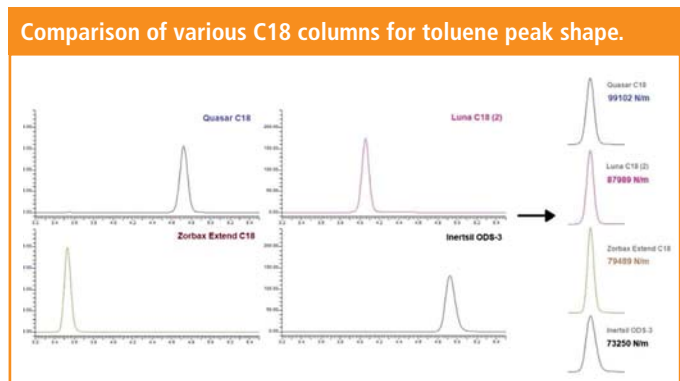
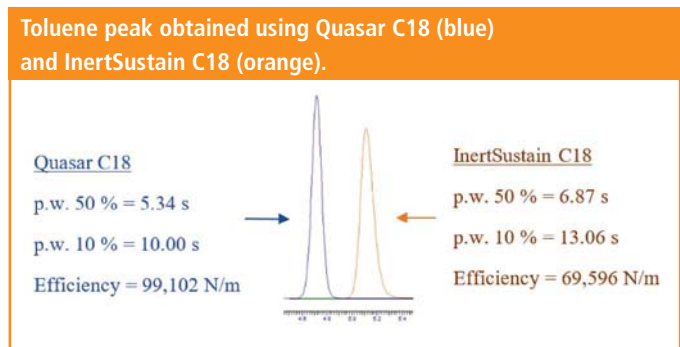
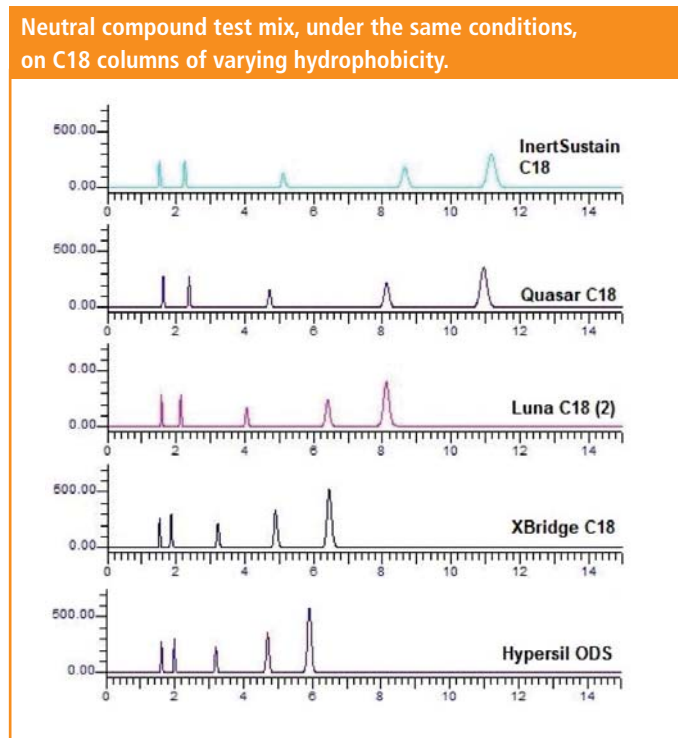
C18 columns remain the workhorse phase for reverse phase HPLC and UHPLC separations. They have a broad applicability from pharmaceuticals to food and environmental analyzers. However, not all C18 columns are alike. Simply swapping a C18 column from one manufacturer to another can result in differences in retention time, resolution and even selectivity. Differences can arise due to variations in hydrophobicity, silanol activity, packing quality, particle size distribution, and silica purity.

Hydrophobicity

Phases with greater hydrophobicity will experience greater analyte retention for a hydrophobic compound. Quasar C18 is a highly retentive phase due to the high surface area of the silica, combined with its optimized ligand bonding process (below). This gives Quasar greater opportunity to resolve analytes without increasing the column length. Additionally, with greater retention, the water content of the mobile phase does not need to be increased to improve retention, yielding greater MS sensitivity.

Neutral Compound Column Efficiency

High retention needs to be accompanied by good peak shape for the most effective separations. Calculation of column efficiencies gains insight into overall column performance. Using a neutral compound (such as toluene) for efficiency measurements allows retention from unwanted secondary interactions to be minimized. This provides greater indication on factors such as particle size, packing efficiency, and particle size distribution. Lower efficiencies indicate broader peaks, which can reduce the resolving power of the column. Quasar demonstrates excellent efficiency and peak shape for neutral compounds, as well as high retention. InertSustain C18 shows to be slightly more retentive than Quasar C18. However, it demonstrates 30 % less efficiency (below).



Alongside high efficiencies, reasonable backpressures are observed using Quasar C18 (below). This allows Quasar to operate easily at higher flow rates and stay within pressure limitations of the pump and column. Continuous use of LC columns under higher backpressures leads to deterioration in overall column efficiency, which can be detrimental to column lifetime. It may also limit the method development scope.

Toluene column efficiency and backpressure for a few C18 columns.

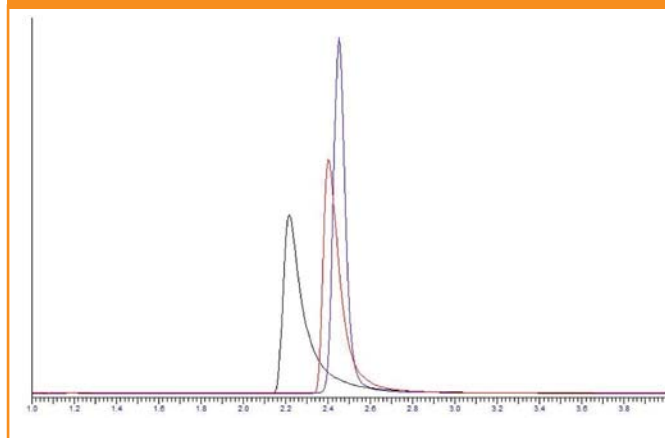


Evaluation of Silanol Activity

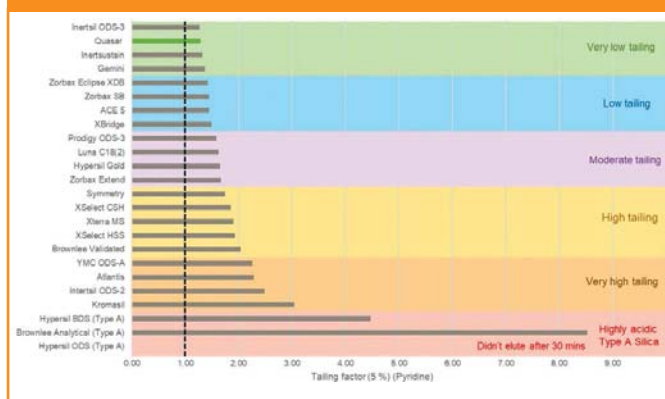
Neutral compounds are useful for determining packing efficiency and efficiency of a column. However, they do not indicate the activity of the silica surface or how the column might perform when separating basic/cationic compounds (e.g. pyridine). Basic compounds can frequently interact with weakly acidic underivatized residual silanols on the surface of the silica particles. This unwanted secondary retention results in peak tailing and impacts on the separation efficiency of the column. Silica purity is also an important factor for LC columns in order to obtain peaks with little tailing and maintain high efficiency separations. Surface metals can further activate free silanol groups, making them even more acidic, and become even more likely to interact with basic analytes.

The Quasar C18 phase demonstrates excellent peak shape with very low peak tailing when compared with other phases, due to its ultra-high purity silica base and low residual silanol activity (right). Inertsil ODS-3 shows comparable peak tailing for pyridine but shows a 26 % drop in efficiency for neutral compound toluene in comparison with Quasar.

Basic compound (pyridine) peak obtained using Quasar C18 at 2.45 mins (blue), YMC ODS-A at 2.40 mins (red), and Kromasil C18 at 2.22 mins (black).



Tailing factors (5 %) obtained for a basic compound (pyridine) on C18 columns.



To read the full Technical Note visit:

www.perkinelmer.com/libraries/TCH-Comparison-of-FullyPorousC18ReversedPhase-HPLCColumns

To watch the webinar 'Choosing the Right HPLC Columns' visit:

www.perkinelmer.com/library/choosing-the-right-hplc-columns-webinar.html

Quasar C18

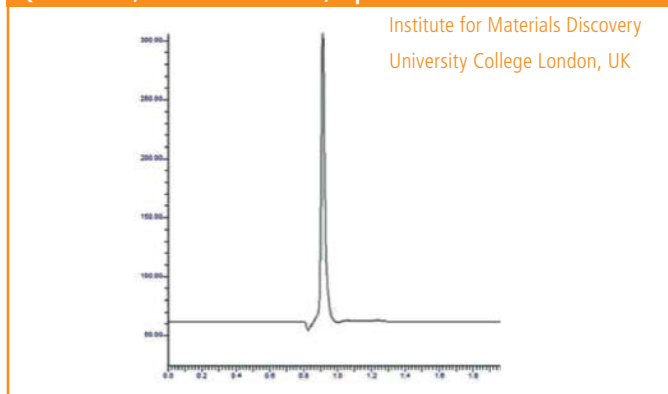
Based on an ultra-high purity silica and combined with optimal ligand bonding technology enables wide pH range for method development. Excellent peak shape for a wide range of compounds is exhibited. Whether it's food, water, or pharmaceutical testing, our Quasar C18 columns allows you to achieve rugged and reproducible results.

Applications

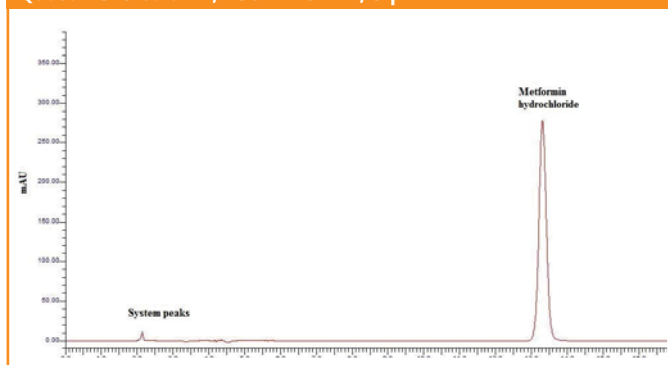
- Workhorse HPLC and UHPLC phase for RP small molecule analysis
- Basic, neutral, and acidic analytes

Phase	Length (mm)	ID (mm)	μm	Part No.
Quasar C18	300	3.9	5	N9308800
Quasar C18	250	4.6	5	N9308801
Quasar C18	150	4.6	5	N9308802
Quasar C18	100	4.6	5	N9308803
Quasar C18	50	4.6	5	N9308804
Quasar C18	150	4.6	3	N9308805
Quasar C18	100	4.6	3	N9308806
Quasar C18	50	4.6	3	N9308807
Quasar C18	150	3	3	N9308808
Quasar C18	100	3	3	N9308809
Quasar C18	50	3	3	N9308810
Quasar C18	150	2.1	3	N9308811
Quasar C18	100	2.1	3	N9308812
Quasar C18	50	2.1	3	N9308813
Quasar C18	100	4.6	1.7	N9308814
Quasar C18	50	4.6	1.7	N9308815
Quasar C18	100	3	1.7	N9308816
Quasar C18	50	3	1.7	N9308817
Quasar C18	100	2.1	1.7	N9308818
Quasar C18	50	2.1	1.7	N9308819
Quasar C18 Guard Cartridge (3/pack)	10	3	5	N9308980
Quasar C18 Guard Cartridge (3/pack)	10	3	3	N9308981
Quasar Guard Cartridge Holder	-	-	-	N9306876

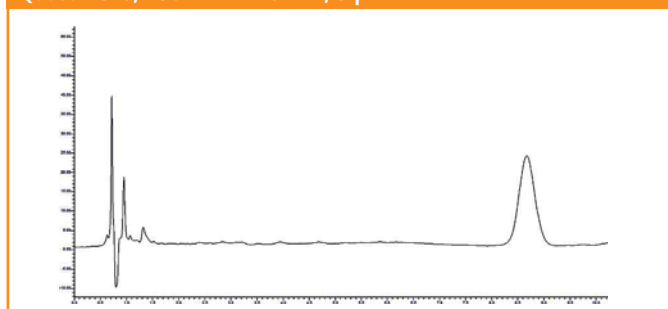
HPLC Analysis of Indoxyl Sulfate using Quasar C18, 100 mm x 4.6 mm, 3 μm.



HPLC analysis of metformin hydrochloride using Quasar C18 column, 250 x 4.6 mm, 5 μm.



HPLC Analysis of Azithromycin using Quasar C18, 150 mm x 4.6 mm, 5 μm.



Quasar C8

The C8 phase is less hydrophobic than the C18 phase and consequently offers less retention. Still based on an ultra-high purity silica and combined with optimal ligand bonding technology enables wide pH range for method development. Excellent peak shape for a wide range of compounds is exhibited.

Applications

- For separations that require less retention
- More hydrophobic compounds, both charged and neutral
- Lipids and steroids

Phase	Length (mm)	ID (mm)	μm	Part No.
Quasar C8	250	4.6	5	N9308879
Quasar C8	150	4.6	5	N9308880
Quasar C8	100	4.6	5	N9308881
Quasar C8	50	4.6	5	N9308882
Quasar C8	150	4.6	3	N9308883
Quasar C8	100	4.6	3	N9308884
Quasar C8	50	4.6	3	N9308885
Quasar C8	150	3	3	N9308886
Quasar C8	100	3	3	N9308887
Quasar C8	50	3	3	N9308888
Quasar C8	150	2.1	3	N9308889
Quasar C8	100	2.1	3	N9308890
Quasar C8	50	2.1	3	N9308891
Quasar C8	100	4.6	1.7	N9308892
Quasar C8	50	4.6	1.7	N9308893
Quasar C8	100	3	1.7	N9308894
Quasar C8	50	3	1.7	N9308895
Quasar C8	100	2.1	1.7	N9308896
Quasar C8	50	2.1	1.7	N9308897
Quasar C8 Guard Cartridge (3/pack)	10	3	5	N9308982
Quasar C8 Guard Cartridge (3/pack)	10	3	3	N9308983
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC Analysis of Omeprazole (in accordance with USP) using Quasar C8, 150 x 4.6 mm, 5 μm.



Quasar Biphenyl

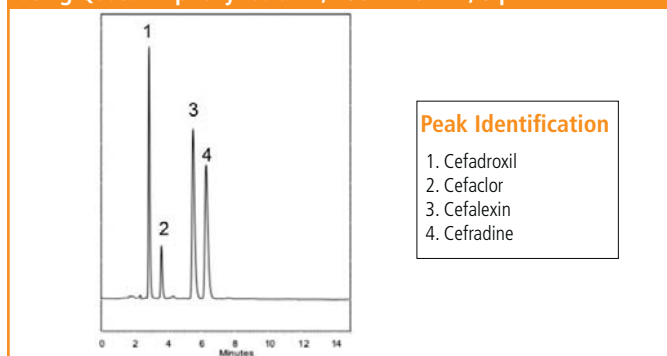
Utilizing a biphenyl bonded phase, the Quasar Biphenyl stationary phase provides π - π interactions to facilitate alternative selectivity.

Applications

- Alternative selectivity for aromatic containing analytes
- Metabolite analysis and isomer separations

Phase	Length (mm)	ID (mm)	μm	Part No.
Quasar BiPhenyl	300	3.9	5	N9308859
Quasar BiPhenyl	250	4.6	5	N9308860
Quasar BiPhenyl	150	4.6	5	N9308861
Quasar BiPhenyl	100	4.6	5	N9308862
Quasar BiPhenyl	50	4.6	5	N9308863
Quasar BiPhenyl	150	4.6	3	N9308864
Quasar BiPhenyl	100	4.6	3	N9308865
Quasar BiPhenyl	50	4.6	3	N9308866
Quasar BiPhenyl	150	3	3	N9308867
Quasar BiPhenyl	100	3	3	N9308868
Quasar BiPhenyl	50	3	3	N9308869
Quasar BiPhenyl	150	2.1	3	N9308870
Quasar BiPhenyl	100	2.1	3	N9308871
Quasar BiPhenyl	50	2.1	3	N9308872
Quasar BiPhenyl	100	4.6	1.7	N9308873
Quasar BiPhenyl	50	4.6	1.7	N9308874
Quasar BiPhenyl	100	3	1.7	N9308875
Quasar BiPhenyl	50	3	1.7	N9308876
Quasar BiPhenyl	100	2.1	1.7	N9308877
Quasar BiPhenyl	50	2.1	1.7	N9308878
Quasar Biphenyl Guard Cartridge (3/pack)	10	3	5	N9304490
Quasar Biphenyl Guard Cartridge (3/pack)	10	3	3	N9304491
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC Analysis of cephalosporins using Quasar Biphenyl column, 150 x 4.6 mm, 5 μm.



Quasar AQ

The drive for improved retention of polar compounds without the addition of additives led to the development of "AQ" type phases. There are two general approaches to the bonded phase chemistry of AQ columns; to either employ a polar or hydrophilic endcapping or embed a polar entity, such as an amide, within the alkyl chain.

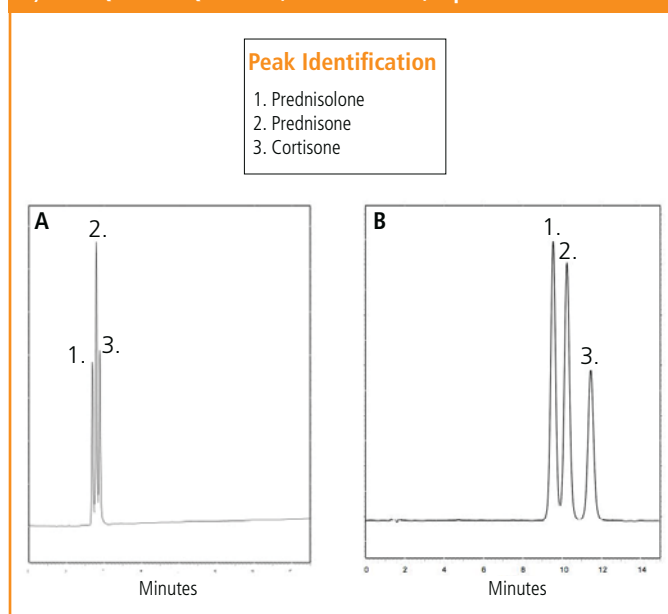
The Quasar AQ phase has a polar endcap, improving the retention of polar compounds, under reverse phase HPLC conditions, without the addition of ion pair reagents. The graphs (right) illustrate the difference in chromatography between the C18 and AQ bonded phases for the separation of steroids.

Applications

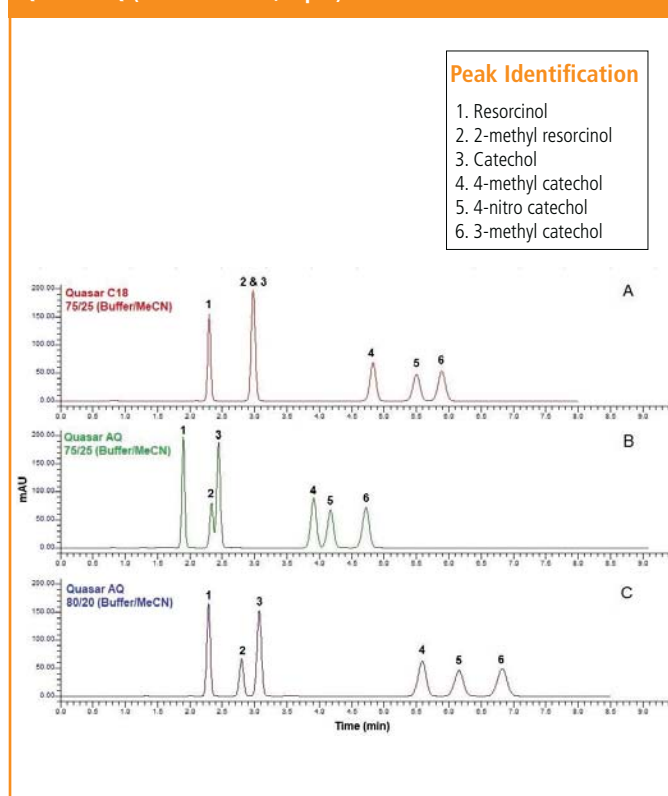
- Improved retention for more hydrophilic compounds
- Increased retention of polar compounds without the addition of IP reagents
- Vitamins, polar pesticides

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar AQ	250	4.6	5	N9308840
Quasar AQ	150	4.6	5	N9308841
Quasar AQ	100	4.6	5	N9308842
Quasar AQ	50	4.6	5	N9308843
Quasar AQ	150	4.6	3	N9308844
Quasar AQ	100	4.6	3	N9308845
Quasar AQ	50	4.6	3	N9308846
Quasar AQ	150	3	3	N9308847
Quasar AQ	100	3	3	N9308848
Quasar AQ	50	3	3	N9308849
Quasar AQ	150	2.1	3	N9308850
Quasar AQ	100	2.1	3	N9308851
Quasar AQ	50	2.1	3	N9308852
Quasar AQ	100	4.6	1.7	N9308853
Quasar AQ	50	4.6	1.7	N9308854
Quasar AQ	100	3	1.7	N9308855
Quasar AQ	50	3	1.7	N9308856
Quasar AQ	100	2.1	1.7	N9308857
Quasar AQ	50	2.1	1.7	N9308858
Quasar AQ Guard Cartridge (3/pack)	10	3	5	N9308986
Quasar AQ Guard Cartridge (3/pack)	10	3	3	N9308987
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC analysis of Prednisolone, Prednisone and Cortisone steroids A) on a Quasar C18 column, 150 x 4.6 mm, 5 µm B) on a Quasar AQ column, 150 x 4.6 mm, 5 µm.



HPLC Analysis of Resorcinols and Catechols A) on a Quasar C18 (150 x 4.6 mm, 5 µm) with 75/25 Buffer/MeCN, B) on a Quasar AQ (150 x 4.6 mm, 5 µm) with 75/25 Buffer/MeCN, and C) on a Quasar AQ (150 x 4.6 mm, 5 µm) with 80/20 Buffer/MeCN.



Quasar AQ Plus

The Quasar AQ Plus phase, with its proprietary end capping and bonding, offers increased retention of polar compounds and provides alternative selectivity for method development. It provides resolution of analyte species which standard C18 stationary phases may struggle to resolve.

Applications

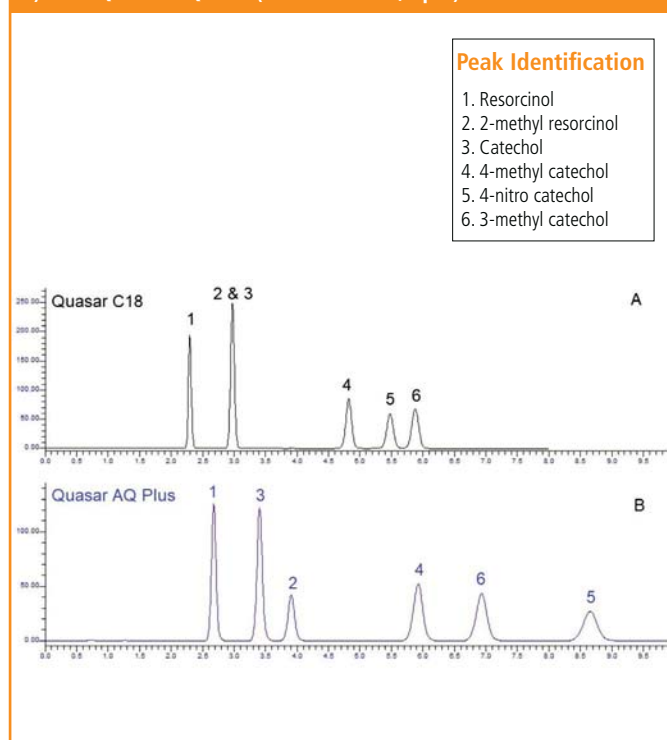
- Increased retention for polar compounds
- Improved separations with polar, acidic, basic and phenolic compounds

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar AQ Plus	250	4.6	5	N9304440
Quasar AQ Plus	150	4.6	5	N9304441
Quasar AQ Plus	100	4.6	5	N9304442
Quasar AQ Plus	50	4.6	5	N9304443
Quasar AQ Plus	150	4.6	3	N9304410
Quasar AQ Plus	100	4.6	3	N9304411
Quasar AQ Plus	50	4.6	3	N9304412
Quasar AQ Plus	150	3.0	3	N9304413
Quasar AQ Plus	100	3.0	3	N9304414
Quasar AQ Plus	50	3.0	3	N9304450
Quasar AQ Plus	150	2.1	3	N9304451
Quasar AQ Plus	100	2.1	3	N9304452
Quasar AQ Plus	50	2.1	3	N9304453
Quasar AQ Plus	100	4.6	1.7	N9304454
Quasar AQ Plus	50	4.6	1.7	N9304455
Quasar AQ Plus	100	3.0	1.7	N9304456
Quasar AQ Plus	50	3.0	1.7	N9304457
Quasar AQ Plus	100	2.1	1.7	N9304458
Quasar AQ Plus	50	2.1	1.7	N9304459
Quasar AQ Plus Guard Cartridge (3/pack)	10	3	5	N9304460
Quasar AQ Plus Guard Cartridge (3/pack)	10	3	3	N9304461
Quasar Guard	-	-	-	-
Cartridge Holder	-	-	-	N9306876

HPLC Analysis of Resorcinols and Catechols

A) on a Quasar C18 (150 x 4.6 mm, 5µm),

B) on a Quasar AQ Plus (150 x 4.6 mm, 5µm).



Quasar HILIC

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 separation mechanism is more complex than partitioning alone, with dipole-dipole and electrostatic interactions also contributing to retention. The elution order opposite to that observed in reverse phase HPLC.

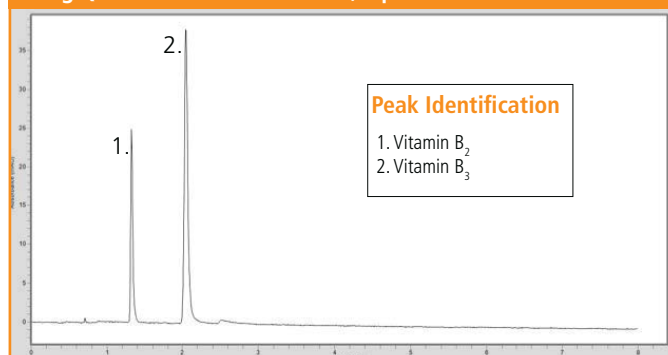
Any polar chromatographic surface can be used for HILIC separations. Typical HILIC stationary phases consist of classical bare silica or silica modified with polar functional groups. Based on an ultra-high purity silica the Quasar HILIC column is bonded diol phase.

Applications

- Retention of very polar, hydrophilic compounds
- Herbicides, nucleotides, alkaloids, and peptides

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar HILIC	250	4.6	5	N9308820
Quasar HILIC	150	4.6	5	N9308821
Quasar HILIC	100	4.6	5	N9308822
Quasar HILIC	50	4.6	5	N9308823
Quasar HILIC	150	4.6	3	N9308824
Quasar HILIC	100	4.6	3	N9308825
Quasar HILIC	50	4.6	3	N9308826
Quasar HILIC	150	3	3	N9308827
Quasar HILIC	100	3	3	N9308828
Quasar HILIC	50	3	3	N9308829
Quasar HILIC	150	2.1	3	N9308830
Quasar HILIC	100	2.1	3	N9308831
Quasar HILIC	50	2.1	3	N9308832
Quasar HILIC	100	4.6	1.7	N9308833
Quasar HILIC	50	4.6	1.7	N9308834
Quasar HILIC	100	3	1.7	N9308835
Quasar HILIC	50	3	1.7	N9308836
Quasar HILIC	100	2.1	1.7	N9308837
Quasar HILIC	50	2.1	1.7	N9308838
Quasar HILIC Guard Cartridge (3/pack)	10	3	5	N9308984
Quasar HILIC Guard Cartridge (3/pack)	10	3	3	N9308985
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC Analysis of Vitamin B₂ and Vitamin B₃ using Quasar HILIC 150 x 3.0 mm, 3 µm.



Quasar Cyano

The Quasar cyano phase is less hydrophobic phase than the alkyl C8 and C18 phases. The cyano functionality offers increased dipole interactions for alternative selectivity.

Applications

- Suitable for RP and NP applications
- Higher molecular weight compounds in RP

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar Cyano	250	4.6	5	N9308898
Quasar Cyano	150	4.6	5	N9308899
Quasar Cyano	100	4.6	5	N9308990
Quasar Cyano	50	4.6	5	N9308991
Quasar Cyano	150	3	3	N9308902
Quasar Cyano	100	3	3	N9308903
Quasar Cyano	50	3	3	N9308904
Quasar Cyano	150	2.1	3	N9308905
Quasar Cyano	100	2.1	3	N9308906
Quasar Cyano	50	2.1	3	N9308907
Quasar CN Guard Cartridge (3/pack)	10	3	5	N9308988
Quasar CN Guard Cartridge (3/pack)	10	3	3	N9308989
Quasar Guard Cartridge Holder	-	-	-	N9306876

Quasar Silica

The Quasar silica phase is based on an ultra-high purity silica which makes it an ideal choice for normal phase separation of polar compounds. Especially those that exhibit a poor peak shape on more acidic traditional type A silicas.

Applications

- Traditionally used for NP applications
- Can be used in the HILIC mode

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar Silica	250	4.6	5	N9308908
Quasar Silica	150	4.6	5	N9308909
Quasar Guard Cartridge Holder	-	-	-	N9306876

Quasar Amino

The Quasar amino phase is based on an ultra-high purity silica which makes it an ideal choice for both reverse and normal phase separations and analysis of compounds with weak ion exchange capacity.

Applications

- Sugars, Carbohydrates, Vitamins

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar Amino	250	4.6	5	N9304400
Quasar Amino	150	4.6	5	N9304401
Quasar Amino	100	4.6	5	N9304402
Quasar Amino	50	4.6	5	N9304403
Quasar Amino	150	3	3	N9304404
Quasar Amino	100	3	3	N9304405
Quasar Amino	50	3	3	N9304406
Quasar Amino	150	2.1	3	N9304407
Quasar Amino	100	2.1	3	N9304408
Quasar Amino	50	2.1	3	N9304409

Quasar C18 Method Validation Kits

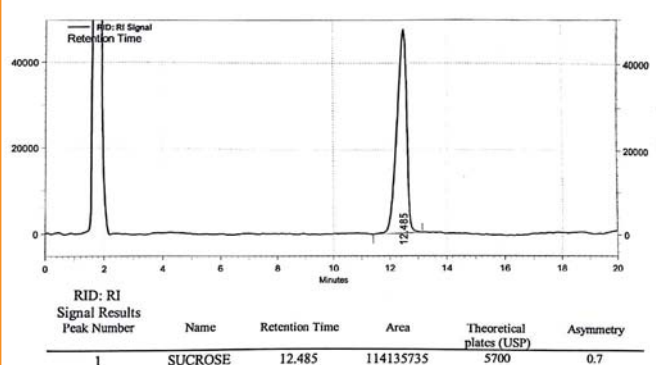
We recognize your need for 3 different batches of material when validating a method, to ensure reproducibility. We have made that easy for you, by providing method validation kits. Conveniently order a single part number to ensure 3 different lots of phase.



Method Validation Kit

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar C18	250	4.6	5	N9300940
Quasar C18	150	4.6	5	N9300941
Quasar SPP C18	150	4.6	2.6	N9300942
Quasar SPP C18	100	3	2.6	N9300943

Iron Sucrose Injection Assay by HPLC using Quasar Amino, 250 x 4.6 mm, 5 µm.



Mr. Sreedhar, SIPRA Labs Ltd.

Quasar SPP Columns

Our next-generation superficially porous particle (SPP) phases promise productivity with shorter run times and less solvent.

When it comes to your applications, it's all about efficiency. Quasar SPP phases are just as robust as traditional silica phases, featuring excellent ligand stability and solid packed bed and resulting in robust, reliable columns. A comparison of the same column dimensions packed with silica C18 phase versus a SPP C18 phase (opposite) clearly shows the reduction in run time achieved by making the switch. The additional benefit is reduced solvent consumption and cost. There is the scope to decrease run times further by using shorter columns.

Whether you're using an ultrahigh-performance liquid chromatography (UHPLC) system or a traditional high-performance liquid chromatography (HPLC) system, you can seamlessly switch to Quasar SPP columns and enjoy the benefits right away.

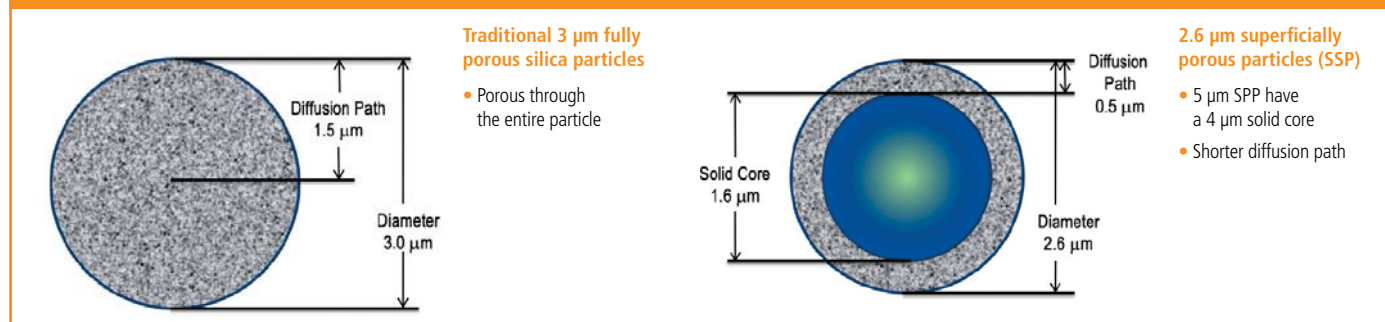
Features and Benefits

- Next-generation superficially porous particle (SPP) phases that promise productivity
- Faster run times and method development
- No specialized filtrations of sample and mobile phase
- Optimized low-band spreading
- Lower back pressures compared to sub 2 μm columns with robust operation

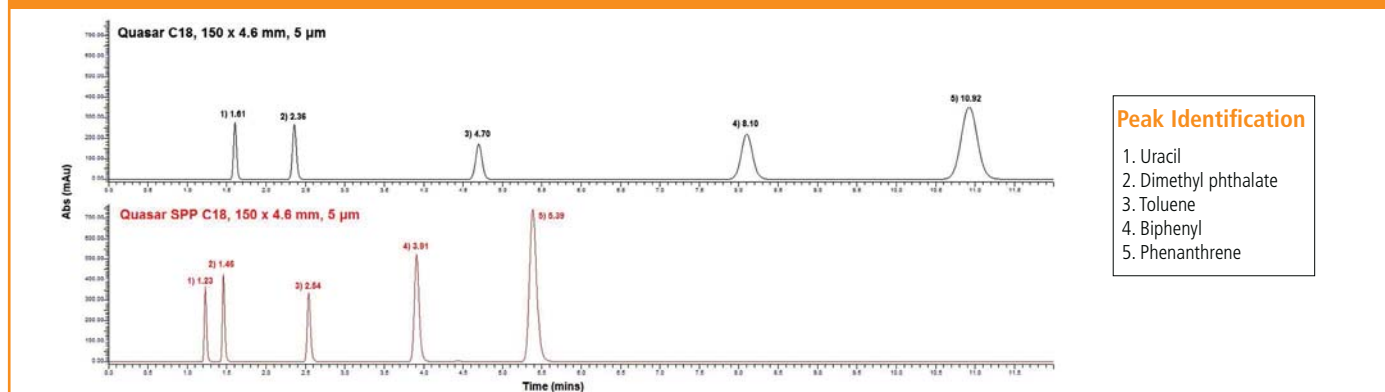
Material Characteristics

Brand	Phase	Particle Size (μm)	Pore Size (\AA)	Carbon %	End Cap	pH Stability	USP Code
Quasar SPP	C18	2.6, 5	80	10%	Yes	1-9	L1
Quasar SPP	C18/PFP	2.6, 5	80	8%	Yes	2-9	L1
Quasar SPP	HILIC	2.6, 5	80	-	No	2-8	L20
Quasar SPP	Biphenyl	2.6, 5	80	7%	Yes	2-9	L11
Quasar SPP	RP Amide	2.6, 5	80	9%	Yes	2-9	L60
Quasar SPP	PFP	2.6, 5	80	6%	Yes	2-9	L43

Quasar Particles: Porous vs. SPP.



Silica vs. SPP.



Quasar SPP C18

Utilizing fused core technology, based on ultra-high purity silica, the Quasar SPP phase offers excellent peak shape for a wide range of compounds. The optimal ligand bonding facilitates wide pH range for method development.

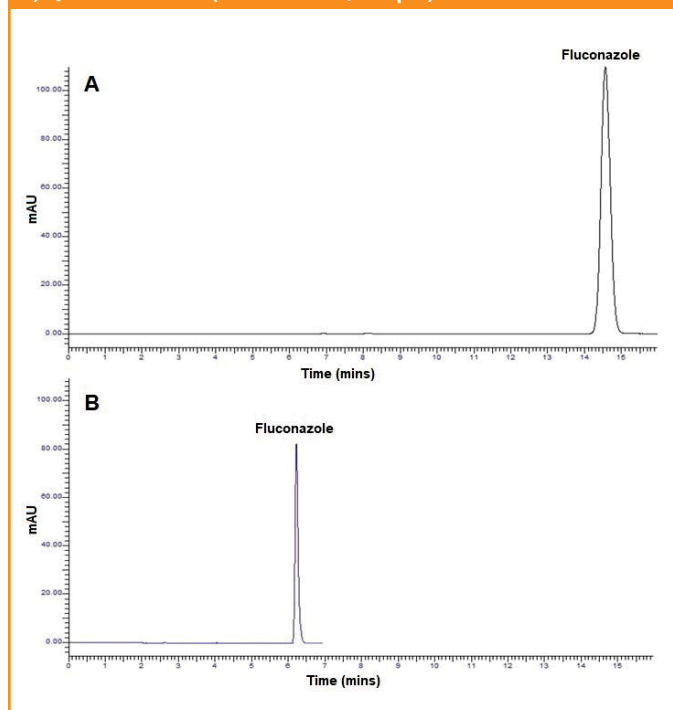
We recognize the need for three different batches of material when validating a method, to ensure reproducibility. Method validation kits ensure three different lots of phase, conveniently ordered under a single part number.

Applications

- Workhorse phase for small molecule analysis
- Basic, neutral and acidic analytes
- Pesticides, antibiotics

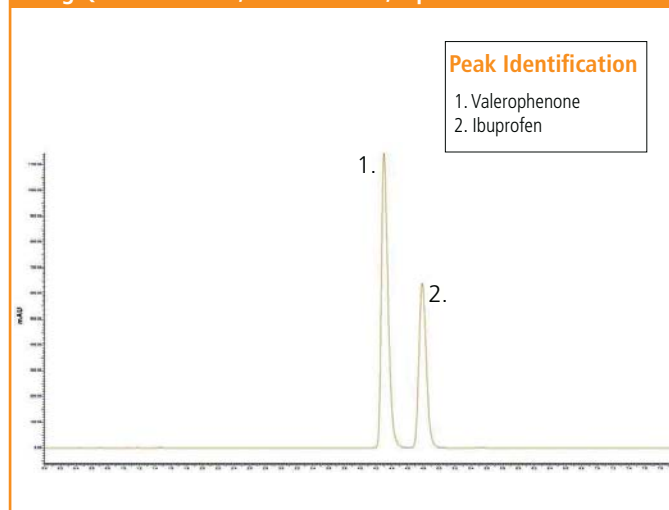
HPLC Analysis of Fluconazole (in accordance with USP) using

- A) Quasar C18 (150 x 4.6 mm, 3 μ m),
 B) Quasar SPP C18 (150 x 4.6mm, 2.6 μ m).



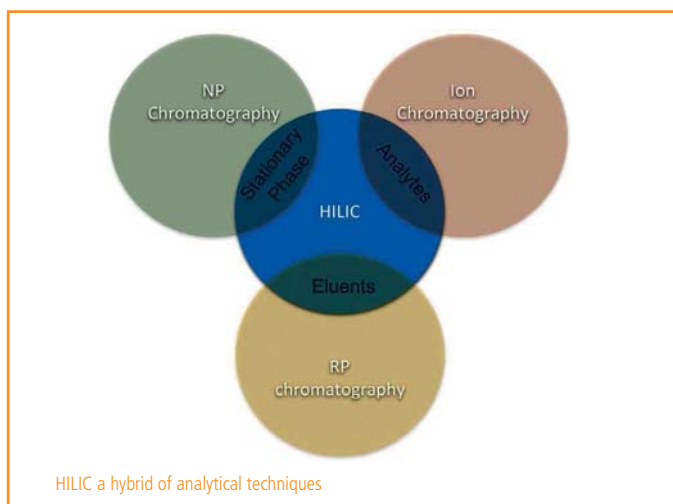
Phase	Length (mm)	ID (mm)	μ m	Part No.
Quasar SPP C18	150	4.6	2.6	N9308910
Quasar SPP C18	100	4.6	2.6	N9308911
Quasar SPP C18	50	4.6	2.6	N9308912
Quasar SPP C18	150	3	2.6	N9308913
Quasar SPP C18	100	3	2.6	N9308914
Quasar SPP C18	50	3	2.6	N9308915
Quasar SPP C18	150	2.1	2.6	N9308916
Quasar SPP C18	100	2.1	2.6	N9308917
Quasar SPP C18	50	2.1	2.6	N9308918
Quasar SPP C18	250	4.6	5	N9308955
Quasar SPP C18	150	4.6	5	N9308956
Quasar SPP C18	100	4.6	5	N9308957
Quasar SPP C18	50	4.6	5	N9308958
Quasar SPP C18 Guard Cartridge (3/pack)	10	3	2.6	N9308992
Quasar SPP C18 Guard Cartridge (3/pack)	10	3	5	N9308993
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC Analysis of Ibuprofen (in accordance with USP) using Quasar SPP C18, 150 x 4.6 mm, 5 μ m.



Quasar SPP HILIC

HILIC is a hybrid of normal phase (NP), reverse phase (RP) and ion chromatography techniques, (see diagram below). 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. However, 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 observed in reverse phase HPLC.

Any polar chromatographic surface can be used for HILIC separations. Typical HILIC stationary phases consist of classical bare silica or silica modified with polar functional groups. Based on an ultra-high purity silica the Quasar SPP HILIC column is silica phase, based on an ultra-high purity fused core silica.

Applications

- HILIC separation mode for increased retention of very polar compounds under RP conditions

Phase	Length (mm)	ID (mm)	µm	Part No.
Quasar SPP HILIC	150	4.6	2.6	N9308919
Quasar SPP HILIC	100	4.6	2.6	N9308920
Quasar SPP HILIC	50	4.6	2.6	N9308921
Quasar SPP HILIC	150	3	2.6	N9308922
Quasar SPP HILIC	100	3	2.6	N9308923
Quasar SPP HILIC	50	3	2.6	N9308924
Quasar SPP HILIC	150	2.1	2.6	N9308925
Quasar SPP HILIC	100	2.1	2.6	N9308926
Quasar SPP HILIC	50	2.1	2.6	N9308927
Quasar SPP HILIC	150	4.6	5	N9308960
Quasar SPP HILIC	100	4.6	5	N9308961
Quasar SPP HILIC	50	4.6	5	N9308962
Quasar SPP HILIC Guard Cartridge (3/pack)	10	3	2.6	N9308994
Quasar SPP HILIC Guard Cartridge (3/pack)	10	3	5	N9308995
Quasar Guard Cartridge Holder	-	-	-	N9306876



Each Quasar column is individually tested and is supplied with its own unique test certificate.

Quasar SPP Biphenyl

The Quasar SPP Biphenyl bonded phase provides π - π interactions to facilitate alternative selectivity. It also benefits from no MS bleed, maximizing sensitivity.

Applications

- Alternative selectivity for aromatic containing analytes
- Separation of structurally similar analytes

Phase	Length (mm)	ID (mm)	μm	Part No.
Quasar SPP Biphenyl	150	4.6	2.6	N9308937
Quasar SPP Biphenyl	100	4.6	2.6	N9308938
Quasar SPP Biphenyl	50	4.6	2.6	N9308939
Quasar SPP Biphenyl	150	3	2.6	N9308940
Quasar SPP Biphenyl	100	3	2.6	N9308941
Quasar SPP Biphenyl	50	3	2.6	N9308942
Quasar SPP Biphenyl	150	2.1	2.6	N9308943
Quasar SPP Biphenyl	100	2.1	2.6	N9308944
Quasar SPP Biphenyl	50	2.1	2.6	N9308945
Quasar SPP Biphenyl	150	4.6	5	N9308968
Quasar SPP Biphenyl	100	4.6	5	N9308969
Quasar SPP Biphenyl	50	4.6	5	N9308970
Quasar SPP Biphenyl Guard Cartridge (3/pack)	10	3	2.6	N9308998
Quasar SPP Biphenyl Guard Cartridge (3/pack)	10	3	5	N9308999
Quasar Guard Cartridge Holder	-	-	-	N9306876

Quasar SPP RP Amide

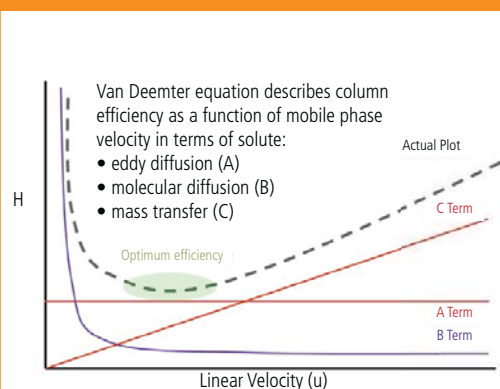
The Quasar SPP RP Amide phase contains a polar embedded group within alkyl chain. This facilitates alternative selectivities due to the mixed mode interactions that can now occur between the analyte and the stationary phase. Excellent peak shape for a wide range of compounds, including basic analytes is observed.

Applications

- Alternative selectivity to alkyl chain phases
- Ideal method development starting point due to wide analyte applicability with both hydrophobic and dipolar phase interactions

Phase	Length (mm)	ID (mm)	μm	Part No.
Quasar SPP RP Amide	150	4.6	2.6	N9308946
Quasar SPP RP Amide	100	4.6	2.6	N9308947
Quasar SPP RP Amide	50	4.6	2.6	N9308948
Quasar SPP RP Amide	150	3	2.6	N9308949
Quasar SPP RP Amide	100	3	2.6	N9308950
Quasar SPP RP Amide	50	3	2.6	N9308951
Quasar SPP RP Amide	150	2.1	2.6	N9308952
Quasar SPP RP Amide	100	2.1	2.6	N9308953
Quasar SPP RP Amide	50	2.1	2.6	N9308954
Quasar SPP RP Amide	150	4.6	5	N9308972
Quasar SPP RP Amide	100	4.6	5	N9308973
Quasar SPP RP Amide	50	4.6	5	N9308974
Quasar SPP RP Amide Guard Cartridge (3/pack)	10	3	2.6	N9306888
Quasar SPP RP Amide Guard Cartridge (3/pack)	10	3	5	N9306889
Quasar Guard Cartridge Holder	-	-	-	N9306876

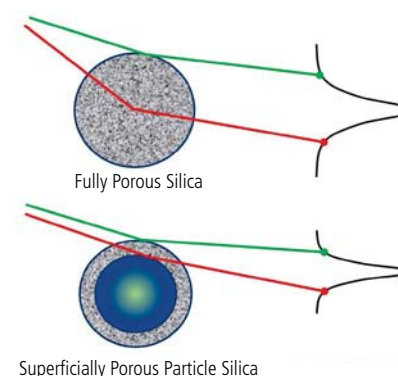
Improved efficiency of SPP Silica.



SPP silica improves column efficiency due to reduced "A" and "C" terms:

SPP silica has much narrower particle size distribution than most fully porous silica particles. This results in a more uniformly packed column, leading to a reduced "A" term.

Solid core and thin porous shell of SPP silica results in a reduced solute diffusion path. This leads to a reduced "C" term.



Quasar SPP C18/PFP

The Quasar SPP C18/PFP utilizes a mixture of C18 alkyl chain ligands and pentafluorophenyl (PFP) ligands. This facilitates alternative selectivity over traditional C18 phases due to the mixed mode interactions which can now occur between the analyte and the stationary phase. The phase provides steric selectivity & π - π interactions, in combination with hydrophobic interactions. Additionally, improved resolution can be achieved even at high speed.

Applications

- Alternative selectivity over traditional C18 phase
- Closely related species and metabolites

Phase	Length (mm)	ID (mm)	μ m	Part No.
Quasar SPP C18/PFP	150	4.6	2.6	N9304420
Quasar SPP C18/PFP	100	4.6	2.6	N9304421
Quasar SPP C18/PFP	50	4.6	2.6	N9304422
Quasar SPP C18/PFP	150	3	2.6	N9304423
Quasar SPP C18/PFP	100	3	2.6	N9304424
Quasar SPP C18/PFP	50	3	2.6	N9304425
Quasar SPP C18/PFP	150	2.1	2.6	N9304426
Quasar SPP C18/PFP	100	2.1	2.6	N9304427
Quasar SPP C18/PFP	50	2.1	2.6	N9304428
Quasar SPP C18/PFP	150	4.6	5	N9304429
Quasar SPP C18/PFP	100	4.6	5	N9304430
Quasar SPP C18/PFP	50	4.6	5	N9304431
Quasar SPP C18/PFP	150	3	5	N9304432
Quasar SPP C18/PFP	100	3	5	N9304433
Quasar SPP C18/PFP	50	3	5	N9304434
Quasar SPP C18/PFP	150	2.1	5	N9304435
Quasar SPP C18/PFP	100	2.1	5	N9304436
Quasar SPP C18/PFP	50	2.1	5	N9304437
Quasar SPP C18/PFP Guard Cartridge (3/pack)	10	3	2.6	N9304438
Quasar SPP C18/PFP Guard Cartridge (3/pack)	10	3	5	N9304439
Quasar Guard Cartridge Holder	-	-	-	N9306876

Quasar SPP PFP

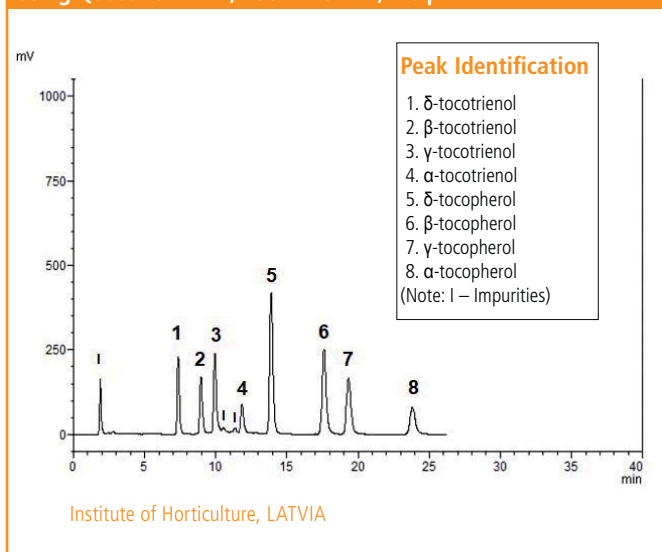
The Quasar SPP PFP phase utilizes a pentafluorophenyl (PFP) stationary phase. It provides π - π interactions to facilitate alternative selectivity.

Applications

- Alternative selectivity to hydrophobic phases
- Metabolite analysis and isomer separations

Phase	Length (mm)	ID (mm)	μ m	Part No.
Quasar SPP PFP	150	4.6	2.6	N9308928
Quasar SPP PFP	100	4.6	2.6	N9308929
Quasar SPP PFP	50	4.6	2.6	N9308930
Quasar SPP PFP	150	3	2.6	N9308931
Quasar SPP PFP	100	3	2.6	N9308932
Quasar SPP PFP	50	3	2.6	N9308933
Quasar SPP PFP	150	2.1	2.6	N9308934
Quasar SPP PFP	100	2.1	2.6	N9308935
Quasar SPP PFP	50	2.1	2.6	N9308936
Quasar SPP PFP	150	4.6	5	N9308964
Quasar SPP PFP	100	4.6	5	N9308965
Quasar SPP PFP	50	4.6	5	N9308966
Quasar SPP PFP Guard Cartridge (3/pack)	10	3	2.6	N9308996
Quasar SPP PFP Guard Cartridge (3/pack)	10	3	5	N9308997
Quasar Guard Cartridge Holder	-	-	-	N9306876

HPLC Analysis of 4 Tocopherols and 4 Tocotrienols using Quasar SPP PFP, 150 x 4.6 mm, 2.6 μ m.



Brownlee Aquapore Columns

Brownlee Aquapore columns are built on large pore (300 Å) silica for the analysis of large biomolecules such as peptides and proteins. Large pore stationary phases are required for the analysis of large molecules because the analytes need to penetrate the pores to improve retention and resolution. The RP-300 is a reverse-phase C8; AX-300 is a weak anion exchanger that is composed of a crosslinked polyethyleneimine phase bonded on the silica surface. The reverse-phase columns are also available in microbore (1.0 mm ID) for increased sensitivity and better compatibility with LC/MS interfaces.

Features and Benefits

- Rugged, spherical silica particles with 300 Å pore size
- Excellent choice for separation of peptides, proteins and other large molecules

ID (mm)	Length (mm)	RP-300 (C8) Part No.	AX-300 Part No.
1.0	250	07120097	
2.1	30	07110056	07110074
2.1	100	07110058	07110076
2.1	220	07110060	
4.6	30	07110055	07110073
4.6	100	07110057	07110075
4.6	220	07110059	07110077
4.6	250	07120033	07120040

Material Characteristics

Phase*	Particle Sizes (µm)	Pore Size (Å)	Carbon Load	End Capping	pH Stability	Temp. Limit (°C)	USP Code
AP RP-300 (C8)	7	300	5%	Yes	2.5 – 8.0	60	L7
AP AX-300†	7	300	–	–	2.0 – 8.0	60	L14

* AP = Aquapore; † AX = Weak Anion Exchange.

Brownlee Aquapore Prep-10 Cartridge Columns

The Brownlee Prep-10 columns are 10 mm ID cartridges packed with 20 µm particle size, 300 Å pore size Aquapore® sorbents. These unique 250 mm cartridges incorporate a moveable inlet plug and filter which compensates for changes in bed volume with continued use. The typical capacity of the 250 mm cartridge is 50 mg to 1 g depending on the resolution and purity required. A separate column holder needs to be purchased in addition to the cartridge column.

Material Characteristics

Phase	Particle Sizes (µm)	Pore Size (Å)	Carbon Load	End Capping	Surface Area (m ² /g)	pH Stability	Temp. Limit (°C)	USP Code
Aquapore ODS (C18)	20	300	10%	Yes	100	2.5 – 8.0	60	L1

Phase	Length (mm)	Particle Size (µm)	Qty.	4.6 mm ID Part No.	Column Holder
Aquapore Octyl (C8)	250	20	Each	07110166	07150006
Aquapore ODS (C18)	250	20	Each		07150006

Brownlee Spheri-5 and Spheri-10 Columns

The Brownlee Spheri line of columns is based on a small-pore (80 Å) silica-based sorbent for optimized for separating small molecules. Spheri-5® columns are based on 5 µm particle size silica and Spheri-10® incorporates a 10 µm silica particle. The Spheri-5 reverse phase C18 type sorbents are available in a monofunctional comb-type (RP-18) and a polyfunctional loop-type (ODS) which provide slight differences in selectivity.

Features and Benefits

- Small pore size (80 Å) designed for separating small molecules
- Reverse phase sorbents in 5 µm and 10 µm particles sizes and normal phase 5 µm particles

Material Characteristics

Phase*	Particle Sizes (µm)	Pore Size (Å)	Carbon Load	End Capping	pH Stability	Temp. Limit (°C)	USP Code
Spheri-5, -10 RP-8	5.0, 10.0	80	6%	Yes	2.5 – 8.0	60	L7
Spheri-5, -10 RP-18	5.0, 10.0	80	11%	Yes	2.5 – 8.0	60	L1
Spheri-5 ODS	5	80	14%	Yes	2.5 – 8.0	60	L1
Spheri-5 Cyano	5	80	4%	No	2.5 – 8.0	60	L10
Spheri-5 Amino	5	80	3%	No	2.5 – 8.0	60	L8

Columns with Cartridge Column Hardware

Columns are supplied in the MPLC cartridge column format and require a separate MPLC column holder.

Phase*	Length (mm)	Particle Size (µm)	Qty.	2.1 mm ID Part No.	4.6 mm ID Part No.	Column Holder Code* w/o Guard	Column Holder Code* w/ Guard
Spheri-5 RP-8	100	5	1	07110004	07110003	07150014	07150016
	220	5	1	07110006	07110005	07150015	07150017
Spheri-5 RP-18	100	5	1	07110016	07110015	07150014	07150016
	220	5	1	07110018	07110017	07150015	07150017
Spheri-5 ODS	100	5	1	07110022	07110021	07150014	07150016
	220	5	1	07110024	07110023	07150015	07150017
Spheri-5 Cyano	100	5	1	07110046	07110045	07150014	07150016
	220	5	1	–	07110047	07150015	07150017
Spheri-5 Amino	220	5	1	–	07110041	07150015	07150017
Spheri 10 RP-8	30	5	2	–	07110121	07150013	
	220	5	1	–	07110119	07150015	07150017
Spheri 10 RP-18	30	5	2	–	07110115	07150013	

* Requires Holder (07150013).

Columns with Conventional Column Hardware

All columns are 250 x 4.6 mm

Phase	Particle Sizes (µm)	Carbon Load	End Capping	USP Code	Part No.
Spheri-5 RP-8	5	6%	Yes	L7	07120012
Spheri-5 RP-18 (monofunctional)	5	11%	Yes	L1	07120016
Spheri-10 RP-18	10	11%	Yes	L1	07120001
Spheri-5 C18 ODS (Polyfunctional)	5	14%	Yes	L1	07120019
Spheri-5 Silica	5	–	–	L3	07120023

Brownlee Pecosphere Cartridge Columns

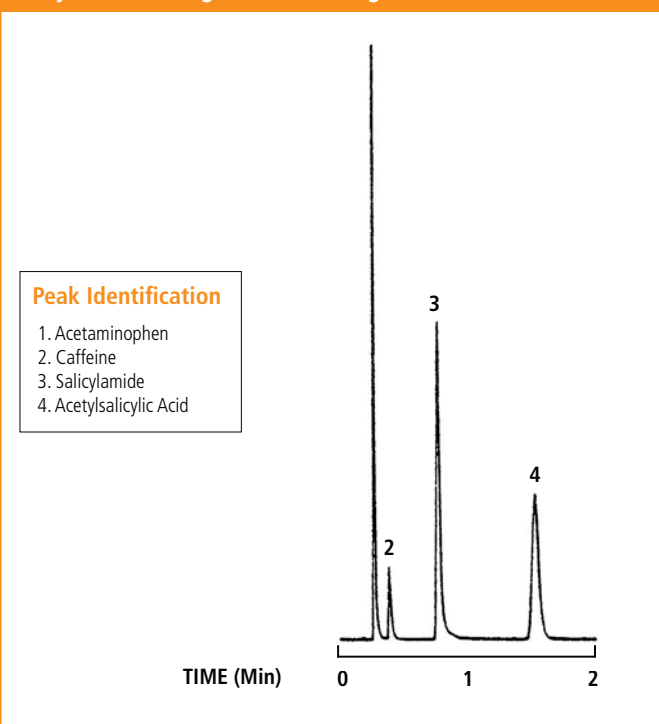
PerkinElmer pioneered the development of Fast HPLC and introduced the popular 3 μm particle size '3 x 3' Columns (33 mm x 4.6 mm) in the 1980s. The '3 x 3' columns are capable of very rapid analysis and still they are still very popular because of the economical price and reliable performance. The Pecosphere cartridges are also available 83 mm and 150 mm lengths for the separation of more complex mixtures.

They are packed with rugged, high purity silica in 3 μm and 5 μm , 80 Å pore size particles; with standard end-capping for the analysis of acidic and neutral analytes. A special end-capped Reduced Activity (RA) version that is especially suited for the analysis basic analytes. In addition, the 10 μm particles size C18 Scavenger cartridge designed to remove contaminants from the mobile phase when installed prior to the HPLC injector. These columns use cartridge style hardware – thus the associated column holder needs to be ordered with the column.

Features and Benefits

- The Pecosphere '3 x 3' column is the world's first fast HPLC column
- Reduced Activity C18 and C8 with low silanol activity for the analysis of basic compounds

Analysis of an Analgesic Tablet Using Fast LC.



Material Characteristics

Phase*	Particle Sizes (μm)	Pore Size (Å)	Carbon Load	Surface Area (M^2/g)	End Capping	pH Stability	USP Code
C18	3.0, 5.0	80	11%	170	Yes	2.0 – 8.0	L1
RA C8	3.0, 5.0	80	5%	200	Yes	2.0 – 8.0	L7
RA C18	3.0, 5.0	80	12%	200	Yes	2.0 – 8.0	L1
C18 Scavenger	10	80	11%	170	Yes	2.0 – 8.0	L1

Cartridge Columns and Hardware

Phase	Length (mm)	Particle Size	Qty.	4.6 mm ID Part No.	Column Holder Part No.
C18	33	3 μm	5	02580164	07150028
	83	3 μm	1	02580166	07150029
	150	5 μm	1	02580169	07150030
RA C18	33	3 μm	5	02580195	07150028
	83	3 μm	1	02580194	07150029
RA C8	33	3 μm	5	02580191	07150028
	83	3 μm	1	02580192	07150029
C18 Scavenger	33	10 μm	5	02580202	07150028
C18 Scavenger Kit*	33	10 μm	1	02580204	–

* Scavenger kit includes C18 cartridge (02580202) and holder (07150028).

Brownlee Polypore Cartridge Columns

Brownlee Polypore® columns are 10 mm, microporous polymer based columns especially suited for the analysis of sugars and organic acids.

Features and Benefits

- Available in calcium (CA) and hydrogen (H) counter ion forms
- For analysis of sugars and organic acids

Material Characteristics

Phase	Particle Sizes (µm)	Pore Size	pH Stability	Temp. Limit (°C)	USP Code
Polypore® H	10	Microporous	1 – 14	90	L17
Polypore® CA	10	Microporous	1 – 14	90	L19

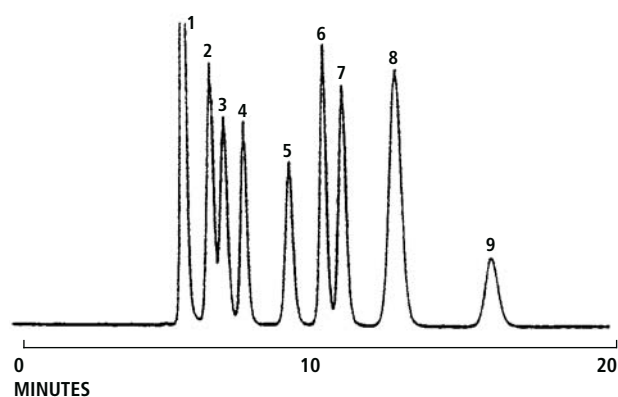
Brownlee Polypore cartridge columns are supplied in the MPLC cartridge column format, requiring a separate MPLC holder to be ordered, if not previously purchased.

Phase	Length (mm)	Particle Size (µm)	Qty.	4.6 mm ID Part No.	Column Holder*
Polypore® H	30	10	2	07110085	07150013
	100	10	1	07110087	07150014
	220	10	1	07110089	07150015
Polypore® CA	30	10	2	07110091	07150013
	100	10	1	07110093	07150014
	220	10	1	07110095	07150015

Organic Acids.

Peak Identification

- | | |
|-----------------------|-----------------|
| 1. Oxalic Acid | 6. Formic Acid |
| 2. Citric Acid | 7. Acetic Acid |
| 3. α-Ketogutaric Acid | 8. Fumaric Acid |
| 4. Malic Acid | 9. Butyric Acid |
| 5. Succinic Acid | |



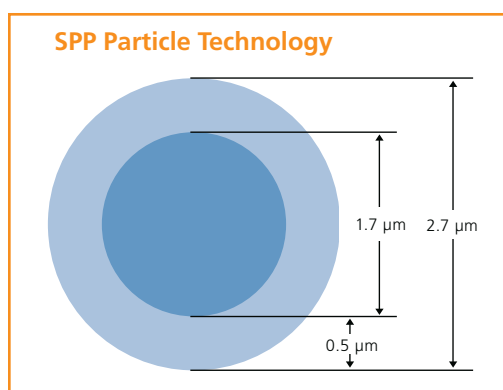
Chromatographic Conditions

Column	Detection	Mobile Phase	Flow Rate	Sample	Part No.
Polypore H (220 x 4.6 mm ID)	210 nm	0.01 NH ₂ SO ₄	0.15 mL/min	25 °C	07110089

Brownlee SPP HPLC and UHPLC Column Solutions

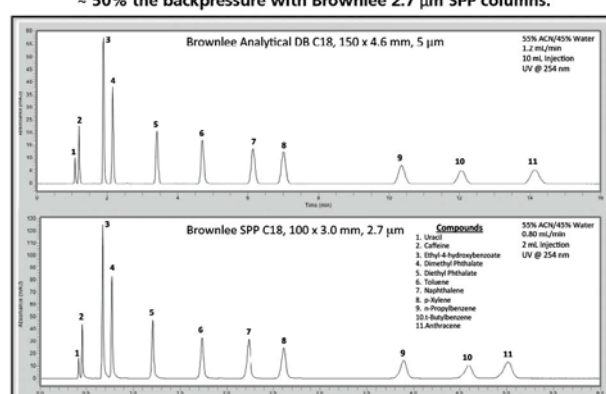
Say goodbye to the limitations of traditional columns and experience greater speed, lasting durability and better results from your liquid chromatography instrument.

Brownlee Superficially Porous Particle (SPP) columns produce sharper peaks and faster separation results. These results are possible due to their breakthrough particle design and size. Brownlee SPP columns use 2.7 μm particles comprised of a thin outer shell of high-quality porous silica fused to a solid inner core. This advanced design allows for a shorter diffusion path, reducing the time solute molecules spend inside the particles while passing through the stationary phase.



Smaller in size and innovative in design, superficially porous particles are made by fusing a porous silica layer to a solid inner core.

Get the speed and efficiency of sub-2 mm UHPLC columns at ~ 50% the backpressure with Brownlee 2.7 μm SPP columns.



Brownlee SPP Phases and Applications

UHPLC Phases*	Pore Size (Å)	Coverage ($\mu\text{mol}/\text{m}^2$)	pH Range	Temp Limit (°C)	Applications	Chromatographic Properties
C18	90	3.5	2 – 9	60	General purpose Octadecyl phase for reversed phase separations	A high purity column that exhibits excellent peak shape for a wide range of compounds
C8	90	3.7	2 – 9	60	General purpose Octyl phase for reversed phase separations when less retention than a C18 is desired	High purity reversed phase packing that exhibits excellent peak shape for a wide range of compounds
HILIC**	90	–	2 – 8	60	General purpose bare silica column for normal phase and HILIC applications	High purity silica substrate
Peptide ES-C18**	160	2.0	1 – 8	90	Sterically protected ligand (isobutyl – side chains), results in an extra stable bonded phase at low pH where most peptide separations are performed	The 160 Å pore size was specially chosen for the molecular weight range of peptides. The ligand was chosen due to its sterically protected bonding technology that inhibits acid hydrolysis of the siloxane bonds, even under extremes of high temperature and low pH
PhenylHexyl	90	3.0	2 – 9	60	Alternative selectivity to alkyl bonded phases, recommended for aromatic groups. Compatible with highly aqueous mobile phases to facilitate the retention and separation of polar compounds	Base-deactivated for good peak shapes when separating basic compounds. Hexyl spacer provides optimal flexibility for phenyl ring to facilitate π - π interactions with solutes

* Maximum pressure 9,000 psi for all columns. All particle sizes are 2.7 μm .

**Not end-capped. All others end-capped.

Brownlee SPP Columns

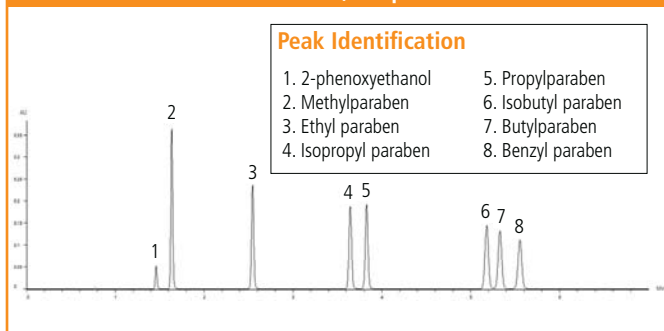
Phase	Length (mm)	2.1 mm ID Part No.	3.0 mm ID Part No.	4.6 mm ID Part No.
C18	30	N9308401	N9308407	N9308413
	50	N9308402	N9308408	N9308414
	75	N9308403	N9308409	N9308415
	100	N9308404	N9308410	N9308416
	150	N9308405	N9308411	N9308417
Peptide ES-C18	50	N9308451	N9308456	N9308461
	75	N9308452	N9308457	N9308462
	100	N9308453	N9308458	N9308463
	150	N9308454	N9308459	N9308464
C8	30	N9308419	N9308424	N9308430
	50	N9308420	N9308425	N9308431
	75	N9308421	N9308426	N9308432
	100	N9308422	N9308427	N9308433
	150	N9308423	N9308428	N9308434
Phenyl Hexyl	50	N9308483	N9308488	N9308493
	75	N9308484	N9308489	N9308494
	100	N9308485	N9308490	N9308495
	150	N9308486	N9308491	N9308496
HILIC	50	N9308436	N9308441	N9308446
	75	N9308437	N9308442	N9308447
	100	N9308438	N9308443	N9308448
	150	N9308439	N9308444	N9308449

SPP Guard Columns (Pkg. 3)*

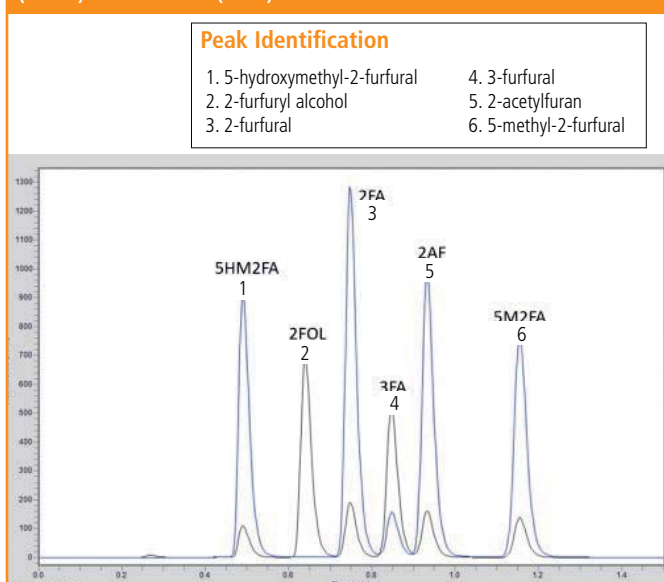
Phase	Length (mm)	2.1 mm ID Part No.	3.0 mm ID Part No.	4.6 mm ID Part No.
C18	5	N9308513	N9308514	N9308515
Peptide ES-C18	5	N9308528	N9308529	N9308530
C8	5	N9308522	N9308523	N9308524
Phenyl Hexyl	5	N9308519	N9308520	N9308521
HILIC	5	N9308525	N9308526	N9308527
SPP Guard Column Holder		N9308534	N9308534	N9308534

* Maximum pressure 9,000 psi for all columns. All particle sizes are 2.7 µm.

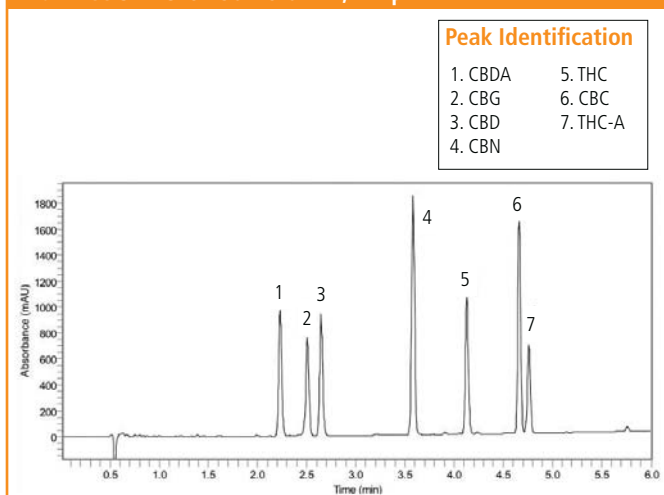
HPLC analysis of 8 parabens using Brownlee SPP C18 100 x 3.0 mm, 2.7 µm.



HPLC analysis of 6 furans using Brownlee SPP C8 100 x 2.1 mm, 2.7 µm. Chromatographic overlay of a standard run at 218 nm (black) and 278 nm (blue).



HPLC analysis of 7 cannabinoids using Brownlee SPP C18 150 x 3.0 mm, 2.7 µm.



NewGuard Cartridges

NewGuard cartridges are small guard cartridges (15 mm x 3.2 mm ID) packed with 5 or 7 µm sorbents. They help to prolong column life by eliminating particulates, contaminants, and strongly bound sample components; acting as replaceable disposable heads of your analytical column. There is negligible loss of efficiency and little effect on retention or resolution. NewGuards are available in a convenient 3-pack and can be coupled directly to any MPLC cartridge with a union (**07150018**), or any LC column using the stand alone holder (**07150001**).

Features and Benefits

- Prolong column life by 2 to 5 times
- Optimized dimensions to prevent loss of resolution
- Easy coupling to MPLC cartridges or conventional columns
- Finger-tight seal to 7,000 psi using NewGuard holders
- Can be used for sample preconcentration (connected to sample injection loop)

















Description	Size (µm)	Shape	Part No.
Amino, Aquapore Amino	7	Spherical	07110098
Anion, Aquapore Anion	7	Spherical	07110102
RP-8, Aquapore Octyl	7	Spherical	07110090
RP-18, Aquapore ODS	7	Spherical	07110092

* Requires holder (**07150001**). Note: Actual bed length of NewGuard is about 13 mm.



a) NewGuard cartridges directly coupled to a 220 mm MPLC cartridge (with union **07150018**) b) connected externally to a 250 mm conventional column with a stand alone holder (**07150001**).

MPLC Cartridge Holders

Description	Part No.
 Single 30 mm holder for MPLC cartridges	07150013
 Single 100 mm holder for MPLC cartridges	07150014
 MPLC holder for directly coupling a NewGuard and a 100 mm cartridge	07150016
 Holder for directly coupling a 30 mm and 100 mm MPLC cartridge	07150032
 Single 220 mm holder for MPLC cartridges	07150015
 MPLC holder for directly coupling a NewGuard and a 220 mm cartridge	07150017
 Holder for a single, stand-alone NewGuard cartridge	07150001
 For direct coupling of two cartridge holders or a NewGuard to any cartridge holder. (NewGuard end assembly required)	07150018
 Used with union to couple a NewGuard to any cartridge holder	07150002
 End assembly for any MPLC holder body	07150019
 Holder body for 100 mm MPLC cartridge	07150021
 Holder body for 220 mm MPLC cartridge	07150022
 Includes 100 mm and 220 mm holder bodies, 2 end assemblies, 1 union and 1 NewGuard end assembly	07150025
 Holder for a single 250 mm Prep-10 MPLC cartridge	07150006
 Holder for a 33 mm fast LC Pecosphere cartridge. (Not for use with MPLC cartridges)	07150028
 Holder for a 83 mm fast LC Pecosphere cartridge. (Not for use with MPLC cartridges)	07150029