Welch

CHROMATOGRAPHY

PRODUCTS CATALOG

- Ghost-Buster Column
- HPLC Column
- UHPLC Column
- Core-Shell Column

Welch Materials, Inc.

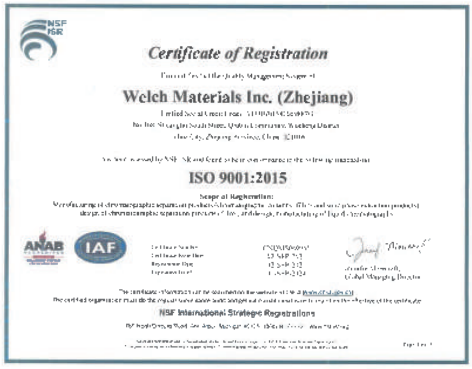
Company Profile



Quality, Innovation, Competitive Price

Welch Materials is a multinational company that develops and manufactures chromatography consumables including HPLC column, Solid Phase Extraction (SPE) cartridge, GC column, Prep column, Flash cartridge and packing materials.

Welch Materials (Shanghai), Inc. was established in 2003 at Shanghai, China and Welch Materials (Zhejiang), Inc. was set in 2011 at Jinhua, Zhejiang, China. We also have set Welch Materials, Inc. at West Haven, CT, USA and Welch Materials India Pvt. Ltd. at Gurgaon, India. Our initial strength was our extensive experience on particle surface modification science and techniques. We are experts on bonding chemistry and innovative packing materials for chromatography applications. Through the optimal utilization of our resources, we have developed many innovative LC and GC consumable products, in particular, our six series HPLC columns, Ultisil®, Welchrom®, Xtimate®, Topsil®, Boltimate® and Blossmate®.

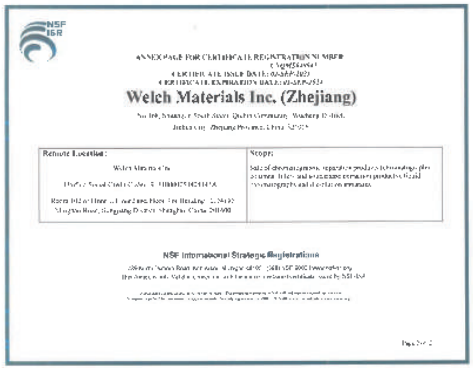


Certificate of Registration

Welch Materials Inc. (Zhejiang)

ISO 9001:2015

NSF International Strategic Registrations



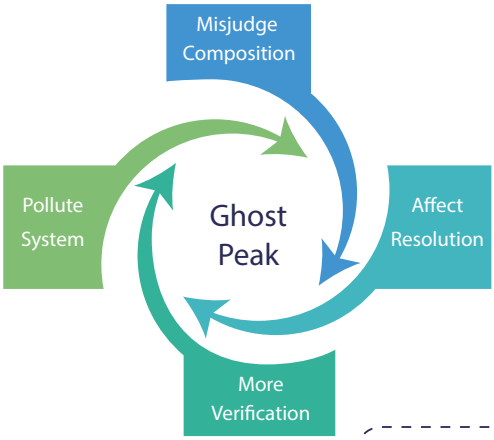
Welch Materials Inc. (Zhejiang)

NSF International Strategic Registrations

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Ghost-Buster Column



What is Ghost Peak?

The peak appears erratically like ghost in chromatographic separation, especially during gradient elution or long-period operation.

Where is Ghost Peak from?

- Water, with impurities
- Purification System, polluted or poorly functioning
- Storage Containers, polluted or breeding bacteria
- Mobile Phase Additives, like salts, acids and alkalis
- Instrument, polluted after long-period use
- Other organic pollutants

Welch Ghost-Buster Column can effectively remove impurities with low polarity and thus prevents the interference from all kinds of ghost peaks. It is installed between gradient mixer and injector, which helps remove not only the impurities in mobile phase, but impurities in mixer and pipelines as well.

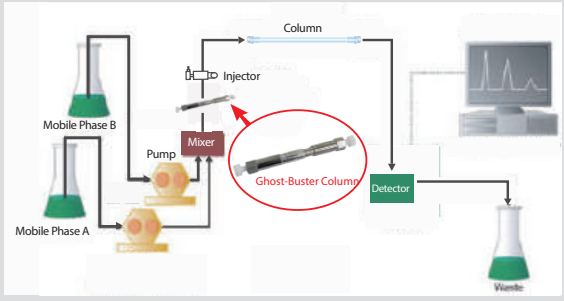
○ Operation Principles

Unlike in-line filters which removes only solid particles but not organic pollutants, Welch Ghost-Buster column provides strong adsorption to weak-polar and non-polar organic impurities, without changing the composition of mobile phase, thus to purify both mobile phase and system, remove most ghost peaks and extend lifetime of column and system.

○ Precautions

1. Install the column between Mixer and Injector. Being installed after injector would cause strong adsorption to samples and affect analysis.
2. For new analytical columns, flush Ghost-Buster column with 80% methanol solution at 1 mL/min for 20 min before new column switching to the system.
3. Not all impurities can be adsorbed by Ghost-Buster column.
4. Ion-pair solvents in mobile phase, would be adsorbed by Ghost-Buster column and affect retention and peak shape. Please use with caution under such mobile phases.
5. Column lifetime depends on analytical conditions, mobile phase and solvent purity. Routine change of Ghost-Buster column is suggested to ensure performance.
6. Ghost-Buster column is rather a purification part to the system, to filtrate impurities and protect column and system.
7. Before and after using buffer salt mobile phase, flush column with high-ratio water to transit, thus to avoid buffer salting out and blocking the column.
8. When Ghost-Buster column shows unsatisfying performance, try disconnect the outlet of the column and flush with 100% acetonitrile.

Install the Ghost-Buster column between Mixer and Injector. Sample solution must not flow through the column.



Application and Result

Column: Ultisil® XB-C18, 4.6×250 mm, 5 µm
Flow Rate: 1.0 mL/min
Injection Volume: 10 µL
Detection: 210 nm
Temperature: 40℃
Sample Preparation: Ultra-pure water
Mobile Phase A: Ultra-pure water
Mobile Phase B: Acetonitrile

Time （min）	Mobile Phase A （%）	Mobile Phase B （%）
0	90	10
20	10	90
30	10	90
30.1	90	10
38	90	10

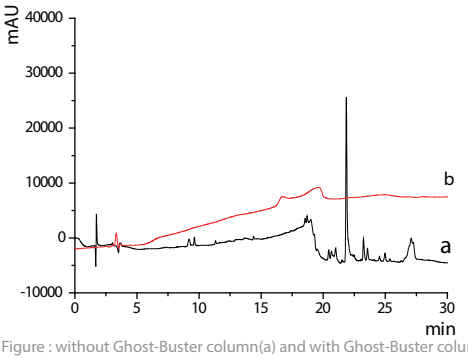


Figure : without Ghost-Buster column(a) and with Ghost-Buster column(b)

Ordering Information

Name	P/N	Dimension	Pressure
Ghost-Buster Column	06100-31000	4.6×50 mm	40MPa
Ghost-Buster Column	06100-31001	7.8×50 mm	40MPa
Ghost-Buster HP Column	06100-31021	2.1×33 mm	100MPa
Ghost-Buster HP Column	06100-31025	2.1×50 mm	100MPa
Ghost-Buster Column Kit	GBKIT-01	4.6×50 mm, With 4 connectors and 2 pipelines	40MPa
Ghost-Buster Column Kit	GBKIT-02	7.8×50 mm, With 4 connectors and 2 pipelines	40MPa

Q&A

Q: For different samples and gradient conditions, should the Ghost-Buster column be removed or changed?
A: Not necessary. But it needs to be removed only for special circumstances like changing of peak position or ion-pair solvents mobile phase.

Q: When gradient elution changed to isocratic, should the Ghost-Buster column be removed?
A: No need to take the Ghost-Buster column if it did not affect the separation, as the elution of mobile phase stays same under isocratic condition. But impurities in mobile phase shall be taken into consideration.

Q: In gradient system, Ghost-Buster column increases the mixed dwell volume. Will this affect the separation?
A: The packing volume of a 4.6×50mm column is ~400 µL and the column is installed before the injector, which would cause little influence on the analysis. If it does, connect Ghost-Buster column to the water phase path before the mixer or switching valve.

Q: Any requirements for the connecting of Ghost-Buster column?
A: No special requirements for the connection. Common PEEK tube and connectors for HPLC system is recommended, as metal connectors may have the possibility of being stuck at column ends.

Ghost-Buster II Column

Further improvement, excellent performance!

During HPLC analysis, especially gradient elution or after long-term system usage, some unexpected peaks, often called "Ghost Peaks", may appear in the chromatogram. Welch Materials original Ghost-Buster Column can capture ghost peaks, but sometimes this has been accompanied with baseline fluctuation which may affect the integration of some peaks.

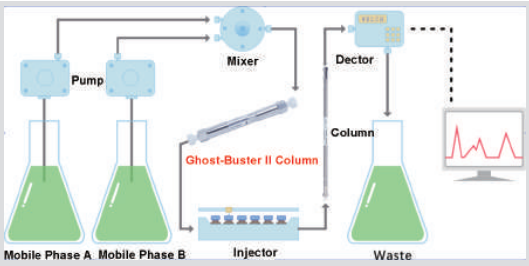
Welch Materials is delighted to announce the launch of Ghost-Buster II Column, an upgraded and improved Ghost-Buster column, which can absorb mobile phase impurities and eliminate ghost peaks. At the same time, baseline drift caused by a high proportion of aqueous solvent in the gradient program will be minimized, which ensures the stable baseline.

Precautions

1. The new Ghost-Buster II Column , should be flushed with 80% methanol at 1.0mL/min for 4-5 hours before using.
2. Not all impurities can be adsorbed by the Ghost-Buster II Column.
3. The GB II column is not compatible with 100% aqueous mobile phases. Mobile phase A should contain at least 5% organic solvent.
4. Ion-pair solvents in mobile phase would be adsorbed by Ghost-Buster II column and affect retention and peak shape. Whether this type of mobile phase can be used should be determined by testing a new GB II column with the specific method.
5. Replacement of the GB II column is recommended once the trapping effect begins to deteriorate. We do not recommend a washing or clean up procedure due to the highly retentive nature of the GB II column packing materials.



Install Ghost-Buster II Column between injector and mixer. Samples must not pass through the Ghost-Buster II Column.



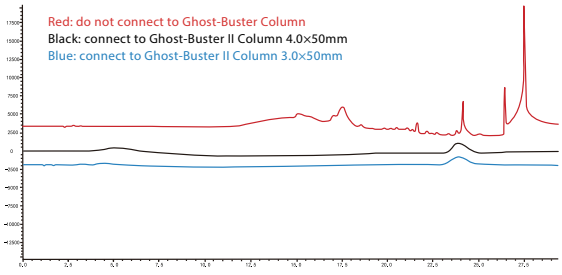
Stronger Capturing Effect

Ghost-Buster II Column uses a specifically optimized stationary phase and improved hardware. Ghost-Buster II Column removes impurities in the mobile phase with stronger retention.

Column: C18 column
GB Column: Ghost-Buster II Column, 3.0×50mm
Ghost-Buster II Column, 4.0×50mm
Mobile phase: A: 0.05% phosphoric acid solution B: acetonitrile
Gradient program:

Time/min	0	3	15	20	20.1	30
A/%	95	95	15	15	95	95
B/%	5	5	85	85	5	5

From the above case, it can be seen that Ghost-Buster II Column captures impurities with high retention and significantly improves baseline drift.



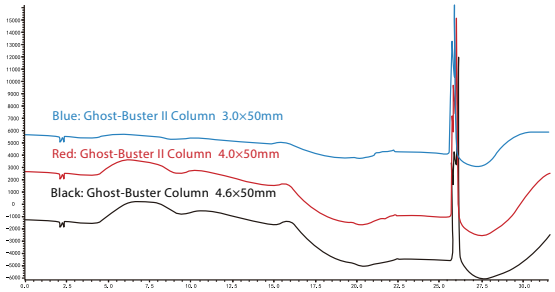
More Stable Baseline

When the initial proportion of aqueous phase is high (generally more than 95%), using conventional GB columns can remove impurities effectively. But some ghost peaks may still occur when the proportion of mobile phase has a drastic change in a few minutes or the baseline has large fluctuation. By improving the overall design of the Ghost-Buster II Column, the mobile phase is fully mixed before entering the analytical column, greatly reducing the baseline fluctuation and drift in the initial phase of the gradient program.

Column: C18 column
GB Column: Ghost-Buster II Column, 3.0×50mm
Mobile phase: A: phosphoric acid buffer B: acetonitrile
Gradient program:

Time/min	0	4	5	8	11	15
A/%	96	89	89	84	80	50
B/%	4	11	11	16	20	50

From the above case, it can be seen that Ghost-Buster II Column, 3.0×50mm is perfectly compatible with the high proportion of aqueous phase, reducing the run time of the gradient program and providing a more stable baseline.



Ordering Information

Name	P/N	Dimension	Pressure
Ghost-Buster II Column	06100-31008	4.0×50mm	40MPa
Ghost-Buster II Column	06100-31016	3.0×50mm	40MPa
Ghost-Buster Column Kit	GBKIT-03	4.0×50 mm, With 4 connectors and 2 pipelines	40MPa
Ghost-Buster Column Kit	GBKIT-04	3.0×50 mm, With 4 connectors and 2 pipelines	40MPa

Q&A

Q: What's the lifetime of GB column?

A: The lifetime of GB column is related to the analysis conditions, brand of the solvents and purity of the mobile phase. If the mobile phase composition (such as water/methanol) is simple, and GB column is carefully used, the lifetime of the GB column is over one year and the number of injections is around 3000 times.

Replacement of the GB column is recommended once the trapping effect begins to deteriorate.

Q: What's the washing procedure and how frequently we have to wash the column?

GB column doesn't need special washing as the adsorption of impurities is irreversible.

Q: Is GB column compatible with ion-pair reagent mobile phases?

Whether ion pair mobile phase can be used should be determined by testing a new GB column as the sorbent in the GB column will absorb ion pair reagent.

1) In most cases, it may not be compatible with the mobile phase which contains ion pair reagent such as sodium 1-heptanesulfonate, tetrabutylammonium hydroxide etc.

2) However, in some cases, GB column might not affect the retention and peak shape. In these cases, this GB column must be the dedicated column for this ion-pair regent and can't be used for another ion-pair regent mobile phase.

4. Can GB column be used for different types of mobile phases (such as potassium phosphate, sodium phosphate, ammonium acetate, TFA, Formic acid, etc.?

Yes, GB column can be used for different type of mobile phase except the mobile phase containing ammonium ion. Other reagents such as potassium phosphate, sodium phosphate, TFA, formic acid, etc. can be used for the column.

5. Is GB column compatible with 100% aqueous buffers/100 % organic solvents?

1) GB column can't be compatible with 100% aqueous buffers. At least 5%-10% of the organic phase should be contained in the mobile phase because low percentage of organic phase (<5%) might result in the unstable baseline. In this circumstance, Ghost-Buster II column, 3.0×50mm (P/N 06100-31016) is recommended.

2) GB column can be used at 100 % organic solvents.

Ultisil® Series HPLC Column

Ultisil Plus series column is based on new high-purity fully porous silica and it adpots Welch's unique bonding process and end-capping technique to ensure higher inertness on the silica surface, resulting in more symmetrical peak shape, higher column efficiency, and more stable separation performance annd better batch reproducibility. It has better performance especially for the analysis of multi-impurity components. The high standard and strict quality control conditions of the column ensure that each column is "survival of the fittest" after strict quality screening before leaving the factory. Ultisil Plus series columns are extremely resistant to contamination, which enables the column to have a long service life while analyzing complex matrix samples.

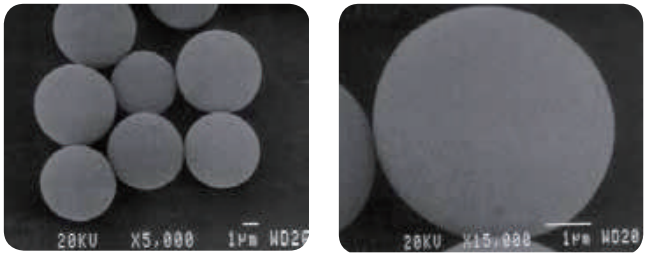
Features

- Super anti-pollution ability
- Excellent longevity
- Excellent batch-to-batch reproducibility
- The first choice for herbal medicine testing

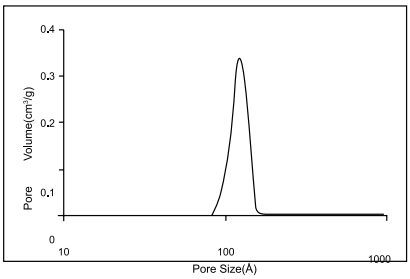
Ultisil® HPLC Column Packing Materials

Pictures below show size uniformity and surface smoothness of the packing particles, characteristics that enable more uniform packing with less channeling effect, resulting in lower back pressure and higher column efficiency.

SEM Pictures of Ultisil® Particles

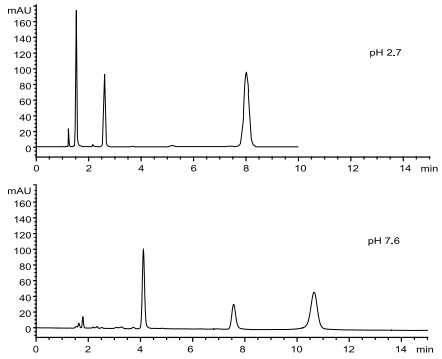


Ultisil® Pore Size Distribution



Trace Amount Metal Contents Test

A useful chromatographic test of trace amount of metal contents in the column is to compare the peak symmetry of one pair of positional isomers, 4,4'-dipyridyl and 2,2'-dipyridyl, and a neutral chelating reagent, 1,2-dihydroxylnaphthalene. 4,4'-dipyridyl, which cannot form chelating complex with metal, is used as a reference. 2,2'-dipyridyl and 1,2-dihydroxylnaphthalene, which are chelating reagents, are sensitive to trace amount metal in silica. When a C18 column based on type A silica or other so-called type B silica with higher metal content is used, the peaks of 2,2'-dipyridyl and 1,2-dihydroxylnaphthalene would tail or even totally disappear.



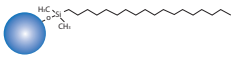
Column:	Ultisil® XB-C18, 4.6 ×150 mm, 5 μm
Mobile Phase:	20 mM phosphate(pH 7.6) / methanol=55/45
Flow rate:	1.0 mL/min
Detector:	215 nm
Temperature:	25°C
Injection Volume:	1 μL
Samples:	1) 4,4'-Dipyridyl 2) 2,2'-Dipyridyl 3) 1,2-Dihydroxylnaphthalene

Ultisil® XB-C18 provides good peak shapes in the separation of these three compounds under pH 7.6, which indicates Ultisil silica contains

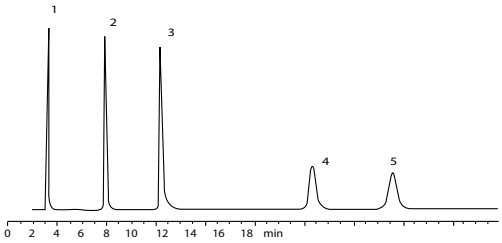
Ultisil® XB-C18—Universal HPLC Analytical Column

Ultisil® XB-C18 is the most commonly used column in the market. It can substitute Waters Symmetry C18, Agilent Zorbax XDB C18, Phenomenex Luna C18, Supelcosil LC-18-DB, YMC ODS-AM, Alltima C18, GL, Inertsil ODS-2 etc. XB-C18 has high theoretical plates and peak capacity, so it's suitable for analysis of complex samples.

Ultisil® XB-C18

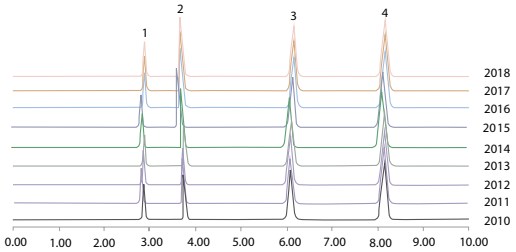
Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	17(120 Å), 8(300 Å)
USP List	L1
Endcapped	Yes

Separation of Basic Compounds Antidepressant at pH 7.0



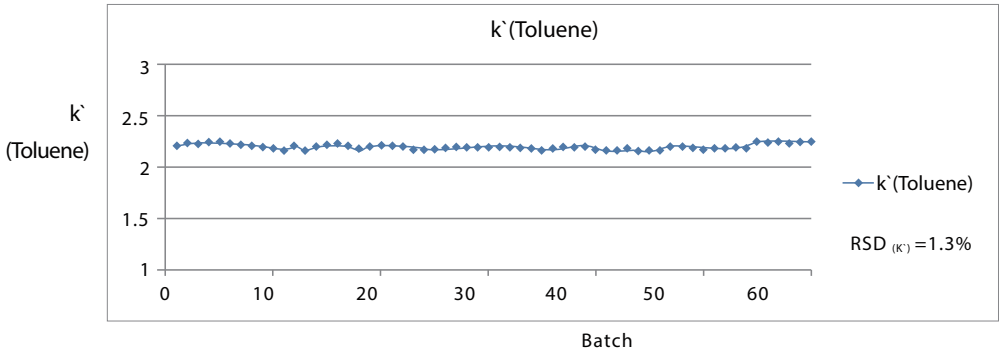
Column:	Ultisil® XB-C18, 4.6 ×150 mm, 5 μm	
Mobile Phase:	20 mM phosphate(pH 7.0) / methanol=20 / 80	
Flow rate:	1.0 mL/min	
Detector:	215 nm	
Temperature:	25°C	
Samples:	1) Uracil 3) Ortriptyline 5) Trimipramine	2) Ropranolol 4) Amitryptyline

Comparison of Peak Shape between Batch to Batch

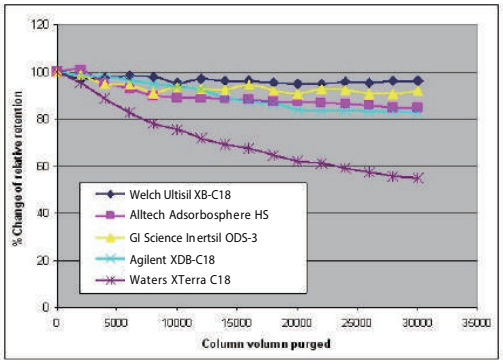


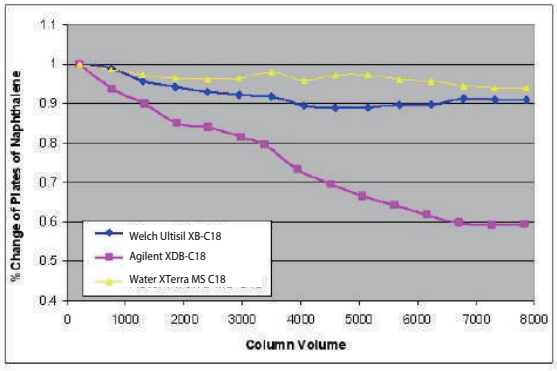
Column:	Ultisil® XB-C18, 4.6 ×250 mm, 5 μm	
Mobile Phase:	Methanol / water=75 / 25	
Flow rate:	1.0 mL/min	
Detector:	254 nm	
Temperature:	25°C	
Samples:	1) Uracil 3) 4-chloronitrobenzen	2) Phenol 4) Methylbenzene

Capacity Factor(K') of Batch to Batch Reproducibility



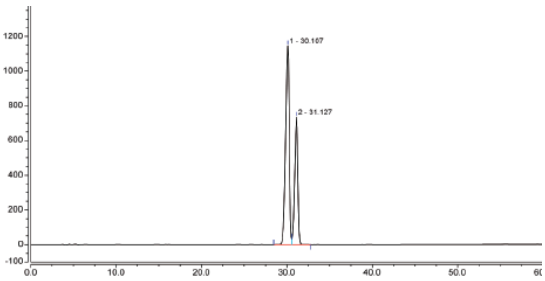
Excellent Stability at Low pH and High pH





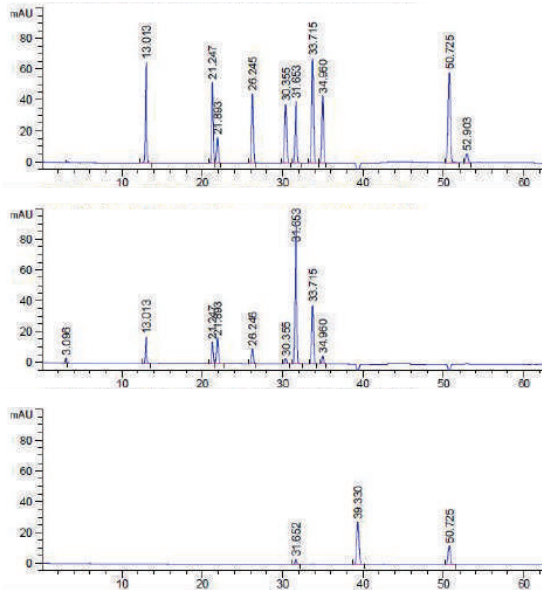
The stability of XB-C18 is better than other brand columns under pH 1.3 or under pH 10.

Argatroban



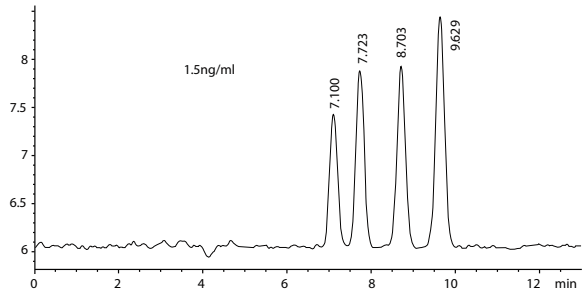
Column:	Ultisil® XB-C18, 4.6 ×250 mm, 3 μm
Mobile Phase:	Mobile Phase A: 10 mmol/L ammonium acetate Mobile Phase B: acetonitrile/methanol=50/30
Gradient Program:	Time(min) A% B% 0 60 40 20 60 40 35 50 50 50 20 80 60 20 80 60.1 60 40 80 60 40
Flow Rate:	0.6 mL/min
Detector:	259 nm
Temperature:	50 °C
Injection Volume:	10 μL
Reference Sample:	S-argatroban, R-argatroban,

Paracetamol Injection USP 36



Column:	Ultisil® XB-C18, 4.6 ×250 mm, 5 μm
Mobile Phase:	A: methanol / water / acetic acid =50/950/1 B: methanol / water / acetic acid =50/500/1
Gradient Program:	Time(min) A% B% 0 82 18 8 82 18 53 0 100 58 0 100 59 82 18 73 82 18
Flow Rate:	0.9 mL/min
Detector:	254 nm, 275 nm, 317 nm
Temperature:	40°C
Injection Volume:	20 μL
Reference Sample:	L-hydroxyproline, glycine, alanine, L-proline

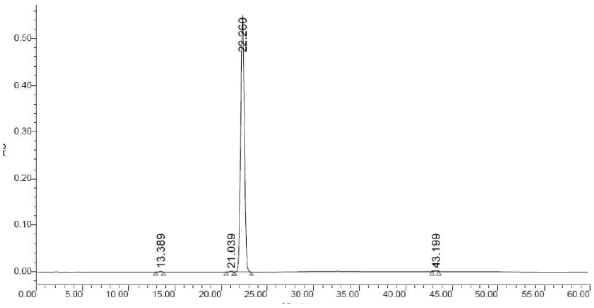
Aflatoxin



Column:	Ultisil® XB-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	Water / methanol / acetonitrile=46/40/14
Flow Rate:	1.0 mL/min
Detector:	Excitation wavelength: 360 nm Emission wavelength: 450 nm Gain:17
Temperature:	30°C
Injection Volume:	Post -column photo chemical derivation (254 nm)

Aflatoxin B1, B2, G1, G2 mixed standards, meets separation requirements

Progesterone(EP 5.0)



Column:	Ultisil® XB-C18, 4.6 ×150 mm, 5 µm
Mobile Phase:	A: water B: acetonitrile
Gradient Program:	Time(min) A% B% 0-20 50 50 20-27 50-20 50-80 27-45 20 80 45-50 50 50
Flow Rate:	0.9 mL/min
Detector:	254 nm, 275 nm, 317 nm
Temperature:	40°C
Injection Volume:	20 µL
Reference Sample:	L-hydroxyproline, glycine, alanine, L-proline

Ordering Information

Ultisil® XB-C18

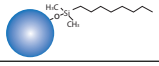
Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	H00201-21009	H00201-21068	H00201-21010	H00201-21011	H00201-21012	H00201-21013	H00201-21014	H00201-21015	H00201-21016	-	H00808-23001	00808-01107
120 Å	3.0	H00201-21018	H00201-21069	H00201-21019	H00201-21020	H00201-21021	H00201-21022	H00201-21023	H00201-21024	H00201-21025	-	H00808-23001	00808-01107
	4.0	H00201-21027	H00201-21070	H00201-21028	H00201-21029	H00201-21030	H00201-21031	H00201-21032	H00201-21033	H00201-21034	-	H00808-03001	00808-01101
	4.6	H00201-21036	H00201-21071	H00201-21037	H00201-21038	H00201-21039	H00201-21040	H00201-21041	H00201-21042	H00201-21043	-	H00808-03001	00808-01101
5 µm	2.1	H00201-31009	H00201-31068	H00201-31010	H00201-31011	H00201-31012	H00201-31013	H00201-31014	H00201-31015	H00201-31016	-	H00808-24001	00808-01107
120 Å	3.0	H00201-31018	H00201-31069	H00201-31019	H00201-31020	H00201-31021	H00201-31022	H00201-31023	H00201-31024	H00201-31025	-	H00808-24001	00808-01107
	4.0	H00201-31027	H00201-31070	H00201-31028	H00201-31029	H00201-31030	H00201-31031	H00201-31032	H00201-31033	H00201-31034	H00201-31035	H00808-04001	00808-01101
	4.6	H00201-31036	H00201-31071	H00201-31037	H00201-31038	H00201-31039	H00201-31040	H00201-31041	H00201-31042	H00201-31043	H00201-31044	H00808-04001	00808-01101
10 µm	4.0	-		-	-	H00201-41030	H00201-41031	H00201-41032	H00201-41033	H00201-41034	H00201-41035	H00808-05001	00808-01101
120 Å	4.6	-		-	-	H00201-41039	H00201-41040	H00201-41041	H00201-41042	H00201-41043	H00201-41044	H00808-05001	00808-01101

300 Å pore size column provided. Please contact Welch or your local distributor for other dimensions.

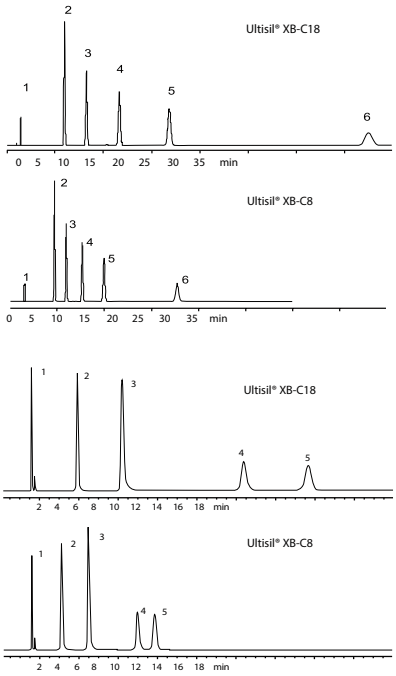
Ultisil® XB-C8--Less retentive than XB-C18

The XB-C8 phase is less retentive than XB-C18 phase, useful for strong hydrophobic compounds that are too strongly retained on C18 phase, and for LC/MS applications, where long retention is not desired. When separating neutral or other highly retained compounds, XB-C8 can save analytical time. However, when separating polar compounds, XB-C8 column provides different selectivity than does XB-C18 column.

Ultisil® XB-C8

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	12(120 Å), 4(300 Å)
USP List	L7
Endcapped	Yes

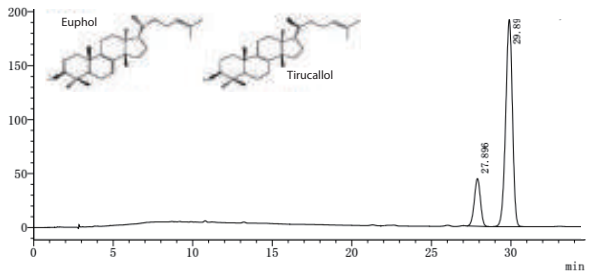
Comparison of Retention of XB-C18 and XB-C8



Column:	4.6 ×150 mm, 5 μm	
Mobile Phase:	Water / acetonitrile=30/70	
Flow rate:	1.0 mL/min	
Detector:	344 nm	
Temperature:	25℃	
Samples:	1) Uracil 2) Ethylbenzene 3) Propylbenzene	4) Butylbenzene 5) Amylbezene 6) Heptylbenzene

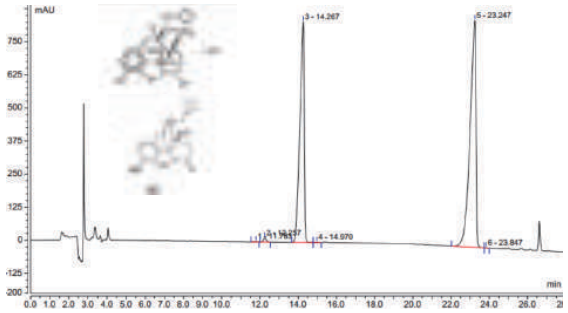
Column:	4.6 ×150 mm, 5 μm	
Mobile Phase:	20 mM phosphate(pH 7.0) / methanol=20 / 80	
Flow rate:	1.0 mL/min	
Detector:	215 nm	
Temperature:	25℃	
Samples:	1) Uracil 2) Ropranolol 3) Ortriptyline	4) Amitryptyline 5) Trimipramine

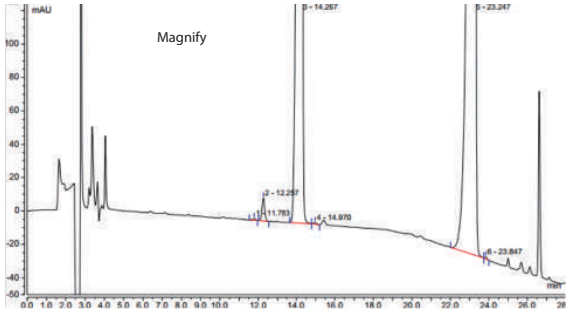
Tirucallol and Euphol



Column:	Ultisil® XB-C8, 4.6 ×250 mm, 5 μm
Mobile Phase:	Acetonitrile/water=90/10
Flow Rate:	1.0 mL/min
Detector:	210 nm
Temperature:	30℃
Injection Volume:	10 μL

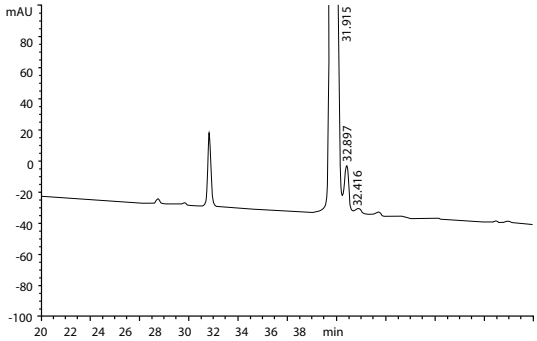
Nalbuphine HCl





Column:	Ultisil® XB-C8, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: 0.02 mol/L KH_2PO_4 buffer(pH 6.5)(%) B: acetonitrile
Gradient Program:	Time(min) A% B% 0 80 20 15 70 30 25 40 60 28 40 60 30 80 20 45 80 20
Flow Rate:	1.0 mL/min
Detector:	220 nm
Temperature:	30°C
Injection Volume:	10 µL

Analysis of Insulin Detemir



Column:	Ultisil® XB-C8, 4.6 ×150 mm, 5 µm
Mobile Phase:	A: 20g $(NH_4)_2SO_4$, 900mL water, 100 mL acetonitrile, adjust pH 2.3 B: acetonitrile/water=80/20; %B=0(0 min) , 30(9 min), 60(40 min)
Flow Rate:	1.0 mL/min
Detector:	214 nm
Temperature:	30 °C
Injection Volume:	20 µL

Ordering Information

Ultisil® XB-C8

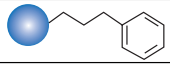
Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00202-21009	H00202-21068	H00202-21010	H00202-21011	H00202-21012	H00202-21013	H00202-21014	H00202-21015	H00202-21016	-	H00808-23002	00808-01107
	3.0	H00202-21018	H00202-21069	H00202-21019	H00202-21020	H00202-21021	H00202-21022	H00202-21023	H00202-21024	H00202-21025	-	H00808-23002	00808-01107
	4.0	H00202-21027	H00202-21070	H00202-21028	H00202-21029	H00202-21030	H00202-21031	H00202-21032	00202-21033	H00202-21034	-	H00808-03002	00808-01101
	4.6	H00202-21036	H00202-21071	H00202-21037	H00202-21038	H00202-21039	H00202-21040	H00202-21041	H00202-21042	H00202-21043	-	H00808-03002	00808-01101
5 µm 120 Å	2.1	H00202-31009	H00202-31068	H00202-31010	H00202-31011	H00202-31012	H00202-31013	H00202-31014	H00202-31015	H00202-31016	-	H00808-24002	00808-01107
	3.0	H00202-31018	H00202-31069	H00202-31019	H00202-31020	H00202-31021	H00202-31022	H00202-31023	H00202-31024	H00202-31025	-	H00808-24002	00808-01107
	4.0	H00202-31027	H00202-31070	H00202-31028	H00202-31029	H00202-31030	00202-31031	H00202-31032	H00202-31033	H00202-31034	H00202-31035	H00808-04002	00808-01101
	4.6	H00202-31036	H00202-31071	H00202-31037	H00202-31038	H00202-31039	00202-31040	H00202-31041	H00202-31042	H00202-31043	H00202-31044	H00808-04002	00808-01101
10 µm 120 Å	4.0	-	-	-	-	-	-	H00202-41032	H00202-41033	H00202-41034	H00202-41035	H00808-05002	00808-01101
	4.6	-	-	-	-	-	-	H00202-41041	H00202-41042	H00202-41043	H00202-41044	H00808-05002	00808-01101

300 Å HPLC column provided. Please contact Welch or your local distributor for other dimensions.

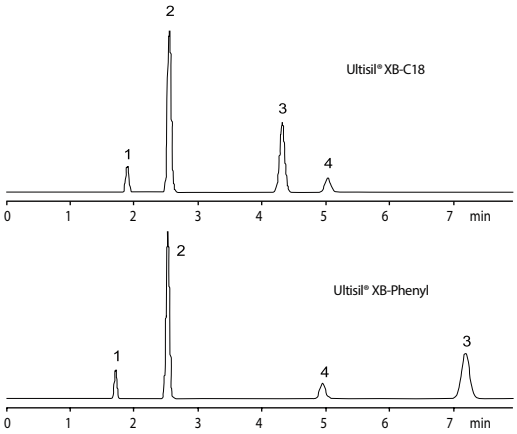
Ultisil® XB-Phenyl--Different Selectivity to Alkyl Phase

Ultisil® XB-Phenyl phase is less retentive than conventional C18 or C8 phases, but more retentive than standard cyano phase. Due to their ability to participate in π-π interactions, XB-Phenyl columns may actually be more retentive than C18 or C8 columns towards certain polar aromatic compounds, depending on running conditions. The selectivity for highly polar aromatics, which are poorly retained on alkyl-bonded phases, together with reduced retentivity towards non-polar compounds, make XB-Phenyl an excellent choice for the analysis of complex mixtures of polar and non-polar analytes. Additionally, this bonding phase boasts high surface coverage and exhaustive double end-capping, leading to better performance.

Ultisil® XB-Phenyl

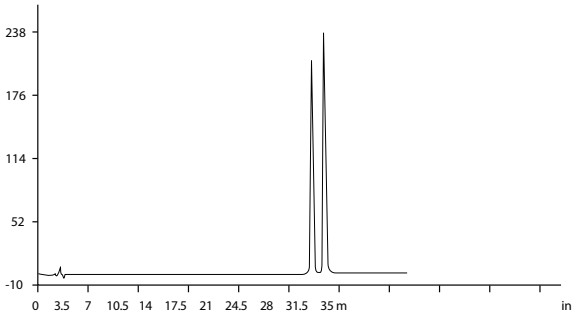
Structural Formula	
pH Range	1.5-10.0
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	12(120 Å), 4(300 Å)
USP List	L11
Endcapped	Yes

Unique Selectivity for Aromatic Compounds of Ultisil® XB-Phenyl Phase



Column:	4.6 ×150 mm, 5 µm
Mobile Phase:	Methanol / water=70/30
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	24°C
Samples:	1. Uracil 2. Phenol 3. Paranitrotoluene 4. Toluene

Montelukast Sodium Isomers

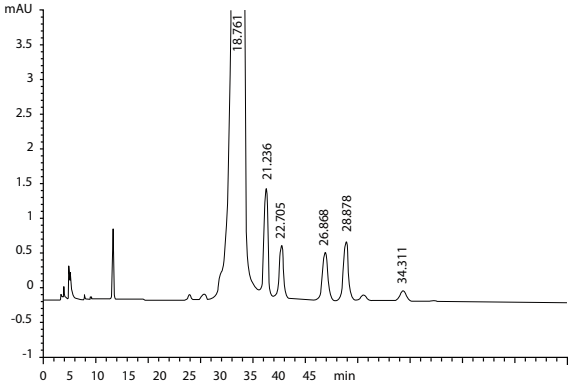


Column:	Ultisil® XB-Phenyl, 4.6 ×150 mm, 3 µm
Mobile Phase:	A: 0.2% TFA B: methanol / acetonitrile=60/40

Time(min)	A(%)	B(%)
0	48	52
5	45	55
12	45	55
22	25	75
23	25	75
25	48	52
30	48	52

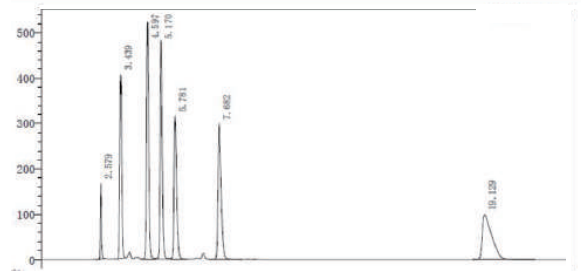
Flow Rate:	1.0 mL/min
Detector:	255 nm
Temperature:	30°C
Injection Volume:	10 µL

Moxifloxacin Hydrochloride



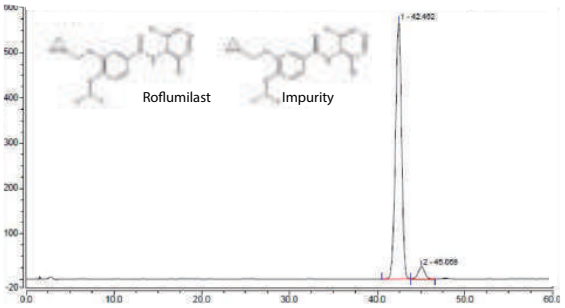
Column:	Ultisil® XB-Phenyl, 4.6 ×250 mm, 5 µm
Mobile Phase:	(0.5g TBAHS, 1g KH_2PO_4, 3.4 g(2 mL) H_3PO_4, 1000 mL water) / methanol=72/28
Flow Rate:	1.3 mL/min
Detector:	293 nm
Temperature:	45°C
Samples:	10 µL

Fenticonazole Nitrate



Column:	Ultisil® XB-Phenyl, 4.6 ×250 mm, 5 µm
Mobile Phase:	KH_2PO_4 buffer solution*/acetonitrile=30/70 *Dissolve 3.4 g of KH_2PO_4 in 900 mL water, adjust pH 3.3 with H_3PO_4, then add water to 1000 mL.
Flow Rate:	1.0 mL/min
Detector:	229nm
Temperature:	30°C
Injection Volume:	20 µL

Roflumilast



Column:	Ultisil® XB-Phenyl, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/water=40/60
Flow Rate:	1.0 mL/min
Detector:	215 nm
Temperature:	30 °C
Samples:	10 µL

Ordering Information

Ultisil® XB-Phenyl

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	H00203-21009	H00203-21068	H00203-21010	H00203-21011	H00203-21012	H00203-21013	H00203-21014	H00203-21015	H00203-21016	-	H00808-23006	00808-01107
120 Å	3.0	H00203-21018	H00203-21069	H00203-21019	H00203-21020	H00203-21021	H00203-21022	H00203-21023	H00203-21024	H00203-21025	-	H00808-23006	00808-01107
	4.0	H00203-21027	H00203-21070	H00203-21028	H00203-21029	H00203-21030	H00203-21031	H00203-21032	H00203-21033	H00203-21034	-	H00808-03006	00808-01101
	4.6	H00203-21036	H00203-21071	H00203-21037	H00203-21038	H00203-21039	H00203-21040	H00203-21041	H00203-21042	H00203-21043	-	H00808-03006	00808-01101
5 µm	2.1	H00203-31009	H00203-31068	H00203-31010	H00203-31011	H00203-31012	H00203-31013	H00203-31014	H00203-31015	H00203-31016	-	H00808-24006	00808-01107
120 Å	3.0	H00203-31018	H00203-31069	H00203-31019	H00203-31020	H00203-31021	H00203-31022	H00203-31023	H00203-31024	H00203-31025	-	H00808-24006	00808-01107
	4.0	H00203-31027	H00203-31070	H00203-31028	H00203-31029	H00203-31030	H00203-31031	H00203-31032	H00203-31033	H00203-31034	H00203-31035	H00808-04006	00808-01101
	4.6	H00203-31036	H00203-31071	H00203-31037	H00203-31038	H00203-31039	H00203-31040	H00203-31041	H00203-31042	H00203-31043	H00203-31044	H00808-04006	00808-01101
10 µm	4.0	-	-	-	-	-	-	H00203-41032	H00203-41033	H00203-41034	H00203-41035	H00808-05006	00808-01101
120 Å	4.6	-	-	-	-	-	-	H00203-41041	H00203-41042	H00203-41043	H00203-41044	H00808-05006	00808-01101

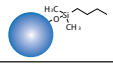
300 Å HPLC column provided. Please contact Welch or your local distributor for other dimensions.

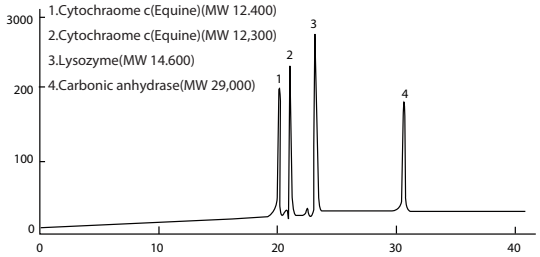
Ultisil® XB-C4--suitable for separation of bio-samples

Features

- Strong retention for hydrophobic and polar compounds
- Column packing of 300Å big pore size particles is appropriate for separation of peptide and protein samples with sharp peak shape
- Minibore column can be used for LC/MS(/MS)

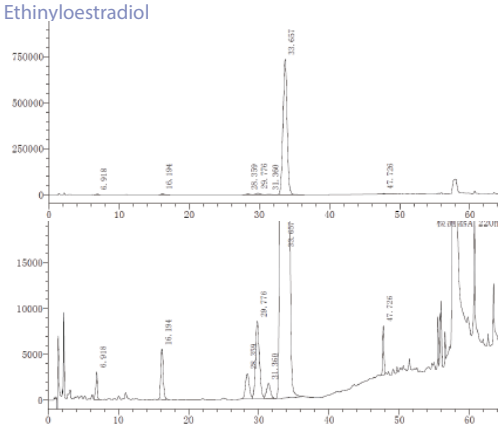
Ultisil® XB-C4

Structural Formula			
pH Range	1.5-10.0	Carbon Loading(%)	8(120 Å), 3(300 Å)
Particle Size	3 µm, 5 µm, 10 µm	USP List	L26
Surface Area(m^2/g)	320(120 Å), 90(300 Å)	Endcapped	Yes



Column:	Ultisil® XB-C4(300Å), 4.6 ×250 mm, 5 µm
Mobile Phase:	A: water / acetonitrile / TFA=90/10/0.05 B: water / acetonitrile / TFA=20/80/0.05 0%-100%B(0-15 min)
Flow Rate:	1.0 mL/min
Temperature:	45°C
Injection Volume:	10 µL

Ethinyloestradiol



Column:	Ultisil® XB-C4, 4.6 ×250 mm, 5 µm
Mobile Phase:	Mobile phase A: acetonitrile/water=30/70 Mobile phase B: acetonitrile/water=75/25

Time(min)	A(%)	B(%)
0	100	0
35	100	0
65	0	100

Flow Rate:	1.5 mL/min
Detector:	220 nm
Temperature:	30°C
Injection Volume:	30 µL

Ordering Information

Particle size	Column ID (mm)	Column Length (mm)									Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	10mm length	
3 µm 120 Å	2.1	H00216-21009	H00216-21068	H00216-21010	H00216-21011	H00216-21012	H00216-21013	H00216-21014	H00216-21015	H00216-21016	H00808-23011	00808-01107
	3.0	H00216-21018	H00216-21069	H00216-21019	H00216-21020	H00216-21021	H00216-21022	H00216-21023	H00216-21024	H00216-21025	H00808-23011	00808-01107
	4.0	H00216-21027	H00216-21070	H00216-21028	H00216-21029	H00216-21030	H00216-21031	H00216-21032	H00216-21033	H00216-21034	H00808-03030	00808-01101
	4.6	H00216-21036	H00216-21071	H00216-21037	H00216-21038	H00216-21039	H00216-21040	H00216-21041	H00216-21042	H00216-21043	H00808-03030	00808-01101
5 µm 120 Å	2.1	H00216-31009	H00216-31068	H00216-31010	H00216-31011	H00216-31012	H00216-31013	H00216-31014	H00216-31015	H00216-31016	H00808-24008	00808-01107
	3.0	H00216-31018	H00216-31069	H00216-31019	H00216-31020	H00216-31021	H00216-31022	H00216-31023	H00216-31024	H00216-31025	H00808-24008	00808-01107
	4.0	H00216-31027	H00216-31070	H00216-31028	H00216-31029	H00216-31030	H00216-31031	H00216-31032	H00216-31033	H00216-31034	H00808-04008	00808-01101
	4.6	H00216-31036	H00216-31071	H00216-31037	H00216-31038	H00216-31039	H00216-31040	H00216-31041	H00216-31042	H00216-31043	H00808-04008	00808-01101
10 µm 120 Å	4.0	-	-	-	-	-	-	H00216-41032	H00216-41033	H00216-41034	H00808-05008	00808-01101
	4.6	-	-	-	-	-	-	H00216-41041	H00216-41042	H00216-41043	H00808-05008	00808-01101

300 Å HPLC column provided. Please contact Welch or your local distributor for other dimensions.

Ultisil® XB-C1

Features

- Lowest hydrophobicity among reversed phases
- Intermediate polarity between normal phase silica and other alkyl bonded reversed phase
- Alternative selectivity to C18 phase

Ultisil® XB-C1

Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	4(120 Å)
USP List	L13
Endcapped	Yes

Ordering Information

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 µm 120 Å	2.1	H00217-31009	H00217-31068	H00217-31010	H00217-31011	H00217-31012	H00217-31013	H00217-31014	H00217-31015	H00217-31016	-	H00808-24023	00808-01107
	3.0	H00217-31018	H00217-31069	H00217-31019	H00217-31020	H00217-31021	H00217-31022	H00217-31023	H00217-31024	H00217-31025	-	H00808-24023	00808-01107
	4.0	H00217-31027	H00217-31070	H00217-31028	H00217-31029	H00217-31030	H00217-31031	H00217-31032	H00217-31033	H00217-31034	H00217-31035	H00808-04026	00808-01101
	4.6	H00217-31036	H00217-31071	H00217-31037	H00217-31038	H00217-31039	H00217-31040	H00217-31041	H00217-31042	H00217-31043	H00217-31044	H00808-04026	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



Ultisil® XB-CN--unique selectivity for polar compounds

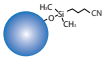
Ultisil® XB-CN column can be used in either reversed or normal phase. Reversed phase CN column has special selectivity for polar compounds, and due to its low hydrophobicity, elution of hydrophobic molecules is fast. Furthermore, XB-CN column shows perfect peak shape for strong basic analytes (including quaternary ammonium salts). Polarity of XB-CN column is the strongest among all reversed columns. It is a good choice for compounds that are strongly retained on standard reversed columns.

Normal phase CN column can replace SiO_2 column. Equilibrium of normal phase column is fast, and the silica surface activity is better than that of silica column. To prolong column life time, alternation between reversed phase and normal phase uses should be avoided. While XB-CN column can be used in either reversed or normal phase, elution sequence is different in different separation mode.

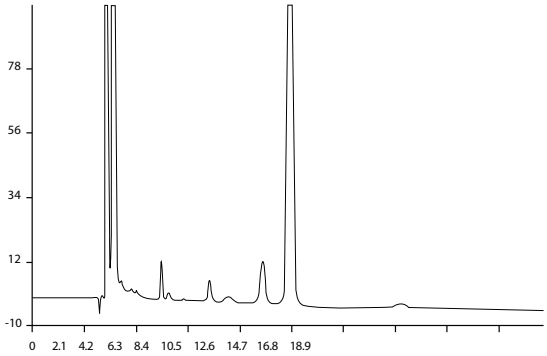
Features

- Can be used in either reversed or normal phases
- Stable bonding chemistry and excellent surface coverage
- Low hydrophobicity, unique selectivity

Ultisil® XB-CN

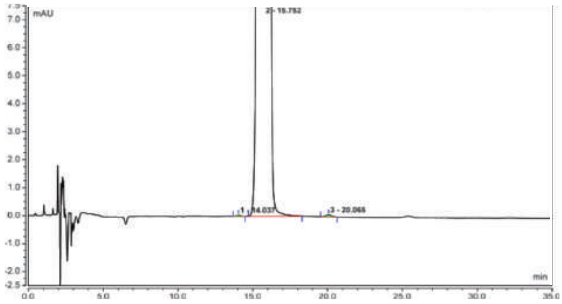
Structural Formula	
pH Range	1.5-9.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	7(120 Å)
USP List	L10
Endcapped	Yes

Rifampicin Isoniazid and Pyrazinamide



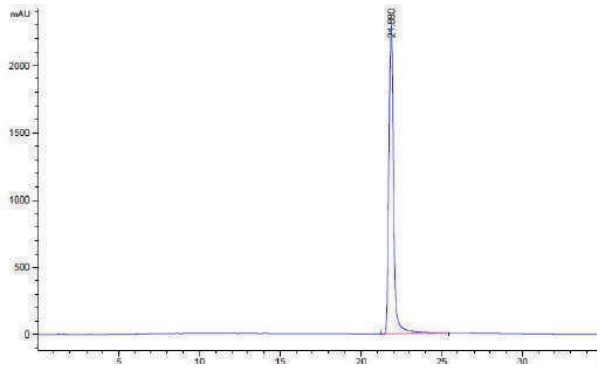
Column:	Ultisil® XB-CN, 4.6 ×250 mm, 5 μm
Mobile Phase:	0.01 mol/L sodium heptanesulfonate solution* / acetonitrile=54/46 * Dissolve 2.0225 g of sodium heptanesulfonate in 1000 mL water, adjust pH 1.85 with H_3PO_4
Flow Rate:	0.6 mL/min
Detector:	254 nm
Temperature:	30°C
Injection Volume:	20 μL

Carbamazepine



Column:	Ultisil® XB-CN, 4.6 ×250 mm, 5 μm
Mobile Phase:	Water/methanol/tetrahydrofuran = 850/120/30 Add 0.2ml formic acid and 0.5ml triethylamine for every 1000ml
Flow Rate:	1.5 mL/min
Detector:	230 nm
Temperature:	40°C
Injection Volume:	20 μL

Cetilistat

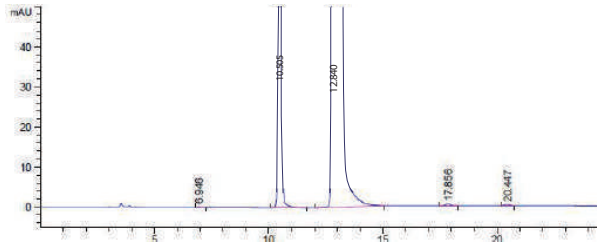


Column:	Ultisil® XB-CN, 4.6 ×250 mm, 5 µm
Mobile Phase:	Mobile phase A: water Mobile Phase B: acetonitrile

Time(min)	A(%)	B(%)
0	60	40
30	20	80
40	20	80

Flow Rate:	1.0 ml/min
Detector:	221 nm
Temperature:	35°C
Injection Volume:	10 µL

Alogliptin Benzoate



Column:	Ultisil® XB-CN, 4.6 ×250 mm, 5 µm
Mobile Phase:	Mobile phase A: acetonitrile/water/TFA=100/1900/1 Mobile Phase B: acetonitrile/water/TFA=1900/100/1

Time(min)	A(%)	B(%)
0	99	1
30	80	20
50	10	90
51	99	1

Flow Rate:	1.0 mL/min
Detector:	278 nm
Temperature:	35°C
Injection Volume:	20 µL

Ordering Information

Ultisil® XB-CN

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	H00205-21009	H00205-21068	H00205-21010	H00205-21011	H00205-21012	H00205-21013	H00205-21014	H00205-21015	H00205-21016	-	H00808-23005	00808-01107
120 Å	3.0	H00205-21018	H00205-21069	H00205-21019	H00205-21020	H00205-21021	H00205-21022	H00205-21023	H00205-21024	H00205-21025	-	H00808-23005	00808-01107
	4.0	H00205-21027	H00205-21070	H00205-21028	H00205-21029	H00205-21030	H00205-21031	H00205-21032	H00205-21033	H00205-21034	-	H00808-03005	00808-01101
	4.6	H00205-21036	H00205-21071	H00205-21037	H00205-21038	H00205-21039	H00205-21040	H00205-21041	H00205-21042	H00205-21043	-	H00808-03005	00808-01101
5 µm	2.1	H00205-31009	H00205-31068	H00205-31010	H00205-31011	H00205-31012	H00205-31013	H00205-31014	H00205-31015	H00205-31016	-	H00808-24005	00808-01107
120 Å	3.0	H00205-31018	H00205-31069	H00205-31019	H00205-31020	H00205-31021	H00205-31022	H00205-31023	H00205-31024	H00205-31025	-	H00808-24005	00808-01107
	4.0	H00205-31027	H00205-31070	H00205-31028	H00205-31029	H00205-31030	H00205-31031	H00205-31032	H00205-31033	H00205-31034	H00205-31035	H00808-04005	00808-01101
	4.6	H00205-31036	H00205-31071	H00205-31037	H00205-31038	H00205-31039	H00205-31040	H00205-31041	H00205-31042	H00205-31043	H00205-31044	H00808-04005	00808-01101
10 µm	4.0	-	-	-	-	-	-	H00205-41032	H00205-41033	H00205-41034	H00205-41035	H00808-05005	00808-01101
120 Å	4.6	-	-	-	-	-	-	H00205-41041	H00205-41042	H00205-41043	H00205-41044	H00808-05005	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

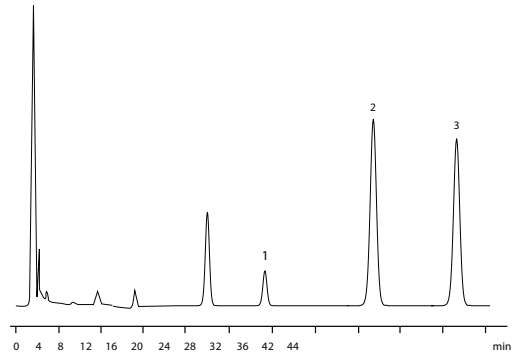
Ultisil® SiO_2

Ultisil SiO_2 column uses ultra-high purity type B silica particles with no metal contents. SiO_2 column can separate strong hydrophilic compounds in high concentration organic solvent in reversed phase. Good result can be obtained for the analysis of polar compounds which are prone to peak tailing in reversed phase.

Ultisil® SiO_2

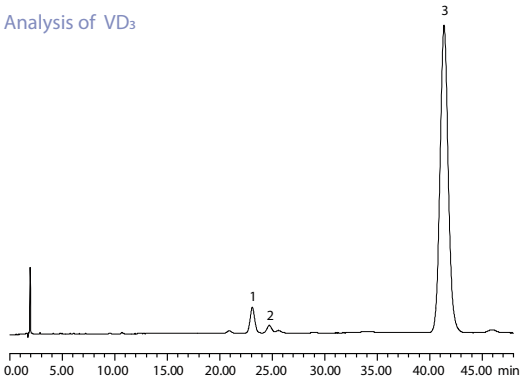
Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å), 90(300Å)
Carbon Loading(%)	N/A
USP List	L3
Endcapped	No

Analysis of VD_2



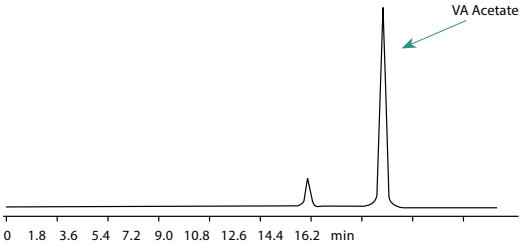
Column:	Ultisil® SiO_2, 4.6 ×250 mm, 5 μm
Mobile Phase:	Hexane / isopropanol＝997/3
Flow Rate:	2.0 mL/min
Detector:	254 nm
Temperature:	30℃
Injection Volume:	1. Facade VD_2 2. Internal Standard 3. VD_2

Analysis of VD_3



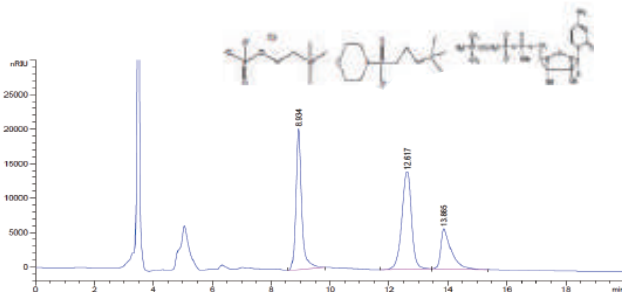
Column:	Ultisil® SiO_2, 4.6 ×250 mm, 5 μm
Mobile Phase:	N-hexane / n-amyl alcohol=99.7/0.3
Detector:	254 nm
Temperature:	30℃
Flow Rate:	2.0 mL/min
Injection Volume:	1. Facade VD_3 2. trans VD_3 3. VD_2

Analysis of VA Acetate



Column:	Ultisil® SiO_2, 4.6 ×250 mm, 5 μm
Mobile Phase:	N-hexane / isopropanol=99.8/0.2
Detector:	326 nm
Temperature:	16℃
Flow rate:	1.0 mL/min
Sample is dissolved with n-hexane.	

Separation of chlorophosphorylcholine, Phosphorylcholine morpholine and Citicoline Sodium



Column:	Ultisil® SiO_2, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile / water/ glacial acetic acid = 60/40/2
Detector:	RID
Temperature:	35°C
Flow rate:	1.0 mL/min
Injection Volume:	10 µL

Ordering Information

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	H00200-21009	H00200-21068	H00200-21010	H00200-21011	H00200-21012	H00200-21013	H00200-21014	H00200-21015	H00200-21016	-	H00808-23007	00808-01107
120 Å	3.0	H00200-21018	H00200-21069	H00200-21019	H00200-21020	H00200-21021	H00200-21022	H00200-21023	H00200-21024	H00200-21025	-	H00808-23007	00808-01107
	4.0	H00200-21027	H00200-21070	H00200-21028	H00200-21029	H00200-21030	H00200-21031	H00200-21032	H00200-21033	H00200-21034	-	H00808-03007	00808-01101
	4.6	H00200-21036	H00200-21071	H00200-21037	H00200-21038	H00200-21039	H00200-21040	H00200-21041	H00200-21042	H00200-21043	-	H00808-03007	00808-01101
5 µm	2.1	H00200-31009	H00200-31068	H00200-31010	H00200-31011	H00200-31012	H00200-31013	H00200-31014	H00200-31015	H00200-31016	-	H00808-24007	00808-01107
120 Å	3.0	H00200-31018	H00200-31069	H00200-31019	H00200-31020	H00200-31021	H00200-31022	H00200-31023	H00200-31024	H00200-31025	-	H00808-24007	00808-01107
	4.0	H00200-31027	H00200-31070	H00200-31028	H00200-31029	H00200-31030	H00200-31031	H00200-31032	H00200-31033	H00200-31034	H00200-31035	H00808-04007	00808-01101
	4.6	H00200-31036	H00200-31071	H00200-31037	H00200-31038	H00200-31039	H00200-31040	H00200-31041	H00200-31042	H00200-31043	H00200-31044	H00808-04007	00808-01101
10 µm	4.0	-	-	-	-	-	-	H00200-41032	H00200-41033	H00200-41034	H00200-41035	H00808-05007	00808-01101
120 Å	4.6	-	-	-	-	-	-	H00200-41041	H00200-41042	H00200-41043	H00200-41044	H00808-05007	00808-01101

300 Å HPLC column provided Please contact Welch or your local distributor for other dimensions.



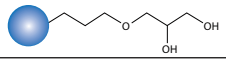
Ultisil® Diol

Ultisil® Diol Column is based on ultra-pure porous spherical silica bonded with 1,2-dihydroxypropyl functional group silica Ultisil® Diol is used in normal phase mostly, suitable for separation of peptides, proteins, polar molecules, and organic acids and its polymers.
Like bare silica, Ultisil® Diol has the ability to form hydrogen bonds and is capable of separating structure isomers. Since most of its surface is covered with organic functions, Ultisil® Diol absorbs less water, which leads to more reproducible activity. It is also the sorbent of choice when working in normal phase in the presence of water. It has a different selectivity than bare silica gel, and slight modification in the composition of solvent mixture may be necessary to obtain a similar retention.
Ultisil® Diol column is more stable than traditional normal phase columns, such as NH_2, SiO_2. Compared with NH_2/SiO_2 column, Diol column is not sensitive to water. Ultisil® Diol column can also be used in reversed phase analysis.

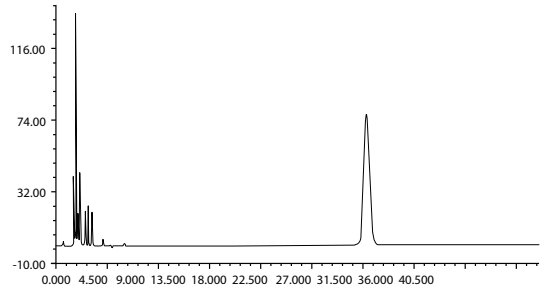
Features

- More stable than traditional normal phase columns, such as Silica, Amine
- Can be used in reversed phase analysis
- Similar polarity to Amine
- Good selectivity without excessive retention
- Improved peak shape compared to bare silica

Ultisil® Diol

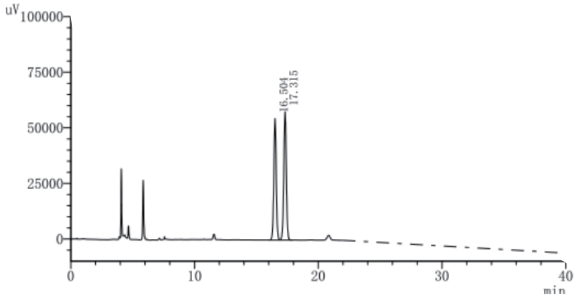
Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	2.5(120 Å)
USP List	L20
Endcapped	No

Tacrolimus



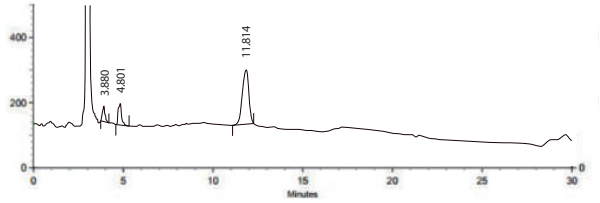
Column:	Ultisil® Diol, 4.6 ×250 mm, 5 μm
Mobile Phase:	N-hexane/ butyl chloride/ acetonitrile=7/2/1
Detector:	225 nm
Temperature:	Ambient
Flow Rate:	1.7 mL/min
Injection Volume:	5 μL

Cloprostenol Sodium



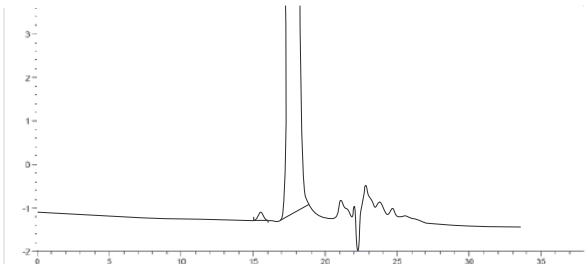
Column:	Ultisil® Diol, 4.6 ×300 mm, 3 μm
Mobile Phase:	N-hexane/isopropanol =99.5/0.5 (volume ratio)
Detector:	220 nm
Temperature:	Ambient
Flow Rate:	1.0 mL/min
Injection Volume:	10 μL

Propofol



Column:	Ultisil® Diol, 4.6 ×250 mm, 5 µm
Mobile Phase:	Mobile phase A: methanol/water/glacial acetic acid/triethylamine=85/15/0.5/0.05 Mobile Phase B: n-hexane/isopropanol/ mobile phase A=20/48/32
Gradient Program:	Time(min) A(%) B(%) 0 5 95 10 22 78 22 22 78 23 90 10 27 5 95
Flow Rate:	1.0 mL/min
Detector:	ELSD: gas flow rate=2.5 L/min, drift tube temperature: 70°C
Temperature:	40°C
Injection Volume:	20 µL

Insulin



Column:	Ultisil® Diol, 7.8 ×300 mm, 5 µm
Mobile Phase:	1 mg/mL L-arginine solution/acetonitrile/ glacial acetic acid=65/20/15
Detector:	276 nm
Temperature:	30°C
Flow Rate:	0.5 mL/min
Injection Volume:	20 µL

Ordering Information

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	H00206-21009	H00206-21068	H00206-21010	H00206-21011	H00206-21012	H00206-21013	H00206-21014	H00206-21015	H00206-21016	-	H00808-23020	00808-01107
120 Å	3.0	H00206-21018	H00206-21069	H00206-21019	H00206-21020	H00206-21021	H00206-21022	H00206-21023	H00206-21024	H00206-21025	-	H00808-23020	00808-01107
	4.0	H00206-21027	H00206-21070	H00206-21028	H00206-21029	H00206-21030	H00206-21031	H00206-21032	H00206-21033	H00206-21034	-	H00808-03020	00808-01101
	4.6	H00206-21036	H00206-21071	H00206-21037	H00206-21038	H00206-21039	H00206-21040	H00206-21041	H00206-21042	H00206-21043	-	H00808-03020	00808-01101
5 µm	2.1	H00206-31009	H00206-31068	H00206-31010	H00206-31011	H00206-31012	H00206-31013	H00206-31014	H00206-31015	H00206-31016	-	H00808-24020	00808-01107
120 Å	3.0	H00206-31018	H00206-31069	H00206-31019	H00206-31020	H00206-31021	H00206-31022	H00206-31023	H00206-31024	H00206-31025	-	H00808-24020	00808-01107
	4.0	H00206-31027	H00206-31070	H00206-31028	H00206-31029	H00206-31030	H00206-31031	H00206-31032	H00206-31033	H00206-31034	H00206-31035	H00808-04020	00808-01101
	4.6	H00206-31036	H00206-31071	H00206-31037	H00206-31038	H00206-31039	H00206-31040	H00206-31041	H00206-31042	H00206-31043	H00206-31044	H00808-04020	00808-01101
10 µm	4.0	-	-	-	-	-	-	H00206-41032	H00206-41033	H00206-41034	H00206-41035	H00808-05020	00808-01101
120 Å	4.6	-	-	-	-	-	-	H00206-41041	H00206-41042	H00206-41043	H00206-41044	H00808-05020	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

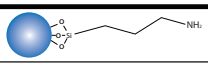
Ultisil® XB-NH₂

Ultisil® XB-NH₂ column is based on propyl-amino silane, mostly used in normal phase, but can also be used in reversed phase.

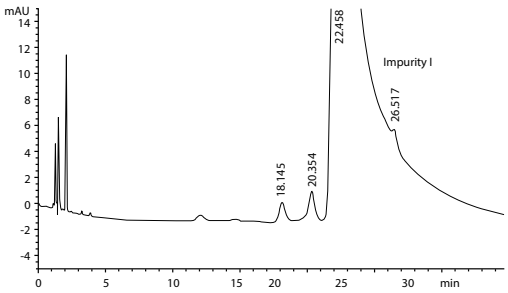
Features

- Used in normal phase for weak anion-exchange, and in reversed-phase HPLC for polar compounds
- For applications in aggressive normal phase mode with aqueous eluent
- Vitamins A and D can be separated in the normal-phase mode
- Carbohydrates and sugars can be separated in the reversed-phase mode

Ultisil® XB-NH₂

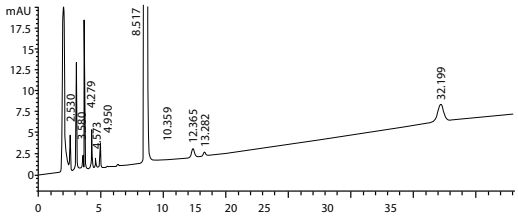
Structural Formula	
pH Range	2.0-8.0
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	4(120 Å)
USP List	L8
Endcapped	No

Acarbose



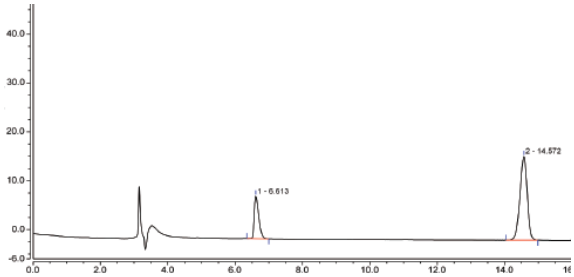
Column:	Ultisil® XB-NH₂, 4.6 ×250 mm, 5 µm
Mobile Phase:	Phosphate buffer */ acetonitrile=28/72 * Dissolve 600 mg of s KH_2PO_4 and 279 mg of ADSP in 100 mL water, add water to make 1000 mL
Detector:	210 nm
Temperature:	35°C
Flow Rate:	2.0 mL/min
Injection Volume:	10 µL

Acetyl-L-carnitine



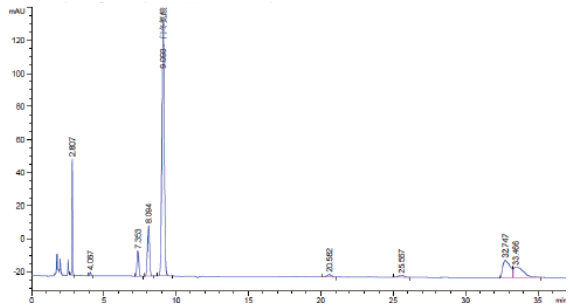
Column:	Ultisil® XB-NH₂, 4.6 ×250 mm, 5µm
Mobile Phase:	Buffer/acetonitrile=30/70
Detector:	205 nm, 210 nm
Temperature:	20°C
Flow Rate:	1.0 mL/min
Injection Volume:	10 µL

Separation of N-tert-butylglycine hydrochloride and N-tert-butylglycine acid chloride hydrochloride



Column:	Ultisil® XB-NH₂, 4.6 ×250 mm, 5 µm
Mobile Phase:	Methanol/isopropanol=80/20
Detector:	210 nm
Temperature:	30°C
Flow Rate:	1.0 mL/min
Injection Volume:	5 µL

Ornithine Aspartate



Column:	Ultisil® XB-NH_2, 4.6 ×250 mm, 5µm
Mobile Phase:	KH_2PO_4 buffer solution*/acetonitrile=40/60 * Dissolve 2.72 g of KH_2PO_4 in 500 mL water, add 5 mL of concentrated ammonia solution, addwater to 1000 mL, adjust pH 5.60±0.05 with H_3PO_4
Detector:	205 nm
Temperature:	30°C
Flow Rate:	1.0 mL/min
Injection Volume:	20 µL

Ordering Information
Ultisil® XB-NH_2

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3µm	2.1	H00204-21009	H00204-21068	H00204-21010	H00204-21011	H00204-21012	H00204-21013	H00204-21014	H00204-21015	H00204-21016	-	H00808-23004	00808-01107
	3.0	H00204-21018	H00204-21069	H00204-21019	H00204-21020	H00204-21021	H00204-21022	H00204-21023	H00204-21024	H00204-21025	-	H00808-23004	00808-01107
	4.0	H00204-21027	H00204-21070	H00204-21028	H00204-21029	H00204-21030	H00204-21031	H00204-21032	H00204-21033	H00204-21034	-	H00808-03004	00808-01101
	4.6	H00204-21036	H00204-21071	H00204-21037	H00204-21038	H00204-21039	H00204-21040	H00204-21041	H00204-21042	H00204-21043	-	H00808-03004	00808-01101
5µm	2.1	H00204-31009	H00204-31068	H00204-31010	H00204-31011	H00204-31012	H00204-31013	H00204-31014	H00204-31015	H00204-31016	-	H00808-24004	00808-01107
	3.0	H00204-31018	H00204-31069	H00204-31019	H00204-31020	H00204-31021	H00204-31022	H00204-31023	H00204-31024	H00204-31025	-	H00808-24004	00808-01107
	4.0	H00204-31027	H00204-31070	H00204-31028	H00204-31029	H00204-31030	H00204-31031	H00204-31032	H00204-31033	H00204-31034	H00204-31035	H00808-04004	00808-01101
	4.6	H00204-31036	H00204-31071	H00204-31037	H00204-31038	H00204-31039	H00204-31040	H00204-31041	H00204-31042	H00204-31043	H00204-31044	H00808-04004	00808-01101
10µm	4.0	-	-	-	-	-	-	H00204-41032	H00204-41033	H00204-41034	H00204-41035	H00808-05004	00808-01101
	4.6	-	-	-	-	-	-	H00204-41041	H00204-41042	H00204-41043	H00204-41044	H00808-05004	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



Ultisil® Ion Exchange Column (XB-SAX & XB-SCX)

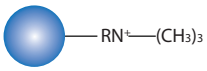
Ultisil® ion exchange columns are available for both Strong Anion Exchange (SAX) and Strong Cation Exchange (SCX) columns. The SCX/SAX columns are silica based with high resolution and high efficiency.

Ultisil® SAX is a polar bonded phase, consisting of an ammonium-functionalized silane, while Ultisil® SCX is a classical strong cation

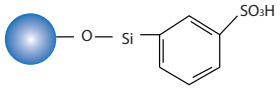
Features

- Organic modifiers such as acetonitrile and methanol may be used with SAX and SCX columns, within organic/buffer solubility constraints
- Retention can be controlled by varying pH, ionic strength and organic modifier content.

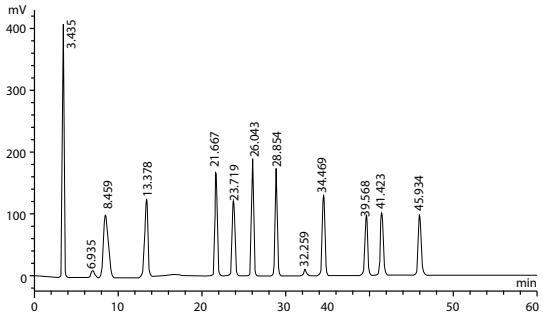
Ultisil® XB-SAX

Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	7.5(120 Å), 1.5(300 Å)
USP List	L14
Endcapped	No

Ultisil® XB-SCX

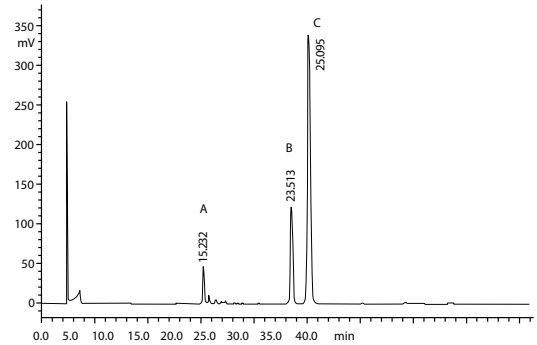
Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	12(120 Å), 5(300 Å)
USP List	L9
Endcapped	No

13 Heparin Disaccharides



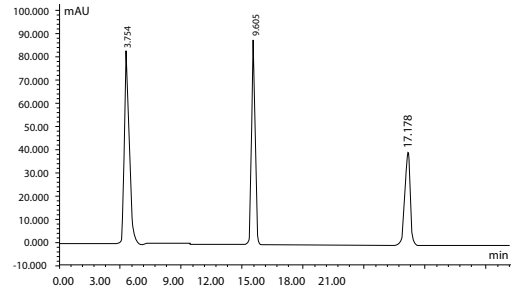
Column:	Ultisil® XB-SAX, 3.0 ×250 mm, 5 μm
Mobile Phase:	A: weight 0.308 g NaH_2PO_4 to 1000 mL volumetric flask, add 950 mL water to dissolve it, adjust pH 2.9 with H_3PO_4, then add water to scale mark B: weight 122 g $NaClO_4$ to 1000 mL volumetric flask, add 950 mL mobile phase A to dissolve, adjust pH 3.0 with H_3PO_4, then add mobile phase A to scale mark.
Detector:	234 nm, 202 nm
Temperature:	50°C
Flow Rate:	0.45 ml/min
Injection Volume:	10 μL

Chondroitin Sulfate



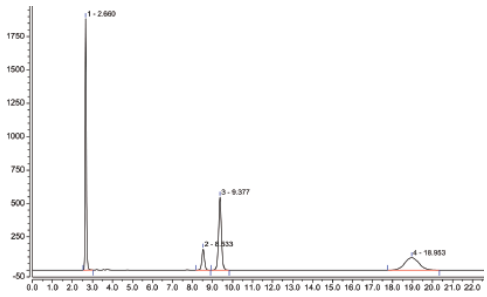
Column:	Ultisil® XB-SAX, 4.6 ×250 mm, 5 μm
Mobile Phase:	A: water, adjust pH 3.5 with diluted HCl B: 2 mol/L NaCl, adjust pH 3.5 with diluted HCl
Detector:	232 nm
Temperature:	Ambient
Flow Rate:	1.0 mL/min
Injection Volume:	20 μL
Mixed Standards:	Chondroitin disaccharide(B) 6- sulfated chondroitin disaccharide(C) 4- sulfated chondroitin disaccharide(A)

Metformin HCL



Column:	Ultisil® XB-SCX, 4.6 ×250 mm, 5 µm
Mobile Phase:	1.7% $NH_4H_2PO_4$(pH 3.0 adjusted by H_3PO_4)
Detector:	218nm
Temperature:	Ambient
Flow Rate:	1.0 mL/min
Injection Volume:	10 µL
Samples In Order:	Icyandiamide, melamine, metformin HCL

Orazamide



Column:	Ultisil® XB-SCX, 4.6 ×250 mm, 5 µm
Mobile Phase:	1.0% $NH_4H_2PO_4$(pH 3.0 adjusted by H_3PO_4)
Detector:	215 nm
Temperature:	30 °C
Flow Rate:	1.0 mL/min
Injection Volume:	10 µL
Samples In Order:	Orotic acid, Pyridinepropanimidamide, 4-Amino-5-imidazolecarboxamide hydrochloride and AZO

Ordering Information

Ultisil® XB-SAX

Particle size	Column ID (mm)	Column Length (mm)					Guard Cartridge	Cartridge holder
		50	100	150	200	250	10mm length	
3 µm 120 Å	2.1	H00213-21010	H00213-21012	H00213-21014	H00213-21015	H00213-21016	H00808-23008	00808-01107
	3.0	H00213-21019	H00213-21021	H00213-21023	H00213-21024	H00213-21025	H00808-23008	00808-01107
	4.0	H00213-21028	H00213-21030	H00213-21032	H00213-21033	H00213-21034	H00808-03008	00808-01101
	4.6	H00213-21037	H00213-21039	H00213-21041	H00213-21042	H00213-21043	H00808-03008	00808-01101
5 µm 120 Å	2.1	H00213-31010	H00213-31012	H00213-31014	H00213-31015	H00213-31016	H00808-24009	00808-01107
	3.0	H00213-31019	H00213-31021	H00213-31023	H00213-31024	H00213-31025	H00808-24009	00808-01107
	4.0	H00213-31028	H00213-31030	H00213-31032	H00213-31033	H00213-31034	H00808-04009	00808-01101
	4.6	H00213-31037	H00213-31039	H00213-31041	H00213-31042	H00213-31043	H00808-04009	00808-01101
10 µm 120 Å	4.6	-	-	H00213-41041	H00213-41042	H00213-41043	H00808-05009	00808-01101

Ultisil® XB-SCX

Particle size	Column ID (mm)	Column Length (mm)					Guard Cartridge	Cartridge holder
		50	100	150	200	250	10mm length	
3 µm 120 Å	2.1	H00212-21010	H00212-21012	H00212-21014	H00212-21015	H00212-21016	H00808-23012	00808-01107
	3.0	H00212-21019	H00212-21021	H00212-21023	H00212-21024	H00212-21025	H00808-23012	00808-01107
	4.0	H00212-21028	H00212-21030	H00212-21032	H00212-21033	H00212-21034	H00808-03033	00808-01101
	4.6	H00212-21037	H00212-21039	H00212-21041	H00212-21042	H00212-21043	H00808-03033	00808-01101
5 µm 120 Å	2.1	H00212-31010	H00212-31012	H00212-31014	H00212-31015	H00212-31016	H00808-24011	00808-01107
	3.0	H00212-31019	H00212-31021	H00212-31023	H00212-31024	H00212-31025	H00808-24011	00808-01107
	4.0	H00212-31028	H00212-31030	H00212-31032	H00212-31033	H00212-31034	H00808-04011	00808-01101
	4.6	H00212-31037	H00212-31039	H00212-31041	H00212-31042	H00212-31043	H00808-04011	00808-01101
10 µm 120 Å	4.6	-	-	H00212-41041	H00212-41042	H00212-41043	H00808-05011	00808-01101

300 Å HPLC column provided. Please contact welch or your local distributor for other dimensions.

Ultisil® XB-C30

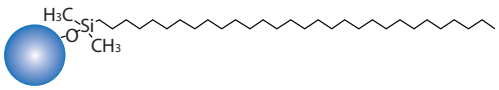
Carotenoids is a broad class of natural products, of which over 600 types have been found so far, including compounds of different carbon chain length, such as C40, C50 and C30 etc. They are well known to have many biological functions, including cancer prevention and treatment functions.

Compared to classical C18 stationary phases, the C30 phase is much more hydrophobic and retaining. Even when pure organic eluent is applied, many sample solutes, such as carotenoids, are able to retain. Ultisil® C30 is designed for the separation of geometric isomers,

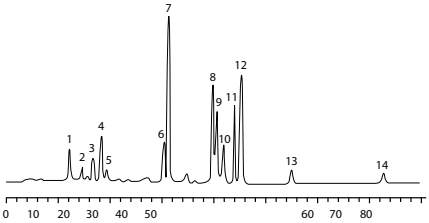
Features

- Polymeric C30 alkyl chains
- Very lipophilic
- Exceptional selectivity pattern for geometric isomers

Ultisil® XB-C30

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	22(120 Å)
USP List	L62
Endcapped	Yes

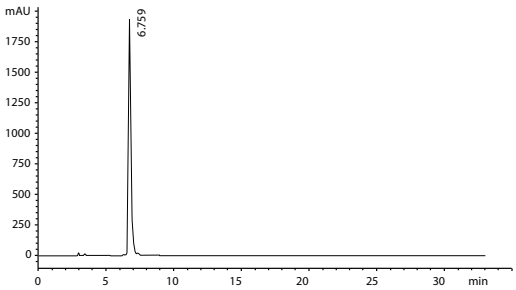
Separation of Carotenoids



1:Astaxanthin
2:Capsanthin
3:Lutein
4:Zeaxanthin
5:Canthaxanthin
6:β-Cryptoxanthin
7:Echinenone
8:15-cis β-Carotene
9:13-cis β-Carotene
10:α-Carotene
11:trans β-Canotene
12:9-cistrans β-Carotene
13:8β-Carotene
14:Lycopene

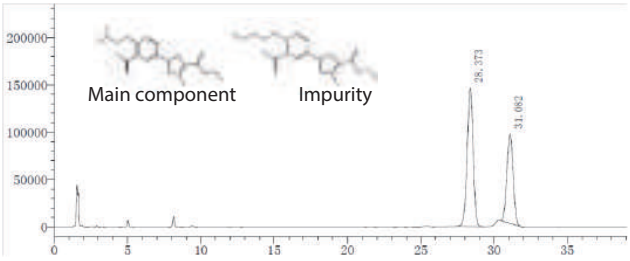
Column:	Ultisil® XB-C30, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: methanol / MTBE / water=81/15/4 B: methanol/ MTBE=10/90
Gradient Program:	0-90 min (0%B-100%B)
Detector:	450 nm
Temperature:	Ambient
Flow Rate:	1.0 mL/min

Analysis of All-trans Astaxanthin



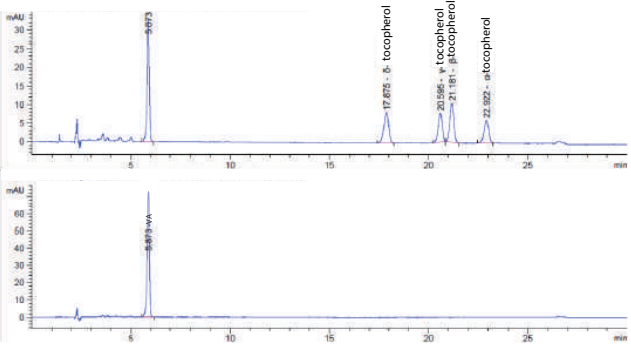
Column:	Ultisil® XB-C30, 4.6 ×250 mm, 5 µm		
Mobile Phase:	A: methanol / 1%H_3PO_4=94/6 B: methanol / TBME/ 1% H_3PO_4=16/80/4		
Gradient Program:	Time(min	A(%)	B(%)
	0	67	23
	15	52	48
	23	0	100
	27	67	33
	30	67	33
Flow Rate:	1.0 mL/min		
Detector:	474 nm		
Temperature:	30 °C		
Injection Volume:	20 µL		

Febuxostat Intermediate



Column:	Ultisil® XB-C30, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/ water=70/30
Detector :	230 nm
Temperature :	30°C
Flow Rate :	1.0 mL/min
Injection Volume	20 µL

VE(α,β,γ,δ-tocopherol) and VA



Column:	Ultisil® XB-C30, 4.6 ×250 mm, 5 µm		
Mobile Phase:	A: water B: methanol		
Gradient Program:	Time(min)	A(%)	B(%)
	0	4	96
	13	4	96
	20	0	100
	24.5	4	96
	30	4	96
Flow Rate:	0.8 mL/min		
Detector:	294/325 nm		
Temperature:	20°C		
Injection Volume:	10 µL		

Ordering Information

Ultisil® XB-C30

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	200	150	250	300		
3 µm 120 Å	2.1	H00223-21009	H00223-21068	H00223-21010	H00223-21011	H00223-21012	H00223-21013	H00223-21015	H00223-21014	H00223-21016	-	H00808-23013	00808-01107
	3.0	H00223-21018	H00223-21069	H00223-21019	H00223-21020	H00223-21021	H00223-21022	H00223-21024	H00223-21023	H00223-21025	-	H00808-23013	00808-01107
	4.0	H00223-21027	H00223-21070	H00223-21028	H00223-21029	H00223-21030	H00223-21031	H00223-21033	H00223-21032	H00223-21034	-	H00808-03035	00808-01101
	4.6	H00223-21036	H00223-21071	H00223-21037	H00223-21038	H00223-21039	H00223-21040	H00223-21042	H00223-21041	H00223-21043	-	H00808-03035	00808-01101
5 µm 120 Å	2.1	H00223-31009	H00223-31068	H00223-31010	H00223-31011	H00223-31012	H00223-31013	H00223-31015	H00223-31014	H00223-31016	-	H00808-24024	00808-01107
	3.0	H00223-31018	H00223-31069	H00223-31019	H00223-31020	H00223-31021	H00223-31022	H00223-31024	H00223-31023	H00223-31025	-	H00808-24024	00808-01107
	4.0	H00223-31027	H00223-31070	H00223-31028	H00223-31029	H00223-31030	H00223-31031	H00223-31033	H00223-31032	H00223-31034	H00223-31035	H00808-04035	00808-01101
	4.6	H00223-31036	H00223-31071	H00223-31037	H00223-31038	H00223-31039	H00223-31040	H00223-31042	H00223-31041	H00223-31043	H00223-31044	H00808-04035	00808-01101
10 µm 120 Å	4.6	-	-	-	-	-	-	H00223-41042	H00223-41041	H00223-41043	H00223-41044	H00808-05013	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

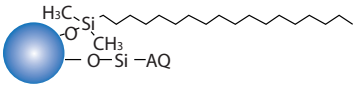
Ultisil® AQ-C18
--The most widely used column in food industry

Ultisil® AQ-C18 columns are designed to have extended retention and selectivity for hydrophilic and polar compounds, which are poorly or not at all retained on other phases. A proprietary bonding chemistry, Ultisil® AQ-C18 avoids so-called "phase collapse", even when 100% water is used, a phenomenon that conventional C18 columns typically exhibit at high water content in the mobile phase. Ultisil® AQ-C18 phase is fully end-capped to ensure the best peak shapes of polar and basic compounds and longer lifetime. Typical applications are separations of water soluble compounds that cannot be retained on traditional C18 phase. Examples include biomolecules, metabolites, and pharmaceutical degradants such as organic acids, water-soluble vitamins, oligosaccharides, amino acids,

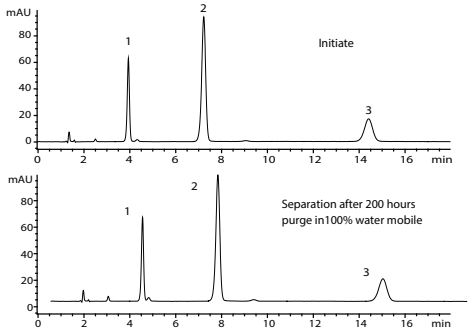
Features

- No phase collapse, suitable for high aqueous mobile phase
- Less retentive than XB-C18 for non-polar compounds
- Increased retention for polar and water-soluble compounds

Ultisil® AQ-C18

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L1/L96
Endcapped	Yes

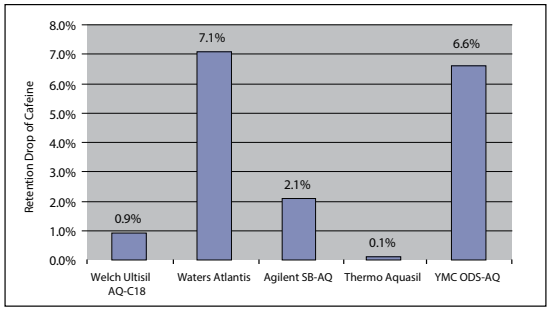
Phase collapse research

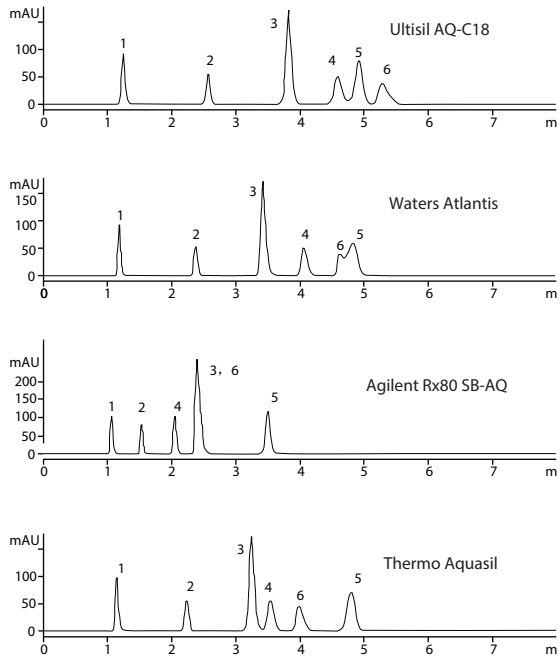


Column:	Ultisil® AQ-C18, 4.6 ×100 mm, 5 μm
Mobile Phase:	Acetonitrile/50 mM phosphate(pH 3.5)=10/90
Detector:	215nm
Temperature:	25°C
Flow Rate:	1.0 mL/min
Samples:	1.Theophylline 2.Caffeine 3.Phenol

Phase Collapse Comparison with Other Brands

Peak shape is excellent for acid, basic and neutral samples on AQ-C18. When in highly aqueous mobile phase, retention for polar compounds such as organic acids, peptides, nucleosides and water soluble vitamins is strong. Under the same condition, when compared with other brands in highly aqueous mobile phase, Ultisil® AQ-C18 shows excellent resistance to phase collapse.



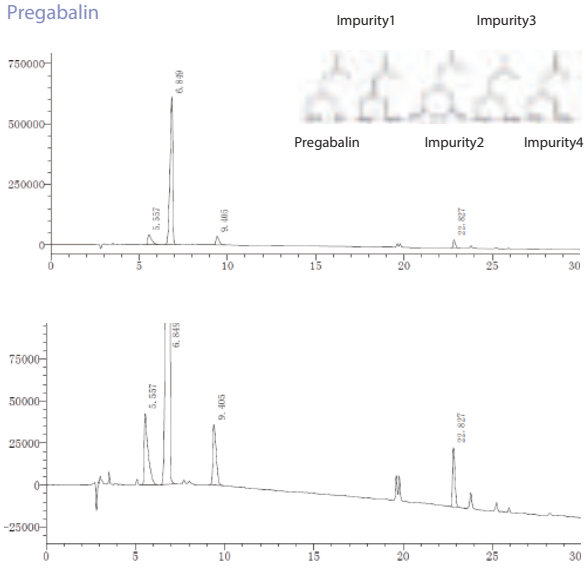


Column:	Ultisil® AQ-C18, 4.6 ×100 mm, 5 µm
Mobile Phase:	50 mM phosphate, pH2.5
Detector:	210 nm
Temperature:	25°C
Flow Rate:	1.0 mL/min
Samples:	1. Oxalic acid 2. Lactic acid 3. Maleic acid 4. Citric acid 5. Fumaric acid 6. Succinic acid

How to choose XB-C18 and AQ-C18?

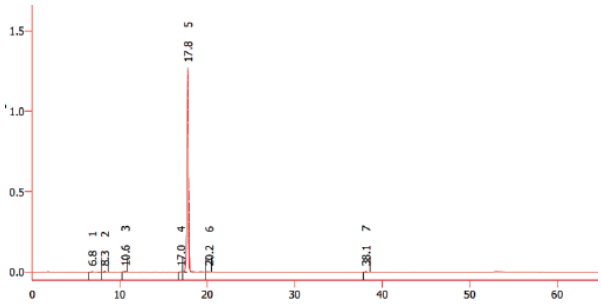
XB-C18	AQ-C18
• Suitable for separation of most pharmaceuticals, environment and chemical compounds • Excellent peak shape for basic and polar samples	• Suitable for water soluble strong polar samples, such as traditional Chinese medicine ingredients, food, beverage, organic acids, peptides, nucleosides and water solution vitamins • Best choice for mobile phase that contains <20% organic content

Pregabalin



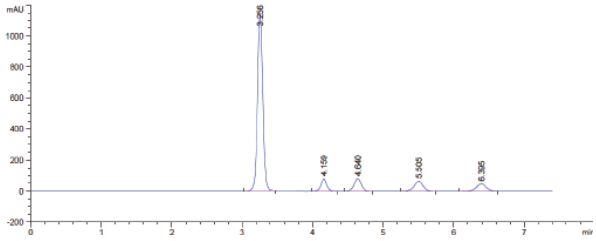
Column:	Ultisil® AQ-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: 40 mm $(NH_4)_2HPO_4$/methanol=80/20 B: acetonitrile/methanol=90/10
Gradient Program:	Time(min) A% B% 0 98 2 5 98 2 30 50 50 31 50 2
Flow Rate:	1.0 mL/min
Detector:	210 nm
Temperature:	35°C
Injection Volume:	20 µL

Vilazodone hydrochloride



Column:	Ultisil® AQ-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	Mobile phase A: 0.025 mol/L K_2HPO_4, adjust pH 6.0 with H_3PO_4 Mobile Phase B: acetonitrile
Gradient Program:	Time(min) A% B% 0 75 25 3 75 25 25 60 40 40 35 65 50 35 65 50.1 75 25 65 75 25
Flow Rate:	1.0 mL/min
Detector:	240 nm
Temperature:	40°C
Injection Volume:	20 µL

NMN(nicotinamide mononucleotide)



Column:	Ultisil® AQ-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	40mM KH_2PO_4 solution*/methanol=68/32 * Dissolve 2.72 g of KH_2PO_4 and 0.85 g of TBAHS in 500 mL water, adjust pH 6.2 with 1 mol/L KOH
Detector :	259 nm
Temperature :	25 ℃
Flow Rate :	1.0 mL/min
Injection Volume	10 µL
Samples:	1. NMN 2. nicotinamide 3. AMP 4. ADP 5. ATP

Ordering Information

Ultisil® AQ-C18

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00207-21009	H00207-21068	H00207-21010	H00207-21011	H00207-21012	H00207-21013	H00207-21014	H00207-21015	H00207-21016	-	H00808-23003	00808-01107
	3.0	H00207-21018	H00207-21069	H00207-21019	H00207-21020	H00207-21021	H00207-21022	H00207-21023	H00207-21024	H00207-21025	-	H00808-23003	00808-01107
	4.0	H00207-21027	H00207-21070	H00207-21028	H00207-21029	H00207-21030	H00207-21031	H00207-21032	H00207-21033	H00207-21034	-	H00808-03003	00808-01101
	4.6	H00207-21036	H00207-21071	H00207-21037	H00207-21038	H00207-21039	H00207-21040	H00207-21041	H00207-21042	H00207-21043	-	H00808-03003	00808-01101
5µm 120Å	2.1	H00207-31009	H00207-31068	H00207-31010	H00207-31011	H00207-31012	H00207-31013	H00207-31014	H00207-31015	H00207-31016	-	H00808-24003	00808-01107
	3.0	H00207-31018	H00207-31069	H00207-31019	H00207-31020	H00207-31021	H00207-31022	H00207-31023	H00207-31024	H00207-31025	-	H00808-24003	00808-01107
	4.0	H00207-31027	H00207-31070	H00207-31028	H00207-31029	H00207-31030	H00207-31031	H00207-31032	H00207-31033	H00207-31034	H00207-31035	H00808-04003	00808-01101
	4.6	H00207-31036	H00207-31071	H00207-31037	H00207-31038	H00207-31039	H00207-31040	H00207-31041	H00207-31042	H00207-31043	H00207-31044	H00808-04003	00808-01101
10 µm 120Å	4.0	-	-	-	-	-	-	H00207-41032	H00207-41033	H00207-41034	H00207-41035	H00808-05003	00808-01101
	4.6	-	-	-	-	-	-	H00207-41041	H00207-41042	H00207-41043	H00207-41044	H00808-05003	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® LP Series HPLC Column

LP is abbreviation for Low pH. LP phases are designed for use at low pH conditions. LP phase consists of two very bulky hydrophobic protective groups to prevent siloxane bond from hydrolysis at low pH condition. So Ultisil® LP column is extremely stable in very low pH mobile phase and at high temperature, even at the lowest pH of 1.0, making it the most stable phase for low pH application in the market. Because it is not endcapped and has more surface silanols, LP phase has more retention for some early eluted polar compounds, and provides different selectivities . Ultisil® LP-C18 is the most polar C18 among all the C18 products of Welch.

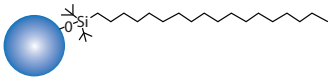
Features

- Not endcapped, prevents siloxane bond from hydrolysis at low pH condition.
- Compatible with 100% water as the mobile phase, more polar than "AQ", better peak shape and resolution
- Best peak shape for polar compounds
- Exceptional lifetime at low pH (0.5-8.0) and high temperature

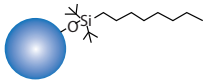
How to choose XB-C18 and LP-C18

When pH<5.0, based on your separation conditions, you may choose either LP-C18 or XB-C18;
When pH<2.0 (such as 0.1%TFA), LP-C18, which provides exceptional stability, longer lifetime, perfect peak shape and superior selectivity, is your best choice

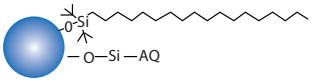
Ultisil® LP-C18

Structural Formula	
pH Range	0.5-8.0
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	10(120 Å), 5(300 Å)
USP List	L1
Endcapped	No

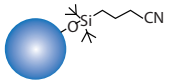
Ultisil® LP-C8

Structural Formula	
pH Range	1.0-8.0
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	320(120 Å), 90(300 Å)
Carbon Loading(%)	5.5(120 Å), 3(300 Å)
USP List	L7
Endcapped	No

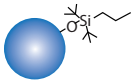
Ultisil® LP-AQ

Structural Formula	
pH Range	1.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	5(120 Å)
USP List	L1/L96
Endcapped	No

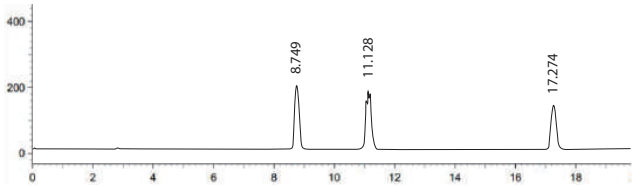
Ultisil® LP-CN

Structural Formula	
pH Range	1.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	6(120 Å)
USP List	L10
Endcapped	No

Ultisil® LP-C3

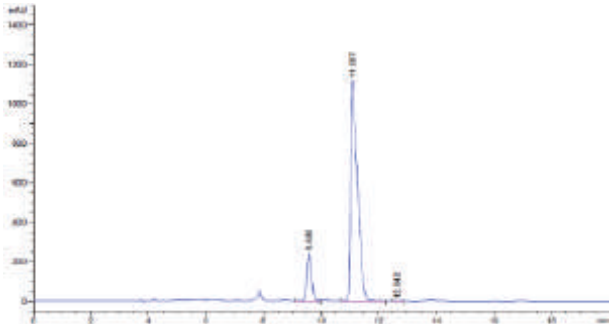
Structural Formula	
pH Range	1.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	4(120 Å)
USP List	L56
Endcapped	No

4-aminocyclohexanone HCl, cis-4-Aminocyclohexanol and trans-4-Aminocyclohexanol



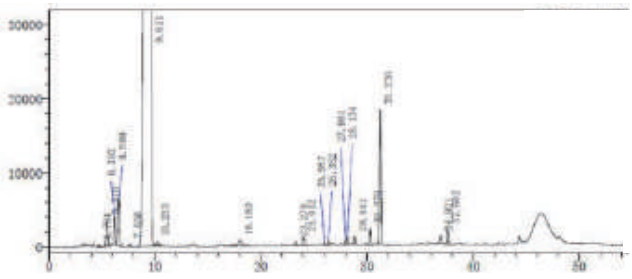
Column:	Ultisil® LP-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: 0.1% heptafluorobutyric acid B: methanol
Gradient Program:	Time(min) A(%) B(%) 0 95 5 10 95 5 20 60 40 21 95 5 30 95 5
Flow Rate:	1.0 mL/min
Detector:	ELSD, 115°C, gas: 3.2 L/min
Temperature:	30°C
Injection Volume:	20 µL
Samples in order:	1. trans-4-Aminocyclohexanol 2. 4-aminocyclohexanone HCl 3. cis-4-Aminocyclohexanol

Cefuroxime Sodium



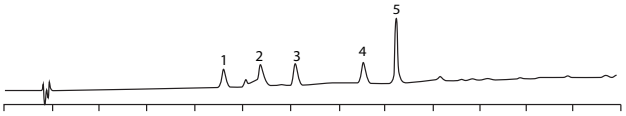
Column:	Ultisil® LP-C8, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetate buffer*/acetonitrile=85/15 *Dissolve 0.68 g of anhydrous sodium acetate, 5.8 g of glacial acetic acid in 1000 mL water, adjust pH 3.4 with glacial acetic acid
Detector:	273 nm
Temperature:	30°C
Flow Rate:	1.0 mL/min
Injection Volume:	20 µL

Ampicillin Capsules



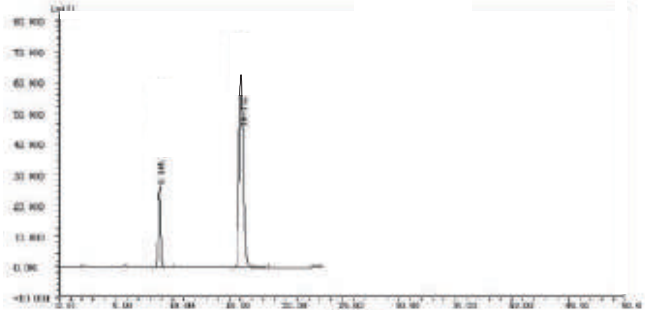
Column:	Ultisil® LP-AQ, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: 12% acetum/0.2 mol/L KH_2PO_4/ acetonitrile/water=0.5/50/50/900 B: 12% acetum/0.2 mol/L KH_2PO_4/ acetonitrile/water=0.5/50/400/550
Gradient Program:	Time(min) A(%) B(%) 0 85 15 10 85 15 40 0 100 55 0 100 60 85 15 70 85 15
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	30°C
Injection Volume:	20 µL

Peptides



Column:	Ultisil® LP-AQ, 4.6 ×150 mm, 5 µm, 300 Å
Mobile Phase:	A: 0.1% TFA/water B: 0.1% TFA/acetonitrile
Gradient Program:	Linear gradient, 0-30% B
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	30°C
Samples in order:	LeuGlyLeu,LeuArgLeu,LeuLeu-amide, leuLealeu,LeuLeaLeu,LeuLeuValtyr

Hydralazine Hydrochloride



Column:	Ultisil® LP-CN, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/buffer*=22/78 *Dissolve 1.44 g of lauryl sodium sulfate, 0.75 g of tetrabutylammonium bromide in 1000 mL water, adjust pH 3.0 with 0.05 mol/L sulfuric acid solution
Detector:	230 nm
Temperature:	35°C
Flow Rate:	1.0 mL/min
Injection Volume:	20 µL

Ordering Information

Ultisil® LP-C18

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00208-21009	H00207-21068	H00208-21010	H00208-21011	H00208-21012	H00208-21013	H00208-21014	H00208-21015	H00208-21016	-	H00808-23014	00808-01107
	3.0	H00208-21018	H00207-21069	H00208-21019	H00208-21020	H00208-21021	H00208-21022	H00208-21023	H00208-21024	H00208-21025	-	H00808-23014	00808-01107
	4.0	H00208-21027	H00207-21070	H00208-21028	H00208-21029	H00208-21030	H00208-21031	H00208-21032	H00208-21033	H00208-21034	-	H00808-03010	00808-01101
	4.6	H00208-21036	H00207-21071	H00208-21037	H00208-21038	H00208-21039	H00208-21040	H00208-21041	H00208-21042	H00208-21043	-	H00808-03010	00808-01101
5 µm 120 Å	2.1	H00208-31009	H00207-31068	H00208-31010	H00208-31011	H00208-31012	H00208-31013	H00208-31014	H00208-31015	H00208-31016	-	H00808-24015	00808-01107
	3.0	H00208-31018	H00207-31069	H00208-31019	H00208-31020	H00208-31021	H00208-31022	H00208-31023	H00208-31024	H00208-31025	-	H00808-24015	00808-01107
	4.0	H00208-31027	H00207-31070	H00208-31028	H00208-31029	H00208-31030	H00208-31031	H00208-31032	H00208-31033	H00208-31034	H00208-31035	H00808-04015	00808-01101
	4.6	H00208-31036	H00207-31071	H00208-31037	H00208-31038	H00208-31039	H00208-31040	H00208-31041	H00208-31042	H00208-31043	H00208-31044	H00808-04015	00808-01101
10 µm 120 Å	4.6	-	-	-	-	-	-	H00208-41041	H00208-41042	H00208-41043	H00208-41044	H00808-05014	00808-01101

Ultisil® LP-C8

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00209-21009	H00209-21068	H00209-21010	H00209-21011	H00209-21012	H00209-21013	H00209-21014	H00209-21015	H00209-21016	-	H00808-23015	00808-01107
	3.0	H00209-21018	H00209-21069	H00209-21019	H00209-21020	H00209-21021	H00209-21022	H00209-21023	H00209-21024	H00209-21025	-	H00808-23015	00808-01107
	4.0	H00209-21027	H00209-21070	H00209-21028	H00209-21029	H00209-21030	H00209-21031	H00209-21032	H00209-21033	H00209-21034	-	H00808-03011	00808-01101
	4.6	H00209-21036	H00209-21071	H00209-21037	H00209-21038	H00209-21039	H00209-21040	H00209-21041	H00209-21042	H00209-21043	-	H00808-03011	00808-01101
5 µm 120 Å	2.1	H00209-31009	H00209-31068	H00209-31010	H00209-31011	H00209-31012	H00209-31013	H00209-31014	H00209-31015	H00209-31016	-	H00808-24012	00808-01107
	3.0	H00209-31018	H00209-31069	H00209-31019	H00209-31020	H00209-31021	H00209-31022	H00209-31023	H00209-31024	H00209-31025	-	H00808-24012	00808-01107
	4.0	H00209-31027	H00209-31070	H00209-31028	H00209-31029	H00209-31030	H00209-31031	H00209-31032	H00209-31033	H00209-31034	H00209-31035	H00808-04012	00808-01101
	4.6	H00209-31036	H00209-31071	H00209-31037	H00209-31038	H00209-31039	H00209-31040	H00209-31041	H00209-31042	H00209-31043	H00209-31044	H00808-04012	00808-01101

5µm Ultisil® LP-CN, LP-C3, LP-AQ

Bonded phase	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
LP-CN	4.6	H00247-31041	H00247-31042	H00247-31043	H00808-04049	00808-01101
LP-C3	4.6	H00265-31041	H00265-31042	H00265-31043	H00808-04050	00808-01101
LP-AQ	4.6	H00259-31041	H00259-31042	H00259-31043	H00808-04042	00808-01101

300 Å HPLC column provided. Please contact Welch or your local distributor for other dimensions.

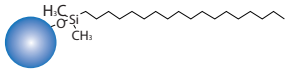
Ultisil® Plus Series HPLC Column

Ultisil Plus series column is based on new high-purity fully porous silica and it adpots Welch's unique bonding process and end-capping technique to ensure higher inertness on the silica surface, resulting in more symmetrical peak shape, higher column efficiency, and more stable separation performance annd better batch reproducibility. It has better performance especially for the analysis of multi-impurity components. The high standard and strict quality control conditions of the column ensure that each column is "survival of the fittest" after strict quality screening before leaving the factory. Ultisil Plus series columns are extremely resistant to contamination, which enables the column to have a long service life while analyzing complex matrix samples.

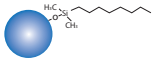
Features

- Super anti-pollution ability
- Excellent longevity
- Excellent batch-to-batch reproducibility
- The first choice for herbal medicine testing

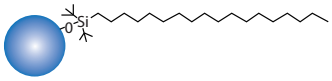
Ultisil® Plus C18

Structural Formula	
pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	160(130 Å)
Carbon Loading(%)	10(130 Å)
USP List	L1
Endcapped	Yes

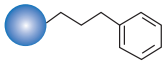
Ultisil® Plus C8

Structural Formula	
pH Range	1.0-10.0
Particle Size	5 μm
Surface Area(m^2/g)	160(130 Å)
Carbon Loading(%)	7(130 Å)
USP List	L7
Endcapped	Yes

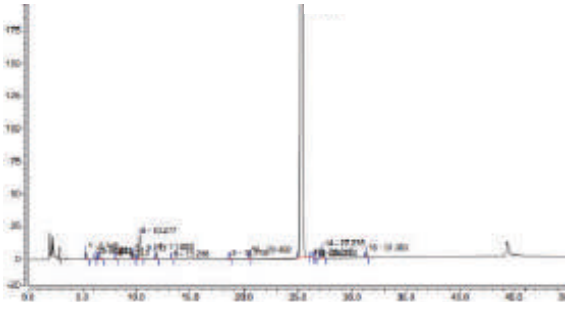
Ultisil® Plus LP-C18

Structural Formula	
pH Range	0.5-8.0
Particle Size	5 μm
Surface Area(m^2/g)	160(130 Å)
Carbon Loading(%)	9(130 Å)
USP List	L1
Endcapped	No

Ultisil® Plus Phenyl

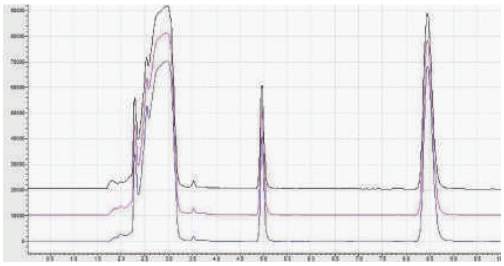
Structural Formula	
pH Range	1.5-10.0
Particle Size	5 μm
Surface Area(m^2/g)	160(130 Å)
Carbon Loading(%)	8(130 Å)
USP List	L11
Endcapped	Yes

Lansoprazole



Column:	Ultisil® Plus C18, 4.6 ×150 mm, 5 μm
Mobile Phase:	A: water B: acetonitrile/water/ triethylamine=160 /40/1(%)(adjust pH 7.0 with H_3PO_4)
Gradient Program:	Time(min) A(%) B(%) 0 90 10 40 20 80 50 20 80 51 90 10 65 90 10
Flow Rate:	0.8 mL/min
Detector:	285 nm
Temperature:	25°C
Injection Volume:	40 μL

Morphine in Poppy Shells

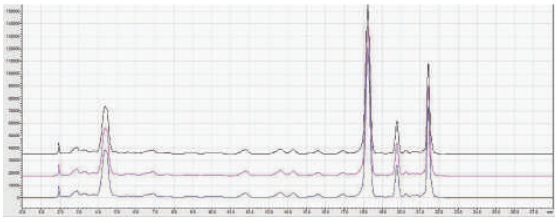


Overlag of morphine samples from different batches

Column:	Welch Ultisil® Plus C8, 4.6×250mm， 5μm
Mobile Phase:	0.01mol/L dipotassium hydrogen phosphate solution: 0.005mol/L heptane sulfonate sodium solution: acetonitrile (40:40:20)
Flow Rate:	1.0 mL/min
Detector:	220 nm
Temperature:	30°C
Injection Volume:	10 μL

Num	Retention time	Area	Peak height	Plates	Tailing factor
1	8.293	2690998	192221	7416	1.413

Rutin in Mulberry Leaves



Overlag of Rutin samples from different batches

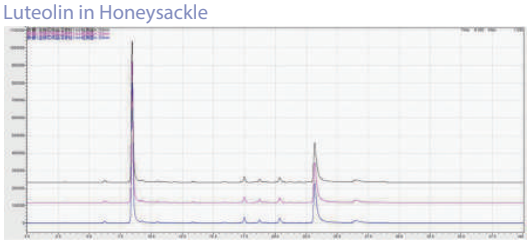
Peak num	Retention time	Area	Degree of separation	Plates	Tailing factor	S/N
1	18.238	2030877	-	27300	0.914	34.93

Column:	Welch Ultisil® Plus LP-C18, 4.6×150mm, 5μm
Mobile Phase:	0.5% phosphoric acid water/methanol

Time(min)	Mobile phase A (%)	Mobile phase A (%)
0	70	30
5	70	30
10	65	35
15	60	40
18	50	50

Flow Rate:	1.0 mL/min
Detector:	358 nm
Temperature:	30°C
Injection Volume:	10 μL

Luteolin in Honeysackle



Overlag of Luteolin samples from different batches

Peak num	Name	Retention time	Area	Resolution(EP)	Plates	Tailing factor	S/N
1	Galuteolin	20.359	349086	-	68166	1.251	1.52

Column:	Welch Ultisil® Plus Phenyl, 4.6×250mm, 5μm
Mobile Phase:	Mobile phase A: 0.5% acetic acid solution: accurately pipette 5 mL of acetic acid, add water and make up to 1 L. Mobile phase B: acetonitrile.

Time(min)	Mobile phase A (%)	Mobile phase A (%)
0-25	10-20	90-80
15-30	20	80
30-40	20-30	80-70

Flow Rate:	1.0 mL/min
Detector:	350 nm
Temperature:	30°C
Injection Volume:	5 μL

Order information

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3.5 μm 120 Å	2.1	H00260-20009	H00260-20068	H00260-20010	H00260-20011	H00260-20012	H00260-20013	H00260-20014	H00260-20015	H00260-20016	-	H00808-23024	00808-01107
	3.0	H00260-20018	H00260-20069	H00260-20019	H00260-20020	H00260-20021	H00260-20022	H00260-20023	H00260-20024	H00260-20025	-	H00808-23024	00808-01107
	4.0	H00260-20027	H00260-20070	H00260-20028	H00260-20029	H00260-20030	H00260-20031	H00260-20032	H00260-20033	H00260-20034	-	H00808-03036	00808-01101
	4.6	H00260-20036	H00260-20071	H00260-20037	H00260-20038	H00260-20039	H00260-20040	H00260-20041	H00260-20042	H00260-20043	-	H00808-03036	00808-01101
5 μm 120 Å	2.1	H00260-31009	H00260-31068	H00260-31010	H00260-31011	H00260-31012	H00260-31013	H00260-31014	H00260-31015	H00260-31016	-	H00808-24029	00808-01107
	3.0	H00260-31018	H00260-31068	H00260-31019	H00260-31020	H00260-31021	H00260-31022	H00260-31023	H00260-31024	H00260-31025	-	H00808-24029	00808-01107
	4.0	H00260-31027	H00260-31068	H00260-31028	H00260-31029	H00260-31030	H00260-31031	H00260-31032	H00260-31033	H00260-31034	H00260-31035	H00808-04036	00808-01101
	4.6	H00260-31036	H00260-31068	H00260-31037	H00260-31038	H00260-31039	H00260-31040	H00260-31041	H00260-31042	H00260-31043	H00260-31044	H00808-04036	00808-01101

Ultisil® Plus C8, Plus phenyl, Plus LP-C18

Bonded phase	4.6×150, 5μm	4.6×250, 5μm
Plus C8	H00283-31041	H00283-31043
Plus phenyl	H00284-31041	H00284-31043
Plus LP- C18	H00285-31041	H00285-31043

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

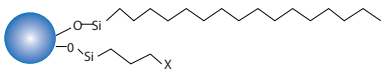
Ultisil® ALK-C18

Ultisil® ALK-C18 is a new generation of C18 column introduced by Welch. In this column, hydrophilic groups are bonded into the silica surface, where large number of silanol groups are replaced, reducing the interactions between basic samples and the silanol groups. As a consequence, the selectivity of ALK-C18 is different from that of traditional C18.

Features:

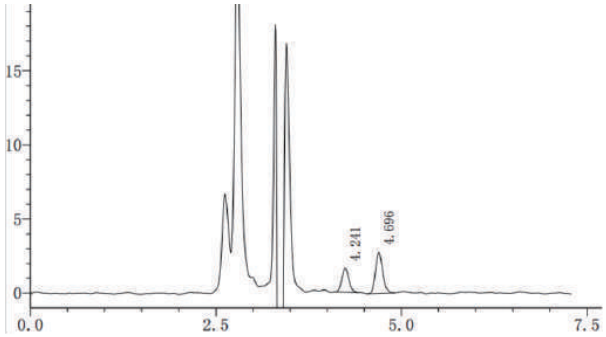
- Mixed solid phase with both hydrophobic and electrostatic interactions
- Excellent peak shape for basic compounds
- Fast separation of similar samples on a column

Ultisil® ALK-C18

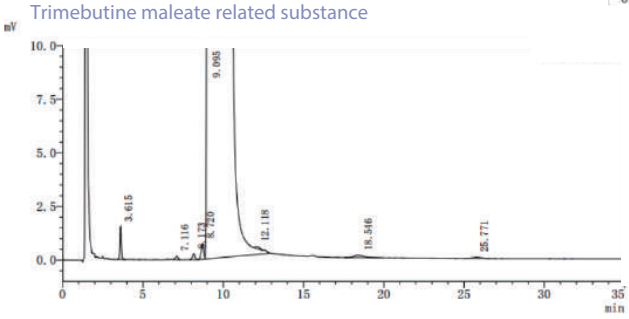
Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L1
Endcapped	Yes

AspartanL-aspartyl-L-phenylalanine

Column:	Ultisil® ALK-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	Citrate buffer/methanol=67/33
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	30°C
Injection Volume:	20 µl



Trimebutine maleate related substance



Column:	Ultisil® ALK-C18, 4.6 ×150 mm, 5 µm
Mobile Phase:	Perchloric acid buffer/acetonitrile=66/35
Flow Rate:	1.1 mL/min
Detector:	254 nm
Temperature:	40°C
Injection Volume:	20 µl

Ordering Information

Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
5 µm	4.6	H00253-31041	H00253-31042	H00253-31043	H00808-04033	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

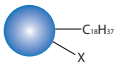
Ultisil® ODS-3
-- High Water-resistance Octadecyl HPLC Column

Ultisil® ODS-3 column is packed with high water-resistance octadecyl reversed-phase packing material. The hydrophilic end group of the octadecyl functional group is strictly endcapped, which brings perfect peaks and low adsorption for both alkaline and acid compounds. The 100% water-resistance packing material avoids the collapse of stationary phase and applies to the separation and determination of most compounds.

Features:

- 100% water resistance
- High efficiency and resolution
- High sample loading
- Easy preparative magnifying
- Different selectivity from common C18

Ultisil® ODS-3

Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm
Surface Area(m^2/g)	380(100 Å)
Carbon Loading(%)	15(100 Å)
USP List	L1
Endcapped	Yes

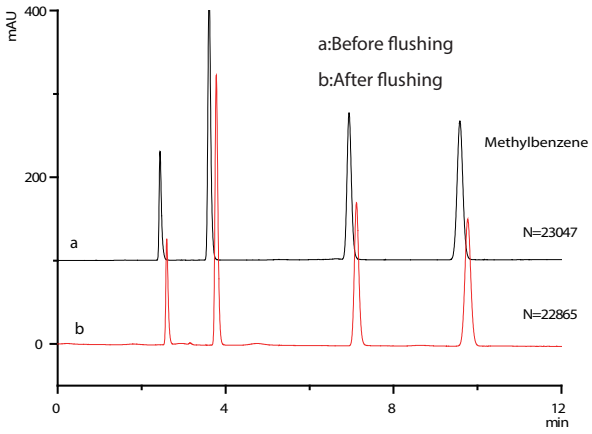
Tests of 48-hour Pure Water Resistance

Mobile Phase: 20 mM K_2HPO_4, adjust pH 7.0 with phosphate

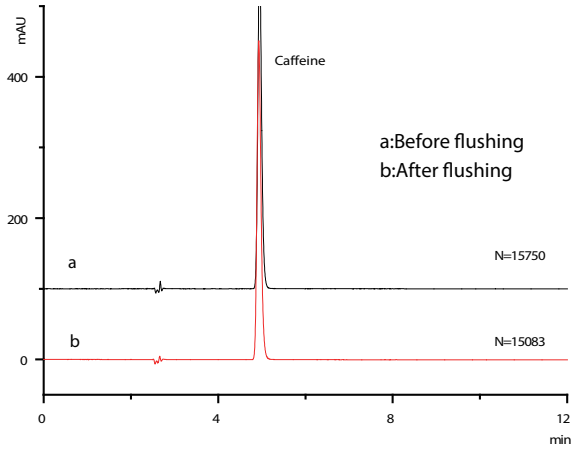
Temperature： 30℃

Flow Rate： 1.0 mL/min

Operation: Flush the column with mobile phase for 24 h. Then test the column efficiency and tailing factor. Control the pressure and change the mobile phase every 24 h.



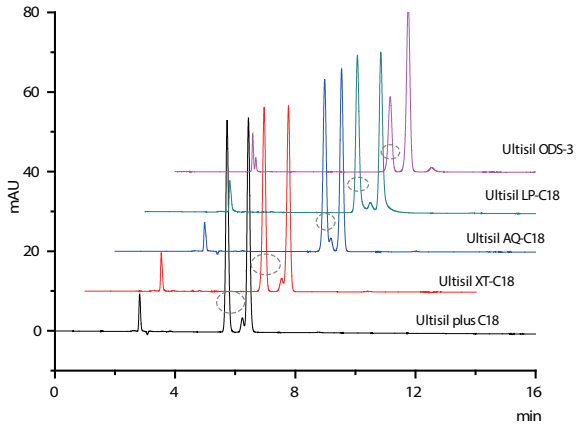
Column:	Ultisil® ODS-3, 4.6 ×250 mm, 5 μm
Mobile Phase:	Methanol/Water =75/25
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	30 ℃
Injection Volume:	20 μL
Test Requirement：	N>20000，T（0.90-1.10）



Column:	Ultisil® ODS-3, 4.6 ×250 mm, 5 µm
Mobile Phase:	Methanol/Water =45/55
Flow Rate:	1.0 mL/min
Detector:	280 nm
Temperature:	30 °C
Injection Volume:	20 µL
Sample Solution:	Caffeine solution（50 µg/ml）

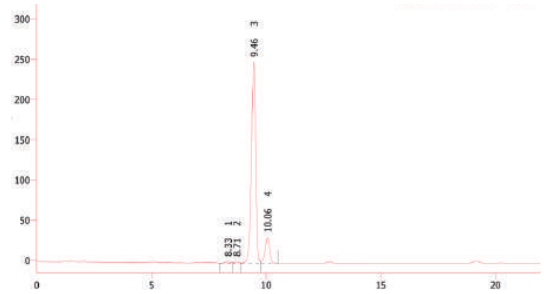
Cefprozil Capsule

Unique selectivity



Column:	Welch C18, 4.6×250 mm, 5 µm
Mobile Phase:	0.05 mol/L $NH_4H_2PO_4$/acetonitrile=95/5 adjust pH 4 with H_3PO_4
Flow Rate:	1.0 mL/min
Detector:	225 nm
Temperature:	35 °C
Injection Volume:	20 µL

Prostaglandin sample



Column:	Ultisil® ODS-3, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/water/H_3PO_4=35/65/0/1
Flow Rate:	1.0 mL/min
Detector:	200 nm
Temperature:	25 °C
Injection Volume:	10 µL

Ordering Information

Ultisil® ODS-3

Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
3 µm	4.6	H00275-21041	H00275-21042	H00275-21043	H00808-03031	00808-01101
5 µm	4.6	H00275-31041	H00275-31042	H00275-31043	H00808-04043	00808-01101

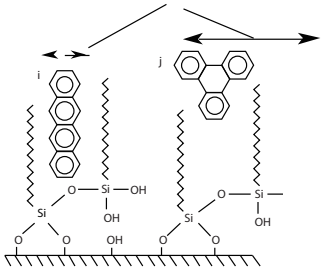
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® XS-C18

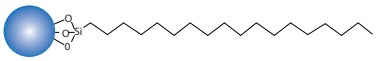
Ultisil® XS-C18 is developed with high column efficiency, high loading and high capacity. It has excellent steric hindrance selectivity, especially shape selectivity.

There are two patterns of Steric Hindrance: Steric Exclusion and Shape Selectivity. Ultisil® XS-C18 uses unique multi-bonding technique, with high bonding density and short distance between ligands, providing better shape selectivity.

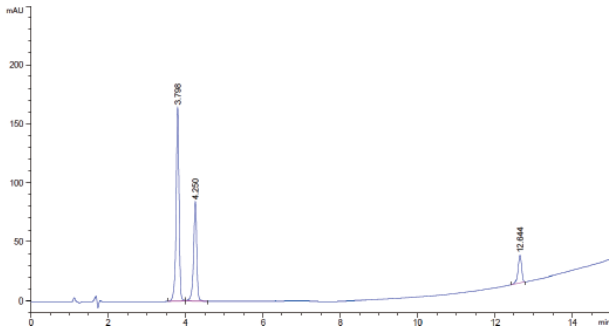
Minimum cross- Section of Solute



Compound i has more narrow size, with smaller cross-sectional area, which allows it go into the ligands and provids better retention. Compound j has wider size, with bigger cross-sectional area, which makes it rejected out by stationary phase, providing shorter retention time. Thus are two compouds separated. Normal bonded columns have bigger interstices btween ligands, which allows both compounds through and results in poor resolution.

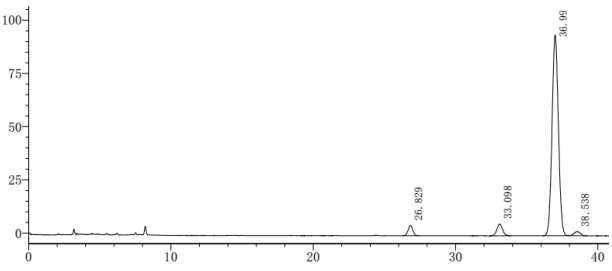
Structural Formula	
pH Range	2.0-10.0
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	23(120 Å)
USP List	L1
Endcapped	Yes

Isocyanate mononitrate



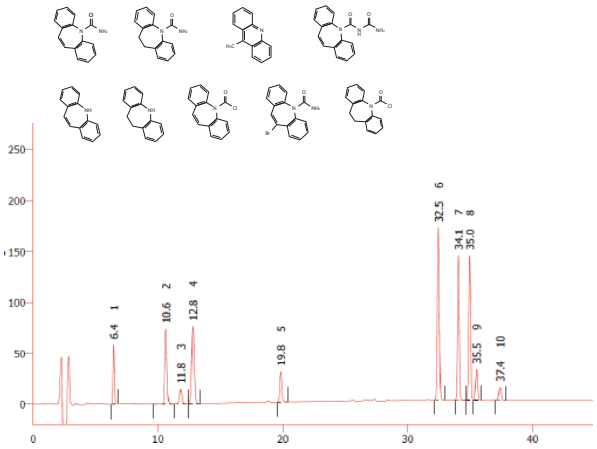
Column:	Ultisil® XS-C18, 4.6 ×150 mm, 5 µm
Mobile Phase:	A: water B: methanol
Gradient Program:	Time(min) A(%) B(%) 0 75 25 5 75 25 15 30 70 15.1 75 25
Flow Rate:	1.0 mL/min
Injection Volume:	210 nm
Temperature:	35°C
Injection Volume:	10 µL
Samples in order:	2-isosorbide mononitrate, isocyanate mononitrate, isocyanate nitrate

Vitamin D_3 and isomers



Column:	Ultisil® XS-C18, 4.6 ×250 mm, 3 µm
Mobile Phase:	Water/methanol=5/95
Flow Rate:	1.0 mL/min
Detector:	264 nm
Temperature:	30°C
Injection Volume:	20 µL
Samples:	Previtamin D_3, Trans vitamin D_3, vitamin D_3, tachysterol D_3

Carbamazepine



Column:	Ultisil® XS-C18, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: water/triethylamine/formic acid=1000/0/5/0/5 B: methanol/formic acid=1000/0.25
Gradient Program:	Time(min) A(%) B(%) 0 65 35 10 65 35 30 40 60 45 40 60 46 65 35
Flow Rate:	1.0 mL/min
Injection Volume:	230 nm
Temperature:	30°C
Injection Volume:	10 µL
Samples in order:	Impurity B, Carbamazepine, impurity A, impurity C, impurity G, impurity D, impurity F, iminodibenzylcarbonyl chloride, impurity F, impurity E

Ordering Information

Ultisil® XS-C18

Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
3 µm	4.6	H00277-21041	H00277-21042	H00277-21043	H00808-03034	00808-01101
5 µm	4.6	H00277-31041	H00277-31042	H00277-31043	H00808-04046	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

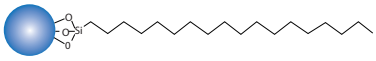


Ultisil® PAH

Ultisil® PAH Column is a special column recently designed by Welch for the separation of PAHs in EPA method 610.

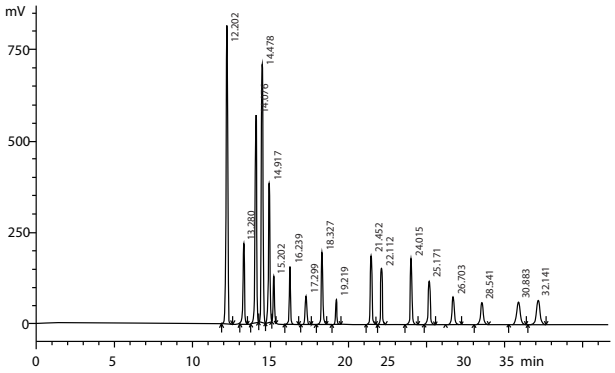
PAHs (Polycyclic Aromatic Hydrocarbon) are hydrocarbons with two or more benzene rings, and considered major pollutants. Therefore, the analysis of these potentially carcinogenic compounds in water, air, soil and food takes high priority. Most of PAHs do not exist alone. Substances that may contain PAHs include charcoal, crude oil, creosote, tar, drugs, dyes, plastic, rubber, pesticide, lube, release agent, electrolyte, mineral oil, pitch, insecticide, and bactericide, etc.

Ultisil® PAH

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	22(120 Å)
USP List	L1/L118
Endcapped	No

Ultisil® PAH columns can separate all 18 PAHS in EPA method 610 rapidly with high resolution. Ultisil® PAH columns are silica based columns for PAH analysis with the best peak shape.

Separation of 18 PAHs in EPA method 610



Column:	Ultisil® PAH, 4.6 ×250 mm, 5 µm
Mobile Phase:	A:water B: acetonitrile
	Time(min) A(%) B(%) 0 60 40 20 0 100 33 0 100 34 60 40
Flow Rate:	1.5 mL/min
Detector:	220 nm
Temperature:	25°C
Injection Volume:	10 µL
Mixed Standards:	1. Naphthalene 2. Acenaphthylene 3. 1- Methyl benzene 4. 2- Methyl benzene 5. Acenaphthene 6. Fluorene 7. Phenanthrene 8. Anthracene 9.Fluoranthene 10. Pyrene 11.Benzo(a)anthracene 12. Chrysene 13. Benzo(b)fluoranthene 14. Benzo(k)fluoranthene 15. Benzo(a)pyrene 16. Indeno(1,2,3-cd)pyrene 17. Dibenzo(a,h)anthracene 18. Benzo(g,hi)perylene

Ordering Information

Ultisil® PAH

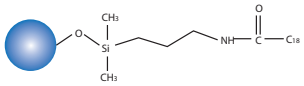
Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
3 µm 120Å	2.1	H00210-21014	H00210-21015	H00210-21016	H00808-23018	00808-01107
	3.0	H00210-21023	H00210-21024	H00210-21025	H00808-23018	00808-01107
	4.6	H00210-21041	H00210-21042	H00210-21043	H00808-03012	00808-01101
5 µm 120 Å	2.1	H00210-31014	H00210-31015	H00210-31016	H00808-24010	00808-01107
	3.0	H00210-31023	H00210-31024	H00210-31025	H00808-24010	00808-01107
	4.6	H00210-31041	H00210-31042	H00210-31043	H00808-04010	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Polar Embedded HPLC Column (polar-RP&Phenyl-Ether)

Ultisil® polar embedded phases have been developed for more than 10 years. Earlier polar embedded phase is developed with amide phase. The polar functional group close to the surface increases the wet ability of this phase, thus decreasing phase collapse, making this phase compatible with mobile phase of up to 95% water content. The polar functional group also shields the effects of unreacted silanol groups, providing excellent peak shape for very polar and strong basic compounds and different selectivity than C18 phase. Welch provides two kinds of packing materials - Ultisil® Polar-RP and Ultisil® Phenyl-Ether.

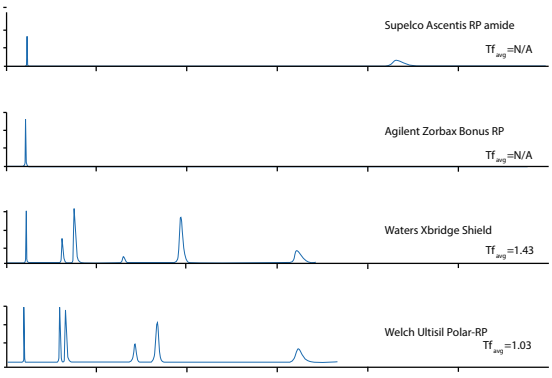
Ultisil® Polar-RP

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	18(120 Å)
USP List	L1
Endcapped	Yes

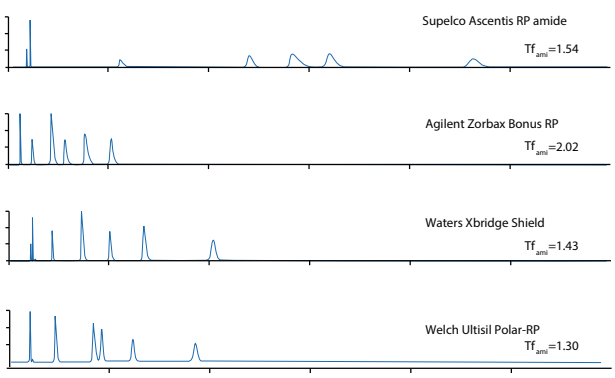
Ultisil® Polar-RP HPLC Column

- Excellent at 100% water content in mobile phase, even better than AQ-C18
- Different selectivity to AQ-C18
- Excellent peak shape for acidic and basic compounds owing to the “shield” effect of polar linkage to silanol activity by forming hydrogen bonding
- Be retentive for polar compounds. Uracil, which can’t be retained on most reversed phase columns at 100% water, can be retained on this column, and eluted after 5-fluorocytosine and cytosine. Analysis of purine, pyrimidine, small molecular acids, catecholamine and water soluble vitamins, requires high water phase content mobile phase

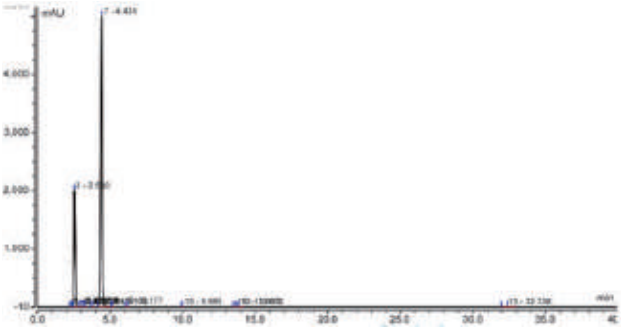
Comparison of separation of acid compounds



Comparison of separation of base compounds

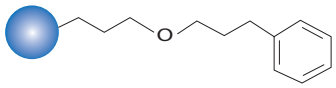


Amoxicillin and clavulanate potassium



Column:	Ultisil® Polar RP, 4.6 ×150 mm, 5 µm
Mobile Phase:	A: phosphate buffer * B: phosphate buffer/acetonitrile=20/80 *Dissolve 1.36 g KH_2PO_3 in 900 mL water, adjust pH 6.0±0.1 with KOH, add water to 1000 mL
Gradient Program:	Time(min) A(%) B(%) 0 95 5 0.5 95 5 30.5 59 41 32 95 5 40 95 5
Flow Rate:	1.0 mL/min
Injection Volume:	215 nm
Temperature:	30°C
Injection Volume:	20 µL

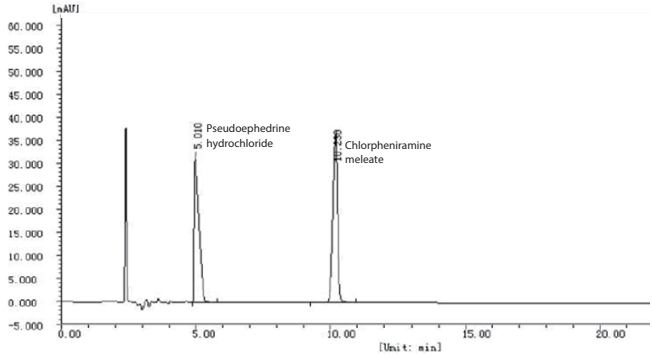
Ultisil® Phenyl-Ether

Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L11
Endcapped	Yes

Ultisil® Phenyl-Ether HPLC Column

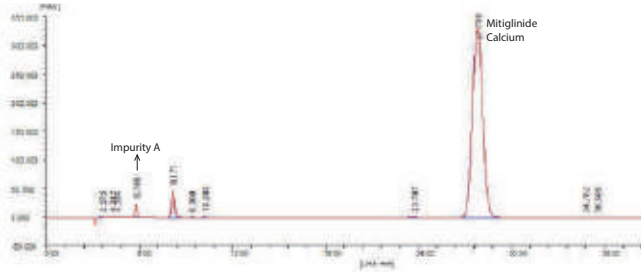
- Improved polar & aromatic reversed phases selectivity that complements the more conventional C18 column chemistries
- Better selectivity than phenyl phase for separation of nitrobenzene isomers
- Improved peak shape of highly acidic polar compounds, and different selectivity from other polar phases such as polar embedded phase
- Compatible with 100% water mobile phase

Chlorphenamine Maleate Pseudoephedrine Hydrochloride Capsules



Column:	Ultisil® Phenyl-Ether, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/methanol/tetrahydrofuran/ H_3PO_4/water=320/80/50/1/550 Add 0.43 g lauryl sodium sulfate, adjust pH 3.5 with concentrated ammonia solution
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	25°C
Injection Volume:	10 µL

Mitiglinide Calcium



Column:	Ultisil® Phenyl-Ether, 4.6 ×250 mm, 5 µm
Mobile Phase:	0.02 mol/L KH_2PO_3 buffer*/methanol=38/62 *Dissolve 2.72 g KH_2PO_3 in water, add 5mL oftriethylamine, add water to 1000 mL, adjust pH 2.5 with H_3PO_4
Flow Rate:	1.0mL/min
Detector:	210 nm
Temperature:	Ambient
Injection Volume:	10 µL

Ordering Information

Ultisil® Polar RP

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00215-21009	H00215-21068	H00215-21010	H00215-21011	H00215-21012	H00215-21013	H00215-21014	H00215-21015	H00215-21016	-	H00808-23009	00808-01107
	3.0	H00215-21018	H00215-21069	H00215-21019	H00215-21020	H00215-21021	H00215-21022	H00215-21023	H00215-21024	H00215-21025	-	H00808-23009	00808-01107
	4.0	H00215-21027	H00215-21070	H00215-21028	H00215-21029	H00215-21030	H00215-21031	H00215-21032	H00215-21033	H00215-21034	-	H00808-03009	00808-01101
	4.6	H00215-21036	H00215-21071	H00215-21037	H00215-21038	H00215-21039	H00215-21040	H00215-21041	H00215-21042	H00215-21043	-	H00808-03009	00808-01101
5 µm 120 Å	2.1	H00215-31009	H00215-31068	H00215-31010	H00215-31011	H00215-31012	H00215-31013	H00215-31014	H00215-31015	H00215-31016	-	H00808-24017	00808-01107
	3.0	H00215-31018	H00215-31069	H00215-31019	H00215-31020	H00215-31021	H00215-31022	H00215-31023	H00215-31024	H00215-31025	-	H00808-24017	00808-01107
	4.0	H00215-31027	H00215-31070	H00215-31028	H00215-31029	H00215-31030	H00215-31031	H00215-31032	H00215-31033	H00215-31034	H00215-31035	H00808-04017	00808-01101
	4.6	H00215-31036	H00215-31071	H00215-31037	H00215-31038	H00215-31039	H00215-31040	H00215-31041	H00215-31042	H00215-31043	H00215-31044	H00808-04017	00808-01101
10 µm 120 Å	4.6	-	-	-	-	-	-	H00215-41041	H00215-41042	H00215-41043	H00215-41044	H00808-05015	00808-01101

Ultisil® Phenyl-Ether

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 µm 120 Å	2.1	H00214-31009	H00214-31068	H00214-31010	H00214-31011	H00214-31012	H00214-31013	H00214-31014	H00214-31015	H00214-31016	-	H00808-24034	00808-01107
	3.0	H00214-31018	H00214-31069	H00214-31019	H00214-31020	H00214-31021	H00214-31022	H00214-31023	H00214-31024	H00214-31025	-	H00808-24034	00808-01107
	4.0	H00214-31027	H00214-31070	H00214-31028	H00214-31029	H00214-31030	H00214-31031	H00214-31032	H00214-31033	H00214-31034	H00214-31035	H00808-04028	00808-01101
	4.6	H00214-31036	H00214-31071	H00214-31037	H00214-31038	H00214-31039	H00214-31040	H00214-31041	H00214-31042	H00214-31043	H00214-31044	H00808-04028	00808-01101

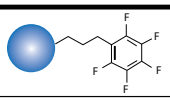
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



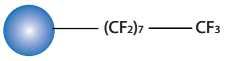
Ultisil® Fluorinated Phase(PFP & F-C8)

Ultisil® Fluorinated Phase has high selectivity and increased retention toward closely related compounds, including both aromatic fluorinated compounds and other nonaromatic halogenated compounds. It can be used in reversed phase and provides an alternative and complementary separation to that performed on C8 or C18 columns for many analytes. Fluorinated phase has better separation for ionic and polar compounds than do alkyl phases. Fluorinated phase can provide different elution orders, leading to enhanced selectivity for compounds that are difficult to separate.

Ultisil® PFP

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L43
Endcapped	Yes

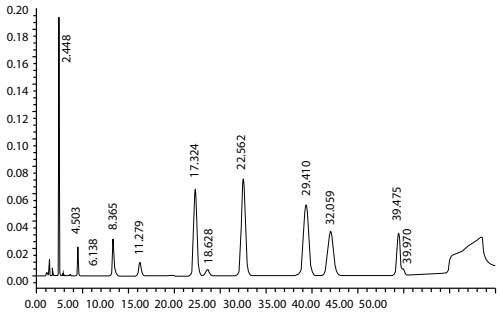
Ultisil® F-C8

Structural Formula	
pH Range	1.5-10.0
Particle Size	3 μm, 5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L7
Endcapped	Yes

Ultisil® PFP

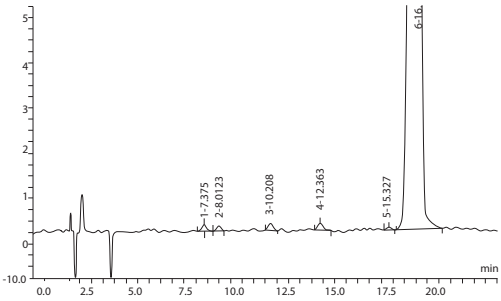
Ultisil® PF-Phenyl is a phase primarily used in the separation of molecules bearing fluorine atoms, but may also be in the separation of non-fluorinated compounds such as Taxol and its derivatives. Because of its phenyl ring, it has a higher selectivity for aromatic molecules than for other alkyl-fluorinated phases. Ultisil® PF-Phenyl can separate nitro-benzene isomers (para vs. ortho), which cannot be separated by conventional phenyl phase.

Analysis of Taxol



Column:	Ultisil® PFP, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A: acetonitrile B:water		
Gradient Program:	Time(min)	A(%)	B(%)
	0	35	65
	35	35	65
	60	80	20
	70	85	15
	80	85	65
Flow Rate:	2.6 mL/min		
Injection Volume:	227 nm		
Temperature:	30°C		
Injection Volume:	10 μL		

Parecoxib Sodium

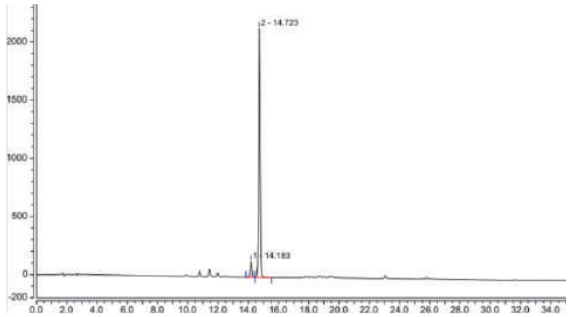


Column:	Ultisil® PFP, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A: 0.1% TFA water solution B: methanol		
Gradient Program:	Time(min)	A(%)	B(%)
	0	55	45
	20	45	55
	40	10	90
Flow Rate:	1.0 mL/min		
Injection Volume:	225 nm		
Temperature:	40°C		
Injection Volume:	10 μL		

Ultisil® F-C8

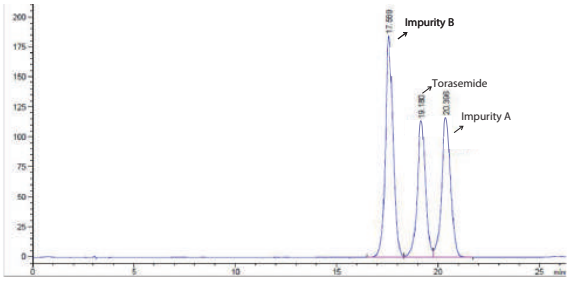
Ultisil® F-C8 column has high selectivity and increased retention toward halogenated aromatic and alkyl compounds, but different from octal alkyl phase.

Dolasetron Mesylate



Column:	Ultisil® F-C8, 4.6 ×250 mm, 5 µm
Mobile Phase:	A: diammonium hydrogen phosphate/ acetonitrile=1000/53 B: diammonium hydrogen phosphate/ acetonitrile=295/795
Gradient Program:	Time(min) A(%) B(%) 0 100 0 28 0 100 38 0 100 40 100 0 50 100 0
Flow Rate:	1.5 mL/min
Injection Volume:	210 nm
Temperature:	30°C
Injection Volume:	20 µL

Torasemide



Column:	Ultisil® F-C8, 4.6 ×250 mm, 5 µm
Mobile Phase:	0.02 mol/L diammonium hydrogen phosphate (pH 7.0)/methanol=65/35
Flow Rate:	1.0 mL/min
Injection Volume:	288 nm
Temperature:	30 ℃
Injection Volume:	20 µL

Ordering Information

Ultisil® PFP

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00224-21009	H00224-21068	H00224-21010	H00224-21011	H00224-21012	H00224-21013	H00224-21014	H00224-21015	H00224-21016	-	H00808-23019	00808-01107
	3.0	H00224-21018	H00224-21069	H00224-21019	H00224-21020	H00224-21021	H00224-21022	H00224-21023	H00224-21024	H00224-21025	-	H00808-23019	00808-01107
	4.0	H00224-21027	H00224-21070	H00224-21028	H00224-21029	H00224-21030	H00224-21031	H00224-21032	H00224-21033	H00224-21034	-	H00808-03024	00808-01101
	4.6	H00224-21036	H00224-21071	H00224-21037	H00224-21038	H00224-21039	H00224-21040	H00224-21041	H00224-21042	H00224-21043	-	H00808-03024	00808-01101
5 µm 120 Å	2.1	H00224-31009	H00224-31068	H00224-31010	H00224-31011	H00224-31012	H00224-31013	H00224-31014	H00224-31015	H00224-31016	-	H00808-24035	00808-01107
	3.0	H00224-31018	H00224-31069	H00224-31019	H00224-31020	H00224-31021	H00224-31022	H00224-31023	H00224-31024	H00224-31025	-	H00808-24035	00808-01107
	4.0	H00224-31027	H00224-31070	H00224-31028	H00224-31029	H00224-31030	H00224-31031	H00224-31032	H00224-31033	H00224-31034	H00224-31035	H00808-04024	00808-01101
	4.6	H00224-31036	H00224-31071	H00224-31037	H00224-31038	H00224-31039	H00224-31040	H00224-31041	H00224-31042	H00224-31043	H00224-31044	H00808-04024	00808-01101

Ultisil® F-C8

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120Å	2.1	H00222-21009	H00222-21068	H00222-21010	H00222-21011	H00222-21012	H00222-21013	H00222-21014	H00222-21015	H00222-21016	-	H00808-23021	00808-01107
	3.0	H00222-21018	H00222-21069	H00222-21019	H00222-21020	H00222-21021	H00222-21022	H00222-21023	H00222-21024	H00222-21025	-	H00808-23021	00808-01107
	4.0	H00222-21027	H00222-21070	H00222-21028	H00222-21029	H00222-21030	H00222-21031	H00222-21032	H00222-21033	H00222-21034	-	H00808-03023	00808-01101
	4.6	H00222-21036	H00222-21071	H00222-21037	H00222-21038	H00222-21039	H00222-21040	H00222-21041	H00222-21042	H00222-21043	-	H00808-03023	00808-01101
5 µm 120Å	2.1	H00222-31009	H00222-31068	H00222-31010	H00222-31011	H00222-31012	H00222-31013	H00222-31014	H00222-31015	H00222-31016	-	H00808-24036	00808-01107
	3.0	H00222-31018	H00222-31069	H00222-31019	H00222-31020	H00222-31021	H00222-31022	H00222-31023	H00222-31024	H00222-31025	-	H00808-24036	00808-01107
	4.0	H00222-31027	H00222-31070	H00222-31028	H00222-31029	H00222-31030	H00222-31031	H00222-31032	H00222-31033	H00222-31034	H00222-31035	H00808-04038	00808-01101
	4.6	H00222-31036	H00222-31071	H00222-31037	H00222-31038	H00222-31039	H00222-31040	H00222-31041	H00222-31042	H00222-31043	H00222-31044	H00808-04038	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

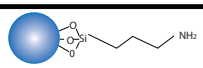
Ultisil® HILIC Column (HILIC Silica & HILIC NH_2)

HILIC (Hydrophilic Interaction Liquid Chromatography) is a separation mode achieved through the partitioning of polar solutes from high concentration, water-miscible, organic mobile phase into hydrophilic surface environment.

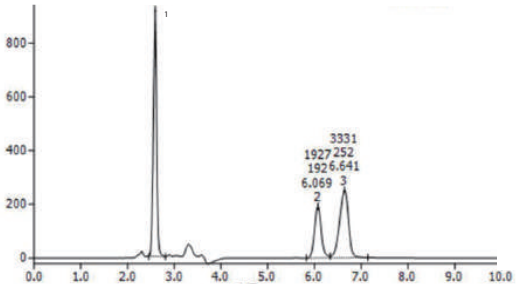
Ultisil® Hilic Silica

Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L3
Endcapped	No

Ultisil® HILIC-NH_2

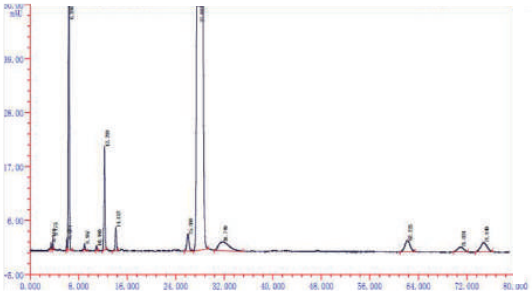
Structural Formula	
pH Range	2.0-8.0
Particle Size	3 μm, 5 μm,10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	4(120 Å)
USP List	L8
Endcapped	No

Glutamine (Gln)



Column:	Ultisil® HILIC Silica, 4.6 ×250 mm, 5 μm
Mobile Phase:	Acetonitrile/0.01mol/L ammonium acetate =65/35
Flow Rate:	1.0 mL/min
Detector:	215 nm
Temperature:	Ambient
Injection Volume:	20 μL
Samples:	Glutamine, chloropropylamine glutamine, dipeptiven

Alanyl Glutamine Injection



Column:	Ultisil® HILIC-NH_2, 4.6 ×250 mm, 5μm
Mobile Phase:	Acetonitrile/0.05 mol/L kH_2PO_3(adjust pH 4.0 with H_3PO_4) =65/35
Flow Rate:	0.7 mL/min
Detector:	215 nm
Temperature:	30°C
Injection Volume:	20 μL
Note:	Use the mobile phase to fully activate the column before testing the sample on the column

Ordering Information

Ultisil® HILIC Silica

Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250	10mm length	
3 μm 120 Å	4.6	H00228-21041	H00228-21042	H00228-21043	H00808-03026	00808-01101
5 μm 120 Å	4.6	H00228-31041	H00228-31042	H00228-31043	H00808-04044	00808-01101
10 μm 120 Å	4.6	H00228-41041	H00228-41042	H00228-41043	H00808-05016	00808-01101

Ultisil® HILIC NH_2

Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	250	300	10mm length	
3 μm120 Å	4.6	H00231-21041	H00231-21042	H00231-21043	H00808-03025	00808-01101
5 μm 120 Å	4.6	H00231-31041	H00231-31042	H00231-31043	H00808-04047	00808-01101
10 μm 120 Å	4.6	H00231-41041	H00231-41042	H00231-41043	H00808-05017	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® HILIC Amide

Ultisil® HILIC Amide column is a special column designed for HILIC mode. As amide group has strong hydrophilicity, stability and electrically neutral, Ultisil® Amide has longer life, better separation repeatability and peak shape than NH_2 phase does.

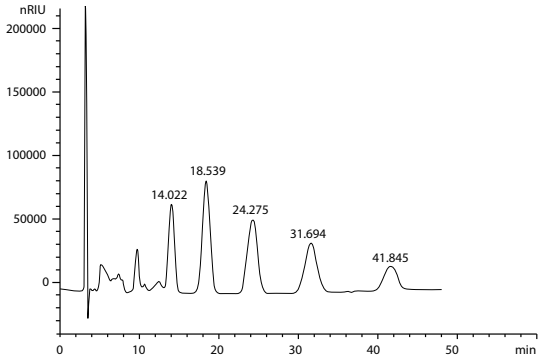
Features

- Based on silica bonded with amide groups, appropriate for the separation of hydrophilic samples
- Multiple actions such as hydrogen bond, molecular and electrostatic interactions
- Good compatibility with many kinds of detectors, such as MS detector
- Stable in organic mobile phase that contains water

Ultisil® HILIC Amide

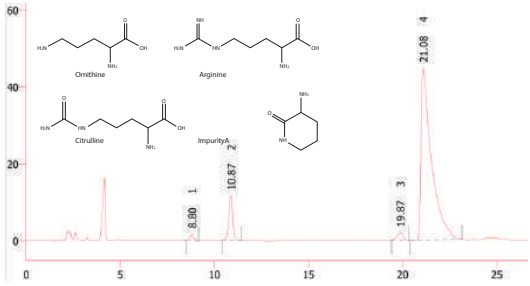
pH Range	2.0-8.0	Carbon Loading(%)	7(120 Å)
Particle Size	3 µm, 5 µm,10 µm	USP List	L68
Surface Area(m^2/g)	320(120 Å)	Endcapped	N/A

Fructo-oligose



Column:	Ultisil® HILIC Amide, 4.6 ×250 mm, 5 µm
Mobile Phase:	Acetonitrile/water =70/30
Detector:	RID (40°C)
Temperature:	40°C
Flow Rate:	1.0mL/min
Injection Volume:	20µL
Mixed Standards:	Sucrose, kestose, nystose, megazyme, 1F-Fructofuranosyl nystose)

Ornithine hydrochloride



Column:	Ultisil® HILIC Amide, 4.6 ×250 mm, 5 µm
Mobile Phase:	20 mmol/L KH_2PO_4（pH5.6）/acetonitrile =38/62
Detector:	205 nm
Temperature:	30°C
Flow Rate:	1.0mL/min
Injection Volume:	20µL
Samples in order:	1．Citrulline 2．Impurity A 3．Arginine 4．Ornithine

Ordering Information

Ultisil® HILIC Amide

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm 120 Å	2.1	H00240-21009	H00240-21068	H00240-21010	H00240-21011	H00240-21012	H00240-21013	H00240-21014	H00240-21015	H00240-21016	-	H00808-23010	00808-01107
	3.0	H00240-21018	H00240-21069	H00240-21019	H00240-21020	H00240-21021	H00240-21022	H00240-21023	H00240-21024	H00240-21025	-	H00808-23010	00808-01107
	4.0	H00240-21027	H00240-21070	H00240-21028	H00240-21029	H00240-21030	H00240-21031	H00240-21032	H00240-21033	H00240-21034	-	H00808-03021	00808-01101
	4.6	H00240-21036	H00240-21071	H00240-21037	H00240-21038	H00240-21039	H00240-21040	H00240-21041	H00240-21042	H00240-21043	-	H00808-03021	00808-01101
5 µm 120 Å	2.1	H00240-31009	H00240-31068	H00240-31010	H00240-31011	H00240-31012	H00240-31013	H00240-31014	H00240-31015	H00240-31016	-	H00808-24025	00808-01107
	3.0	H00240-31018	H00240-31069	H00240-31019	H00240-31020	H00240-31021	H00240-31022	H00240-31023	H00240-31024	H00240-31025	-	H00808-24025	00808-01107
	4.0	H00240-31027	H00240-31070	H00240-31028	H00240-31029	H00240-31030	H00240-31031	H00240-31032	H00240-31033	H00240-31034	H00240-31035	H00808-04025	00808-01101
	4.6	H00240-31036	H00240-31071	H00240-31037	H00240-31038	H00240-31039	H00240-31040	H00240-31041	H00240-31042	H00240-31043	H00240-31044	H00808-04025	00808-01101
10 µm 120 Å	4.6	-	-	-	-	-	-	H00240-41041	H00240-41042	H00240-41043	H00240-41044	H00808-05018	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

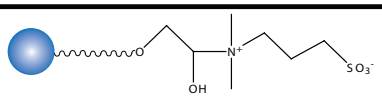
Ultisil® HILIC Amphion II

Ultisil® HILIC Amphion II is a newly developed HILIC column, using amphion-bonded silica as packing material. It applies to the separation of most polar compounds, using acetonitrile or Water other than ion-pairing reagents as mobile phase. The Amphion, containing both Positive Charge Centre and Negative Charge Centre, brings high retention for acid and alkaline compounds through ion-exchange mechanism. Compared with common HILIC packing materials like silica and amino groups, the Amphion-bonded packing material provides better reproducibility and stability.

Features

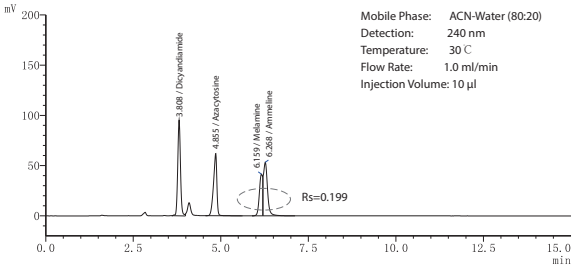
- Amphion-bonded silica stationary phase
- Enhanced hydrophilic interaction brings higher retention for polar and hydrophilic compounds
- Different selectivity from common HILIC packing materials
- Simple mobile phase used for the separation of polar compounds

Ultisil® HILIC Amphion

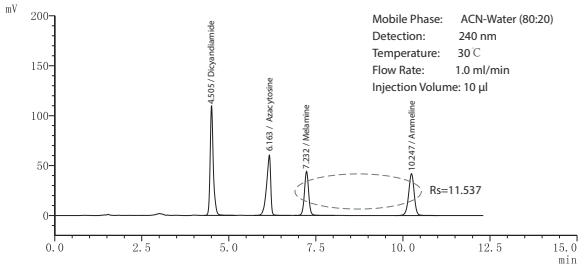
Structural Formula	
pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	6(120 Å)
USP List	L114
Endcapped	N/A

Comparison

Separation of 4 Polar Compounds (Dicyandiamide, Azacytosine, Melamine, Ammeline)

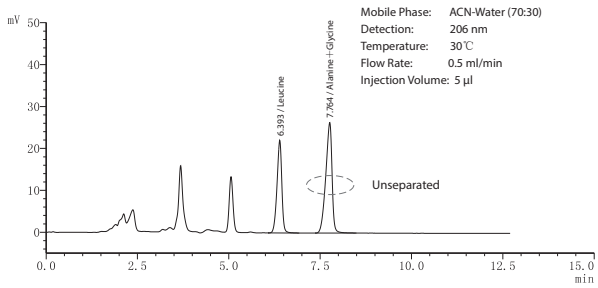


Ultisil® Hilic SiO_2, 5 μm, 4.6×250 mm

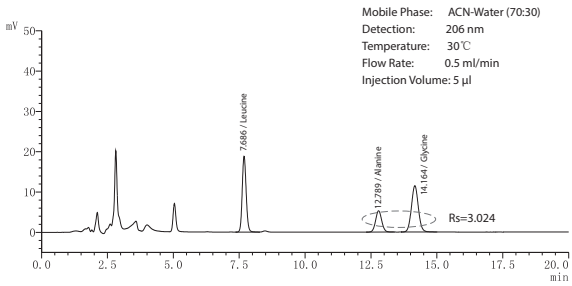


Ultisil® Amphion Ⅱ, 5 μm, 4.6×150 mm

Separation of 3 Aliphatic Amino Acids (Leucine, Alanine, Glycine)



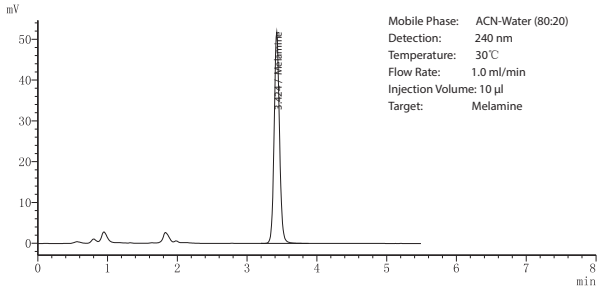
Ultisil® Hilic SiO_2, 5 μm, 4.6×150 mm



Ultisil® Amphion Ⅱ, 5 μm, 4.6×150 mm

Determination of Melamine

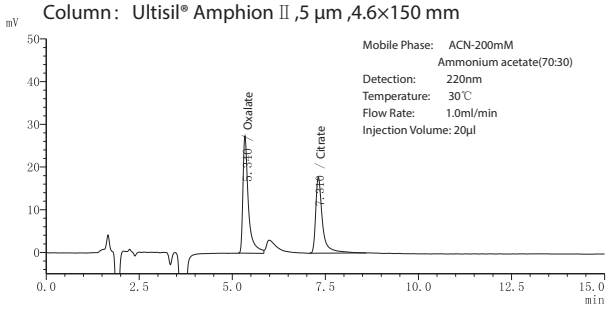
Column： Ultisil® Amphion Ⅱ ,5 μm ,4.6×150 mm



Rt	Plates	Tailing Factor
3.424	8087	1.094

Separation of Citrate and Oxalate

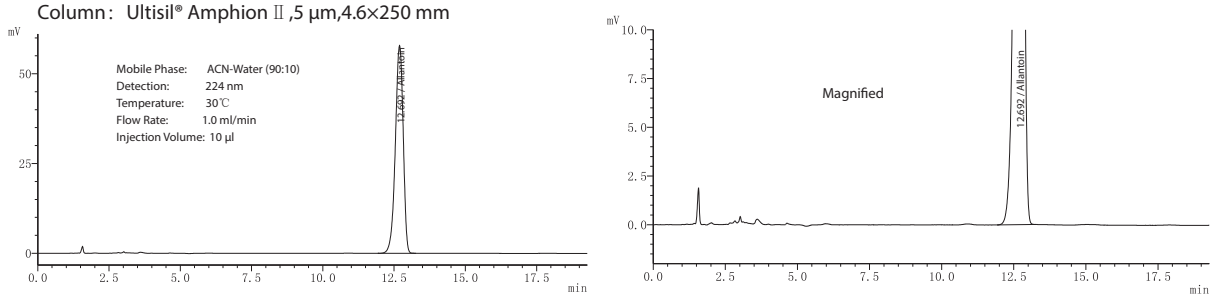
Column： Ultisil® Amphion Ⅱ ,5 μm ,4.6×150 mm



Compound	Rt	Plates	Resolution
Oxalate	5.340	7540	--
Citrate	7.310	9487	7.214

Determation of Allantoin

Column： Ultisil® Amphion Ⅱ ,5 μm,4.6×250 mm



Rt	Plates	Tailing
12.692	10196	Factor0.8

Before use, flush with 50 column volumes of mobile phase (acetonitrile/water, 80:20) to equilibrate. Before injection, flush with 20 column volumes of mobile phase to equilibrate. For gradient analysis, flush with 10 column volumes of original mobile phase between

Note:

1) Shifts of retention time may occur, if not sufficiently equilibrated.

2) Acetonitrile is the most common mobile phase solvent in HILIC mode. Other water-soluble polar organic solvents can also be used as mobile phases. The comparison of elution strength is:THF<Acetone<Acetonitrile<Isopropanol<Ethanol<Methanol<Water.

3) Long-period equilibration required, after using buffer salt mobile phase (like ammonium formate, ammonium acetate etc.) and buffer salt being flushed off.

4) After use, flush off the buffer salt in the column and store in 100% acetonitrile solvent.

Ultisil® HILIC Amphion II

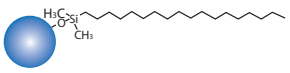
Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 μm 120 Å	2.1	H00274-31009	H00274-31068	H00274-31010	H00274-31011	H00274-31012	H00274-31013	H00274-31014	H00274-31015	H00274-31016		H00808-24039	00808-01107
	3.0	H00274-31018	H00274-31069	H00274-31019	H00274-31020	H00274-31021	H00274-31022	H00274-31023	H00274-31024	H00274-31025	-	H00808-24039	00808-01107
	4.0	H00274-31027	H00274-31070	H00274-31028	H00274-31029	H00274-31030	H00274-31031	H00274-31032	H00274-31033	H00274-31034	H00274-31035	H00808-04029	00808-01101
	4.6	H00274-31036	H00274-31071	H00274-31037	H00274-31038	H00274-31039	H00274-31040	H00274-31041	H00274-31042	H00274-31043	H00274-31044	H00808-04029	00808-01101

Don’t see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Amino Acid

Ultisil® Amino Acid HPLC columns are made from spherical, totally porous, and ultra-high purity (>99.999%) type B silica particles. Our proprietary surface modification before bonding generates a very smooth and uniform surface with less acidic surface silanol. Ultisil® Amino Acid columns provide the best performance in peak shape, efficiency and resolution for the analysis of 18 amino acids. Complete sample preparation can be achieved in as short as 30 min.

Ultisil® AA(Amino Acid)

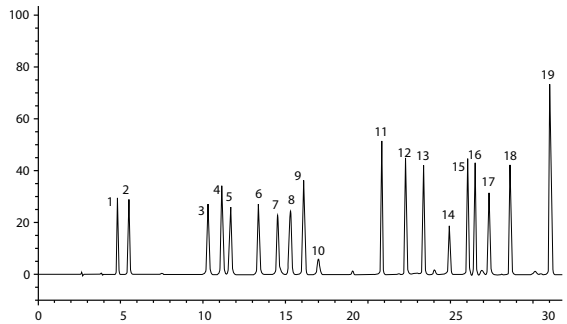
Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	17(120 Å)
USP List	L1
Endcapped	Yes

Ultisil® Amino Acid Method Package

Ultisil® Amino Acid Method Package

- Ultisil® Amino Acid Column (5 µm, 4.6×250 mm), 1 pk
- Amino Acid Standards, 2 bottles. 1 mL/bottle
- Derivatization reagent A
- Derivatization reagent B
- Ultisil® AA method brochure

Separation of 18 Amino Acids



1. Aspartic Acid	2. Glutamic acid
3. Serine	4. Glycine
5. Histidine	6. Arginine
7. Threonine	8. Alanine
9. Proline	10. Ammonium chloride
11. Tyrosine	12. Valine
13. Methionine	14. Cystine
15. Isoleucine	16. Leucine
17. Norleucine	18. Phenylalanine
19. Lysine	

Ordering Information

	P/N	Description
Ultisil® Amino Acid Method Package (P/N 00840-01000)	H00211-31043	Ultisil® Amino Acid Column (4.6×250 mm, 5 µm), 1 pk
	00814-01027 (A)	Derivatization reagent A, 1 bottle, 10 mL/bottle
	00814-01027 (B)	Derivatization reagent B, 1 bottle, 10 mL/bottle
	00814-01030	Derivatization reagent diluent, 6 bottles, 20 mL/bottle
	00815-01001	Amino Acid Standards, 2 bottles. 1 mL/bottle
		Welch Ultisil® AA method brochure

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Amino Acid Plus

Ultisil® Amino Acid Plus column is a dedicated column which through further optimizing the analysis method on the basis of the original column for amino acid analysis. It uses an evaporative light scattering detector to detect more kinds of amino acids with higher stability without derivation of amino acid.

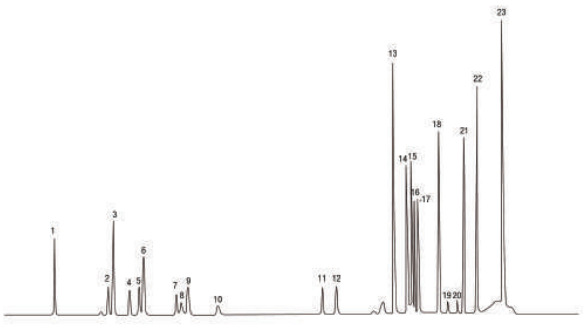
Ultisil® Amino Acid Plus

pH Range	1.0-7.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	10(120 Å)
USP List	L1
Endcapped	Yes

Features

- Separate 23 amino acids by reverse-phase chromatographic analysis without the need of derivation, which makes amino acid analysis more convenient and flexible
- Amino acids which separated and derived from proteolytic products, cell culture medium, food and feed have better resolution
- The special column for amino acid analysis has superb reproducibility and stability, ensuring the stability and reliability of quantitative and qualitative analysis results
- Excellent selectivity and separation, allowing you to get more accurate analysis results
- Multiple interference factors such as reagents, by-products and solvents can be removed by fast extraction
- Adhere to strict quality control standards, each column had been tested with 23 amino acids before sold, ensuring the reliability of the results

Separation of 23 Amino Acids



1. Taurine	2. Glycine
3. Serine	4. Aspartic acid
5. Hydroxyproline	6. Glutamine
7. Threonine	8. Alanine
9. Glutamic acid	10. Cysteine
11. Proline	12. Cystine
13. Valine	14. Lysine
15. Histidine	16. Methionine
17. Tyrosine	18. Arginine
19. Isoleucine	20. Leucine
21. Norleucine	22. Phenylalanine
23. Tryptophan	

Ordering Information

P/N	Description
H00279-31044	Ultisil® Amino Acid Plus Column (4.6×300 mm, 5 μm)

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® OAA(Organic Acids)

Ultisil® OAA is a dedicated reversed-phase column developed by Welch Materials for the detection of water-soluble organic acids. It is designed for efficient and high-throughput organic acid analysis. Compared with the conventional reversed- phase C18 column, OAA column has better performance and higher resolution with more uniform peaks through improvement of the unique bonding technology.

For water-soluble organic acids with larger polarity, if the proportion of organic phase reduces to 5% on C18 column, effective retention may not be achieved. Further reduction of the organic phase or even 100% of the aqueous phase, is prone to cause phase collapse. With optimized bonding technology and the surface hydrophilic treatment of packing materials, Ultisil® OAA column can greatly improve the column's resistance to aqueous phase and the peak shape of organic acid compounds.

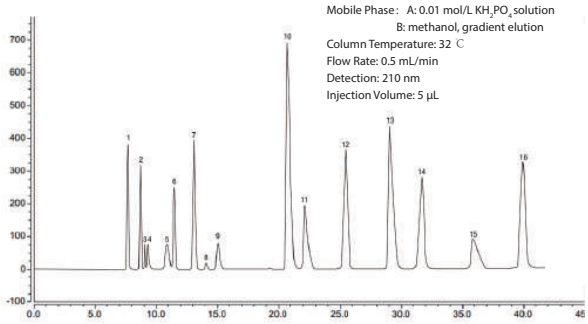
Ultisil® OAA

pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	10(120 Å)
USP List	L1
Endcapped	Yes

Features

- Excellent separation ability for hydrophilic organic acids
- Each column has been tested to ensure excellent hydrolysis stability for hydrophilic organic acid analysis
- Compatible with 100% aqueous phase, having good retention for polar compounds
- Ideal selectivity for a variety of organic acids, with high column efficiency and excellent peak shape
- Excellent in separating hydroxyl fatty acids and aromatic organic acids, optimal choice for organic acid analysis in the pharmaceutical industry, food and beverage detection industry

Separation of 16 kinds of organic acids



1. Oxalic acid	2. Tartaric acid
3. Quinic acid	4. Methanoic acid
5. Pyruvic acid	6. Malic acid
7. Ascorbic acid	8. Lactic acid
9. Acetic acid	10. Maleic acid
11. Citric acid	12. Fumaric acid
13. Cis-aconitic acid	14. Acrylic acid
15. Propionic acid	16. Citraconic acid

Ordering Information

P/N	Description
H00278-31044	Ultisil® OAA Column (4.6×300 mm, 5 μm)

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Mixed Mode Phase(MM C18/SCX & MM NH_2/CN)

Uitisil® Mixed mode phase, whose selectivity is totally different from conventional reversed phase, is a new packing material that is the development trend of liquid chromatography. There are three modes in the mixed mode phase: reversed phase/anion exchange, reversed phase/cation exchange, reversed phase/amphoteric compound.

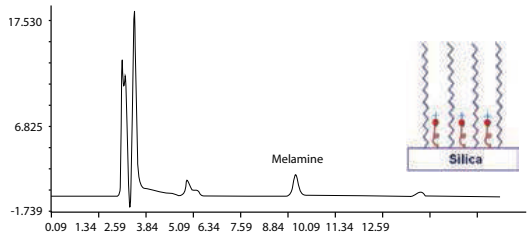
Ultisil® MM C18/SCX

pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	/
Endcapped	N/A

Ultisil® MM NH_2/CN

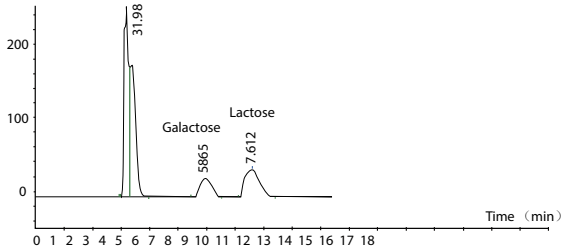
pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	/
Endcapped	N/A

Analysis of Melamine



Column:	Ultisil® MM C18/SCX, 4.6 ×250 mm, 5 μm
Mobile Phase:	0.01 M NH_4AC(pH3.0)/acetonitrile=62/38
Detector:	240 nm
Temperature:	40°C
Flow Rate:	1.0 mL/min
Injection Volume:	20 μL

Separation of Lactose and Galactose



Column:	Ultisil® MM NH_2/CN, 4.6 ×250 mm, 5 μm
Mobile Phase:	Acetonitrile/water =70/30
Detector:	RID (40°C)
Temperature:	45°C
Flow Rate:	1.0 mL/min
Injection Volume:	20 μL

Ultisil® MM C18/SCX

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 μm 120 Å	2.1	H00235-31009	H00235-31068	H00235-31010	H00235-31011	H00235-31012	H00235-31013	H00235-31014	H00235-31015	H00235-31016	-	H00808-24032	00808-01107
	3.0	H00235-31018	H00235-31069	H00235-31019	H00235-31020	H00235-31021	H00235-31022	H00235-31023	H00235-31024	H00235-31025	-	H00808-24032	00808-01107
	4.0	H00235-31027	H00235-31070	H00235-31028	H00235-31029	H00235-31030	H00235-31031	H00235-31032	H00235-31033	H00235-31034	H00235-31035	H00808-04032	00808-01101
	4.6	H00235-31036	H00235-31071	H00235-31037	H00235-31038	H00235-31039	H00235-31040	H00235-31041	H00235-31042	H00235-31043	H00235-31044	H00808-04032	00808-01101

Ultisil® MM NH_2/CN

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 μm 120 Å	2.1	H00243-31009	H00243-31068	H00243-31010	H00243-31011	H00243-31012	H00243-31013	H00243-31014	H00243-31015	H00243-31016	-	H00808-24041	00808-01107
	3.0	H00243-31018	H00243-31069	H00243-31019	H00243-31020	H00243-31021	H00243-31022	H00243-31023	H00243-31024	H00243-31025	-	H00808-24041	00808-01107
	4.0	H00243-31027	H00243-31070	H00243-31028	H00243-31029	H00243-31030	H00243-31031	H00243-31032	H00243-31033	H00243-31034	H00243-31035	H00808-04037	00808-01101
	4.6	H00243-31036	H00243-31071	H00243-31037	H00243-31038	H00243-31039	H00243-31040	H00243-31041	H00243-31042	H00243-31043	H00243-31044	H00808-04037	00808-01101

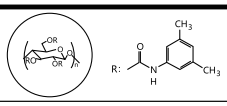
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Chiral Column

Ultisil® Chiral Columns are based on spherical silica particles coated with chiral polymers (amylose derivatives or cellulose derivatives). Welch offers 5 μm and 10 μm particles, and four types of chiral columns: Cellu-D, Cellu-J, Amy-D and Amy-s. 80% of all racemic compounds can be separated by these four chiral columns.

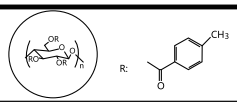
Ultisil® Cellu-D/Cellu-DR

Cellulose tris (3,5-dimethylphenylcarbamate) coated silica

Structural Formula	
pH Range	2.0-9.0
Particle Size	5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L40(Cellu-D), L93(Cellu-DR)
Endcapped	N/A

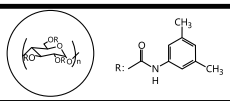
Ultisil® Cellu-J/Cellu-JR

Cellu-J/Cellu-JR: Cellulose tris (4-methyl benzoate) coated silica

Structural Formula	
pH Range	2.0-9.0
Particle Size	5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L80(Cellu-J), L107(Cellu-JR)
Endcapped	N/A

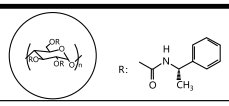
Ultisil® AMY-D/AMY-DR

Amylose tris (3,5-dimethylphenylcarbamate) coated silica

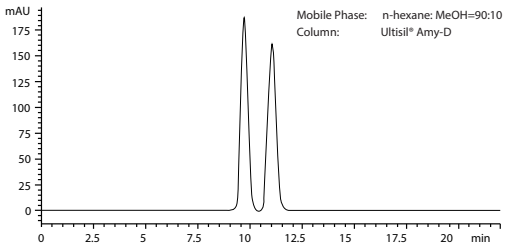
Structural Formula	
pH Range	2.0-9.0
Particle Size	5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L51
Endcapped	N/A

Ultisil® Amy-S/Amy-SR

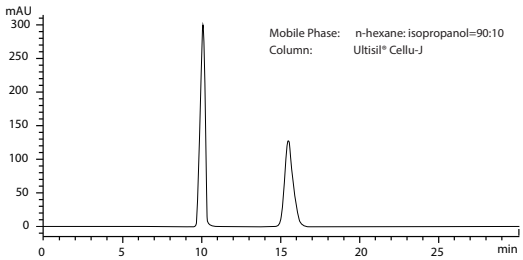
Amylose tris [(S)-α-methylphenyl carbamate] coated Silica

Structural Formula	
pH Range	2.0-9.0
Particle Size	5 μm, 10 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L90
Endcapped	N/A

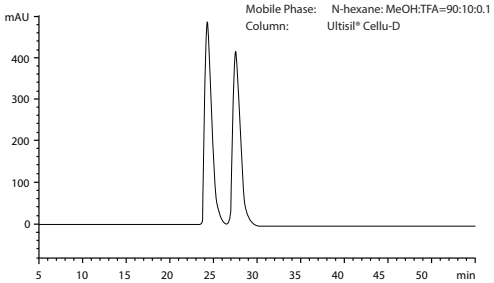
Fenamiphos



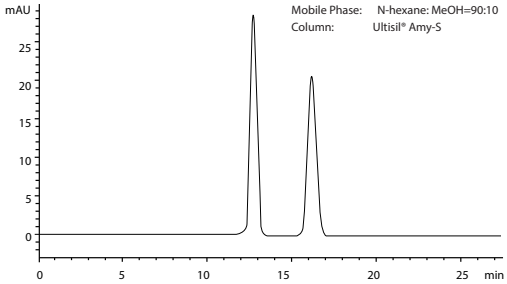
Tr ŏger's Base



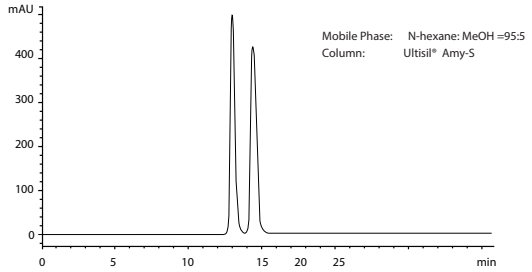
DL-Repaglinide



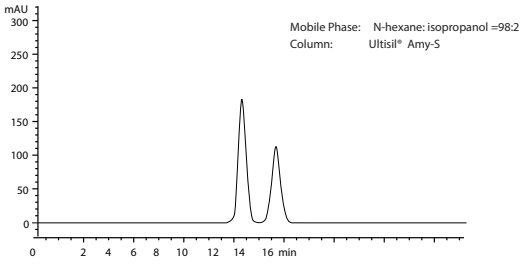
Myclobutanil



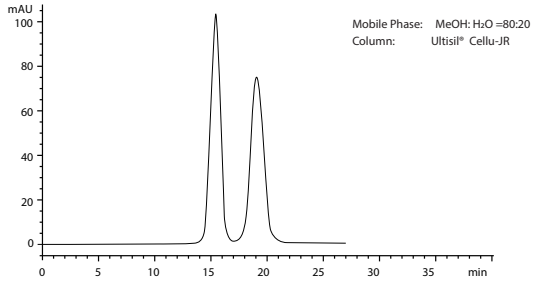
Quizalofop-ethyl



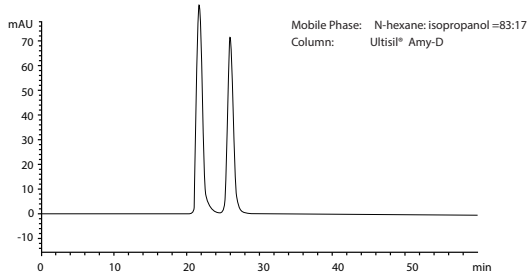
Oxirane,2-[(phenylmethoxy)methyl]-



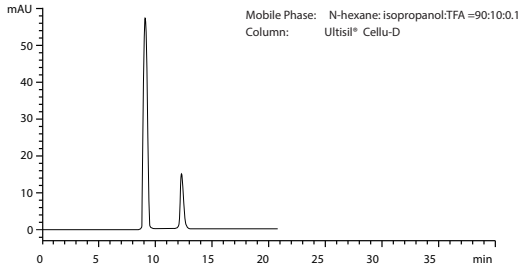
Llaprazole



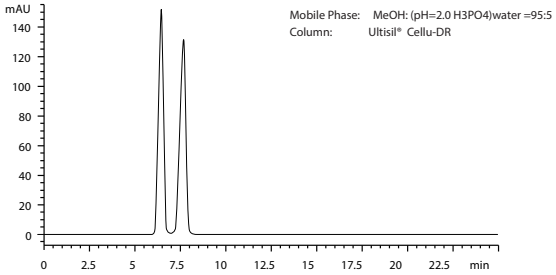
Omeprazole



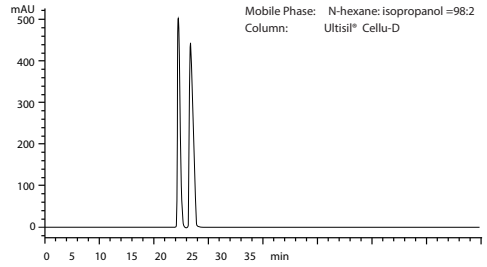
Alkannin



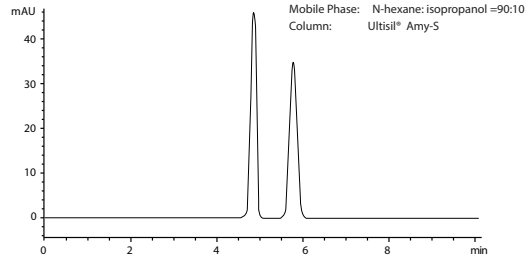
Fmoc-Leu-OH



Butylphthalide



Hexaconazole



Ordering Information

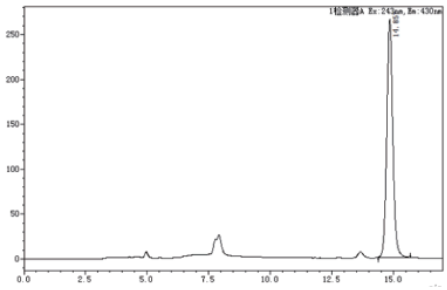
	Particle size	Column ID(mm)	Column Length (mm)		Guard Cartridge	Cartridge holder
			150	250	10mm length	
Cellu-D	5 μm	4.6	H00219-31041	H00219-31043	H00808-04014	00808-01101
	10 μm	4.6	H00219-41041	H00219-41043	H00808-05021	00808-01101
Cellu-DR	5 μm	4.6	H00262-31041	H00262-31043	H00808-04014-R	00808-01101
	10 μm	4.6	H00262-41041	H00262-41043	H00808-05021-R	00808-01101
Amy-D	5 μm	4.6	H00221-31041	H00221-31043	H00808-04040	00808-01101
	10 μm	4.6	H00221-41041	H00221-41043	H00808-05022	00808-01101
Amy-DR	5 μm	4.6	H00264-31041	H00264-31043	H00808-04040-R	00808-01101
	10 μm	4.6	H00264-41041	H00264-41043	H00808-05022-R	00808-01101

	Particle size	Column ID(mm)	Column Length (mm)		Guard Cartridge	Cartridge holder
			150	250	10mm length	
Cellu-J	5 μm	4.6	H00218-31041	H00218-31043	H00808-04039	00808-01101
	10 μm	4.6	H00218-41041	H00218-41043	H00808-05023	00808-01101
Cellu-JR	5 μm	4.6	H00261-31041	H00261-31043	H00808-04039-R	00808-01101
	10 μm	4.6	H00261-41041	H00261-41043	H00808-05023-R	00808-01101
Amy-S	5 μm	4.6	H00220-31041	H00220-31043	H00808-04041	00808-01101
	10 μm	4.6	H00220-41041	H00220-41043	H00808-05024	00808-01101
Amy-SR	5 μm	4.6	H00263-31041	H00263-31043	H00808-04041-R	00808-01101
	10 μm	4.6	H00263-41041	H00263-41043	H00808-05024-R	00808-01101

Ultisil® Zn Column

As a zinc powder reduction column designed for the detection of vitamin K1 or similar substances, Ultisil® Zn column uses zinc powder as packing materials with specifications of 4.6 mm×50 mm and particle size of 50-70μm.

Determination of vitamin K1 in spinach



Column:	Ultisil® AQ-C18 4.6×250mm, 5μm Ultisil® Zn 4.6×50mm
Mobile Phase:	900 mL methanol, 100 mL tetrahydrofuran, 0.3 mL peracetic acid. Add 1.5 g zinc oxide and 0.5 g anhydrous sodium acetate after mixing.
Flow Rate:	1 mL/min
Detector:	243 nm/430nm
Temperature:	30°C
Injection Volume:	10 μL

Ordering Information

P/N	Description
H00225-51037	Ultisil® Zn (4.6×50mm)

Ultisil® Lead Oxide Column

Ultisil® Lead oxide column was specially designed for the detection of malachite green and colorless malachite green in aquatic products by HPLC methods in SC/3021-2004 standard. Because the colorless malachite green fails to absorb in the visible, it is necessary to use this column to oxidize colorless malachite green to malachite green, which solves the difficulty of UV detection of colorless malachite green.

Ordering Information

Specification	Ultisil® Lead Oxide	
	25%PbO_2	50%PbO_2
4.6×35 mm	H00238-51036	H00239-51036
4.6×50 mm	H00238-51037	H00239-51037
4.0×50 mm	H00238-51028	H00239-51028

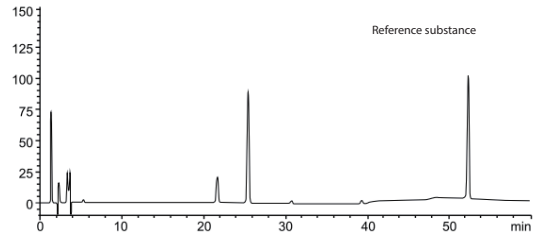
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

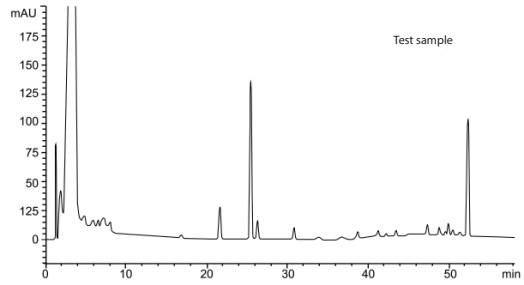
Ultisil® PG-C18

Ultisil® PG-C18 column is a new generation of dedicated column which has unique selectivity for the analysis of ginsenoside with good peak symmetry and high column efficiency. As active ingredients in panax notoginseng, ginseng, red ginseng and American ginseng, Ginsenosides Rg1 and Re also have similar chromatographic properties. It is usually difficult to achieve a resolution of 1.5 on conventional C18 columns (i.e., baseline separation) for that they are very sensitive to the proportion of acetonitrile in the mobile phase. Even a 1% nuance in that will cause a great change in their appearing time, so they can only be seen and separated on the C18 column at about 20% of acetonitrile. Due to this special property, the choice of adjusting the mobile phase to increase the resolution is restricted.

pH Range	2.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	10(150 Å)
USP List	L1
Endcapped	No

Panax Notoginseng Saponins





Column:	Ultisil® PG-C18, 4.6×250 mm, 5 µm
Mobile Phase:	A: water B: acetonitrile
Gradient Program:	Time(min) A(%) B(%) 0 81 19 12 81 19 60 64 36
Flow Rate:	1.0 mL/min
Injection Volume:	203 nm
Temperature:	25°C

Ordering Information

P/N	Description
H00276-31743	Ultisil® PG-C18 (4.6×250mm)

Xtimate® Series HPLC Column

---Next generation beyond mid-range priced Ultisil ® series

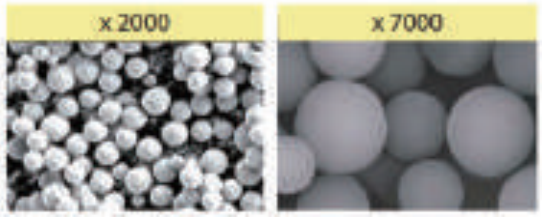
Features

- Extra pH range: wide pH range from 1.0 to 12.5, excellent peak shape for strong bases
- Extra column lifetime: 5 times of similar product such as Gemini
- Extra performance: column efficiency of 5μm columns is as high as 90000/m, 2-3 times of that of Xterra
- Extra care from Welch: enjoy excellent pre-sales and after-sales service from Welch

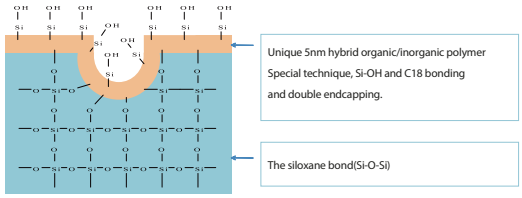
Xtimate® Silica Based HPLC Column

Xtimate® HPLC column derives its outstanding performance from a special hybrid particle based technique, which coats a unique 5nm organic/inorganic polymer layer on the silica surface, so that the pH range is extended to 1.0-12.5.

Xtimate® column is designed for HPLC method development. Regardless of the types of mobile phase or high temperature, Xtimate® HPLC column always has stable performance and long lifetime.

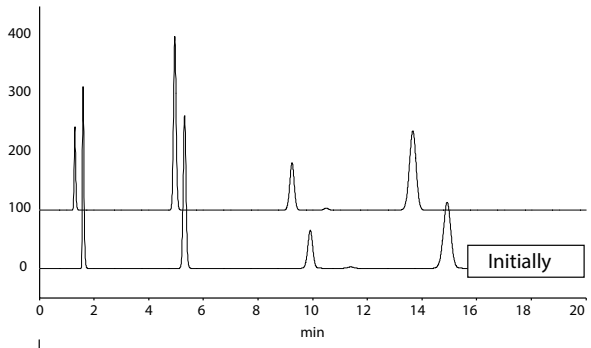


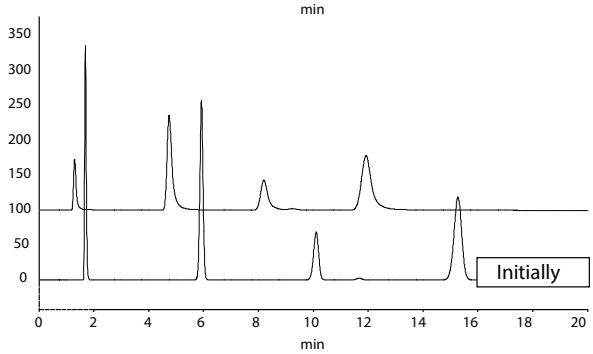
SEM of Hybrid particle



Hybrid Particles Based Xtimate Technology

Comparison of Peak Shape After Soaking In Base



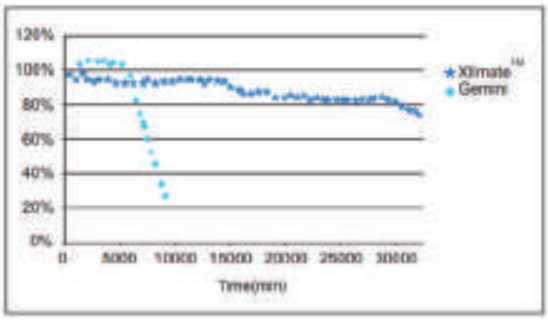


Column:	Xtimate® C18, 5 μm, 150 x 4.6 mm
Mobile Phase:	CH_3CN/0.01N-NaOHaq.(pH=12)=30/70
Flow Rate:	1.0ml/min
Temperature:	40°C
Soak Time:	4 hours

Column:	Ultisil® C18, 5 μm, 150 x 4.6 mm
Mobile Phase:	CH_3OH/H_2O=60/40
Flow Rate:	1.0 mL/min
Temperature:	40°C
Detector:	UV 254nm
Samples:	1.Uracil 2.Methyl benzoate 3.Toluence 4.Naphthalene

After test at pH 12 condition for 4h, the peak shape of hybrid particles based Xtimate® column shows no difference.

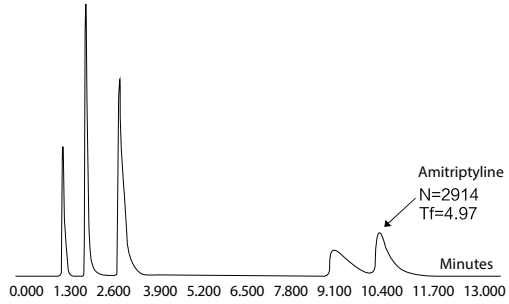
Lifetime Test Comparison: 5 Times Longer Than Gemini



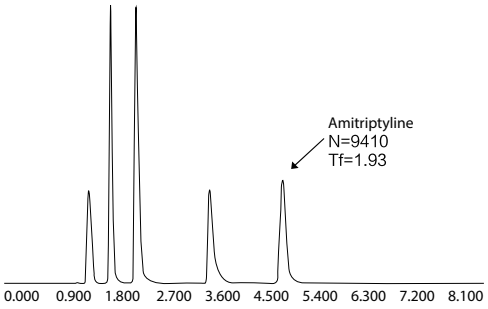
Column:	Xtimate® C18, 5 µm, 150x4.6 mm / Gemini C18, 5 µm, 150x4.6 mm
Mobile Phase:	A: 10mM Ammonium Bicarbonate pH 10.5 B: 90:10 Acetonitrile/buffer
Gradient Program:	0% to 100% B in 10min. 100% B for 7min. 0% B for 3min.
Flow Rate:	1.0 mL/min
Temperature:	50°C
Detector:	UV 254 nm
Samples:	1.Uracil 2.Methyl benzoate 3.Toluence 4.Naphthalene

Unprecedented Peak Shape

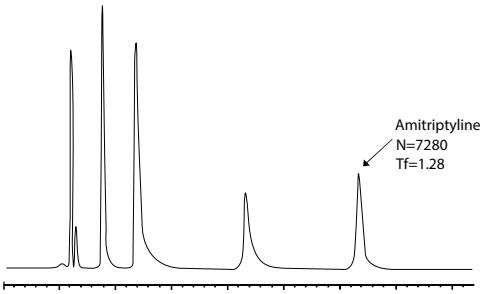
At mid pH, strong bases usually exhibit bad tailing due to secondary interactions between the analytes and the surface silaols. In Welch's unique technique, the hybrid layer totally covers the surface silanols and blocks analytes' access to these surface silanols. Improved bonding and endcapping further reduce silanol activity. As a result, hybrid particle based Xtimate® columns show unprecedented peak shape.



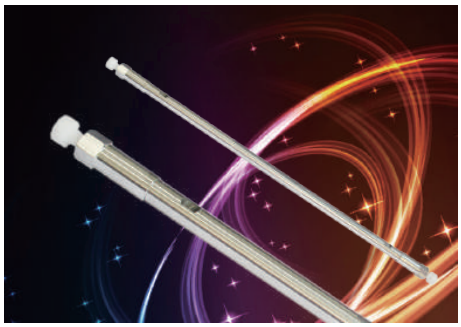
The detection of amitriptyline by poor endcapping product



The detection of Amitriptyline by Symmetry C18



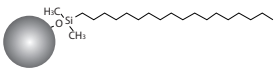
The detection of amitriptyline by Xtimate® C18



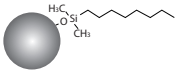
Xtimate® HPLC Column

Besides C18 and C8 bonded phases, Xtimate also provides C4, CN, Phenyl bonded phases.
Xtimate® applies a new special SmoothpakTM technique to C18, C8, C4, CN, Phenyl and amino phases, different than the bonding method of other series. As a result, Xtimate® provides a different selectivity, improved stability and reproducibility. In particular, for the Phenyl phase of Phenyl-Hexyl, Xtimate® is totally different from Ultisil® Phenyl. Xtimate® Phenyl phase's longer hexyl group provides extra hydrocarbon interaction and longer retention than conventional phenyl-propyl phase; it also provides better chemical stability. Welch also adds polar embedded phase, Polar-RP on Xtimate® particles, to further improve peak shape for very polar and strong basic

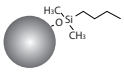
Xtimate® C18

Structural Formula	
pH Range	1.0-12.5
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	14(120 Å)
USP List	L1
Endcapped	Yes

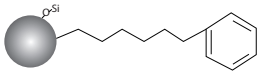
Xtimate® C8

Structural Formula	
pH Range	1.0-12.5
Particle Size	3 µm, 5 µm, 10 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	10(120 Å)
USP List	L7
Endcapped	Yes

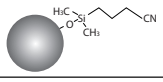
Xtimate® C4

Structural Formula	
pH Range	1.0-12.5
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	8(120 Å)
USP List	L26
Endcapped	Yes

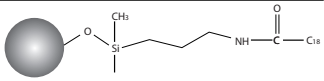
Xtimate® Phenyl-Hexyl

Structural Formula	
pH Range	1.0-12.5
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L11
Endcapped	Yes

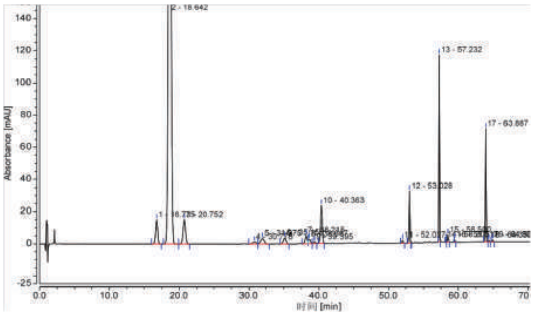
Xtimate® CN

Structural Formula	
pH Range	1.0-12.5
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	7(120 Å)
USP List	L10
Endcapped	Yes

Xtimate® Polar-RP

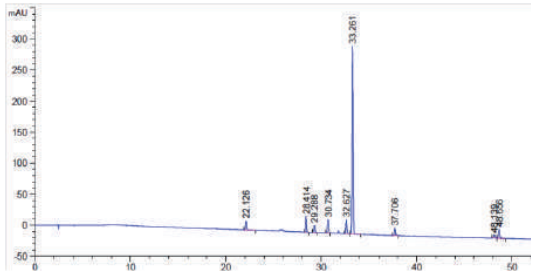
Structural Formula	
pH Range	1.0-12.5
Particle Size	5 µm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	16(120 Å)
USP List	L1
Endcapped	Yes

Rosuvastatin Calcium



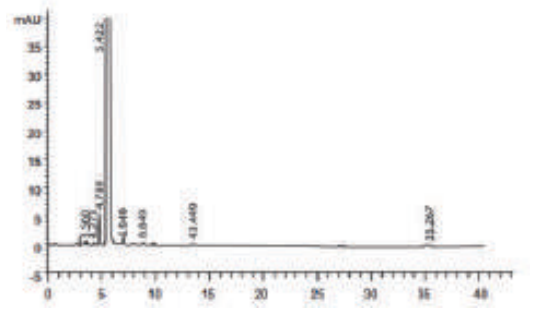
Column:	Xtimate® C18, 3.0 ×150 mm, 3 μm
Mobile Phase:	A: 1% TFA/acetonitrile/water=1/29/70 B: 1% TFA/acetonitrile/water=1/75/24
	Time(min) A(%) B(%) 0-30 100 0 30-50 100-50 0-40 50-60 60-0 40-100 60-70 0 100
Flow Rate:	0.75 mL/min
Temperature:	40°C
Detector:	242 nm
Injection Volume:	10 μL

Cangrelor



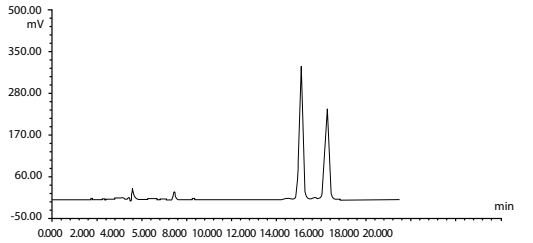
Column:	Xtimate® C18, 4.6 ×250 mm, 5 μm
Mobile Phase:	Mobile phase A: 0.05 mol/L K_2HPO_4(pH 8.5) Mobile Phase B: acetonitrile
	Time(min) A(%) B(%) 0 95 5 3 95 5 35 67 33 50 60 40 60 35 65 65 35 65 66 95 5 75 95 5
Flow Rate:	1.0 mL/min
Temperature:	25°C
Detector:	242 nm
Injection Volume:	5 μL

Valaciclovir Hydrochloride



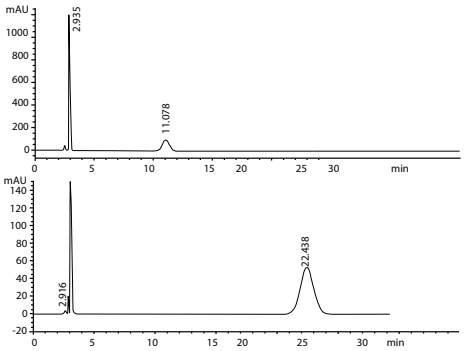
Column:	Xtimate® Phenyl-Hexyl, 250 x 4.6 mm, 5 μm
Mobile Phase:	Methanol/0.01mol/L KH_2PO_4(pH3.0)=15/85
Flow Rate:	1.0 mL/min
Temperature:	35°C
Detector:	251 nm
Injection Volume:	20 μL

Omeprazole



Column:	Xtimate® C8, 250 x 4.6 mm, 5 μm
Mobile Phase:	10 mmoL/L Na_2HPO_4(pH7.4)/ Acetonitrile=70/30
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detector:	280 nm
Injection Volume:	20 μL

Enalapril Maleate



Column:	Xtimate® C8, 250 x 4.6 mm, 5 µm
Mobile Phase:	Phosphate buffer/acetonitrile=75/25
Flow Rate:	1.0mL/min
Temperature:	50°C
Detector:	280 nm
Injection Volume:	20 µL

Ordering Information

Xtimate® C18

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	00101-11009	00101-11071	00101-11010	00101-11011	00101-11012	00101-11013	00101-11014	00101-11015	00101-11016	-	00808-23101	00808-01107
	3.0	00101-11018	00101-11072	00101-11019	00101-11020	00101-11021	00101-11022	00101-11023	00101-11024	00101-11025	-	00808-23101	00808-01107
	4.0	00101-11027	00101-11073	00101-11028	00101-21029	00101-11030	00101-11031	00101-11032	00101-11033	00101-11034	-	00808-03101	00808-01101
	4.6	00101-11036	00101-11074	00101-11037	00101-21038	00101-11039	00101-11040	00101-11041	00101-11042	00101-11043	-	00808-03101	00808-01101
5 µm	2.1	00101-21009	00101-21071	00101-21010	00101-21011	00101-21012	00101-21013	00101-21014	00101-21015	00101-21016	-	00808-24101	00808-01107
	3.0	00101-21018	00101-21072	00101-21019	00101-21020	00101-21021	00101-21022	00101-21023	00101-21024	00101-21025	-	00808-24101	00808-01107
	4.0	00101-21027	00101-21073	00101-21028	00101-21029	00101-21030	00101-21031	00101-21032	00101-21033	00101-21034	00101-21035	00808-04101	00808-01101
	4.6	00101-21036	00101-21074	00101-21037	00101-21038	00101-21039	00101-21040	00101-21041	00101-21042	00101-21043	00101-21044	00808-04101	00808-01101
10 µm	4.0	-	-	-	-	-	-	00101-31032	00101-31033	00101-31034	00101-31035	00808-05101	00808-01101
	4.6	-	-	-	-	-	-	00101-31041	00101-31042	00101-31043	00101-31044	00808-05101	00808-01101

Xtimate® C8

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	00102-11009	00102-11071	00102-11010	00102-11011	00102-11012	00102-11013	00102-11014	00102-11015	00102-11016	-	00808-23102	00808-01107
	3.0	00102-11018	00102-11072	00102-11019	00102-11020	00102-11021	00102-11022	00102-11023	00102-11024	00102-11025	-	00808-23102	00808-01107
	4.0	00102-11027	00102-11073	00102-11028	00102-21029	00102-11030	00102-11031	00102-11032	00102-11033	00102-11034	-	00808-03102	00808-01101
	4.6	00102-11036	00102-11074	00102-11037	00102-21038	00102-11039	00102-11040	00102-11041	00102-11042	00102-11043	-	00808-03102	00808-01101
5 µm	2.1	00102-21009	00102-21071	00102-21010	00102-21011	00102-21012	00102-21013	00102-21014	00102-21015	00102-21016	-	00808-24102	00808-01107
	3.0	00102-21018	00102-21072	00102-21019	00102-21020	00102-21021	00102-21022	00102-21023	00102-21024	00102-21025	-	00808-24102	00808-01107
	4.0	00102-21027	00102-21073	00102-21028	00102-21029	00102-21030	00102-21031	00102-21032	00102-21033	00102-21034	00102-21035	00808-04102	00808-01101
	4.6	00102-21036	00102-21074	00102-21037	00102-21038	00102-21039	00102-21040	00102-21041	00102-21042	00102-21043	00102-21044	00808-04102	00808-01101
10 µm	4.0	-	-	-	-	-	-	00102-31032	00102-31033	00102-31034	00102-31035	00808-05102	00808-01101
	4.6	-	-	-	-	-	-	00102-31041	00102-31042	00102-31043	00102-31044	00808-05102	00808-01101

Xtimate® Phenyl-Hexyl

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	00104-11009	00104-11071	00104-11010	00104-11011	00104-11012	00104-11013	00104-11014	00104-11015	00104-11016	-	00808-23106	00808-01107
	3.0	00104-11018	00104-11072	00104-11019	00104-11020	00104-11021	00104-11022	00104-11023	00104-11024	00104-11025	-	00808-23106	00808-01107
	4.0	00104-11027	00104-11073	00104-11028	00104-21029	00104-11030	00104-11031	00104-11032	00104-11033	00104-11034	-	00808-03106	00808-01101
	4.6	00104-11036	00104-11074	00104-11037	00104-21038	00104-11039	00104-11040	00104-11041	00104-11042	00104-11043	-	00808-03106	00808-01101
5 µm	2.1	00104-21009	00104-21071	00104-21010	00104-21011	00104-21012	00104-21013	00104-21014	00104-21015	00104-21016	-	00808-24106	00808-01107
	3.0	00104-21018	00104-21072	00104-21019	00104-21020	00104-21021	00104-21022	00104-21023	00104-21024	00104-21025	-	00808-24106	00808-01107
	4.0	00104-21027	00104-21073	00104-21028	00104-21029	00104-21030	00104-21031	00104-21032	00104-21033	00104-21034	00104-21035	00808-04106	00808-01101
	4.6	00104-21036	00104-21074	00104-21037	00104-21038	00104-21039	00104-21040	00104-21041	00104-21042	00104-21043	00104-21044	00808-04106	00808-01101

Xtimate® C4

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
3 µm	2.1	00107-11009	00107-11071	00107-11010	00107-11011	00107-11012	00107-11013	00107-11014	00107-11015	00107-11016	-	00808-23103	00808-01107
	3.0	00107-11018	00107-11072	00107-11019	00107-11020	00107-11021	00107-11022	00107-11023	00107-11024	00107-11025	-	00808-23103	00808-01107
	4.0	00107-11027	00107-11073	00107-11028	00107-21029	00107-11030	00107-11031	00107-11032	00107-11033	00107-11034	-	00808-03103	00808-01101
	4.6	00107-11036	00107-11074	00107-11037	00107-21038	00107-11039	00107-11040	00107-11041	00107-11042	00107-11043	-	00808-03103	00808-01101
5 µm	2.1	00107-21009	00107-21071	00107-21010	00107-21011	00107-21012	00107-21013	00107-21014	00107-21015	00107-21016	-	00808-24103	00808-01107
	3.0	00107-21018	00107-21072	00107-21019	00107-21020	00107-21021	00107-21022	00107-21023	00107-21024	00107-21025	-	00808-24103	00808-01107
	4.0	00107-21027	00107-21073	00107-21028	00107-21029	00107-21030	00107-21031	00107-21032	00107-21033	00107-21034	00107-21035	00808-04103	00808-01101
	4.6	00107-21036	00107-21074	00107-21037	00107-21038	00107-21039	00107-21040	00107-21041	00107-21042	00107-21043	00107-21044	00808-04103	00808-01101

Xtimate® CN

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 µm	2.1	00105-21009	00105-21071	00105-21010	00105-21011	00105-21012	00105-21013	00105-21014	00105-21015	00105-21016	-	00808-24105	00808-01107
	3.0	00105-21018	00105-21072	00105-21019	00105-21020	00105-21021	00105-21022	00105-21023	00105-21024	00105-21025	-	00808-24105	00808-01107
	4.0	00105-21027	00105-21073	00105-21028	00105-21029	00105-21030	00105-21031	00105-21032	00105-21033	00105-21034	00105-21035	00808-04105	00808-01101
	4.6	00105-21036	00105-21074	00105-21037	00105-21038	00105-21039	00105-21040	00105-21041	00105-21042	00105-21043	00105-21044	00808-04105	00808-01101

Xtimate® Polar-RP

Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300	10mm length	
5 µm	2.1	00118-21009	00118-21071	00118-21010	00118-21011	00118-21012	00118-21013	00118-21014	00118-21015	00118-21016	-	00808-24111	00808-01107
	3.0	00118-21018	00118-21072	00118-21019	00118-21020	00118-21021	00118-21022	00118-21023	00118-21024	00118-21025	-	00808-24111	00808-01107
	4.0	00118-21027	00118-21073	00118-21028	00118-21029	00118-21030	00118-21031	00118-21032	00118-21033	00118-21034	00118-21035	00808-04152	00808-01101
	4.6	00118-21036	00118-21074	00118-21037	00118-21038	00118-21039	00118-21040	00118-21041	00118-21042	00118-21043	00118-21044	00808-04152	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



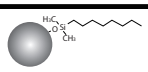
Xtimate® C8 300Å

Welch launched a new Xtimate® C8 300Å column to meet the needs of biopharmaceutical customers to detect protein samples at high pH , and to provide our customers a column with high column efficiency, long life and wide pH range.

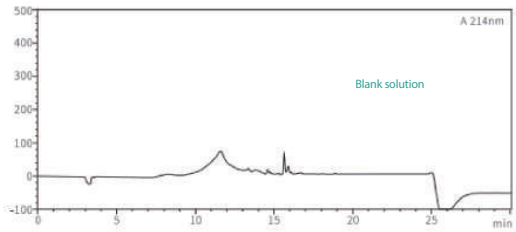
Features

- The pH range is widened to 1.0-12.5
- Excellent stability for high pH applications
- Excellent peak shape for strong alkaline compounds

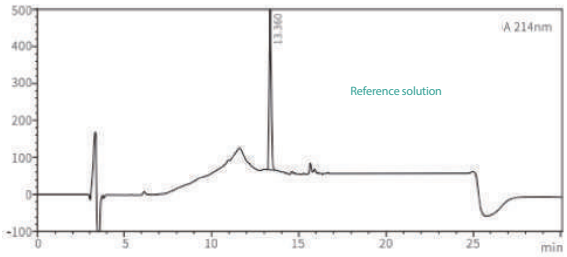
Xtimate® C8

Structural Formula			
pH Range	1.0-12.5	Carbon Loading(%)	5(300 Å)
Particle Size	5 μm	USP List	L7
Surface Area(m^2/g)	100(300 Å)	Endcapped	Yes

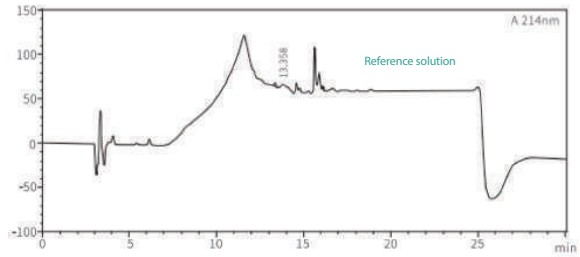
Interleukin-2



Column:	Xtimate® C8 300Å(4.6×250mm, 5μm)
Mobile Phase:	Mobile phase A: 0.1% trifluoroacetic acid aqueous solution Mobile phase B: 0.1% trifluoroacetic acid in acetonitrile
Flow Rate:	1.0 mL/min
Temperature:	30 ℃
Detector:	214 nm
Injection Volume:	10 μL

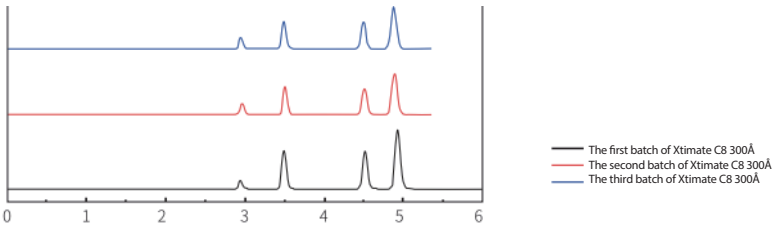


Retention time	Area	Height	Number of plates(USP)	Compound name
13.360	3206759	437905	69712	Interleukin 2



Retention time	Area	Height	Number of plates(USP)	Compound name
13.358	24247	4111	93524	Interleukin 2

Three batches of Xtimate® C8 300 Å packing materials factory test result



Ordering Information

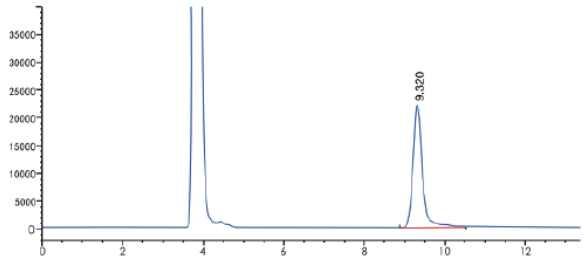
Specification	P/N
4.6 mm × 250mm, 5 μm	00102-23043
4.6 mm × 150mm, 5 μm	00102-23041

Xtimate® Lactose-NH_2 Column

A special bonding technique is adopted to make the retention of lactose more stable so that RSD value of lactose peak area is very low.

Xtimate® Lactose-NH_2

pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	450(120 Å)
Carbon Loading(%)	7(120 Å)
USP List	L8
Endcapped	No



Column:	Xtimate® Lactose-NH_2 , 4.6×250mm, 5μm
Mobile Phase:	Acetonitrile/water=70/30
Flow Rate:	1 mL/min
Detector:	RID (45°C)
Temperature:	40°C
Injection Volume:	10 μL

Rt (min)	Area (nRIU*S)	Height (nRIU)	Symmetrical factor	Width (min)	Plates	Resolution	Selectivity
9.320	3.5546e5	2.20093e4	0.79	0..2298	9103	-	-

Ordering Information

Dimension	P/N	Guard Cartridge(10mm length)	Guard Column
4.6×300, 5 μm	00121-21044	00808-04151	00808-01101

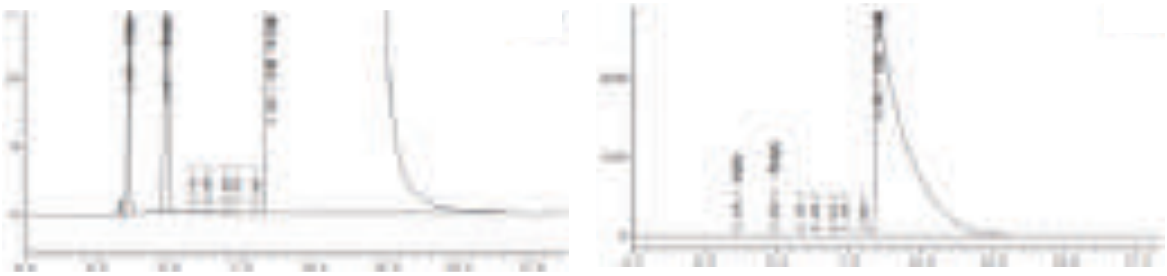
Xtimate® XB-SCX

Xtimate® XB-SCX column which formed by cations bonded silica gel packing materials is mainly used for the separation of metformin hydrochloride. This column not only makes the resolution of melamine and metformin much greater than 10, but also makes dicyandiamide have excellent peak shape, which completely avoids the interference of solvent peak to dicyandiamide.

Xtimate® XB-SCX

pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	350(120 Å)
Carbon Loading(%)	2(120 Å)
USP List	L9
Endcapped	No

Determination of content of metformin hydrochloride



Column:	Xtimate® XB-SCX , 4.6×250mm, 5μm
Mobile Phase:	1.7% ammonium dihydrogen phosphate solution, adjust pH to 3.00 with phosphoric acid
Flow Rate:	1 mL/min
Detector:	218nm
Temperature:	Room temperature
Injection Volume:	10 μL

Ordering Information

Dimension	P/N	Guard Cartridge(10mm length)	Guard Column
4.6×150, 5 μm	00120-21041	00808-04153	00808-01101
4.6×250, 5 μm	00120-21043	00808-04153	00808-01101

Xtimate® Polymer Based Column

Xtimate® Sugar-H is a special column designed for Ribavirin. Packed with H+ modified low-linking polystyrene-divinybenzene spheres (PS-DVB), this column can be applied for the analysis of organic acids and mixed alcohols.

Xtimate® Sugar-Ca is a strong cation exchange column packed with Ca2+ modified PS-DVB resins, can be used for the analysis of sugar products.

Xtimate® PS/DVB is based on polystyrene-divinybenzene. This column can be used in extreme conditions(pH 1-14).

Xtimate® Sugar-H

pH Range	1.0-3.0
Particle Size	5 μm, 8 μm
Cross-link	8%
Counter Ion	H^+
USP List	L17
Max. Temp.	95°C

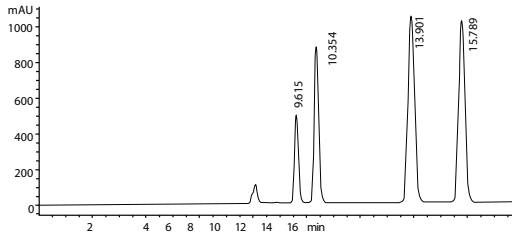
Xtimate® Sugar-Ca

pH Range	5.0-9.0
Particle Size	5 μm, 8 μm
Cross-link	8%
Counter Ion	Ca^{2+}
USP List	L19
Max. Temp.	95°C

Xtimate® PS/DVB

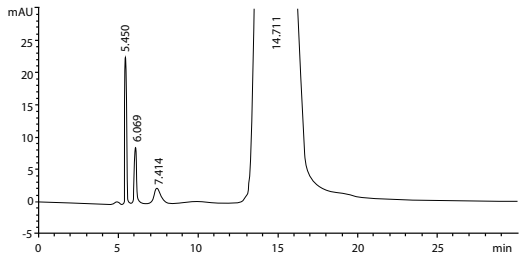
pH Range	1.0-14.0
Particle Size	5 μm, 10 μm
Surface Area(m^2/g)	450(300 Å)
USP List	L21
Max. Temp.	75°C

Separation of Organic Acids



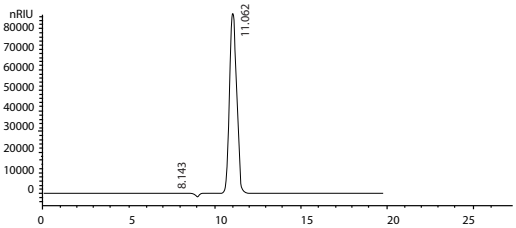
Column:	Xtimate® Sugar-H, 5 μm, 300 x 7.8 mm
Mobile Phase:	H_2SO_4 water solution (pH 2.0)
Flow Rate:	0.5 mL/min
Temperature:	60°C
Detector:	RID
Injection Volume:	20 μL
Organic Acids:	Maleic acid, L-malic acid, fumaric acid, sodium acetate trihydrate

Ketophenylalanine Calcium



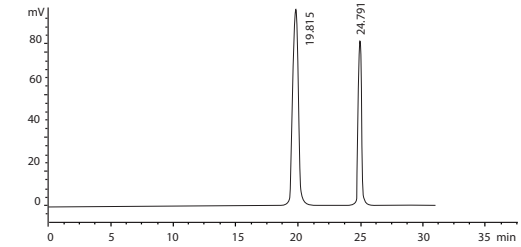
Column:	Xtimate® Sugar-H, 5 μm, 300 x 7.8 mm
Mobile Phase:	0.025 mol/L H_2SO_4 water solution
Flow Rate:	0.8 mL/min
Temperature:	20°C
Detector:	205 nm
Injection Volume:	20 μL

Xylose



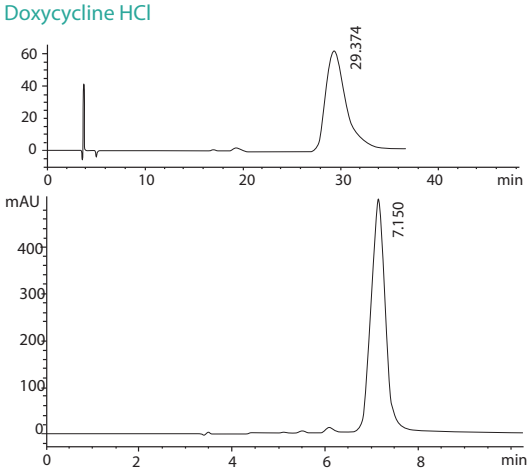
Column:	Xtimate® Sugar-Ca, 5 μm, 300 x 7.8 mm
Mobile Phase:	Ultra-pure water
Flow Rate:	0.6 mL/min
Temperature:	85°C
Detector:	RID 55°C
Injection Volume:	20 μL

Mannitol



Column:	Xtimate® Sugar-Ca, 8 µm, 300 x 7.8 mm
Mobile Phase:	Ultra-pure water
Flow Rate:	0.5 mL/min
Temperature:	80°C
Detector:	20 µL
Injection Volume:	R of mannitol and Sorbitol >2

Doxycycline HCl



Column:	Xtimate® PS/DVB, 8 µm, 250 x 7.8 mm
Mobile Phase:	50g TBA with 100 mL water, 200 mL buffer (pH 8.0), 25 mL TBAHS(10g/L, pH 8.0, adjust with NaOH), 5 mL EDTA(40 g/L, pH 8.0, adjust with NaOH), dilute to 500 mL with water
Flow Rate:	2.0 mL/min
Temperature:	75°C
Detector:	254 nm
Injection Volume:	20 µL
Notes:	Be sensitive to column temperature

Ordering Information

Xtimate® PS/DVB

Particle size	Column ID(mm)	Column Length (mm)	
		250	300
5 µm	4.6	00111-21043	00111-21044
100 Å	7.8	00111-21051	00111-21052
5 µm	4.6	00111-23043	00111-23044
300 Å	7.8	00111-23051	00111-23052
10 µm	4.6	00111-33043	00111-33044
300 Å	7.8	00111-33051	00111-33052

Xtimate® Sugar-H

Particle size	Column ID(mm)	Column Length (mm)		
		150	250	300
5 µm	4.6	00109-41041	00109-41043	00109-41044
	7.8	00109-41050	00109-41051	00109-41052
8 µm	4.6	00109-43041	00109-43043	00109-43044
	7.8	00109-43050	00109-43051	00109-43052

Xtimate® Sugar-Ca

Particle size	Column ID(mm)	Column Length (mm)		
		150	250	300
5 µm	4.6	00108-41041	00108-41043	00108-41044
	7.8	00108-41050	00108-41051	00108-41052
8 µm	4.6	00108-43041	00108-43043	00108-43044
	7.8	00108-43050	00108-43051	00108-43052

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Xtimate® SEC

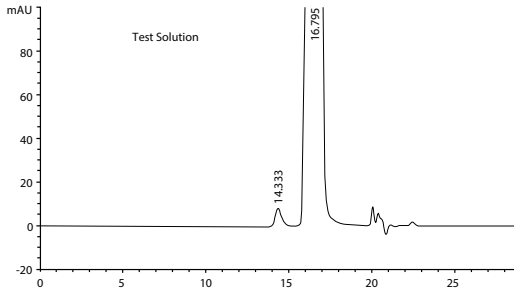
Xtimate® SEC (size exclusion chromatography), also known as “global protein hydrophilic modified silica column”, is made from ultra-high purity, stable silica bonded with hydrophilic polymer and diol functional groups. This double bonding mechanism, which makes possible of nonspecific adsorption of high Mw polymers, proteins, biological enzymes, polypeptides and other biological samples, can be applied to separating water-soluble polymers from biomacromolecules.

Features:

- Ultra-high purity, stable silica bonded with hydrophilic polymer and diol functional groups.
- 5 µm or 3 µm silica microsphere, high separation efficiency.
- 120 Å minibore columns fit for analysis of polar compounds such as cephalosporins; 300Å ones fit for biomacromolecules such as proteins and polypeptides.
- Five pore sizes: 120 Å, 300 Å, 500 Å, 700 Å and 1000 Å.

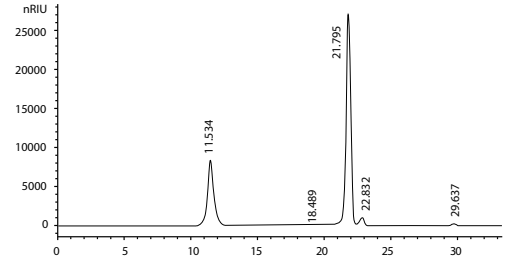
Phase	Xtimate® SEC-120	Xtimate® SEC-300	Xtimate® SEC-500	Xtimate® SEC-700	Xtimate® SEC-1000
Materials	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer
Particle Size(µm)	3, 5	3, 5	5	5	5
Pore Size(Å)	120	300	500	700	1000
Protein Molecule Range	500-150,000	5,000-1,250,000	10,000-3,500,000	15,000-5,000,000	50,000-7,500,000
Soluble Polymer Molecule Mass Range	500-25,000	1,000-100,000	2,000-500,000	2,500-500,000	5,000-1,500,000
Maximum Pressure	~4,500	~3,500	~3,000	~3,000	~3,000
pH Range	2-7.5 (7.5-9,5 for short time)	2-7.5 (7.5-9,5 for short time)	2-7.5 (7.5-9,5 for short time)	2-7.5 (7.5-9,5 for short time)	2-7.5 (7.5-9,5 for short time)
Range of Salt Concentration	20 mM~2.0 M	20 mM~2.0 M	20 mM~2.0 M	20 mM~2.0 M	20 mM~2.0 M
Highest Temperature(℃)	~80℃	~80℃	~80℃	~80℃	~80℃
Mobile Phase	Aqueous or organic phase	Aqueous or organic phase	Aqueous or organic phase	Aqueous or organic phase	Aqueous or organic phase

Sex Hormone in Cosmetics



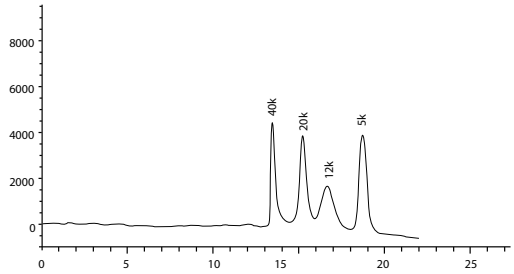
Column:	Xtimate® SEC-120, 3 µm, 300 x 7.8 mm
Mobile Phase:	Acetic acid/acetonitrile/ 0.1%rginine=15/20/65
Flow Rate:	0.5 mL/min
Temperature:	35°C
Detector:	276 nm
Injection Volume:	100 µL

Iron Dextran



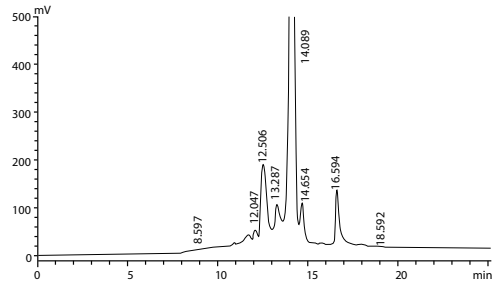
Column:	Xtimate® SEC-300, 5 µm, 300 x 7.8 mm
Mobile Phase:	Dissolve 7.1g Na_2SO_4 to 1000 mL water, filter
Flow Rate:	0.5 mL/min
Temperature:	Ambient
Detector:	RID
Injection Volume:	20 µL

Analysis of Molecular Weight of Polyethylene Glycol



Column:	Xtimate® SEC-300, 5 µm, 300 x 7.8 mm
Mobile Phase:	Ultrapure Water
Flow Rate:	1.0 mL/min
Temperature:	40°C, RID: 40°C
Detector:	RID
Injection Volume:	20 µL

Cefoxitin Sodium



Column:	Xtimate® SEC-120, 5 µm, 300 x 7.8 mm
Mobile Phase:	Phosphate buffer/acetonitrile=95/5
Flow Rate:	0.9 mL/min
Temperature:	30°C
Detector:	232 nm
Injection Volume:	20 µL

Ordering Information

Bonded phase	Particle size	Column ID(mm)	Column Length (mm)	
			250	300
SEC-120	3 µm	4.6	00237-21043	00237-21044
		7.8	00237-21051	00237-21052
	5 µm	4.6	00237-31043	00237-31044
		7.8	00237-31051	00237-31052
SEC-300	3 µm	4.6	00237-23043	00237-23044
		7.8	00237-23051	00237-23052
	5 µm	4.6	00237-33043	00237-33044
		7.8	00237-33051	00237-33052
SEC-700	5 µm	4.6	00237-34043	00237-34044
		7.8	00237-34051	00237-34052
SEC-1000	5 µm	4.6	00237-35043	00237-35044
		7.8	00237-35051	00237-35052

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

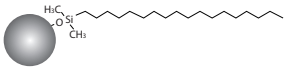
Topsil® Series HPLC Column

Topsil® series HPLC column is a next-generation column by Welch, besides Ultisil®, Xtimate® and Welchrom®. This series use different silica and provide different selectivity.

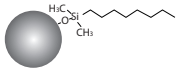
Features:

- High purity silica (99.99%) with 150 Å pore size and 260 m^2/g surface area
- 12% carbon loading for C18 phase
- Because of large pore and moderate carbon loading, Topsil C18 phase can also be used as AQ-C18 without phase collapse
- Endcapped for excellent peak shape and lifetime
- Lower back pressure than Ultisil, almost the same column efficiency as Ultisil
- Good for small molecules and peptides
- Topsil phases including C18, C8, Phenyl-Hexyl, Silica, NH_2 and CN

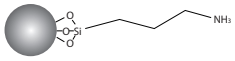
Topsil® C18

Structural Formula	
pH Range	2.0-9.5
Particle Size	3 µm, 5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	12(150 Å)
USP List	L1
Endcapped	Yes

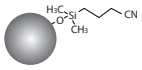
Topsil® C8

Structural Formula	
pH Range	2.0-9.5
Particle Size	3 µm,5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	10(150 Å)
USP List	L7
Endcapped	Yes

Topsil® NH_2

Structural Formula	
pH Range	2.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	3(150 Å)
USP List	L8
Endcapped	No

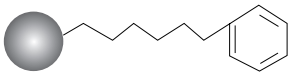
Topsil® CN

Structural Formula	
pH Range	2.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	6(150 Å)
USP List	L10
Endcapped	Yes

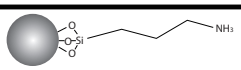
Topsil® Silica

Structural Formula	
pH Range	2.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	N/A
USP List	L3
Endcapped	No

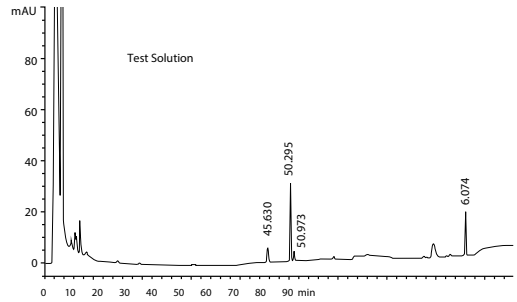
Topsil® Phenyl-Hexyl

Structural Formula	
pH Range	2.0-9.5
Particle Size	3 µm,5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	12(150 Å)
USP List	L11
Endcapped	Yes

Topsil® HILIC NH_2

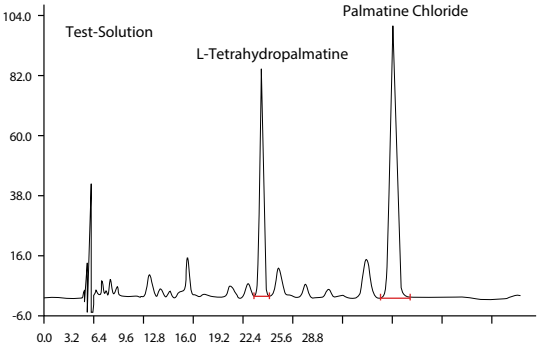
Structural Formula	
pH Range	2.0-8.0
Particle Size	5 µm
Surface Area(m^2/g)	260(150 Å)
Carbon Loading(%)	3(150 Å)
USP List	L8
Endcapped	No

Compound Salvia Tablets



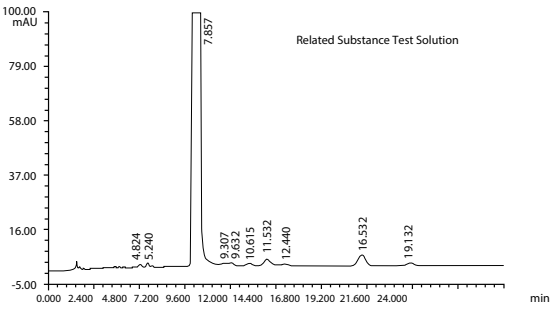
Column:	Topsil® C18, 250x4.6 mm, 5 µm		
Mobile Phase:	A: acetonitrile B: water		
Gradient Program:	Time(min)	A(%)	B(%)
	0	19	81
	35	19	81
	55	71	29
	70	71	29
	100	40	60
Flow Rate:	1.0 mL/min		
Temperature:	30°C		
Detector:	203 nm		
Injection Volume:	20 µL		

Epigeal Srephaia Root



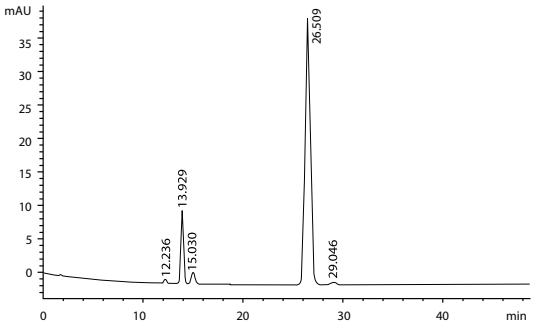
Column:	Topsil® C18, 250x4.6 mm, 5 µm
Mobile Phase:	25 mM sodium acetate buffer(2% trimethylamine, adjust pH to 3.50 with acetic acid)
Flow Rate:	1.5 mL/min
Temperature:	40°C
Detector:	280 nm
Injection Volume:	20 µL

Ketoprofen



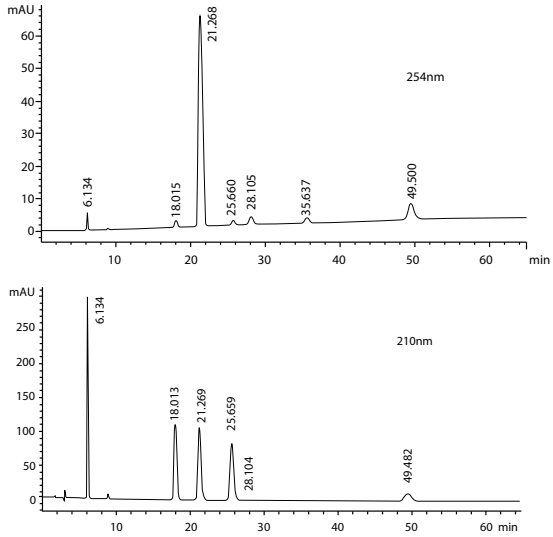
Column:	Topsil® C18, 150x4.6 mm, 5 µm
Mobile Phase:	Phosphate buffer (68g KH_2PO_4 dissolve in 1000 mL water, adjust pH to 3.5 with H_3PO_4)
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	233 nm
Injection Volume:	20 µL

Vitamin D3



Column:	Topsil® Silica, 250x4.6 mm, 5 µm
Mobile Phase:	N-hexane/n-amyl alcohol=99.7/0.3
Flow Rate:	2.0 mL/min
Temperature:	30°C
Detector:	254 nm
Injection Volume:	20 µL

Sex hormone in Cosmetics



Column:	Topsil® Phenyl-Hexyl, 250x4.6 mm, 5 µm
Mobile Phase:	Methanol/water=60/40
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	210 nm, 254 nm
Injection Volume:	20 µL
Mixed Standards:	Estrogen: estradiol, oestrone, estrostilben, estriol Androgen: testosterone, methyltestosterone Progestational hormone:progesterone

Ordering Information
3 µm Topsil analytical columns

Bonded phase	Column ID (mm)	Column Length (mm)									Guard Cartridge	Cartridge holder
		30	50	75	100	125	150	200	250	300	10mm length	
C18	2.1	00410-02009	00410-02010	00410-02011	00410-02012	00410-02013	00410-02014	00410-02015	00410-02016		00808-23301	00808-01107
	3.0	00410-02018	00410-02019	00410-02020	00410-02021	00410-02022	00410-02023	00410-02024	00410-02025	-	00808-23301	00808-01107
	4.0	00410-02027	00410-02028	00410-02029	00410-02030	00410-02031	00410-02032	00410-02033	00410-02034	00410-02035	00808-03301	00808-01101
	4.6	00410-02036	00410-02037	00410-02038	00410-02039	00410-02040	00410-02041	00410-02042	00410-02043	00410-02044	00808-03301	00808-01101
C8	2.1	00420-02009	00420-02010	00420-02011	00420-02012	00420-02013	00420-02014	00420-02015	00420-02016		00808-23302	00808-01107
	3.0	00420-02018	00420-02019	00420-02020	00420-02021	00420-02022	00420-02023	00420-02024	00420-02025	-	00808-23302	00808-01107
	4.0	00420-02027	00420-02028	00420-02029	00420-02030	00420-02031	00420-02032	00420-02033	00420-02034	00420-02035	00808-03302	00808-01101
	4.6	00420-02036	00420-02037	00420-02038	00420-02039	00420-02040	00420-02041	00420-02042	00420-02043	00420-02044	00808-03302	00808-01101
Phenyl-Hexyl	2.1	00460-02009	00460-02010	00460-02011	00460-02012	00460-02013	00460-02014	00460-02015	00460-02016		00808-23305	00808-01107
	3.0	00460-02018	00460-02019	00460-02020	00460-02021	00460-02022	00460-02023	00460-02024	00460-02025	-	00808-23305	00808-01107
	4.0	00460-02027	00460-02028	00460-02029	00460-02030	00460-02031	00460-02032	00460-02033	00460-02034	00460-02035	00808-03305	00808-01101
	4.6	00460-02036	00460-02037	00460-02038	00460-02039	00460-02040	00460-02041	00460-02042	00460-02043	00460-02044	00808-03305	00808-01101

5 µm Topsil analytical columns

Bonded phase	Column ID (mm)	Column Length (mm)									Guard Cartridge	Cartridge holder
		30	50	75	100	125	150	200	250	300	10mm length	
C18	2.1	00410-01009	00410-01010	00410-01011	00410-01012	00410-01013	00410-01014	00410-01015	00410-01016		00808-24301	00808-01107
	3.0	00410-01018	00410-01019	00410-01020	00410-01021	00410-01022	00410-01023	00410-01024	00410-01025	-	00808-24301	00808-01107
	4.0	00410-01027	00410-01028	00410-01029	00410-01030	00410-01031	00410-01032	00410-01033	00410-01034	00410-01035	00808-04301	00808-01101
	4.6	00410-01036	00410-01037	00410-01038	00410-01039	00410-01040	00410-01041	00410-01042	00410-01043	00410-01044	00808-04301	00808-01101
C8	2.1	00420-01009	00420-01010	00420-01011	00420-01012	00420-01013	00420-01014	00420-01015	00420-01016	-	00808-24302	00808-01107
	3.0	00420-01018	00420-01019	00420-01020	00420-01021	00420-01022	00420-01023	00420-01024	00420-01025	-	00808-24302	00808-01107
	4.0	00420-01027	00420-01028	00420-01029	00420-01030	00420-01031	00420-01032	00420-01033	00420-01034	00420-01035	00808-04302	00808-01101
	4.6	00420-01036	00420-01037	00420-01038	00420-01039	00420-01040	00420-01041	00420-01042	00420-01043	00420-01044	00808-04302	00808-01101
Phenyl-Hexyl	2.1	00460-01009	00460-01010	00460-01011	00460-01012	00460-01013	00460-01014	00460-01015	00460-01016	-	00808-24305	00808-01107
	3.0	00460-01018	00460-01019	00460-01020	00460-01021	00460-01022	00460-01023	00460-01024	00460-01025	-	00808-24305	00808-01107
	4.0	00460-01027	00460-01028	00460-01029	00460-01030	00460-01031	00460-01032	00460-01033	00460-01034	00460-01035	00808-04305	00808-01101
	4.6	00460-01036	00460-01037	00460-01038	00460-01039	00460-01040	00460-01041	00460-01042	00460-01043	00460-01044	00808-04305	00808-01101
CN	2.1	00440-01009	00440-01010	00440-01011	00440-01012	00440-01013	00440-01014	00440-01015	00440-01016	-	00808-24304	00808-01107
	3.0	00440-01018	00440-01019	00440-01020	00440-01021	00440-01022	00440-01023	00440-01024	00440-01025	-	00808-24304	00808-01107
	4.0	00440-01027	00440-01028	00440-01029	00440-01030	00440-01031	00440-01032	00440-01033	00440-01034	00440-01035	00808-04304	00808-01101
	4.6	00440-01036	00440-01037	00440-01038	00440-01039	00440-01040	00440-01041	00440-01042	00440-01043	00440-01044	00808-04304	00808-01101
NH_2	2.1	00430-01009	00430-01010	00430-01011	00430-01012	00430-01013	00430-01014	00430-01015	00430-01016	-	00808-24303	00808-01107
	3.0	00430-01018	00430-01019	00430-01020	00430-01021	00430-01022	00430-01023	00430-01024	00430-01025	-	00808-24303	00808-01107
	4.0	00430-01027	00430-01028	00430-01029	00430-01030	00430-01031	00430-01032	00430-01033	00430-01034	00430-01035	00808-04303	00808-01101
	4.6	00430-01036	00430-01037	00430-01038	00430-01039	00430-01040	00430-01041	00430-01042	00430-01043	00430-01044	00808-04303	00808-01101
Silica	2.1	00450-01009	00450-01010	00450-01011	00450-01012	00450-01013	00450-01014	00450-01015	00450-01016	-	00808-24306	00808-01107
	3.0	00450-01018	00450-01019	00450-01020	00450-01021	00450-01022	00450-01023	00450-01024	00450-01025	-	00808-24306	00808-01107
	4.0	00450-01027	00450-01028	00450-01029	00450-01030	00450-01031	00450-01032	00450-01033	00450-01034	00450-01035	00808-04306	00808-01101
	4.6	00450-01036	00450-01037	00450-01038	00450-01039	00450-01040	00450-01041	00450-01042	00450-01043	00450-01044	00808-04306	00808-01101
HILIC NH_2	2.1	00431-01009	00431-01010	00431-01011	00431-01012	00431-01013	00431-01014	00431-01015	00431-01016	-	00808-24307	00808-01107
	3.0	00431-01018	00431-01019	00431-01020	00431-01021	00431-01022	00431-01023	00431-01024	00431-01025	-	00808-24307	00808-01107
	4.0	00431-01027	00431-01028	00431-01029	00431-01030	00431-01031	00431-01032	00431-01033	00431-01034	00431-01035	00808-04307	00808-01101
	4.6	00431-01036	00431-01037	00431-01038	00431-01039	00431-01040	00431-01041	00431-01042	00431-01043	00431-01044	00808-04307	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



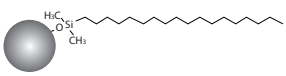
Welchrom® Seires HPLC Column

-- Combination of perfect peak shape and lowest back pressure

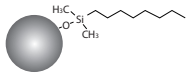
Features:

- Perfect peak shape and low back pressure
- Ultra-high purity (>99.999%) Type B silica particles
- New Bonding and endcapping technique
- Economically priced

Welchrom® C18

Structural Formula	
pH Range	1.5-10.0
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	19(120 Å)
USP List	L1
Endcapped	Yes

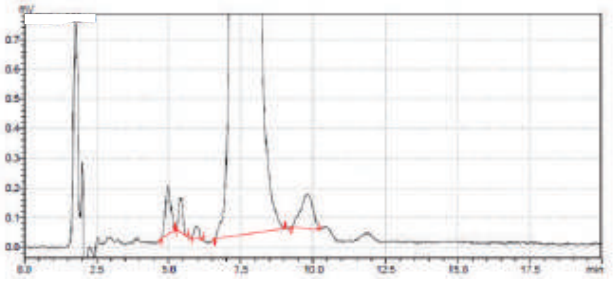
Welchrom® C8

Structural Formula	
pH Range	1.5-10
Particle Size	5 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L7
Endcapped	Yes

Comparison with other brands

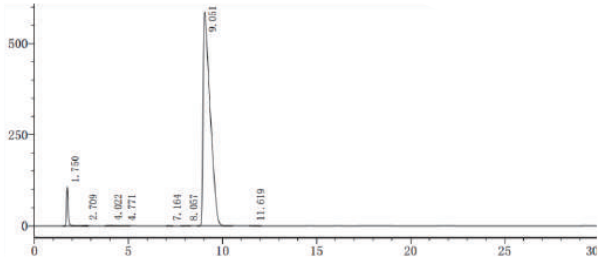
Brands	Tailing factor(amitriptyline)	Back pressure(Methanol/H_2O)=75/25
Welchrom® XB-C18	1.29	77 bar
Chrom C18	1.52	108 bar
Sino Chrom C18	1.71	106 bar
BinChrom C18	1.67	102 bar

Butenafine HCL



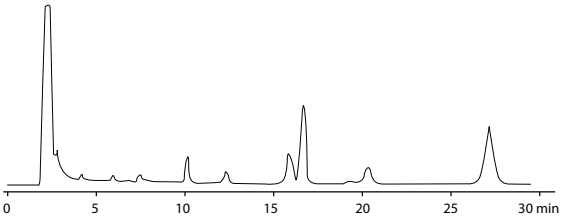
Column:	Welchrom® C18, 4.6x250 mm, 5 μm
Mobile Phase:	Acetate buffer/methanol/ isopropanol=17/70/13
Flow Rate:	1.0 mL/min
Temperature:	Ambient
Detector:	282 nm
Injection Volume:	10 μL

Pentoxyverine citrate



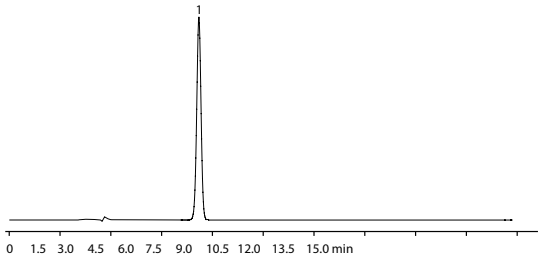
Column:	Welchrom® C18, 4.6x150 mm, 5 μm
Mobile Phase:	Water* /methanol=45/55 * Dilute 10 mL triethylamine to 1000 mL, adjust pH 3.0 with H_3PO_4
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	215 nm
Injection Volume:	20 μL

Tanshinone IIA in Salvia Miltiorrhiza



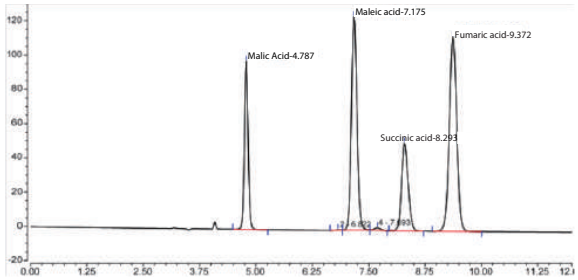
Column:	Welchrom® C18, 4.6x250 mm, 5 µm
Mobile Phase:	Methanol/water=75/25
Flow Rate:	1.0 mL/min
Temperature:	22°C
Detector:	270 nm

Imidacloprid



Column:	Welchrom® C18, 250x4.6 mm, 5 µm
Mobile Phase:	Methanol/water=45/55
Flow Rate:	1.0 mL/min
Temperature:	25°C
Detector:	260 nm

Malic acid



Column:	Welchrom® C8, 4.6x250 mm , 5 µm
Mobile Phase:	Phosphoric acid/methanol/ water=1/100/900
Flow Rate:	0.8 mL/min
Temperature:	20°C
Detector:	214nm
Injection Volume:	5 µL

Ordering Information
5 µm Welchrom Analytical Column

Bonded phase	Column ID (mm)	Column Length (mm)									Guard Cartridge	Cartridge holder
		30	50	75	100	125	150	200	250	300	10mm length	
C18	2.1	00310-02009	00310-02010	00310-02011	00310-02012	00310-02013	00310-02014	00310-02015	00310-02016	-	00808-24201	00808-01107
	3.0	00310-02018	00310-02019	00310-02020	00310-02021	00310-02022	00310-02023	00310-02024	00310-02025	-	00808-24201	00808-01107
	4.0	00310-02027	00310-02028	00310-02029	00310-02030	00310-02031	00310-02032	00310-02033	00310-02034	00310-02035	00808-04201	00808-01101
	4.6	00310-02036	00310-02037	00310-02038	00310-02039	00310-02040	00310-02041	00310-02042	00310-02043	00310-02044	00808-04201	00808-01101
C8	2.1	00320-02009	00320-02010	00320-02011	00320-02012	00320-02013	00320-02014	00320-02015	00320-02016	-	00808-24202	00808-01107
	3.0	00320-02018	00320-02019	00320-02020	00320-02021	00320-02022	00320-02023	00320-02024	00320-02025	-	00808-24202	00808-01107
	4.0	00320-02027	00320-02028	00320-02029	00320-02030	00320-02031	00320-02032	00320-02033	00320-02034	00320-02035	00808-04202	00808-01101
	4.6	00320-02036	00320-02037	00320-02038	00320-02039	00320-02040	00320-02041	00320-02042	00320-02043	00320-02044	00808-04202	00808-01101

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

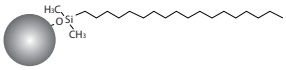
Welchrom® Vantage C18

Welchrom® Vantage C18 column uses ultra-pure fully porous spherical silica as the matrix, and adopts the unique stationary phase bonding process and silica surface treatment technology. It is a new liquid phase with high column efficiency and high selectivity. The column has excellent chromatographic peak shape, separation efficiency, stability and reproducibility, and is especially suitable for the detection and application of multi-component complex matrices.

Features

- Perfect peak shape and low back pressure
- Ultra-high purity(>99.999%) Type B silica particles
- New bonding and endcapping technique
- Economically priced

Welchrom® Vantage C18

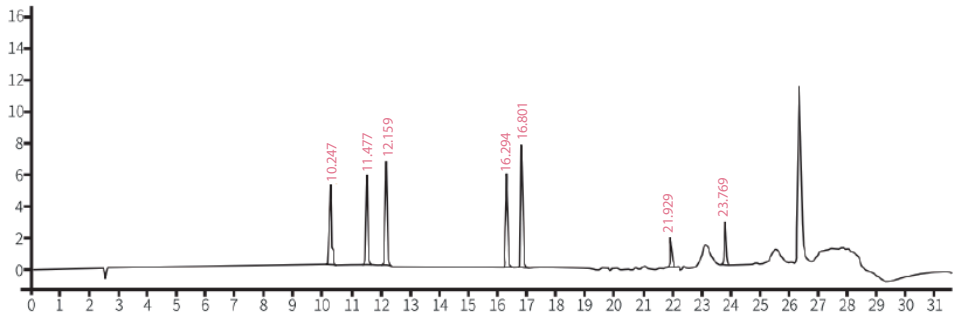
Structural Formula	
pH Range	2.0-8.0
Particle Size	5 μm
Surface Area(m^2/g)	280(130 Å)
Carbon Loading(%)	13(130 Å)
USP List	L1
Endcapped	Yes

Applications

Seven Colorants in Cola

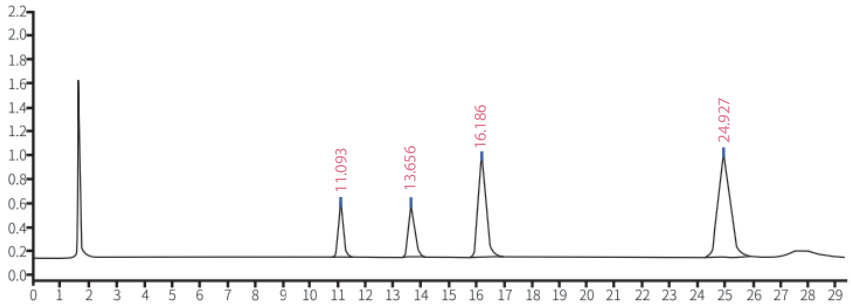
Column:	Welchrom® Vantage C18 Column (4.6×250mm, 5um)
Mobile Phase:	Mobile Phase A: Acetonitrile Mobile Phase B: 100mM Ammonium Acetate
Flow Rate:	1.0 mL/min
Temperature:	40°C
Injection volume:	10μL
Detector:	245 nm

Time (min)	Mobile phase A(%)	Mobile phase B (%)
0	3	97
5	6	94
11	14	86
22	40	60
25	40	60
25.1	3	97
35	3	97



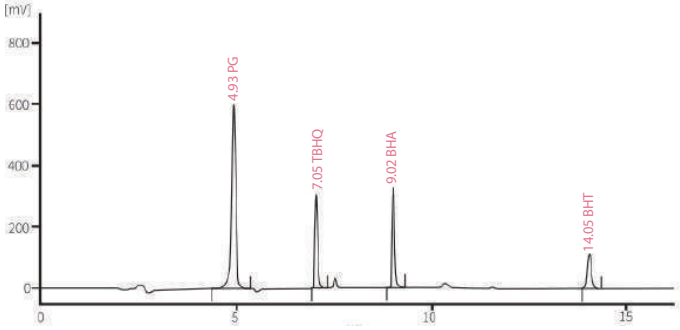
Foxin in Fish

Column:	Welchrom® Vantage C18 Column (4.6×250mm,5um)
Mobile Phase:	10mM tetrabutylammonium bromide (pH adjusted by phosphoric acid=3.0):acetonitrile=94:6
Flow Rate:	1.0 mL/min
Temperature:	35°C
Injection volume:	10μL
Detector:	Excitation wavelength 280nm, emission wavelength 480nm



Antioxidants in food

Column:	Welchrom® Vantage C18 Column (4.6×250mm, 5um)
Mobile Phase:	Mobile phase A: water: acetonitrile = 60: 40, containing 1% acetic acid Mobile phase B: acetonitrile (containing 1% acetic acid)
Flow Rate:	1.0 mL/min
Temperature:	40°C
Injection volume:	10μL
Detector:	245mm



Time (min)	Mobile phase A(%)	Mobile phase B (%)
0	100	0
1	100	0
5	10	90
16	10	90

Ordering Information

P/N	Specification
00360-04041	Welchrom® Vantage C18, 5um, 4.6×150mm
00360-04043	welchrom® Vantage C18, 5um, 4.6×250mm
00360-04044	Welchrom® Vantage C18, 5um, 4.6×300mm

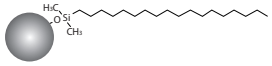
UHPLC Column

Welch also offers Ultisil® UHPLC (1.8 μm) columns. With high column efficiency and good lot-to-lot reproducibility, Ultisil® UHPLC can generate high quality data, decreasing the probability of repeated sample analyses while reducing the consumption of solvent at the same time. Ultisil® UHPLC series offer a variety of bonded phases, specified guard columns and pre-columns for the users to design and realize faster and more environmentally friendly chromatography applications with higher resolution.

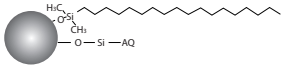
Feature

- Ultra resolution: same resolution as or better than that of conventional column which has more packing materials.
- Ultra speed: UHPLC offers more information per unit time and higher speed owing to its smaller particles.
- Sensitivity: higher N, narrower peak width (W), higher peak height. The system sensitivity of 1.8 μm UHPLC is 70% and 40% higher than that of conventional colμmn of 5μm and 3.5μm packings, respectively.

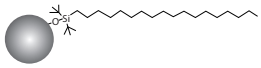
Ultisil® UHPLC XB-C18

Structural Formula	
pH Range	1.5-10.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	17(120 Å)
USP List	L1
Endcapped	Yes

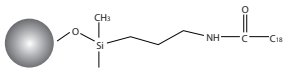
Ultisil® UHPLC AQ-C18

Structural Formula	
pH Range	1.5-10.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L1
Endcapped	Yes

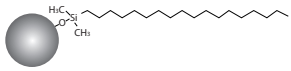
Ultisil® UHPLC LP-C18

Structural Formula	
pH Range	0.5-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	10(120 Å)
USP List	L1
Endcapped	No

Ultisil® UHPLC Polar-RP

Structural Formula	
pH Range	1.5-10.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	18(120 Å)
USP List	L1
Endcapped	Yes

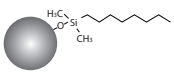
Xtimate® UHPLC C18

Structural Formula	
pH Range	1.0-12.5
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	14(120 Å)
USP List	L1
Endcapped	Yes

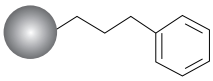
Ultisil® UHPLC HILIC

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	N/A
USP List	L3
Endcapped	No

Ultisil® UHPLC XB-C8

Structural Formula	
pH Range	1.5-10.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L7
Endcapped	Yes

Ultisil® UHPLC XB-Phenyl

Structural Formula	
pH Range	1.5-10.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L11
Endcapped	Yes

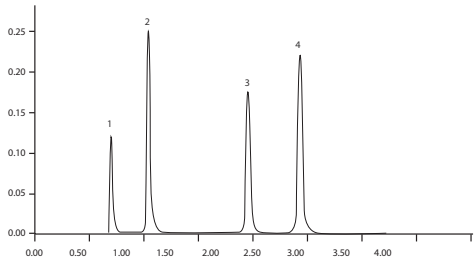
Hardware Features:

Hardware Features:
- New design
- Low dead volume
- New special frit



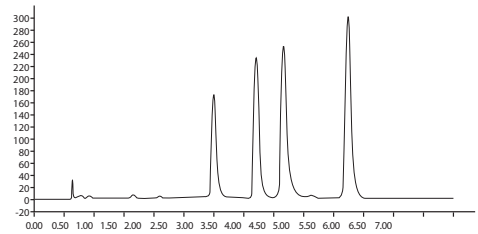
Packing Materials Features:
- High efficiency 1.8μm particles
- High column efficiency and excellent strength
- Variety of bonding chemistries
- Stable column bed, highest pressure: 15000psi

Column Packing Features:
- Unique column packing technique
- Withstand ultra-high pressure of UHPLC instruments



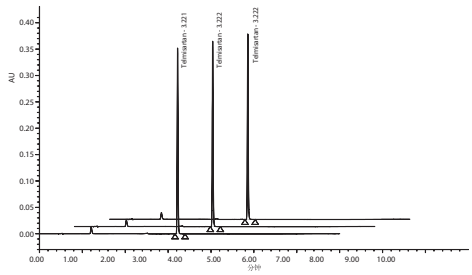
Column:	Ultisil® UHPLC XB-C18, 2.1 ×100 mm, 1.8 μm
Mobile Phase:	Acetonitrile/water=65/35
Gradient Program:	254 nm
Temperature:	Ambient
Flow Rate:	0.35 mL/min
Injection Volume:	2 μL
Back Pressure:	5000 psi
Instrument:	Water Acquity UPLC
Samples in Order:	Uracil Phenol 4-chloronitrobenzene Toluene

Analysis of Aflatoxin



Column:	Ultisil® UHPLC XB-C18, 2.1 ×100 mm, 1.8 μm
Mobile Phase:	Methanol/acetonitirile/water=18/18/64
Detector:	FLD Excitation:365 nm Emission:450 nm
Temperature:	35°C
Flow Rate:	0.35 mL/min
Injection Volume:	2 μL
Instrument:	Water UPLC
Samples in Order:	G2, G1, B2, B1

Analysis of Telmisartan Tablets



	Sample Name	Retention Time	Area	USP Theoretical plate number
1	Telmisartan	3.222	487938	126585
2	Telmisartan	3.222	487646	126607
3	Telmisartan	3.221	488317	126791

Ordering Information

1.8 μm UHPLC column

Bonded phase	Column ID (mm)	Column Length (mm)					Guard Cartridge	Guard Column
		30	50	75	100	150		
Ultisil XB-C18	2.1	H00201-11009	H00201-11010	H00201-11011	H00201-11012	H00201-11014	HU808-201-25	H00808-01109
	3.0	H00201-11018	H00201-11019	H00201-11020	H00201-11021	H00201-11023	HU808-201-25	H00808-01109
	4.6	H00201-11036	H00201-11037	H00201-11038	H00201-11039	H00201-11041	HU808-201-45	H00808-01109
Ultisil XB-C8	2.1	H00202-11009	H00202-11010	H00202-11011	H00202-11012	H00202-11014	HU808-202-25	H00808-01109
	3.0	H00202-11018	H00202-11019	H00202-11020	H00202-11021	H00202-11023	HU808-202-25	H00808-01109
	4.6	H00202-11036	H00202-11037	H00202-11038	H00202-11039	H00202-11041	HU808-202-45	H00808-01109
Ultisil AQ-C18	2.1	H00207-11009	H00207-11010	H00207-11011	H00207-11012	H00207-11014	HU808-207-25	H00808-01109
	3.0	H00207-11018	H00207-11019	H00207-11020	H00207-11021	H00207-11023	HU808-207-25	H00808-01109
	4.6	H00207-11036	H00207-11037	H00207-11038	H00207-11039	H00207-11041	HU808-207-45	H00808-01109
Ultisil XB-Phenyl	2.1	H00203-11009	H00203-11010	H00203-11011	H00203-11012	H00203-11014	HU808-203-25	H00808-01109
	3.0	H00203-11018	H00203-11019	H00203-11020	H00203-11021	H00203-11023	HU808-203-25	H00808-01109
	4.6	H00203-11036	H00203-11037	H00203-11038	H00203-11039	H00203-11041	HU808-203-45	H00808-01109
Ultisil LP-C18	2.1	H00208-11009	H00208-11010	H00208-11011	H00208-11012	H00208-11014	HU808-208-25	H00808-01109
	3.0	H00208-11018	H00208-11019	H00208-11020	H00208-11021	H00208-11023	HU808-208-25	H00808-01109
	4.6	H00208-11036	H00208-11037	H00208-11038	H00208-11039	H00208-11041	HU808-208-45	H00808-01109
Ultisil Polar-RP	2.1	H00215-11009	H00215-11010	H00215-11011	H00215-11012	H00215-11014	HU808-215-25	H00808-01109
	3.0	H00215-11018	H00215-11019	H00215-11020	H00215-11021	H00215-11023	HU808-215-25	H00808-01109
	4.6	H00215-11036	H00215-11037	H00215-11038	H00215-11039	H00215-11041	HU808-215-45	H00808-01109
Ultisil HILIC	2.1	H00200-11009	H00200-11010	H00200-11011	H00200-11012	H00200-11014	HU808-209-25	H00808-01109
	3.0	H00200-11018	H00200-11019	H00200-11020	H00200-11021	H00200-11023	HU808-209-25	H00808-01109
	4.6	H00200-11036	H00200-11037	H00200-11038	H00200-11039	H00200-11041	HU808-2 09-45	H00808-01109
Xtimate C18	2.1	00101-01009	00101-01010	00101-01011	00101-01012	00101-01014	U808-101-25	00808-01109
	3.0	00101-01018	00101-01019	00101-01020	00101-01021	00101-01023	U808-101-25	00808-01109
	4.6	00101-01036	00101-01037	00101-01038	00101-01039	00101-01041	U808-101-45	00808-01109

Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Inline Filter for UHPLC

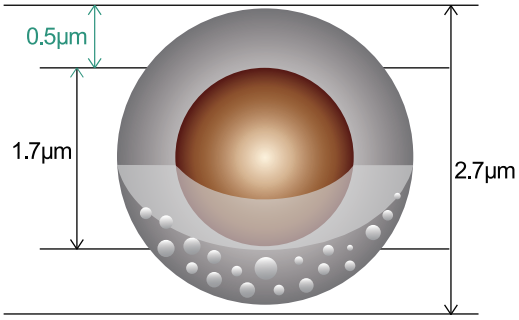
	P/N	Description
	00808-01221	UltraShield inline Fliter, SS, 0.5 μm stainless steel frit, 15000 psi
	00808-01222	Direct Connect Precolumn inline Fliter， with 0.2μm Replacement Frits×5, 18000 psi
	00808-UF020	Replaceable firts (0.2 μm)

Boltimate® Core-Shell HPLC Column

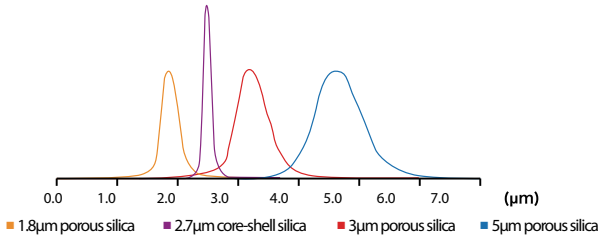
Welch Boltimate® core-shell HPLC column particle size is 2.7 μm, which consists of 1.7 μm solid core and 0.5 μm porous layer(porous shell). This kind of column can provide sub-2 μm efficiencies (~200000 p/m) and high resolution at much lower back pressure. Boltimate core-shell column can be used on both HPLC and UHPLC system, and method optimization is also very easy.

Features

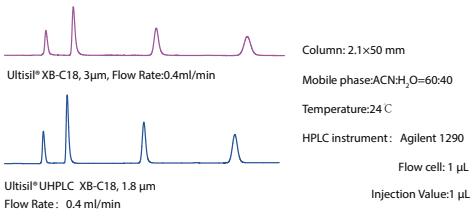
- Provide sub-2 μm efficiencies (~200000 p/m) and ultra-high resolution at much lower back pressure
- Ultra fast separation
- Compatible with both HPLC and UHPLC systemUltra fast separation
- Narrow particle size distribution
- A standard 2 μm inlet firt is used to resist plugging with dirty samples, suitable for complex sample
- A variety of bonding phases provide different selectivities, excellent peak shape and lot-to-lot reproducibility
- Maximμm pressure: 600 bar

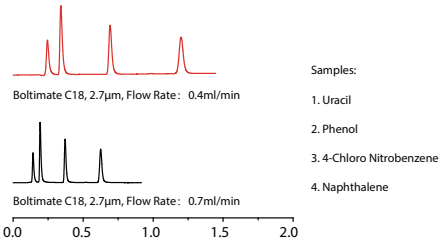


With the solid core and thin porous layer, the diffusion distance of sample molecular deceased, which means fast mobile phase flow rate can be used to increase the analytical speed. Compared with traditional porous HPLC columns, Boltimate core-shell column has the narrower particle size distribution, which provides higher column efficiency, higher resolution and lower back pressure.



	D10	D90	D90/D10
5μm porous silica	3.61	5.22	1.44
3μm porous silica	2.83	3.98	1.41
1.8μm porous silica	1.51	2.11	1.40
2.7μm Boltimate core-shell silica	2.51	2.81	1.12





Column	Theoretical plates	Column Pressure (bar)	Time
Ultisil® XB-C18, 3 μm, 2.1×50 mm	5600	85	2.0 min
Ultisil® UHPLC XB-C18, 1.8 μm, 2.1×50 mm	10500	260	1.8 min
Boltimate® C18, 2.7 μm, 2.1×50 mm	10100	108	1.5 min
Boltimate® C18, 2.7 μm, 2.1×50 mm	9500	190	0.8 min

Boltimate C18 column efficiency is almost the same with 1.8 μm porous C18 column, and two times of 3 μm porous C18 column. Even with 2X faster flow rate, the pressure of Boltimate is still lower than 1.8 μm porous C18 column with the same column dimensions run under the same analysis conditions, without decreasing efficiency at the mean time.

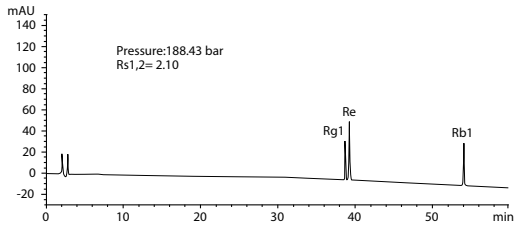
Detection of Ginsenosides :

Chromatographic conditions:

Column : three types of C18 columns from Welch / Temperature : room temperature / Detection : UV 203 nm
Mobile phase A : 0.1%H_3PO_4 in water / Mobile phase B: Acetonitrile

1. Welch Ultisil® XB-C18(4.6×250 mm, 5 µm)

Flow Rate: 1.3 mL/min Injection Volume: 10 µL

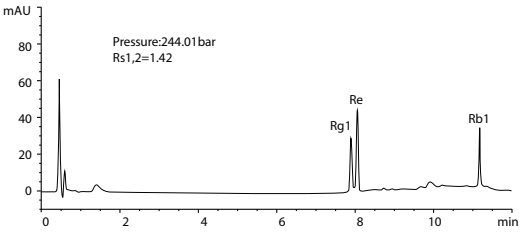


Welch Ultisil® XB-C18, 4.6×250 mm, 5 µm, separation of three ginsenosides

Gradient program:

Time(min)	Mobile Phase A (%)	Mobile Phase B (%)
0	81	19
30	81	19
35	76	24
60	60	40
60.1	0	100
70	0	100
70.1	81	19
78	81	19

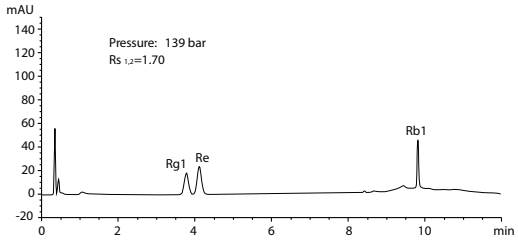
2.Welch Ultisil® UHPLC XB-C18 (2.1×5 mm, 1.8 µm)



Welch Ultisil® XB-C18, 2.1×50 mm, 1.8 µm,separation of three ginsenosides

Time(min)	Mobile Phase A (%)	Mobile Phase B (%)
0	81	19
6	81	19
7	76	24
12	60	40
12.1	0	100
14	0	100
15	81	19
18	81	19

3.Welch Boltimate® C18 (3.0×50 mm, 2.7 µm)



Welch Boltimate® C18, 3.0×50mm, 2.7µm, separation of three ginsenosides

Time(min)	Mobile Phase A (%)	Mobile Phase B (%)
0	81	19
6	81	19
7	76	24
12	60	40
12.1	0	100
14	0	100
15	81	19
18	81	19

From the results above, Boltimate core-shell column has a lower column pressure and faster analysis time , and the resolution is high.

Welch provides a variety of bonding phases

Bonded Phase	Features	Particle Size µm	Solid Core Diameter µm	Porous Shell Depth µm	Pore Size Å	Surface Area m^2/g	C%	End/ capped	pH Range	Maximum Pressure bar	USP List
C18	Excellent peak shape and resolution for acids, bases, and neutrals. Exceptional resolution and lifetime.	2.7	1.7	0.5	90	120	9	Double	2-8.5	600	L1
Phenyl-Hexyl	Alternative selectivity for phenyl groups	2.7	1.7	0.5	90	120	7	Double	2-8.5		L11

Bonded Phase	Features	Particle Size µm	Solid Core Diameter µm	Porous Shell Depth µm	Pore Size Å	Surface Area m^2/g	C%	End/ capped	pH Range	Maximum Pressure bar	USP List
EXT-C18	The exist of hybrid organic/inorganic layer extend pH range of silica. pH range: 1.5-12	2.7	1.7	0.5	90	120	8	Double	1.5-12	600	L1
EXT-PFP	An alternative selectivity for halogenated compounds and polar analytes. Wide pH range	2.7	1.7	0.5	90	120	5	Double	1.5-12		L43
HILIC	With its unbonded silica, Boltimate HILIC retains and separates polar analytes.	2.7	1.7	0.5	90	120	-	No	2-8.5		L3
LP-C18	Excellent peak shape and resolution at low pH.	2.7	1.7	0.5	90	120	7	No	1-8.5		L1

Ordering Information

2.7µm, 90Å， Boltimate Core-shell Column

Particle size	Column ID (mm)	Column Length (mm)						Guard Cartridge	Cartridge holder
		30	50	75	100	150	250		
C18	2.1	960-04009	960-04010	960-04011	960-04012	960-04014	-	U808-960-25	00808-01109
	3.0	960-04018	960-04019	960-04020	960-04021	960-04023	-	U808-960-25	00808-01109
	4.6	960-04036	960-04037	960-04038	960-04039	960-04041	960-04043	U808-960-45	00808-01109
Phenyl-Hexyl	2.1	961-04009	961-04010	961-04011	961-04012	961-04014	-	U808-961-25	00808-01109
	3.0	961-04018	961-04019	961-04020	961-04021	961-04023	-	U808-961-25	00808-01109
	4.6	961-04036	961-04037	961-04038	961-04039	961-04041	961-04043	U808-961-45	00808-01109
EXT-C18	2.1	962-04009	962-04010	962-04011	962-04012	962-04014	-	U808-962-25	00808-01109
	3.0	962-04018	962-04019	962-04020	962-04021	962-04023	-	U808-962-25	00808-01109
	4.6	962-04036	962-04037	962-04038	962-04039	962-04041	962-04043	U808-962-45	00808-01109
EXT-PFP	2.1	963-04009	963-04010	963-04011	963-04012	963-04014	-	U808-963-25	00808-01109
	3.0	963-04018	963-04019	963-04020	963-04021	963-04023	-	U808-963-25	00808-01109
	4.6	963-04036	963-04037	963-04038	963-04039	963-04041	963-04043	U808-963-45	00808-01109
HILIC	2.1	964-04009	964-04010	964-04011	964-04012	964-04014	-	U808-964-25	00808-01109
	3.0	964-04018	964-04019	964-04020	964-04021	964-04023	-	U808-964-25	00808-01109
	4.6	964-04036	964-04037	964-04038	964-04039	964-04041	964-04043	U808-964-45	00808-01109
LP-C18	2.1	965-04009	965-04010	965-04011	965-04012	965-04014	-	U808-965-25	00808-01109
	3.0	965-04018	965-04019	965-04020	965-04021	965-04023	-	U808-965-25	00808-01109
	4.6	965-04036	965-04037	965-04038	965-04039	965-04041	965-04043	U808-965-45	00808-01109

A in-line filter or a guard column can save your money by extending the life of your analytical column.

Inline Filter for Boltimate:

	P/N	Description
	00808-01221	UltraShield inline Fliter, SS, 0.5 µm stainless steel frit, 15000 psi
	00808-01222	Direct Connect Precolumn inline Fliter， with 0.2µm Replacement Frits×5, 18000 psi
	00808-UF020	Replaceable firts (0.2 µm)

Blossmate® Seires HPLC Column

Blossmate series column is a high-end HPLC column launched by Welch Materials. Compared with Xtimate and Ultisil series, Blossmate's column performance and reproducibility have been improved in an all way and it is especially suitable for the detection of multi-component impurity projects.

Features:

- It adopts a new generation of ultra-high-purity fully porous silica gel, which greatly ensures the perfect column efficiency and separation performance.
- Each column is tested individually with special testing prodecure under stricter standards, which guarantee the quality and performance of the column.
- Extremely stable separation performance to ensure better analysis reproducibility and perfect peak shape.
- Excellent batch-to-batch reproducibility, especially for the analysis of multi-impurity component applications.
- Blossmate uses a unique bonding process that enables the column to withstand high water phase, high pH experimental environments.

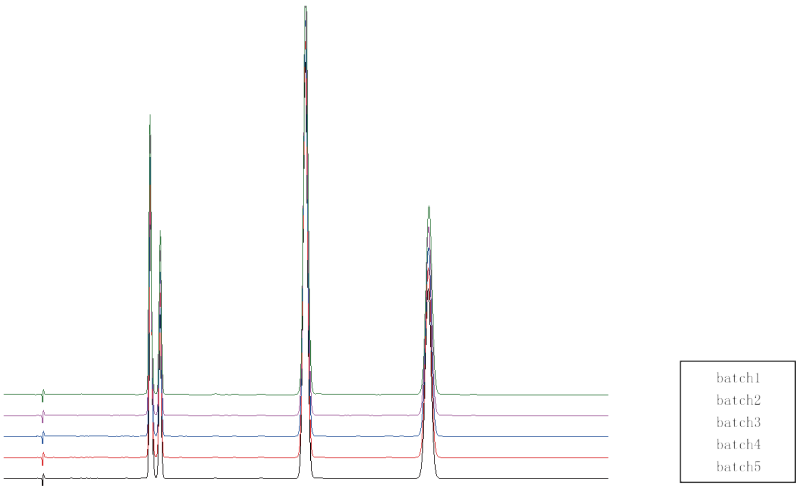
Blossmate® Series Silica

Blossmate® series HPLC column uses a new fully porous silica packing materials, which has higher silica purity, more uniform particle size and more uniform pore size distribution. Under the unique packing process and strict quality control conditions, Blossmate silica not only has the high mechanical strength and high column efficiency, but also has the perfect and excellent reproducibility, makes it to be the best choice for highly reproducible project.

Blossmate® series columns provide better reproducibility, higher efficiency and higher peak capacity.

Blossmate® series columns use a new high-purity fully porous silica and Welch's unique bonding process and double end-capping techniques to ensure that the silica surface has a higher inertness, and thus has a more symmetrical peak shape and higher column efficiency.

Blossmate columns adopt high-standard strict quality control conditions to ensure that each column has undergone strict quality screening before leaving the factory, which makes the column have better reproducibility and higher peak capacity.

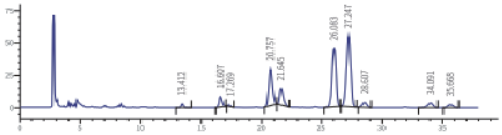


Blossmate® C18

Blossmate® C18 is a general-purpose, highly versatile column which suitable for sample analysis of many complex components, as well as flexible method development under a range of chromatographic conditions.

Bonded phase	Octadecyl group	Surface Area(m^2/g)	300(100 Å)
pH Range	2-8	Carbon Loading(%)	14(100 Å)
Particle Size	5 μm	USP List	L1
Endcapped	Yes		

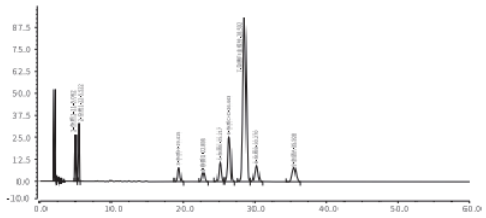
Ganoderma lucidum spore powder fingerprint



Retention time	Area	Area%	Peak height	Plates	Resolution(USP)	Asymmetry
18.584	14526	1.469	806	26473	n.a.	1.08160
23.608	32974	3.334	1479	28102	9.85059	1.18897
24.872	7717	0.780	382	32232	2.26092	0.96729
30.278	156595	15.834	5161	47563	8.42344	1.44760
31.970	72213	7.302	2437	49831	2.30160	1.03876
39.074	294653	29.798	9159	53714	8.87067	1.01296
41.307	35396	3.579	1046	53794	2.60083	0.95249
43.794	23177	2.344	610	59056	2.57241	0.98393
45.527	21926	2.217	487	63587	8.03340	1.08107
55.686	13179	1.333	294	34346	2.69108	1.13076

Column:	Blossmate® C18 (4.6×250mm, 5μm)
Mobile Phase:	Acetonitrile/isopropyl alcohol=51: 49
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	Evaporative Light Scattering Detector Drift Tube Temperature 25 ℃, carrier gas flow rate 1.5L/min
Injection Volume:	5 μL

Palonosetron hydrochloride related substances



Retention time	Area	Height	Plates(USP)	Asymmetry(EP)	Resolution(EP)
5.062	2.409	26.515	20333	1.03	n.a.
5.522	217	32.938	20724	1.02	3.12
19.415	3.144	8.367	17349	0.99	37.50
22.895	2.172	5.066	18684	0.95	5.54
25.217	5.019	11.058	19813	0.98	3.36
26.443	12.174	25.787	19976	0.98	1.68
28.592	48.148	93.887	19769	1.00	2.78
30.270	5.191	9.390	18748	0.96	1.98
35.508	5.403	8.344	19345	0.96	5.51

Column:	Blossmate® C18 (4.6×250mm,5μm)
Mobile Phase:	0.04mol/L potassiμm hexafluorosulfonate solution (pH1.5)/acetonitrile=68/32
Flow Rate:	1.0 mL/min
Temperature:	25°C
Detector:	210nm
Injection Volume:	10 μL

Ordering Information

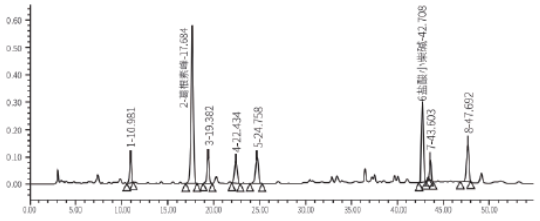
P/N	Particle size	Specification
00601-21043	5 μm	4.6×250 mm

Blossmate® Aqs C18
--High Water-resistance HPLC Column

PH range	Carbon load	Pore Size	Specific surface area	Maximum temperature	Maximum pressure
2.0-8.0	10%	100Å	300m²/g	60 ℃	40MPa

Blossmate® Aqs C18 is a C18 reversed-phase column compatible with pure water phase and pure salt phase. Under the condition of high proportion of water phase, the column still has excellent stability and high column efficiency, suitable for analysis of hydrophilic and highly polar samples.

Characteristic atlas of Gegenqinlian Tablet



Name	Retention time	Area	Height	Plates	Separation	Tailing factor
1	10.981	1433409	98041	12635	n.a	0.93
2 Puerarin Peak	17.684	10686518	600548	23503	15.45	0.97
3	19.382	1928910	106398	25512	2.54	1.00
4	22.434	1605460	105394	27028	3.61	1.02
5	24.758	2119983	101433	34077	4.04	0.91
6 Berberine hydrochloride	42.708	6113662	194424	107618	38.83	1.12
7	43.603	814727	29827	99280	1.71	1.15
8	47.692	2510271	144772	171772	10.94	0.88

Column:	Welch Blossmate® Aqs-C18 (4.6×250mm, 5μm)
Mobile Phase:	Mobile phase A: get grade methanol. Mobile phase B: take 1.5 mL of trifluoroacetic acid, add it to 1000 mL of water to make a 0.15% trifluoroacetic acid solution, mix well, and ultrasonically degas.

Time (min)	Mobile Phase A(%)	Mobile Phase B(%)
0	23	77
25	30	70
26	35	65
39	42	58
40	45	55
55	45	55

Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	Characteristic Spectrum 250nm Content Determination Puerarin 250nm Berylkerine Hydrochloride 348nm
Injection Volume:	10 μL

Ordering Information

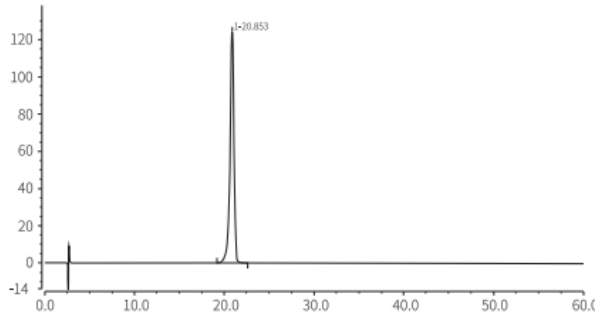
P/N	Particle size	Specification
00602-21043	5 μm	4.6×250mm

Blossmate® ST C18
--Wide pH Range HPLC Column

PH range	Carbon load	Pore size	Specific surface area	Maximum temperature	Maximum pressure
1.0 - 11.0	12%	100Å	300m²/g	60 ℃	40MPa

Blossmate® ST-C18 column adopts a special silica matrix surface treatment technology, while maintaining the high mechanical strength and high column efficiency of the silica matrix, the pH tolerance range of the column is extended to 1.0-11.0, suitable for the analysis of basic samples, and in method development at higher pH conditions.

Determination of Xinanning Tablets



Column:	Blossmate® ST-C18 (4.6×250mm, 5μm)
Mobile Phase:	Methanol/Water=25/75
Flow Rate:	1.0 mL/min
Temperature:	25°C
Detector:	250nm
Injection Volume:	10 μL

Retention time	Area	Height	Plates	Asymmetry/EP	Separation
20.853	64.682	123.983	11137	0.89	n.a.

Ordering Information

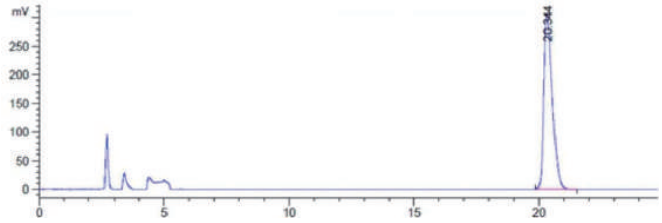
P/N	Particle size	Specifications
00603-21043	5μm	4.6×250mm

Blossmate® Polar-Propylamide

Blossmate® Polar-Propylamide column is a high-end series hydrophilic (HILIC) column designed to achieve the separation of large polar drug molecules. Based on ultra high purity and high mechanical strength spherical silica gel, the packing materials effectively bonded the polar propyl amide group. As a new generation of Leonurus dedicated column, its results can meet the test requirements of Chinese Pharmacopoeia I for Leonurus content determination while ensuring excellent reproducibility.

Bonded phase	Polar propyl amide group	Surface Area(m^2/g)	300(120 Å)
pH Range	2-8	Carbon Loading(%)	7(120 Å)
Particle Size	5 μm	USP List	L68
Endcapped	N/A		

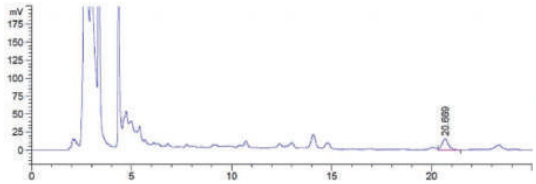
Systematic adaptability



Rt	Symmetry factor	Plates
20.344	0.71	16867

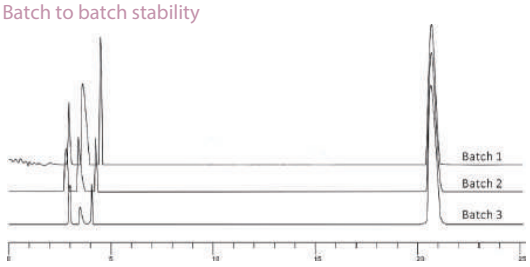
Column:	Blossmate® Polar-Propylamide, 4.6×250mm, 5μm
Mobile Phase:	Acetonitrile: 0.2% glacial acetic acid = 80:20 (V/V)
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	ELSD
Injection Volume:	10 μL

Test Sample



Rt	Symmetry factor	Plates
20.669	0.89	22579

Batch to batch stability



Column:	Blossmate®Polar-Propylamide, 4.6×250mm, 5μm, (Batch 1) Blossmate®Polar-Propylamide, 4.6×250mm, 5μm, (Batch 2) Blossmate®Polar-Propylamide, 4.6×250mm, 5μm, (Batch 3)
Mobile Phase:	Acetonitrile: 0.2% glacial acetic acid = 80: 20 (v/v)
Flow Rate:	1.0 mL/min
Temperature:	30℃
Detector:	ELSD
Injection Volume:	10 μL

From the results above, multiple batches of column were selected to test the hydrothorax hydrochloride, showing Blossmate Polar-Propylamide column has excellent reproducibility and stability.

Ordering Information

Blossmate® Polar-Propylamide Column

P/N	Particle size	Specification
00604-21041	5 μm	4.6×150mm
00604-21043	5 μm	4.6×250 mm

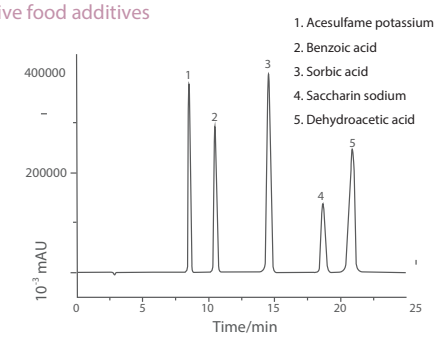
Blossmate® PSV C18

Blossmate® PSV C18 is a newly developed HPLC column which can be compatible with high proportion of aqueous phase. Taking super high purity spherical silica as matrix, it bonded high-density alkyl functional groups. Its packing materials have high selectivity and strong retention ability for hydrophilic and polar compounds which are often difficult to be retained and separated in normal C18 columns. Blossmate® PSV C18 is fully end-capped, which greatly enhances the packing materials' stability. Even under neutral pH condition, it keeps stable baseline and high sensitivity, making it particularly suitable for high efficiency separation columns with LC-MS. Now, it is widely used in the separation and analysis of oligosaccharides, amino acids, small peptides, nucleotides, organic acids and other active components.

Features:

- WIth strong separation and retention ability, better peak shape, higher column efficiency.
- Remain stable baseline and high sensitivity even under neutral pH condition.
- Suitable for high efficiency separation columns by LC-MS.

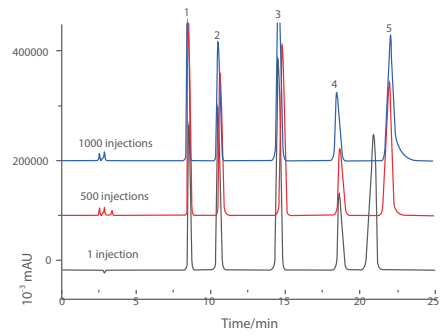
Five food additives



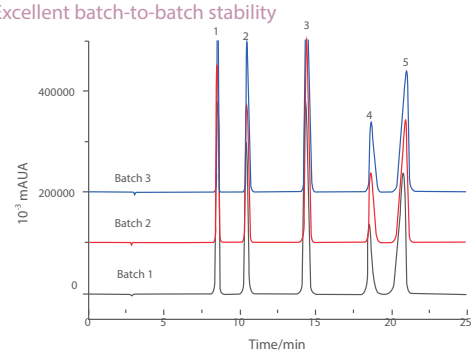
Column:	Blossmate® PSV C18 4.6×250 mm, 5 μm
Mobile Phase:	20 mM ammonium acetate solution: methanol=93: 7(on-line blending)
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	230nm
Injection Volume:	5 μL

Note: When the Blossmate® PSV C18 column is used for the determination of five kinds of food additives, in order to ensure the resolution and the life of the column, the proportion of the water phase in the mobile phase shall not be less than 7%.

High stability, longer lifetime



Excellent batch-to-batch stability



From the results above, multiple batches of column were selected to test the column, showing Blossmate PSV C18 column has excellent reproducibility and stability.

Ordering Information

P/N	Particle size	Specification
00605-21041	5 μm	4.6×150mm
00605-21043	5 μm	4.6×250 mm

Blossmate® PSV C18 Plus
--the next generation dedicated column for preservatives

Why is the preservative testing so harmful to HPLC columns?

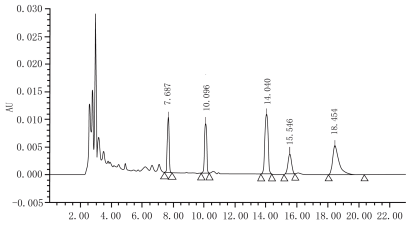
Complex sample matrix but simple pretreatment.

There are many kinds of food on the market, juice, biscuits, cakes, soy sauce, meat.....basically all of them contain preservatives. But for so many kinds of samples, same pretreatment method is used, which leads to a large amount of small molecular impurities and particulate matter are existed in the test samples, which can easily contaminate the column, resulting in a rapid decline in the column performance. To resolve this problem, Welch launched Blossmate PSV Plus Column to meet your requirements of preservative testing.



Blossmate PSV C18 Plus column adopts the integrated design of the guard column and the analytical column. An integrated guard column is added at the front end of the analytical column to protect the analytical column in all directions. At the same time, the dead volume is small, and the replacement of the cartridge is convenient.

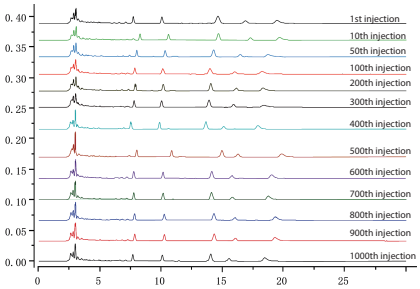
Analysis of Five Food Additives



Column:	Blossmate® PSV C18 plus 4.6×250mm, 5μm
Mobile Phase:	20mM ammonium acetate solution: methanol = 93:7 (online mixing)
Flow Rate:	1.0 mL/min
Temperature:	30°C
Detector:	230nm
Injection Volume:	5 μL

Name	Retention time	Area	Height	R	Plates	Tailing factor
Acesulfame	7.687	85170	10969		22332	1.00
Benzoic acid	10.096	95190	9935	10.25	24980	0.96
Sorbic acid	14.040	155694	11442	12.56	24061	0.96
Sodium Saccharin	15.546	63598	4132	3.83	22703	0.94
Dehydroacetic acid	18.454	150007	5520	5.27	12723	1.80

Service Life Experiment



Injections	Flow rate (mL/min)	R of dehydroacetic acid & sodium saccharin (R≥1.50)	Plate (dehydroacetic acid)	Tailing factor (dehydroacetic acid)	Column pressure (MPa)
1st	1.0	5.27	12723	1.80	14.0
10th	1.0	5.73	13344	1.78	14.0
50th	1.0	5.92	13702	1.66	14.1
100th	1.0	5.49	14407	1.70	14.1
200th	1.0	6.01	14604	1.67	14.3
300th	1.0	6.41	15408	1.61	14.2
400th	1.0	5.51	14487	1.68	14.1
500th	1.0	3.49	15917	1.83	14.3
600th	1.0	3.83	11100	1.81	14.3
700th	1.0	3.44	8189	1.82	14.4
800th	1.0	4.09	12662	1.38	14.2
900th	1.0	3.98	12791	1.70	14.3
1000th	1.0	3.96	11340	1.83	14.3

Ordering Information

P/N	Specification
00607-21441	4.6×150mm, 5μm
00607-21443	4.6×250mm, 5μm
00808-04143	Cartridge: 4.6×10mm, 5μm, 120Å

Blossmate® SAX

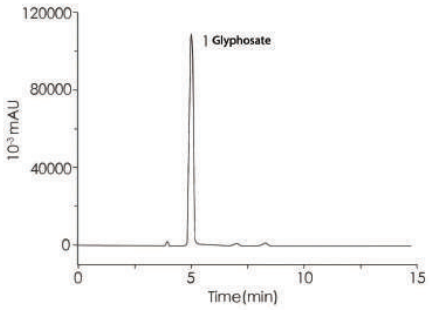
Blossmate® SAX column can be used under the condition of high flow rate and high pressure. It is compatible with ionic strength change of various mobile phase to achieve fast equilibrium and suitable for the separation and purification of polar small molecules and other biological macromolecules compounds, such as glyphosate, nucleotides, proteins and peptides.

Features:

- Based on ultra pure spherical silica gel, bonded quaternary ammonium functional group with high density and high mechanical strength.
- Remain stable baseline and high sensitivity even under neutral pH condition.
- Compatible with organic solvent and mobile phase of buffer salts, remain stable chromatographic properties.
- Comply with the standard of determination of glyphosate, excellent batch to batch stability and long lifetime, ensuring efficient analysis properties.

Bonded phase	Quaternary ammonium functional group	Surface Area(m^2/g)	300(120 Å)
pH Range	2-8	Carbon Loading(%)	6.5(120 Å)
Particle Size	5 μm	USP List	L14
Endcapped	No		

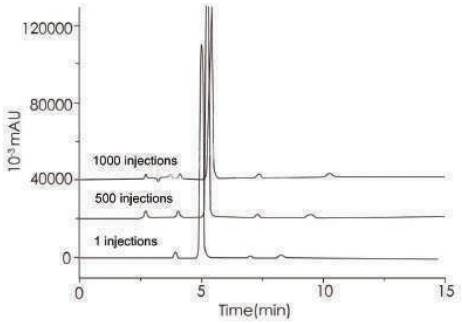
Glyphosate



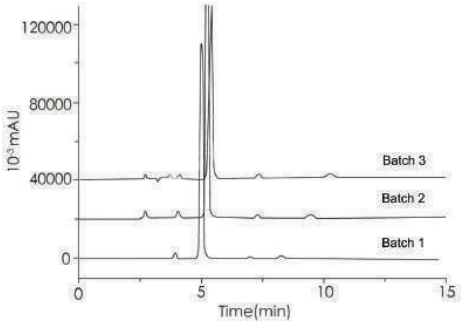
Column:	Blossmate® SAX, 4.6×250mm, 5μm
Mobile Phase:	100mM KH_2PO_4:CH_3OH=85: 15 (adjust pH to 2)
Flow Rate:	1.0 mL/min
Temperature:	25°C
Detector:	195nm
Injection Volume:	20 μL

Note: after mixing mobile phase well, adjust pH to 2.0.

High stability, longer lifetime



Excellent batch-to-batch stability



From the results above, multiple batches of column were selected to test the column, showing Blossmate SAX column has excellenet reproducibility and stability.

Ordering Information

Blossmate® SAX Column

P/N	Particle size	Specification
00606-21041	5 μm	4.6×150 mm
00606-21043	5 μm	4.6×250mm

Blossmate® C4

Welch Materials has launched a new Blossmate® C4 column, which fully meets the needs of detecting various biological samples, and provides customers with a HPLC column with higher accuracy, faster peak output, lower cost and a wider range of protein measurement.

Features:

Higher Accuracy: Porous particle silica packing (3.5μm) with large pore size (450Å) to improve protein resolution.

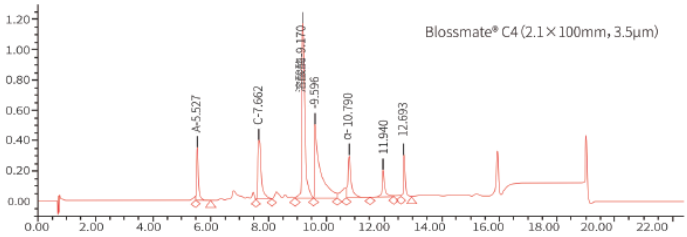
Faster peak times: Compared to columns packed with the same size fully porous particles, the analysis time is shorter.

Lower cost: Stable porous layer packed bed and 2μm inlet frit prevent inlet clogging, thus extending column life.

Wider testing range: measurable protein molecular weight 12kDa-250kDa.

Product name	Bonded phase	Particle size μm	Pore size Å	Specific surface area m²/g	Carbon load %	pH stability	Endcapped
Blossmate® C4	Butylsilane	3.5	450Å	15	0.5	1.5-10.0	Yes

Separation of Seven Proteins on Blossmate® C4 Column



Name	Retention time	Area	Height	Area%	Resolution	Plates	Tailing factor
RNase A	5.527	1760396	387558	6.75	n.a.	39328	1.74
Cytochrome c	7.662	3465735	433891	13.30	13.71	27913	n.a.
Lysozyme	9.170	8614697	1203650	33.05	8.02	46827	2.70
Transferrin	9.596	6962972	532132	26.71	1.86	27533	n.a.
A-lactalbumin	10.790	2401376	316898	9.21	5.45	91394	n.a.
Catalase	11.940	1458165	219515	5.59	7.63	128660	3.03
Carbonic anhydrase	12.693	1400960	316344	5.38	5.89	210042	1.26

Column:	Blossmate® C4
Mobile Phase:	Mobile phase A: 0.1% trifluoroacetic acid Mobile phase B: 0.1% trifluoroacetic acid in acetonitrile
Flow Rate:	0.3 mL/min
Temperature:	60°C
Detector:	214nm
Injection Volume:	5 μL

Ordering Information

Product name	P/N	Specification
Blossmate® C4	00608-31010	2.1×50mm, 3.5μm
Blossmate® C4	00608-31012	2.1×10 0mm, 3.5μm

Blossmate® Phenyl

Welch Materials has launched a new Blossmate® Phenyl column to fully meet the needs of detecting various biological samples, providing customers with higher accuracy, faster peak output, lower cost and a wider range of protein measurement columns.

Features:

Higher Accuracy: Porous particle silica packing (3.5μm) with large pore size (450Å) to improve protein resolution.

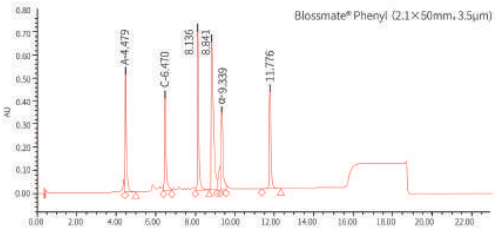
Faster peak times: Compared to columns packed with the same size fully porous particles, the analysis time is shorter.

Lower cost: Stable porous layer packed bed and 2μm inlet frit prevent inlet clogging, thus extending column life.

Wider testing range: measurable protein molecular weight 12kDa-250kDa.

Product name	Bonded phase	Particle size μm	Pore size Å	Specific surface area m²/g	Carbon load %	pH stability	Endcapped
Blossmate® Phenyl	Phenylsilane	3.5	450Å	15	1.0	1.5-10.0	Yes

Separation of Six Proteins on Blossmate® Phenyl



Name	Retention time	Area	Height	Area%	Resolution	Plates	Tailing factor
RNase A	4.479	2740222	521395	15.26	n.a.	18343	n.a.
Cytochrome c	6.470	2369215	412742	13.19	14.82	39592	n.a.
Lysozyme	8.136	3443765	700496	19.18	13.06	77448	2.30
Transferrin	8.841	4900384	664186	27.29	3.87	42062	n.a.
A-lactalbumin	9.339	2133699	337141	11.88	2.55	75760	n.a.
carbonic anhydrase	11.776	2370479	425492	13.20	16.90	113433	1.88

Column:	Blossmate® Phenyl
Mobile Phase:	Mobile phase A: 0.1% trifluoroacetic acid Mobile phase B: 0.1% trifluoroacetic acid in acetonitrile
Flow Rate:	0.3 mL/min
Temperature:	60°C
Detector:	220nm
Injection Volume:	5 μL

Ordering Information

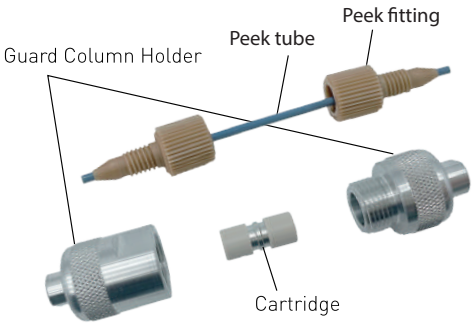
Product name	P/N	Specification
Blossmate® Phenyl	00609-31010	2.1×50mm, 3.5μm
Blossmate® Phenyl	00609-31012	2.1×100mm, 3.5μm

Guard Column and Pre-Column Inline Filter

Guard column	Pre-column Inline Filter

- **Between injector and analytical column**
- **All have column holders**
- **All have frit to retain solid particles**

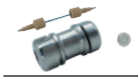
Packing materials inside a Guard Column cartridge.	Filter inside a Pre-column.
Remove strongly adsorbed sample components	Trap particulate matter from the fluid path, but does not remove sample components or contaminants.
Internal diameters should match as closely as possible and packing material should be of the same particle size and chemistry as the analytical column	i) Can be used with other brands of columns ii) Designed to be wholly disposable or has replaceable filters in a re-useable holder



General Guard Column Kit(e.g. Ultisil XB-C18, 4.6×10 mm)

P/N	Description	Piece
H00808-01101	Stand Alone Analytical Guard Holder(φ: 4.6mm, 7000psi)	1
H00808-04001	Ultisil® XB-C18, Cartridge: 5μm,120Å, 4.6×10mm	2
H00808-01301	1/16"Peek Tube, 7cm Length	1
H00808-01303	PEEK Fitting, for 1/16" OD tubing	2

Pre-Column Inline Filter

Picture	Description	Configuration	P/N	Instrument
	ColumnShield Precolumn Fliter, PEEK, 0.5μm Ti frit, 5000 psi	Column Shield Precolumn Fliter, PEEK × 1	00808-01220	HPLC
	In-Line Precolumn Fliter holder, 6000 psi	In-Line Precolumn Fliter holder × 1	00808-01201-1	
	Analytical Replacement Frits, 2 μm	Analytical Replacement Frits, 2 μm × 1	00808-01202	
	Analytical Replacement Frits, 0.5 μm	Analytical Replacement Frits, 0.5 μm × 1	00808-01203	
	In-Line Precolumn Fliter holder kit（2μm）	In-Line Precolumn Fliter holder, 6000 psi × 1 Analytical Replacement Frits 2 μm × 2 1/16"Peek Tube, 7 cm Length × 1 PEEK Fitting, for 1/16" OD tubing × 2	00808-01201	
	In-Line Precolumn Fliter holder kit（0.5μm）	In-Line Precolumn Fliter holder, 6000 psi × 1 Analytical Replacement Frits, 0.5 μm × 2 1/16"Peek Tube, 7cm Length × 1 PEEK Fitting, for 1/16" OD tubing × 2	00808-01201-05	
	UltraShield Precoumn Fliter, SS, 0.5 μm stainless steel frit, 15000 psi	Column Shield Precolumn Fliter, SST ×1 5/16"solid wrench × 1	00808-01221	UHPLC, Core-shell
		Column Shield Precolumn Fliter, SST, Waters Port × 1, 5/16"solid wrench × 1	00808-01221-W	
	Direct Connect Precolumn Fliter, with 0.2 μm Replacement Frits × 5, 18000 psi	Direct Connect Precolumn Fliter × 1 0.2μm UHPLC Replacement Frits × 5 3/8" solid wrench × 2	00808-01222	
	UHPLC Replacement Frits, 0.2 μm	0.2 μm UHPLC Replacement Frits × 1	00808-UF020	

Guard Column Holder

Picture	Description	Configuration	P/N	Instrument
	Stand Alone Analytical Guard Holder (φ: 4.6 mm, 7000 psi)	Stand Alone Analytical Guard Holder × 1	00808-01101	HPLC
	Stand Alone NarrowBore Guard Holder (φ: 2.1 mm, 7000 psi)	Stand Alone Narrow Bore Guard Holder,× 1	00808-01107	
	Direct Connect Analytical Guard Holder (φ: 4.6 mm, 7000 psi), compatible with Parker, Valco, Waters columns	Direct Connect Analytical Guard Holder × 1 1/4" solid wrench × 1	00808-01108	
	Holder: 316L Stainless Steel, PEEK Ferrule, 15000 psi, 5 mm UHPLC Cartridges	Direct Connect UHPLC Analytical Guard Holder × 1, 7/16"solid wrench × 2	00808-01109	UHPLC, Core-shell

Guard Column Cartridges

Xtimate Guard Column Cartridges

Specification	3 μm, 2.1×10 mm (Cartridges)	5 μm, 2.1×10 mm (Cartridges)	3 μm, 4.6×10 mm (Cartridges)	5 μm, 4.6×10 mm (Cartridges)	10 μm, 4.6×10 mm (Cartridges)
C18	00808-23101	00808-24101	00808-03101	00808-04101	00808-05101
C8	00808-23102	00808-24102	00808-03102	00808-04102	00808-05102
Phenyl-Hexyl	00808-23106	00808-24106	00808-03106	00808-04106	-
C4	00808-23103	00808-24103	00808-03103	00808-04103	-
CN	-	00808-24105	-	00808-04105	-
Polar-RP	-	00808-24111	-	00808-04152	-
Lactose-NH_2	-	00808-24110	-	00808-04151	-
XB-SCX	-	00808-24112	-	00808-04153	-

Ultisil Guard Column Cartridges

Specification	3 μm, 2.1×10 mm (Cartridges)	5 μm, 2.1×10 mm (Cartridges)	3 μm, 4.6×10 mm (Cartridges)	5 μm, 4.6×10 mm (Cartridges)	10 μm, 4.6×10 mm (Cartridges)
XB-C18	H00808-23001	H00808-24001	H00808-03001	H00808-04001	H00808-05001
XB-C8	H00808-23002	H00808-24002	H00808-03002	H00808-04002	H00808-05002
XB-Phenyl	H00808-23006	H00808-24006	H00808-03006	H00808-04006	H00808-05006
XB-C4	H00808-23011	H00808-24008	H00808-03030	H00808-04008	H00808-05008
XB-C1	-	H00808-24023	-	H00808-04026	-
XB-CN	H00808-23005	H00808-24005	H00808-03005	H00808-04005	H00808-05005
SiO_2	H00808-23007	H00808-24007	H00808-03007	H00808-04007	H00808-05007
Diol	H00808-23020	H00808-24020	H00808-03020	H00808-04020	H00808-05020
XB-NH_2	H00808-23004	H00808-24004	H00808-03004	H00808-04004	H00808-05004
XB-SAX	H00808-23008	H00808-24009	H00808-03008	H00808-04009	H00808-05009
XB-SCX	H00808-23012	H00808-24011	H00808-03033	H00808-04011	H00808-05011
XB-C30	H00808-23013	H00808-24024	H00808-03035	H00808-04035	H00808-05013
AQ-C18	H00808-23003	H00808-24003	H00808-03003	H00808-04003	H00808-05003
LP-C18	H00808-23014	H00808-24015	H00808-03010	H00808-04015	H00808-05014
LP-C8	H00808-23015	H00808-24012	H00808-03011	H00808-04012	-
LP-AQ	-	H00808-24026	-	H00808-04042	-
LP-CN	-	H00808-24027	-	H00808-04049	-
LP-C3	-	H00808-24028	-	H00808-04050	-
Plus C18	H00808-23024(3.5μm)	H00808-24029	H00808-03036(3.5μm)	H00808-04036	-
ALK C18	-	H00808-24030	-	H00808-04033	-
ODS-3	H00808-23016	H00808-24031	H00808-03031	H00808-04043	-
PG-C18	-	-	-	H00808-04045	-

Ultisil Guard Column Cartridges

Specification	3 μm, 2.1×10 mm (Cartridges)	5 μm, 2.1×10 mm (Cartridges)	3 μm, 4.6×10 mm (Cartridges)	5 μm, 4.6×10 mm (Cartridges)	10 μm, 4.6×10 mm (Cartridges)
XS-C18	H00808-23017	H00808-24033	H00808-03034	H00808-04046	-
PAH	H00808-23018	H00808-24010	H00808-03012	H00808-04010	-
Polar-RP	H00808-23009	H00808-24017	H00808-03009	H00808-04017	H00808-05015
Phenyl-Ether	-	H00808-24034	-	H00808-04028	-
PFP	H00808-23019	H00808-24035	H00808-03024	H00808-04024	-
F-C8	H00808-23021	H00808-24036	H00808-03023	H00808-04038	-
HILIC Silica	H00808-23023	H00808-24037	H00808-03026	H00808-04044	H00808-05016
HILIC NH_2	H00808-23022	H00808-24038	H00808-03025	H00808-04047	H00808-05017
HILIC Amide	H00808-23010	H00808-24025	H00808-03021	H00808-04025	H00808-05018
HILIC Amphion	-	H00808-24039	-	H00808-04029	-
Amino Acid	-	H00808-24040	-	H00808-04023	-
MM C18/SCX	-	H00808-24032	-	H00808-04032	-
MM NH_2/CN	-	H00808-24041	-	H00808-04037	-
Cellu-D	-	H00808-24042	-	H00808-04014	H00808-05021
Cellu-DR	-	H00808-24042-R	-	H00808-04014-R	H00808-05021-R
Amy-D	-	H00808-24043	-	H00808-04040	H00808-05022
Amy-DR	-	H00808-24043-R	-	H00808-04040-R	H00808-05022-R
Cellu-J	-	H00808-24044	-	H00808-04039	H00808-05023
Cellu-JR	-	H00808-24044-R	-	H00808-04039-R	H00808-05023-R
Amy-S	-	H00808-24045	-	H00808-04041	H00808-05024
Amy-SR	-	H00808-24045-R	-	H00808-04041-R	H00808-05024-R

Topsil Guard Column Cartridges

Specification	3 μm, 2.1×10 mm (Cartridges)	5 μm, 2.1×10 mm (Cartridges)	3 μm, 4.6×10 mm (Cartridges)	5 μm, 4.6×10 mm (Cartridges)
C18	00808-23301	00808-24301	00808-03301	00808-04301
C8	00808-23302	00808-24302	00808-03302	00808-04302
Phenyl-Hexyl	00808-23305	00808-24305	00808-03305	00808-04305
CN	-	00808-24304	-	00808-04304
NH_2	-	00808-24303	-	00808-04303
Silica	-	00808-24306	-	00808-04306
Hilic-NH_2	-	00808-24307	-	00808-04307

Welchrom Guard Column Cartridges

Specification	5 μm, 2.1×10 mm (Cartridges)	5 μm, 4.6×10 mm (Cartridges)
C18	00808-24201	00808-04201
C8	00808-24202	00808-04202

UHPLC Guard Column Cartridges

	Column ID (mm)	
	2.0-3.0	3.2-8.0
	Cartridges(mm)	
	2.1 × 5.0mm	4.0 × 5.0 mm
Ultisil UHPLC XB-C18	U808-201-25	U808-201-45
Ultisil UHPLC AQ-C18	U808-207-25	U808-207-45
Ultisil UHPLC XB-C8	U808-202-25	U808-202-45
Ultisil UHPLC XB-Phenyl	U808-203-25	U808-215-45
Ultisil UHPLC Polar RP	U808-215-25	U808-215-45
Ultisil UHPLC LP-C18	U808-208-25	U808-208-45
Ultisil UHPLC HILIC	**U808-209-25**	**U808-209-45**
Xtimate UHPLC C18	U808-101-25	U808-101-45

Boltimate Guard Column Cartridges

	Column ID (mm)	
	2.0-3.0	3.2-8.0
	Cartridges(mm)	
	2.1 × 5.0mm	4.0 × 5.0 mm
Boltimate C18	U808-960-25	U808-960-45
Boltimate Phenyl- Hexyl	U808-961-25	U808-961-45
Boltimate EXT-C18	U808-962-25	U808-962-45
Boltimate EXT-PFP	U808-963-25	U808-963-45
Boltimate HILIC	U808-964-25	U808-964-45
Boltimate LP-C18	**U808-965-25**	**U808-965-45**

Description	P/N
1/16"Peek Tube，7cm Length	00808-01301
PEEK Fitting，for 1/16" OD tubing	00808-01303
PEEK Ferrule，for 1/16" OD tubing	00808-01308
1/4"-5/16"solid wrench	3/9-7/16-sw
3/8"-7/16"solid wrench	3/9-7/16-sw

Multi-Batch LC Column Bundles

—Multi-batch column combinations suitable for analytical method development and method validation

Method development and validation

Analytical method validation is essential to demonstrate the quality, reliability and consistency of a developed chemical drug or biologic. Proper validation methods provide documented proof of method performance and specify ongoing measures to ensure quality monitoring of method life. However, insufficient method validation remains an important issue in drug development and manufacturing. Improper execution can result in product approval delays, incomplete API (Active Pharmaceutical Ingredient) development, or regulatory delays in commercialization.

During the method development process, experienced chromatographers realize that any method developed using a uniquely selective column must be easily transferable and reproducible in the laboratory, while being independent of the LC system used. Platform restrictions.



Different batches of columns to escort your method validation

The Welch Materials Multi-Lot LC Column Bundle contains three different lots of columns. The column uses ultra-high-purity spherical silica as the matrix, and is bonded with high-density alkyl functional groups, which has stable selectivity and column efficiency, and is an ideal choice for your method development and validation.

	Ultisil XB-C18	Xtimate C18	Ultisil LP-C18	Welchrom C18	Ultisil ODS-3	Ultisil Plus C18	Ultisil Polar RP
Inner diameter (mm)	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Column length (mm)	250	250	250	250	250	250	250
Particle size (μm)	5	5	5	5	5	5	5
Pore size (Å)	120	120	120	120	120	120	120
Carbon load	17%	14%	10%	19%	15%	10%	18%
Specific surface area (m^2/g)	320	320	320	320	380	160	320
End capping	Yes	Yes	No	Yes	Yes	Yes	Yes
pH range	1.5-10.0	1.0-12.5	0.5-8.0	1.5-10.0	2.0-8.0	2.0-8.0	1.5-10.0

Each Multi-Lot LC Column Bundle has passed strict quality control and validation to ensure stable consistency between columns, and is suitable for column selection and method development of different pH mobile phase conditions and samples with different properties.

Ordering Information

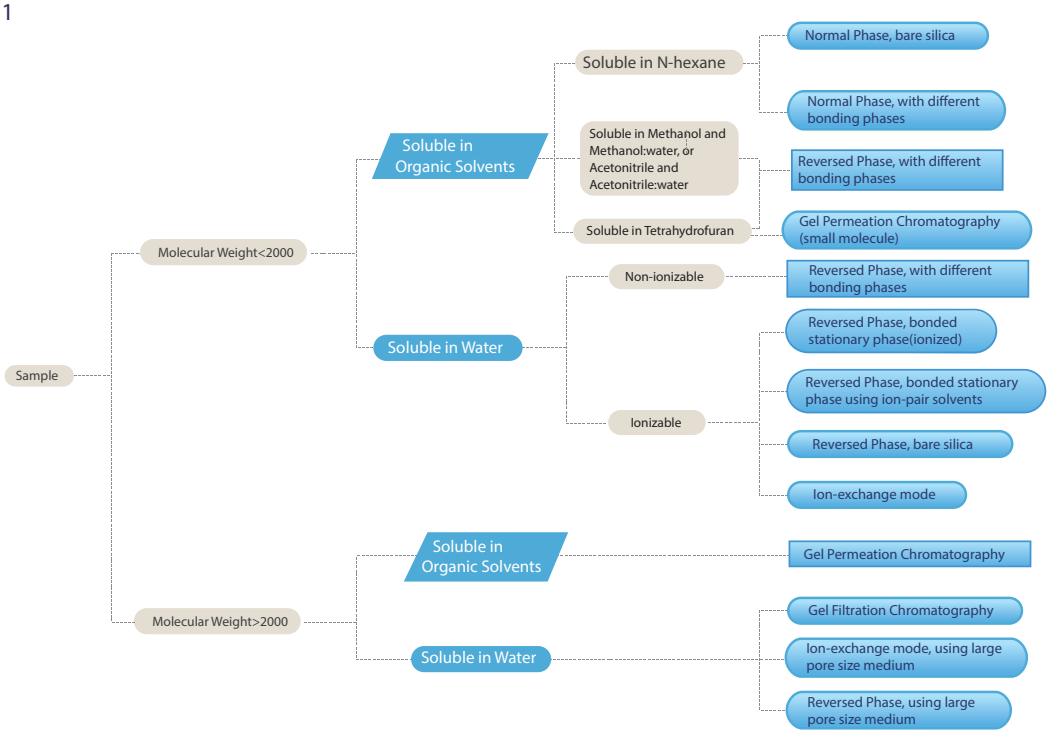
Product name	Product Specifications	P/N
Ultisil XB-C18	Ultisil XB-C18, 5μm, 4.6×250mm, 3pk	K201-31043-3P
Xtimate C18	Xtimate C18, 5μm, 4.6×250mm, 3pk	K101-21043-3P
Ultisil LP-C18	Ultisil LP-C18, 5μm, 4.6×250mm, 3pk	K208-31043-3P
Welchrom C18	Welchrom C18, 5μm, 4.6×250mm, 3pk	K310-02043-3P
Ultisil ODS-3	Ultisil ODS-3, 5μm, 4.6×250mm, 3pk	K275-31043-3P
Ultisil Plus C18	Ultisil Plus C18, 5μm, 4.6×250mm, 3pk	K260-31043-3P
Ultisil Polar RP	Ultisil Polar RP, 5μm, 4.6×250mm, 3pk	K215-31043-3P

*Special instructions: This product does not provide a trial, once sold, it will not be returned.

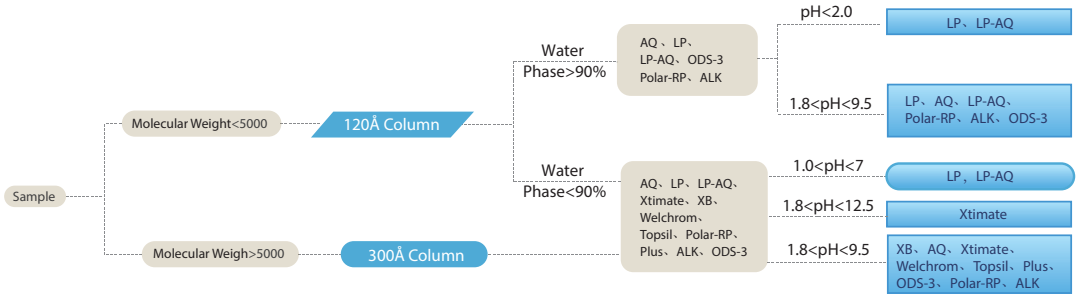
Appendix

1.Selection of Analysis Modes

Selection 1



Selection 2



2. Method Development Tool Kit for Pharmaceutical Industry

This kit consists of different columns with different bonding phases and selectivities. Please refer to details below for the application range. Besides columns, the tool kit also includes technical support from Welch technical team throughout the development of methods.
To develop a new method, purpose and requirements of the analysis shall first be confirmed, thus ideal parameters and results can be confirmed. First of all shall be the HPLC mode, which determined normally by following factors:

- Type and solubility of target compound
- Molecular weight of target compound
- Sample matrix
- Available stationary phases and columns

☆ **Please select the tool kit based on preliminary analysis of above tips.**

The "Universal" Kit

Column	Bonded phase	USP	Dimension	Description	Application range
Xtimate® C18	C18	L1	4.6×250mm, 5μm	Organic–inorganic hybridized surface; high chemical stability under high–content buffer salts conditions High pH tolerance (1.0–12.5); Double end–capped, high universality.	First choice for beginning; Great universality; Better peak shape.
Ultisil® LP–C18	C18	L1	4.6×250mm, 5μm	Side chain steric protection to shield hydroxyl group; No end–capping (pH range 0.5–8.0); High steric hindrance selectivity; 100% water to 0% water and normal reagents applicable; Little loss on MS or ELSD under strong acid conditions.	First choice for mobile phase pH under 2; Strong orthogonality with Xtimate C18 column.
Ultisil® XS–C18	C18	L1	4.6×250mm, 5μm	Unique high–density bonding, high carbon capacity, double end–capping; high steric hindrance selectivity, strong separation ability for mixture of planar solid structure; applies to separation of structural isomerism.	Strong orthogonality with normal C18 column; First choice for separating isomers.
Ultisil® Polar–RP	C18	L1	4.6×250mm, 5μm	Polar group embedded in carbon chain of reversed–phase C18 stationary phase, brings good retention and peak symmetry for strong polar and alkalic substances; Embedded polar group enables hydrophilic stationary phase, with better retention of materials not retained on normal C18, and high tolerance to high water content mobile phase.	100% water tolerable; First choice for strong polar substances.
Ultisil® XB–Phenyl	Phenyl	L11	4.6×250mm, 5μm	Classic reverse–phase bonding phase, provides better selectivity for benzene rings compared to linear alkane bonded phases.	Substance containing benzene rings.
Ultisil® PFP	Phenyl	L11	4.6×250mm, 5μm	Fluorinated stationary phase, stronger ion exchange and polarity than alkyl stationary phase; Good selectivity for halogen–containing substances and structural isomers.	Separation of positional isomers on phenyl ring; Substance with halogen substituent.
Ultisil® XB–NH_2	NH_2	L8	4.6×250mm, 5μm	First choice for sugar compounds	Polar compounds or sugar
Ultisil® HILIC SiO_2	SiO_2	L3	4.6×250mm, 5μm	Most classic bonding phase in HILIC mode.	Strong polar compound
Ultisil® UHPLC XB–C18	C18	L1	2.1×100mm, 1.8μm	Ultra high pressure LC, shortening retention time.	Fast separation under ultra high pressure.
Boltimate® EXT–C18	C18	L1	3.0×100mm, 2.7μm	Low column pressure, high efficiency.	Fast separation in normal LC system

Tool Kits for "Special Application"

"High-Select & Universal" Kit

Contains: Ultisil® XB-C18, Ultisil® LP-C18, Xtimate® C18
Dimension: 4.6*250mm, 5μm (other dimensions also available)

- Applies to method screening, for general chromatographic analysis requirements;
- Suitable for strong polar compounds, acidic, neutral, alkaline substances.

"Extended Selectivity" Kit

Contains: Ultisil® Polar-RP, Ultisil® ALK-C18, Ultisil® XB-CN
Dimension: 4.6*250mm, 5μm (other dimensions also available)

- Applies to method screening, for general chromatographic analysis requirements;
- Applies to strong polar or non–polar compounds and alkalines, with high water ratio conditions.

"Isomer Analysis" Kit

Contains: Ultisil® PFP, Ultisil® PAH, Ultisil® Hilic SiO_2
Dimension: 4.6*250mm, 5μm (other dimensions also available)

- Applies to isomer mixtures.
- Strong selectivity for ortho, para, meta isomers on indophenol ring and planar solid structure mixtures.

"Hydrophilic Substance Analysis" Kit

Contains: Ultisil® AQ-C18, Ultisil® Polar-RP, Ultisil® LP-C18
Dimension: 4.6*250mm, 5μm (other dimensions also available)

- Applies to strong polar substance without retention on normal C18, or separation of organic acid mixtures;
- Compatible with 100% – 0% water phase mobile phase.

"Bio-samples Analysis" Kit

Contains: Ultisil® LP-C18 (300Å), Ultisil® XB-C4 (300Å), Ultisil® XB-C8 (300Å)
Dimension: 4.6*250mm, 5μm (other dimensions also available)

- Large pore size (300Å), suitable for macromolecules like proteins or peptides etc, providing better interaction with bonded phases;
- Various bonding phases with different retention, applies to retention and separation of proteins and peptides of various molecular sizes.

For further details about the columns, please refer to user manual attached with each column.

3. Welch HPLC Column Selection by USP Listing

HPLC Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L1: Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 1.5 to 10 µm in diameter, or a monolithic rod.					
Ultisil XB-C18	3, 5, 10 µm	1.5-10.0	17%(120Å), 8%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil AQ-C18	3, 5, 10 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil LP-C18	3, 5, 10 µm	0.5-8.0	10%(120Å), 5%(300Å)	320(120Å), 90(300Å)	No
Ultisil LP-AQ	5 µm	1.0-8.0	5%(120Å)	320(120Å)	No
Ultisil Polar-RP	3, 5,10 µm	1.5-10.0	18%(120Å)	320(120Å)	Yes
Ultisil AA(Amino Acid)	5 µm	1.5-10.0	17%(120Å)	320(120Å)	Yes
Ultisil Amino Acid Plus	5 µm	1.0-7.0	10%(120Å)	320(120Å)	Yes
Ultisil OAA	5 µm	1.0-7.0	10%(120Å)	320(120Å)	Yes
Ultisil PAH	3, 5 µm	1.5-10.0	22%(120Å)	320(120Å)	No
Ultisil ALK C18	5 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil Plus C18	3.5, 5 µm	2.0-8.0	10%(130Å)	160(130Å)	Yes
Ultisil Plus LP-C18	5 µm	0.5-8.0	9%(130Å)	160(130Å)	Yes
Ultisil ODS-3	3, 5 µm	2.0-8.0	15%(100Å)	380(100Å)	Yes
Ultisil XS-C18	3, 5 µm	2.0-10.0	23%(120Å)	320(120Å)	Yes
Ultisil PG-C18	5 µm	2.0-8.0	10%(150Å)	260(150Å)	No
Xtimate C18	3, 5, 10 µm	1.0-12.5	14%(120Å)	320(120Å)	Yes
Xtimate Polar-RP	5 µm	1.0-12.5	16%(120Å)	320(120Å)	Yes
Welchrom C18	5 µm	1.5-10.0	19%(120Å)	320(120Å)	Yes
Welchrom Vantage C18	5 µm	2.0-8.0	13%(130Å)	280(130Å)	Yes
Topsil C18	3, 5 µm	2.0-9.5	12%(150Å)	260(150Å)	Yes
Boltimate C18(Core-shell)	2.7 µm	2.0-8.5	9%(90Å)	120(90Å)	Yes
Boltimate EXT-C18 (Core-shell)	2.7 µm	1.5-12.0	8%(90Å)	120(90Å)	Yes
Boltimate LP-C18 (Core-shell)	2.7 µm	1.0-8.5	7%(90Å)	120(90Å)	No
Blossmate C18	5 µm	2.0-8.0	14%(100Å)	300(100Å)	Yes
Blossmate Aqs C18	5 µm	2.0-8.0	10%(100Å)	300(100Å)	Yes
Blossmate ST C18	5 µm	1.0-11.0	12%(100Å)	300(100Å)	Yes
Ultisil UHPLC XB-C18	1.8 µm	1.5-10.0	17%(120Å)	320(120Å)	No
Ultisil UHPLC AQ-C18	1.8 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil UHPLC LP-C18	1.8 µm	0.5-8.0	10%(120Å)	320(120Å)	No
Ultisil UHPLC Polar-RP	1.8 µm	1.5-10.0	18%(120Å)	320(120Å)	Yes
Xtimate UHPLC C18	1.8 µm	1.0-12.5	14%(120Å)	320(120Å)	Yes
L3: Porous silica particles, 1.5 to 10 µm in diameter, or a mondithic silica rod.					
Ultisil SiO_2	3, 5, 10 µm	2.0-8.0	N/A	320(120Å),90(300Å)	No
Ultisil HILIC Silica	3, 5, 10 µm	2.0-8.0	N/A	320(120Å)	No
Ultisil UHPLC HILIC	1.8 µm	2.0-8.0	N/A	320(120Å)	No
Topsil Silica	5 µm	2.0-8.0	N/A	260(150Å)	No
Boltimate HILIC	2.7 µm	2.0-8.5	N/A	120(90Å)	No
L7: Octyl silane chemically bonded to totally porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silca rod.					
Ultisil XB-C8	3, 5, 10 µm	1.5-10.0	12%(120Å), 4%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil LP-C8	3, 5 µm	1.0-8.0	5.5%(120Å), 3%(300Å)	320(120Å), 90(300Å)	No
Ultisil Plus C8	5 µm	1.5-10.0	7%(130Å)	160(130Å)	Yes
Ultisil F-C8	3, 5 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Xtimate C8	3, 5, 10 µm	1.0-12.5	10%(120Å), 5%(300Å)	320(120Å), 100(300Å)	Yes
Welchrom C8	5 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Topsil C8	3, 5 µm	2.0-9.5	10%(150Å)	260(150Å)	Yes
Ultisil UHPLC XB-C8	1.8 µm	1.5-10.0	12%(120Å)	320(120Å)	
L8: An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 3 to 10 µm in diameter.					
Ultisil XB-NH_2	3, 5, 10 µm	2.0-8.0	4%(120Å)	320(120Å)	No
Ultisil HILIC-NH_2	3, 5, 10 µm	2.0-8.0	4%(120Å)	320(120Å)	No
Topsil NH_2	5 µm	2.0-8.0	3%(150Å)	260(150Å)	No
Topsil Hilic-NH_2	5 µm	2.0-8.0	3%(150Å)	260(150Å)	No
Xtimate Lactose-NH_2	5 µm	2.0-8.0	7%(120Å)	450(120Å)	No
L9: Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 µm in diameter.					
Ultisil XB-SCX	3, 5,10 µm	2.0-8.0	12%(120Å), 5%(300Å)	320(120Å), 90(300Å)	No
Xtimate XB-SCX	5 µm	2.0-8.0	2%(120Å)	350(120Å)	No
L10: Nitrile groups chemically bonded to porous silica particles, 3 to 10 µm in diameter.					
Ultisil XB-CN	3, 5, 10 µm	1.5-9.0	7%(120Å)	320(120Å)	Yes
Ultisil LP-CN	5 µm	1.0-8.0	6%(120Å)	320(120Å)	No
Xtimate CN	5 µm	1.0-12.5	7%(120Å)	320(120Å)	Yes
Topsil CN	5 µm	2.0-8.0	6%(150Å)	260(150Å)	Yes

HPLC Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L11: Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.					
Ultisil XB-Phenyl	3, 5, 10 µm	1.5-10.0	12%(120Å), 4%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil Phenyl-Ether	5 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil PFP	3, 5 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil Plus Phenyl	5 µm	1.5-10.0	8%(130Å)	160(130Å)	Yes
Xtimate Phenyl-hexyl	3, 5 µm	1.0-12.5	12%(120Å)	320(120Å)	Yes
Topsil Phenyl-hexyl	3, 5 µm	2.0-9.5	12%(150Å)	260(150Å)	Yes
Boltimate Phenyl-hexyl(Core-shell)	2.7 µm	2.0-8.5	7%(90Å)	120(90Å)	Yes
Boltimate EXT-PFP(Core-shell)	2.7 µm	1.5-12.0	5%(90Å)	120(90Å)	Yes
Blossmate Phenyl	3.5 µm	1.5-10.0	1%(450Å)	15(450Å)	Yes
Ultisil UHPLC XB-Phenyl	1.8 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
L13:Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.					
Ultisil XB-C1	5 µm	1.5-10.0	4%(120Å)	320(120Å)	Yes
L14: Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter.					
Ultisil XB-SAX	3, 5,10 µm	2.0-8.0	7.5%(120Å), 1.5%(300Å)	320(120Å), 90(300Å)	No
Blossmate SAX	5 µm	2.0-8.0	6.5%(300Å)	300(120Å)	No
L17: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter.					
Xtimate Sugar-H	5, 8 µm	1.0-3.0	N/A	N/A	N/A
L19: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 9 µm in diameter.					
Xtimate Sugar-Ca	5, 8 µm	5.0-9.0	N/A	N/A	N/A
L20: Dihydroxypropane groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter.					
Ultisil Diol	3, 5, 10 µm	2.0-8.0	2.5%(120Å)	320(120Å)	No
L21: A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter.					
Xtimate PS/DVB	5, 10 µm	1.0-14.0	N/A(100Å, 300Å)	N/A	N/A
L22: A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10 µm in size.					
Xtimate Sugar-H	5, 8 µm	1.0-3.0	N/A	N/A	N/A
L26: Butyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.					
Ultisil XB-C4	3, 5, 10 µm	1.5-10.0	8%(120Å), 3%(300Å)	320(120Å), 90(300Å)	Yes
Xtimate C4	3, 5 µm	1.0-12.5	8%(120Å)	320(120Å)	Yes
Blossmate C4	3.5 µm	1.5-10.0	0.5%(450Å)	15(450Å)	Yes
L33: Packing having the capacity to separate dextrans of 4,000 to 500,000 daltons. It is spherical, silica-based and processed to provide pH stability.					
Xtimate SEC-120	3, 5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate SEC-300	3, 5 µm	2.0-7.5	N/A(300Å)	N/A	N/A
Xtimate SEC-500	5 µm	2.0-7.5	N/A(500Å)	N/A	N/A
Xtimate SEC-700	5 µm	2.0-7.5	N/A(700Å)	N/A	N/A
Xtimate SEC-1000	5 µm	2.0-7.5	N/A(1000Å)	N/A	N/A
L40: Cellulose tris-3,5-dimethylphenylcarb-amate coated porous silica particles, 5 to 20 µm in diameter.					
Ultisil Cellu-D	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L43: Pentafluoro phenyl groups chemically bonded to silica particles 5 to 10 µm in diameter.					
Ultisil PFP	3, 5 µm	1.5-10.0	13%(120Å)	320(120Å)	Yes
Boltimate EXT-PFP(Core-shell)	2.7 µm	1.5-12.0	5%(90Å)	120(90Å)	Yes
L51: Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10 µm in diameter.					
Ultisil Amy-D	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L56: Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.					
Ultisil LP-C3	5 µm	1.0-8.0	4%(120Å)	320(120Å)	No
L59: Packing having the capacity to separate proteins by molecular weight over the range of 5 to 7000 kDa. It is spherical (1.5-10 µm),silica-based, and processed to provide hydrophilic characteristicsand pH stability.					
Xtimate SEC-120	3, 5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate SEC-300	3, 5 µm	2.0-7.5	N/A(300Å)	N/A	N/A
Xtimate SEC-500	5 µm	2.0-7.5	N/A(500Å)	N/A	N/A
Xtimate SEC-700	5 µm	2.0-7.5	N/A(700Å)	N/A	N/A
Xtimate SEC-1000	5 µm	2.0-7.5	N/A(1000Å)	N/A	N/A

HPLC Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L60: Spherical, porous silica gel, 10 µm or less in diameter, surface has been covalently modified with alkyl amide groups and endcapped.					
Ultisil Polar-RP	3, 5,10 µm	1.5-10.0	18%(120Å)	320(120Å)	Yes
Xtimate Polar-RP	5 µm	1.0-12.5	16%(120Å)	320(120Å)	Yes
Ultisil UHPLC Polar-RP	1.8 µm	1.5-10.0	18%(120Å)	320(120Å)	Yes
L62: C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter.					
Ultisil XB-C30	3, 5, 10 µm	1.5-10.0	22%(120Å)	320(120Å)	Yes
L68: Spherical, porous silica, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped.					
Ultisil HILIC Amide	3, 5, 10 µm	2.0-8.0	7%(120Å)	320(120Å)	N/A
Blossmate Polar-Propylamide	5 µm	2.0-8.0	7%(120Å)	300(120Å)	N/A
L80: Cellulose tris(4-methylbenzoate)-coated, porous, spherical, silicaparticles, 5 µm in diameter.					
Ultisil Cellu-J	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L90: Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter.					
Ultisil Amy-S	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L93: Cellulose tris(3,5-dimethylphenylcarbamate) reversed phase chiral stationary phase coated on 3 or 5 µm silica gel particles.					
Ultisil Cellu-DR	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L96: Alkyl chain, reversed-phase bonded totatlly or superficially porous silica designed to retain hydrophilic and other oplar compounds when using highly aqueous mobile phases, including 100% aqueous, 1.5 µm to 10 µm in diameter.					
Ultisil AQ-C18	3, 5, 10 µm	1.5-10.0	12%(120Å)	320(120Å)	Yes
Ultisil LP-AQ	5 µm	1.0- 8.0	5%(120Å)	320(120Å)	No
L107: Cellulose tris(4-methylbenzoate)-coated porous spherical particles, 3 to 5 µm in diameter, for use with reversed phase mobile phases.					
Ultisil Cellu-JR	5, 10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
L114: Sulfobetaine graft-polymerized to totally or superficially porous silica, 1.5 to 10 µm in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.					
Ultisil HILIC Amphion II	5 µm	2.0-8.0	6%(120Å)	320(120Å)	N/A
L118: Aqueous polymerized C18 groups on silica particles, 1.2 to 5 µm in diameter.					
Ultisil PAH	3, 5 µm	1.5-10.0	22%(120Å)	320(120Å)	No
Not included in USP List					
Ultisil MM NH_2/CN	5 µm	2.0-8.0	N/A(120Å)	320(120Å)	N/A
Ultisil MM C18/SCX	5 µm	2.0-8.0	N/A(120Å)	320(120Å)	N/A
Ultisil Zn	N/A	N/A	N/A(120Å)	N/A(120Å)	N/A
Ultisil Lead oxide	N/A	N/A	N/A(120Å)	N/A(120Å)	N/A
Ultisil Amy-SR	5,10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A
Ultisil Amy-DR	5,10 µm	2.0-9.0	N/A(120Å)	320(120Å)	N/A

4. Cross Reference

Ultisil XB-C18 can substitute:

Symmetry C18	Symmetry shield RP C18	
Luna C18	Luna C18(2)	Disc overy C18
Hypersil BDS C18	Alltima C18	Zorbax Eclipse C18
BetaBasic C18	Platinum EPS C18	Betasil C18
Inertsil ODS-2	Inertsil ODS-3	Supelcosil LC-18-DB
Kromasil 100A C18	HyPURITY C18	

Ultisil AQ-C18 can substitute:

Aquasil C18	Atlantis C18	Zorbax SB-AQ C18
Synergi Hydro-RP C18	HydroBond AQ C18	HydroBond PS C18
Ultra Aqueous C18	Prontosil C18 AQ	YMC-Pack ODS-AQ
Elite Sino Chrom ODS-BP		

Ultisil XB-C8 can substitute:

Symmetry C8	Luna C8	Luna C8(2)
Discovery C8	Hypersil BDS C8	Alltima C8
Zorbax Eclipse XDB C8	BetaBasic C8	Platinum EPS C8
Betasil C8	Inertsil C8	Inertsil C8-3
Supercosil LC-8-DB	Kromasil 100A C8	HyPURITY C8
YMC-Pack C8-AM	Adsorbosphere HS C8	Develosil C8
Cosmosil C8-MS	Nucleosil 100 C8 HD	

Other Ultisil Columns: XB-CN, XB-Phenyl, XB-CN, SiO_2 and Polar RP can replace the most of the same type columns of other brands.

Xtimate (wide pH range) can substitute:

Waters	Xterra series	Xbridge series
Agilent	Extend series	
Phenomenex	Gemini series	

Chiral Column Reference Table

Company	Company	Coated Normal Phase				Coated Reversed Phase			
Welch	Ultisil	Cellu-D	Cellu-J	Amy-D	Amy-S	Cellu-D/R	Cellu-J/R	Amy-D/R	Amy-S/R
Daicel	Chiralcel	OD-H	OJ-H			OD-RH	OJ-RH		
	Chiralpak			AD-H	AS-H			AD-RH	AS-RH

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