

welch
月旭科技

JK SCIENCE
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CHROMATOGRAPHY PRODUCTS CATALOG



Welch Materials, Inc.

HPLC Column, Preparative Column, Flash Column, GC Column,
Packing Materials, SPE, QuEChERS, HPLC Instrument

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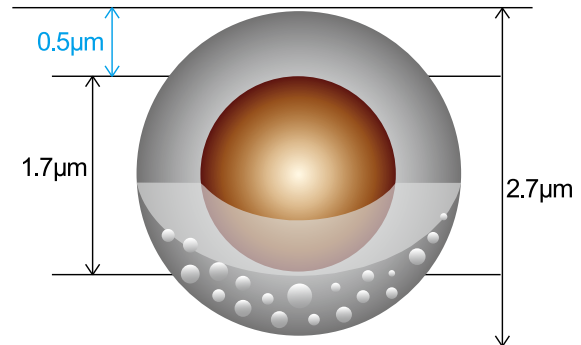
Boltimate™ Core-Shell HPLC Column

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).

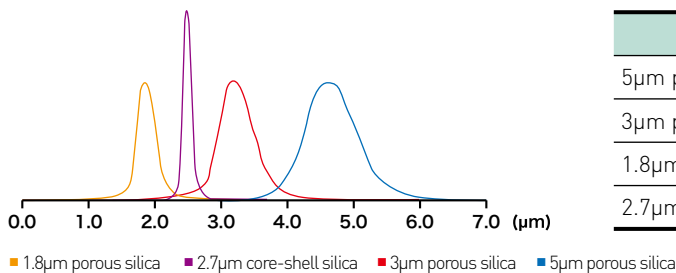
This kind of column can provide sub-2 μm efficiencies (~200000 p/m) and high resolution at much lower back pressure. Boltimate core-shell column can be used on both HPLC and UHPLC system, and method optimization is also very easy.

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 system
- Narrow particle size distribution
- A standard 2 μm inlet frit is used to resist plugging with dirty samples, suitable for complex samples
- A variety of bonding phases provide different selectivities, excellent peak shape and lot-to-lot reproducibility
- Maximum pressure: 600bar

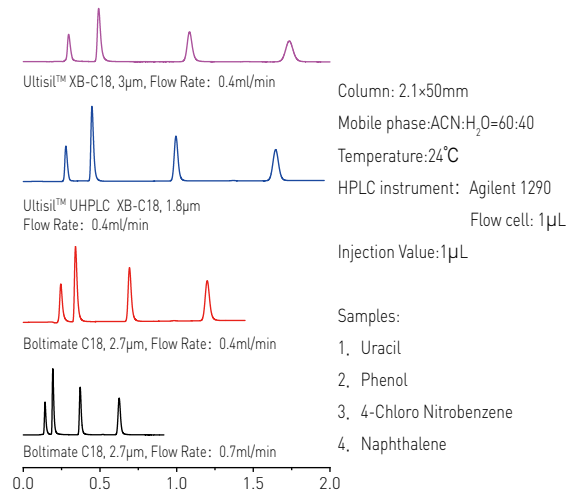


With the solid core and thin porous layer, the diffusion distance of sample molecular decreased, which means fast mobile phase flow rate can be used to increase the analytical speed. Compared with traditional porous HPLC columns, Boltimate core-shell column has the narrower particle size distribution,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



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

Theoretical plate number and column pressure (based on Naphthalene)



Boltimate C18 column efficiency is almost the same with 1.8 μm TPP (Total Porous Particle) C18 column and two times of 3 μm TPP (Total Porous Particle) 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.

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

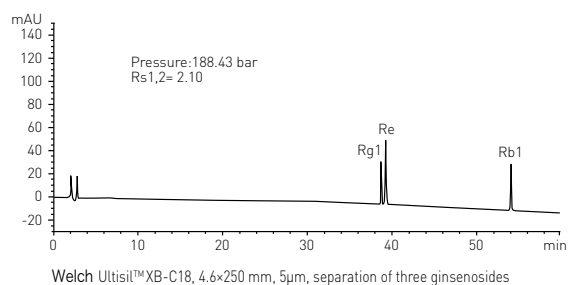
Detection of Ginsenosides:

Chromatographic conditions:

Column: three types of C18 columns from Welch / Temperature: room temperature / Detection : UV 203 nm
 Mobile phase A: 0.1% H₃PO₄ in water / Mobile phase B: Acetonitrile

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

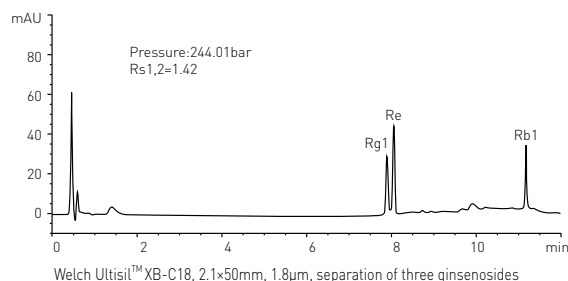
Flow Rate: 1.3 ml/min Injection Volume: 10 μl



Gradient program:

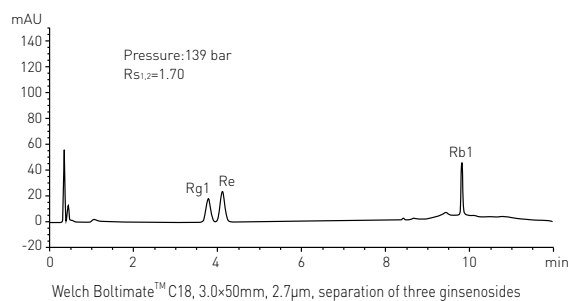
Time(min)	Mobile Phase A (%)	Mobile Phase B (%)
0	81	19
30	81	19
35	76	24
60	60	40
60.1	0	100
70	0	100
70.1	81	19
78	81	19

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



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 (3.0×50mm, 2.7μm)



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

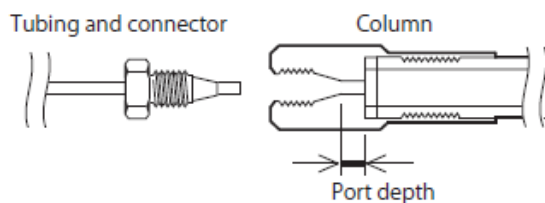
From the results above, Boltimate core-shell column has a lower column pressure and faster analysis time, and the resolution is high.

Welch provides a variety of bonding phases

Bonding Phases	Features	Particle Size μm	Solid Core Diameter μm	Porous Shell Depth μm	Pore Size \AA	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		L1
Phenyl-Hexyl	Alternative selectivity for phenyl groups.	2.7	1.7	0.5	90	120	7	Double	2-8.5		L11
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	1.5-10		L43
HILIC	With its unbonded silica, Boltimate HILIC retains and separates polar analytes.	2.7	1.7	0.5	90	120	-	-	2-8.5		L3

Ordering Information


2.7 μm , 90 \AA , Boltimate Core-shell Column					
Size(mm)	C18	Phenyl-Hexyl	EXT-C18	EXT-PFP	HILIC
2.1×30	960-04009	961-04009	962-04009	963-04009	964-04009
2.1×50	960-04010	961-04010	962-04010	963-04010	964-04010
2.1×75	960-04011	961-04011	962-04011	963-04011	964-04011
2.1×100	960-04012	961-04012	962-04012	963-04012	964-04012
2.1×150	960-04014	961-04014	962-04014	963-04014	964-04014
3.0×30	960-04018	961-04018	962-04018	963-04018	964-04018
3.0×50	960-04019	961-04019	962-04019	963-04019	964-04019
3.0×75	960-04020	961-04020	962-04020	963-04020	964-04020
3.0×100	960-04021	961-04021	962-04021	963-04021	964-04021
3.0×150	960-04023	961-04023	962-04023	963-04023	964-04023
4.6×30	960-04036	961-04036	962-04036	963-04036	964-04036
4.6×50	960-04037	961-04037	962-04037	963-04037	964-04037
4.6×75	960-04038	961-04038	962-04038	963-04038	964-04038
4.6×100	960-04039	961-04039	962-4039	963-04039	964-04039
4.6×150	960-04041	961-04041	962-04041	963-04041	964-04041
4.6×250	960-04043	961-04043	962-04043	963-04043	964-04043



Port Style of Endfitting	Port depth
Parker	2mm

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
Direct connect inline filter, maximum pressure 15000psi. Inline frit, cannot be replaced.		00808-01221	Pre-column inline filter, 0.5µm
Direct connect inline filter, maximum pressure 18000psi.		00808-01222	Direct connect inline filter, contain 5 replaceable frits (0.2µm)
		00808-UF020	Replaceable frits (0.2µm)

Guard Column for Boltimate

		P/N	Description
Direct connect guard column, maximum pressure 15000psi, contain 5mm cartridge.		00808-01109	Direct connect guard column

Replaceable cartridge, 5mm length Maximum pressure 15000psi Boltimate packing material.		According to your HPLC column ID(mm):	
		2.0-3.0	3.2-8.0
		Choose suitable cartridge (mm):	
		2.1 × 5.0mm	4.0 × 5.0mm
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

Ultisil™ Series HPLC Column

Ultisil™ Series HPLC Columns based on ultra pure (purity > 99.999%) spherical and totally porous silica, adopted unique bonding chemistry and proprietary surface modification technique, which provide excellent peak shape, column efficiency and exceptional lot-to-lot reproducibility. Ultisil™ column is the best choice for method development, due to the complete bonding chemistries and stable performance.

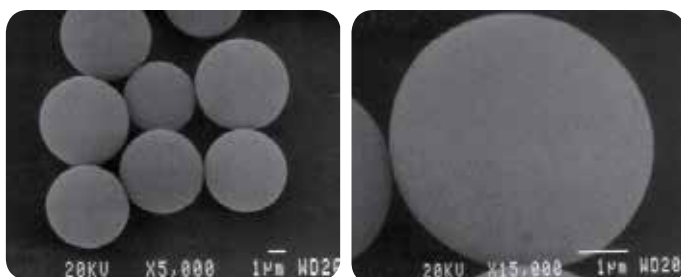
Features:

- Competitive price
- Ultra pure spherical porous silica, purity > 99.999%
- Unique bonding chemistry and endcapping technology
- High efficiency: Theoretical plate > 80000/m
- Excellent peak symmetry: tailing factor = 0.95~1.05
- Wide pH range: 1.5-10
- Long column lifetime
- Exceptional lot-to-lot reproducibility
- Complete bonding chemistries, provide different selectivities

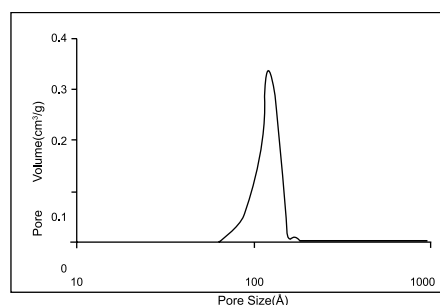
Ultisil™ HPLC Column Packing Materials

The pictures show the uniformity of the particle sizes and smoothness of particle surface, which enables more uniform packing with less channeling effect and leads to lower back pressure and the higher column efficiency. Our silica has a surface area of 320 m²/g with a controlled mean pore size of 120 Å.

SEM Pictures of Ultisil™ Particles

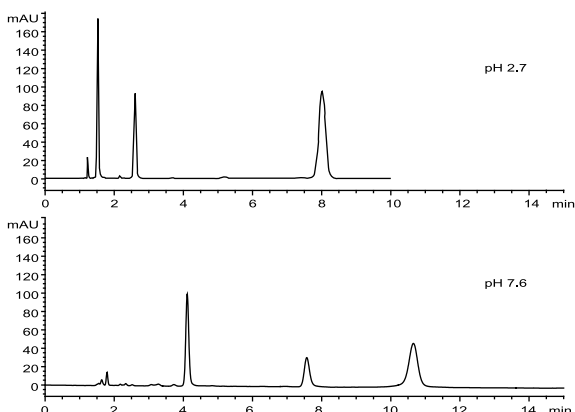


Ultisil™ Pore Size Distribution



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 one neutral chelating reagent, 2,2-dihydroxynaphthalene. 4,4'-dipyridyl, which cannot form chelating complex with metal, is used as a reference. 2,2'-dipyridyl and 2,2-dihydroxynaphthalene, which are chelating reagents, are sensitive to trace amount metal in silica. When type A silica based C18 column or other so-called type B silica with higher metal content column is used, the peaks of 2,2'-dipyridyl and 2,2-dihydroxynaphthalene would tail or even totally disappear.



Column:	Ultisil™ XB-C18, 4.6 × 150 mm, 5 µm
Mobile Phase:	45% MeOH/55% 20 mM phosphate, pH 7.6
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-Dihydroxynaphthalene

Ultisil™ XB Series HPLC Column

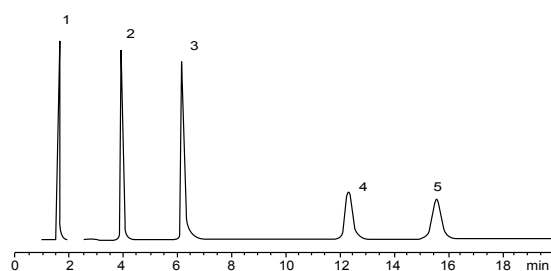
Ultisil™ XB series column is the first series introduced by Welch, which contains complete bonding chemistries, provides a variety of selectivities for method development.

- Develop or improve your HPLC method
- Excellent performance, exceptionally rugged USP phases
- Exceptional lot-to-lot reproducibility

Ultisil™ XB-C18—Universal HPLC Analytical Column

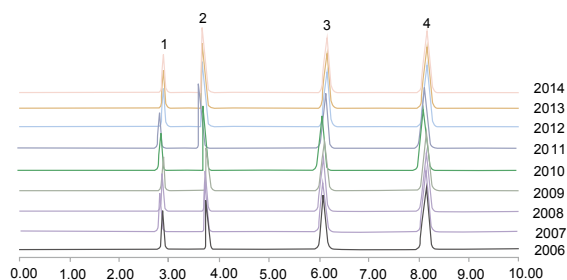
Ultisil™ XB-C18 is the most common used column in the market, which can substitute Waters Symmetry C18, Agilent Zorbax XDB C18, Phenomenex Luna C18, Supelcosil LC-18-DB, YMC ODS-AM, Alltima C18, GL Inertsil ODS-2 etc. XB-C18 has high theoretical plates and peak capacity, so it's suitable for analysis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

Separation of Basic Compound Antidepressant at pH 7.0



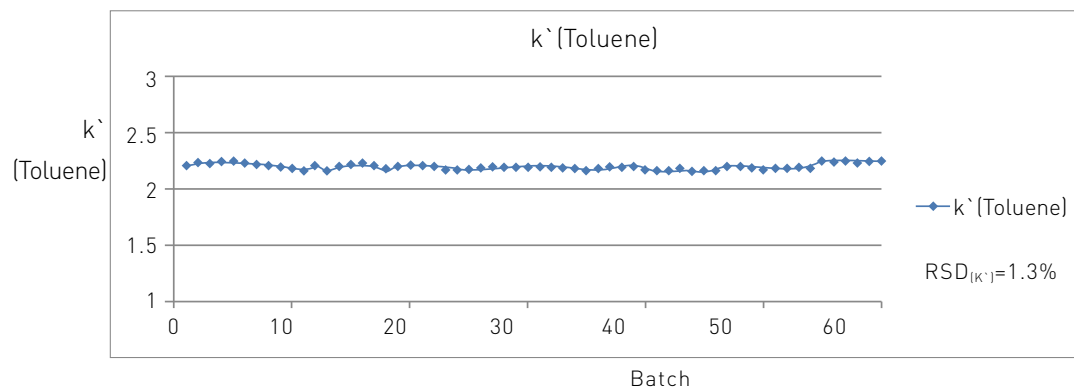
Column:	Ultisil™ XB-C18, 4.6 × 150 mm, 5 μm
Mobile Phase:	20% phosphate, pH 7.0. 80% MeOH
Flow Rate:	1.0 mL/min
Detector:	215 nm
Temperature:	25 °C
Samples:	1) Uracyl 2) Ropranolol 3) Ortriptyline 4) Amitriptyline 5) Trimipramine

Comparison of Peak Shape Between Batch to Batch

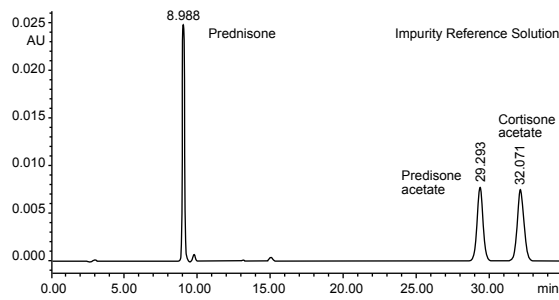


Column:	Ultisil™ XB-C18, 4.6 × 250 mm, 5 μm
Mobile Phase:	75% MeOH/25% water
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature :	25 °C
Samples:	1) Uracyl 2) Phenol 3) 3,4-chloronitrobenzene 4) Methylbenzene

Capacity Factor(K') of Batch to Batch Reproducibility

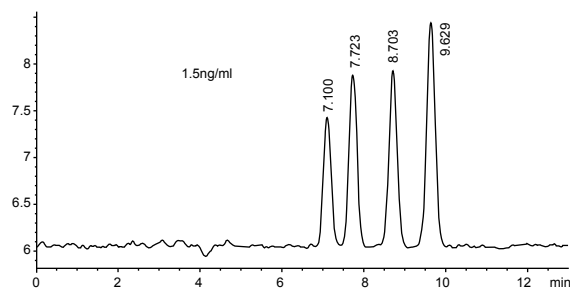


Analysis of Prednisone Acetate



Column:	Ultisil™ XB-C18, 4.6 ×150 mm, 5 μm
Mobile Phase:	ACN/Water=33:67
Flow Rate:	1.0 ml/min
Detector:	240nm
Temperature:	30 °C
Injection Volume:	20 μl

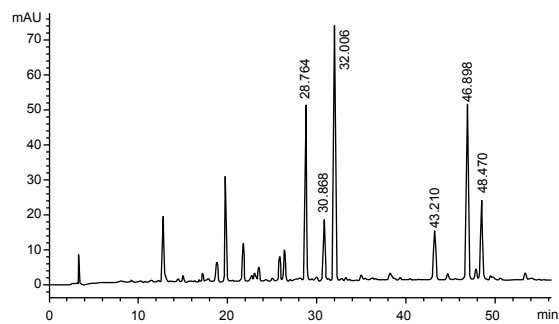
Analysis of Aflatoxin



Column:	Ultisil™ XB-C18, 4.6×250 mm, 5 μm
Mobile Phase:	Water:MeOH:ACN=46:40:14
Flow Rate:	1.0 ml/min
Detector:	Excitation wavelength:360 nm Emission wavelength:450 nm Gain:17
Temperature:	30 °C
Derivation Way:	Post-column photo chemical derivation(254nm)

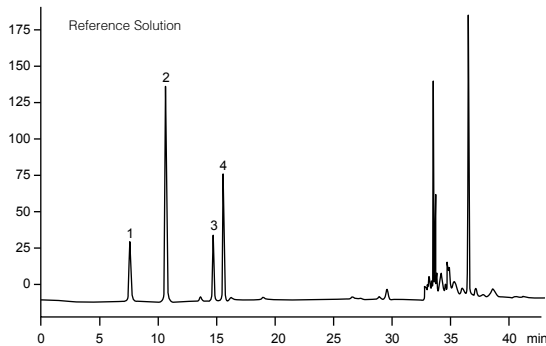
Aflatoxin B1, B2, G1, G2 mixed standards, meets separation requirements

Tropa Belladonna Spectrogram



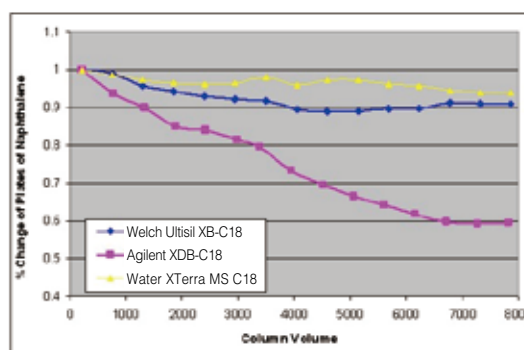
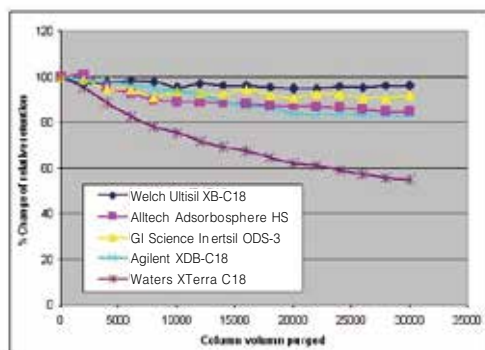
Column:	Ultisil™ Special column for Tropa Belladonan, 4.6 ×250 mm, 5 μm
Mobile Phase:	Mobile phase A: MeOH Mobile phase B:0.05% Phosphoric acid solution
Flow Rate:	1.0 ml/min
Detector:	344nm
Temperature:	30 °C
Injection Volume:	10 μl

Analysis of Donkey-hide Gelatin



Column:	Ultisil™ XB-C18, 4.6 ×250 mm, 5 μm
Mobile Phase:	Mobile phase A: ACN:0.1 mol/L NaAC(pH 6.5)=7:93 Mobile phase B: ACN:water=4:1
Gradient Program:	Time(min) Mobile Phase A Mobile Phase B
	0~11 100~93 0~7
	11~13.9 93~88 7~12
	13.9~14 88~85 12~15
	14~29 85~66 15~34
	29~30 66~0 34~100
Flow Rate:	1.0 ml/min
Temperature:	43 °C
Injection Volume:	5 μl
Reference Samples:	L-hydroxyproline、glycine、alanine、L-proline

Excellent Stability at Low pH and High pH

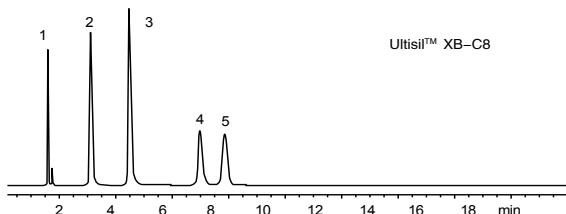
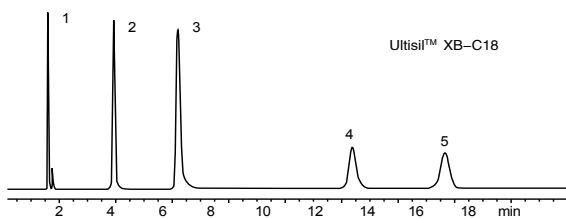
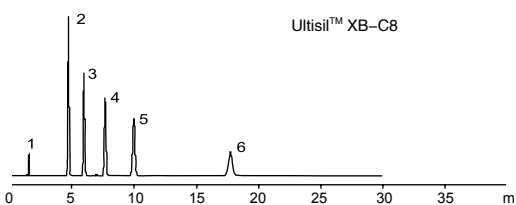
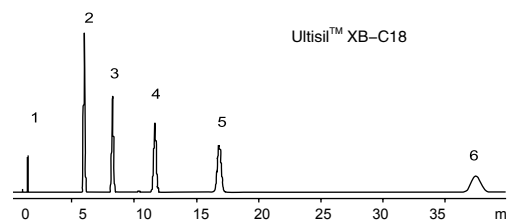


The stability of XB-C18 is better than other brand columns under pH 1.3 and pH 10.

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

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

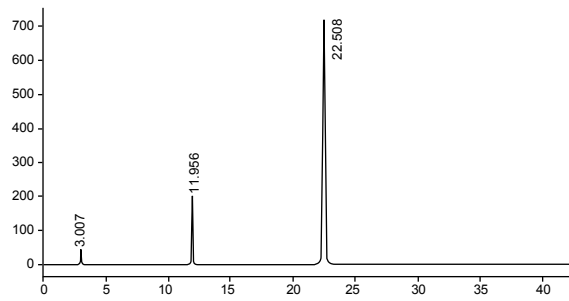
Comparison of Retention of XB-C18 and XB-C8



Column:	4.6 ×150 mm, 5 μm
Mobile Phase:	30% water/70% ACN
Flow Rate:	1.0 ml/min
Detector:	344nm
Temperature:	25 °C
Samples:	1. Uracil 2. Ethylbenzene 3. Propylbenzene 4. Butylbenzene 5. Amylbenzene 6. Heptylbenzene

Column:	4.6 ×150 mm, 5 μm
Mobile Phase:	20% 20mM phosphate, pH7.0, 80% MeOH
Flow Rate:	1.0 ml/min
Detector:	215nm
Temperature:	25 °C
Samples:	1. Uracil 2. Ropranolol 3. Ortriptyline 4. Amitriptyline 5. Trimipramine

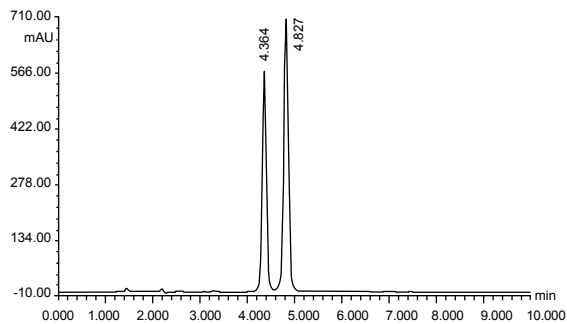
Analysis of Adefovir Dipivoxil



Column:	Ultisil™ XB-C8, 4.6 ×250 mm, 5 μm		
Mobile Phase:	Mobile phase A: 0.05mol/L KH ₂ PO ₄ buffer: ACN=50:50 Mobile phase B: 0.05mol/L KH ₂ PO ₄		
Gradient Program:	Time(min)	Mobile Phase A	Mobile Phase B
	0	20	80
	5	20	80
	20	100	0
	32	100	0
	40	20	80
Flow Rate:	1.0 ml/min		
Temperature:	40 °C		
Injection Volume:	10 μl		

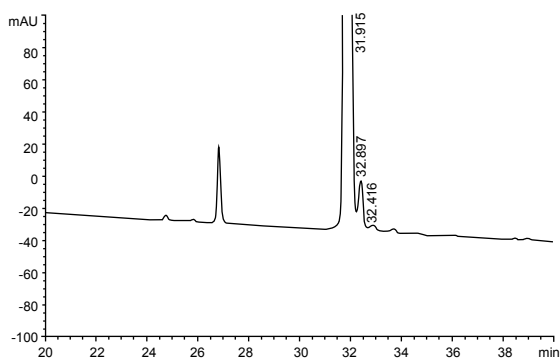
System suitability solution: adefovir, adefovir monopivoxil, adefovir dipivoxil.

Analysis of Albuterol



Column:	Ultisil™ XB-C8, 4.6 ×150 mm, 5 μm		
Mobile Phase:	Sodium heptanesulfonate solution(Sodium heptanesulfonate 2.5g, dilute with water to 1000ml, adjust pH to 3.65 with H ₃ PO ₄):ACN=78:22		
Flow Rate:	1.0 ml/min		
Detector:	220nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

Analysis of Insulin Detemir

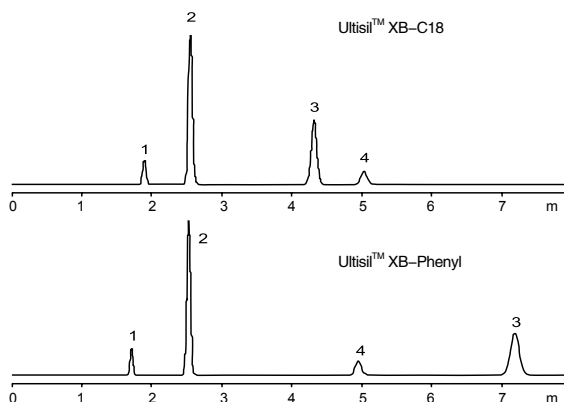


Column:	Ultisil™ XB-C8, 4.6 ×150 mm, 5 μm		
Mobile Phase:	A: 20g (NH ₄) ₂ SO ₄ , 900ml water, 100ml ACN, adjust pH to 2.3 B: ACN:water=80:20; %B=0(0min) , 30(9min) , 60(40min)		
Flow Rate:	1.0 ml/min		
Detector:	214nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

Ultisil™ XB-Phenyl--- Different selectivity to alkyl phase

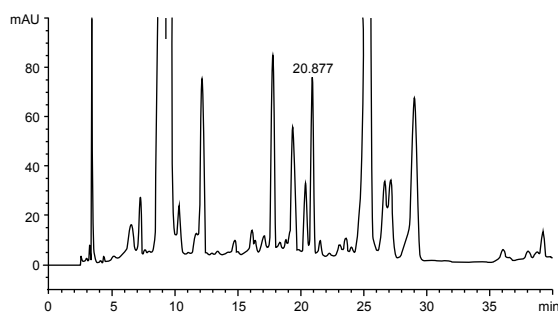
Ultisil™ XB Phenyl phase is less retentive than conventional C18 and C8 phases, but more retentive than standard cyano phase. Due to their ability to participate in interactions, XB-Phenyl columns may actually more retentive than C18 or C8 columns towards certain polar aromatic compounds, depending on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

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



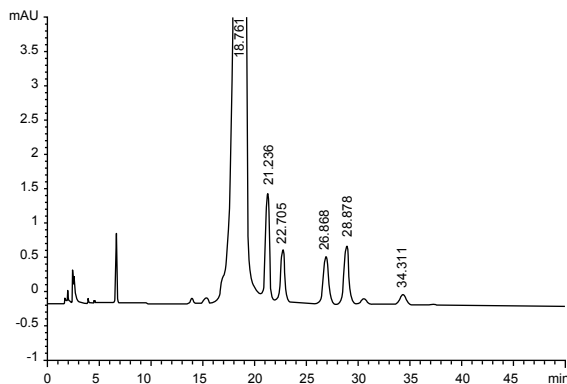
Column:	4.6 ×150 mm, 5 μm
Mobile Phase:	70% MeOH/30% water
Flow Rate:	1.0 ml/min
Detector:	254nm
Temperature:	24 °C
Samples:	1. Uracil 2. Phenol 3. Paranitrotoluene 4. Toluene

Analysis of Galuteolin in Honeysuckle



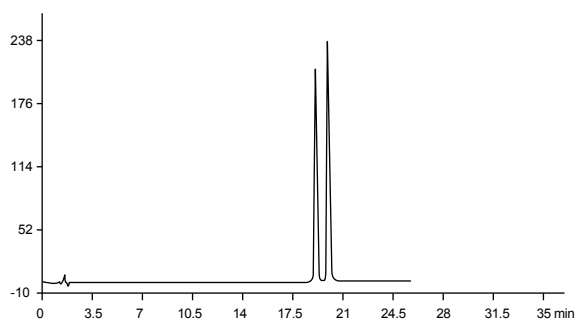
Column:	Ultisil™ XB-Phenyl, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A:ACN B:0.5% glacial acetic acid		
Gradient Program:	Time(min)	A(%)	B(%)
	0-15	10-20	90-80
	15-30	20	80
	30-40	30	80-70
Flow Rate:	1.0 ml/min		
Detector:	350nm		
Temperature:	30 °C		
Injection Volume:	10 μl		

Analysis of Galuteolin in Honeysuckle



Column:	Ultisil™ XB-Phenyl, 4.6 ×250 mm, 5 μm
Mobile Phase:	(0.5g TBAHS, 1g KH ₂ PO ₄ , 3.4g(2mL) H ₃ PO ₄ , 1000mL water):MeOH=72:28
Flow Rate:	1.3 ml/min
Detector:	293nm
Temperature:	45 °C
Injection Volume:	10 μl

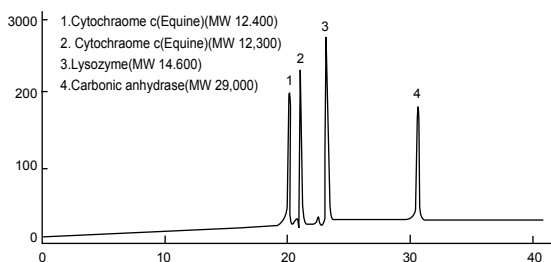
Separation of Montelukast Sodium Isomers



Column:	Ultisil™ XB-Phenyl, 4.6 ×150 mm, 3 μm		
Mobile Phase:	A:0.2% TFA B:MeOH:ACN=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:	255nm		
Temperature:	30 °C		
Injection Volume:	10 μl		

Ultisil™ XB-C4---Suitable for separation of bio-samples

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



Column:	Ultisil™ XB-C4(300Å), 4.6 ×250 mm, 5 μm
Mobile Phase:	A: H ₂ O:ACN:TFA=90:10:0.05 B: H ₂ O:ACN:TFA=20:80:0.05 0%-100%B(0-15min)
Flow Rate:	1.0 ml/min
Temperature:	45 °C
Injection Volume:	10 μl

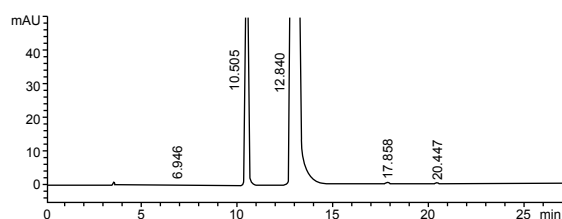
Ultisil™ XB-CN---Unique selectivity for polar compounds

Ultisil™ XB-CN column can be used in both reversed and 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 the reversed columns, it is a good choice for the compounds that are strong retain on standard reversed columns.

Normal phase CN column can replace SiO₂ column. Equilibrium of normal phase column is fast, and the silica surface activity is better than silica column. To prolong the life time of the column, it should be avoid to alternately using reversed phase and normal phase. CN column can be used in reversed and normal phase, but when at different separation mode, the elution sequence is different.

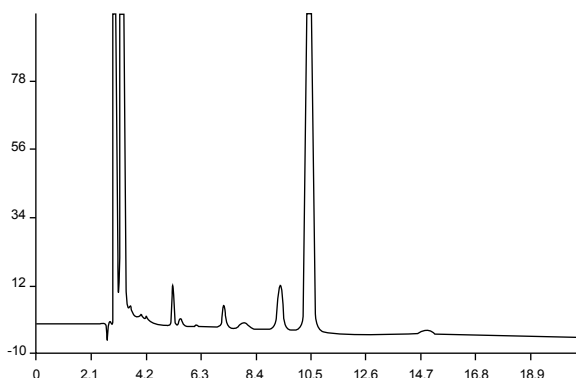
- Can be used in both reversed and normal phases
- Stable bonding chemistry and excellent surface coverage
- Low hydrophobicity, unique selectivity

Analysis of Alogliptin Benzoate



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

Analysis of Rifampicin Isoniazidand Pyrazinamide



Column:	Ultisil™ XB-CN, 4.6 ×250 mm, 5 μm		
Mobile Phase:	0.01 mol/L Sodium Heptanesulfonate(Sodium Heptanesulfonate 2.0225g, 1000mL water, adjust pH to 1.85 with H ₃ PO ₄):ACN=54:46		
Flow Rate:	0.6 ml/min		
Detector:	254nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

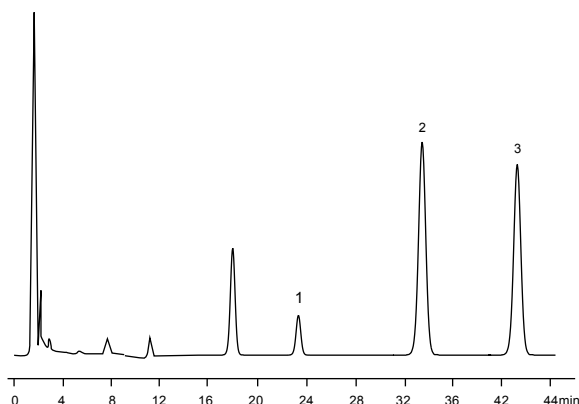
Ultisil™ XB Series Normal Phase Column

Ultisil™ XB series normal phase columns contain XB-NH₂, XB-CN, SiO₂ and Diol columns.

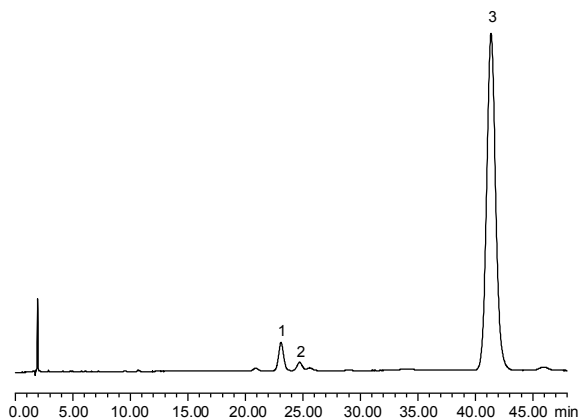
Ultisil™ SiO₂ column

Ultisil SiO₂ column is applied with ultra high purity type B silica particles with no metal contents. SiO₂ column can separate strong hydrophilic compounds with high organic solvent at normal phase. We can get good result for the analysis of polar compounds which always leads to peak tailing.

Analysis of VD₂

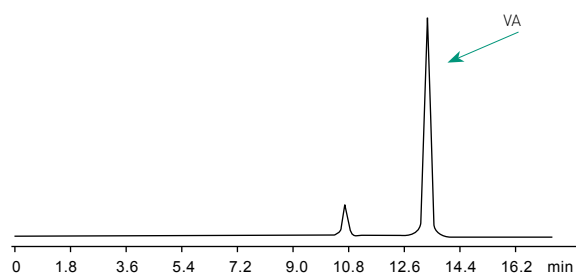


Column:	Ultisil™ SiO ₂ , 4.6 ×250 mm, 5 μm		
Mobile Phase:	Hexane/ IPA = 997/ 3		
Flow Rate:	2.0 ml/min		
Detector:	254nm		
Temperature:	30 °C		
Samples:	1. Facade VD ₂ 2. Internal Standard 3. VD ₂		

Analysis of VD₃

Column:	Ultisil™ SiO ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	N-hexane:n-amy alcohol=99.7:0.3
Detector:	254 nm
Temperature:	30 °C
Flow Rate:	2.0 ml/min
Samples:	1. Facade VD ₃ 2. Trans VD ₃ 3. VD ₂

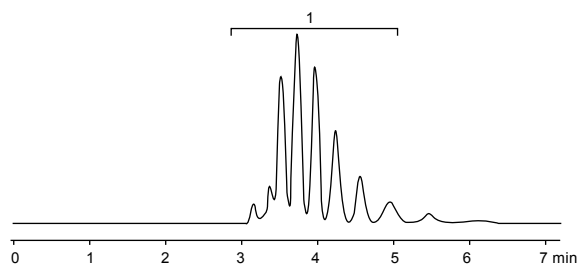
Analysis of VA Acetate



Column:	Ultisil™ SiO ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	N-hexane:isopropanol=99.8:0.2
Detector:	326nm
Temperature:	16 °C
Flow Rate:	1.0 ml/min

Sample is dissolved with n-hexane.

Analysis of Pesticide Emulsifier Triton-X100



Column:	Ultisil™ SiO ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	Ethyl Acetate:EtOH=80:20
Detector:	254nm
Temperature:	30 °C
Flow Rate:	1.0 ml/min

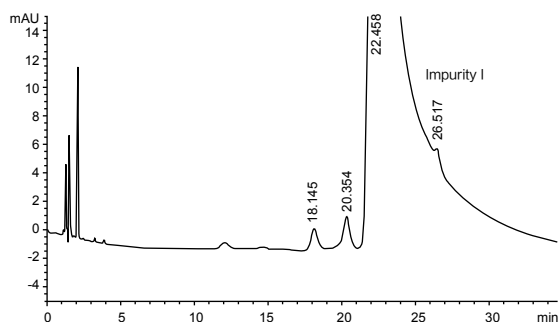


Ultisil™ XB-NH₂ column

Ultisil™ XB-NH₂ column is based on propyl-amino silane, mostly used in normal phase, also can be used in HILIC mode and reversed phase.

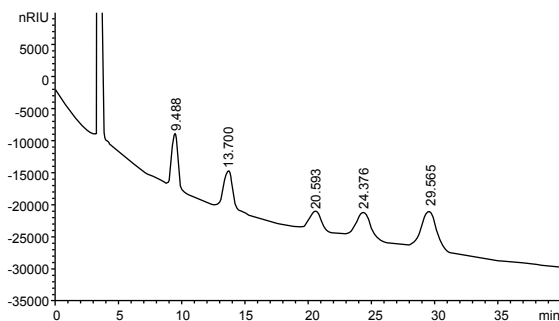
- Used for normal phase and weak anion-exchange, and for reversed-phase HPLC of polar compounds
- For applications in aggressive normal phase mode with aqueous eluent
- Vitamins A and D are separated in the normal-phase mode
- Carbohydrates and sugars are separated in the reversed-phase mode on XB-NH₂

Acarbose



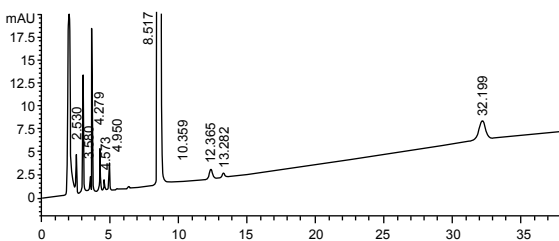
Column:	Ultisil™ XB-NH ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	Phosphate buffer(KH ₂ PO ₄ 600 mg, ADSP 279 mg, dissolve in 100 mL water and dilute to 1000 mL): ACN=28:72
Detector:	210nm
Temperature:	35 °C
Flow Rate:	2.0 ml/min
Injection Volume:	10 μl

Sugars

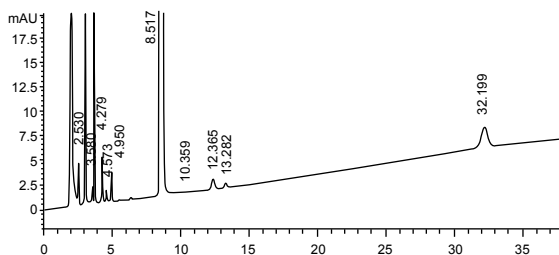


Column:	Ultisil™ XB-NH ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	70% ACN-water solution
Detector:	RID
Temperature:	35 °C
Flow Rate:	0.9 ml/min
Injection Volume:	10 μl
Samples:	Fructose, glucose, maltose, maltotriose, maltopentaose in order

Acetyl-L-carnitine



Column:	Ultisil™ XB-NH ₂ , 4.6 ×250 mm, 5 μm
Mobile Phase:	Buffer:ACN=30:70
Detector:	205nm 210nm
Temperature:	20 °C
Flow Rate:	1.0ml/min
Injection Volume:	10 μl



Ordering Information

3 μ m Minibore Column

	XB-C18	XB-C8	XB-C4	XB-C1	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
2.1×30	00201-21009	00202-21009	00216-21009	00217-21009	00203-21009	00205-21009	00204-21009	00200-21009
2.1×50	00201-21010	00202-21010	00216-21010	00217-21010	00203-21010	00205-21010	00204-21010	00200-21010
2.1×100	00201-21012	00202-21012	00216-21012	00217-21012	00203-21012	00205-21012	00204-21012	00200-21012
2.1×150	00201-21041	00202-21041	00216-21041	00217-21041	00203-21041	00205-21041	00204-21041	00200-21041

5 μ m Minibore Column

	XB-C18	XB-C8	XB-C4	XB-C1	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
2.1×30	00201-31009	00202-31009	00216-31009	00217-31009	00203-31009	00205-31009	00204-31009	00200-31009
2.1×50	00201-31010	00202-31010	00216-31010	00217-31010	00203-31010	00205-31010	00204-31010	00200-31010
2.1×100	00201-31012	00202-31012	00216-31012	00217-31012	00203-31012	00205-31012	00204-31012	00200-31012
2.1×150	00201-31041	00202-31041	00216-31041	00217-31041	00203-31041	00205-31041	00204-31041	00200-31041

3 μ m Analytical Column

	XB-C18	XB-C8	XB-C4	XB-C1	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
3.0×30	00201-21018	00202-21018	00216-21018	00217-21018	00203-21018	00205-21018	00204-21018	00200-21018
3.0×50	00201-21019	00202-21019	00216-21019	00217-21019	00203-21019	00205-21019	00204-21019	00200-21019
4.6×50	00201-21037	00202-21037	00216-21037	00217-21037	00203-21037	00205-21037	00204-21037	00200-21037
4.6×150	00201-21041	00202-21041	00216-21041	00217-21041	00203-21041	00205-21041	00204-21041	00200-21041

5 μ m Analytical Column

	XB-C18	XB-C8	XB-C4	XB-C1	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
4.6×50	00201-31037	00202-31037	00216-31037	00217-31037	00203-31037	00205-31037	00204-31037	00200-31037
4.6×100	00201-31039	00202-31039	00216-31039	00217-31039	00203-31039	00205-31039	00204-31039	00200-31039
4.6×150	00201-31041	00202-31041	00216-31041	00217-31041	00203-31041	00205-31041	00204-31041	00200-31041
4.6×250	00201-31043	00202-31043	00216-31043	00217-31043	00203-31043	00205-31043	00204-31043	00200-31043

Welch provides 120Å and 300Å pore size packing materials. Please contact Welch or your local distributor for other dimensions.

Ultisil™ Diol Column

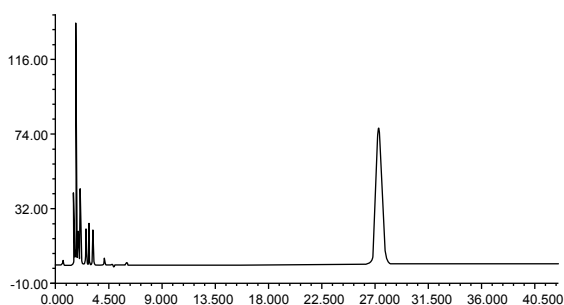
Ultisil™ Diol Column is based on ultra pure porous spherical silica which bonded with 1,2-dihydroxypropyl functional group silica. Ultisil™ Diol is used in normal phase mostly, also can be used in HILIC mode, suits for separation of peptides, proteins, polar molecules and organic acids and its polymers.

Like bare silica, Ultisil™ Diol has the ability to form hydrogen bonds and has the capacity to separate structure isomers. Since most of its surface is covered with organic functions, the Ultisil™ Diol absorbs less water, which leads to a 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.

The Ultisil™ Diol column is more stable than the traditional normal phase columns, such as NH₂, SiO₂. Compared with NH₂/SiO₂ column, the Diol column is not sensitive with water. The Ultisil™ Diol column could also be used in reversed phase analysis.

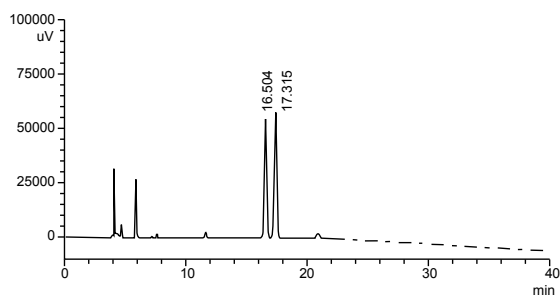
- More stable than the traditional normal phase columns, such as Silica, Amine
- Could be used in reversed phase analysis
- Similar polarity to Amine
- Good selectivity without excessive retention
- Improved peak shape versus bare silica

Tacrolimus



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

Cloprostenol Sodium α, β



Column:	Ultisil™ Diol, 4.6 ×300 mm, 3μm
Mobile Phase:	N-hexane/isopropanol(v/v)=99.5/0.5
Flow Rate:	1.0 ml/min
Detector:	220 nm
Temperature:	25 °C
Injection Volume:	10μl

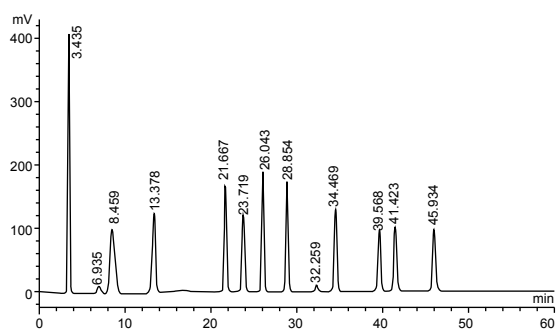
Ultisil™ XB-SAX and XB-SCX Ion Exchange Column

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 exchange, consisting of a covalently bonded aromatic sulfonic acid moiety.

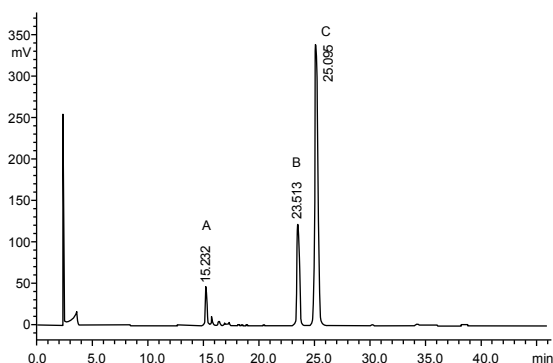
- Organic modifiers such as acetonitrile and methanol may be used with SAX and SCX columns, within organic/buffer solubility constraints
- Retention can be controlled by varying pH, ionic strength and organic modifier content
- Stable pH range from 2.0 to 7.0

13 Heparin Disaccharides



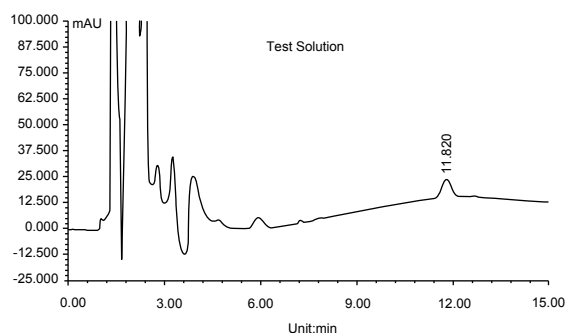
Column:	Ultisil™ XB-SAX, 3.0 ×250 mm, 5 μm
Mobile Phase:	A: weight 0.308g NaH ₂ PO ₄ to 1000 ml volumetric flask, add 950mL water to dissolve it, adjust pH with H ₃ PO ₄ to 2.9, then add water to scale mark. B: weight 122g NaClO ₄ to 1000 ml volumetric flask, add 950ml mobile phase A to dissolve, adjust pH to 3.0 with H ₃ PO ₄ , then add mobile phase A to scale mark.
Detector:	234nm, 202nm
Temperature:	50 °C
Flow Rate:	0.45 ml/min
Injection Volume:	10 μl

Chondroitin Sulfate



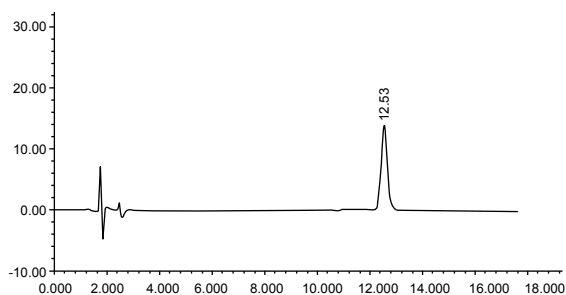
Column:	Ultisil™ XB-SAX, 4.6 ×250 mm, 5 μm
Mobile Phase:	A: water, adjust pH to 3.5 with diluted HCl B: 2mol/L NaCl, adjust pH to 3.5 with diluted HCl
Detector:	232nm
Temperature:	Ambient
Flow Rate:	1.0 ml/min
Injection Volume:	20 μl
Mixed Standards:	Chondroitin disaccharide(B) 6- sulfated chondroitin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

Leonurus Granule



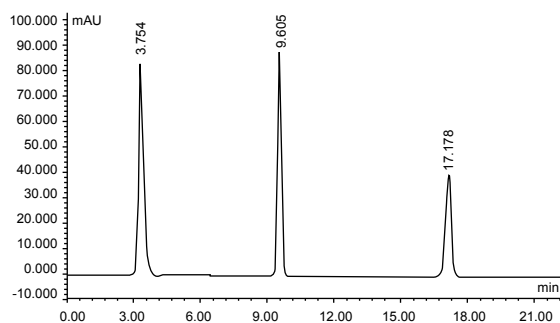
Column:	Ultisil™ XB-SCX, 4.6 ×150 mm, 5 μm
Mobile Phase:	ACN:0.05mol/LKH ₂ PO ₄ :H ₃ PO ₄ =15:85:0.15
Detector:	192nm
Temperature:	Ambient
Flow Rate:	1.0 ml/min
Injection Volume:	10 μl

Melamine



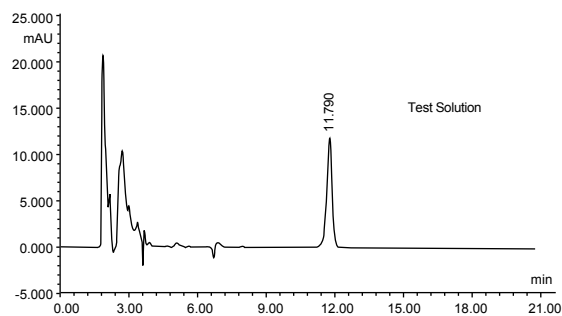
Column:	Ultisil™ XB-SCX, 4.6 ×250 mm, 5 μm
Mobile Phase:	0.05M KH ₂ PO ₄ [adjust pH to 4.7 with H ₃ PO ₄]:ACN=70:30
Detector:	240nm
Temperature:	25 °C
Flow Rate:	1.5 ml/min
Injection Volume:	20 μl

Metformin HCL



Column:	Ultisil™ XB-SCX, 4.6 ×250 mm, 5 μm
Mobile Phase:	1.7% NH ₄ H ₂ PO ₄ [adjust pH to 3.0 with H ₃ PO ₄]
Detector:	218nm
Temperature:	Ambient
Flow Rate:	1.0 ml/min
Injection Volume:	10 μl
Samples In Order:	Icyandiamide, melamine, metformin HCL

Domiphen Bromide Buccal Tablets



Column:	Ultisil™ XB-SCX, 4.6 ×250 mm, 5 μm
Mobile Phase:	MeOH:0.05mol/L NaAC=80:20
Detector:	274nm
Temperature:	Ambient
Flow Rate:	1.0 ml/min
Injection Volume:	100 μl

Ordering information

Dimensions	XB-SCX	XB-SAX	Diol
3μm, 2.1×150mm	00212-21014	00213-21014	00206-21014
3μm, 4.6×150mm	00212-21041	00213-21041	00206-21041
3μm, 4.6×250mm	00212-21043	00213-21043	00206-21043
3μm, 4.6×300mm	00212-21044	00213-21044	00206-21044
3μm, 7.8×300mm	00212-21052	00213-21052	00206-21052
5μm, 2.1×150mm	00212-31014	00213-31014	00206-31014
5μm, 4.6×150mm	00212-31041	00213-31041	00206-31041
5μm, 4.6×250mm	00212-31043	00213-31043	00206-31043
5μm, 4.6×300mm	00212-31044	00213-31044	00206-31044
5μm, 7.8×300mm	00212-31052	00213-31052	00206-31052

Welch provides 120Å, 300Å pore size packing materials. Please contact Welch or your local distributor for other dimensions.

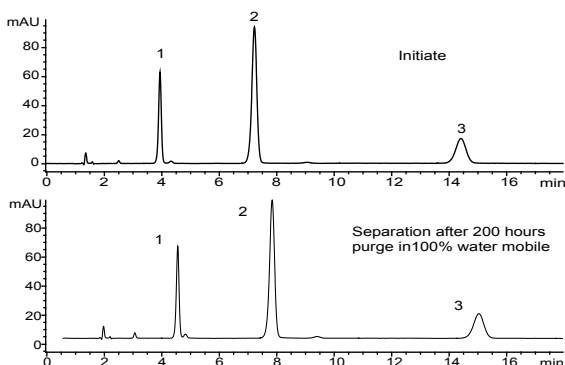
Ultisil™ AQ-C18----The most widely used column in food industry

Ultisil™ AQ-C18 columns are designed to show extended retention and selectivity for hydrophilic and polar compounds, which are either not or poorly retained on other phases. A proprietary bonding chemistry avoids so-called "phase collapse", even if 100% water is used, which conventional C18 columns exhibit at high water contents in the mobile phase. The 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, and small peptides and nucleotides.

Features:

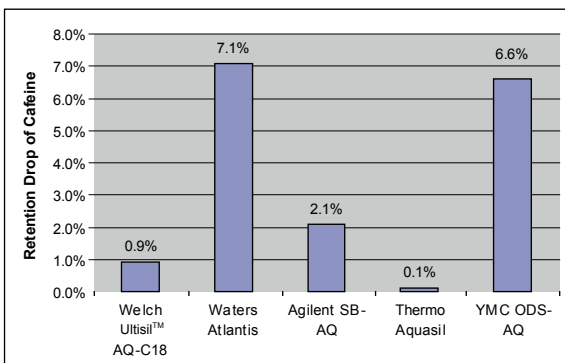
- No phase collapse, suitable for high aqueous mobile phase
- Less retentive than XB-C18 for non-polar compounds
- Increased retention for polar and water soluble compounds
- Carbon loading: 12%, pore size: 120Å, particle size: 3µm, 5µm, 10µm

Phase Collapse Research



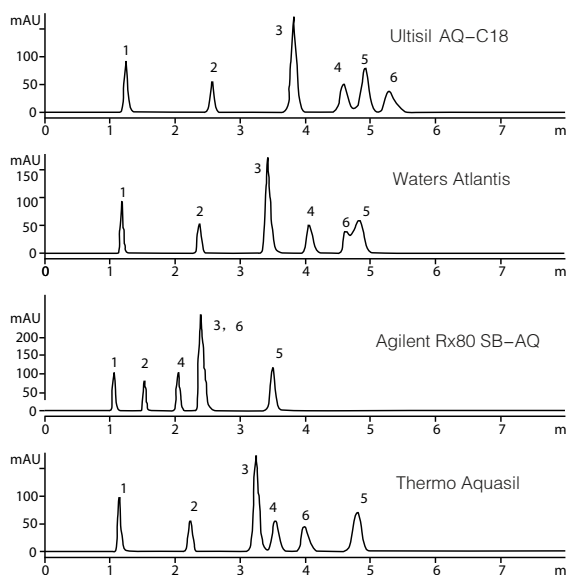
Column:	Ultisil™ AQ-C18, 4.6 × 100 mm, 5 µm
Mobile Phase:	10% ACN/90% 50 mM phosphate, pH 3.5
Detector:	215nm
Temperature:	25 °C
Flow Rate:	1.0 ml/min
Samples:	1. Theophylline 2. Caffeine 3. Phenol

Phase Collapse Comparison with Other Brands



Peak shape is excellent when analysis for acid, basic and neutral samples on AQ-C18. When at 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 at highly aqueous mobile phase, Ultisil™ AQ-C18 shows excellent resistant to phase collapse.



Column:	Ultisil™ AQ-C18, 4.6 × 100 mm, 5 μm
Mobile Phase:	50mM phosphate, pH2.5
Detector:	210nm
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 or AQ-C18?

XB-C18	AQ-C18
<ul style="list-style-type: none"> • Suitable for separation of most pharmaceuticals, environment and chemical compounds • Excellent peak shape for basic and polar samples 	<ul style="list-style-type: none"> • Suitable for water soluble strong polar samples, such as traditional Chinese medicine, food, beverage, organic acids, peptides, nucleosides and water solution vitamins • Best choice for the mobile phase that contains <20% organic phase

Ordering Information

Dimensions	AQ-C18	
	3μm	5μm
2.1×30mm	00207-21009	00207-31009
2.1×50mm	00207-21010	00207-31010
2.1×100mm	00207-21012	00207-31012
2.1×150mm	00207-21014	00207-31014
2.1×200mm	00207-21015	00207-31015
2.1×250mm	00207-21016	00207-31016
4.6×50mm	00207-21037	00207-31037
4.6×100mm	00207-21039	00207-31039
4.6×150mm	00207-21041	00207-31041
4.6×200mm	00207-21042	00207-31042
4.6×250mm	00207-21043	00207-31043
4.6×300mm	00207-21044	00207-31044

Welch provides 120Å and 300Å pore size packing materials. Please contact Welch or your local distributor for other dimensions.

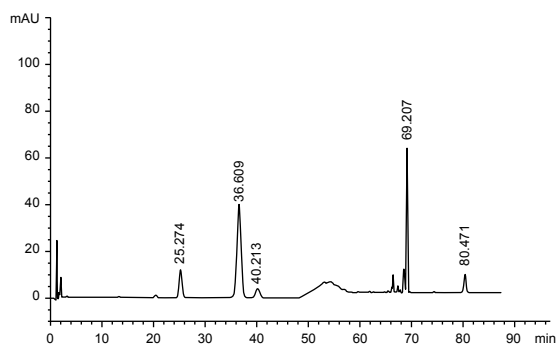
Ultisil™ LP Series HPLC Column

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

- Not end-capped, prevent siloxane bond from hydrolysis at low pH condition
- Endure 100% water as the mobile phase, more polar than "AQ", better peak shape and resolution
- Best peak shape for polar compounds analysis
- Exceptional lifetime at low pH (0.5-8.0) and high temperature
- 300Å LP-C18 is exclusively used for separation of polypeptide and protein

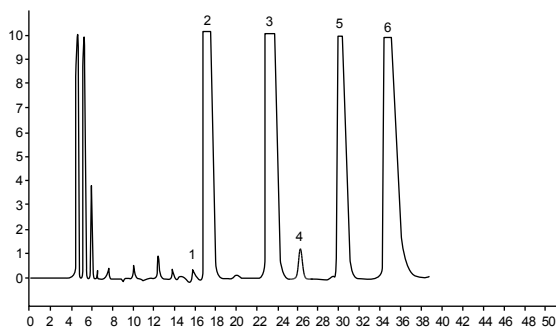
**When pH<5.0, according to your separate condition, you may freely choose LP-C18 or XB-C18;
When pH<2.0 (such as 0.1%TFA), LP-C18, which provide you exceptional stability, longer lifetime, perfect peak shape and superior selectivity, is your best choice**

PNS (Panax Notoginseng Saponins) Finger-print



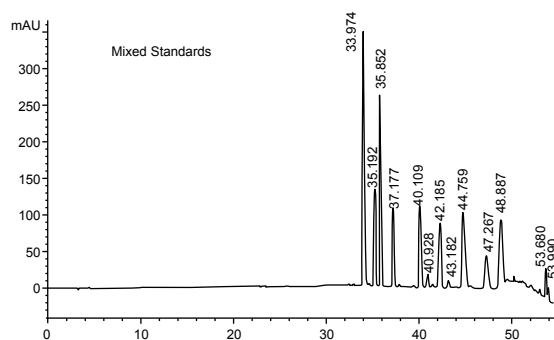
Column:	Ultisil™ LP-C18, 4.6 ×150 mm, 5 μm		
Mobile Phase:	A:ACN B:H ₂ O		
Gradient Program:	Time(min)	A(%)	B(%)
	0	20	80
	45	20	80
	65	34	66
	85	34	66
	86	90	10
	96	90	10
97	20	80	
Flow Rate:	1.0 ml/min		
Detector:	203nm		
Temperature:	30 °C		
Injection Volume:	10 μl		

Analysis of Gentamicin Sulphate



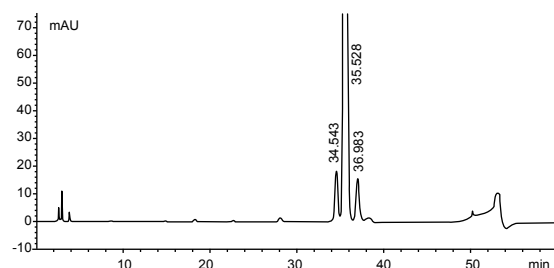
Column:	Ultisil™ LP-C18, 4.6 ×250 mm, 5 μm		
Mobile Phase:	0.2mol/L TFA:methanol=92:8		
Detector:	ELSD		
Temperature:	110 °C		
Gas Flow Rate:	2.8L/min		
Flow Rate:	0.6ml/min		
Injection Volume:	20 μl		
Samples:	1. Sisomicin 2. Gentamicin C1a 3. C2 4. Micronomicin 5. C2a 6. C1		

Analysis of Isoquinoline Alkaloid



Column:	Ultisil™ LP-C18, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A:0.2% HAC,pH 4.0, adjust with triethylamine B:MeOH		
Gradient Program:	Time(min)	A(%)	B(%)
	0	85	15
	5	85	15
	25	75	35
	30	65	35
	35	60	40
	45	60	40
50	0	100	
60	0	100	
Flow Rate:	1.0 ml/min		
Detector:	240nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

Analysis of Thymalfasin



Column:	Ultisil™ LP-C18, 4.6 ×250 mm, 5 μm		
Mobile Phase:	(NH ₄) ₂ SO ₄ buffer: (NH ₄) ₂ SO ₄ 26.4g, H ₃ PO ₄ 25mL, dissolved in water to 2000mL A:(NH ₄) ₂ SO ₄ buffer:ACN=90:10 B:(NH ₄) ₂ SO ₄ buffer:ACN=50:50		
Gradient Program:	Time(min)	A(%)	B(%)
	0	88	12
	45	82	20
	50	50	50
	60	88	12
Flow Rate:	1.0 ml/min		
Detector:	210nm		
Temperature:	50 °C		
Injection Volume:	20 μl		

Ordering Information

Minibore Column

Dimensions	3 μm		5 μm	
	LP-C18	LP-C8	LP-C18	LP-C8
2.1×30mm	00208-21009	00209-21009	00208-31009	00209-31009
2.1×50mm	00208-21010	00209-21010	00208-31010	00209-31010
2.1×100mm	00208-21012	00209-21012	00208-31012	00209-31012
2.1×150mm	00208-21014	00209-21014	00208-31014	00209-31014
2.1×200mm	00208-21015	00209-21015	00208-31015	00209-31015
2.1×250mm	00208-21016	00209-21016	00208-31016	00209-31016

Analytical Column

Dimensions	3 μm		5 μm	
	LP-C18	LP-C8	LP-C18	LP-C8
4.6×50mm	00208-21037	00209-21037	00208-31037	00209-31037
4.6×100mm	00208-21039	00209-21039	00208-31039	00209-31039
4.6×150mm	00208-21041	00209-21041	00208-31041	00209-31041
4.6×200mm	00208-21042	00209-21042	00208-31042	00209-31042
4.6×250mm	00208-21043	00209-21043	00208-31043	00209-31043
4.6×300mm	00208-21044	00209-21044	00208-31044	00209-31044

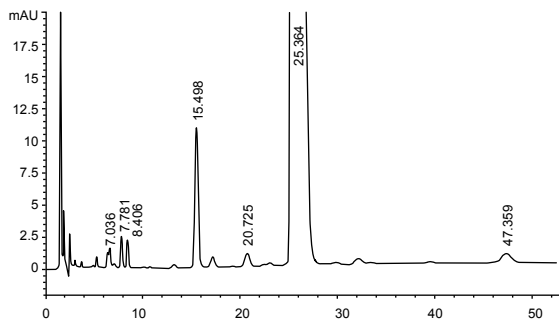
Welch provides 120Å, 300Å pore size packing materials. Please contact Welch or your local distributor for other dimensions.

Ultisil™ Plus C18 HPLC Column

Ultisil™ Plus C18 HPLC Column is a new generation of C18 column that introduced by Welch. Plus C18 is adopted unique bonding technique and double endcapping technique, it shows excellent peak shape, separation efficiency, stability and reproducibility.

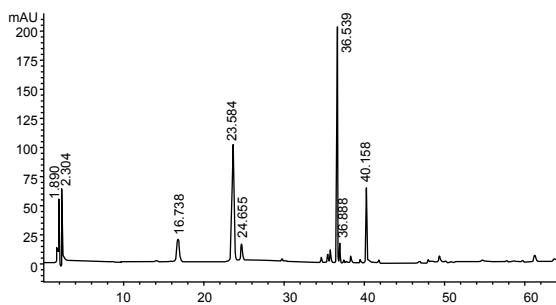
- USP listing: L1
- pH Range: 2.0-8.0
- Surface Area: 160m²/g
- Pore Size: 130Å
- Carbon Loading: 10%

Analysis of ROX (roxithromycin)



Column:	Ultisil™ Plus C18, 4.6 ×150 mm, 5 μm		
Mobile Phase:	A:Buffer:ACN=74:26 B:water:ACN=30:70		
Gradient Program:	Time(min)	A(%)	B(%)
	0	100	0
	50	100	0
	51	90	10
	80	90	10
	81	100	0
	100	100	0
Flow Rate:	1.0 ml/min		
Detector:	205nm		
Temperature:	15 °C		
Injection Volume:	20 μl		

Analysis of PNS (Panax Notoginseng Saponins)



Column:	Ultisil™ Plus C18, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A:ACN B:water		
Gradient Program:	Time(min)	A(%)	B(%)
	0~20	20	80
	20~45	20~46	80~54
	45~55	46~55	54~45
	55~60	55	45
Flow Rate:	1.5 ml/min		
Detector:	203nm		
Temperature:	25 °C		
Injection Volume:	20 μl		

Ordering Information

Dimensions	P/N
5μm, 4.6×150mm	00260-31041
5μm, 4.6×250mm	00260-31043

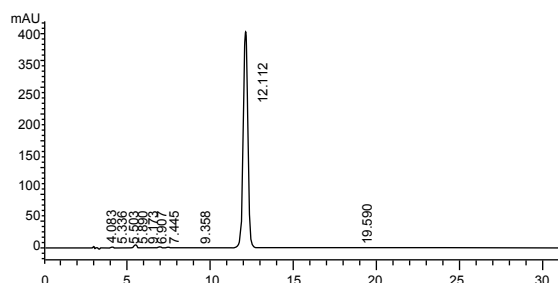
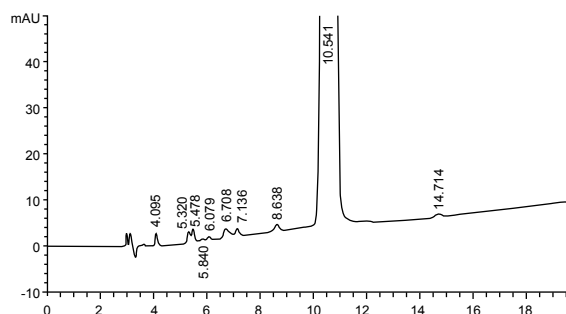
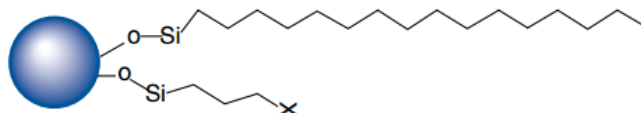
Ultisil™ ALK-C18 HPLC Column

Ultisil™ ALK-C18 is a new generation of C18 column that introduced by Welch. Hydrophilic group is bonded into the silica surface, thus a lot of silanol groups are replaced, preventing the interaction between basic samples and silanol groups. Selectivity of ALK-C18 is obviously different from traditional C18 as existence of hydrophilic groups.

Features:

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

USP listing: L1
 pH Range: 1.5-10.0
 Surface Area: 320m²/g
 Pore Size: 120Å
 Carbon Loading: 12%



Column:	Ultisil™ ALK-C18, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A:0.5 mol/L KH ₂ PO ₃ (adjust pH to 3.5 with H ₃ PO ₄):MeOH:water=10:30:60 B:0.5 mol/L KH ₂ PO ₃ (adjust pH to 3.5 with H ₃ PO ₄):MeOH:water=10:50:40		
Gradient Program:	Time(min)	A(%)	B(%)
	0	70	30
	20	0	100
	35	0	100
	50	70	30
Flow Rate:	1.0 ml/min		
Detector:	225nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

Ordering Information

Dimensions	P/N
5μm, 4.6×150mm	00253-31041
5μm, 4.6×250mm	00253-31043

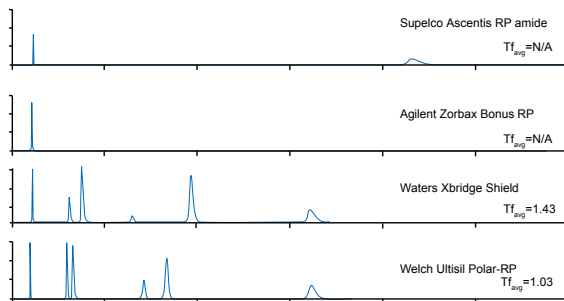
Ultisil™ Polar Embedded HPLC Column

Polar embedded phases have been developed for more than 10 years. The earlier development of polar embedded phase is on amide phase. The polar functional group close to the surface increases the wettability of phase, thus decreasing phase collapse, so that up to 95% water phase could be applied in the mobile phase. It 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. We provide two kinds of packing materials - Ultisil™ Polar-RP and Ultisil™ Phenyl-Ether.

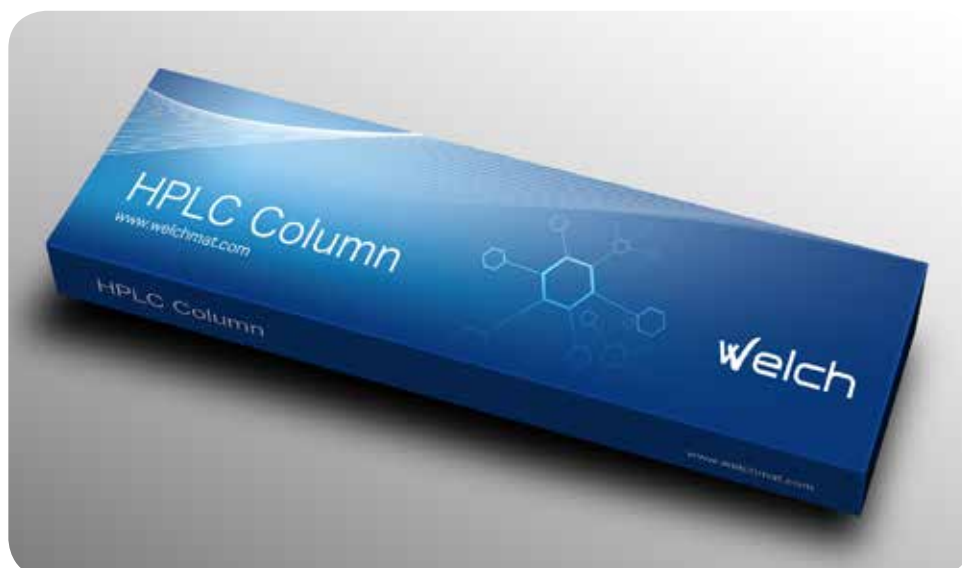
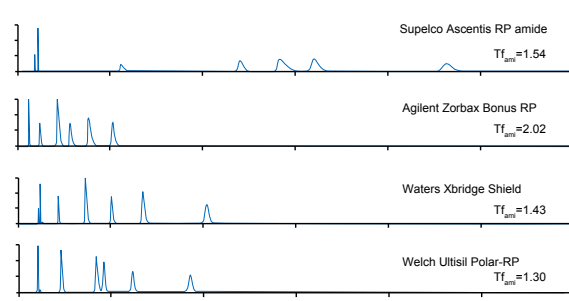
Ultisil™ Polar RP HPLC Column

- Exhibit at 100% water contents in mobile phase, even better than AQ-C18
- Different selectivity to AQ-C18
- Excellent peak shape for acid and basic compounds due to the "shield" effect of polar linkage to silanol activity by forming hydrogenbonding
- Be retentive for polar compounds. Uracil, which can't be retained on most reversed phase columns, when at 100% water, can be retained on this column, even be eluted after 5-fluorocytosine and cytosine. Analysis of purine, pyrimidine, small molecular acid, catecholamine and water soluble vitamins, require high water phase content mobile phase
- Fast separation of similar samples on a column

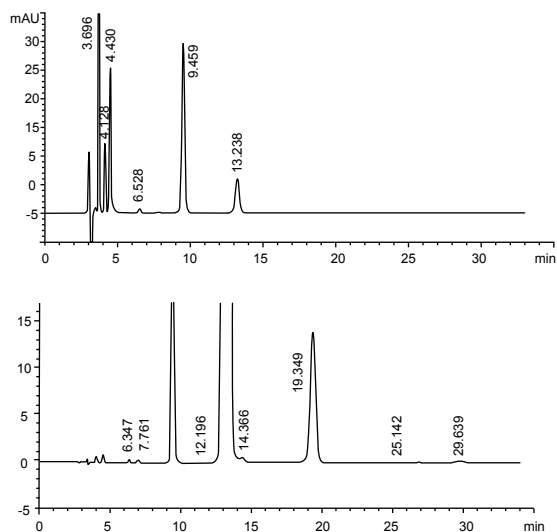
Comparison of separation of acid compounds



Comparison of separation of base compound



Analysis of Cefradine

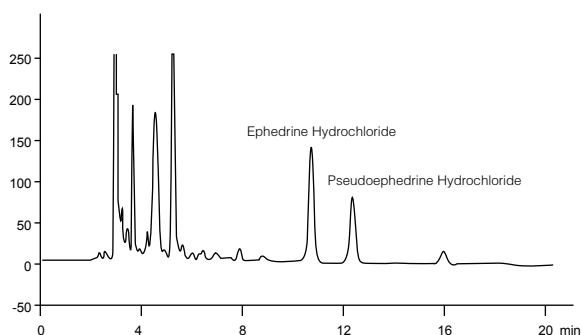


Column:	Ultisil™ Polar RP, 4.6 ×250 mm, 5 μm
Mobile Phase:	MeOH:water:3.86% NaAC:4%HAC=400:1564:30:6
Detector:	254nm 220nm
Temperature:	Ambient
Flow Rate:	0.9ml/min
Injection Volume:	20 μl
Samples:	Impurity reference solution 220nm 7-ADCA: 3.696min Dihydrophenylglycine: 4.128min Cefalexin: 9.495min Cefradine: 13.238min

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 the highly acidic polar compound, and an alternative selectivity compared to other polar phases such as polar embedded phase
- Compatible with 100% water mobile phase

Analysis of Ephedra



Column:	Ultisil™ Phenyl-Ether, 4.6 ×250 mm, 5 μm
Mobile Phase:	MeOH:0.092% H_3PO_4 solution(contain 0.04% trimethylamine and 0.02% n-butylamine)=1.5:98.5
Detector:	210nm
Temperature:	Ambient
Flow Rate:	1.0ml/min
Injection Volume:	10 μl

Ordering Information

Dimensions	Ultisil™ Polar RP	Ultisil™ Phenyl-Ether
5μm, 4.6×150mm	00215-31041	00214-31041
5μm, 4.6×250mm	00215-31043	00214-31043

Ultisil™ UHPLC Column

Welch also provide Ultisil™ UHPLC (1.8 μm) columns. Due to the high column efficiency and good lot-to-lot reproducibility, Ultisil™ UHPLC could get high quality data, decreases the probability of repeated analysis sample and reduces the consumption of solvents at the same time. Ultisil™ UHPLC series include different kinds of bonded phase, specified guard column and pre-column for you to select and realize faster, higher resolution and more environmental chromatography applications.

Ultra Resolution: the same or better resolution than normal column which is longer and has more packing materials than UHPLC.

Ultra speed: UHPLC offer more information in unit time and higher speed due to its small 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 the system sensitivity of 5μm and 3.5μm.

Hardware Features:

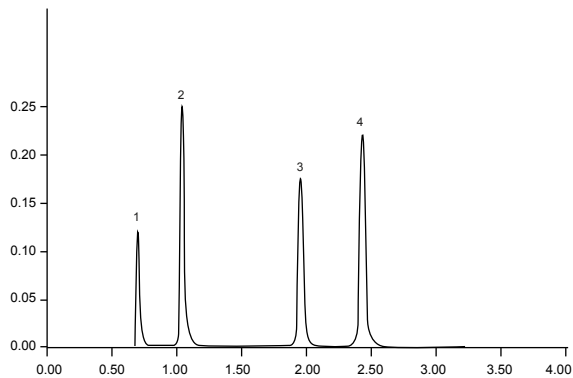
- New design
- Low dead volume
- New special frit

Packing Materials Features:

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

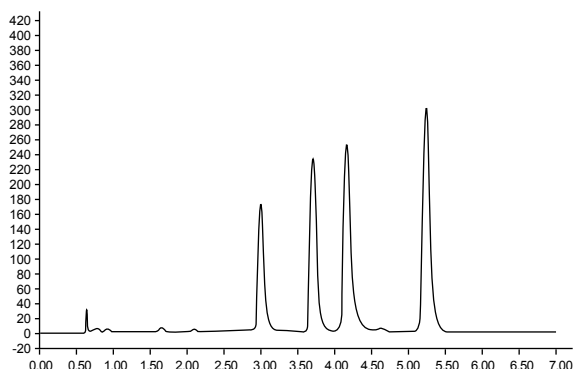
Column Packing Features:

- Unique column packing technique
- Endure ultra high pressure of UHPLC instruments



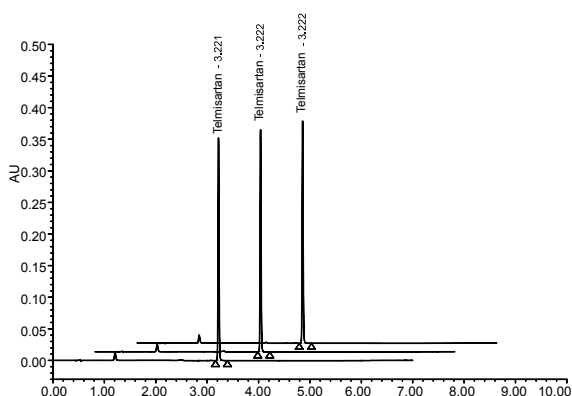
Column:	Ultisil™ UHPLC XB-C18, 2.1 × 100 mm, 1.8 μm
Mobile Phase:	ACN:water=65:35
Detector:	254nm
Temperature:	Ambient
Flow Rate:	0.35ml/min
Injection Volume:	2 μl
Back Pressure:	5000psi
Instrument:	Waters Acquity UPLC
Samples in Order:	Uracil Phenol 4-chloronitrobenzene Toluene

Analysis of Aflatoxin



Column:	Ultisil™ UHPLC XB-C18, 2.1×100 mm, 1.8 μm
Mobile Phase:	MeOH:ACN:water=18:18:64
Detector:	FLD Excitation:365 nm Emission:450nm
Temperature:	35°C
Flow Rate:	0.35ml/min
Injection Volume:	2 μl
Instrument:	Waters 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

1.8μm Analytical Column

Dimensions	XB-C18	XB-C8	XB-Phenyl	LP-C18	SiO ₂	Polar RP
2.1×30	00201-11009	00202-11009	00203-11009	00208-11009	00200-11009	00215-11009
2.1×50	00201-11010	00202-11010	00203-11010	00208-11010	00200-11010	00215-11010
2.1×100	00201-11012	00202-11012	00203-11012	00208-11012	00200-11012	00215-11012
2.1×150	00201-11014	00202-11014	00203-11014	00208-11014	00200-11014	00215-11014
4.6×30	00201-11036	00202-11036	00203-11036	00208-11036	00200-11036	00215-11036
4.6×50	00201-11037	00202-11037	00203-11037	00208-11037	00200-11037	00215-11037

Not find the size you want? Contact Welch or your local distributor for other dimensions.

Ultisil™ PAH Column

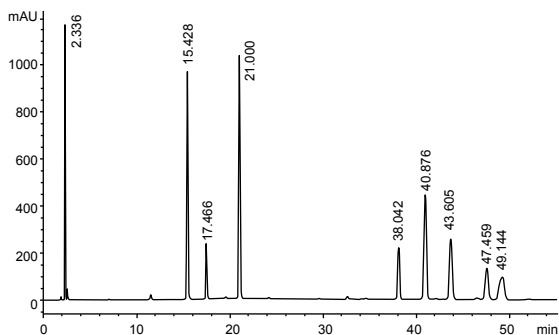
Ultisil™ PAH Column is the special column which just designed for separation of PAHs in EPA method 610 by Welch. PAHs (Polycyclic Aromatic Hydrocarbon) are the hydrocarbons which contain two or more benzene rings, considered priority pollutants and the analysis of these potentially carcinogenic compounds in water, air, soil and food. Most of the PAHs do not exist alone, they always come together. The materials may contain PAHs: charcoal, crude oil, creosote, tar, drugs, dyes, plastic, rubber, pesticide, lube, release agent, electrolyte, mineral oil, pitch, insecticide, bactericide etc.

16 PAHs:

Naphthalene	Benzo(a)anthracene
Acenaphthylene	Chrysene
Acenaphthene	Benzo(b)fluoranthene
Fluorene	Benzo(k)fluoranthene
Phenanthrene	Benzo(a)pyrene
Anthracene	Indeno(1,2,3-cd)pyrene
Fluoranthene	Dibenzo(a,h)anthracene
Pyrene	Benzo(g,hi)perylene

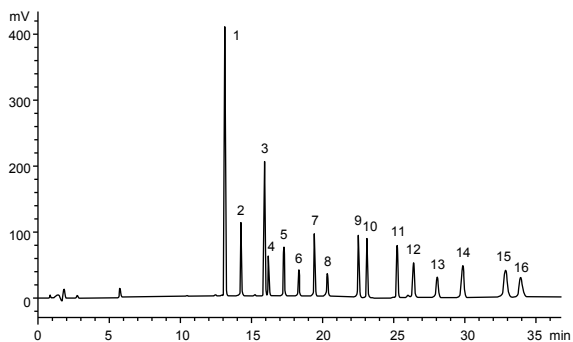
The Ultisil™ PAH columns separate all of the 16 PAHs in EPA method 610 quickly (less than 30 min) with high resolution. The Ultisil™ PAH columns is silica based columns for PAHs analysis with best peak shape.

Analysis of 9 Pesticide Residues in Water



Column:	Ultisil™ PAH, 4.6 ×250 mm, 5 μm
Mobile Phase:	Water:ACN=70:30(0min) 30:70(30min)
Detector:	220nm
Temperature:	30°C
Flow Rate:	1.0ml/min
Injection Volume:	10μl
Mixed Standards:	Melbine, uracil, atrazine, terbutylazine, estradiol, pendimethalin, fondantone, pyrene, cypermethrin

Separation of 16 PAHs in EPA method 610



Column:	Ultisil™ PAH, 4.6 ×250 mm, 5 μm
Mobile Phase:	A:water B:ACN Gradient
Detector:	220nm
Temperature:	Ambient
Flow Rate:	1.5ml/min
Injection Volume:	10μl
Mixed Standards:	1. Naphthalene 2. Acenaphthylene 3. Acenaphthene 4. Fluorene 5. Phenanthrene 6. Anthracene 7. Fluoranthene 8. Pyrene 9. Benzo(a)anthracene 10. Chrysene 11. Benzo(b)fluoranthene 12. Benzo(k)fluoranthene 13. Benzo(a)pyrene 14. Dibenzo(a,h)anthracene 15. Benzo(g,hi)perylene 16. Indeno(1,2,3-cd)pyrene

Ordering Information

Dimensions	P/N
3µm, 4.6×150mm	00210-21041
3µm, 4.6×250mm	00210-21043
5µm, 4.6×150mm	00210-31041
5µm, 4.6×250mm	00210-31043

Welch provides 120Å and 300Å pore size packing materials. Please contact Welch or your local distributor for other dimensions.

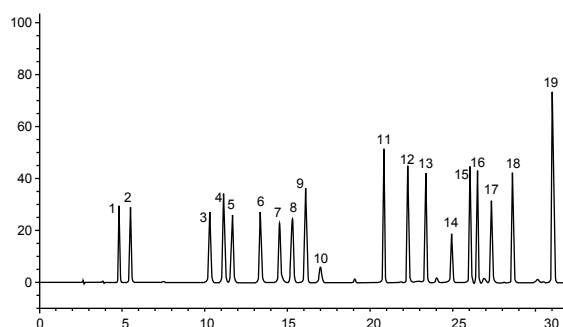
Ultisil™ Amino Acid HPLC Column

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. Total sample preparing time can be achieved in as little as 30 min.

Ultisil™ Amino Acid Method Package

- Ultisil Amino Acid Column (5µm, 4.6×250mm), 1pk
- Amino Acid Standards, 2 bottles. 1mL/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

Dimensions	P/N
3µm, 4.6×150mm	00211-21041
3µm, 4.6×250mm	00211-21043
5µm, 4.6×150mm	00211-31041
5µm, 4.6×250mm	00211-31043

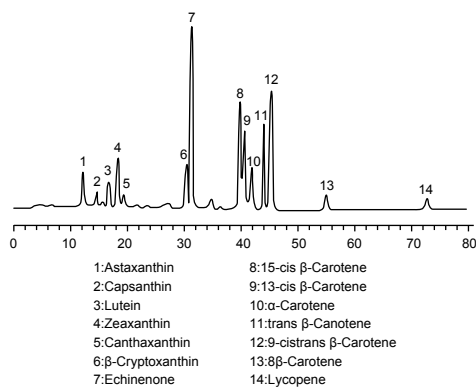
Not find the size you want? Contact Welch or your local distributor for other dimensions.

Ultisil™ C30 HPLC Column

Compared to classical C18 stationary phase, C30 is much more hydrophobic and retainable. Ultisil™ C30 is designed for the separation of geometric isomer recognition, polar carotenes, polar and nonpolar xanthophylls, steroids, retinols and fat-soluble vitamins [A, D, K and E].

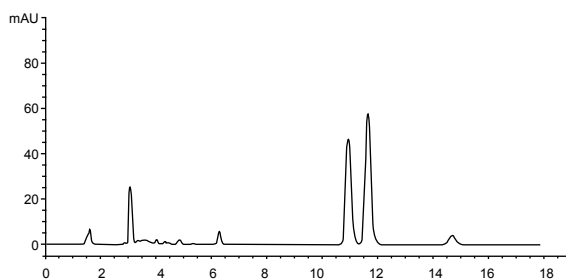
- Polymeric C30 alkyl chains
- High lipophilic
- Exceptional selectivity pattern for geometric isomers
- pH range: 1.5-10

Separation of Carotenoids



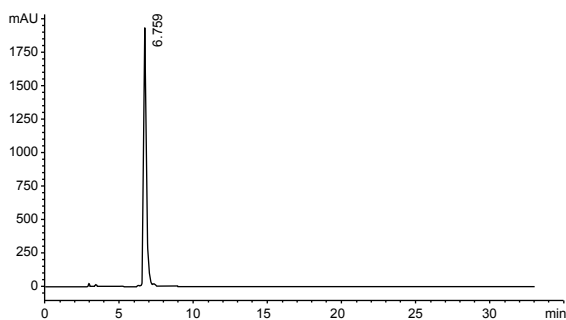
Column:	Ultisil™ C30, 4.6 ×250 mm, 5 μm
Mobile Phase:	A:MeOH:MTBE:H ₂ O=81:15:4 B: MeOH:MTBE=10:90
Gradient Program:	0-90min (0%B-100%B)
Detector:	450nm
Temperature:	Ambient
Flow Rate:	1.0ml/min

Separation of Ursolic Acid and Oleanolic Acid



Column:	Ultisil™ C30, 4.6 ×250 mm, 5 μm
Mobile Phase:	ACN:water=93:7
Detector:	210nm
Temperature:	20°C
Flow Rate:	1.0ml/min
Injection Volume:	10μl

Analysis of All-trans Astaxanthin



Column:	Ultisil™ C30, 4.6 ×250 mm, 5 μm		
Mobile Phase:	A: MeOH:1%H ₃ PO ₄ =94:4 B: MeOH:TBME:1% H ₃ PO 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:	474nm		
Temperature:	30 °C		
Injection Volume:	20 μl		

Ordering Information

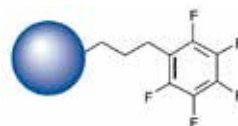
Dimensions	P/N
3µm, 4.6×150mm	00223-21041
3µm, 4.6×250mm	00223-21043
5µm, 4.6×150mm	00223-31041
5µm, 4.6×250mm	00223-31043

Not find the size you want? Contact Welch or your local distributor for other dimensions.

Ultisil™ Fluorinated Phase HPLC Column

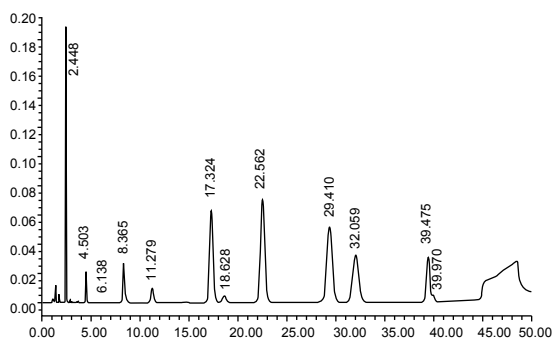
Ultisil™ Fluorinated Phase has high selectivity and increased retention toward closely related compounds, not just for aromatic fluorinated compounds, but also for other nonaromatic halogenated compounds. It could be used as usual reversed phase and provide an alternative and complementary separation for many analytes performed on C8 or C18 columns. Fluorinated phase has better separation for the ion exchange and polar compounds than alkyl phase. Fluorinated phases can provide different elution orders, leading to enhance selectivity for difficult-to-separate compounds.

Ultisil™ PFP HPLC Column



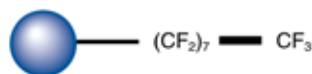
Ultisil™ PF-Phenyl is a phase primarily used in the separation of molecules bearing fluorine atoms, but may also be in the separation of non-fluorous compounds such as Taxol and its derivatives. Because of its phenyl ring, it has a higher selectivity for aromatics containing molecules compared to the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

Analysis of Taxol



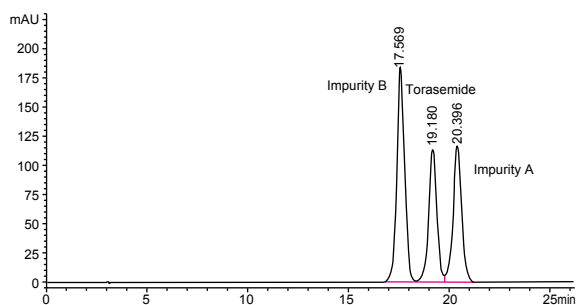
Column:	Ultisil™ PFP, 4.6 ×250 mm, 5 µm		
Mobile Phase:	A: ACN B: water		
Gradient Program:	Time(min)	A(%)	B(%)
	0	35	65
	35	35	65
	60	80	20
	70	85	15
80	85	65	
Flow Rate:	2.6 ml/min		
Detector:	227nm		
Temperature:	30 °C		
Injection Volume:	10 µl		

Ultisil™ F-C8 HPLC Column



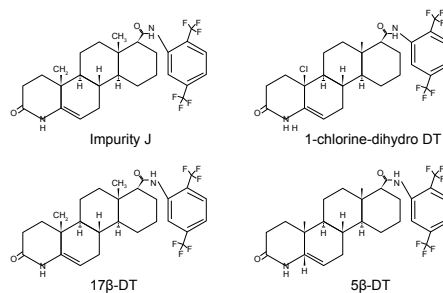
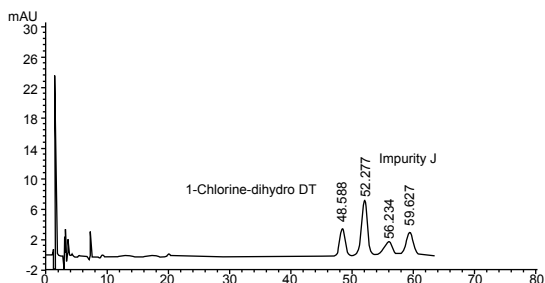
Ultisil™ F-C8 column has high selectivity and increased retention toward halogenated aromatic and alkyl compounds, just different from octyl alkyl phase.

Torasemide



Column:	Ultisil™ F-C8, 4.6 ×250 mm, 3μm
Mobile Phase:	0.02mol/L KH ₂ PO ₄ (pH 7.0)/ MeOH=65/35
Flow Rate:	1.0 ml/min
Detector:	288 nm
Temperature:	30 °C
Injection Volume:	20μl
Notes:	Be sensitive to mobile phase pH

Analysis of DT Impurities



Column:	Ultisil™ F-C8, 4.6 ×250 mm, 3μm
Mobile Phase:	MeOH/ACN/water=54/6/40
Flow Rate:	1.0 ml/min
Detector:	288 nm
Temperature:	Ambient
Injection Volume:	10μl

Ordering Information

Dimensions	Ultisil™ PFP	Ultisil™ F-C8
5μm, 4.6×150mm	00224-31041	00222-31041
5μm, 4.6×250mm	00224-31043	00222-31043

Ultisil™ Mixed Mode Phase

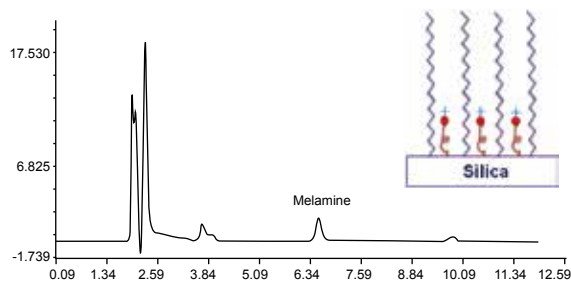
Ultisil™ Mixed mode phase, whose selectivity is totally different from traditional reversed phase, is a new packing material which is the development trend of liquid chromatography. There are three mode of mixed mode phase: reversed phase/anion exchange, reversed phase/cation exchange, reversed phase/amphoteric compound.

- Different selectivity from reversed phase/anion exchange column
- Can separate strong polar compounds without using ion-pair agent
- Separate positive compounds, negative compounds and neutral compounds simultaneously
- Appropriate for MS analysis

Ultisil™ MM C18/SCX

- Ultra pure spherical porous silica
- Can be used for separation of hydrophobic and ion compounds
- The best choice for analysis of unknown samples, especially metabolites
- The first mixed column in China

Analysis of Melamine

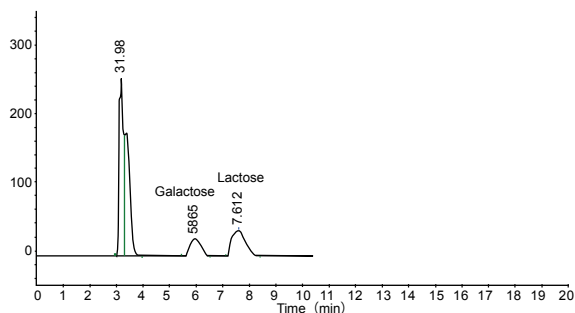


Column:	Ultisil™ MM C18/SCX, 4.6 ×250 mm, 5 μm
Mobile Phase:	0.01 M NH ₄ AC(pH3.0):ACN=62:38
Detector:	240 nm
Temperature:	40 °C
Flow Rate:	1.0 ml/min
Injection Volume:	20 μl

Ultisil™ MM NH₂/CN

- HILIC mode
- Base on ultra pure spherical porous silica
- Appropriate for analysis of sugars which are hard to separate

Separation of Lactose and Galactose



Column:	Ultisil™ MM NH ₂ /CN, 4.6 ×250 mm, 5μm
Mobile Phase:	ACN:water =70:30
Detector:	RID (40°C)
Temperature:	45°C
Flow Rate:	1.0ml/min
Injection Volume:	20μl

Ordering Information

5μm Analytical Column

Dimensions	MM C18/SCX	MM NH ₂ /CN
2.1×50	00235-31010	00243-31010
2.1×100	00235-31012	00243-31012
2.1×150	00235-31014	00243-31014
4.6×150	00235-31041	00243-31041
4.6×250	00235-31043	00243-31043

Ultisil™ HILIC Column

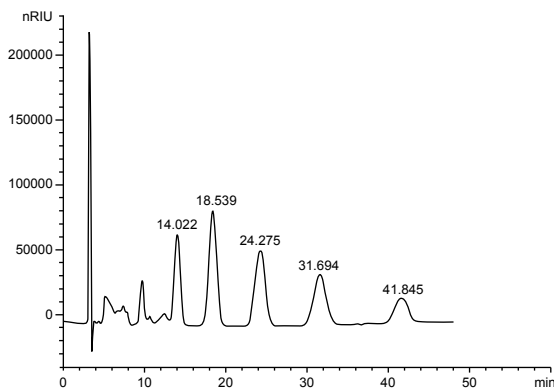
Hilic(Hydrophilic interaction liquid chromatography) is a separation mode which is achieved through the partitioning of polar solutes from high concentration, water-miscible, organic mobile phase into hydrophilic surface environment.

Ultisil™ HILIC Amide

Ultisil™ HILIC Amide column is a special column designed for HILIC mode. As amide group has strong hydrophilicity and stability and it is also an electrically neutral group, so Ultisil™ Amide has a longer life, better separate repeatability and peak shape than NH₂.

- Based on the silica bonded with amide groups, appropriate for the separation of hydrophilic samples
- Multiple action like hydrogen bond, molecular and electrostatic force
- Good compatible with kinds of detectors, such as MS detector
- Stable on organic mobile phase which contains water

Fructo-oligose



Column:	Ultisil™ HILIC Amide, 4.6 ×250 mm, 5μm
Mobile Phase:	ACN: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)

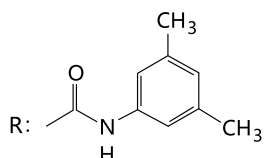
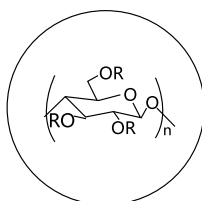


Ultisil™ Chiral Column

Ultisil™ Chiral columns are based on chiral polymer (amylose derivatives or cellulose derivatives) coated spherical silica. We have 5µm and 10µm two dimensions, and four kinds of chiral columns, including Cellu-D, Cellu-J, Amy-D and Amy-S. 80% of all racemic compounds could be separated by those four chiral columns.

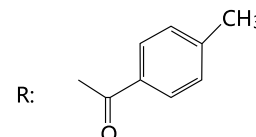
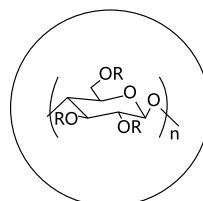
Cellu-D/Cellu-DR:

Cellulose tris (3,5-dimethylphenylcarbamate) coated silica



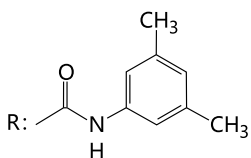
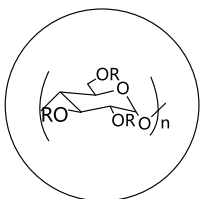
Cellu-J/Cellu-JR:

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



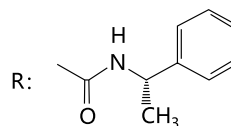
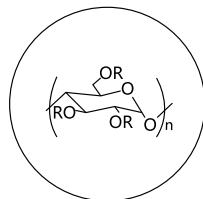
Amy-D/Amy-DR:

Amylose tris (3,5-dimethylphenylcarbamate) coated silica

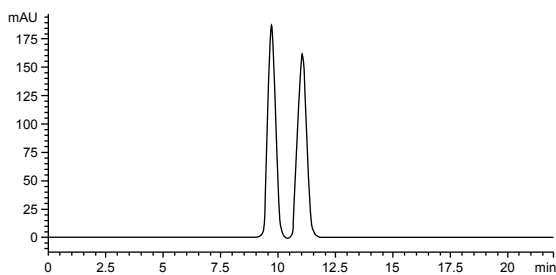


Amy-S/Amy-SR:

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

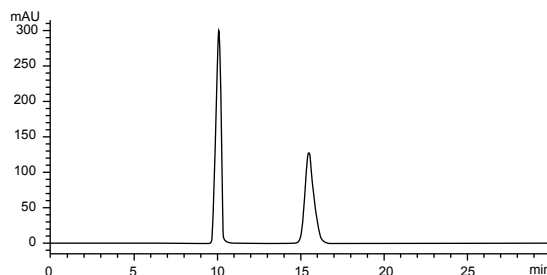


Fenamiphos



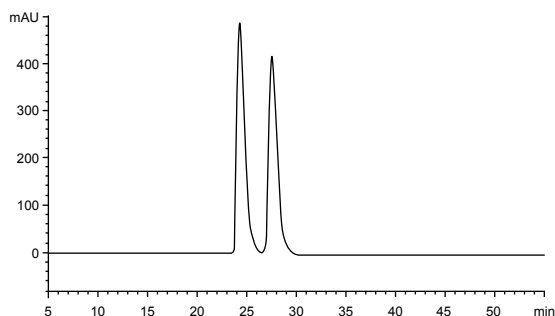
Column:	Ultisil™ Amy-D
Mobile Phase:	N-hexane: MeOH=90:10

Tröger's Base



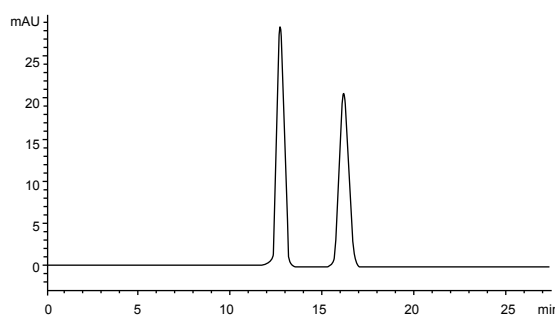
Column:	Ultisil™ Cellu-J
Mobile Phase:	N-hexane: isopropanol=90:10

DL-Repaglinide



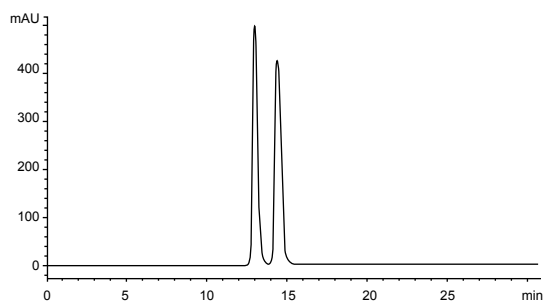
Column:	Ultisil™ Cellu-D
Mobile Phase:	N-hexane: MeOH:TFA=90:10:0.1

Myclobutanil



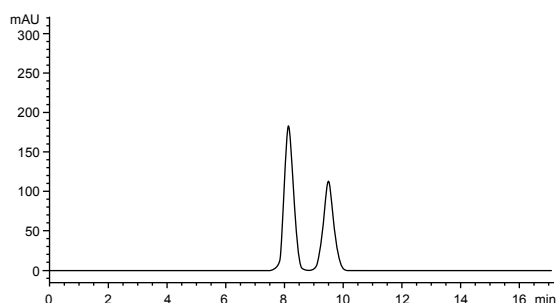
Column:	Ultisil™ Amy-S
Mobile Phase:	N-hexane: MeOH=90:10

Quizalofop-ethyl



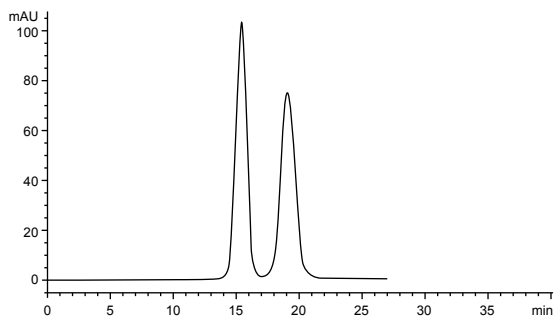
Column:	Ultisil™ Amy-D
Mobile Phase:	N-hexane: MeOH =95:5

Oxirane,2-[(phenylmethoxy)methyl]-



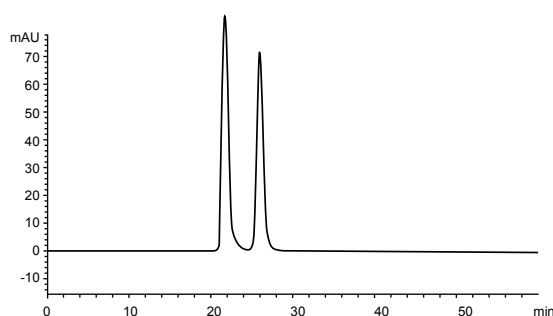
Column:	Ultisil™ Amy-S
Mobile Phase:	N-hexane: isopropanol =98:2

Llaprazole



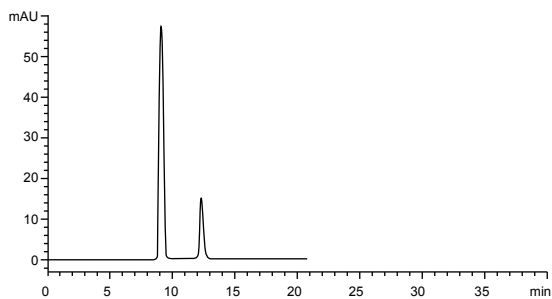
Column:	Ultisil™ Cellu-JR
Mobile Phase:	MeOH: H ₂ O =80:20

Omeprazole



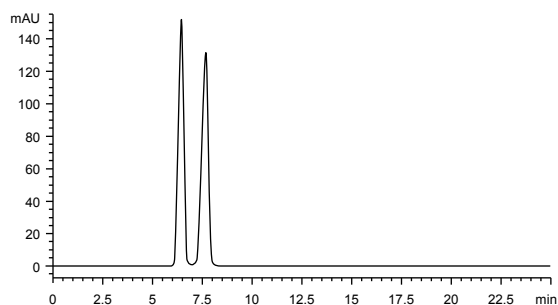
Column:	Ultisil™ Amy-D
Mobile Phase:	N-hexane: isopropanol =83:17

Alkannin



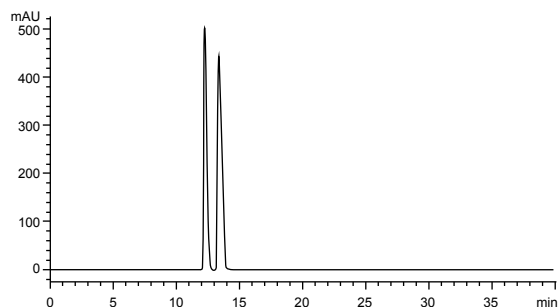
Column:	Ultisil™ Cellu-D
Mobile Phase:	N-hexane: isopropanol:TFA =90:10:0.1

Fmoc-Leu-OH



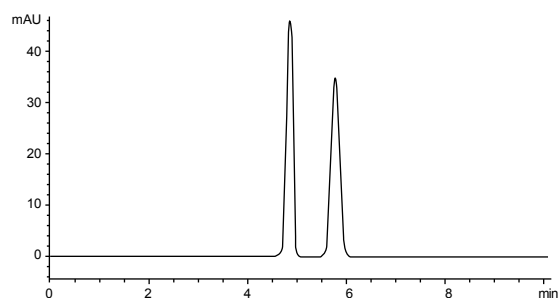
Column:	Ultisil™ Cellu-DR
Mobile Phase:	MeOH: (pH=2.0 H ₃ PO ₄)water =95:5

Butylphthalide



Column:	Ultisil™ Cellu-D
Mobile Phase:	N-hexane: isopropanol =98:2

Hexaconazole



Column:	Ultisil™ Amy-S
Mobile Phase:	N-hexane: isopropanol =90:10

Ordering Information

Dimensions	Cellu-D	Amy-D	Cellu-J	Amy-S	Cellu-DR	Amy-DR	Cellu-JR	Amy-SR
5µm, 4.6×150mm	00219-31041	00221-31041	00218-31041	00220-31041	00262-31041	00264-31041	00261-31041	00263-31041
5µm, 4.6×250mm	00219-31043	00221-31043	00218-31043	00220-31043	00262-31043	00264-31043	00261-31043	00263-31043
10µm, 4.6×150mm	00219-41041	00221-41041	00218-41041	00220-41041	00262-41041	00264-41041	00261-41041	00263-41041
10µm, 4.6×250mm	00219-41043	00221-41043	00218-41043	00220-41043	00262-41043	00264-41043	00261-41043	00263-41043
5µm, 10×150mm	02682-21101	02684-21101	02681-21101	02683-21101	02686-21101	02688-21101	02685-21101	02687-21101
5µm, 10×250mm	02682-21102	02684-21102	02681-21102	02683-21102	02686-21102	02688-21102	02685-21102	02687-21102
10µm, 10×150mm	02682-31101	02684-31101	02681-31101	02683-31101	02686-31101	02688-31101	02685-31101	02687-31101
10µm, 10×250mm	02682-31102	02684-31102	02681-31102	02683-31102	02686-31102	02688-31102	02685-31102	02687-31102
5µm, 20×150mm	02682-21131	02684-21131	02681-21131	02683-21131	02686-21131	02688-21131	02685-21131	02687-21131
5µm, 20×250mm	02682-21132	02684-21132	02681-21132	02683-21132	02686-21132	02688-21132	02685-21132	02687-21132
10µm, 20×150mm	02682-31131	02684-31131	02681-31131	02683-31131	02686-31131	02688-31131	02685-31131	02687-31131
10µm, 20×250mm	02682-31132	02684-31132	02681-31132	02683-31132	02686-31132	02688-31132	02685-31132	02687-31132

Xtimate® Series HPLC Column

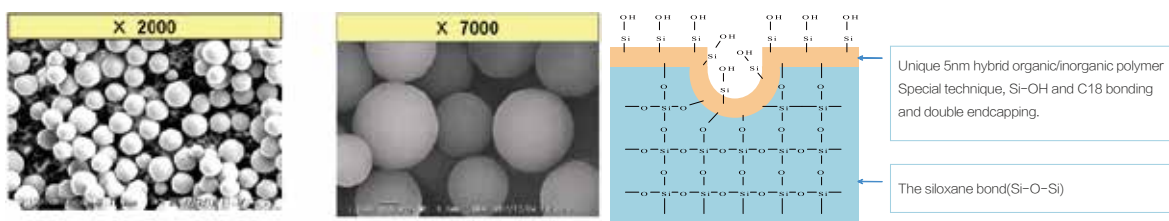
---Next generation beyond mid-range priced Ultisil™ series

X features of Xtimate® column

- 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 high to 90000/m, 2-3 times of Xterra
- eXtra care from Welch: enjoy good pre-sales and after-sales service from Welch

Xtimate® Silica Based HPLC Column

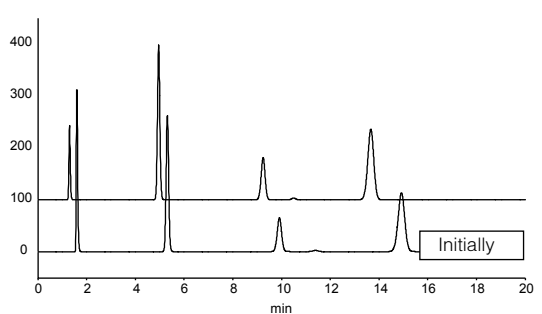
Xtimate® HPLC column applied special hybrid particles based technique, which coat a unique 5nm organic/inorganic polymer on the surface of the silica, so the pH range is extended to 1.0-12.5. Xtimate® column is designed for HPLC method development, no matter in variety of mobile phases or high temperature, Xtimate® HPLC column also has stable performance and longer lifetime.



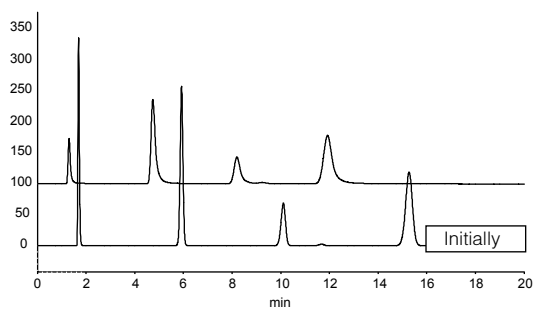
SEM of Hybrid particle

Hybrid Particles Based Xtimate® Technology

Comparison of Peak Shape After Soaking In Base



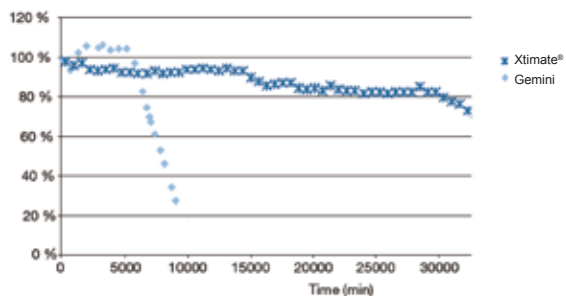
Column:	Xtimate® C18, 5 µm, 150 x 4.6 mm
Mobile Phase:	CH ₃ CN/0.01N NaOHaq.(pH=12)=30/70
Flow Rate:	1.0ml/min
Temperature:	40°C
Soak Time:	4 hours



Column:	Ultisil™ C18, 5 µm, 150 x 4.6 mm
Mobile Phase:	CH ₃ OH/H ₂ O=60/40
Flow Rate:	1.0ml/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 shows little difference difference.

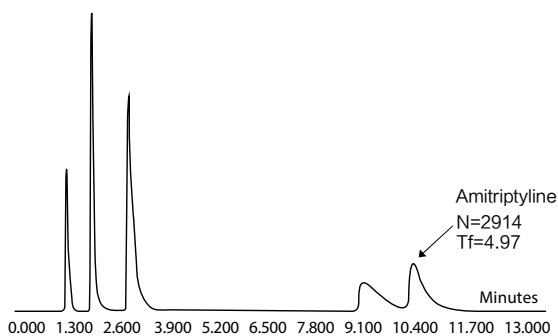
Lifetime Test Comparison: 5 Times Longer Than Gemini



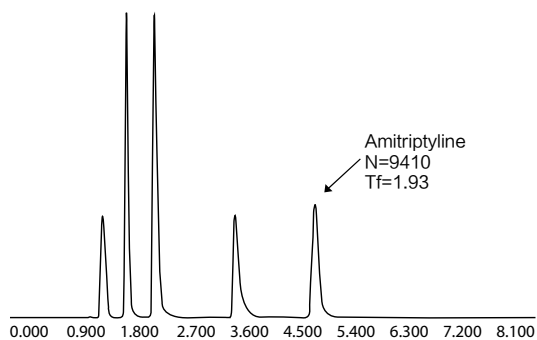
Column:	Xtimate® C18, 5 µm, 150x4.6 mm / Gemini C18, 5 µm, 150x4.6 mm
Mobile Phase:	A: 10mM Ammonium Bicarbonate pH 10.5 B: 90:10 Acetonitrile/buffer
Gradient Program:	0% to 100% B in 10min. 100% B for 7min. 0% B for 3min.
Flow Rate:	1.0 mL/min
Temperature:	50°C
Detector:	UV 254nm
Samples:	1.Uracil 2.Methyl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

Unprecedented Peak Shape

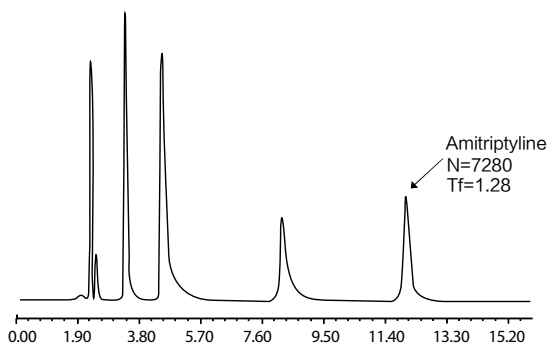
At mid pH, the strong bases usually exhibit bad tailing due to the secondary interaction between the analytes and the surface silanols. Because of our technique, the hybrid layer totally covers the surface silanols and blocks the access of analytes to surface silanols. The improved bonding and endcapping further reduce silanol activity. As a result, hybrid particles 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



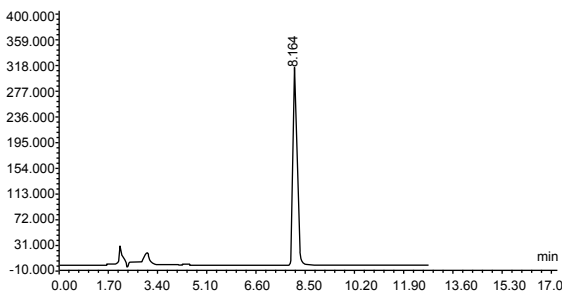
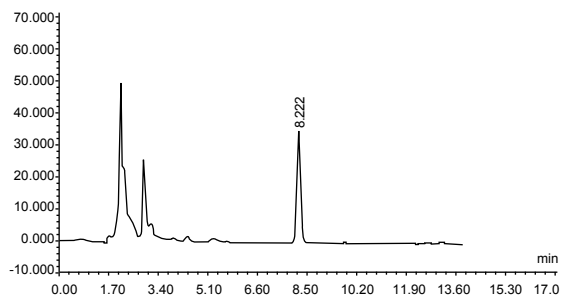
Xtimate[®] HPLC Column Bonded Phases

Beside C18 and C8 bonded phases, Xtimate also provide C4, CN, Phenyl bonded phases.

Xtimate[®] applied new special Smoothpak[™] technique, the bonding method of C18, C8, C4, CN, Phenyl, amino phases is different from other series, providing a different selectivity, stability and reproducibility, specially Phenyl phase Phenyl-Hexyl, is totally different from Ultisil[™] Phenyl, the longer hexyl group provides extra hydrocarbon interaction and longer retention than typical phenylpropyl phase; it also provides phase better chemical stability.

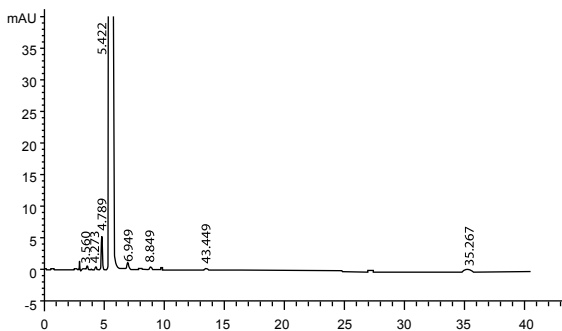
We also have polar polar embedded phase, Polar-RP on Xtimate[®] particles, to further improve peak shape for high polar and strong basic compounds and provide different selectivity than C18 phase.

Solifenacin Succinate



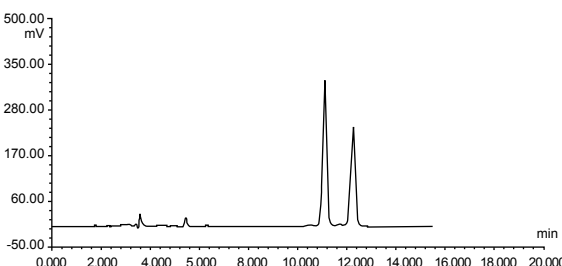
Column:	Xtimate [®] C18, 5 μ m, 250 x 4.6mm
Mobile Phase:	50mmol/L K ₂ HPO ₄ (pH3.0):ACN=60:40
Flow Rate:	1.0ml/min
Temperature:	40°C
Detector:	UV 210nm
Injection Volume:	20 μ l

Valaciclovir Hydrochloride



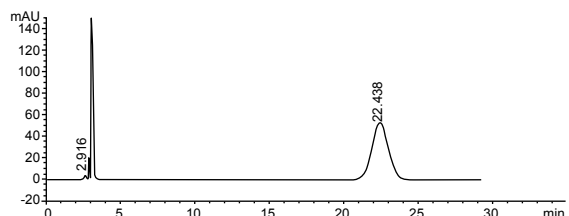
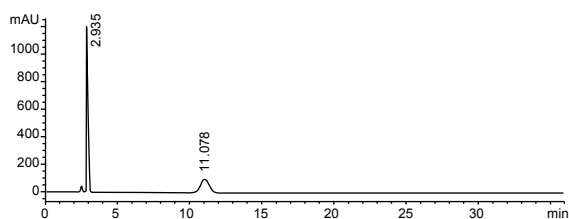
Column:	Xtimate [®] Phenyl-Hexyl, 5 μ m, 250 x 4.6mm
Mobile Phase:	MeOH:0.01mol/L KH ₂ PO ₄ (pH3.0)=15:85
Flow Rate:	1.0ml/min
Temperature:	35°C
Detector:	251nm
Injection Volume:	20 μ l

Omeprazole



Column:	Xtimate [®] C8, 5 μ m, 250 x 4.6mm
Mobile Phase:	10mmol/L Na ₂ HPO ₄ (pH7.4):ACN=70:30
Flow Rate:	1.0ml/min
Temperature:	Ambient
Detector:	280nm
Injection Volume:	20 μ l

Enalapril Maleate



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

Ordering Information

3µm Minibore Column

	C18	C8	C4	Phenyl-Hexyl	CN	NH ₂	SiO ₂
2.1×30	00101-21009	00102-21009	00107-21009	00104-21009	00105-21009	00103-21009	00100-21009
2.1×50	00101-21010	00102-21010	00107-21010	00104-21010	00105-21010	00103-21010	00100-21010
2.1×100	00101-21012	00102-21012	00107-21012	00104-21012	00105-21012	00103-21012	00100-21012
2.1×150	00101-21041	00102-21041	00107-21041	00104-21041	00105-21041	00103-21041	00100-21041

5µm Minibore Column

	XB-C18	XB-C8	XB-C4	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
2.1×30	00101-31009	00102-31009	00107-31009	00104-31009	00105-31009	00103-31009	00100-31009
2.1×50	00101-31010	00102-31010	00107-31010	00104-31010	00105-31010	00103-31010	00100-31010
2.1×100	00101-31012	00102-31012	00107-31012	00104-31012	00105-31012	00103-31012	00100-31012
2.1×150	00101-31041	00102-31041	00107-31041	00104-31041	00105-31041	00103-31041	00100-31041

3µm Analytical Column

	XB-C18	XB-C8	XB-C4	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
3.0×30	00101-21018	00102-21018	00107-21018	00104-21018	00105-21018	00103-21018	00100-21018
3.0×50	00101-21019	00102-21019	00107-21019	00104-21019	00105-21019	00103-21019	00100-21019
4.6×50	00101-21037	00102-21037	00107-21037	00104-21037	00105-21037	00103-21037	00100-21037
4.6×150	00101-21041	00102-21041	00107-21041	00104-21041	00105-21041	00103-21041	00100-21041

5µm Analytical Column

	XB-C18	XB-C8	XB-C4	XB-Phenyl	XB-CN	XB-NH ₂	SiO ₂
4.6×50	00101-31037	00102-31037	00107-31037	00104-31037	00105-31037	00103-31037	00100-31037
4.6×100	00101-31039	00102-31039	00107-31039	00104-31039	00105-31039	00103-31039	00100-31039
4.6×150	00101-31041	00102-31041	00107-31041	00104-31041	00105-31041	00103-31041	00100-31041
4.6×250	00101-31043	00102-31043	00107-31043	00104-31043	00105-31043	00103-31043	00100-31043

Not find the size you want? Contact Welch or your local distributor for other dimensions.

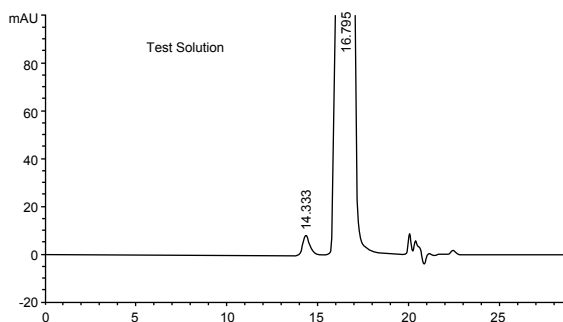
Xtimate[®] SEC

Xtimate[®] SEC (size exclusion chromatography), can also be named "global protein hydrophilic modified silica column", is made from ultra high purity, stable silica bonding hydrophilic polymer and diol functional groups. This double bonding mechanism, made nonspecific adsorption of high polymer, protein, biological enzyme, polypeptide and other biological samples, could be applied in separating water-soluble polymer and biomacromolecule. Ultra high purity, stable silica bonding hydrophilic polymer and diol functional groups.

- 5µm or 3µm silica microsphere, high separation efficiency
- 120Å minibore columns is fit for polar compounds like cephalosporins, 300Å is fit for biomacromolecule like protein and polypeptide
- Four pore sizes: 120 Å, 300 Å, 500 Å and 1000 Å

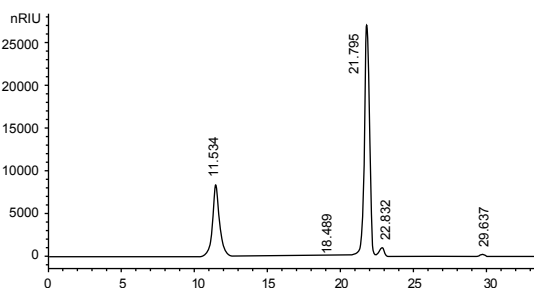
Phase	Xtimate [®] SEC-120	Xtimate [®] SEC-300	Xtimate [®] SEC-700	Xtimate [®] SEC-1000
Materials	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer	Silica particles bonding hydrophilic polymer
Particle Size(µm)	5	5	5	5
Pore Size(Å)	120	300	700	1000
Protein Molecule Range	500-150000	5000-1250000	15000-5000000	50000-7500000
Soluble Polymer Molecule Mass Range	500-25000	1000-100000	2500-500000	5000-1500000
Maximum Pressure	~4500	~3500	~3000	~3000
pH Range	2-7.5, 8.5-9.5 for short time	2-7.5, 8.5-9.5 for short time	2-7.5, 8.5-9.5 for short time	2-7.5, 8.5-9.5 for short time
Range of Salt Concentration	20mM~2.0M	20mM~2.0M	20mM~2.0M	20mM~2.0M
Highest Temperature(°C)	~80°C	~80°C	~80°C	~80°C
Mobile Phase	Aqueous or organic phase	Aqueous or organic phase	Aqueous or organic phase	Aqueous or organic phase

Sex Hormone in Cosmetics



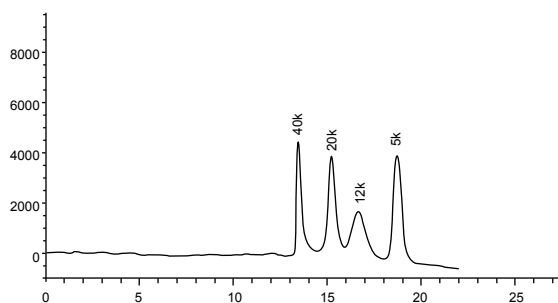
Column:	Xtimate [®] SEC-120, 3µm, 300 x 7.8mm
Mobile Phase:	HAC:ACN:0.1%Arginine=15:20:65
Flow Rate:	0.5ml/min
Temperature:	35°C
Detector:	276nm
Injection Volume:	100µl

Iron Dextran



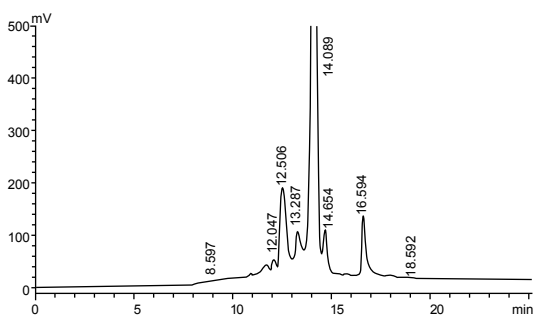
Column:	Xtimate [®] SEC-300, 5µm, 300 x 7.8mm
Mobile Phase:	Dissolve 7.1g Na ₂ SO ₄ to 1000mL water, filter
Flow Rate:	0.5ml/min
Temperature:	Ambient
Detector:	RID
Injection Volume:	20µl

Analysis of Molecular Weight of Polyethylene Glycol



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

Cefoxitin Sodium



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

Ordering Information

Dimension	SEC-120	SEC-300	SEC-700	SEC-1000
4.6×250	00237-31043	00237-33043	00237-34043	00237-35043
7.8×300	00237-31052	00237-33052	00237-34052	00237-35052

Xtimate® Polymer Based Column

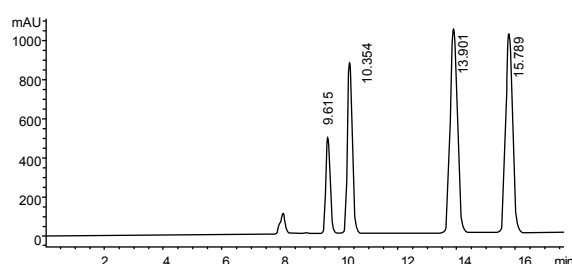
Xtimate® Sugar-H is a special column design for Ribavirin. This column is packed with H⁺ modified low-linking polystyrene-divinylbenzene spheres (PS-DVB), can be applied for the analysis of organic acids and mixed alcohols.

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-divinylbenzene. This kind of column can used in extreme condition(pH 1-14).

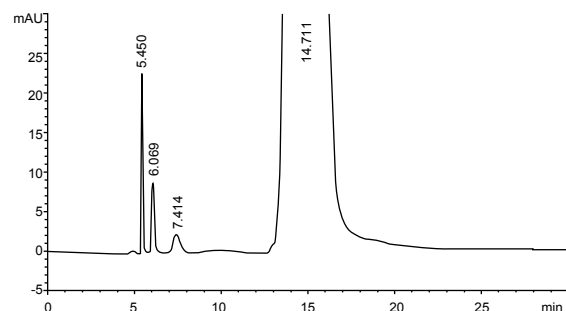
Xtimate® G-10 glucan gel chromatographic column which is applied with GE Healthcare Sephadex G-10 glucan gel , is a special column developed for analysis of ceftazidime, ceftriaxone sodium, cefoperazone sodium, cefotaxime sodium and any other cephalosporins polymers.

Separation of Organic Acids



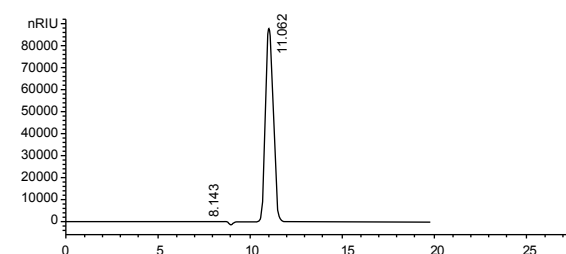
Column:	Xtimate® Sugar-H, 5µm, 300 x 7.8mm
Mobile Phase:	H ₂ SO ₄ water solution (pH 2.0)
Flow Rate:	0.5ml/min
Temperature:	60°C,
Detector:	RID
Injection Volume:	20µl
Organic Acids:	Maleic acid, L-malic acid, fumaric acid, sodium acetate trihydrate

Ketophenylalanine Calcium



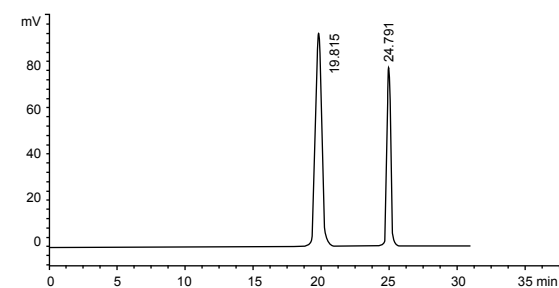
Column:	Xtimate® Sugar-H, 8µm, 300 x 7.8mm
Mobile Phase:	0.025mol/L H ₂ SO ₄ water solution
Flow Rate:	0.8ml/min
Temperature:	20°C,
Detector:	205nm
Injection Volume:	20µl

Xylose



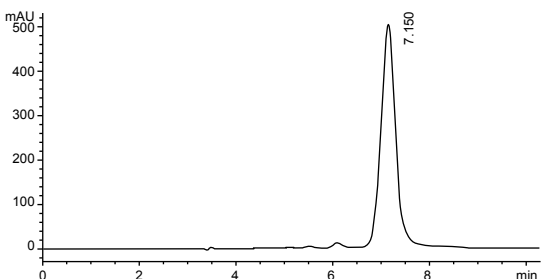
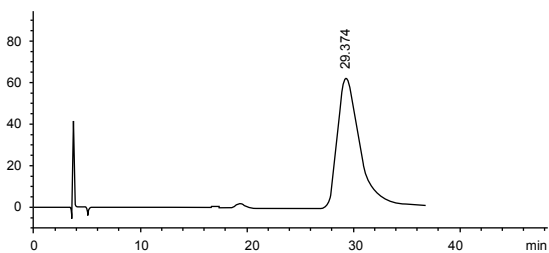
Column:	Xtimate® Sugar-Ca, 5µm, 300 x 7.8mm
Mobile Phase:	Ultra-pure water
Flow Rate:	0.6ml/min
Temperature:	85°C
Detector:	RID 55°C
Injection Volume:	20µl

Mannitol



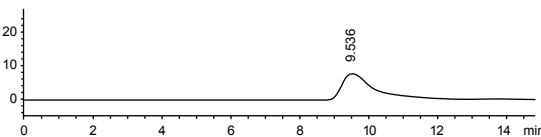
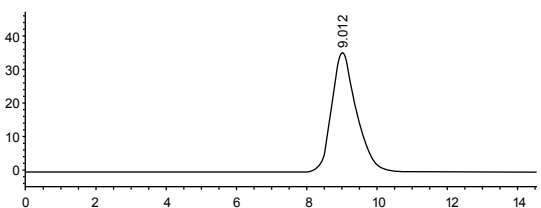
Column:	Xtimate® Sugar-Ca, 8µm, 300 x 7.8mm
Mobile Phase:	Ultra-pure water
Flow Rate:	0.5ml/min
Temperature:	80°C
Detector:	RID 55°C
Injection Volume:	20µl
System suitability test:	R of mannitol and Sorbitol >2

Doxycycline HCl



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

Cefradine Polymer



Column:	Xtimate® G-10, 300x15.0mm
Mobile Phase:	A: 0.2M Na ₂ HPO ₄ :0.2MNaH ₂ PO ₄ =95:5 B: water
Flow Rate:	1.5ml/min
Temperature:	30°C
Detector:	254nm
Injection Volume:	50µl

Ordering Information:

	Sugar-H	Sugar-Ca
8µm, 7.8x50mm	00109-43048	00108-43048
8µm, 7.8x100mm	00109-43049	00108-43049
8µm, 7.8x150mm	00109-43050	00108-43050
8µm, 7.8x250mm	00109-43051	00108-43051
8µm, 7.8x300mm	00109-43052	00108-43052
8µm, 4.6x250mm	00109-43053	00108-43053
5µm, 4.6x250mm	00109-41043	00108-41043
5µm, 4.6x300mm	00109-41044	00108-41044
5µm, 7.8x150mm	00109-41050	00108-41050
5µm, 7.8x250mm	00109-41051	00108-41051
5µm, 7.8x300mm	00109-41052	00108-41052

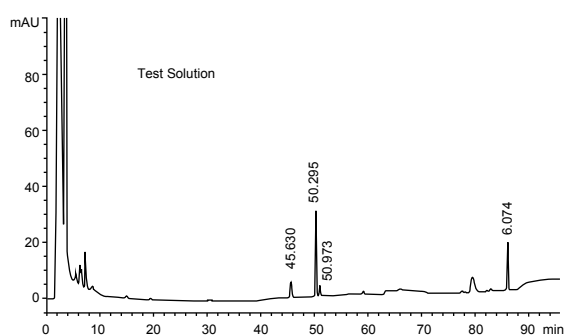
Topsil[®] Series HPLC Column

Topsil[®] series HPLC column is the next generation column of Welch, beside Ultisil[™], Xtimate[®] and Welchrom[®]. This series applied different silica which performs different selectivity.

Features:

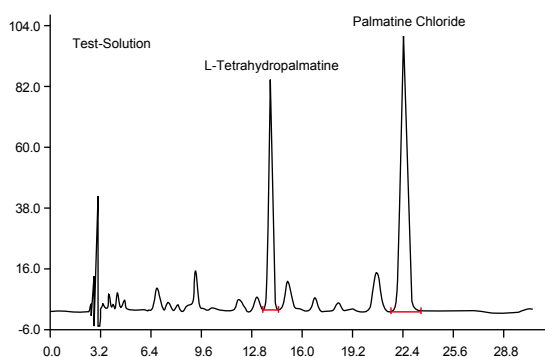
- High purity silica (99.99%) with 150 Å pore size and 250 m²/g surface area
- 12% carbon loading for C18 phase
- Because of large pore and moderate carbon loading, Topsil[®] C18 phase can also be used as AQ-C18 without phase collapse
- Endcapped for excellent peak shape and lifetime
- Lower back pressure than Ultisil[™], almost the same column efficiency with Ultisil[™]
- Good for small molecules and peptides
- Topsil phases including C18, C8, Phenyl-Hexyl, Silica, NH₂ and CN

Compound Salvia Tablets



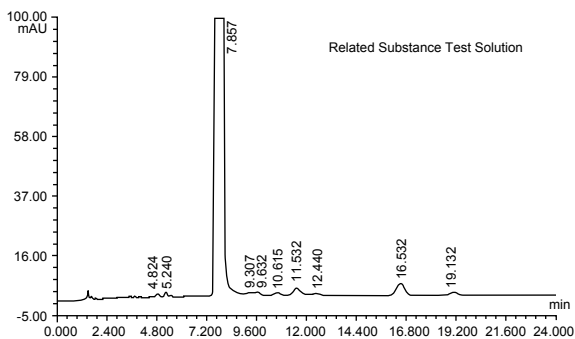
Column:	Topsil [®] C18, 250x4.6mm, 5µm		
Mobile Phase:	A: ACN B: Water		
Gradient Program:	Time(min)	A(%)	B(%)
	0	19	81
	35	19	81
	55	71	29
	70	71	29
	100	40	60
Flow Rate:	1.0ml/min		
Temperature:	30°C		
Detector:	203nm		
Injection Volume:	20µl		

Epigeal Srephaia Root



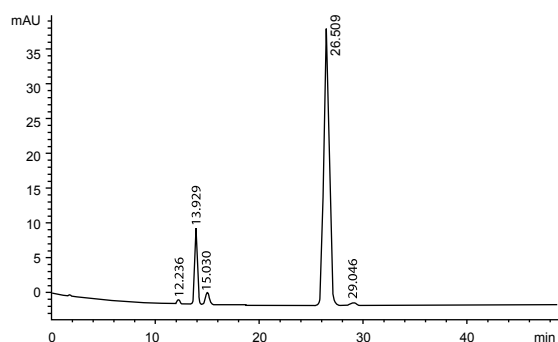
Column:	Topsil [®] C18, 250x4.6mm, 5µm		
Mobile Phase:	25mM NaAC buffer(2% trimethylamine, adjust pH to 3.50 with HAC)		
Flow Rate:	1.5ml/min		
Temperature:	40°C		
Detector:	280nm		
Injection Volume:	20µl		

Ketoprofen



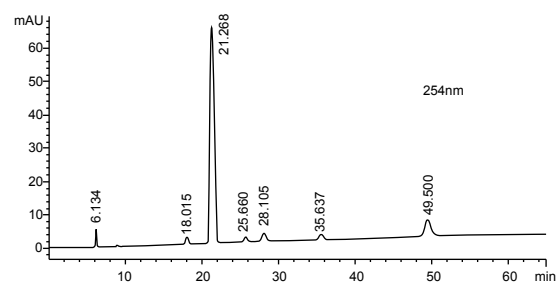
Column:	Topsil® C18, 150x4.6mm, 5µm
Mobile Phase:	Phosphate buffer (68g KH ₂ PO ₄ dissolve in 1000mL water, adjust pH to 3.5 with H ₃ PO ₄)
Flow Rate:	1.0ml/min
Temperature:	30°C
Detector:	233nm
Injection Volume:	20µl

Vitamin D3

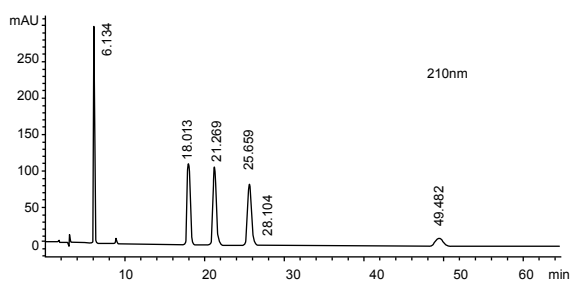


Column:	Topsil® Silica, 250x4.6mm, 5µm
Mobile Phase:	N-hexane:n-amyl alcohol=99.7:0.3
Flow Rate:	2.0ml/min
Temperature:	30°C
Detector:	254nm
Injection Volume:	20µl

Sex Hormone in Cosmetics



Column:	Topsil® Phenyl-Hexyl, 250x4.6mm, 5µm
Mobile Phase:	MeOH:H ₂ O=60:40
Flow Rate:	1.0ml/min
Temperature:	30°C
Detector:	210nm, 254nm
Injection Volume:	20µl



Mixed Standards:	Estrogen: estradiol, oestrone, estrostillben, estriol Androgen: testosterone, methyltestosterone Progestational hormone: progesterone
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Ordering Information

Dimension	Particle Size	C18	C8	NH ₂	CN	Silica	Phenyl-Hexyl
2.1×30mm	5μm	00410-01009	00420-01009	00430-01009	00440-01009	00450-01009	00460-01009
2.1×50mm	5μm	00410-01010	00420-01010	00430-01010	00440-01010	00450-01010	00460-01010
2.1×100mm	5μm	00410-01012	00420-01012	00430-01012	00440-01012	00450-01012	00460-01012
2.1×150mm	5μm	00410-01014	00420-01014	00430-01014	00440-01014	00450-01014	00460-01014
2.1×200mm	5μm	00410-01015	00420-01015	00430-01015	00440-01015	00450-01015	00460-01015
2.1×250mm	5μm	00410-01016	00420-01016	00430-01016	00440-01016	00450-01016	00460-01016
3.0×30mm	5μm	00410-01018	00420-01018	00430-01018	00440-01018	00450-01018	00460-01018
3.0×50mm	5μm	00410-01019	00420-01019	00430-01019	00440-01019	00450-01019	00460-01019
3.0×100mm	5μm	00410-01021	00420-01021	00430-01021	00440-01021	00450-01021	00460-01021
3.0×150mm	5μm	00410-01023	00420-01023	00430-01023	00440-01023	00450-01023	00460-01023
3.0×200mm	5μm	00410-01024	00420-01024	00430-01024	00440-01024	00450-01024	00460-01024
3.0×250mm	5μm	00410-01025	00420-01025	00430-01025	00440-01025	00450-01025	00460-01025
3.0×300mm	5μm	00410-01026	00420-01026	00430-01026	00440-01026	00450-01026	00460-01026
4.0×30mm	5μm	00410-01027	00420-01027	00430-01027	00440-01027	00450-01027	00460-01027
4.0×50mm	5μm	00410-01028	00420-01028	00430-01028	00440-01028	00450-01028	00460-01028
4.0×100mm	5μm	00410-01030	00420-01030	00430-01030	00440-01030	00450-01030	00460-01030
4.0×150mm	5μm	00410-01032	00420-01032	00430-01032	00440-01032	00450-01032	00460-01032
4.0×200mm	5μm	00410-01033	00420-01033	00430-01033	00440-01033	00450-01033	00460-01033
4.0×250mm	5μm	00410-01034	00420-01034	00430-01034	00440-01034	00450-01034	00460-01034
4.0×300mm	5μm	00410-01035	00420-01035	00430-01035	00440-01035	00450-01035	00460-01035
4.6×30mm	5μm	00410-01036	00420-01036	00430-01036	00440-01036	00450-01036	00460-01036
4.6×50mm	5μm	00410-01037	00420-01037	00430-01037	00440-01037	00450-01037	00460-01037
4.6×100mm	5μm	00410-01039	00420-01039	00430-01039	00440-01039	00450-01039	00460-01039
4.6×150mm	5μm	00410-01041	00420-01041	00430-01041	00440-01041	00450-01041	00460-01041
4.6×200mm	5μm	00410-01042	00420-01042	00430-01042	00440-01042	00450-01042	00460-01042
4.6×250mm	5μm	00410-01043	00420-01043	00430-01043	00440-01043	00450-01043	00460-01043
4.6×300mm	5μm	00410-01044	00420-01044	00430-01044	00440-01044	00450-01044	00460-01044

Welchrom[®] Seires HPLC Column

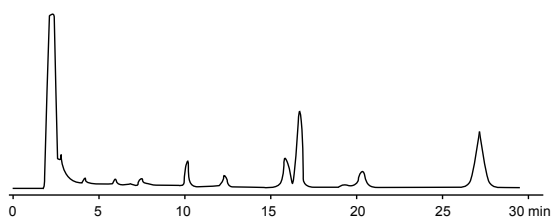
--- Combination of perfect peak shape and lowest back pressure

- Perfect peak shape and low back pressure
- Ultra high purity(>99.999%) Type B silica particals
- New bonding and endcapping technique
- Very economical price

Comparison with other brands

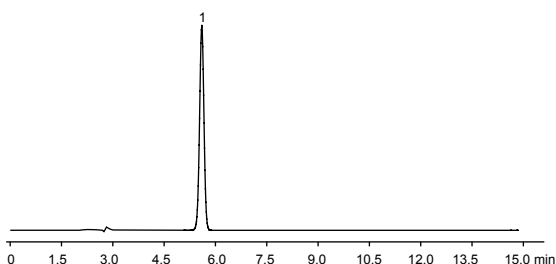
Brands	Tailing factor(amitriptyline)	Back pressure(Methanol/H ₂ O)=75/25
Welchrom [®] C18	1.29	77bar
Chrom C18	1.52	108bar
Sino Chrom C18	1.71	106bar
BinChrom C18	1.67	102bar

Tanshinone IIA in *Salvia Miltiorrhiza*



Column:	Welchrom [®] C18, 250x4.6mm, 5µm
Mobile Phase:	MeOH:H ₂ O=75:25
Flow Rate:	1.0ml/min
Temperature:	22°C
Detector:	270nm

Imidacloprid



Column:	Welchrom [®] C18, 250x4.6mm, 5µm
Mobile Phase:	MeOH:H ₂ O=45:55
Flow Rate:	1.0ml/min
Temperature:	25°C
Detector:	260nm

Ordering Information

Dimension	Welchrom [®] C18	Welchrom [®] C8
4.6x150mm, 5µm	00310-02041	00320-02041
4.6x200mm, 5µm	00310-02042	00320-02042
4.6x250mm, 5µm	00310-02043	00320-02043

Preparative HPLC Column

How to Choose a Preparative Column?

Step1: select the column packing

Welch provides all kinds of packing materials, the detail of the packing materials is showed in packing materials part

According to molecular weight to choose pore size						
Molecular Weight	< 800	< 2000	< 10,000	< 50,000	< 250,000	≥ 300,000
Pore Size	60Å	120Å	200Å	300Å	1000Å	≥ 1000Å

According to stress tolerance to choose proper particle size						
Pressure	90bar	40bar	20bar	6bar	4bar	1bar
Particle Size	5μm	10μm	15μm	20-40μm	40-70μm	≥ 200μm

Step2: select particle size, pore size to achieve good recovery depend on the sample properties

C18, C8, C4 are the most universal bonding phase to separate protein, peptides.

Bonding Phase		Pore Size		C18		C8		C4		Molecular Weight
				Slow ←	Retention time	→ Fast	High ←	Plate number	→ Low	
High	High	120 Å	◆	→	◇	→	◇	≤ 5000		
Plate Number	Column Pressure	200 Å	◇	←	◆	→	◇	5000-20,000		
Low	Low	300 Å	◇	←	◇	←	◆	20,000-100,000		

◆ Most appropriate ◇ Appropriate.

Step 3: choosing preparative columns—based on mass loading and sample property

Mass Loading	Particle		5	10	10/20	15/30	50
	Size μm	Diameter mm	N=90000	N=40000	N=20000	N=10000	N=5000
Test	4.6		▲	▲	▲	▲	▲
10-50mg	10		★	◆	▲	▲	▲
	20		★	★	▲	▲	▲
50-100mg	30		◆	★	◆	▲	▲
0.1-1g	50		▲	★	★	▲	▲
1-10g	100			▲	★	◆	▲
	150			▲	★	◆	▲
10-100g	200					◆	★
≥ 100g	≥ 300					▲	★

Changes of column efficiency, column pressure and cost	Column Efficiency		
	High	← Cost →	Low
	Column pressure		

★: Most appropriate ◆: Appropriate ▲: According to the purpose

Step 4: determine flow rate, mass loading, start experiment

$$\text{Scale-up factor} = \frac{(\text{Diameter prep})^2}{(\text{Diameter anal})^2} \times \frac{\text{Length prep}}{\text{Length analytical}}$$

Consider scaling up from a 4.6×250mm column to a 10×250mm column:

$$\text{Scale-up factor} = \frac{(10)^2}{(4.6)^2} \times \frac{250}{250} = 4.73$$

$$\text{Flow rate:} \\ \text{Flow rate[Prep]} = \text{Flow rate[anal]} \times \frac{(\text{Diameter prep})^2}{(\text{Diameter anal})^2}$$

Consider 4.6mm analytical column, flow rate 1ml/min to 10 mm prep column, the flow rate = $1 \times \frac{(10)^2}{(4.6)^2} \approx 4.7 \text{ ml/min}$

The calculated flow rate may be used for the larger column to ensure the same linear velocity of mobile phases as used in the analytical run. However, reasonable flow rates are based on column diameters. Systems will be limited by increasing backpressure with increasing column length and decreasing particle size.

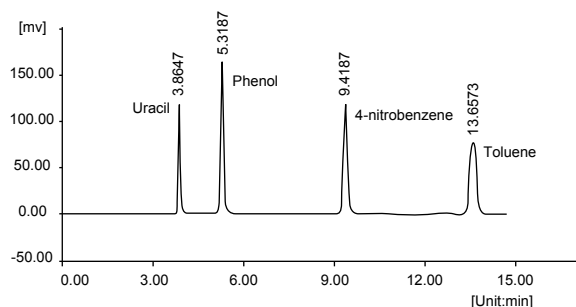
Mass loading Approximate Mass Loading Capacity

Items	Diameter				
	4.6×250mm	10×250mm	21.2×250mm	30×250mm	50×250mm
Packing Amount(g)	3	13	60	110	350
Scale-up Factor	1	4.73	21.2	42.5	118
Mass Loading(mg)	0.03-3	0.15-13	0.6-60	1.1-110	3-350
Flow Rate Range(ml/min)	0.5-2	3-9	14-40	28-85	80-250

Preparative Column

Preparative Column applied the same packing materials with analytical column, to make sure the best reproducibility of analysis and preparative scale. Special packing technique and stainless modular column tube make sure the stability of column bed. The Theoretical plate number of 10µm column is greater than 35000/m, for 5µm column, Theoretical plate number is greater than 75000/m, peak symmetry is around 0.95-1.20.

Better Column Efficiency and Tailing

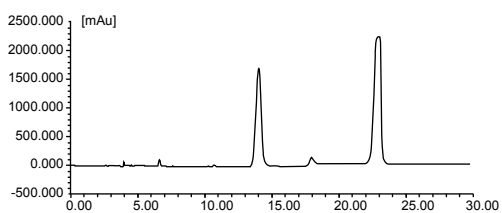


Column	Ultisil™ XB-C18, 250x10mm, 5µm
Mobile Phase	75% MeOH
Flow Rate	3.0ml/min
Detector	254nm

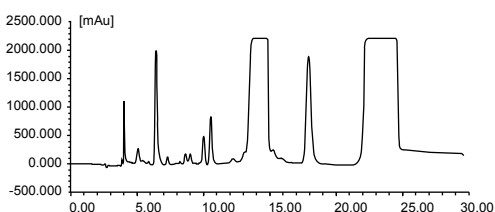
Samples	Retention time(min)	Half Peak Width(min)	Theoretical Plate Number	R	Tailing Factor
Uracil	3.8647	0.0713	16261	0.00	1.18
Phenol	5.3187	0.0933	17990	10.40	1.19
4-nitrobenzene chloride	9.4197	0.1537	20817	19.55	1.11
Methylbenzene	13.6573	0.2210	21157	13.32	1.07

Use the prep packing materials with analytical column to simulate linear amplification.

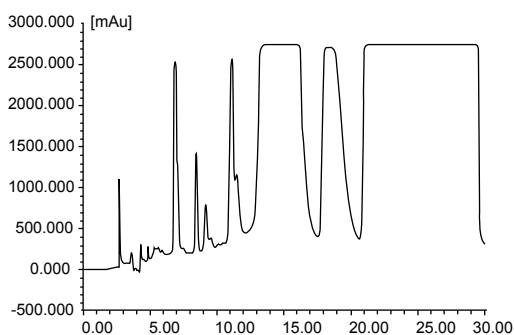
Perfect separation with different dimensions



Column	Ultisil™ XB-C18, 250x10mm, 5μm
Flow Rate	1.0ml/min
Injection Volume	0.5mg



Column	Ultisil™ XB-C18, 250x20mm, 5μm
Flow Rate	20ml/min
Injection Volume	100mg



Column	Ultisil™ XB-C18, 250x50mm, 5μm
Flow Rate	118ml/min
Injection Volume	2000mg

Ultisil™ 5μm Preparative Column Ordering Information

Ultisil™ series also provides 10μm packing materials.

Phases	XB-C18	XB-C8	XB-C30	AQ-C18	XB-Phenyl	Polar RP	LP-C18
10x100mm	02610-21100	02620-21100	02628-21100	02612-21100	02640-21100	02621-21100	02613-21100
10x150mm	02610-21101	02620-21101	02628-21101	02612-21101	02640-21101	02621-21101	02613-21101
10x250mm	02610-21102	02620-21102	02628-21102	02612-21102	02640-21102	02621-21102	02613-21102
20x50mm	02610-21130	02620-21130	02628-21130	02612-21130	02640-21130	02621-21130	02613-21130
20x150mm	02610-21132	02620-21132	02628-21132	02612-21132	02640-21132	02621-21132	02613-21132
20x250mm	02610-21134	02620-21134	02628-21134	02612-21134	02640-21134	02621-21134	02613-21134
30x150mm	02610-21107	02620-21107	02628-21107	02612-21107	02640-21107	02621-21107	02613-21107
30x250mm	02610-21108	02620-21108	02628-21108	02612-21108	02640-21108	02621-21108	02613-21108
50x150mm	02610-21209	02620-21209	02628-21209	02612-21209	02640-21209	02621-21209	02613-21209
50x250mm	02610-21210	02620-21210	02628-21210	02612-21210	02640-21210	02621-21210	02613-21210

Phases	SiO ₂	XB-Diol	XB-SAX	XB-SCX	LP-C8	XB-NH ₂	XB-CN
10x100mm	02600-21100	02611-21100	02690-21100	02614-21100	02625-21100	02630-21100	02650-21100
10x150mm	02600-21101	02611-21101	02690-21101	02614-21101	02625-21101	02630-21101	02650-21101
10x250mm	02600-21102	02611-21102	02690-21102	02614-21102	02625-21102	02630-21102	02650-21102
20x50mm	02600-21130	02611-21130	02690-21130	02614-21130	02625-21130	02630-21130	02650-21130
20x150mm	02600-21132	02611-21132	02690-21132	02614-21132	02625-21132	02630-21132	02650-21132
20x250mm	02600-21134	02611-21134	02690-21134	02614-21134	02625-21134	02630-21134	02650-21134
30x150mm	02600-21107	02611-21107	02690-21107	02614-21107	02625-21107	02630-21107	02650-21107
30x250mm	02600-21108	02611-21108	02690-21108	02614-21108	02625-21108	02630-21108	02650-21108
50x150mm	02600-21209	02611-21209	02690-21209	02614-21209	02625-21209	02630-21209	02650-21209
50x250mm	02600-21210	02611-21210	02690-21210	02614-21210	02625-21210	02630-21210	02650-21210

Xtimate® Preparative Column Ordering Information

Dimension	Particle Size	C18	C8	SiO ₂	NH ₂	Phenyl-Hexyl	CN	Polar RP	SEC-120
10x250mm	5µm	01610-21102	01620-21102	01600-21102	01630-21102	01670-21102	01650-21102	01621-21102	01631-21102
20x150mm	5µm	01610-21132	01620-21132	01600-21132	01630-21132	01670-21132	01650-21132	01621-21132	01631-21132
20x250mm	5µm	01610-21134	01620-21134	01600-21134	01630-21134	01670-21134	01650-21134	01621-21134	01631-21134
30x150mm	5µm	01610-21107	01620-21107	01600-21107	01630-21107	01670-21107	01650-21107	01621-21107	01631-21107
30x250mm	5µm	01610-21108	01620-21108	01600-21108	01630-21108	01670-21108	01650-21108	01621-21108	01631-21108
50x150mm	5µm	01610-21109	01620-21109	01600-21109	01630-21109	01670-21109	01650-21109	01621-21109	01631-21109
50x250mm	5µm	01610-21110	01620-21110	01600-21110	01630-21110	01670-21110	01650-21110	01621-21110	01631-21110
10x250mm	10µm	01610-31102	01620-31102	01600-31102	01630-31102	01670-31102	01650-31102	01621-31102	01631-31102
20x150mm	10µm	01610-31132	01620-31132	01600-31132	01630-31132	01670-31132	01650-31132	01621-31132	01631-31132
20x250mm	10µm	01610-31134	01620-31134	01600-31134	01630-31134	01670-31134	01650-31134	01621-31134	01631-31134
30x150mm	10µm	01610-31107	01620-31107	01600-31107	01630-31107	01670-31107	01650-31107	01621-31107	01631-31107
30x250mm	10µm	01610-31108	01620-31108	01600-31108	01630-31108	01670-31108	01650-31108	01621-31108	01631-31108
50x150mm	10µm	01610-31209	01620-31209	01600-31209	01630-31209	01670-31209	01650-31209	01621-31209	01631-31209

Flash Column—Low Pressure Preparative Column

Flash column chromatography is a quick and (usually) easy way to separate complex mixtures of compounds. It is applied in separation of organic compounds natural products, biomacromolecule and any other active substance.

Features of WelFlash

- Homogeneous particle and pore size, special bonding technique from welch
- Perfect result reproducibility, best performance
- All kinds of packing materials and specification
- Polypropylene tube and joint to tolerate the column pressure of fast chromatography
- Provide abundant applications
- Easy operation, low cost, fast separation and low back pressure

Packing materials of WelFlash

	Parti	Pore Size(Å)	Surface Area (m ² /g)	Description	
Amorphous spherical silica based packing material	WelFlash™ SiO ₂ -2	-	60	-	Normal phase, could separate weak polar compound and use more weak polar mobile phase at the same time.
	WelFlash™ C18-2	-	60	-	Reversed phase, the most universal packing material.
Spherical silica based packing material	WelFlash™ SiO ₂	20-40 40-70	120	480	Considered the most polar normal-phase sorbent available, Highly polar sorbent to retain polar compounds from nonpolar matrices.
	WelFlash™ C18	20-40 40-70	120	480	The most popular C18 sorbent.
	WelFlash™ Phenyl	20-40 40-70	120	480	Similar polarity to C8, Additional polar secondary π - π interactions enhanced retention of aromatic compounds.
	WelFlash™ CN	20-40 40-70	120	480	Separate polar or non-polar compounds.
	WelFlash™ NH ₂	20-40 40-70	120	480	Can be used for compounds containing -OH, -NH or -SH group by hydrogen bonding.
	WelFlash™ Hilic	20-40 40-70	120	480	Polar/Hydrophilic compounds have sufficient retention in HILIC Can be an interesting alternative to RPLC for some types of compounds.
	WelFlash™ SAX	20-40 40-70	120	480	Retains negatively charged compounds.
	WelFlash™ SCX	20-40 40-70	120	480	Useful for compounds with cationic and basic characteristics.
Inorganic absorption packing material (aluminium oxide)	WelFlash™ Alumina-N	-	-	-	Neutral polar aluminaorbent (pH6.5) widely used in the sample separation of aldehyde, ketone, quinone, some glycosides.
	WelFlash™ Alumina-B	-	-	-	Basic alumina sorbent (pH 8.5). Ideal for separation of hydrocarbon, remove oxy-compound from hydrocarbon.
	WelFlash™ Alumina-A	-	-	-	Slightly acidic alumina sorbent (pH 4.5). ideal for separation of natural and synthesis acidic pigment and other acid, and aldehyde.

Excellent Packing Technique

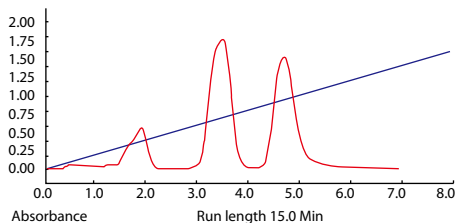


Fig.A: WelFlash Column(12g)

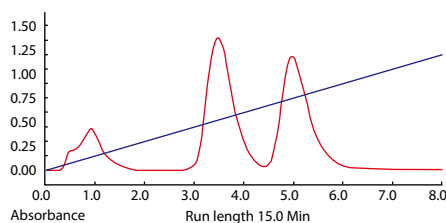
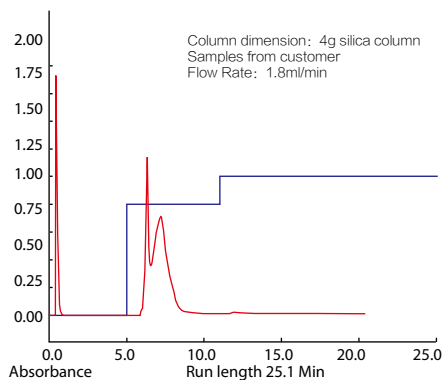


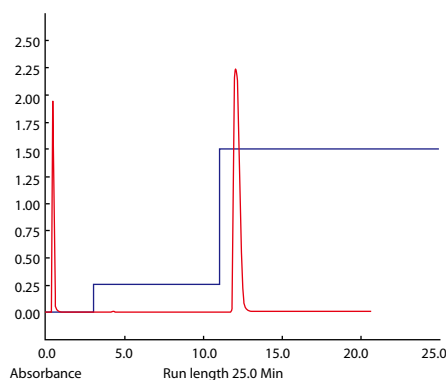
Fig.B: Flash Column(12g) of company S

Compared WelFlash™ Column with S company's flash column at the same chromatographic condition, we can find WelFlash can achieve baseline separation at shorter time.

Optimize method to achieve faster separation



Before Method Optimization



After Method Optimization

After method optimization, we can find adsorb and elution capacity increased, and peak shape became better, half width of main peak became smaller, so the time is saved when collecting samples.

WelFlash Dimensions

The easiest way to shorten separation time is using short column and high flow rate. But short column length will lead to column efficiency decrease, so we applied 10-75mm column length, which is the best proportion after optimization to ensure largest sample loading and best separation efficiency.

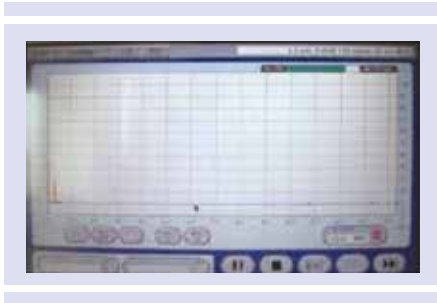
WelFlash dimension: 4g, 12g, 20g, 40g, 80g, 120g, 220g and 330g.

WelFlash Column Compatibility

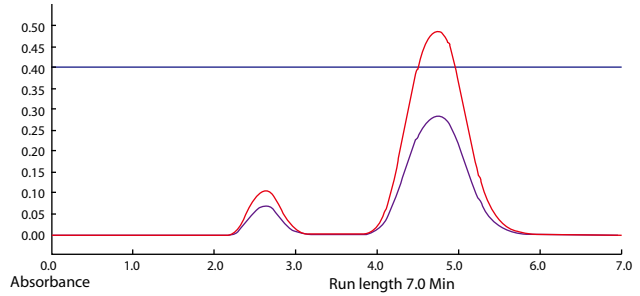
- 1) Luer-lok™ import and Lucr™ export, good compatibility with almost system, such as Isco®, Biotage®, Armen® and so on.
- 2) PP column tube and adapter, can tolerate the pressure of regular system.

Strict Products Quality Testing Process

1) Pressure Tolerance



2) Performance Test (good peak shape and separation performance)



Applications

Comparison of Spherical Silica and Amorphous Spherical Silica

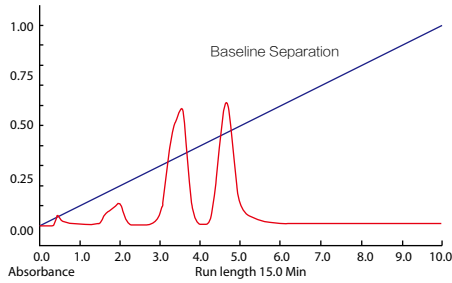
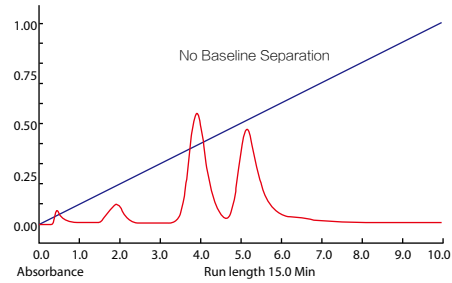


Fig. 1 WelFlash Column: 4g Spherical Silica (20-40µm)



WelFlash Column: 4g Amorphous Silica (40-63µm)

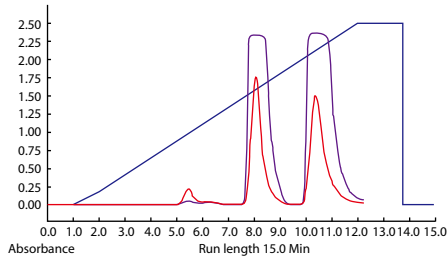
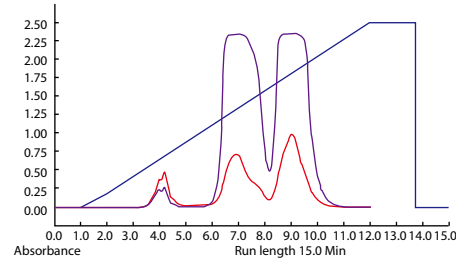
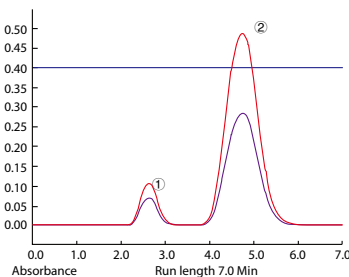


Fig. 2 WelFlash Column: 40g Spherical Silica (20-40µm)

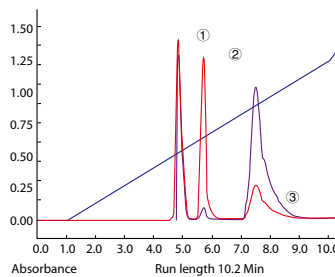


WelFlash Column: 40g Amorphous Silica (40-63µm)

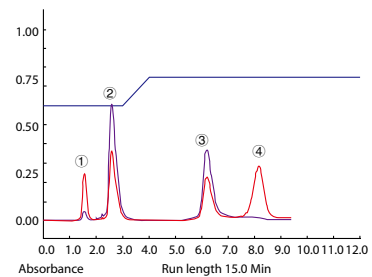
At the same condition, 4g Spherical WelFlash column can get baseline separation in a short time, but amorphous WelFlash can't. When compared to 40g amorphous silica column, 40g spherical WelFlash column shows better performance.



1. Acetophenone 2. Methoxyacetophenone



1. Acetophenone 2. Methyparaben
3. 4-aminobenzoic acid



1. Acetophenone 2. Methyparaben
3. 4-aminobenzoic acid

Ordering Information

Amorphous spherical silica based packing material

WelFlash™	4 g, 20 pk	12 g, 18 pk	25 g, 12 pk	40 g, 10 pk	80 g, 10 pk	120 g, 10pk	220g, 6pk	330 g, 4 pk
SiO ₂ -2	00001-05011	00001-05021	00001-05031	00001-05042	00001-05053	00001-05063	00001-05075	00001-05084
C18-2	00002-05011	00002-05021	00002-05031	00002-05042	00002-05053	00002-05063	00002-05075	00002-05084

Spherical silica based packing material

20-40 μm								
WelFlash™	4 g, 20 pk	12 g, 18 pk	25 g, 12 pk	40 g, 10 pk	80 g, 10 pk	120 g, 10pk	220g, 6pk	330 g, 4 pk
SiO ₂	00001-03011	00001-03021	00001-03031	00001-03042	00001-03053	00001-03063	00001-03075	00001-03084
C18	00002-03011	00002-03021	00002-03031	00002-03042	00002-03053	00002-03063	00002-03075	00002-03084
Phenyl	00003-03011	00003-03021	00003-03031	00003-03042	00003-03053	00003-030633	00003-03075	00003-03084
CN	00004-03011	00004-03021	00004-03031	00004-03042	00004-03053	00004-03063	00004-03075	00004-03084
Diol	00014-03011	00014-03021	00014-03031	00014-03042	00014-03053	00014-03063	00014-03075	00014-03084
40-70 μm								
WelFlash™	4 g, 20 pk	12 g, 18 pk	25 g, 12 pk	40 g, 10 pk	80 g, 10 pk	120 g, 10pk	220g, 6pk	330 g, 4 pk
SiO ₂	00001-04011	00001-04021	00001-04031	00001-04042	00001-04053	00001-04063	00001-04075	00001-04084
C18	00002-04011	00002-04021	00002-04031	00002-04042	00002-04053	00002-04063	00002-04075	00002-04084

Inorganic absorption packing material(aluminium oxide)

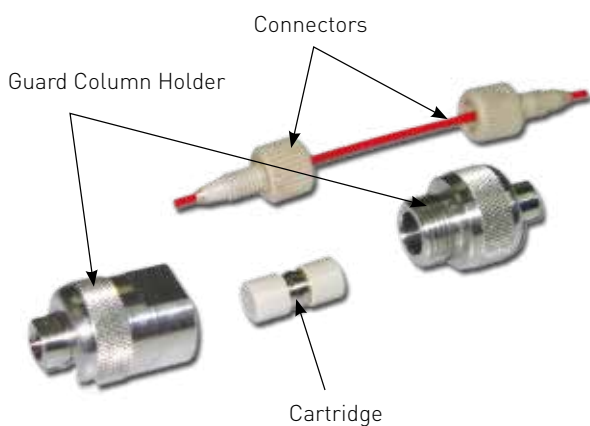
WelFlash™	8g, 20 pk	24 g, 18 pk	50 g, 12 pk	80 g, 10 pk	160 g, 10 pk	240 g, 10pk	440g, 6pk	660 g, 4 pk
Alumina-N	00011-00011	00011-00021	00011-00031	00011-00042	00011-00053	00011-00063	00011-00075	00011-00084
Alumina-B	00010-00011	00010-00021	00010-00031	00010-00042	00010-00053	00010-00063	00010-00075	00010-00084
Alumina-A	00009-00011	00009-00021	00009-00031	00009-00042	00009-00053	00009-00063	00009-00075	00009-00084

Guard Column and Pre-Column

Column Protection

- Guard and filters to protect your analytical column
- Economical extension of column life time

Guard column	Pre-column
	<ul style="list-style-type: none"> • Between the injector and analytical column • All have column holders • All have first to avoid solide particles
Guard column cartridge with packing materials inside.	Filter inside.
Remove strongly adsorbed sample compents	Trap particulate matter from the fluid path, do not remove sample interference or contaminants.
The internal diameters should match as closely as possible and the packing material should be the same particle size and chemistry as the analytical column	i) Could be used with other brands of columns ii) Be designed to be wholly disposable or have replaceable filters in a re-useable holder



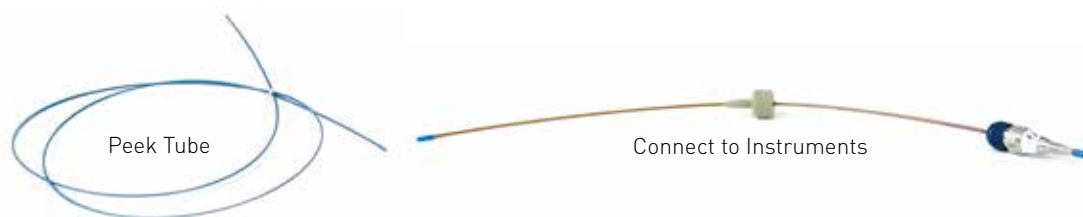
Pre-column holder and filter for preparative column (ID 21.1mm)



Sime-Preparative Guard Column (ID 10mm, holder and cartridge)



Preparative Guard Column (ID 21.2mm, holder and cartridge)



Ordering Information

Ultisil™ Guard Cartridges

Phases	5 µm particle			10 µm particle		
	4.6×10 mm	10×10 mm	21.2×10 mm	4.6×10 mm	10×10 mm	21.2×10 mm
XB-C18	00808-04001	00808-04401	00808-04801	00808-05001	00808-05401	00808-05801
AQ-C18	00808-04003	00808-04403	00808-04803	00808-05003	00808-05403	00808-05803
XB-C8	00808-04002	00808-04402	00808-04802	00808-05002	00808-05402	00808-05802
XB-NH ₂	00808-04004	00808-04404	00808-04804	00808-05004	00808-05404	00808-05804
XB-CN	00808-04005	00808-04405	00808-04805	00808-05005	00808-05405	00808-05805
XB-Phenyl	00808-04006	00808-04406	00808-04806	00808-05006	00808-05406	00808-05806

Xtimate™ Guard Cartridges

Phases	5 µm particle			10 µm particle		
	4.6×10 mm	10×10 mm	21.2×10 mm	4.6×10 mm	10×10 mm	21.2×10 mm
C18	00808-04101	00808-04501	00808-04901	00808-05101	00808-05501	00808-05901
C8	00808-04102	00808-04502	00808-04902	00808-05102	00808-05502	00808-05902
C4	00808-04103	00808-04503	00808-04903	00808-05103	00808-05503	00808-05903
NH ₂	00808-04104	00808-04504	00808-04904	00808-05104	00808-05504	00808-05904
CN	00808-04105	00808-04505	00808-04905	00808-05105	00808-05505	00808-05905
Phenyl	00808-04106	00808-04506	00808-04906	00808-05106	00808-05506	00808-05906

Guard Column Holder

4.6 mm ID (Analytical Column)	00808-01101
10 mm ID (Semi Prep Column)	00808-01103
21.2 mm ID (Prep Column)	00808-01105

Pre-column Holder

4.6 mm ID (Analytical Columns)	00808-01201
21.2 mm ID (Prep Column)	00808-01204
Connection Parts for Guard Column(Peek Tube)	00808-01301
Connection Parts for pre-column	00808-01302

Pre-column Frit

0.2 µm frit (Analytical Column)	00808-01202
2 µm frit (Analytical Column)	00808-01203
2 µm frit (Prep Column)	00808-01205

GC Column

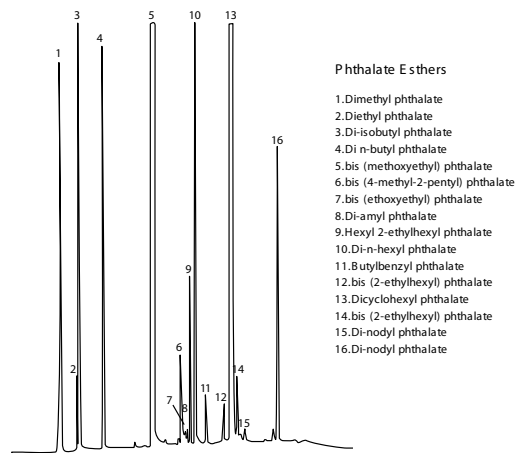
WM Series High Performance GC Column WEL Series Economical GC Column (Contact Welch for this serie)

WM high-performance	Composition of Stationary Phase	Polarity	Temperature Limit	Characteristics and Applications
WM-1, WM-1 MS	100% Dimethyl Polysiloxane	Nonpolarity	-60 to 325/350	Hydrocarbon, Aromatic Compound, Pesticide, Phenols, Herbicide, Amine, Fatty Acid Methyl Ester etc
WM-5, WM-5MS	5% Phenyl, 95% Dimethyl Polysiloxane	Weak polarity	-60 to 325/350	Hydrocarbon, Aromatic Compound, Pesticide, Herbicide, Drugs etc.
WM-1301	6% Cyanopropyl-phenyl 94% Dimethyl Polysiloxane	Moderate polarity	-20 to 280/300	Alcohols, Pesticides, VOC's, Iodine, Pesticide Residue etc.
WM-624	6% Cyanopropyl 94% Dimethyl Polysiloxane	Moderate polarity	-20 to 280/300	VOC, Solvent Impurities etc.
WM-35, WM-35MS	35% phenyl, 65% Dimethyl Polysiloxane	Moderate polarity	40 to 320/340	Alcohols, Pesticides, Drugs
WM-1701	14% Cyanopropyl-phenyl 86% Dimethyl Polysiloxane	Moderate polarity	-20 to 280/300	Pesticide, Herbicide, Drugs, Environmental Sample etc.
WM-17	50% Phenyl 50% Dimethyl Polysiloxane	Moderate polarity	0 to 300/320	Pesticide, Herbicide, Drugs, Environmental Sample etc.
WM-InoWax	PEG-20M	Strong polarity	40 to 260/280	Alcohol, Free Acid, Fatty Acid Methyl Ester, Polynuclear, Aromatic Compound, Solvent, Essential Oil etc.
WM-FFAP	Reaction products of PEG-20M and TPA	Strong polarity	40 to 260	Alcohols, Free Acid, Fatty Acid Methyl Ester, Aldehyde, Acrylic Ester, Ketone etc.

Welch GC Columns by USP listing

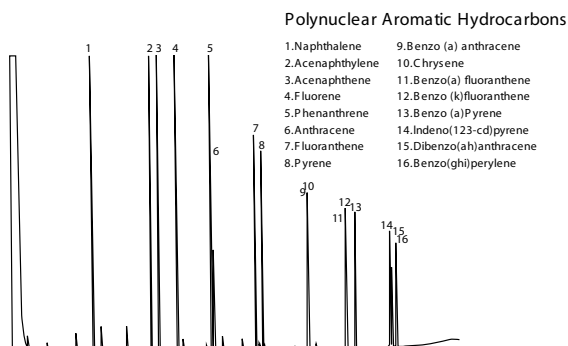
WEL	USP	Similar stationary phase
WM-1	G2	DB-1, HP-1, OV-1, Rtx-1, SBP-1, CP-Sil 5CB
WM-1 MS	G2	DB-1 MS, HP-1 MS, ZB-1 MS, OV-1 MS
WM-5	G27	BP-5, ZB-5, CP-Sil 8CB, DB-5, HP-5, SPB-5, Rtx-5, OV-5
WM-5MS	G27	ZB-5MS, DB-5MS, HP-5MS, OV-5 MS
WM-20	-	Rtx-20, SPB-20, VOCOL
WM-1301	G43	DB-1301, HP-1301, PE-1301, Rtx-1301
WM-624	G46	007-624, AT-624, CP-624, DB-624, HP-624, Rtx-502.2, VOCOL
WM-225	G7	007-225, DB-225, BP-225, HP-225, CP-Sil 43CB, Rtx-Wax
WM-35	G42	DB-35, HP-35, SPB-35, Rtx-35, PE-35, AT-35
WM-1701	G46	BP-10, CB-1701, CP-Sil 19CB, DB-1701, Rtx-1701
WM-17	G3	DB-17, HP-17, HP-50, Rtx-50, AT-50, ZB-50, SPB-50, CP-Sil 24, SP-2250
WM-InoWax	G16	CP-Wax, DB-Wax, HP-Innowax, PE-Wax, Rtx-Wax
WM-FFAP	G35	BP-21, HP-FFAP, PE-FFAP, CP-FFAP, DB-FFAP, Nukol

Phthalate Esters



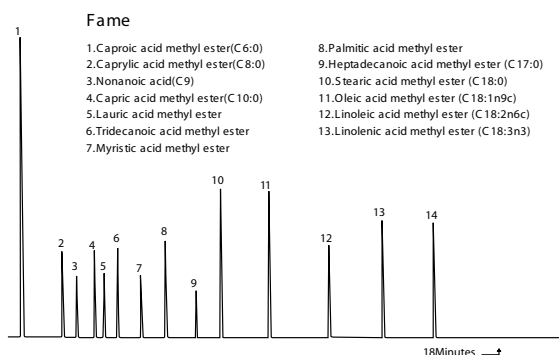
Column	
WM-5, 30×0.25 mm, 0.5 μm; P/N: 03902-22002	
Temperature	
100°C $\xrightarrow{10^\circ\text{C}/\text{min}}$ 250°C (maintain 10min)	
Injection port temperature	250°C
Detector temperature	300°C
Detector	F.I.D.

Polynuclear Aromatic Hydrocarbons



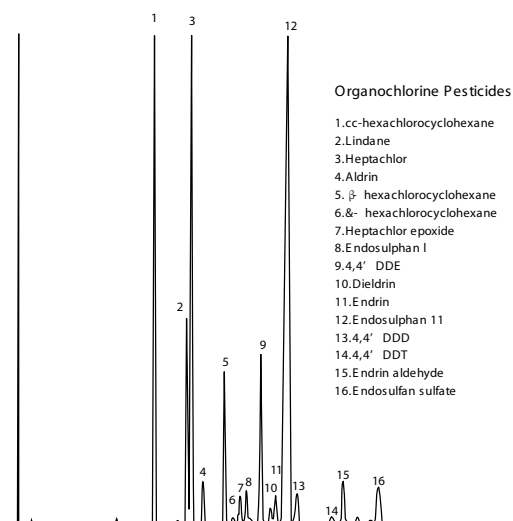
Column	
WM-5, 30×0.32 mm, 0.25 μm; P/N: 03902-32001	
Temperature	
70°C(maintain 4min) $\xrightarrow{10^\circ\text{C}/\text{min}}$ 250°C(maintain 10min)	
Injection port temperature	250°C
Detector temperature	300 °C
Detector	F.I.D.

Fame



Column	
WM-INOWAX, 30×0.32 mm, 0.25 μm; P/N: 03909-32001	
Temperature	
80°C(maintain 4min) $\xrightarrow{10^\circ\text{C}/\text{min}}$ 200°C(maintain 10min)	
Injection port temperature	200°C
Detector temperature	250 °C
Detector	F.I.D.

Organicchloride Pesticides



Column

WM-INOWAX, 30x0.32 mm, 0.25 μm; P/N: 03907-32001

Temperature

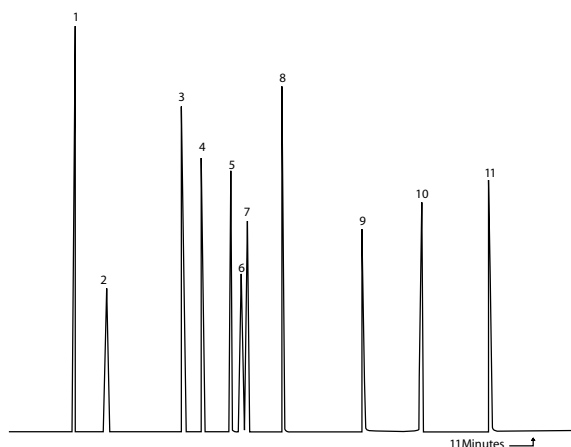
80°C(maintain 1min) $\xrightarrow{10^\circ\text{C}/\text{min}}$ 200°C(maintain 1min)
 $\xrightarrow{5^\circ\text{C}/\text{min}}$ 275°C(maintain 3min)

Injection port temperature 200°C

Detector temperature 310 °C

Detector F.I.D.

Volatile Organic Compounds (VOC)



Volatile Organic Compounds (VOC)

- | | | | |
|----------------------|----------------------|------------------------|----------------------|
| 1.1,1-Dichloroethene | 4.Chloroform | 7.Carbon Tetrachloride | 10.Tetrachloroethene |
| 2.Methylene Chloride | 5.1,2-Dichloroethane | 8.Trichloroethene | 11.Chlorobenzene |
| 3.2-Butanone(MEK) | 6.Benzene | 9.Pyricline | |

Column

WM-624, 30x0.32 mm, 1.8 μm; P/N: 03908-32004

Temperature

40°C(maintain 1min) $\xrightarrow{10^\circ\text{C}/\text{min}}$ 140°C

Injection port temperature 200°C

Detector temperature 250 °C

Ordering Information

Length*ID*Thick Film m*mm*um	WM-1	WM-1MS	WM-5	WM-5MS	WM-1301	WM-1701
30*0.25*0.25	03901-22001	03903-22001	03902-22001	03904-22001	03905-22001	03907-22001
30*0.25*0.5	03901-22002	03903-22002	03902-22002	03904-22002	03905-22002	03907-22002
30*0.25*1.0	03901-22003	03903-22003	03902-22003	03904-22003	03905-22003	03907-22003
30*0.32*0.25	03901-32001	03903-32001	03902-32001	03904-32001	03905-32001	03907-32001
30*0.32*0.5	03901-32002	03903-32002	03902-32002	03904-32002	03905-32002	03907-32002
30*0.32*1.0	03901-32003	03903-32003	03902-32003	03904-32003	03905-32003	03907-32003
30*0.53*0.5	03901-52002	03903-52002	03902-52002	03904-52002	03905-52002	03907-52002
30*0.53*1.0	03901-52003	03903-52003	03902-52003	03904-52003	03905-52003	03907-52003
30*0.53*2.0	03901-52005	03903-52005	03902-52005	03904-52005	03905-52005	03907-52005

30*0.53*3.0	03901-52006	03903-52006	03902-52006	03904-52006	03905-52006	03907-52006
30*0.53*5.0	03901-52010	03903-52010	03902-52010	03904-52010	03905-52010	03907-52010
60*0.25*0.25	03901-24001	03903-24001	03902-24001	03904-24001	03905-24001	03907-24001
60*0.25*0.5	03901-24002	03903-24002	03902-24002	03904-24002	03905-24002	03907-24002
60*0.25*1.0	03901-24003	03903-24003	03902-24003	03904-24003	03905-24003	03907-24003
60*0.32*0.25	03901-34001	03903-34001	03902-34001	03904-34001	03905-34001	03907-34001
60*0.32*0.5	03901-34002	03903-34002	03902-34002	03904-34002	03905-34002	03907-34002
60*0.32*1.0	03901-34002	03903-34002	03902-34002	03904-34002	03905-34002	03907-34002

Length*ID*Thick Film m*mm*um	WM-624	WM-225	WM-17	WM-35	INOWAX	WM-FFAP
30*0.25*0.25	03908-22001	03919-22001	03916-22001	03921-22001	03909-22001	03911-22001
30*0.25*0.5	03908-22002	03919-22002	03916-22002	03921-22002	03909-22002	03911-22002
30*0.25*1.0	03908-22003	03919-22003	03916-22003	03921-22003	03909-22003	03911-22003
30*0.32*0.25	03908-32001	03919-32001	03916-32001	03921-32001	03909-32001	03911-32001
30*0.32*0.5	03908-32002	03919-32002	03916-32002	03921-32002	03909-32002	03911-32002
30*0.32*1.0	03908-32003	03919-32003	03916-32003	03921-32003	03909-32003	03911-32003
30*0.53*0.5	03908-52002	03919-52002	03916-52002	03921-52002	03909-52002	03911-52002
30*0.53*1.0	03908-52003	03919-52003	03916-52003	03921-52003	03909-52003	03911-52003
30*0.53*2.0	03908-52005	03919-52005	03916-52005	03921-52005	03909-52005	03911-52005
30*0.53*3.0	03908-52006	03919-52006	03916-52006	03921-52006	03909-52006	03911-52006
30*0.53*5.0	03908-52010	03919-52010	03916-52010	03921-52010	03909-52010	03911-52010
60*0.25*0.25	03908-24001	03919-24001	03916-24001	03921-24001	03909-24001	03911-24001
60*0.25*0.5	03908-24002	03919-24002	03916-24002	03921-24002	03909-24002	03911-24002
60*0.25*1.0	03908-24003	03919-24003	03916-24003	03921-24003	03909-24003	03911-24003
60*0.32*0.25	03908-34001	03919-34001	03916-34001	03921-34001	03909-34001	03911-34001
60*0.32*0.5	03908-34002	03919-34002	03916-34002	03921-34002	03909-34002	03911-34002
60*0.32*1.0	03908-34002	03919-34002	03916-34002	03921-34002	03909-34002	03911-34002

Not find the size you want? Contact Welch or your local distributor for other dimensions.

Welchrom[®] series GC packed column

Stationary phase:

OV-1, OV-17, OV-101, OV-225, SE-30, SE-52, SE-54, PRG-400, PEG-600, PEG-1500, PEG-4000, PEG-6000, PEG-20M, DEGS, EGA, EGS, QF-1, FFAP, DNP, β, β- Diethoxyacetonitrile, silicone oil, apiezon, squalane, DC series and etc.

Supporter:

diatomite(Chrosorb series and etc.), organic supporter

Adsorbent and polymer microsphere:

Porapak series, Proasil series, GDx series, HDG series, SD series, molecular sieve, carbon molecular sieve, graphitized carbon black, silica gel, aluminium oxide and etc.

Specification:

Inner diameter 2-4 mm, length: 0.5-9 m.

Welch also offer GC packed column custom-made. Please provide GC model number; column tube type, stationary phase composition; supporter type and its particle size; inner diameter and length and what kind of samples to analysis.

GC Packed Column Ordering Information

1.Packed Column Specification

Materials	3mm(OD), 2mm(ID)	4mm(OD), 3mm(ID)	1/8(OD), 2.0mm(ID)	1/16(OD), 1.0mm(ID)
Stainless Steel				
Passivated stainless steel				
Glass				
PP				

2.Materials

Supporter: (such as Chromosorb WAW DMCS)	Mesh Number:
Stationary Phase A: Coated Amount: %	Stationary Phase B: Coated Amount: %

3.Instrument Model

(Such as HP 5890/6890)

4.Dimension

Length:	OD:	ID:	For glass column, ID is required
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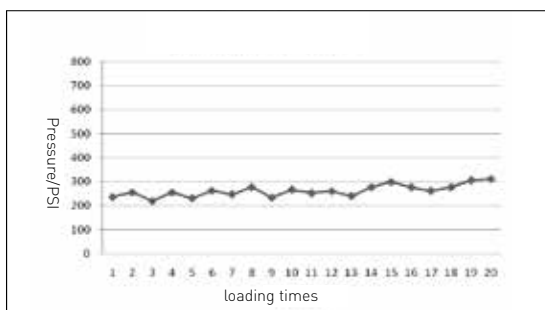
Note: for glass column, ID and the center distance between injector and detector are required.

Packing materials

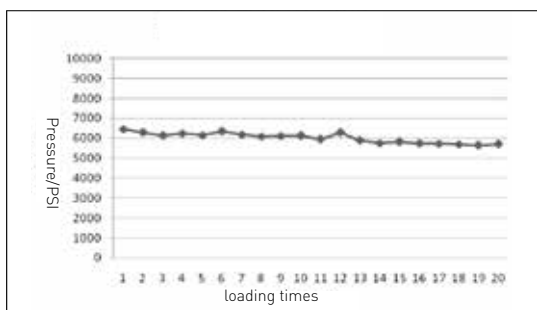
— Best material, special patent technique, high quality packing materials

- Higher mechanical strength than analysis column packing materials
- Ultra pure (purity > 99.999% SiO₂) spherical, and totally porous silica
- Proper particle size and narrow size distribution, bigger mass loading

Loading times and pressure



Loading times and column efficiency



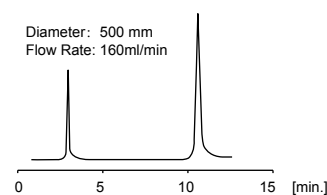
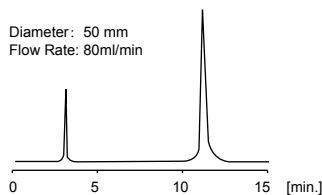
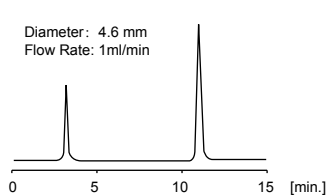
Ultra low metal content

Method: ICP-MS

Items	Result(mg/kg)	LOD(mg/kg)
Na	Not detected	1.0
Mg	Not detected	1.0
Cd	Not detected	1.0
Cr	Not detected	1.0
Hg	Not detected	1.0
Cu	Not detected	1.0
Fe	Not detected	1.0
CA	Not detected	1.0



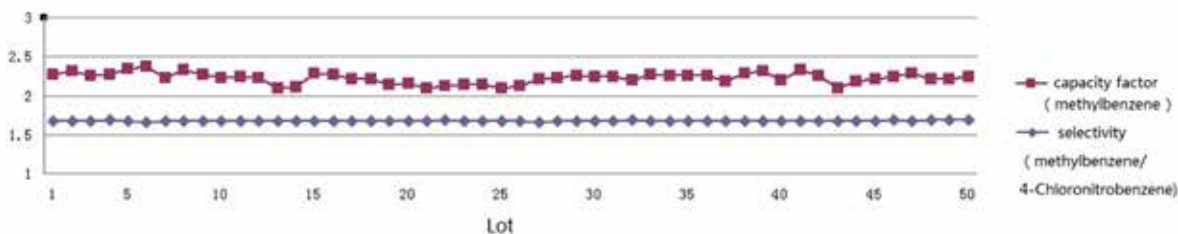
Easier to enlarge: higher separation and lower cost



Stationary phase: Ultisil 120Å C18, 10µm
 Column length: 250mm Samples: uracil and methylbenzene

Mobile phase: methanol/water(75/25)
 Detector: UV 254nm

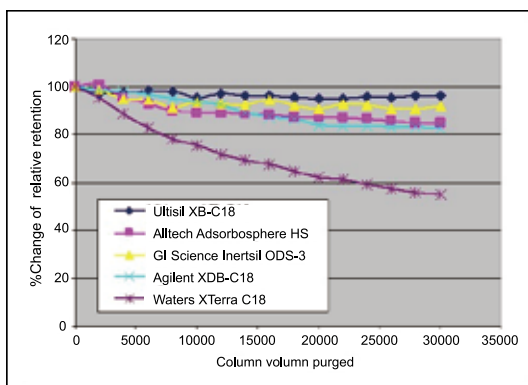
Good lot-to-lot reproducibility between 50 lots Ultisil C18 10µm 120 Å



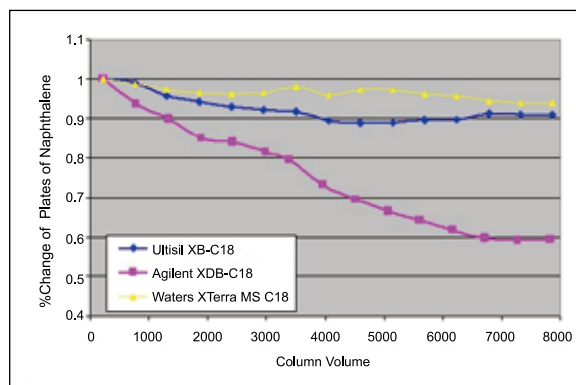
Stationary phase: Ultisil 120Å C18, 10µm Mobile phase: methanol/water(75/25) Flow rate: 1.0 ml/min
 Column length: 250mm Samples: methylbenzene, 4-chloronitrobenzene Detector: UV 254nm

pH Stability

pH 1.3



pH 10



Ultisil™ Packing Material

Packing Material	Partical Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load (%)	End Capping	pH Stability
XB-C18	5, 10 µm	120	320 m ² /g	17	Yes	1.5-10.0
XB-C8	5, 10 µm	120	320 m ² /g	12	Yes	1.5-10.0
LP-C18	5, 10 µm	120	320 m ² /g	15	No	1.5-10.0
AQ-C8	5, 10 µm	120	320 m ² /g	12	Yes	1.5-10.0
XB-Phenyl	5, 10 µm	120	320 m ² /g	12	Yes	1.5-10.0
XB-CN	5, 10 µm	120	320 m ² /g	7	Yes	1.5-9.0
XB-NH ₂	5, 10 µm	120	320 m ² /g	4	No	/
XB-SiO ₂	5, 10 µm	120	320 m ² /g	0	No	/
XB-Diol	5, 10 µm	120	320 m ² /g	2.5	No	/

Welch also provides 300Å packing materials.

pH Stability

– Wide pH range, perfect peak shape!

Packing Material	Partical Size (µm)	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load (%)	End Capping	pH Stability
Xtimate® C18	5, 10 µm	120	320 m ² /g	14	Yes	1.0-12.5
Xtimate® C8	5, 10 µm	120	320 m ² /g	10	Yes	1.0-12.5
Xtimate® Phenyl-Hexyl	5, 10 µm	120	320 m ² /g	12	No	1.0-12.5

Amorphous silica based packing material

– Welch also provide amorphous silica based packing materials

- Ultra pure (purity > 99.999% SiO₂), low mental content
- Narrow particle size distribution
- High BET, higher loading sampling amount
- 40-63 µm, 35-70 µm and other proper specifications, can be used for flash and SPE columns

Ultisil™ Packing Material

Phases	5µm	7µm	10µm	15µm	20µm	20-40µm	40-70µm
XB-C18	02710-02100	02710-04100	02710-03100	02710-05100	02710-06100	02710-07100	02710-08100
AQ-C18	02712-02100	02712-04100	02712-03100	02712-05100	02712-06100	02712-07100	02712-08100
XB-C8	02720-02100	02720-04100	02720-03100	02720-05100	02720-06100	02720-07100	02720-08100
XB-C4	02760-02100	02760-04100	02760-03100	02760-05100	02760-06100	02760-07100	02760-08100
XB-C1	02722-02100	02722-04100	02722-03100	02722-05100	02722-06100	02722-07100	02722-08100
XB-Phenyl	02740-02100	02740-04100	02740-03100	02740-05100	02740-06100	02740-07100	02740-08100
XB-Diol	02711-02100	02711-04100	02711-03100	02711-05100	02711-06100	02711-07100	02711-08100
XB-CN	02750-02100	02750-04100	02750-03100	02750-05100	02750-06100	02750-07100	02750-08100
XB-NH ₂	02730-02100	02730-04100	02730-03100	02730-05100	02730-06100	02730-07100	02730-08100
XB-SiO ₂	02700-02100	02700-04100	02700-03100	02700-05100	02700-06100	02700-07100	02700-08100
Polar-RP	02718-02100	02718-04100	02718-03100	02718-05100	02718-06100	02718-07100	02718-08100
XB-C30	02724-02100	02724-04100	02724-03100	02724-05100	02724-06100	02724-07100	02724-08100
Hilic Amide	02743-02100	02743-04100	02743-03100	02743-05100	02743-06100	02743-07100	02743-08100
XB-SAX	02790-02100	02790-04100	02790-03100	02790-05100	02790-06100	02790-07100	02790-08100
XB-SCX	02714-02100	02714-04100	02714-03100	02714-05100	02714-06100	02714-07100	02714-08100

Xtimate® Packing Material

Particle size	C18	C8	SiO ₂	NH ₂	Phenyl-Hexyl	CN	Polar-RP	SEC-120
5µm	01710-02100	01720-02100	01760-02100	01730-02100	01770-02100	01750-02100	01718-02100	01745-02100
10µm	01710-03100	01720-03100	01760-03100	01730-03100	01770-03100	01750-03100	01718-03100	01745-03100

Amorphous Silica Based Packing Material

Particle size	C18	C8	SiO ₂
40-63µm	00559-11053	00505-11053	00500-11053

