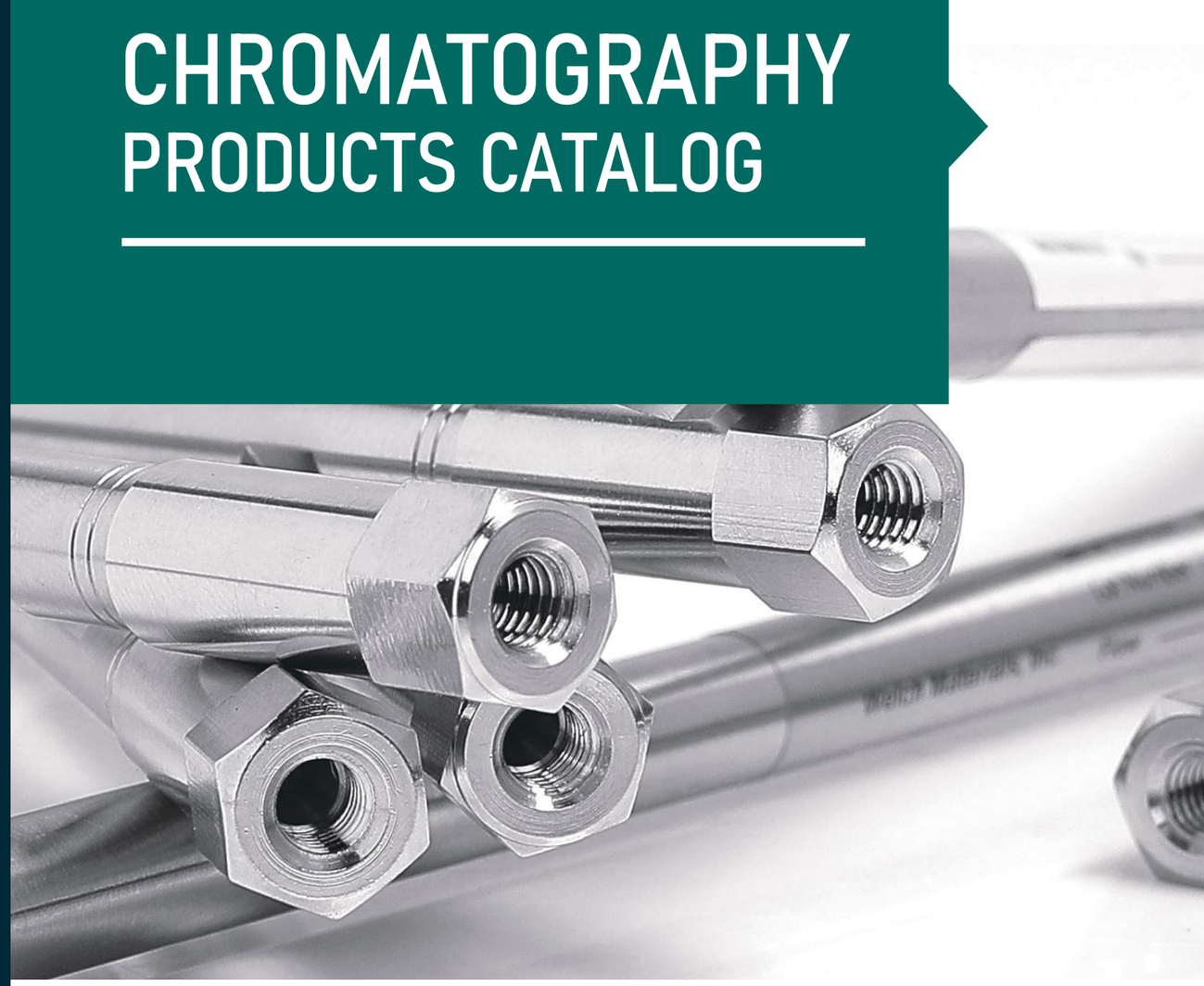
INNOVATIVE | REPRODUCIBLE | RUGGED

WELCH MATERIALS, INC.

WEB: WWW.WELCH-US.COM
EMAIL: INFO@WELCHMAT.COM

Welch Materials

CHROMATOGRAPHY PRODUCTS CATALOG



COMPANY PROFILE

Welch Materials, Inc., founded in 2003, is an integrated chromatography and separation technology enterprise providing R&D, manufacturing, sales, and service for critical industries including biopharmaceuticals, food safety, fine chemicals and environmental monitoring.

Welch develops in-house columns and packing materials under brands such as Ultisil, Xtimate, Boltimate and Welchrom. The company holds 58 patents, with 19 column models listed in USP-PQRI database and 96 bonded phases in USP-ChromColumns; Its columns are recommended in 13 test items in the 2025 Chinese Pharmacopoeia.

With R&D and production sites in eastern China and marketing centers in Shanghai, the U.S. and India, Welch delivers global technical support, logistics and customer service to accelerate method development and chromatography solutions.

Welch Materials is positioned to strengthen its competitiveness in the global chromatography industry and to enter a new phase of performance growth.

Our Mission: "Innovating Chromatography Technology" — Precise separation · Empowering the future

Our Vision: Committed to becoming an internationally leading and domestically first-class solution provider of chromatographic separation and purification.

Our Core Values: Customer first; Quality as the Foundation; Technological Innovation; Win-win Collaboration.


Certificate CN24/00003771

SGS

The management system of

Welch Materials (Zhejiang), Inc.

Business Registration Address: No. 168, Shuangfe South Street, Qibin Community, Wucheng District, Jinhua City, Zhejiang Province, P.R. China

Business Operation Address: No. 168, Shuangfe South Street, Qibin Community, Wucheng District, Jinhua City, Zhejiang Province, P.R. China

has been assessed and certified as meeting the requirements of

ISO 9001:2015

For the following activities

Design and manufacture of liquid chromatographs and liquid chromatographic separation products (fillers) Manufacture of chromatographic separation products (chromatographic columns and solid phase extraction products)

This certificate is valid from 02 September 2024 until 01 September 2027 and remains valid subject to satisfactory surveillance audits.

Issue 2. Certified since 02 September 2021

Authorised by

Jonathan Hall

Global Head - Certification Services

SGS United Kingdom Ltd

Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, UK

t +44 (0)151 350 6666 - www.sgs.com

The certification information can be verified on the web site of Certification and Accreditation Administration of the People's Republic of China www.cnca.gov.cn

SGS UKAS IAF

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CHROMATOGRAPHY
PRODUCTS CATALOG

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01.

ADVANCHROM SERIES HPLC COLUMN

ADVANCHROM SERIES HPLC COLUMN

Advanchrom® C18

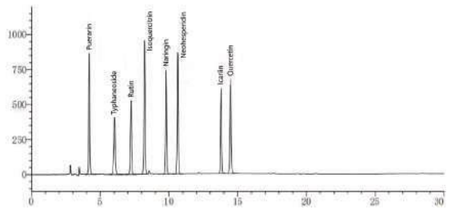
Features

- Wide pH Tolerance: Capable of withstanding mobile phases across pH 1–12.5, making it particularly well-suited for the separation of basic compounds in complex matrices.
- Enhanced Anti-Fouling Properties: Significantly reduces the adsorption of non-polar compounds, minimizing impurity retention and column contamination. Ideal for food safety analysis (e.g., preservatives and additives), Traditional Chinese medicine (e.g., crude herbs and decoction pieces), and pharmaceutical QC (e.g., reaction monitoring and impurity profiling).
- Exceptional Batch-to-Batch Reproducibility: Thanks to a fully standardized manufacturing process and rigorous quality control, Advanchrom C18 ensures consistency in key performance metrics—retention time, resolution, and plate number—across production batches.

Specifications

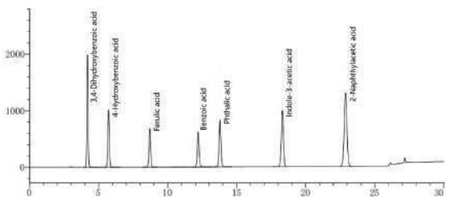
Bonded Phase	C18
pH Range	1.0-12.5
Pore Size	180 Å
Surface Area	220 m^2/g
Carbon Loading	14 %
USP List	L1
Endcapped	Yes

Flavonoids and Related Compounds



Column:	Advanchrom C18 4.6×250 mm, 5 μm
Mobile Phase:	A: 0.1% phosphoric acid; B: acetonitrile
Wavelength:	210 nm
Column Temperature:	/
Flow Rate:	1 mL/min
Volume:	10 μL

Acidic Compounds



Column:	Advanchrom C18 4.6×250 mm, 5 μm
Mobile Phase:	A: 0.1% phosphoric acid; B: acetonitrile
Wavelength:	210 nm
Column Temperature:	/
Flow Rate:	1 mL/min
Volume:	10 μL

Advanchrom HIC-Butyl

Advanchrom HIC-Butyl is an ideal choice for low hydrophobicity antibodies, proteins, and ADCs.

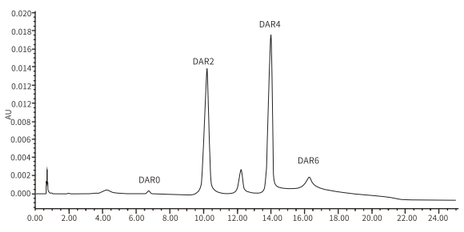
Features

- Achieves good retention and separation of protein samples with low ammonium sulfate concentration in the mobile phase system.
- Compatible with MS-compatible mobile phase systems (ammonium acetate, acetonitrile, etc.), correlating LC-UV separation results with LC-MS characterization more accurately and more rapidly.

Specifications

Bonded Phase	Butyl
pH Range	2.0-8.0
Particle Size	3 μm
Pore Size	1000 Å
Max. Pressure	6000 psi
Max. Temperature	60 ℃
Column Material	Stainless Steel
Mobile Phase System	Ammonium sulfate or ammonium acetate
Applications	Separation of proteins of low hydrophobicity

DAR Analysis of an ADC Sample



Column:	Advanchrom HIC-Butyl
Specification:	4.6×50 mm, 3 μm
Mobile Phases:	A: 1.0 M ammonium acetate, pH=7.0 B: 25 mM ammonium acetate : ACN = 50:50
Flow Rate:	1.0 mL/min
Wavelength:	280 nm
Temperature:	30 °C
Injection Volume:	10 μL

Advanchrom Bio HIC-Butyl

Advanchrom Bio HIC-Butyl is a high-performance column designed for protein separation based on hydrophobic interaction chromatography. It is well-suited for the separation of antibodies, antibody-drug conjugates (ADCs), and other protein-based biopharmaceutical products.

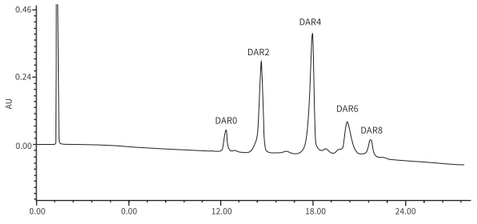
Features

- Unique chemical design offering excellent selectivity for ADC molecules
- Ultra-high purity large-pore silica microsphere matrix for superior column efficiency
- Low non-specific adsorption ensuring high recovery rates
- Excellent pressure tolerance and durability
- Outstanding batch-to-batch reproducibility

Specifications

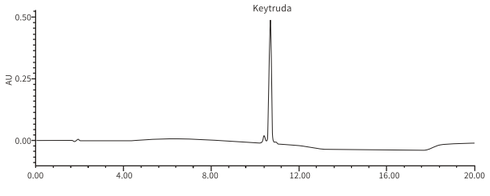
Bonded Phase	Butyl
pH Range	2.0-8.0
Particle Size	5 μm
Pore Size	1000 Å
Max. Pressure	6000 psi
Max. Temperature	60 °C
Column Material	Stainless Steel
Mobile Phase System	Ammonium sulfate
Applications	Primary HIC column choice

DAR Analysis of Disitamab Vedotin



Column:	Advanchrom Bio HIC-Butyl
Specification:	4.6×100 mm, 5 μm
Mobile Phases:	A: 50 mM PB solution + 2.0 M ammonium sulfate, pH=7.0 B: 50 mM PB solution, pH=7.0 : IPA = 75:25
Flow Rate:	1.0 mL/min
Wavelength:	280 nm
Temperature:	30 °C
Injection Volume:	10 μL

Determination of Pembrolizumab



Column:	Advanchrom Bio HIC-Butyl
Specification:	4.6×100 mm, 5 μm
Mobile Phases:	A: 100 mM PB solution + 2.0 M ammonium sulfate, pH=7.0 B: 100 mM PB solution, pH=7.0
Flow Rate:	1.0 mL/min
Wavelength:	280 nm
Temperature:	30 °C
Injection Volume:	10 μL

Advanchrom Amine

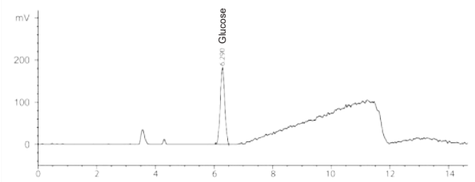
Specially developed for the determination of Poria cocos (China root) content in the 2025 Chinese Pharmacopoeia, the Advanchrom Amine column features ultra-pure silica bonded with secondary/tertiary amine functional groups. It precisely meets the stringent pharmacopoeia requirements for Poria cocos composition analysis, providing a reliable solution for quality control.

Low-bleed performance: Exhibits extremely low background noise on evaporative light scattering detectors (ELSD), improving detection sensitivity, minimizing baseline interference, and ensuring accurate identification and quantification of trace components. This stability and reliability make it ideal for complex sample matrices.

Specifications

Stationary Phase	Secondary / Tertiary Amine
Particle Size	5 µm
Surface Area	300 m²/g
Carbon Loading	6%
End-capped	Yes
pH Range	2.0–8.0
USP Code	/

Applications



Column:	Advanchrom Amine
Mobile Phases:	Acetonitrile : water = 80:20
Detector:	Agilent 1260 ELSD, drifting tube temperature 90°C, carrier gas flow rate 2.0 mL/min
Column Temperature:	30°C
Flow Rate:	1.0 mL/min
Injection Volume:	Reference: 5 µL, 10 µL; Test subject: 5 µL

Ordering Information

Name	Particle Size	P/N	Length	Inner Diameter
Advanchrom C18	5 µm	0002-02038	75 mm	4.6 mm
	5 µm	0002-02041	150 mm	4.6 mm
	5 µm	0002-03043	250 mm	4.6 mm
Advanchrom HIC-Butyl	3 µm	0001-01036	35 mm	4.6 mm
	3 µm	0001-01037	50 mm	4.6 mm
Advanchrom Bio HIC-Butyl	5 µm	0004-05039	100 mm	4.6 mm
Advanchrom Amine	5 µm	0003-03043	250 mm	4.6 mm

02.

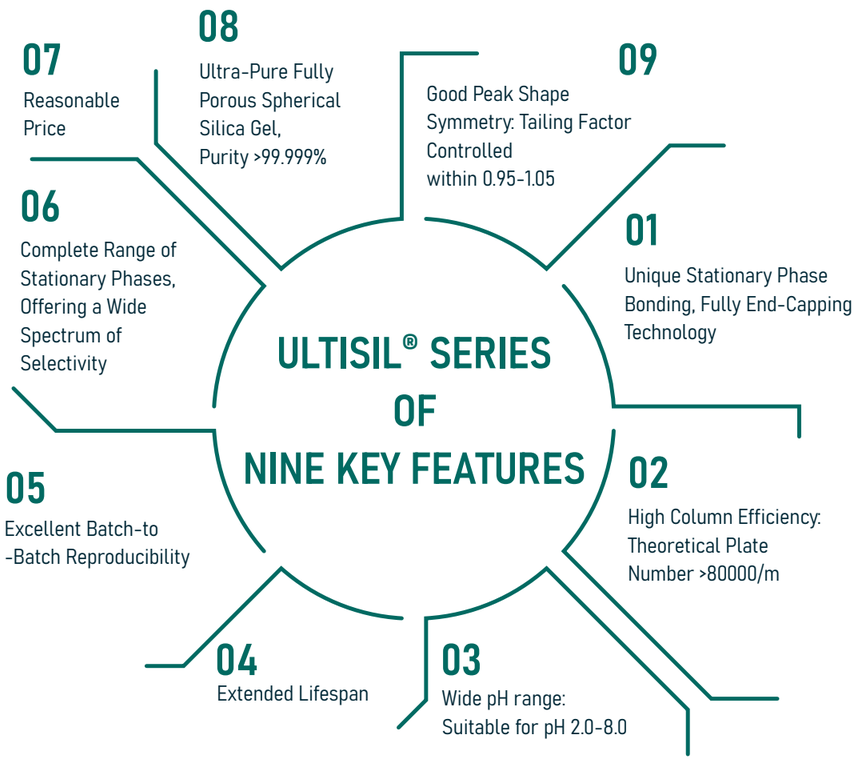
ULTISIL® SERIES HPLC COLUMN

ULTISIL® SERIES HPLC COLUMN
— CLASSIC COLUMN BRAND

ULTIMATE PERFORMANCE | **REASONABLE PRICE** | **BEST SERVICE**

Ultisil® "Ultimate" Series High Performance Liquid Chromatography Columns use ultra-high purity fully porous spherical silica gel as the matrix. They are produced using the company's unique stationary phase bonding technology and silica surface treatment technology, resulting in excellent chromatographic peak shape, separation efficiency, stability, and reproducibility. The series offers a complete range of bonded phases, with stable performance, making it the best choice for a wide range of chromatographers in method development.

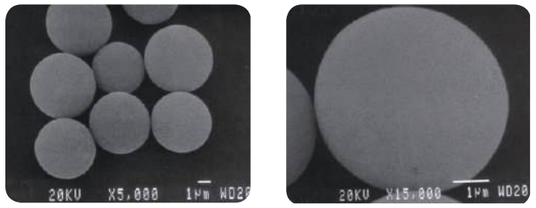
Product Characteristics



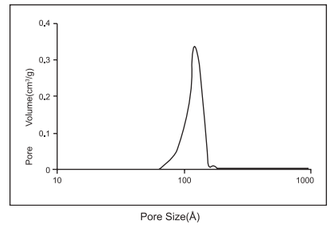
Ultisil® Series Packing Material

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

SEM Pictures of Ultisil® Silica Particles

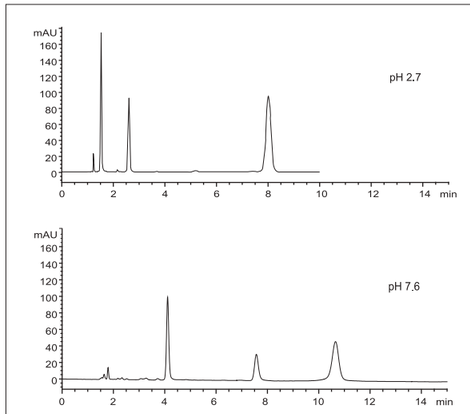


Ultisil® Pore Size Distribution



Trace Amount Metal Contents Test

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



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

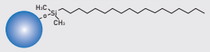
Ultisil® XB-C18 provides good peak shapes in the separation of these three compounds under pH 7.6, which indicates Ultisil silica contains hardly any metals.

ULTISIL® XB SERIES HPLC COLUMN

Ultisil® XB-C18—Universal HPLC Analytical Column

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

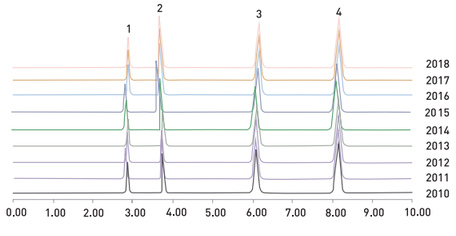
Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	17(120Å), 8(300Å)
USP List	L1
Endcapped	Yes

Separation of Basic Compounds Antidepressant at pH 7.0

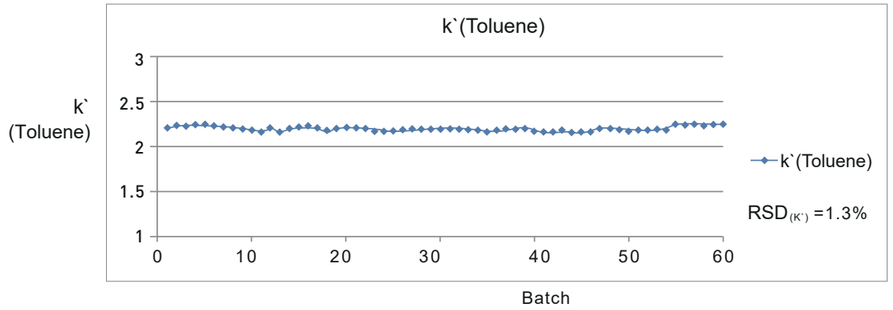
Column: Ultisil® XB-C18, 4.6×150mm, 5μm
Mobile Phase: 20mM phosphate(pH 7.0) / methanol=20/80
Flow rate: 1.0mL/min
Detector: 215nm
Temperature: 25°C
Samples: 1) Uracil 2) Ropranolol 3) Ortriptyline 4) Amitryptyline 5) Trimipramine

Comparison of Peak Shape between Batch to Batch

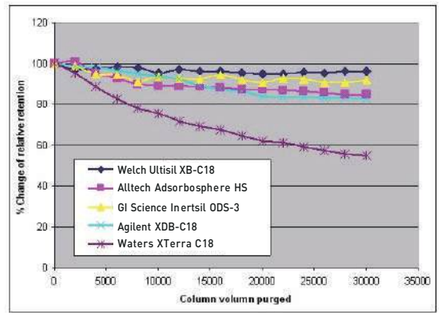


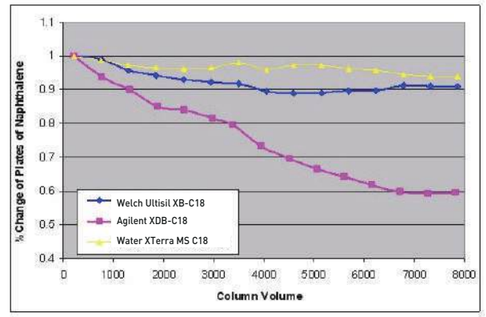
Column: Ultisil® XB-C18, 4.6×250mm, 5μm
Mobile Phase: Methanol/water=75/25
Flow rate: 1.0mL/min
Detector: 254nm
Temperature: 25°C
Samples: 1) Uracil 2) Phenol 3) 4-chloronitrobenzen 4) Methylbenzene

Capacity Factor(K') of Batch to Batch Reproducibility



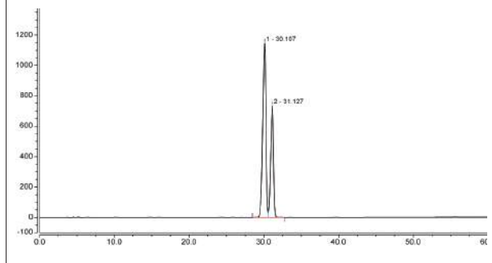
Excellent Stability at Low pH and High pH





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

Argatroban

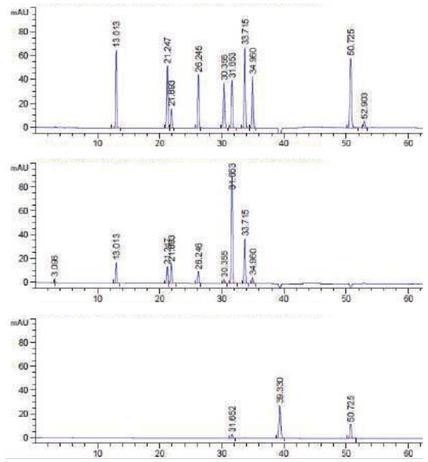


Column: Ultisil® XB-C18, 4.6×250mm, 3μm
Mobile Phase: A: 10mmol/L ammonium acetate
B: acetonitrile/methanol=50/30
Flow Rate: 0.6mL/min
Detector: 259nm
Temperature: 50°C
Injection Volume: 10μL
Reference Sample: S-argatroban, R-argatroban

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	60	40
20	60	40
35	50	50
50	20	80
60	20	80
60.1	60	40
80	60	40

Paracetamol Injection USP 36

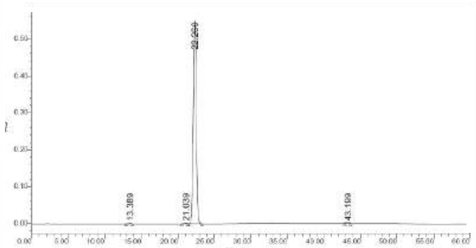


Column: Ultisil® XB-C18, 4.6×250mm, 5μm
Mobile Phase: A: methanol/water/acetic acid =50/950/1
B: methanol/water/acetic acid =50/500/1
Flow Rate: 0.9mL/min
Detector: 254nm, 275nm, 317nm
Temperature: 40°C
Injection Volume: 20μL
Reference Sample: L-hydroxyproline, glycine, alanine, L-proline

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	82	18
8	82	18
53	0	100
58	0	100
59	82	18
73	82	18

Progesterone(EP 5.0)

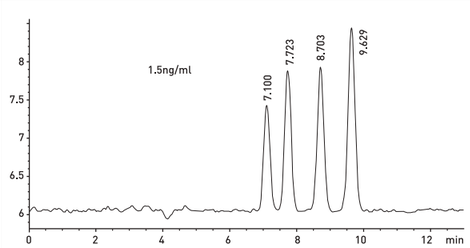


Column: Ultisil® XB-C18, 4.6×150mm, 5μm
Mobile Phase: A: water B: acetonitrile
Flow Rate: 0.9mL/min
Detector: 254nm, 275nm, 317nm
Temperature: 40°C
Injection Volume: 20μL
Reference Sample: L-hydroxyproline, glycine, alanine, L-proline

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0-20	50	50
20-27	50-20	50-80
27-45	20	80
45-50	50	50

Aflatoxin



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

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

Ordering Information—Ultisil® XB-C18

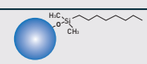
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00201-21009	H00201-21010	H00201-21011	H00201-21012	H00201-21014	H00201-21015	H00201-21016	-	H00808-23001	00808-01107
	3.0	H00201-21018	H00201-21019	H00201-21020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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

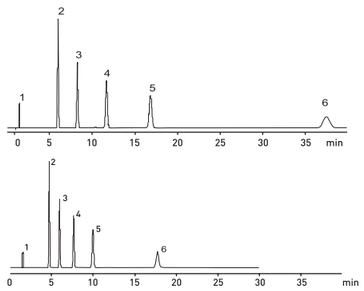
Ultisil® XB-C8-Less retentive than XB-C18

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

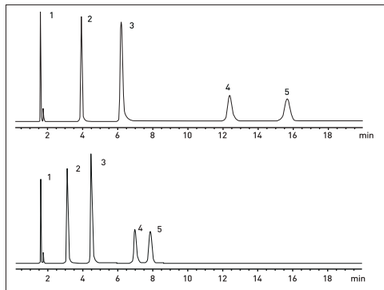
Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	12(120Å), 4(300Å)
USP List	L7
Endcapped	Yes

Comparison of Retention of XB-C18 and XB-C8

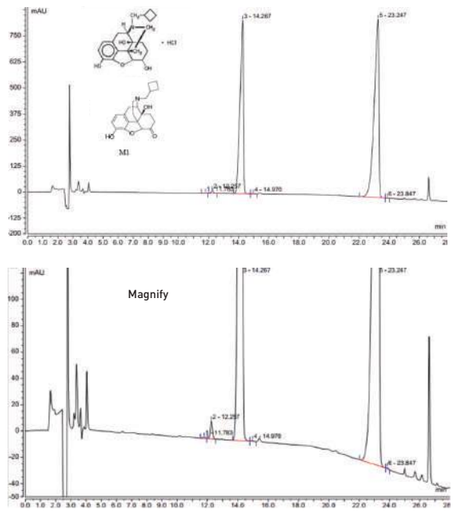


Column:	4.6×150mm, 5μm
Mobile Phase:	Water/acetonitrile=30/70
Flow rate:	1.0mL/min
Detector:	344nm
Temperature:	25°C
Samples:	1) Uracil 2) Ethylbenzene 3) Propylbenzene 4) Butylbenzene 5) Amylbezene 6) Heptylbenzene



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

Nalbuphine HCl

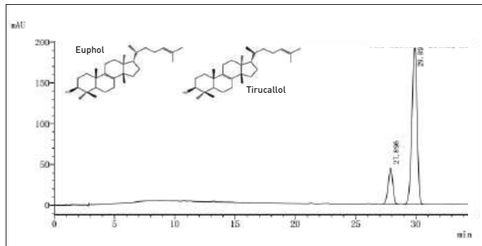


Column:	Ultisil® XB-C8, 4.6×250mm, 5μm
Mobile Phase:	A: 0.02mol/L KH_2PO_4 buffer(pH 6.5)(%) B: acetonitrile
Flow Rate:	1.0mL/min
Detector:	220nm
Temperature:	30°C
Injection Volume:	10μL

Gradient Program:

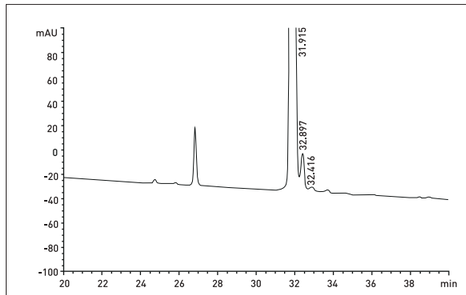
Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	80	20
15	70	30
25	40	60
28	40	60
30	80	20
45	80	20

Tirucallol and Euphol



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

Analysis of Insulin Detemir



Column:	Ultisil® XB-C18, 4.6×250mm, 5μm
Mobile Phase:	A: 20g $(NH_4)_2SO_4$, 900mL water, 100mL acetonitrile, adjust pH 2.3 B: acetonitrile/water=80/20; %B=0(0min) , 30(9min), 60(40min)
Flow Rate:	1.0mL/min
Detector:	214nm
Temperature:	30°C
Injection Volume:	20μL

Ordering Information—Ultisil® XB-C8

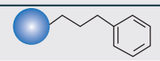
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00202-21009	H00202-21010	H00202-21011	H00202-21012	H00202-21014	H00202-21015	H00202-21016	-	H00808-23002	00808-01107
	3.0	H00202-21018	H00202-21019	H00202-21020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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

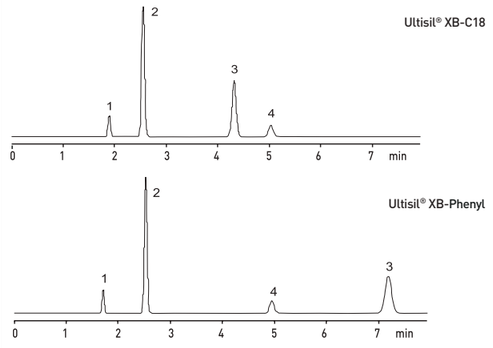
Ultisil® XB-Phenyl-Different Selectivity to Alkyl Phase

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

Specifications

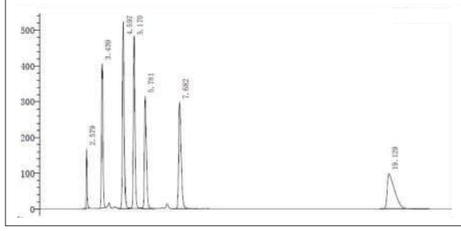
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m_2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	12(120Å), 4(300Å)
USP List	L11
Endcapped	Yes

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



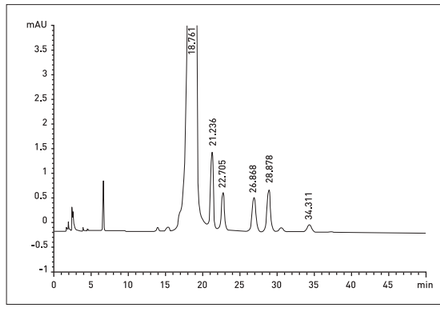
Column: 4.6×150mm, 5μm
Mobile Phase: Methanol/ water=70/30
Flow rate: 1.0mL/min
Detector: 254nm
Temperature: 24°C
Samples: 1) Uracil 2) Phenol
3) Paranitrotoluene 4) Toluene

Fenticonazole Nitrate



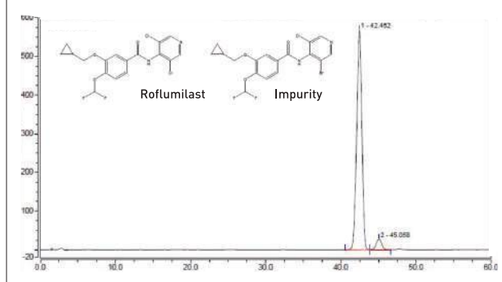
Column: Ultisil® XB-Phenyl, 4.6×250mm, 5μm
Mobile Phase: KH_2PO_4 buffer solution*/acetonitrile=30/70
*Dissolve 3.4g of KH_2PO_4 in 900mL water, adjust pH 3.3 with H_3PO_4, then add water to 1000mL
Flow rate: 1.0mL/min
Detector: 229nm
Temperature: 30°C
Injection Volume: 20μL

Moxifloxacin Hydrochloride



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

Roflumilast



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

Ordering Information—Ultisil® XB-Phenyl

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

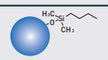
300Å column is available. Please contact Welch or your local distributor for other dimensions..

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

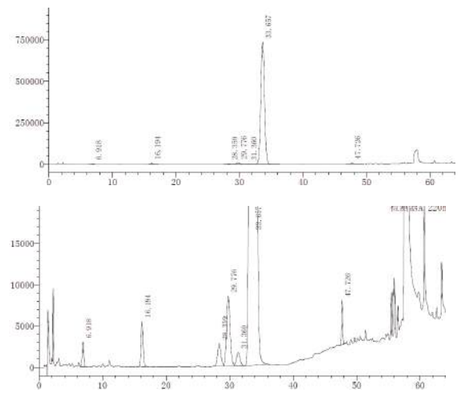
Features

- Optimize the packing process, employ an improved production method for a more effective capture, and longer durability.
- Column packing of 300Å big pore size particles is appropriate for separation of peptide and protein samples with sharp peak shape.
- Minibore column can be used for LC/MS(/MS).

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	8(120Å), 3(300Å)
USP List	L26
Endcapped	Yes

Ethinyloestradiol

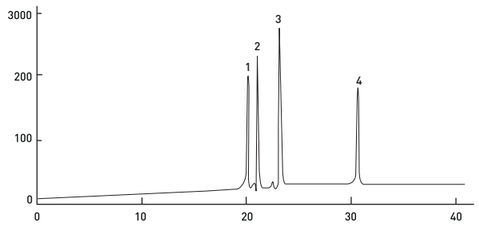


Column: Ultisil® XB-C4, 4.6×250mm, 5μm
Mobile Phase: A: acetonitrile/water=30/70
B: acetonitrile/water=75/25
Flow Rate: 1.5mL/min
Detector: 220nm
Temperature: 30°C
Injection Volume: 30μL

Gradient Program:

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

Detection of Protein Standards



Column: Ultisil® XB-C4(300Å), 4.6×250mm, 5μm
Mobile Phase: A: water/acetonitrile/TFA=90/10/0.05
B: water/acetonitrile/TFA=20/80/0.05
0%-100%B(0-15min)
Flow rate: 1.0mL/min
Temperature: 25°C
Injection Volume: 10μL
Samples: 1) Cytochraome c(Equine)(MW 12,400)
2) Cytochraome c(Equine)(MW 12,300)
3) Lysozyme(MW 14,600)
4) Carbonic anhydrase(MW 29,000)

Ordering Information—Ultisil® XB-C4

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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

Ultisil® XB-C1

Ultisil® XB-C1 column is bonded with trimethylchlorosilane, possessing medium polarity. It can be used with common reverse-phase solvents to analyze hydrophobic compounds or with high-water content solvents to analyze highly polar compounds. Due to hydrophobic interactions, the retention is lower compared to other high-performance liquid chromatography columns, enabling rapid elution of hydrophobic compounds. Sometimes, it can also provide better separation of hydrophilic compounds than other reverse-phase columns. It is suitable for separating samples that are highly polar and difficult to separate with general reverse-phase or normal-phase columns.

Features

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	4(120Å)
USP List	L13
Endcapped	Yes

Ordering Information—Ultisil® XB-C1

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

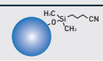
Ultisil® XB-CN-unique selectivity for polar compounds

Ultisil® XB-CN column can be used in either reversed or normal phase. Reversed phase CN column has special selectivity for polar compounds, and due to its low hydrophobicity, elution of hydrophobic molecules is fast. Furthermore, XB-CN column shows perfect peak shape for strong basic analytes (including quaternary ammonium salts). Polarity of XB-CN column is the strongest among all reversed columns. It is a good choice for compounds that are strongly retained on standard reversed columns.
Normal phase CN column can replace SiO_2 column. Equilibrium of normal phase column is fast, and the silica surface activity is better than that of silica column. To prolong column life time, alternation between reversed phase and normal phase uses should be avoided. While XB-CN column can be used in either reversed or normal phase, elution sequence is different in different separation mode.

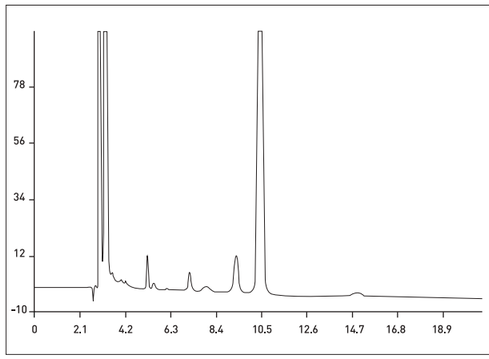
Features

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

Specifications

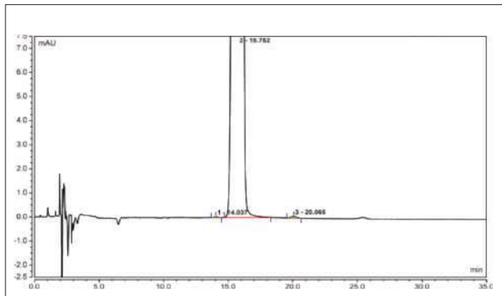
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	7(120Å)
USP List	L10
Endcapped	Yes

Rifampicin Isoniazid and Pyrazinamide



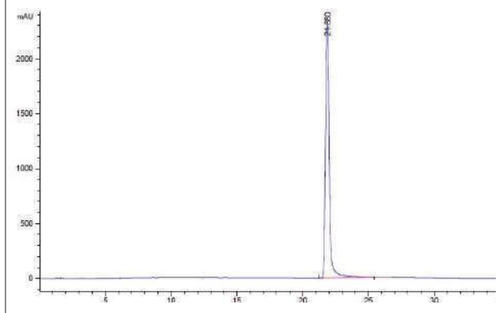
Column: Ultisil® XB-CN, 4.6×250mm, 5μm
Mobile Phase: 0.01mol/L sodium heptanesulfonate solution* / acetonitrile=54/46
* Dissolve 2.0225g of sodium heptanesulfonate in 1000mL water, adjust pH 1.85 with H_3PO_4
Detector: 254nm
Flow rate: 0.6mL/min
Temperature: 30°C
Injection Volume: 20μL

Carbamazepine



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

Cetilistat

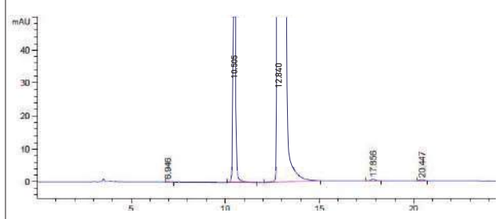


Column: Ultisil® XB-CN, 4.6×250mm, 5μm
Mobile Phase: A: water B: acetonitrile
Flow Rate: 1.0mL/min
Detector: 221nm
Temperature: 35°C
Injection Volume: 10μL

Gradient Program:

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

Alogliptin Benzoate



Column: Ultisil® XB-CN, 4.6×250mm, 5μm
Mobile Phase: A: acetonitrile/water/TFA=100/1900/1
B: acetonitrile/water/TFA=1900/100/1
Flow Rate: 1.0mL/min
Detector: 278nm
Temperature: 35°C
Injection Volume: 20μL

Gradient Program:

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

Ordering Information—Ultisil® XB-CN

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00205-21009	H00205-21010	H00205-21011	H00205-21012	H00205-21014	H00205-21015	H00205-21016	-	H00808-23007	00808-01107
	3.0	H00205-21018	H00205-21019	H00205-21020	H00205-21021	H00205-21023	H00205-21024	H00205-21025	-	H00808-23007	00808-01107
	4.0	H00205-21027	H00205-21028	H00205-21029	H00205-21030	H00205-21032	H00205-21033	H00205-21034	-	H00808-03007	00808-01101
	4.6	H00205-21036	H00205-21037	H00205-21038	H00205-21039	H00205-21041	H00205-21042	H00205-21043	-	H00808-03007	00808-01101
5μm 120 Å	2.1	H00205-31009	H00205-31010	H00205-31011	H00205-31012	H00205-31014	H00205-31015	H00205-31016	-	H00808-24007	00808-01107
	3.0	H00205-31018	H00205-31019	H00205-31020	H00205-31021	H00205-31023	H00205-31024	H00205-31025	-	H00808-24007	00808-01107
	4.0	H00205-31027	H00205-31028	H00205-31029	H00205-31030	H00205-31032	H00205-31033	H00205-31034	H00205-31035	H00808-04007	00808-01101
	4.6	H00205-31036	H00205-31037	H00205-31038	H00205-31039	H00205-31041	H00205-31042	H00205-31043	H00205-31044	H00808-04007	00808-01101
10μm 120 Å	4.0	-	-	-	-	H00205-41032	H00205-41033	H00205-41034	H00205-41035	H00808-05007	00808-01101
	4.6	-	-	-	-	H00205-41041	H00205-41042	H00205-41043	H00205-41044	H00808-05007	00808-01101

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

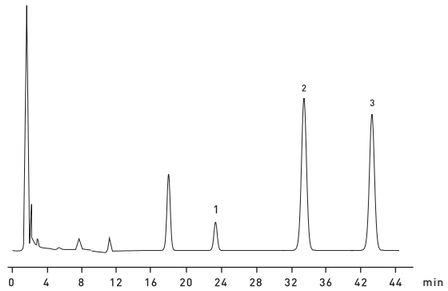
Ultisil® SiO_2

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

Specifications

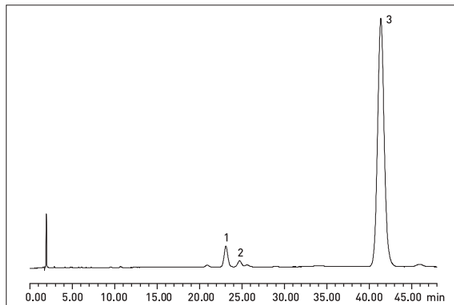
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	N/A
USP List	L3
Endcapped	No

Analysis of VD_2



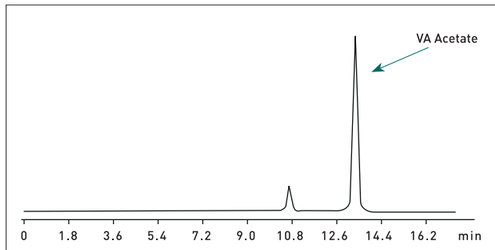
Column: Ultisil® SiO_2, 4.6×250mm, 5μm
Mobile Phase: Hexane/isopropanol＝997/3
Flow Rate: 2.0mL/min
Detector: 254nm
Temperature: 30°C
Samples: 1) Facade VD_2 2) Internal Standard 3) VD_2

Analysis of VD_3



Column: Ultisil® SiO_2, 4.6×250mm, 5μm
Mobile Phase: N-hexane/n-amyl alcohol=99.7/0.3
Flow Rate: 2.0mL/min
Detector: 254nm
Temperature: 30°C
Samples: 1) Facade VD_3 2) Trans VD_3 3) VD_3

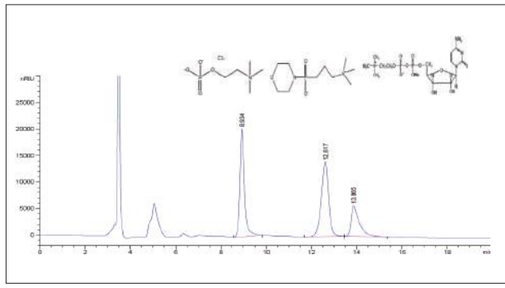
Analysis of VA Acetate



Column: Ultisil® SiO_2, 4.6×250mm, 5μm
Mobile Phase: N-hexane/isopropanol=99.8/0.2
Flow Rate: 1.0mL/min
Detector: 326nm
Temperature: 16°C

Sample is dissolved with n-hexane

Separation of chlorophosphorylcholine, Phosphorylcholine morpholine and Citicoline Sodium



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

Ordering Information—Ultisil® SiO_2

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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

Ultisil® Diol

Ultisil® Diol Column is based on ultra-pure porous spherical silica bonded with 1,2-dihydroxypropyl functional group silica. Ultisil® Diol is used in normal phase mostly, suitable for separation of peptides, proteins, polar molecules, and organic acids and its polymers.

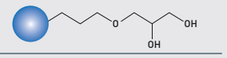
Like bare silica, Ultisil® Diol has the ability to form hydrogen bonds and is capable of separating structure isomers. Since most of its surface is covered with organic functions, Ultisil® Diol absorbs less water, which leads to more reproducible activity. It is also the sorbent of choice when working in normal phase in the presence of water. It has a different selectivity than bare silica gel, and slight modification in the composition of solvent mixture may be necessary to obtain a similar retention.

Ultisil® Diol column is more stable than traditional normal phase columns, such as NH_2, SiO_2. Compared with NH_2/SiO_2 column, Diol column is not sensitive to water. Ultisil® Diol column can also be used in reversed phase analysis.

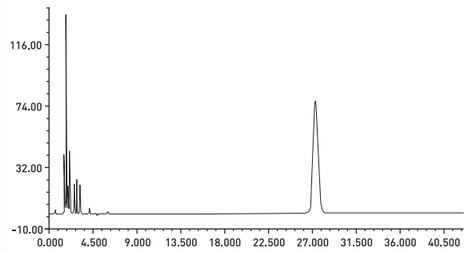
Features

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

Specifications

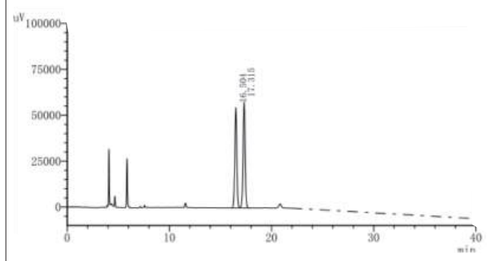
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	2.5(120Å)
USP List	L20
Endcapped	No

Tacrolimus



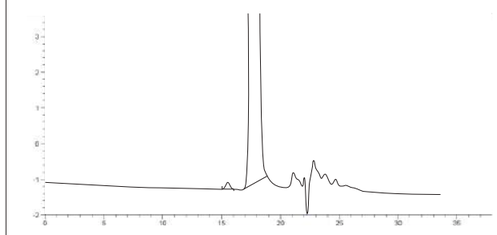
Column: Ultisil® Diol, 4.6×250mm, 5μm
Mobile Phase: N-hexane/butyl chloride/acetonitrile=7/2/1
Flow Rate: 1.7mL/min
Detector: 225nm
Temperature: Ambient
Injection Volume: 5μL

Cloprostenol Sodium



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

Insulin



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

Ordering Information—Ultisil® Diol

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

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

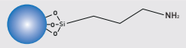
Ultisil® XB-NH_2

Ultisil® XB-NH_2 column is based on propyl-amino silane, mostly used in normal phase, but can also be used in reversed phase.

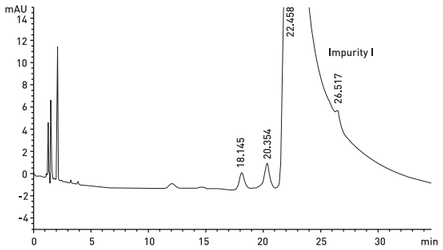
Features

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

Specifications

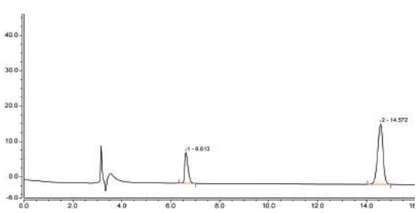
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	4 (120Å)
USP List	L8
Endcapped	No

Acarbose



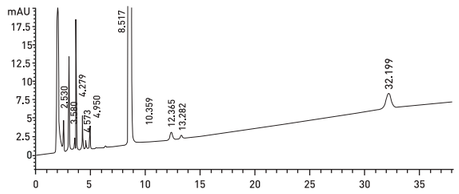
Column: Ultisil® XB-NH_2, 4.6×250mm, 5μm
Mobile Phase: Phosphate buffer */acetonitrile=28/72
* Dissolve 600mg of KH_2PO_4 and 279mg of ADSP in 100mL water, add water to make 1000mL
Flow Rate: 2.0mL/min
Detector: 210nm
Temperature: 35°C
Injection Volume: 10μL

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



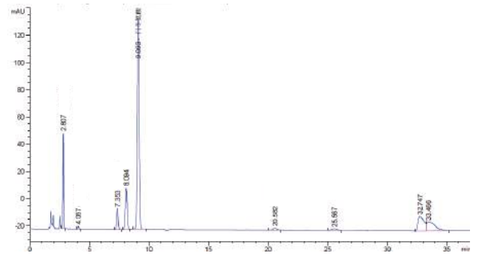
Column: Ultisil® XB-NH_2, 4.6×250mm, 5μm
Mobile Phase: Methanol/isopropanol=80/20
Flow Rate: 1.0mL/min
Detector: 210nm
Temperature: 30°C
Injection Volume: 5μL

Acetyl-L-carnitine



Column: Ultisil® XB-NH_2, 4.6 ×250 mm, 5μm
Mobile Phase: Buffer/acetonitrile=30/70
Flow Rate: 1.0mL/min
Detector: 205nm, 210nm
Temperature: 20°C
Injection Volume: 10μL

Ornithine Aspartate



Column: Ultisil® XB-NH_2, 4.6×250mm, 5μm
Mobile Phase: KH_2PO_4 buffer solution*/acetonitrile=40/60
* Dissolve 2.72g of KH_2PO_4 in 500mL water, add 5mL of concentrated ammonia solution, addwater to 1000mL, adjust pH 5.60±0.05 with H_3PO_4
Flow Rate: 1.0mL/min
Detector: 205nm
Temperature: 30°C
Injection Volume: 10μL

Ordering Information—Ultisil® XB-NH_2

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00204-21009	H00204-21010	H00204-21011	H00204-21012	H00204-21014	H00204-21015	H00204-21016	-	H00808-23004	00808-01107
	3.0	H00204-21018	H00204-21019	H00204-21020	H00204-21021	H00204-21023	H00204-21024	H00204-21025	-	H00808-23004	00808-01107
	4.0	H00204-21027	H00204-21028	H00204-21029	H00204-21030	H00204-21032	H00204-21033	H00204-21034	-	H00808-03004	00808-01101
	4.6	H00204-21036	H00204-21037	H00204-21038	H00204-21039	H00204-21041	H00204-21042	H00204-21043	-	H00808-03004	00808-01101
5μm 120 Å	2.1	H00204-31009	H00204-31010	H00204-31011	H00204-31012	H00204-31014	H00204-31015	H00204-31016	-	H00808-24004	00808-01107
	3.0	H00204-31018	H00204-31019	H00204-31020	H00204-31021	H00204-31023	H00204-31024	H00204-31025	-	H00808-24004	00808-01107
	4.0	H00204-31027	H00204-31028	H00204-31029	H00204-31030	H00204-31032	H00204-31033	H00204-31034	H00204-31035	H00808-04004	00808-01101
	4.6	H00204-31036	H00204-31037	H00204-31038	H00204-31039	H00204-31041	H00204-31042	H00204-31043	H00204-31044	H00808-04004	00808-01101
10μm 120 Å	4.0	-	-	-	-	H00204-41032	H00204-41033	H00204-41034	H00204-41035	H00808-05004	00808-01101
	4.6	-	-	-	-	H00204-41041	H00204-41042	H00204-41043	H00204-41044	H00808-05004	00808-01101

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

Ultisil® XB-SAX

Ultisil ion exchange column series includes both Strong Cation Exchange (SCX) and Strong Anion Exchange (SAX) modes. The stationary phase is based on ultra-pure, fully porous spherical silica gel. Through the unique fixed phase bonding technology developed by Welch, the ion exchange functional groups are densely and uniformly bonded to the surface of the silica gel matrix, resulting in a high-capacity ion exchange layer.

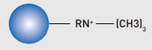
Features

- Organic modifiers such as acetonitrile and methanol can be used on SAX and SCX columns (within the solubility limits of organic solvents/buffer solutions). By adjusting pH, ionic strength, and organic modifier content, the retention time of samples can be controlled
- pH range: 2.0-8.0
- Provides high column efficiency and rapid analysis

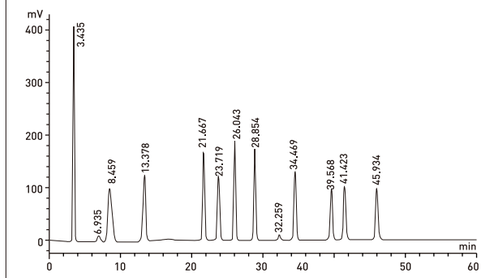
Ultisil® XB-SAX

Ultisil® XB-SAX columns utilize a polarity-bonded packing material consisting of ammonium-functionalized silanes chemically bonded to ultra-pure silica gel matrices, suitable for efficient anion exchange HPLC. Special applications include separation of carboxylic and sulfonic acids from several classes of organic acids such as aromatic and aliphatic. Specific application areas include pesticides, herbicides, pharmaceuticals, inorganic anions, and biological samples such as nucleotides and nucleosides.

Specifications

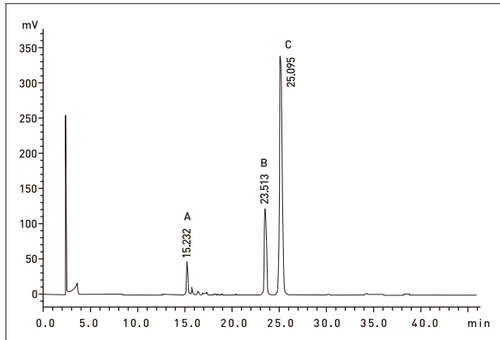
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å), 90(300Å)
Carbon Loading(%)	7.5(120Å), 1.5(300Å)
USP List	L14
Endcapped	No

13 Heparin Disaccharides



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

Chondroitin Sulfate



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

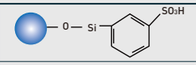
Ordering Information—Ultisil® XB-SAX

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

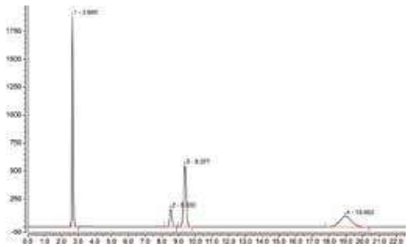
Ultisil® XB-SCX

Ultisil XB-SCX columns, also based on silica gel matrices, utilize aromatic sulfonic acid groups as the bonded phase, making them typical cation exchange columns. They are commonly used for separation of compounds in alkaline aqueous solutions. Special applications include organic bases such as basic amino acids, anilines, medicinal salts, inorganic cations, and nucleotides.

Specifications

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

Orazamide



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

Ordering Information—Ultisil® XB-SCX

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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

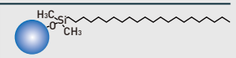
Ultisil® XB-C30

Carotenoids is a broad class of natural products, of which over 600 types have been found so far, including compounds of different carbon chain length, such as C40, C50 and C30 etc. They are well known to have many biological functions, including cancer prevention and treatment functions.
Compared to classical C18 stationary phases, the C30 phase is much more hydrophobic and retaining. Even when pure organic eluent is applied, many sample solutes, such as carotenoids, are able to retain. Ultisil® C30 is designed for the separation of geometric isomers, polar carotenes, polar and nonpolar xanthophylls, steroids, retinols and fat-soluble vitamins (A, D, K and E).

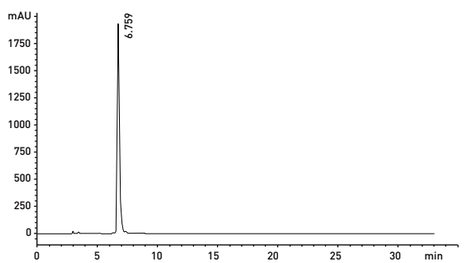
Features

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	22(120Å)
USP List	L62
Endcapped	Yes

Analysis of All-trans Astaxanthin

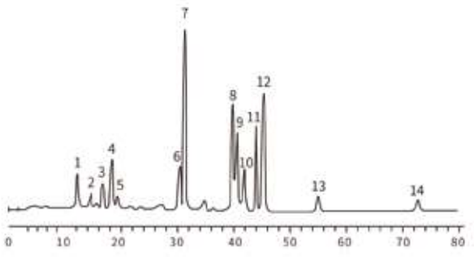


Column: Ultisil® XB-C30, 4.6×250mm, 5μm
Mobile Phase: A: methanol/1%H_3PO_4=94/6
B: methanol/TBME/1%H_3PO_4=16/80/4
Flow Rate: 1.0mL/min
Detector: 474nm
Temperature: 30°C
Injection Volume: 20μL

Gradient Program:

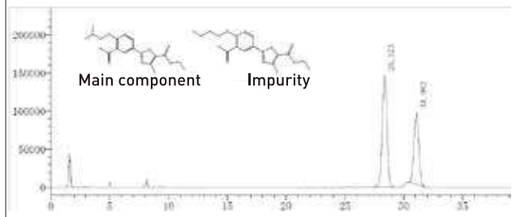
Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	67	23
15	52	48
23	0	100
27	67	33
30	67	33

Separation of Carotenoids



Column:	Ultisil® XB-C30, 4.6×250mm, 5μm
Mobile Phase:	A: methanol/MTB /water=81/15/4 B: methanol/MTBE=10/90
Gradient Program:	0-90min (0%B-100%B)
Flow Rate:	1.0 mL/min
Detector:	450nm
Temperature:	Ambient
Samples:	1) Astaxanthin 2) Capsanthin 3) Lutein 4) Zeaxanthin 5) Canthaxanthin 6) β-Cryptoxanthin 7) Echinenone 8)15-cis β-Carotene 9)13-cis β-Carotene 10) α-Carotene 11) trans β-Canotene 12) 9-cistrans β-Carotene 13) 8β-Carotene 14) Lycopene

Febuxostat Intermediate



Column:	Ultisil® XB-C30, 4.6×150mm, 5μm
Mobile Phase:	Acetonitrile/water=70/30
Flow rate:	1.0mL/min
Detector:	230 nm
Temperature:	30°C
Injection Volume:	20μL

Ordering Information—Ultisil® XB-C30

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00223-21009	H00223-21010	H00223-21011	H00223-21012	H00223-21014	H00223-21015	H00223-21016	-	H00808-23013	00808-01107
	3.0	H00223-21018	H00223-21019	H00223-21020	H00223-21021	H00223-21023	H00223-21024	H00223-21025	-	H00808-23013	00808-01107
	4.0	H00223-21027	H00223-21028	H00223-21029	H00223-21030	H00223-21032	H00223-21033	H00223-21034	-	H00808-03035	00808-01101
	4.6	H00223-21036	H00223-21037	H00223-21038	H00223-21039	H00223-21041	H00223-21042	H00223-21043	-	H00808-03035	00808-01101
5μm 120 Å	2.1	H00223-31009	H00223-31010	H00223-31011	H00223-31012	H00223-31014	H00223-31015	H00223-31016	-	H00808-24024	00808-01107
	3.0	H00223-31018	H00223-31019	H00223-31020	H00223-31021	H00223-31023	H00223-31024	H00223-31025	-	H00808-24024	00808-01107
	4.0	H00223-31027	H00223-31028	H00223-31029	H00223-31030	H00223-31032	H00223-31033	H00223-31034	H00223-31035	H00808-04035	00808-01101
	4.6	H00223-31036	H00223-31037	H00223-31038	H00223-31039	H00223-31041	H00223-31042	H00223-31043	H00223-31044	H00808-04035	00808-01101
10μm 120 Å	4.6	-	H00212-41041	H00212-41042	H00212-41043	00808-01101	00808-01101	00808-01101	00808-01101	H00808-05013	00808-01101

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

ULTISIL® LP SERIES HPLC COLUMN

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

Ultisil® LP-C18

Features

- Not endcapped, prevents siloxane bond from hydrolysis at low pH condition.
- Compatible with 100% water as the mobile phase, more polar than "AQ", better peak shape and resolution.
- Best peak shape for polar compounds.
- Exceptional lifetime at low pH (0.5-8.0) and high temperature.
- Ultisil® LP-C18 is the most polar C18 among all the C18 products of Welch.

When pH<5.0

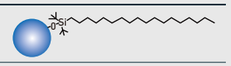
When pH<5.0, based on your separation conditions, you may choose either LP-C18 or XB-C18;

How to choose XB-C18 and LP-C18?

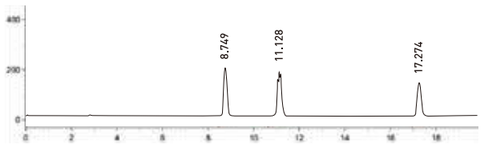
When pH<2.0

When pH<2.0 (such as 0.1%TFA), LP-C18, which provides exceptional stability, longer lifetime, perfect peak shape and superior selectivity, is your best choice

Specifications

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

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



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

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	95	5
10	95	5
20	60	40
21	95	5
30	95	5

Ordering Information—Ultisil® LP-C18

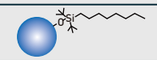
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00208-21009	H00208-21010	H00208-21011	H00208-21012	H00208-21014	H00208-21015	H00208-21016	-	H00808-23014	00808-01107
	3.0	H00208-21018	H00208-21019	H00208-21020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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

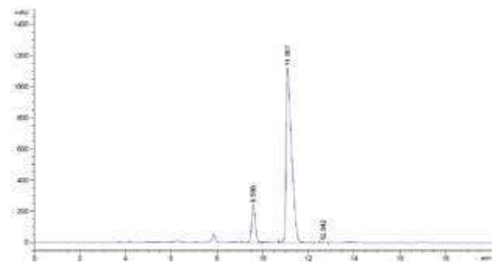
Ultisil® LP-C8

Ultisil® LP-C8 column has a longer lifespan under acidic conditions compared to XB-C8 and offers a different selectivity from XB-C18. It is suitable for use with 100% aqueous mobile phase.

Specifications

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

Cefuroxime Sodium



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

Ordering Information—Ultisil® LP-C8

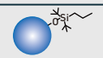
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00209-21009	H00209-21010	H00209-21011	H00209-21012	H00209-21014	H00209-21015	H00209-21016	-	H00808-23015	00808-01107
	3.0	H00209-21018	H00209-21019	H00209-21020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

300Å column is available. Please contact Welch or your local distributor for other dimensions.

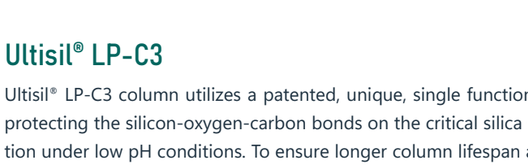
Ultisil® LP-C3

Ultisil® LP-C3 column utilizes a patented, unique, single functional group silane with larger isopropyl side chain groups, protecting the silicon-oxygen-carbon bonds on the critical silica surface to prevent carbon chain hydrolysis and degradation under low pH conditions. To ensure longer column lifespan and optimal reproducibility during separations at low pH conditions (down to pH 1), the column is left un-capped. This column can withstand 100% aqueous to 100% organic phases. The high-purity, low-acidity silica gel provides excellent peak shapes for acidic, basic, and neutral compounds, making it the preferred choice for method development under low pH mobile phase conditions.

Specifications

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

Recombinant Type III Collagen



Column: Ultisil® LP-C3, 4.6×250mm, 5μm, 300Å
Mobile Phase: A: 0.1% Trifluoroacetic acid B: acetonitrile
Flow Rate: 1.0mL/min
Detector: 215nm
Temperature: 30°C
Injection Volume: 10μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	100	0
20	10	90
21	100	0
35	100	0

Ordering Information—Ultisil® LP-C3

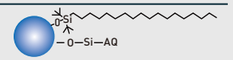
Bonded phase	ID (mm)	Particle Size	Column Length (mm)			Guard Cartridge	Cartridge Holder
			150	200	250	10mm length	
LP-C3	4.6	5μm 120Å	H00265-31041	H00265-31042	H00265-31043	H00808-04050	00808-01101

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

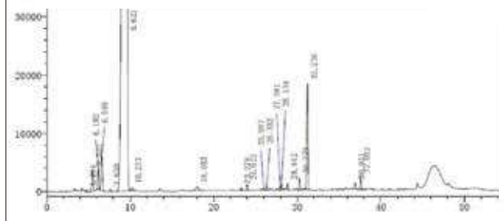
Ultisil® LP-AQ

Ultisil® LP-AQ column is designed to withstand 100% aqueous phases while also tolerating strong acidic conditions. It maintains stability of the stationary phase even at low pH values and offers a different selectivity compared to LP-C18.

Specifications

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

Ampicillin Capsules



Column: Ultisil® LP-AQ, 4.6×250mm, 5μm
Mobile Phase: A: 12% acetum/0.2mol/L KH_2PO_4/acetonitrile/water=0.5/50/50/900
B: 12% acetum/0.2mol/L KH_2PO_4/acetonitrile/water=0.5/50/400/550
Flow Rate: 1.0mL/min
Detector: 254nm
Temperature: 30°C
Injection Volume: 20μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	85	15
10	85	15
40	0	100
55	85	100
60	85	15
70	85	15

Ordering Information—Ultisil® LP-AQ

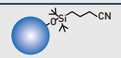
Bonded phase	ID (mm)	Particle Size	Column Length (mm)			Guard Cartridge	Cartridge Holder
			150	200	250	10mm length	
LP-AQ	4.6	5μm 120Å	H00259-31041	H00259-31042	H00259-31043	H00808-04042	00808-01101

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

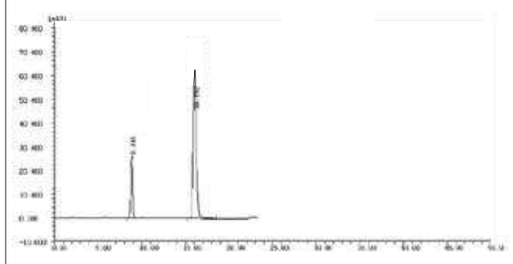
Ultisil® LP-CN

Ultisil® LP-CN column has a longer lifespan under acidic conditions compared to XB-CN. It can be used simultaneously in both reverse phase and normal phase modes. In reverse phase mode, it offers unique selectivity for polar compounds and provides excellent peak shapes for separating strong basic compounds. In normal phase mode, it is suitable for separating polar compounds.

Specifications

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

Hydralazine Hydrochloride



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

Ordering Information—Ultisil® LP-CN

Bonded phase	ID (mm)	Particle Size	Column Length (mm)			Guard Cartridge	Cartridge Holder
			150	200	250	10mm length	
LP-CN	4.6	5μm 120Å	H00247-31041	H00247-31042	H00247-31043	H00808-04049	00808-01101

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

ULTISIL® PLUS SERIES HPLC COLUMN

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

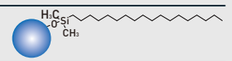
Features

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

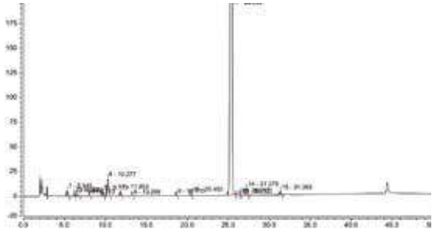
Ultisil® Plus C18

Ultisil® Plus C18 column is an improved version of Ultisil®XB-C18, representing a new generation of HPLC liquid chromatography column developed by Welch Materials. Utilizing Welch's unique stationary phase bonding technology and double end-capping technique, Ultisil® Plus C18 chromatographic column demonstrates excellent peak shapes, separation efficiency, stability, and reproducibility. It is the preferred choice for chromatographers conducting method development.

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 3.5μm, 5μm
Surface Area(m^2/g)	160(130Å)
Carbon Loading(%)	10(130Å)
USP List	L1
Endcapped	Yes

Lansoprazole



Column: Ultisil® XB-C18, 4.6×250mm, 5μm
Mobile Phase: A: water B: acetonitrile/water/triethylamine=160/40/1(%)(adjust pH 7.0 with H_3PO_4)
Flow Rate: 0.8mL/min
Detector: 285nm
Temperature: 25°C
Injection Volume: 40μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	90	10
40	20	80
50	20	80
51	90	10
65	90	10

Ordering Information—Ultisil® Plus C18

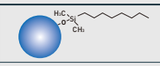
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3.5μm 130 Å	2.1	H00260-20009	H00260-20010	H00260-20011	H00260-20012	H00260-20014	H00260-20015	H00260-20016	-	H00808-23024	00808-01107
	3.0	H00260-20018	H00260-20019	H00260-20020	H00260-20021	H00260-20023	H00260-20024	H00260-20025	-	H00808-23024	00808-01107
	4.6	H00260-20036	H00260-20037	H00260-20038	H00260-20039	H00260-20041	H00260-20042	H00260-20043	-	H00808-03036	00808-01101
5μm 130 Å	2.1	H00260-31009	H00260-31010	H00260-31011	H00260-31012	H00260-31014	H00260-31015	H00260-31016	-	H00808-24029	00808-01107
	3.0	H00260-31018	H00260-31019	H00260-31020	H00260-31021	H00260-31023	H00260-31024	H00260-31025	-	H00808-24029	00808-01107
	4.6	H00260-31036	H00260-31037	H00260-31038	H00260-31039	H00260-31041	H00260-31042	H00260-31043	H00260-31044	H00808-04036	00808-01101

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

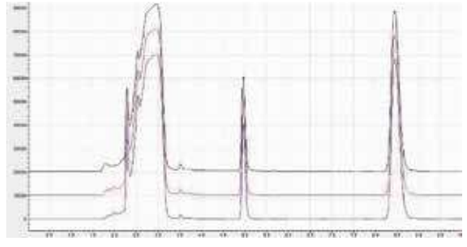
Ultisil® Plus C8

Ultisil® Plus C8 exhibits classic reverse phase retention capability and selectivity slightly lower than C18.

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	160(130Å)
Carbon Loading(%)	7(130Å)
USP List	L7
Endcapped	Yes

Morphine in Poppy Shells



Overlag of morphine samples from different batches

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

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

Ordering Information—Ultisil® Plus C8

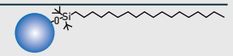
Bonded phase	4.6×150, 5μm	4.6×250, 5μm
Plus C8	H00283-31041	H00283-31043

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

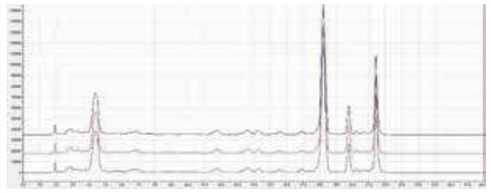
Ultisil® Plus LP-C18

Ultisil®Plus LP-C18 exhibits superior stability and longest lifespan compared to other C18 columns under low pH conditions. It is suitable for separating polar compounds, offering strong retention and excellent peak shapes for such compounds.

Specifications

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

Rutin in Mulberry Leaves



Overlag of Rutin samples from different batches

Column: Ultisil® Plus LP-C18, 4.6×150mm, 5μm
Mobile Phase: 0.5% phosphoric acid water/methanol
Flow Rate: 1.0mL/min
Detector: 358nm
Temperature: 30°C
Injection Volume: 10μL

Gradient Program:

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

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

Ordering Information—Ultisil® Plus LP-C18

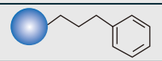
Bonded phase	4.6×150, 5μm	4.6×250, 5μm
Plus LP-C18	H00285-31041	H00285-31043

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

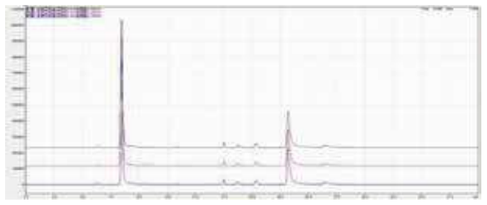
Ultisil® Plus Phenyl

Ultisil® Plus Phenyl demonstrates excellent separation performance for aromatic compounds, polar compounds, and challenging-to-separate drugs.

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	160(130Å)
Carbon Loading(%)	8(130Å)
USP List	L11
Endcapped	Yes

Luteolin in Honeysackle



Overlag of Luteolin samples from different batches

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

Column: Ultisil® Plus Phenyl, 4.6×250mm, 5μm

Mobile Phase: A: 0.5% acetic acid solution: accurately pipette 5mL of acetic acid, add water and make up to 1L. B: acetonitrile.

Flow Rate: 1.0mL/min

Detector: 350nm

Temperature: 30°C

Injection Volume: 5μL

Gradient Program:

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

Ordering Information—Ultisil® Plus Phenyl

Bonded phase	4.6×150, 5μm	4.6×250, 5μm
Plus Phenyl	H00284-31041	H00284-31043

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

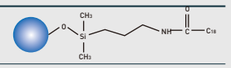
ULTISIL® POLAR EMBEDDED HPLC COLUMN

Ultisil® polar embedded phases have been developed for more than 20 years. Earlier polar embedded phase is developed with amide phase. The polar functional group close to the surface increases the wet ability of this phase, thus decreasing phase collapse, making this phase compatible with mobile phase of up to 95% water content. The polar functional group also shields the effects of unreacted silanol groups, providing excellent peak shape for very polar and strong basic compounds and different selectivity than C18 phase. Welch provides two kinds of packing materials - Ultisil® Polar-RP and Ultisil® Phenyl-Ether.

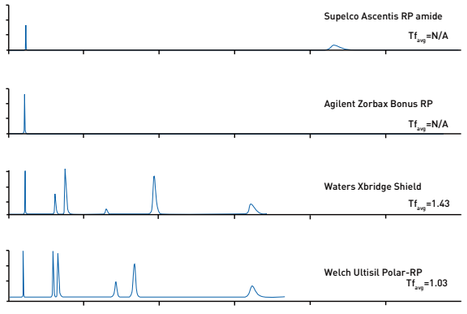
Ultisil® Polar-RP

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

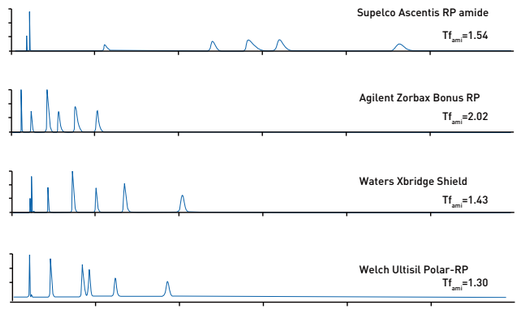
Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	18(120Å)
USP List	L1
Endcapped	Yes

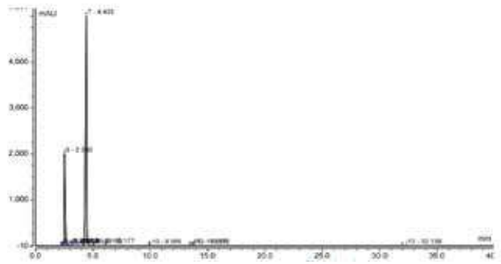
Comparison of separation of acid compounds



Comparison of separation of base compounds



Amoxicillin and clavulanate potassium



Column: Ultisil® Polar RP, 4.6×150mm, 5μm
Mobile Phase: A: phosphate buffer * B: phosphate buffer/acetonitrile=20/80 *Dissolve 1.36g KH_2PO_3 in 900mL water, adjust pH6.0±0.1 with KOH, add water to 1000mL
Flow Rate: 1.0mL/min
Detector: 215nm
Temperature: 30°C
Injection Volume: 20μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	95	5
0.5	95	5
30.5	59	41
32	95	5
40	95	5

Ordering Information—Ultisil® Polar RP

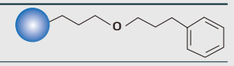
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	00808-01107
3μm 120 Å	2.1	H00215-21009	H00215-21010	H00215-21011	H00215-21012	H00215-21014	H00215-21015	H00215-21016	-	H00808-23009	00808-01107
	3.0	H00215-21018	H00215-21019	H00215-21020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

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

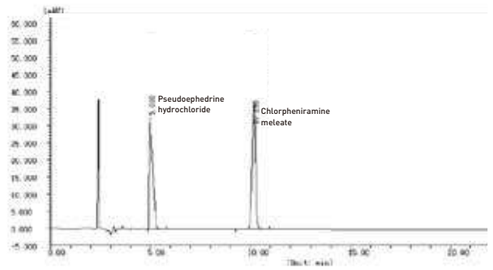
Ultisil® Phenyl-Ether

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L11
Endcapped	Yes

Chlorphenamine Maleate Pseudoephedrine Hydrochloride Capsules



Column: Ultisil® Phenyl-Ether, 4.6×250mm, 5μm
Mobile Phase: Acetonitrile/methanol/tetrahydrofuran/H_3PO_4/water=320/80/50/1/550
Add 0.43g lauryl sodium sulfate, adjust pH3.5 with concentrated ammonia solution
Flow Rate: 1.0mL/min
Detector: 254nm
Temperature: 25°C
Injection Volume: 10μL

Ordering Information—Ultisil® Phenyl-Ether

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

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

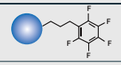
ULTISIL® FLUORINATED PHASE HPLC COLUMN

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

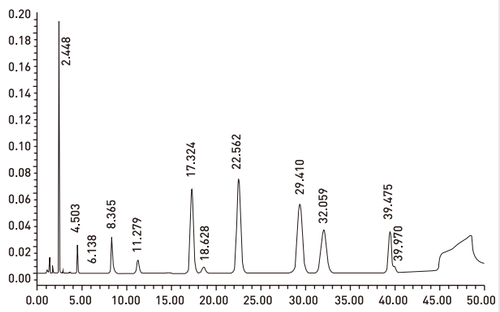
Ultisil® PFP

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L43
Endcapped	Yes

Analysis of Taxol



Column: Ultisil® PFP, 4.6×250 mm, 5μm
Mobile Phase: A: acetonitrile B:water
Flow Rate: 2.6mL/min
Detector: 227nm
Temperature: 30°C
Injection Volume: 10μL
Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	35	65
35	35	65
60	80	20
70	85	15
80	85	65

Ordering Information Ultisil® PFP

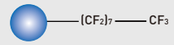
Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
3μm 120 Å	2.1	H00224-21009	H00224-21010	H00224-21011	H00224-21012	H00224-21014	H00224-21015	H00224-21016	-	H00808-23019	00808-01107
	3.0	H00224-21018	H00224-21019	H00224-21020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

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

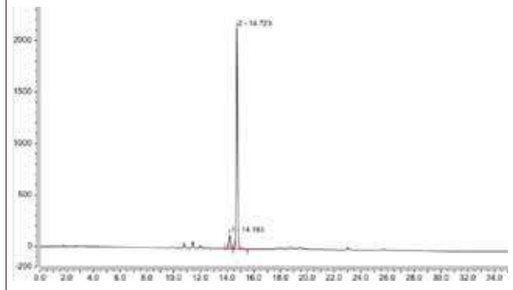
Ultisil® F-C8

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L7
Endcapped	Yes

Dolasetron Mesylate



Column: Ultisil® F-C8, 4.6×250mm, 5μm
Mobile Phase: A: diammonium hydrogen phosphate /acetonitrile=1000/53
B: diammonium hydrogen phosphate /acetonitrile=295/795
Flow Rate: 1.5mL/min
Detector: 210nm
Temperature: 30°C
Injection Volume: 20μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	100	0
28	0	100
38	0	100
40	100	0
50	100	0

Ordering Information—Ultisil® F-C8

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

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

ULTISIL® HILIC SERIES HPLC COLUMN

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

Ultisil® HILIC Silica

Ultisil® HILIC silica columns are designed to retain highly polar organic molecules that cannot be retained by reversed-phase chromatography due to their high polarity. Unlike reversed-phase separation, which uses a high proportion of aqueous phase to retain polar molecules, Ultisil HILIC silica columns use highly volatile mobile phases (>80% organic phase), which is ideal for mass spectrometry response and detection sensitivity.

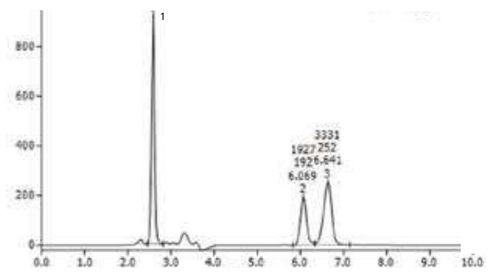
Features

- Unique chemical bonding technology provides the surface of the HILIC stationary phase with acidic, neutral, and basic characteristics.
- High chemical stability with low stationary phase loss.
- Suitable for the separation of polar drugs, peptides, amino acids, and other compounds.

Specifications

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

Glutamine (Gln)



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

Ordering Information—Ultisil® HILIC Silica

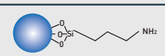
Particle Size	ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge Holder
		150	200	250	10mm length	
3μm 120 Å	4.6	H00228-21041	H00228-21042	H00228-21043	H00808-03026	00808-01101
5μm 120 Å	4.6	H00228-31041	H00228-31042	H00228-31043	H00808-04044	00808-01101
10μm 120 Å	4.6	H00228-41041	H00228-41042	H00228-41043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

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

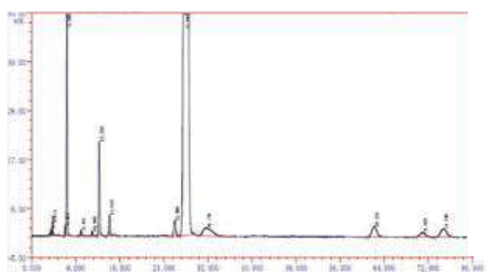
Ultisil® HILIC NH_2

Ultisil® HILIC NH_2 silica-based matrix undergoes special hydrophilic treatment, resulting in better stability and reproducibility for the separation of mixed monosaccharides compared to XB-NH_2, due to the multiple forces of weak anion exchange and hydrophilic partitioning.

Specifications

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

Alanyl Glutamine Injection



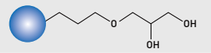
Column:	Ultisil® HILIC-NH_2, 4.6×250 mm, 5μm
Mobile Phase:	Acetonitrile/0.05 mol/L kH_2PO_3(adjust pH 4.0 with H_3PO_4) =65/35
Flow Rate:	0.7mL/min
Detector:	215nm
Temperature:	30°C
Injection Volume:	20μL
Note:	Use the mobile phase to fully activate the column before testing the sample on the column

Ordering Information—Ultisil® HILIC NH_2

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

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

Ultisil® HILIC Diol

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

Ordering Information—Ultisil® HILIC Diol

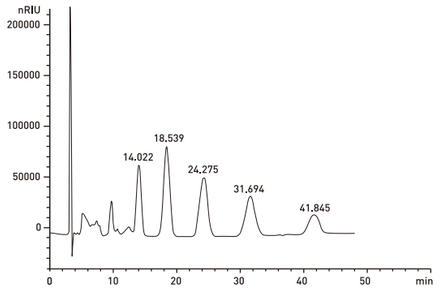
Particle Size	ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge Holder
		150	250	300	10mm length	
3μm 120 Å	4.6	H00242-21041	H00242-21042	H00242-21043	H00808-03029	00808-01101
5μm 120 Å	4.6	H00242-31041	H00242-31042	H00242-31043	H00808-04054	00808-01101

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

Ultisil® HILIC Amide

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

Fructo-oligose



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

Ordering Information—Ultisil® HILIC Amide

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

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

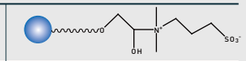
Ultisil® HILIC Amphion II

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

Features

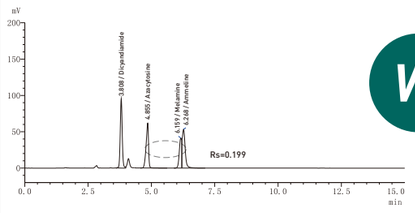
- Amphion-bonded silica stationary phase.
- Enhanced hydrophilic interaction brings higher retention for polar and hydrophilic compounds.
- Different selectivity from common HILIC packing materials.
- Simple mobile phase used for the separation of polar compounds.

Specifications

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

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

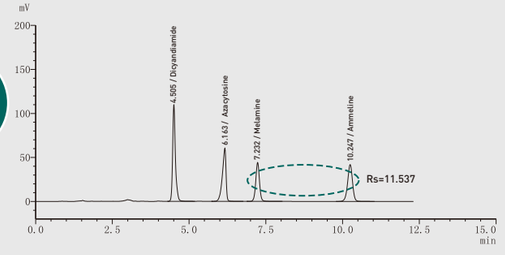
Ultisil® HILIC SiO_2, 5μm, 4.6×250mm



Mobile Phase: ACN-Water (80:20)
Detection: 240nm
Temperature: 30 C
Flow Rate: 1.0mL/min
Injection Volume: 10μL

VS

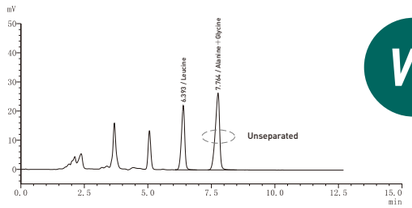
Ultisil® HILIC Amphion II, 5μm, 4.6×150mm



Mobile Phase: ACN-Water (80:20)
Detection: 240nm
Temperature: 30 C
Flow Rate: 1.0mL/min
Injection Volume: 10μL

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

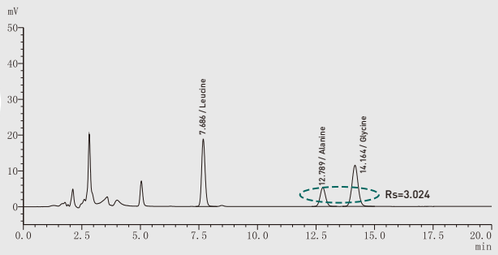
Ultisil ® HILIC SiO_2, 5μm, 4.6×150mm



Mobile Phase: ACN-Water (70:30)
Detection: 206nm
Temperature: 30 ℃
Flow Rate: 0.5mL/min
Injection Volume: 5μL

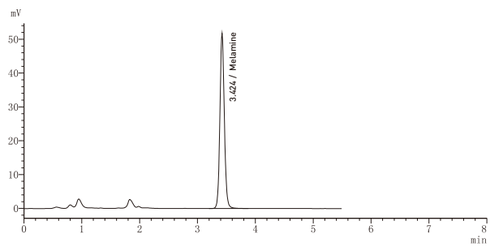
VS

Ultisil® HILIC Amphion II, 5μm, 4.6×150mm



Mobile Phase: ACN-Water (70:30)
Detection: 206nm
Temperature: 30 ℃
Flow Rate: 0.5mL/min
Injection Volume: 5μL

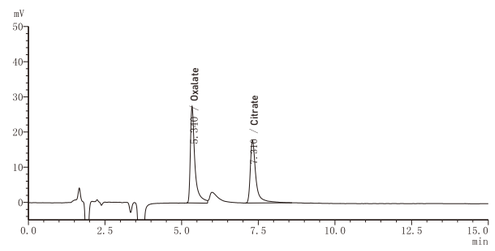
Determination of Melamine



Column: Ultisil® HILIC Amphion II, 5μm, 4.6×150mm
Mobile Phase: ACN-Water (80:20)
Flow Rate: 1.0mL/min
Detector: 240nm
Temperature: 30°C
Injection Volume: 10μL
Target: Melamine

Rt	Plates	Tailing Factor
3.424	8087	1.094

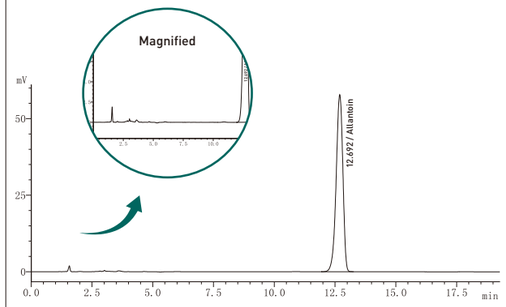
Separation of Citrate and Oxalate



Column: Ultisil® HILIC Amphion II, 5μm, 4.6×150mm
Mobile Phase: ACN-200mM Ammonium acetate(70:30)
Flow Rate: 1.0mL/min
Detector: 220nm
Temperature: 30°C
Injection Volume: 20μL

Compound	Rt	Plates	Tailing Factor
Oxalate	5.340	7540	--
Citrate	7.310	9487	7.214

Determation of Allantoin



Column: Ultisil® HILIC Amphion II, 5μm, 4.6×250mm
Mobile Phase: ACN-Water (90:10)
Flow Rate: 1.0mL/min
Detector: 224nm
Temperature: 30°C
Injection Volume: 10μL

Rt	Plates	Tailing Factor
12.692	10196	0.892

Notes

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

1) Shifts of retention time may occur, if not sufficiently equilibrated.
2) Acetonitrile is the most common mobile phase solvent in HILIC mode. Other water-soluble polar organic solvents can also be used as mobile phases. The comparison of elution strength is:THF<Acetone<Acetonitrile<Isopropanol<Ethanol<-Methanol<Water.
3) Long-period equilibration required, after using buffer salt mobile phase (like ammonium formate, ammonium acetate etc.) and buffer salt being flushed off.
4) After use, flush off the buffer salt in the column and store in 100% acetonitrile solvent.

Ordering Information—Ultisil® HILIC Amphion II

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

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

ULTISIL® MIXED MODE PHASE HPLC COLUMN

Mixed Mode Phase, as a novel packing material, exhibits dual mechanisms of hydrophobic and ion exchange actions, providing distinct selectivity compared to traditional single-bonded phases. It is considered one of the trends in the future development of the liquid chromatography column industry.

Ultisil® MM C18/SCX

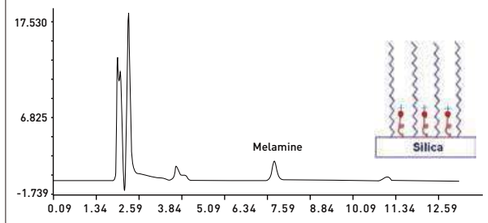
Features

- Utilizes high-purity spherical porous silica gel as the matrix.
- C18 and SCX mixed bonding ratio is 4:1.
- Applicable for separating and analyzing hydrophobic and ionized compounds.
- Ideal for the analysis of unknown compounds, particularly in metabolite research.

Specifications

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

Analysis of Melamine



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

Ordering Information—Ultisil® MM C18/SCX

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

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

Ultisil® MM SCX/C18

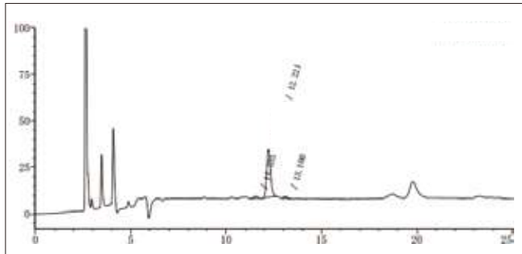
Features

- Utilizes high-purity spherical porous silica gel as the matrix.
- SCX and C18 mixed bonding ratio is 4:1.
- Applicable for separating and analyzing hydrophobic and ionized compounds.
- Ideal for the analysis of unknown compounds, particularly in metabolite research.

Specifications

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

Stachydrine Hydrochloride



Column:	Ultisil® MM SCX/C18, 4.6×250mm,5μm
Mobile Phase:	Triethylamine -0.025mol/L potassium dihydrogen phosphate solution
Flow Rate:	1.0mL/min
Detector:	192nm
Temperature:	35°C
Injection Volume:	10μL

Ordering Information—Ultisil® MM SCX/C18

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	75	100	150	200	250	300	10mm length	
5μm 120 Å	2.1	H00270-31009	H00270-31010	H00270-31011	H00270-31012	H00270-31014	H00270-31015	H00270-31016	-	H00808-24032	00808-01107
	3.0	H00270-31018	H00270-31019	H00270-31020	H00270-31021	H00270-31023	H00270-31024	H00270-31025	-	H00808-24032	00808-01107
	4.0	H00270-31027	H00270-31028	H00270-31029	H00270-31030	H00270-31032	H00270-31033	H00270-31034	H00270-31035	H00808-04032	00808-01101
	4.6	H00270-31036	H00270-31037	H00270-31038	H00270-31039	H00270-31041	H00270-31042	H00270-31043	H00270-31044	H00808-04032	00808-01101

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

Ultisil® MM NH_2/CN

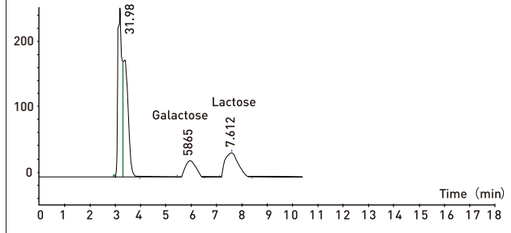
Features

- Possesses characteristics of HILIC chromatography columns.
- NH_2 and CN mixed bonding.
- Utilizes high-purity spherical porous silica gel as the matrix.
- Suitable for the analysis and separation of similar sugar compounds that are challenging to separate.

Specifications

pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	N/A
USP List	L18
Endcapped	N/A

Separation of Lactose and Galactose



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

Ordering Information—Ultisil® MM NH_2/CN

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

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

ULTISIL® SPECIALIZED C18 HPLC COLUMN

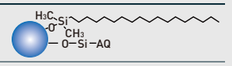
Ultisil® AQ-C18-The most widely used column in food industry

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

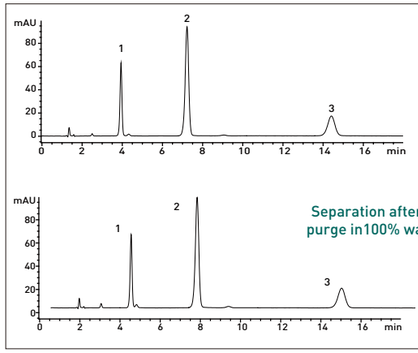
Features

- 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.

Specifications

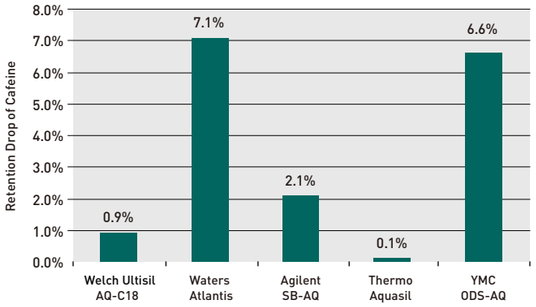
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L1/L96
Endcapped	Yes

Phase collapse research

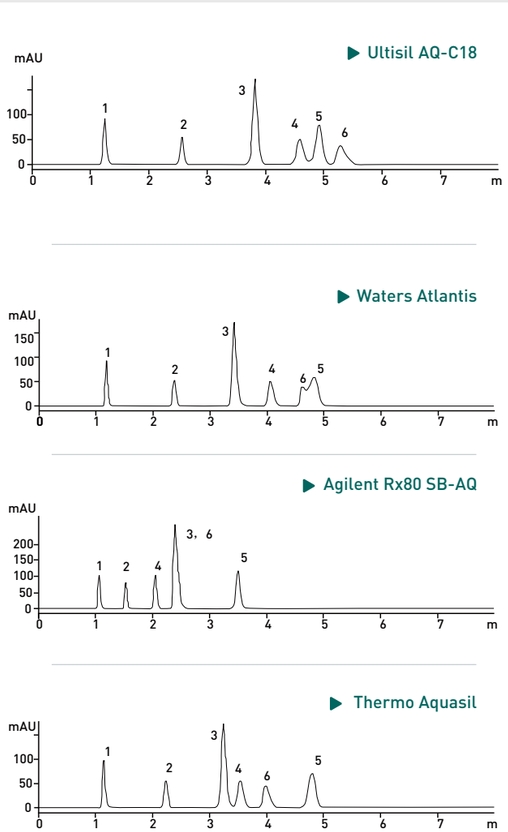


Column:	Ultisil® AQ-C18, 4.6×100mm, 5μm
Mobile Phase:	Acetonitrile/50mM phosphate(pH 3.5)=10/90
Flow Rate:	1.0 mL/min
Detector:	215nm
Temperature:	25°C
Samples:	1) Theophylline 2) Caffeine 3) Phenol

Phase Collapse Comparison with Other Brands



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



Column:	4.6×100mm, 5μm
Mobile Phase:	50mM phosphate, pH 2.5
Flow Rate:	1.0mL/min
Detector:	210nm
Temperature:	25°C
Samples:	1) Oxalic acid 2) Lactic acid 3) Maleic acid 4) Citric acid 5) Fumaric acid 6) Succinic acid

XB-C18

1. Suitable for separation of most pharmaceuticals, environment and chemical compounds

2. Excellent peak shape for basic and polar samples

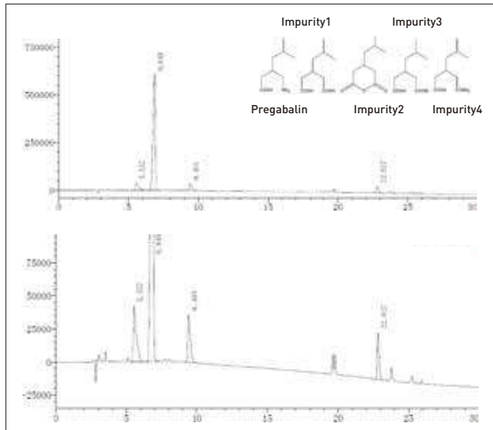
How to choose XB-C18 and AQ-C18?

AQ-C18

1. Suitable for water soluble strong polar samples, such as traditional Chinese medicine ingredients, food, beverage, organic acids, peptides, nucleosides and water solution vitamins

2. Best choice for mobile phase that contains <20% organic content

Pregabalin

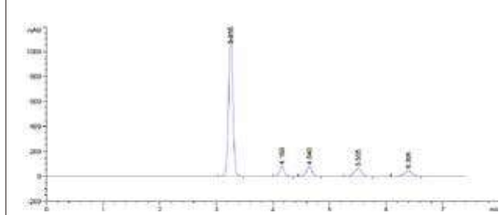


Column:	Ultisil® AQ-C18, 4.6×250mm, 5μm
Mobile Phase:	A: 40mm $(NH_4)_2HPO_4$/methanol=80/20 B: acetonitrile/methanol=90/10
Flow Rate:	1.0mL/min
Detector:	210nm
Temperature:	35°C
Injection Volume:	20μL

Gradient Program:

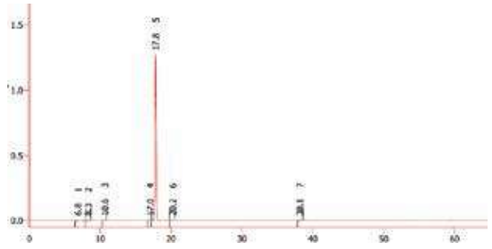
Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	98	2
5	98	2
30	50	50
31	50	50

NMN(nicotinamide mononucleotide)



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

Vilazodone hydrochloride



Column: Ultisil® AQ-C18, 4.6×250mm, 5μm
Mobile Phase: A: 0.025mol/L K_2HPO_4,adjust pH6.0 with H_3PO_4
B: acetonitrile
Flow Rate: 1.0mL/min
Detector: 240nm
Temperature: 40°C
Injection Volume: 20μL

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	75	25
3	75	25
25	60	40
40	35	65
50	35	65
50.1	75	25
65	75	25

Ordering Information—Ultisil® AQ-C18

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

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

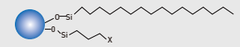
Ultisil® ALK-C18

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

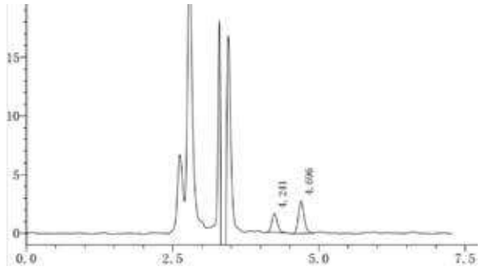
Features

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

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L1
Endcapped	Yes

AspartanL-aspartyl-L-phenylalanine



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

Ordering Information—Ultisil® ALK-C18

Particle Size	ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge Holder
		150	200	250	10mm length	
5μm	4.6	H00253-31041	H00228-21042	H00253-31043	H00808-04033	00808-01101

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

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

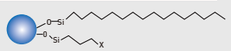
Ultisil® ODS-3-High Water-resistance Octadecyl HPLC Column

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

Features

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

Specifications

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

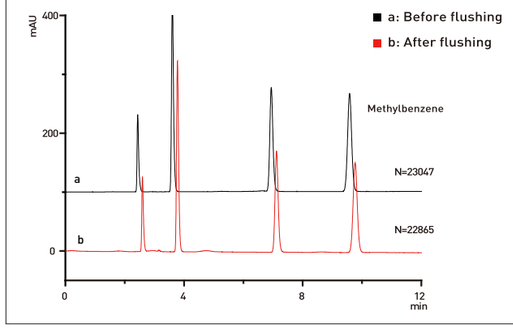
Tests of 48-hour Pure Water Resistance

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

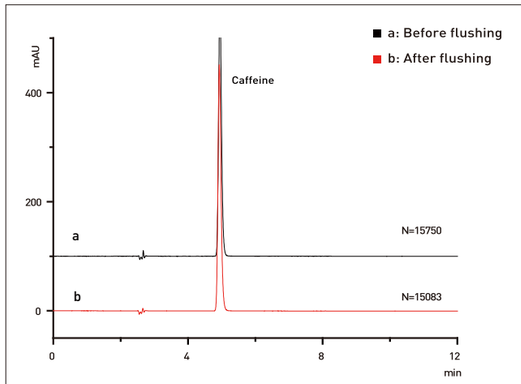
Temperature: 30°C

Flow Rate: 1.0mL/min

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

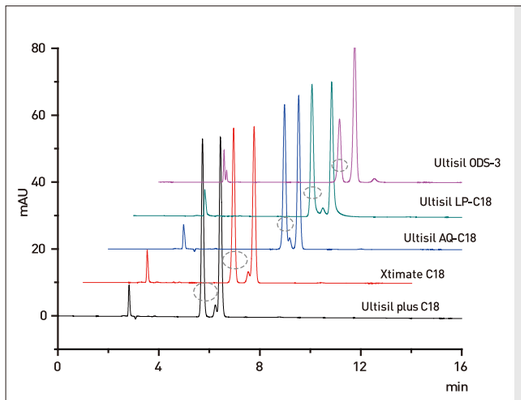


Column:	Ultisil® ODS-3, 4.6×250mm, 5μm
Mobile Phase:	Methanol/Water =75/25
Flow Rate:	1.0mL/min
Detector:	254nm
Temperature:	30°C
Injection Volume:	20μL
Test Requirement:	N>20000，T (0.90-1.10)



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

Cefprozil Capsule



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

Ordering Information —Ultisil® ODS-3

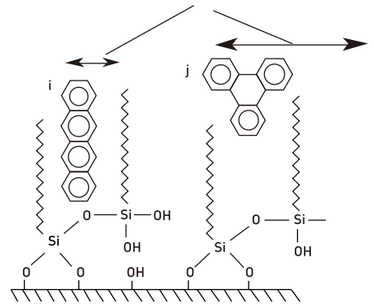
Particle Size	ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge Holder
		150	200	250	10mm length	
3μm	4.6	H00275-21041	H00275-21042	H00275-21043	H00808-03031	00808-01101
5μm	4.6	H00275-31041	H00275-31042	H00275-31043	H00808-04043	00808-01101

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

Ultisil® XS-C18

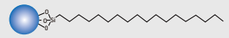
Ultisil® XS-C18 is developed with high column efficiency, high loading and high capacity. It has excellent steric hindrance selectivity, especially shape selectivity.
There are two patterns of Steric Hindrance: Steric Exclusion and Shape Selectivity. Ultisil® XS-C18 uses unique multi-bonding technique, with high bonding density and short distance between ligands, providing better shape selectivity.

Minimum Cross-Section of Solute

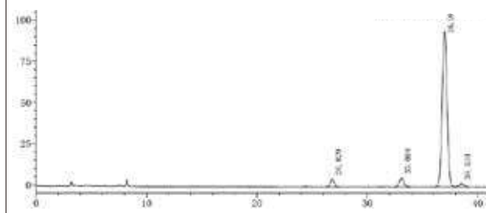


Compound i has more narrow size, with smaller cross-sectional area, which allows it go into the ligands and provids better retention. Compound j has wider size, with bigger cross-sectional area, which makes it rejected out by stationary phase, providing shorter retention time. Thus are two compouds separated.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

Specifications

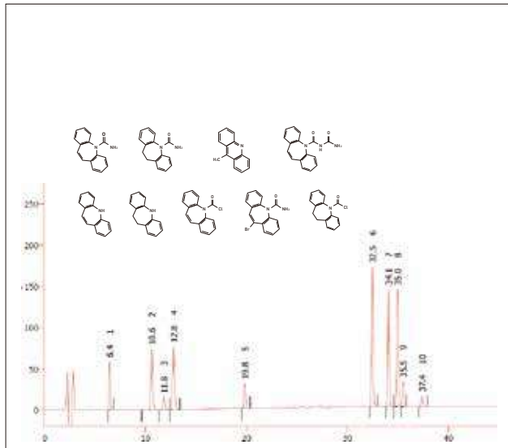
Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm,5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	23(120Å)
USP List	L1
Endcapped	Yes

Vitamin D3 and isomers



Column: Ultisil® XS-C18, 4.6×250mm, 3μm
Mobile Phase: Water/methanol=5/95
Flow Rate: 1.0mL/min
Detector: 264nm
Temperature: 30°C
Injection Volume: 20μL
Samples: 1) Previtamin D_3 2) Trans vitamin D_3 3) vitamin D_3 4) tachysterol D_3

Carbamazepine

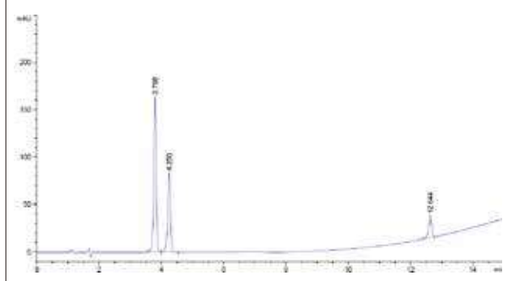


Column: Ultisil® XS-C18, 4.6×250mm, 5μm
Mobile Phase: A: water/triethylamine/formic acid=1000/0.5/0.5
B: methanol/formic acid=1000/0.25
Flow Rate: 1.0mL/min
Detector: 230nm
Temperature: 30°C
Injection Volume: 10μL
Samples in order: 1) impurity B 2) carbamazepine 3) impurity A 4) impurity C 5) impurity G 6) impurity D 7) impurity F 8) iminodibenzylcarbonyl 9) chloride 10) impurity F 11) impurity E

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	65	35
10	65	35
30	40	60
45	40	60
46	65	35

Isocyanate mononitrate



Column: Ultisil® XS-C18, 4.6×150mm, 5μm
Mobile Phase: A: water B: methanol
Flow Rate: 1.0mL/min
Detector: 210nm
Temperature: 35°C
Injection Volume: 10μL
Samples in order: 1) 2-isosorbide mononitrate 2) isocyanate 3) mononitrate 4) isocyanate nitrate

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	75	25
5	75	25
15	30	70
15.1	75	25

Ordering Information—Ultisil® XS-C18

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

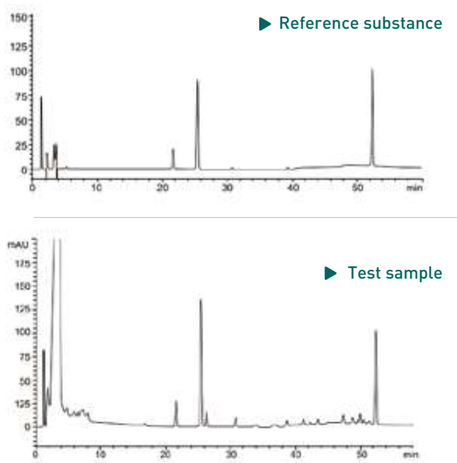
Ultisil® PG-C18

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

Specifications

pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	260(150Å)
Carbon Loading(%)	10(150Å)
USP List	L1
Endcapped	Yes

Panax Notoginseng Saponins



Column: Ultisil® PG-C18, 4.6×250mm, 5μm
Mobile Phase: A: water B: acetonitrile
Flow Rate: 1.0 ml/min
Detector: 203nm
Temperature: 25°C

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	81	19
12	81	19
60	64	36

Ordering Information—Ultisil® PG-C18

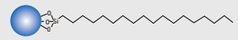
P/N	Description
H00276-31743	Ultisil® PG-C18, 4.6x250mm, 5μm

ULTISIL® SPECIALIZED HPLC COLUMN

Ultisil® PAH

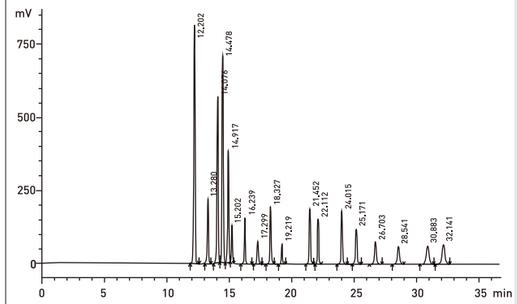
Ultisil® PAH Column is a special column recently designed by Welch for the separation of PAHs in EPA method 610. PAHs (Polycyclic Aromatic Hydrocarbon) are hydrocarbons with two or more benzene rings, and considered major pollutants. Therefore, the analysis of these potentially carcinogenic compounds in water, air, soil and food takes high priority. Most of PAHs do not exist alone. Substances that may contain PAHs include charcoal, crude oil, creosote, tar, drugs, dyes, plastic, rubber, pesticide, lube, release agent, electrolyte, mineral oil, pitch, insecticide, and bactericide, etc

Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	22(120Å)
USP List	L1/L118
Endcapped	Yes

Separation of 18 PAHs in EPA method 610

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



Column: Ultisil® PAH, 4.6×250 mm, 5μm
Mobile Phase: A: water B: acetonitrile
Flow Rate: 1.5mL/min
Detector: 220nm
Temperature: 25°C
Injection Volume: 10μL

Mixed Standards:

1) Naphthalene 2) Acenaphthylene 3) 1- Methyl benzene,
4) 2- Methyl benzene 5) Acenaphthene 6) Fluorene 7) Phenanthrene
8) Anthracene 9) Fluoranthene 10) Pyrene 11) Benzo(a)anthracene
12) Chrysene 13) Benzo(b)fluoranthene 14) Benzo(k)fluoranthene
15) Benzo(a)pyrene 16) Indeno(1,2,3-cd)pyrene
17) Dibenzo(a,h)anthracene 18) Benzo(g,hi)perylene

Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	60	40
20	0	100
33	0	100
34	60	40

Ordering Information—Ultisil® PAH

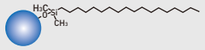
Particle Size	ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge Holder
		150	200	250	10mm length	
3μm 120Å	4.6	H00210-21041	H00210-21042	H00210-21043	H00808-03012	00808-01101
5μm 120Å	4.6	H00210-31041	H00210-31042	H00210-31043	H00808-04010	00808-01101

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

Ultisil® Amino Acid

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

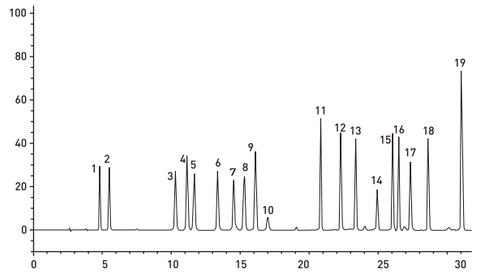
Specifications

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	17(120Å)
USP List	L1
Endcapped	Yes

Ultisil® Amino Acid Method Package

- Ultisil® Amino Acid Column (5μm, 4.6×250mm)×1
- Amino Acid Standards, 1 mL×2
- Derivatization reagent A×1
- Derivatization reagent B×1
- Derivatization reagent diluent, 20mL×6
- Ultisil® Amino Acid method brochure×1

Separation of 18 Amino Acids



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

Ordering Information—Ultisil® Amino Acids

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

Ultisil® Amino Acid Plus

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

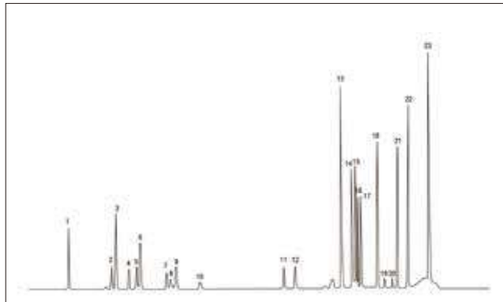
Specifications

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

Features

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

Separation of 23 Amino Acids



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

Ordering Information—Ultisil® Amino Acid Plus

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

ULTISIL® OAA(Organic Acids)

Ultisil® OAA is a dedicated reversed-phase column developed by Welch Materials for the detection of water-soluble organic acids. Compared with the conventional reversed- phase C18 column, OAA column has better performance and higher resolution with more uniform peaks. For water-soluble organic acids with larger polarity, if the proportion of organic phase reduces to 5% on C18 column, effective retention may not be achieved. Further reduction of the organic phase or even 100% of the aqueous phase, is prone to cause phase collapse. With optimized bonding technology and the surface hydrophilic treatment of packing materials, Ultisil® OAA column can greatly improve the column's resistance to aqueous phase and the peak shape of organic acid compounds.

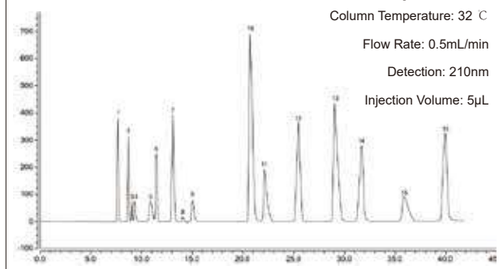
Specifications

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

Features

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

Separation of 16 kinds of organic acids



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

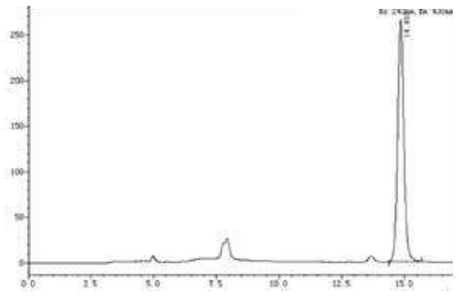
Ordering Information—Ultisil® OAA(Organic Acids)

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

Ultisil® Zn Column

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

Determination of vitamin K1 in spinach



Column:	Ultisil® AQ-C18, 4.6×250mm, 5μm Ultisil® Zn, 4.6×50mm
Mobile Phase:	900mL methanol,100mL tetrahydrofuran, 0.3mL peracetic acid. Add 1.5g zinc oxide and 0.5g anhydrous sodium acetate after mixing.
Flow Rate:	1.0mL/min
Detector:	243 nm/430nm
Temperature:	30°C
Injection Volume:	10μL

Ordering Information—Ultisil® Zn Column

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

Ultisil® Lead Oxide Column

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

Ordering Information—Ultisil® Lead Oxide Column

Phase	P/N	Specification	Phase	P/N	Specification
25%PbO_2	H00238-51036	4.6×35 mm	50%PbO_2	H00239-51036	4.6×35 mm
	H00238-51037	4.6×50 mm		H00239-51037	4.6×50 mm
	H00238-51028	4.0×50 mm		H00239-51028	4.0×50 mm

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

03.

XTIMATE® SERIES HPLC COLUMN

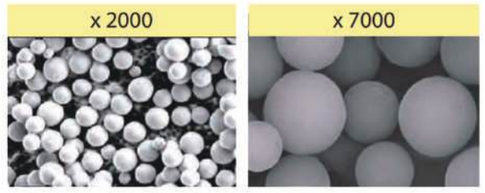
XTIMATE® SERIES HPLC COLUMN

— Next generation beyond mid-range priced Ultisil® series

Xtimate® HPLC column derives its outstanding performance from a special hybrid particle based technique, which coats a unique 2nm organic/inorganic polymer layer on the silica surface, so that the pH range is extended to 1.0-12.5. Xtimate® column is designed for HPLC method development. Regardless of the types of mobile phase or high temperature, Xtimate® HPLC column always has stable performance and long lifetime.

Features

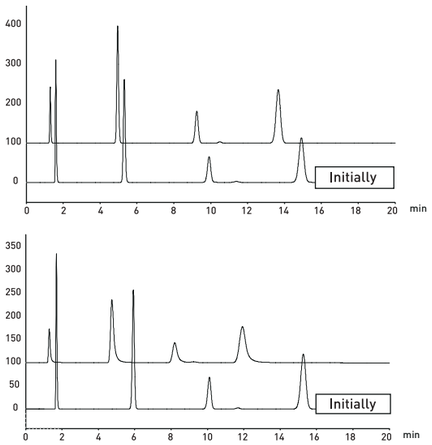
- EXtra pH range: wide pH range from 1.0 to 12.5, excellent peak shape for strong bases.
- EXtra column lifetime: 5 times of similar product such as Gemini.
- EXtra performance: column efficiency of 5μm columns is as high as 90000/m, 2-3 times of that of Xterra.
- EXtra care from Welch: enjoy excellent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



SEM of Hybrid particle

Hybrid Particles Based Xtimate Technology

Comparison of Peak Shape After Soaking In Base

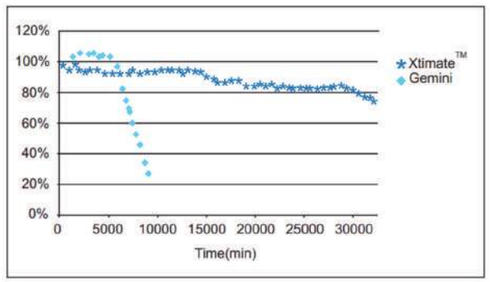


Column:	Xtimate® C18, 5μm, 150×4.6mm
Mobile Phase:	CH_3CN/0.01N-NaOHaq.(pH=12)=30/70
Flow Rate:	1.0ml/min
Temperature:	30°C
Soak Time:	4hours

Column:	Ultisil® XB-C18, 5μm, 150×4.6mm
Mobile Phase:	CH_3OH/H_2O=60/40
Flow Rate:	1.0ml/min
Temperature:	40°C
Soak Time:	UV 254nm
Samples:	1)Uracil 2)Methyl benzoate 3)Toluence 4)Naphthalene

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

Lifetime Test Comparison: 5 Times Longer Than Gemini



Column:	Xtimate® C18, 5μm, 150×4.6mm Gemini C18, 5μm, 150×4.6mm
Mobile Phase:	A: 10mM Ammonium Bicarbonate pH 10.5 B: 90:10 Acetonitrile/buffer
Flow Rate:	1.0mL/min
Detector:	UV 254nm
Temperature:	50°C
Samples:	1) Uracil 2) Methyl benzoate 3)Toluence 4) Naphthalene
Gradient Program:	0% to 100% B in 10min. 100% B for 7min. 0% B for 3min.

Unprecedented Peak Shape

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

Figure 1:

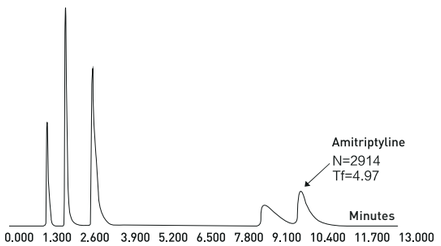


Figure 2:

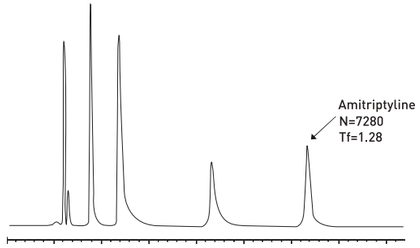
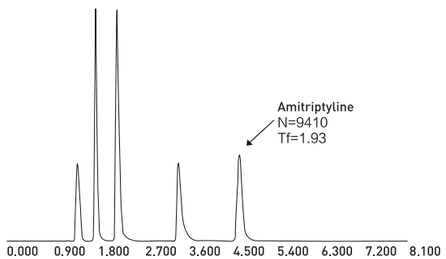


Figure 3:



Notes:

Figure 1: The detection of amitriptyline by poor endcapping product

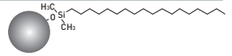
Figure 2: The detection of amitriptyline by Xtimate® C18

Figure 3: The detection of Amitriptyline by Symmetry C18

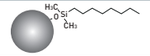
XTIMATE® HYBRID SERIES HPLC COLUMN

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

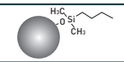
Xtimate® C18

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

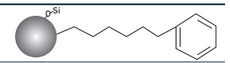
Xtimate® C8

Structural Formula	
pH Range	1.0-12.5
Particle Size	3μm, 5μm, 10μm
Surface Area(m^2/g)	320(120Å),100(300Å)
Carbon Loading(%)	10(120Å), 5(300Å)
USP List	L7
Endcapped	Yes

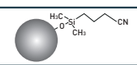
Xtimate® C4

Structural Formula	
pH Range	1.0-12.5
Particle Size	3μm, 5μm
Surface Area(m^2/g)	320(120Å), 100(300Å)
Carbon Loading(%)	8(120Å), 4(300Å)
USP List	L26
Endcapped	Yes

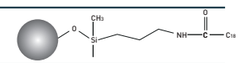
Xtimate® Phenyl-Hexyl

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

Xtimate® CN

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

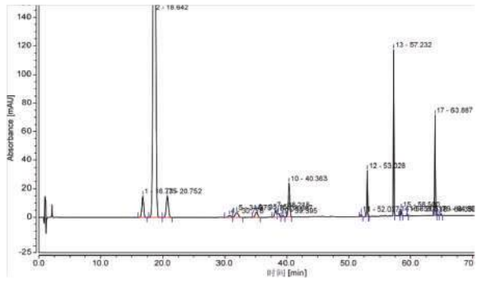
Xtimate® Polar-RP

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

Xtimate® NH_2

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

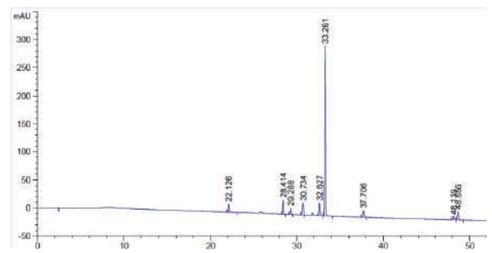
Rosuvastatin Calcium



Column: Xtimate® C18, 3.0×150mm, 3μm
Mobile Phase: A: 1% TFA/acetonitrile/water=1/29/70
B: 1% TFA/acetonitrile/water=1/75/24
Flow Rate: 0.75mL/min
Detector: 242nm
Temperature: 40°C
Injection Volume: 10μL
Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0-30	100	0
30-50	100-50	0-40
50-60	60-0	40-100
60-70	0	100

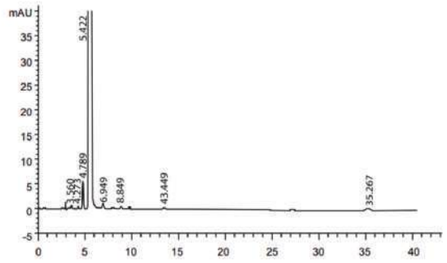
Cangrelor



Column: Xtimate® C18, 4.6×250mm, 5μm
Mobile Phase: A: 0.05 mol/L K_2HPO_4(pH 8.5)
B: acetonitrile
Flow Rate: 1.0mL/min
Detector: 242nm
Temperature: 25°C
Injection Volume: 5μL
Gradient Program:

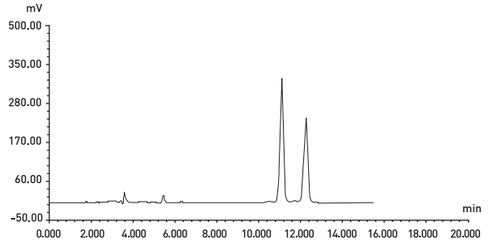
Time(min)	A(%)	B(%)	Time(min)	A(%)	B(%)
0	95	5	60	35	65
3	95	5	65	35	65
35	67	33	66	95	5
50	60	40	75	95	5

Valaciclovir Hydrochloride



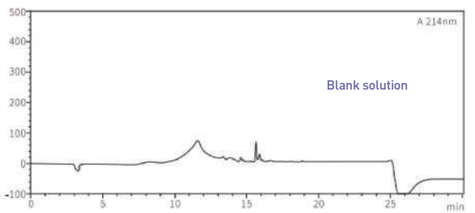
Column: Xtimate® Phenyl-Hexyl, 250×4.6mm, 5μm
Mobile Phase: Methanol/0.01mol/L KH_2PO_4(pH3.0)=15/85
Flow Rate: 1.0mL/min
Detector: 251nm
Temperature: 35°C
Injection Volume: 20μL

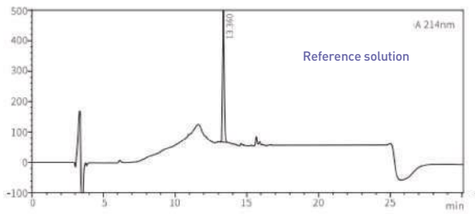
Omeprazole



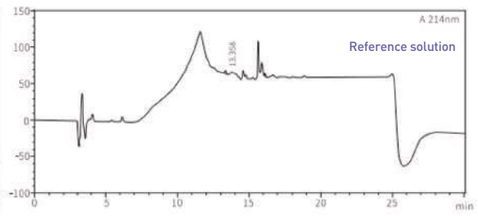
Column: Xtimate® C8, 250×4.6mm, 5μm
Mobile Phase: 10mmoL/L Na_2HPO_4(pH7.4)/Acetonitrile=70/30
Flow Rate: 1.0mL/min
Detector: 280nm
Temperature: Ambient
Injection Volume: 20μL

Interleukin-2





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



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

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

Ordering Information—Xtimate® C18

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

Ordering Information—Xtimate® C8

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

Ordering Information—Xtimate® Phenyl-Hexyl

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

Ordering Information—Xtimate® C4

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

Ordering Information—Xtimate® CN

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	50	100	150	200	250	300	10mm length	
5μm	2.1	00105-21009	00105-21010	00105-21010	00105-21012	00105-21014	00105-21015	00105-21016	-	00808-24105	00808-01107
	3.0	00105-21018	00105-21019	00105-21019	00105-21021	00105-21023	00105-21024	00105-21025	-	00808-24105	00808-01107
	4.0	00105-21027	00105-21028	00105-21028	00105-21030	00105-21032	00105-21033	00105-21034	00105-21035	00808-04105	00808-01101
	4.6	00105-21036	00105-21037	00105-21037	00105-21039	00105-21041	00105-21042	00105-21043	00105-21044	00808-04105	00808-01101

Ordering Information—Xtimate® Polar-RP

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

Ordering Information—Xtimate® NH_2

Particle Size	ID (mm)	Column Length (mm)								Guard Cartridge	Cartridge Holder
		30	50	50	100	150	200	250	300	10mm length	
5μm	2.1	00103-21009	00103-21010	00103-21010	00103-21012	00103-21014	00103-21015	00103-21016	-	00808-24104	00808-01107
	3.0	00103-21018	00103-21019	00103-21019	00103-21021	00103-21023	00103-21024	00103-21025	-	00808-24104	00808-01107
	4.0	00103-21027	00103-21028	00103-21028	00103-21030	00103-21032	00103-21033	00103-21034	00103-21035	00808-04104	00808-01101
	4.6	00103-21036	00103-21037	00103-21037	00103-21039	00103-21041	00103-21042	00103-21043	00103-21044	00808-04104	00808-01101

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

XTIMATE® POLYMER SERIES HPLC COLUMN

Xtimate® Sugar-H is a special column designed for Ribavirin. Packed with H^+ modified low-linking polystyrene-divinybenzene spheres (PS-DVB), this column can be applied for the analysis of organic acids and mixed alcohols.
Xtimate® Sugar-Ca is a strong cation exchange column packed with Ca^{2+} modified PS-DVB resins, can be used for the analysis of sugar products.
Xtimate® PS/DVB is based on polystyrene-divinybenzene. This column can be used in extreme conditions(pH 1-14).

Xtimate® Sugar-H

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

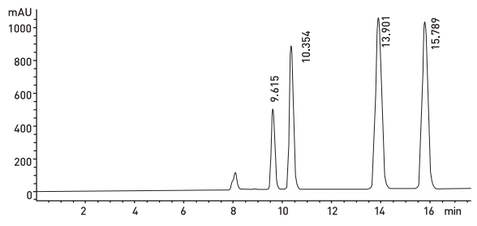
Xtimate® Sugar-Ca

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

Xtimate® PS/DVB

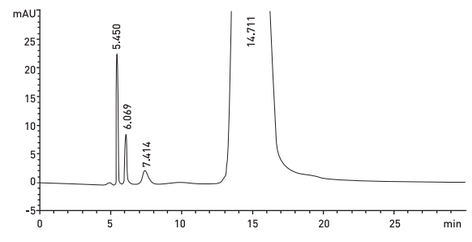
pH Range	1.0-14.0	USP List	L21
Particle Size	5μm, 10μm	Max. Temp.	75°C
Surface Area(m^2/g)	450(300Å)		

Separation of Organic Acids



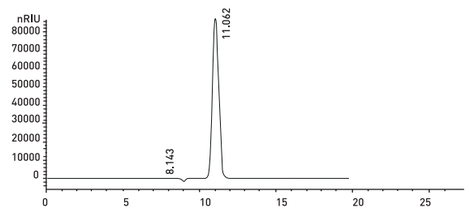
Column: Xtimate® Sugar-H, 5μm, 300×7.8mm
Mobile Phase: H_2SO_4 water solution (pH 2.0)
Flow Rate: 0.5mL/min
Detector: RID
Temperature: 60°C
Injection Volume: 20μL
Organic Acids: Maleic acid, L-malic acid, fumaric acid, sodium acetate trihydrate

Ketophenylalanine Calcium



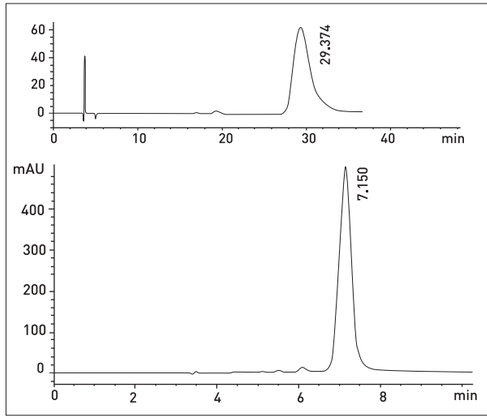
Column: Xtimate® Sugar-H, 5μm, 300×7.8mm
Mobile Phase: 0.025mol/L H_2SO_4 water solution
Flow Rate: 0.8mL/min
Detector: 205nm
Temperature: 20°C
Injection Volume: 20μL

Xylose



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

Doxycycline HCl



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

Notes: Be sensitive to column temperature

Ordering Information—Xtimate® PS/DVB

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

Ordering Information—Xtimate® Sugar-H

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

Ordering Information—Xtimate® Sugar-Ca

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

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

XTIMATE® SEC SERIES HPLC COLUMN

Xtimate® SEC

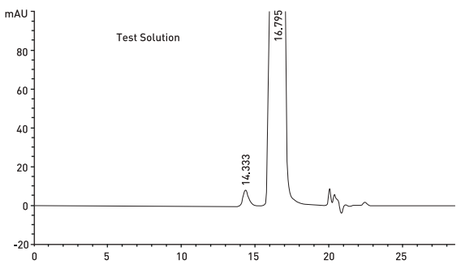
Xtimate® SEC (size exclusion chromatography), also known as "global protein hydrophilic modified silica column", is made from ultra-high purity, stable silica bonded with hydrophilic polymer and diol functional groups. This double bonding mechanism, which makes possible of nonspecific adsorption of high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

Features

- Ultra-high purity, stable silica bonded with hydrophilic polymer and diol functional groups.
- 5μm or 3μm silica microsphere, high separation efficiency.
- 120Å minibore columns fit for analysis of polar compounds such as cephalosporins; 300Å ones fit for biomacromolecules such as proteins and polypeptides.
- Seven pore sizes: 120Å, 200Å, 300Å, 500Å, 700Å, 1000Å and 2000Å.

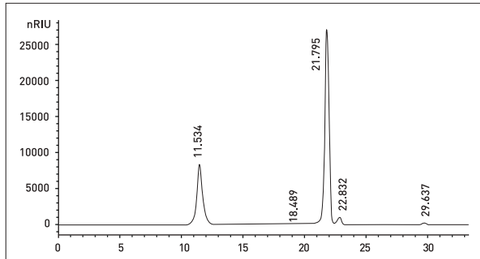
Phase	SEC-120	SEC-200	SEC-300	SEC-500	SEC-700	SEC-1000	SEC-2000
Materials	Silica particles bonding hydrophilic polymer						
Particle Size (μm)	3, 5	5	3, 5	5	5	5	5
Pore Size(Å)	120	300	300	500	700	1,000	1,000
Protein Molecule Range	500-150,000	500-200,000	5,000-1,250,000	10,000-3,500,000	15,000-5,000,000	50,000-7,500,000	>10,000,000
Soluble Polymer Molecule Mass Range	500-25,000	500-50,000	1,000-100,000	2,000-500,000	2,500-500,000	5,000-1,500,000	50,000-2,500,000
Maximum Pressure (psi)	~4,500	~4,500	~3,500	~3,000	~3,000	~3,000	~3,000
pH Range	2-7.5 (7.5-9.5 for short time)						
Range of Salt Concentration	20mM~2.0M						
Highest Temperature(°C)	~80°C						
Mobile Phase	Aqueous or organic phase						

Sex Hormone in Cosmetics



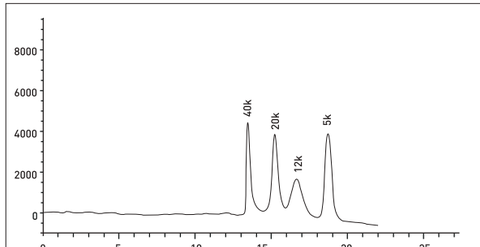
Column: Xtimate® SEC-120, 3μm, 300×7.8mm
Mobile Phase: Acetic acid/acetonitrile/0.1%rginine=15/20/65
Flow Rate: 0.5mL/min
Detector: 276nm
Temperature: 35°C
Injection Volume: 100μL

Iron Dextran



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

Analysis of Molecular Weight of Polyethylene Glycol



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

Ordering Information—Xtimate® SEC

Bonded Phase	Particle Size	ID (mm)	Column Length (mm)	
			250	300
SEC-120	3μm	4.6	00237-21043	00237-21044
		7.8	00237-21051	00237-21052
	5μm	4.6	00237-31043	00237-31044
		7.8	00237-31051	00237-31052
SEC-200	5μm	4.6	00237-32043	00237-32044
		7.8	00237-32051	00237-32052
SEC-300	3μm	4.6	00237-23043	00237-23044
		7.8	00237-23051	00237-23052
	5μm	4.6	00237-33043	00237-33044
		7.8	00237-33051	00237-33052
SEC-700	5μm	4.6	00237-34043	00237-34044
		7.8	00237-34051	00237-34052
SEC-1000	5μm	4.6	00237-35043	00237-35044
		7.8	00237-35051	00237-35052
SEC-2000	5μm	4.6	00237-37043	00237-37044
		7.8	00237-37051	00237-37052

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

Xtimate® Bio SEC

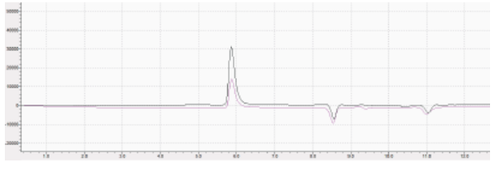
Xtimate® Bio SEC column is a size exclusion chromatography column with ultra-pure silica gel as the matrix, and its stationary phase is a hydrophilic high molecular weight polymer with uniform nano-thickness, bonded evenly on the surface of ultra-pure silica gel microspheres. Welch adopts unique surface modification technology to ensure the complete and uniform bonding of polymer nano-layers on the silica gel surface, greatly covering the silica gel surface, reducing non-specific adsorption of biological samples in the silica gel filler, while possessing good stability and batch reproducibility. The main application fields include biomolecules (such as proteins, nucleic acids, peptides, oligonucleotides), bacteria, viruses, etc.

Features

- The stationary phase consists of hydrophilic high molecular weight polymer with uniform nano-thickness bonded evenly on the surface of ultra-pure silica gel microspheres.
- Available in 5μm and 3μm silica gel microspheres to meet high-throughput testing requirements.
- Products with different pore size parameters are available to meet various needs for separation and analysis of biomolecules.
- Minimal non-specific adsorption of biomolecular samples.
- Excellent stability and good reproducibility between batches.

Phase	Bio SEC-100	Bio SEC-120	Bio SEC-150	Bio SEC-200	Bio SEC-300	Bio SEC-1000
Materials	Surface-bonded hydrophilic polymer on silica gel microspheres					
Particle Size (μm)	3μm, 5μm					
Pore Size(Å)	100	120	150	200	300	1,000
Protein Molecule Range	100-100,000	500-150,000	500-200,000	1,000-500,000	5,000-1,250,000	50,000-7,500,000
Pressure Tolerance	100 bar (5μm); 200 bar (3μm)					
pH Range	2-8					
column ID	4.6×300mm; 7.8×300mm					
Flow Rate	0.1 ~ 0.4mL/min (4.6mm inner diameter); 0.3~1.0mL/min (7.8mm inner diameter)					
Temp. Range	5-60 ℃					

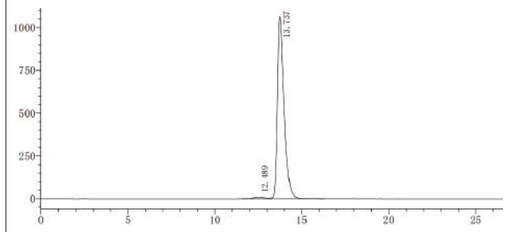
Separation and Detection of Bovine Serum Albumin



Black:Welch Xtimate Bio SEC-120 Red:SEC columns from a manufacturer

Column: Xtimate® Bio SEC-120, 5μm, 4.6×300mm
Mobile Phase: 150mM Phosphate buffer (pH 6.8)
Flow Rate: 0.3mL/min
Detector: 215nm
Temperature: 25°C
Injection Volume: 10μL
Sample concentration: 50μg/mL

Separation and Detection of Monoclonal Antibody Samples



Peak Number	Retention Time	Area	Height	Theoretical Plates Numbere	Tailing Factor	Resolution (usp)
1	12.489	453603	9505	1454	-	-
2	13.737	28930016	1065356	6197	1.544	1.243
Total		29383619	1074861			

Column: Xtimate® Bio SEC-300, 5μm, 4.6×300mm
Mobile Phase: 150mM Phosphate buffer+300mM sodium chloride buffer
Flow Rate: 0.2mL/min
Detector: 280nm
Temperature: 25°C
Injection Volume: 10μL
Sample concentration: Stoste

Ordering Information—Xtimate® Bio SEC

Bonded Phase	Particle Size	ID (mm)	Column Length (mm)
			300
Bio SEC-100	5μm	4.6	00289-46044
		7.8	00289-46052
Bio SEC-120	5μm	4.6	00289-31044
		7.8	00289-31052
Bio SEC-150	5μm	4.6	00289-47044
		7.8	00289-47052
Bio SEC-200	5μm	4.6	00289-32044
		7.8	00289-32052
Bio SEC-300	3μm	4.6	00289-23044
		7.8	00289-23052
	5μm	4.6	00289-33044
		7.8	00289-33052
Bio SEC-1000	5μm	4.6	00289-35044
		7.8	00289-35052

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

Xtimate® PEG-SEC

Xtimate® PEG-SEC columns represent the continuous innovation and breakthroughs achieved by the R&D team at Welch Materials in the field of surface modification technology of silica gel. They utilize a unique organic-inorganic hybrid bonding process, bonding hydrophilic polymer and hydrophilic polyethylene glycol (PEG) functional groups onto the surface of silica spheres. This design combines the high column efficiency and mechanical strength of silica gel matrix with the high pH tolerance of polymer fillers, making it a nearly perfect and internationally leading HPLC chromatographic column product.

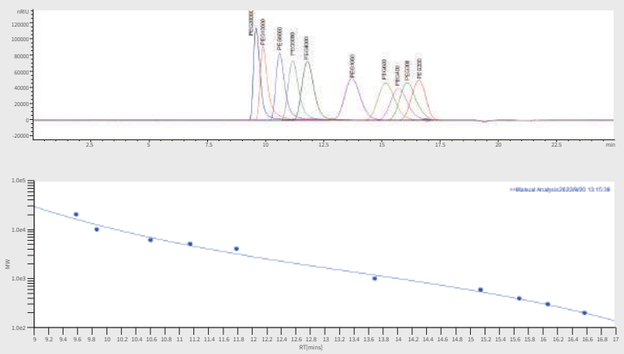
Xtimate® PEG-SEC column is a size exclusion chromatography column with a silica gel matrix, featuring a chromatographic filler comprising high-purity silica gel microspheres surface-bonded with hydrophilic high molecular weight polymer. Welch Materials employs special surface modification techniques to ensure that the filler maintains good stability and reproducibility between batches.

Features

- Special surface modification technology ensures good stability and reproducibility between batches of the filler.
- Unique dual bonding mechanism minimizes non-specific adsorption of polyethylene glycol samples, facilitating their separation and detection.
- The chromatographic column can systematically test polyethylene glycols of different molecular weights, providing a comprehensive solution for polyethylene glycol molecular weight distribution determination.

Name	Molecular weight range	Particle Size(μm)	Pore Size(Å)
PEG-SEC-120	200- 20,000	5	120
PEG-SEC-200	200- 40,000	5	200
PEG-SEC-300	200- 80,000	5	300

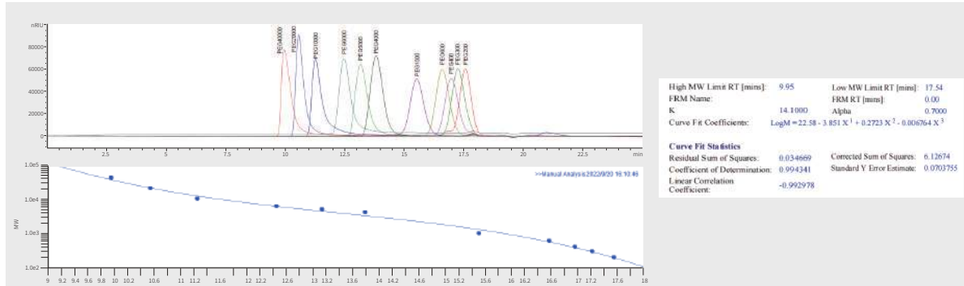
Testing Polyethylene Glycol According to the 20th Edition Pharmacopoeia: Xtimate® PEG-SEC-120 single chromatographic column



Column:	Xtimate® PEG-SEC, 5μm 300×7.8mm
Mobile Phase:	0.1mol/L Sodium nitrate
Flow Rate:	0.6mL/min
Detector:	RID
Temperature:	35°C
Injection Volume:	100μL

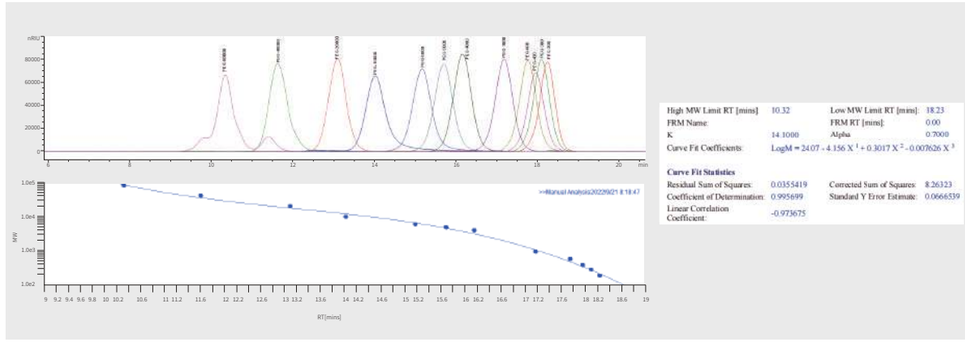
High MW Limit RT [mins]:	9.58	Low MW Limit RT [mins]:	16.56
FRM Name:		FRM RT [mins]:	0.00
K	14.1000	Alpha	0.7000
Curve Fit Coefficients:	LogM = 16.89 - 2.653 X^1 + 0.1824 X^2 - 0.004552 X^3		
Curve Fit Statistics			
Residual Sum of Squares:	0.038633	Corrected Sum of Squares:	4.47433
Coefficient of Determination:	0.991366	Standard Y Error Estimate:	0.0802424
Linear Correlation Coefficient:	-0.99367		

Xtimate® PEG-SEC-200 single chromatographic column



High MW Limit RT [mins]:	9.95	Low MW Limit RT [mins]:	17.54
FRM Name:		FRM RT [mins]:	0.00
K	14.1000	Alpha	0.7000
Curve Fit Coefficients:	LogM = 22.58 - 3.851 X^1 + 0.2723 X^2 - 0.006764 X^3		
Curve Fit Statistics			
Residual Sum of Squares:	0.034669	Corrected Sum of Squares:	6.12674
Coefficient of Determination:	0.994341	Standard Y Error Estimate:	0.0703755
Linear Correlation Coefficient:	-0.992978		

Xtimate® PEG-SEC-300 single chromatographic column



High MW Limit RT [mins]	10.32	Low MW Limit RT [mins]:	18.23
FRM Name:		FRM RT [mins]:	0.00
K	14.1000	Alpha	0.7000
Curve Fit Coefficients:	LogM = 24.07 - 4.156 X^1 + 0.3017 X^2 - 0.007626 X^3		
Curve Fit Statistics			
Residual Sum of Squares:	0.0355419	Corrected Sum of Squares:	8.26323
Coefficient of Determination:	0.995699	Standard Y Error Estimate:	0.0666539
Linear Correlation Coefficient:	-0.973675		

Ordering Information—Xtimate® PEG-SEC

P/N	Description
00288-31052	Xtimate® PEG-SEC-120, 5μm, 7.8×300mm
00288-32052	Xtimate® PEG-SEC-200, 5μm, 7.8×300mm
00288-33052	Xtimate® PEG-SEC-300, 5μm, 7.8×300mm

Xtimate® G-10

Through rigorous column technology research, Welch Materials has developed the Xtimate® G-10 column to meet the requirements of the 2015 Chinese Pharmacopoeia. Designed specifically for the analysis of high-molecular-weight impurities in β-lactam antibiotics as described in the Pharmacopoeia, this column is ideal for the determination of polymeric impurities in amoxicillin, cefradine, ceftriaxone sodium, cefotaxime, among other antibiotics. Xtimate® G-10 covers a molecular weight fractionation range below 700 for globular proteins and dextrans.

Features

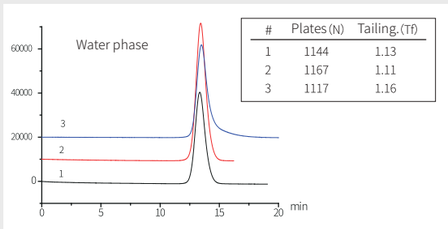
- Excellent stability
- High reproducibility
- Moderate tailing
- High efficiency
- Meets the height-to-valley ratio requirements.

Xtimate® G-10

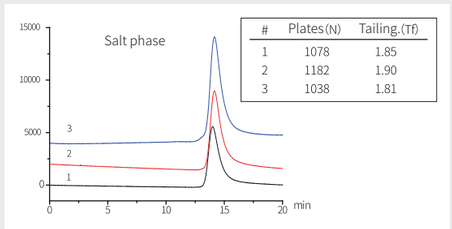
Packing Material	G-10 gel
Particle Size	40–120 μm
Density	2–3 mL/g
Exclusion Limit	700

Batch Reproducibility

Three batches of 14×300 mm Xtimate G-10 columns were used to test amoxicillin via the 2015 Chinese Pharmacopoeia

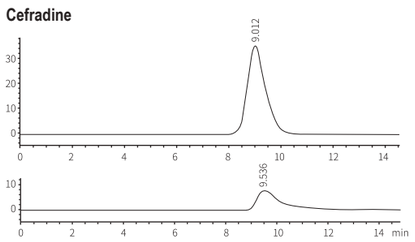


#	Plates (N)	Tailing. (Tf)
1	1144	1.13
2	1167	1.11
3	1117	1.16



#	Plates (N)	Tailing. (Tf)
1	1078	1.85
2	1182	1.90
3	1038	1.81

Applications



Column:	Xtimate® G-10, 14×300 mm
Wavelength:	254 nm
Mobile Phase:	A: 0.2 M Na_2HPO_4:0.2 M NaH_2PO_4 = 95:5
	B: Water
Flow Rate:	1.5 mL/min
Temperature:	30°C
Injection Volume:	50 μL

Ordering Information—Xtimate® G-10

P/N	Description
00110-00153	Xtimate® G-10, 14x300 mm
00110-00154	Xtimate® G-10, 14x400 mm

XTIMATE® SPECIALIZED HPLC COLUMN

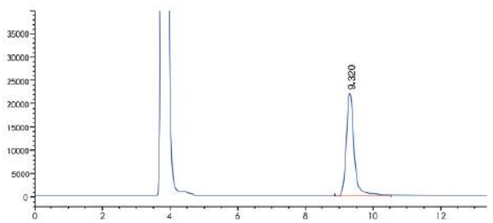
Xtimate® Lactose-NH_2

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

Specifications

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

Iron Dextran



Rt (min)	Area (nRIU*S)	Height (nRIU)	Symmetrical factor	Widt (min)	Plates	Resolution	Selectivity
9.320	3.5546e5	2.20093e4	0.79	0.2298	9103	-	-

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

Ordering Information—Xtimate® Lactose-NH_2

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

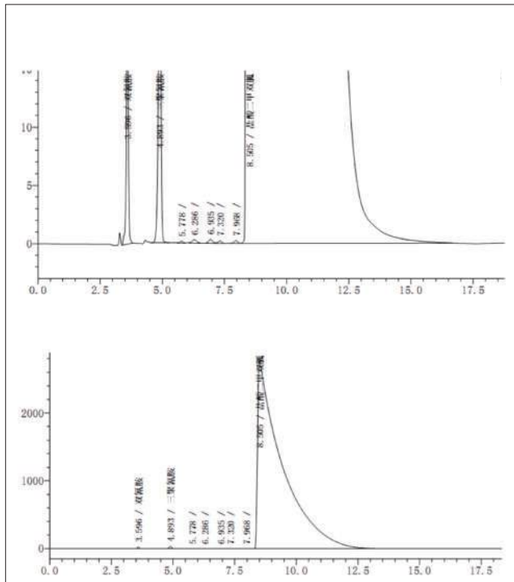
Xtimate® XB-SCX

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

Specifications

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

Determination of content of metformin hydrochloride



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

Ordering Information—Xtimate® XB-SCX(Metformin HCL)

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

Xtimate® GPC-GLY

The Xtimate GPC-GLY column is designed in accordance with the test conditions for glycerol monostearate and distearate in the 2020 edition of the Chinese Pharmacopoeia (Vol. IV), offering a new solution to challenges in quantitative determination.

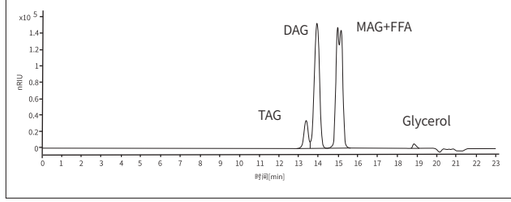
- Xtimate GPC-GLY is a proprietary product developed by Welch Materials, based on a highly cross-linked and fully porous styrene-divinylbenzene copolymer with high performance.
- Its packing material features a narrow pore size distribution, extended service life, and excellent column efficiency.

Xtimate® GPC-GLY

Particle Size	5 μm
Pore Size	100 Å

Application

Resolutions between all peaks meet the criteria from the pharmacopoeia



Column: Two Xtimate GPC-GLY's in series
Mobile Phase: THF
Detector: RID 40 °C
Flow Rate: 1.0 mL/min
Temperature: 40 °C
Injection Volume: 40 μL

Ordering Information—Xtimate® GPC-GLY

Particle Size	Length	I.D.	P/N
5μm	300 mm	7.8 mm	00823-00005

04.

TOPSIL® SEIRES HPLC COLUMN

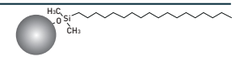
TOPSIL® SERIES HPLC COLUMN

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

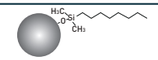
Features

- High purity silica (99.99%) with 150Å pore size and 260m²/g surface area
- 12% carbon loading for C18 phase
- Because of large pore and moderate carbon loading, Topsil C18 phase can also be used as AQ-C18 without phase collapse
- Endcapped for excellent peak shape and lifetime
- Lower back pressure than Ultisil, almost the same column efficiency as Ultisil
- Good for small molecules and peptides
- Topsil phases including C18, C8, Phenyl-Hexyl, Silica, NH_2 and CN

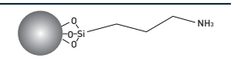
Topsil® C18

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm
Surface Area(m^2/g)	260(150Å)
Carbon Loading(%)	12(150Å)
USP List	L1
Endcapped	Yes

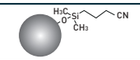
Topsil® C8

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm, 5μm
Surface Area(m^2/g)	260(150Å)
Carbon Loading(%)	10(150Å)
USP List	L7
Endcapped	Yes

Topsil® NH_2

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

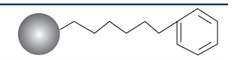
Topsil® CN

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

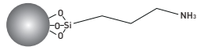
Topsil® Silica

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

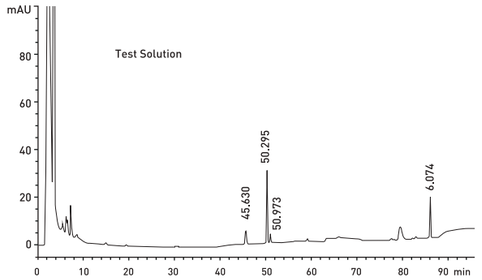
Topsil® Phenyl-Hexyl

Structural Formula	
pH Range	2.0-8.0
Particle Size	3μm,5μm
Surface Area(m^2/g)	260(150Å)
Carbon Loading(%)	12(150Å)
USP List	L11
Endcapped	Yes

Topsil® HILIC NH_2

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

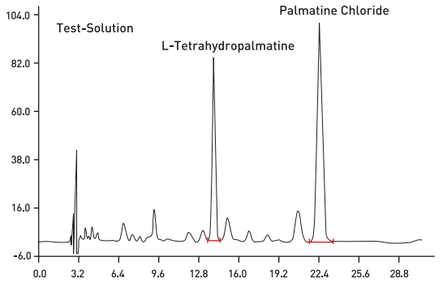
Compound Salvia Tablets



Column: Topsil® C18, 250×4.6mm, 5μm
Mobile Phase: A: acetonitrile B: water
Flow Rate: 1.0mL/min
Detector: 203nm
Temperature: 30°C
Injection Volume: 20μL
Gradient Program:

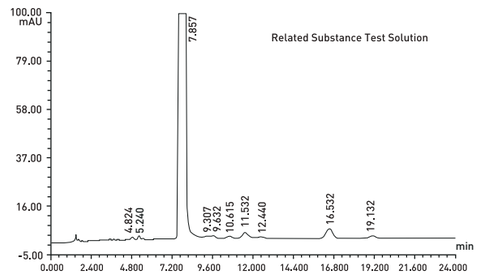
Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	19	81
35	19	81
55	71	29
70	71	29
100	40	60

Epigeal Srephaia Root



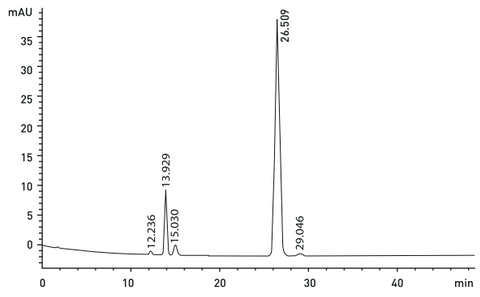
Column: Topsil® C18, 250×4.6mm, 5μm
Mobile Phase: 25mM sodium acetate buffer(2% trimethylamine adjust pH to 3.50 with acetic acid)
Flow Rate: 1.5mL/min
Detector: 280nm
Temperature: 40°C
Injection Volume: 20μL

Ketoprofen



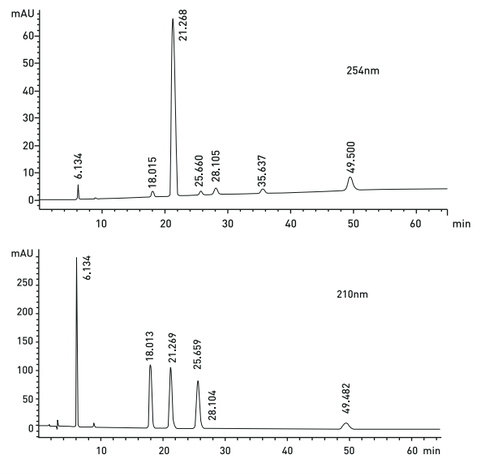
Column: Topsil® C18, 150×4.6mm, 5μm
Mobile Phase: Phosphate buffer (68g KH_2PO_4 dissolve in 1000mL water, adjust pH to 3.5 with H_3PO_4)
Flow Rate: 1.0mL/min
Detector: 233nm
Temperature: 30°C
Injection Volume: 20μL

Vitamin D3



Column: Topsil® Silica, 250×4.6mm, 5μm
Mobile Phase: N-hexane/n-amyl alcohol=99.7/0.3
Flow Rate: 2.0mL/min
Detector: 254nm
Temperature: 30°C
Injection Volume: 20μL

Sex hormone in Cosmetics



Column: Topsil® Phenyl-Hexyl, 250×4.6mm, 5μm
Mobile Phase: Methanol/water=60/40
Flow Rate: 1.0mL/min
Detector: 210nm, 254nm
Temperature: 30°C
Injection Volume: 20μL
Mixed Standards: Estrogen: estradiol, oestrone, estrostilben, estriol Androgen: testosterone, methyltestosterone Progestational hormone:progesterone

Ordering Information—3μm Topsil analytical columns

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

Ordering Information—5μm Topsil analytical columns

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

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

05.

WELCHROM® SEIRES HPLC COLUMN

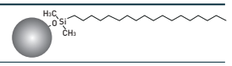
WELCHROM® SEIRES HPLC COLUMN

—Combination of perfect peak shape and lowest back pressure

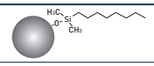
Features

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

Welchrom® C18

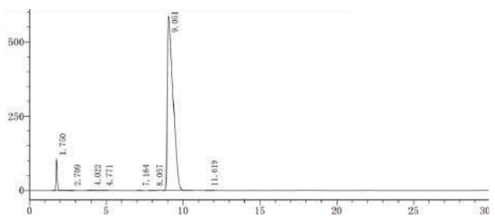
Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	19(120Å)
USP List	L1
Endcapped	Yes

Welchrom® C8

Structural Formula	
pH Range	2.0-8.0
Particle Size	5μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L7
Endcapped	Yes

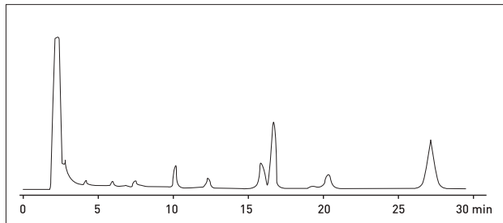
Brands	Tailing factor(amitriptyline)	Back pressure(Methanol/H2O)=75/25
Welchrom® XB-C18	1.29	77 bar
Chrom C18	1.52	108 bar
Sino Chrom C18	1.71	106 bar
BinChrom C18	1.67	102 bar

Pentoxyverine citrate



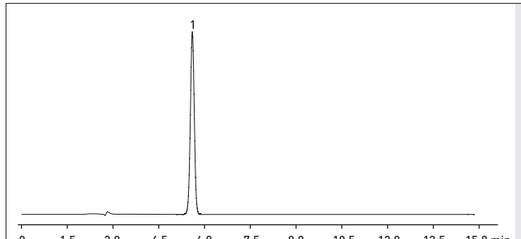
Column:	Welchrom® C18, 4.6×150mm, 5μm
Mobile Phase:	Water* /methanol=45/55 * Dilute 10mL triethylamine to 1000mL, adjust pH 3.0 with H_3PO_4
Flow Rate:	1.0mL/min
Detector:	215nm
Temperature:	30°C
Injection Volume:	20μL

Tanshinone IIA in Salvia Miltiorrhiza



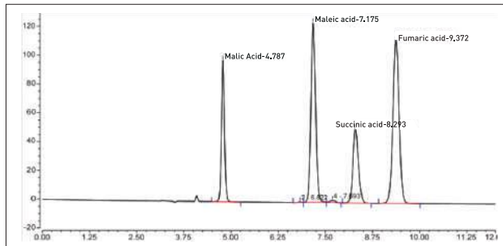
Column:	Welchrom® C18, 4.6x250mm, 5μm
Mobile Phase:	Methanol/water=75/25
Flow Rate:	1.0mL/min
Detector:	270nm
Temperature:	22°C

Imidacloprid



Column:	Welchrom® C18, 250×4.6mm, 5μm
Mobile Phase:	Methanol/water=45/55
Flow Rate:	1.0mL/min
Detector:	260nm
Temperature:	25°C

Malic acid



Column:	Welchrom® C8, 4.6×250mm, 5μm
Mobile Phase:	Phosphoric acid/methanol/water=1/100/900
Flow Rate:	0.8mL/min
Detector:	214nm
Temperature:	20°C
Injection Volume:	5μL

Ordering Information—5μm Welchrom C18, Welchrom C8

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

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

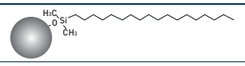
Welchrom® Vantage C18

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

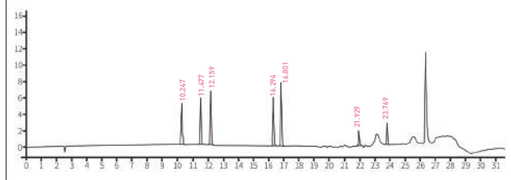
Features

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

Specifications

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

Seven Colorants in Cola



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

Gradient Program:

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

Ordering Information—Welchrom® Vantage C18

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

Welchrom® PSV C18

Welchrom PSV C18 is an HPLC column specifically developed for the routine analysis of preservatives and colorants in food. It is manufactured using ultra-pure silica matrix, with Welch's proprietary bonding and end-capping technology, delivering enhanced resistance to contamination and extended operational life.

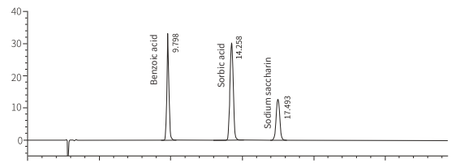
Features

- High fouling resistance: the large silica pores and low surface area reduce particulate adsorption, improving robustness when analysing fatty or heavily pigmented foods.
- Excellent batch-to-batch reproducibility: tight control of stationary phase manufacturing preserves retention times, theoretical plate counts, tailing factors and resolution across lots.

Specifications

Stationary Phase	C18
pH Range	2.0-9.0
Particle Size	5 μm
Surface Area	230 m^2/g (150 Å)
Carbon Loading	13% (150 Å)
Endcapped	Yes

Preservatives in Food



	Ret. Time(min)	Analyte	Area (mV×s)	Height(mV)	Plates(USP)	Tailing.	Res.(USP)
1	9.798	Benzoic acid	359644	33279	18348	1.105	--
2	14.258	Sorbic acid	478505	31044	19681	1.067	12.818
3	17.493	Sodium saccharin	227884	12808	21774	1.052	7.344

Column:	Welchrom PSV C18, 4.6×250 mm, 5 μm
Mobile Phase:	20 mmol/L CH_3COONH_4 : MeOH = 95:5
Flow Rate:	1.0 mL/min
Column Temperature:	30°C
Wavelength:	230 nm
Volume:	10 μL
Sorbic acid:	20 μg/mL
Benzoic acid:	Benzoic acid: 20 μg/mL
Sodium saccharin:	20 μg/mL

Ordering Information—Welchrom® PSV C18

P/N	Description
00370-02043	Welchrom PSV C18, 5 μm, 4.6×250 mm

06.

BLOSSMATE® SEIRES HPLC COLUMN

BLOSSMATE® SEIRES HPLC COLUMN

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

Features

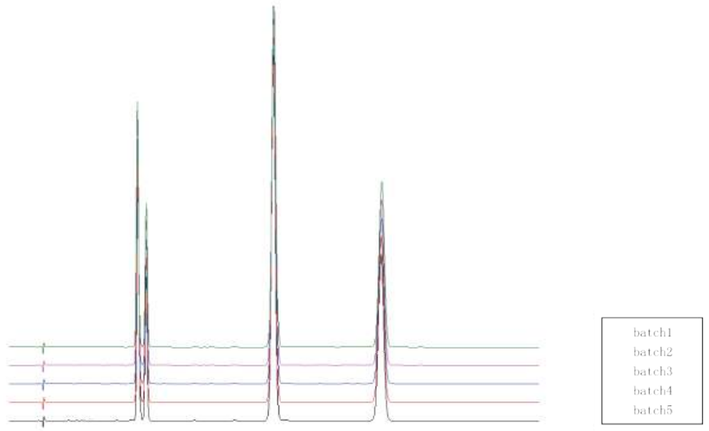
- It adopts a new generation of ultra-high-purity fully porous silica gel, which greatly ensures the perfect column efficiency and separation performance.
- Each column is tested individually with special testing prodecure under stricter standards, which guarantee the quality and performance of the column.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

Blossmate® series silica

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

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

Blossmate® series columns use a new high-purity fully porous silica and Welch's unique bonding process and double end-capping techniques to ensure that the silica surface has a higher inertness, and thus has a more symmetrical peak shape and higher column efficiency.
Blossmate columns adopt high-standard strict quality control conditions to ensure that each column has undergone strict quality screening before leaving the factory, which makes the column have better reproducibility and higher peak capacity.



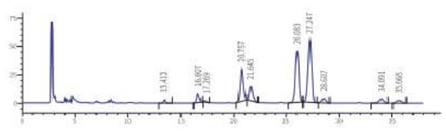
Blossmate® C18

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

Specifications

Bonded phase	Octadecyl group	Surface Area(m^2/g)	300(100Å)
pH Range	2.0-8.0	Carbon Loading(%)	14(100Å)
Particle Size	5μm	USP List	L1
Endcapped	Yes		

Ganoderma lucidum spore powder fingerprint



Rt (min)	Area	Area (%)	Peak height	Plates	Resolution (USP)	Asymmetry
18.584	14526	1.469	806	26475	n.a.	1.08160
23.608	32974	3.334	1479	28102	9.85059	1.18897
24.872	7717	0.780	382	32232	2.26092	0.96729
30.278	156595	15.834	5161	27563	8.42344	1.44760
31.970	72213	7.302	2437	29831	2.30160	1.03876
39.024	294693	29.798	9159	33714	8.87067	1.01296
41.307	351960	35.589	10469	33294	2.60093	0.95249
43.794	23177	2.344	610	29056	2.57241	0.98393
52.527	21926	2.217	487	33587	8.03340	1.08107
55.686	13179	1.333	294	34346	2.69108	1.13076

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

Ordering Information—Blossmate® C18

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

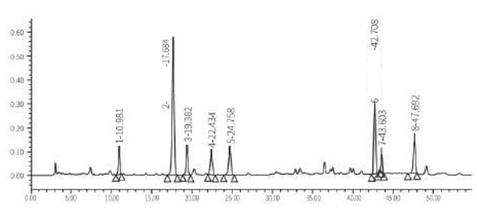
Blossmate® Aqs C18

— High Water-resistance HPLC Column

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

pH range	Carbon load	Pore Size	Specific Surface Area	Maximum Temperature	Maximum Pressure
2.0-8.0	10%	100Å	300m^2/g	60°C	40MPa

Characteristic atlas of Gegenqinlian Tablet



Name	Rt (min)	Area	Peak Height	Plates	Resolution	Tailing Factor
1	10.981	1433409	98041	12632	n.a.	0.93
2 Puerarin Peak	17.684	10686918	600548	23303	15.45	0.97
3	19.382	1928910	106398	25632	3.54	1.00
4	22.434	1659460	85394	29652	6.01	1.02
5	24.758	2122902	101434	34075	4.33	0.91
6 Pachaline hydrochloride	42.708	4111863	294465	207619	38.63	1.22
7	43.603	814122	79927	399390	2.71	1.15
8	47.692	2510271	144775	171772	10.94	0.88

Column: Blossmate® Aqs-C18, 4.6×250mm, 5μm
Mobile Phase: A: methanol B: take 1.5mL of trifluoroacetic acid, add it to 1000mL of water to make a 0.15% trifluoroacetic acid solution, mix well, and ultrasonically degas.
Flow Rate: 1.0mL/min
Detector: Characteristic Spectrum 250nm Content Determination Puerarin 250nm Berylkerine Hydrochloride 348nm
Temperature: 30°C
Injection Volume: 10μL
Gradient Program:

Time(min)	Mobile Phase A(%)	Mobile Phase B(%)
0	23	77
25	30	70
26	35	65
39	42	68
40	45	55
55	45	55

Ordering Information—Blossmate® Aqs C18

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

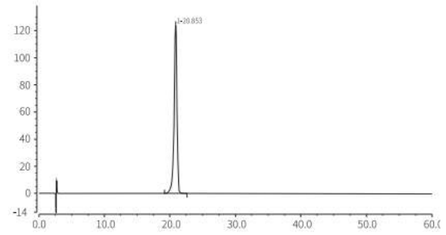
Blossmate® ST C18

— Wide pH Range HPLC Column

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

pH range	Carbon load	Pore Size	Specific Surface Area	Maximum Temperature	Maximum Pressure
1.0-11.0	12%	100Å	300m²/g	60°C	40MPa

Determination of Xinanning Tablets



Rt (min)	Area	Height	Plates	Asymmetry/EP	Resolution
20.853	64.682	123.983	11137	0.89	n.a.

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

Ordering Information—Blossmate® ST C18

P/N	Particle Size	Specification
00603-21043	5μm	4.6×250mm

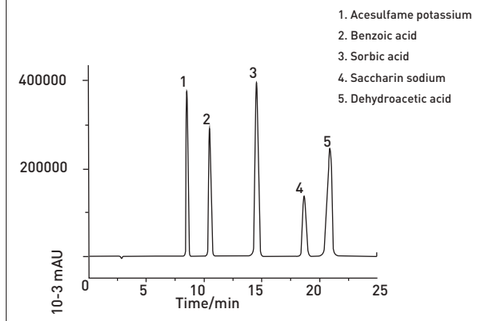
Blossmate® PSV C18

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

Features

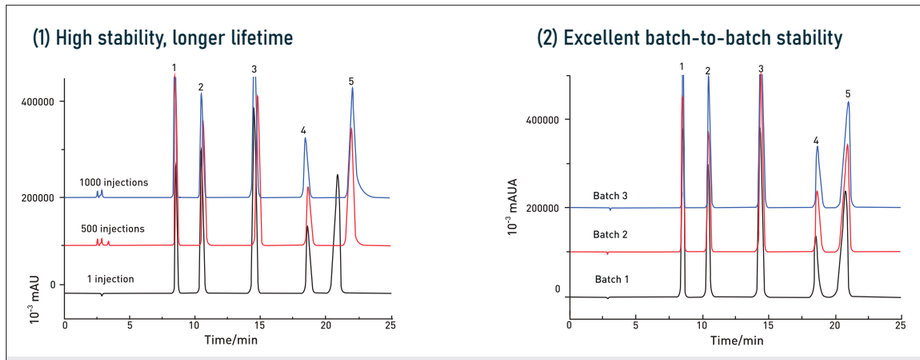
- WIth strong separation and retention ability, better peak shape, higher column efficiency.
- Remain stable baseline and high sensitivity even under neutral pH condition.
- Suitable for high efficiency separation columns by LC-MS.

Five food additives



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

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



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

Ordering Information—Blossmate® PSV C18

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

Blossmate® PSV C18 Plus

— the next generation dedicated column for preservatives

Why is the preservative testing so harmful to HPLC columns?

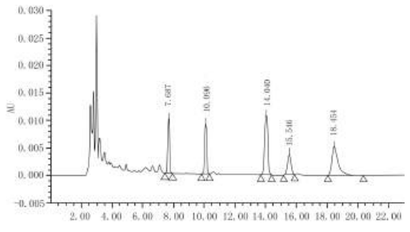
Complex sample matrix but simple pretreatment.

There are many kinds of food on the market, juice, biscuits, cakes, soy sauce, meat.....basically all of them contain preservatives. But for so many kinds of samples, same pretreatment method is used, which leads to a large amount of small molecular impurities and particulate matter are existed in the test samples, which can easily contaminate the column, resulting in a rapid decline in the column performance.

To resolve this problem, Welch launched Blossmate PSV Plus Column to meet your requirements of preservative testing.

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

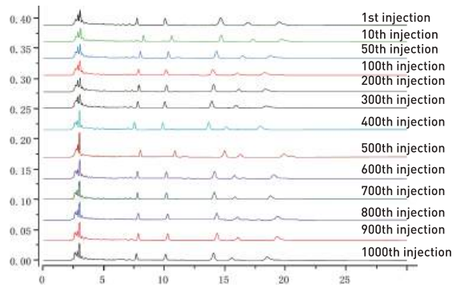
Analysis of Five Food Additives



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

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

Service Life Experiment



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

Ordering Information—Blossmate® PSV C18 Plus

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

Blossmate® SAX

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

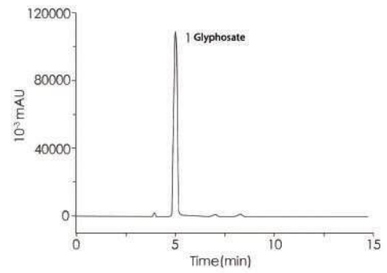
Features

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

Specifications

Bonded phase	Quaternary ammonium functional group	Surface Area(m^2/g)	300(120Å)
pH Range	2.0-8.0	Carbon Loading(%)	6.5(120Å)
Particle Size	5μm	USP List	L14
Endcapped	No		

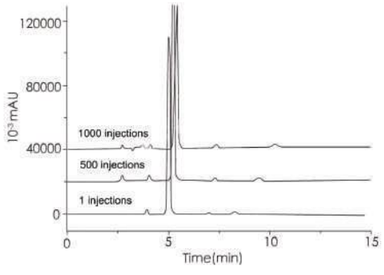
Glyphosate



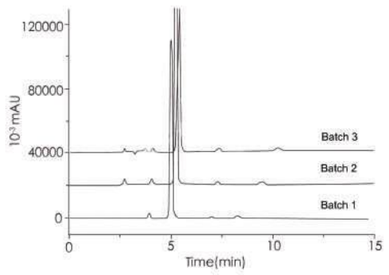
Column: Blossmate® SAX, 4.6×250mm, 5μm
Mobile Phase: 100mM KH_2PO_4:CH_3OH=85: 15 (adjust pH to 2)
Flow Rate: 1.0mL/min
Detector: 195nm
Temperature: 30°C
Injection Volume: 20μL

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

(1) High stability, longer lifetime



(2) Excellent batch-to-batch stability



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

Ordering Information—Blossmate® SAX

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

Blossmate® C4

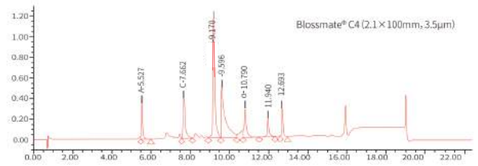
Welch Materials has launched a new Blossmate® C4 column, which fully meets the needs of detecting various biological samples, and provides customers with a HPLC column with higher accuracy, faster peak output, lower cost and a wider range of protein measurement.

Features

- Higher Accuracy: Porous particle silica packing (3.5μm) with large pore size (450Å) to improve protein resolution.
- Faster peak times: Compared to columns packed with the same size fully porous particles, the analysis time is shorter.
- Lower cost: Stable porous layer packed bed and 2μm inlet frit prevent inlet clogging, thus extending column life.
- Wider testing range: measurable protein molecular weight 12kDa-250kDa.

Name	Bonded Phase	Particle Size	Pore Size	Specific Surface Area	Carbon load	pH Stability	Endcapped
Blossmate® C4	Butylsilane	3.5μm	450Å	15m^2/g	0.5%	2.0-8.0	Yes

Separation of Seven Proteins on Blossmate® C4 Column



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

Column: Blossmate® C14, 2.1×100mm, 3.5μm
Mobile Phase: A: 0.1% trifluoroacetic acid
B: 0.1% trifluoroacetic acid in acetonitrile
Flow Rate: 0.3mL/min
Detector: 214nm
Temperature: 60°C
Injection Volume: 5μL

Ordering Information—Blossmate® C4

Name	P/N	Specification
Blossmate® C4	00608-31010	2.1×50mm, 3.5μm
Blossmate® C4	00608-31012	2.1×100mm, 3.5μm

Blossmate® Phenyl

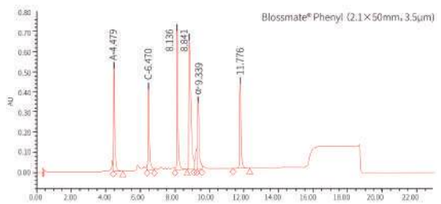
Welch Materials has launched a new Blossmate® Phenyl column to fully meet the needs of detecting various biological samples, providing customers with higher accuracy, faster peak output, lower cost and a wider range of protein measurement columns.

Features

- Higher Accuracy: Porous particle silica packing (3.5μm) with large pore size (450Å) to improve protein resolution.
- Faster peak times: Compared to columns packed with the same size fully porous particles, the analysis time is shorter.
- Lower cost: Stable porous layer packed bed and 2μm inlet frit prevent inlet clogging, thus extending column life.
- Wider testing range: measurable protein molecular weight 12kDa-250kDa.

Name	Bonded Phase	Particle Size	Pore Size	Specific Surface Area	Carbon load	pH Stability	Endcapped
Blossmate® Phenyl	Phenylsilane	3.5μm	450Å	15m²/g	1.0%	2.0-8.0	Yes

Separation of Six Proteins on Blossmate® Phenyl Column



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

Column: Blossmate® Phenyl, 2.1×50mm, 3.5μm
Mobile Phase: A: 0.1% trifluoroacetic acid
B: 0.1% trifluoroacetic acid in acetonitrile
Flow Rate: 0.3mL/min
Detector: 220nm
Temperature: 60°C
Injection Volume: 5μL

Ordering Information—Blossmate® Phenyl

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

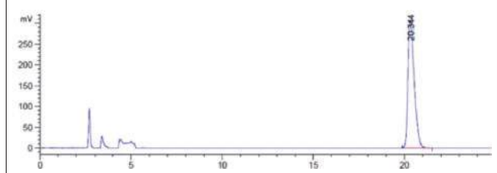
Blossmate® Polar-Propylamide

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

Specifications

Bonded phase	Polar propyl amide group	Surface Area(m²/g)	300(120Å)
pH Range	2.0-8.0	Carbon Loading(%)	7(120Å)
Particle Size	5μm	USP List	L68
Endcapped	N/A		

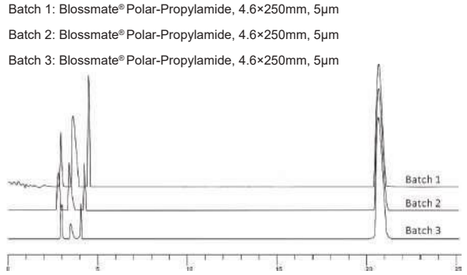
Systematic adaptability



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

Rt	Symmetry factor	Plates
20.344	0.71	16867

Batch to batch stability



Mobile Phase: Acetonitrile: 0.2% glacial acetic acid = 80:20 (v/v)
Flow Rate: 1.0mL/min
Detector: ELSD
Temperature: 30°C
Injection Volume: 10μL

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

Ordering Information—Blossmate® Polar-Propylamide

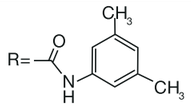
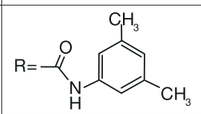
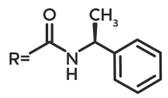
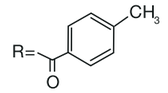
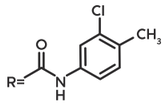
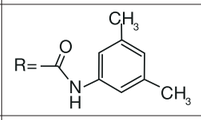
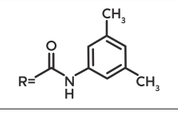
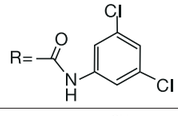
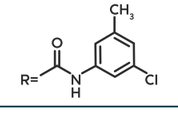
P/N	Particle size	Specification
00604-21041	5μm	4.6×150mm
00604-21043	5μm	4.6×150mm

Blossmate® Chiral Series

Your Chiral Separation Partner - One Platform, All Scales.High Selectivity, High Loading Capacity, Consistent and Reproducible Results.

Welch Blossmate chiral stationary phases are designed for high-performance enantiomeric separations in analytical, preparative, and bulk purification scale. Available in both coated and immobilized polysaccharide phases, Blossmate delivers selectivity, reproducibility, and scalability from R&D through commercial purification.

Blossmate Chiral Phase Overview

Welch Chirla Phase	Phase	Structure	Type	Equivalent to
Blossmate Amy-D	Amylose tris (3,5-dimethylphenyl carbamate)		Coated	AD
Blossmate Cellu-D	Cellulose tris (3,5-dimethylphenyl carbamate)		Coated	OD
Blossmate Amy-S	Amylose tris (S)-α-methylbenzyl carbamate)		Coated	OS
Blossmate Cellu-J	Cellulose tris (4-methylbenzoate)		Coated	OJ
Blossmate Cellu-Z	Cellulose tris (3-chloro-4-methylphenyl carbamate)		Coated	OZ
Blossmate IMMA	Amylose tris (3,5-dimethylphenyl carbamate)		Immobillized	IA
Blossmate IMMB	Cellulose tris (3,5-dimethylphenyl carbamate)		Immobillized	IB
Blossmate IMMC	Cellulose tris (3,5-dimethylphenyl carbamate)		Immobillized	IC
Blossmate IMMG	Amylose tris (3-chloro-5-methylphenyl carbamate)		Immobillized	IG

Blossmate Chiral Phase Availability

Type	ID(mm)	Length(mm)	Particle Size(μm)
Analytical	4.6	150/250	5 & 10
Preparative	10/21.2/30/50	250	5 & 10
Bulk Media	-	-	5 & 10

Key Advantages

- Excellent Selectivity: Polysaccharide-based CSPs provide superior recognition and resolution across a wide range of chiral molecules.
- High Efficiency & Superior Separation: Achieve strong peak shape, high plate count and consistent reproducibility.
- Scale-Up Capability: Available in analytical columns → prep columns → bulk media for seamless process development to production.
- SFC and HPLC Compatibility: All Blossmate preparative column is compatible with SFC -- no separate hardware reguired.

Modes of Use

- Normal Phase (NP)
- Polar Organic
- Reversed Phase (RP)
- Supercritical Fluid Chromatography (SFC)

Important Guidance for Mode Switching (NP→ RP)

While Blossmate phases can operate in both NP & RP modes, once switched from NP →> RP, the same columr should remain dedicated for RP use only.

Recomnended Conditioning Before Switching

- Test column in NP mode to confirm performance.
- Flush with IPA at 0.25 nL/min (4.6 mm ID) for 2 0 minutes.
- Then flush with methariol.
- Transition to RP using aqueous methapol or aqyieous acetonitrile.

Why Choose Blossmate for Chiral Purification?

- Proven phase che mistry aligned'with) widely used global equivalents
- Lower cost of operation compared to irnported CSPs
- Local support, faster supply & technital application guidance
- Scalable from method development—>pilot —> commercial purification

Free chiral method screening support

Share samples —> We evaluate on multiple blossmate phases —>Recommend best separation phase and method conditions.

No cost. Fast turnaround.

Ordering Information—Blossmate® Chiral

Bonded Phase	Particle Size	ID(mm)	Column Length	
			150mm	250mm
Blossmate® Cellu-D	5μm	4.6	00611-21041	00611-21043
	10μm	4.6	00611-41041	00611-41043
Blossmate® Cellu-DR	5μm	4.6	00621-21041	00621-21043
	10μm	4.6	00621-41041	00621-41043
Blossmate® Cellu-J	5μm	4.6	00612-21041	00612-21043
	10μm	4.6	00612-41041	00612-41043
Blossmate® Cellu-JR	5μm	4.6	00622-21041	00622-21043
	10μm	4.6	00622-41041	00622-41043
Blossmate® Amy-D	5μm	4.6	00613-21041	00613-21043
	10μm	4.6	00613-41041	00613-41043
Blossmate® Amy-DR	5μm	4.6	00623-21041	00623-21043
	10μm	4.6	00623-41041	00623-41043
Blossmate® Amy-S	5μm	4.6	00614-21041	00614-21043
	10μm	4.6	00614-41041	00614-41043
Blossmate® Amy-SR	5μm	4.6	00624-21041	00624-21043
	10μm	4.6	00624-41041	00624-41043
Blossmate® Cellu-Z	5μm	4.6	00615-21041	00615-21043
	10μm	4.6	00615-41041	00615-41043
Blossmate® Cellu-ZR	5μm	4.6	00625-21041	00625-21043
	10μm	4.6	00625-41041	00625-41043
Blossmate® IMMA	5μm	4.6	00616-21041	00616-21043
	10μm	4.6	00616-41041	00616-41043
Blossmate® IMMB	5μm	4.6	00617-21041	00617-21043
	10μm	4.6	00617-41041	00617-41043
Blossmate® IMMC	5μm	4.6	00618-21041	00618-21043
	10μm	4.6	00618-41041	00618-41043
Blossmate® IMMG	5μm	4.6	00619-21041	00619-21043
	10μm	4.6	00619-41041	00619-41043

07.

BOLTIMATE® CORE-SHELL HPLC COLUMN

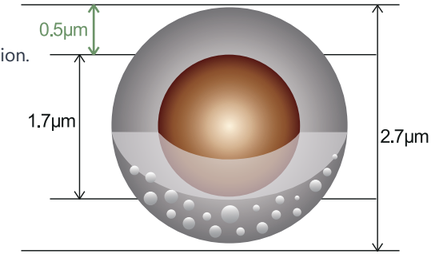
BOLTIMATE® CORE-SHELL HPLC COLUMN

Welch Boltimate® core-shell HPLC column particle size is 2.7µm, which consists of 1.7µm solid core and 0.5µm porous layer(porous shell).

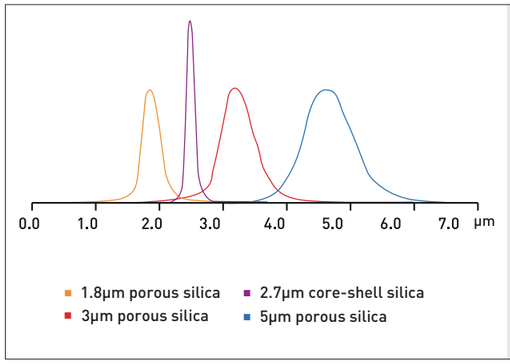
This kind of column can provide sub-2µm efficiencies (~200,000p/m) and high resolution at much lower back pressure. Boltimate core-shell column can be used on both HPLC and UHPLC system, and method optimization is also very easy.

Features

- Provide sub-2µm efficiencies (~200,000p/m) and ultra-high resolution at much lower back pressure.
- Ultra fast separation.
- Compatible with both HPLC and UHPLC systemUltra fast separation.
- Narrow particle size distribution.
- A standard 2µm inlet firt is used to resist plugging with dirty samples, suitable for complex sample.
- A variety of bonding phases provide different selectivities, excellent peak shape and lot-to-lot reproducibility.
- Maximum pressure: 600bar.

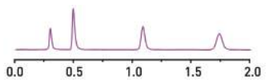


With the solid core and thin porous layer, the diffusion distance of sample molecular deceased, which means fast mobile phase flow rate can be used to increase the analytical speed. Compared with traditional porous HPLC columns, Boltimate core-shell column has the narrower particle size distribution,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

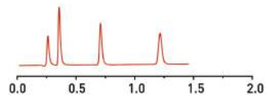


	D10	D90	D90/D10
5µm porous silica	3.61	5.22	1.44
3µm porous silica	2.83	3.98	1.41
1.8µm porous silica	1.51	2.11	1.40
2.7µm Boltimate core-shell silica	2.51	2.81	1.12

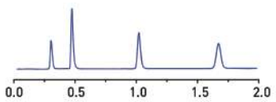
Ultisil® XB-C18, 3μm
Flow Rate: 0.4mL/min



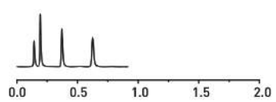
Boltimate® C18, 2.7μm
Flow Rate: 0.4mL/min



Ultisil® UHPLC XB-C18, 1.8μm
Flow Rate: 0.4mL/min



Boltimate® C18, 2.7μm
Flow Rate: 0.7mL/min



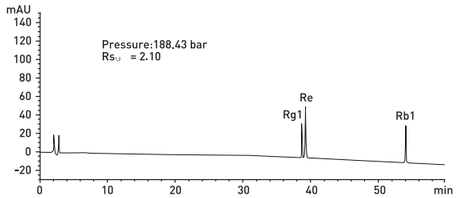
Column: 2.1×50mm
Mobile phase: ACN:H_2O=60:40
Temperature: 24°C
HPLC instrument: Agilent 1290
Flow cell: 1μL
Injection Volume: 1μL
Samples: 1) Uracil 2) Phenol
3) 4-Chloro Nitrobenzene
4) Naphthalene

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

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

Detection of Ginsenosides:

1. Ultisil® XB-C18, 4.6×250mm, 5μm
Flow Rate: 1.3mL/min Injection Volume: 10μL

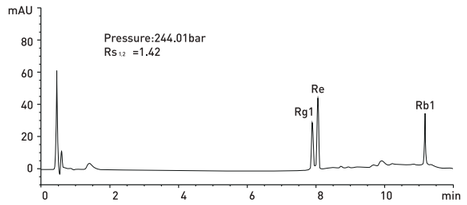


Column: Three types of Welch C18 columns
Mobile phase: A: 0.1% H_3PO_4 in water B: Acetonitrile
Temperature: Room temperature
Detection: UV 203nm

Gradient Program 1:

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

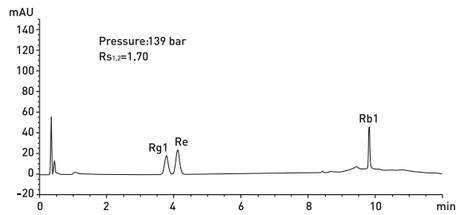
2. Ultisil® UHPLC XB-C18, 2.1×5mm, 1.8μm
Flow Rate: 1.3mL/min Injection Volume: 10μL



Gradient Program 2:

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. Boltimate® C18, 3.0×50mm, 2.7μm
Flow Rate: 1.3mL/min Injection Volume: 10μL



Gradient Program 3:

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.

Specifications

Phase	Features	Particle Size	Solid Core Diameter	Porous Shell Depth	Pore Size	Surface Area	C%	Endcapped	pH Range	Maximum Pressure	USP List
C18	Excellent peak shape and resolution for acids, bases, and neutrals. Exceptional resolution and lifetime.	2.7μm	1.7μm	0.5μm	90Å	120m^2/g	9	Double	2-8.0	600bar	L1
Phenyl -Hexyl	Alternative selectivity for phenyl groups						7	Double	2-8.0		L11
EXT-C18	The exist of hybrid organic /inorganic layer extend pH range of silica.						8	Double	1.5-12		L1
EXT-PFP	An alternative selectivity for halogenated compounds and polar analytes. Wide pH range						5	Double	1.5-10		L43
HILIC	With its unbonded silica, Boltimate HILIC retains and separates polar analytes.						-	No	2-8.0		L3
LP-C18	Excellent peak shape and resolution at low pH.						7	No	1-8.0		L1

Specifications

Phase	Features	Particle Size	Solid Core Diameter	Porous Shell Depth	Pore Size	Surface Area m^2/g	C%	Endcapped	pH Range	Maximum Pressure	USP List
C8	Excellent peak shape and resolution for acids, bases, and neutrals. Exceptional resolution and lifetime.	2.7μm	1.7μm	0.5μm	90Å	120m^2/g	5	Double	2-8.5	600bar	L7
Phenyl	Bonded with Phenyl propyl functional group which has steric hindrance selectivity, it has better separation effect on achiral isomers. 100% water phase resistance.						5	Double	2-8.0		L11

Ordering Information—Boltimate Core-shell Column

Phase	ID (mm)	Column Length (mm)						Guard Cartridge	Cartridge Holder
		30	50	75	100	150	250	5mm length	
C18	2.1	960-04009	960-04010	960-04011	960-04012	960-04014	-	U808-960-25	00808-01109
	3.0	960-04018	960-04019	960-04020	960-04021	960-04023	-	U808-960-25	00808-01109
	4.6	960-04036	960-04037	960-04038	960-04039	960-04041	960-04043	U808-960-45	00808-01109
Phenyl -Hexyl	2.1	961-04009	961-04010	961-04011	961-04012	961-04014	-	U808-961-25	00808-01109
	3.0	961-04018	961-04019	961-04020	961-04021	961-04023	-	U808-961-25	00808-01109
	4.6	961-04036	961-04037	961-04038	961-04039	961-04041	961-04043	U808-961-45	00808-01109
EXT-C18	2.1	962-04009	962-04010	962-04011	962-04012	962-04014	-	U808-962-25	00808-01109
	3.0	962-04018	962-04019	962-04020	962-04021	962-04023	-	U808-962-25	00808-01109
	4.6	962-04036	962-04037	962-04038	962-04039	962-04041	962-04043	U808-962-45	00808-01109
EXT-PFP	2.1	963-04009	963-04010	963-04011	963-04012	963-04014	-	U808-963-25	00808-01109
	3.0	963-04018	963-04019	963-04020	963-04021	963-04023	-	U808-963-25	00808-01109
	4.6	963-04036	963-04037	963-04038	963-04039	963-04041	963-04043	U808-963-45	00808-01109
HILIC	2.1	964-04009	964-04010	964-04011	964-04012	964-04014	-	U808-964-25	00808-01109
	3.0	964-04018	964-04019	964-04020	964-04021	964-04023	-	U808-964-25	00808-01109
	4.6	964-04036	964-04037	964-04038	964-04039	964-04041	964-04043	U808-964-45	00808-01109
LP-C18	2.1	965-04009	965-04010	965-04011	965-04012	965-04014	-	U808-965-25	00808-01109
	3.0	965-04018	965-04019	965-04020	965-04021	965-04023	-	U808-965-25	00808-01109
	4.6	965-04036	965-04037	965-04038	965-04039	965-04041	965-04043	U808-965-45	00808-01109
C8	2.1	966-04009	966-04010	966-04011	966-04012	966-04014	-	U808-966-25	00808-01109
	3.0	966-04018	966-04019	966-04020	966-04021	966-04023	-	U808-966-25	00808-01109
	4.6	966-04036	966-04037	966-04038	966-04039	966-04041	966-04043	U808-966-45	00808-01109
Phenyl	2.1	967-04009	967-04010	967-04011	967-04012	967-04014	-	U808-967-25	00808-01109
	3.0	967-04018	967-04019	967-04020	967-04021	967-04023	-	U808-967-25	00808-01109
	4.6	967-04036	967-04037	967-04038	967-04039	967-04041	967-04043	U808-967-45	00808-01109

An in-line filter or a guard column can save your money by extending the life of your analytical column. Inline Filter for Boltimate:

	P/N	Description
	00808-01221	UltraShield inline Fliter, SS, 0.5μm stainless steel frit, 15,000psi
	00808-01222	Direct Connect Precolumn inline Filter, with 0.2μm Replacement Frits×5, 18,000psi
	00808-UF020	Replaceable frits (0.2μm)

08.

UHPLC COLUMN

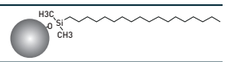
UHPLC COLUMN

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

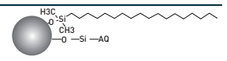
Features

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

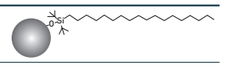
Ultisil® UHPLC XB-C18

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	17(120Å)
USP List	L1
Endcapped	Yes

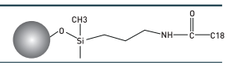
Ultisil® UHPLC AQ-C18

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L1
Endcapped	Yes

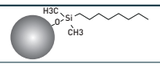
Ultisil® UHPLC LP-C18

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

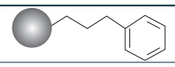
Ultisil® UHPLC Polar-RP

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	18(120Å)
USP List	L1
Endcapped	Yes

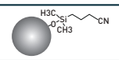
Ultisil® UHPLC XB-C8

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	12(120Å)
USP List	L7
Endcapped	Yes

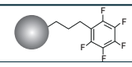
Ultisil® UHPLC XB-Phenyl

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	13(120Å)
USP List	L11
Endcapped	Yes

Ultisil® UHPLC XB-CN

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	8(120Å)
USP List	L10
Endcapped	Yes

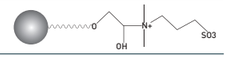
Ultisil® UHPLC PFP

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	10(120Å)
USP List	L11/L43
Endcapped	Yes

Ultisil® UHPLC HILIC

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

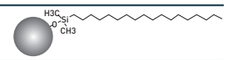
Ultisil® UHPLC HILIC Amphion II

Structural Formula	
pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	5(120Å)
USP List	L114
Endcapped	N/A

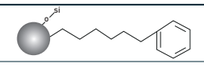
Ultisil® UHPLC Amide

pH Range	2.0-8.0
Particle Size	1.8 μm
Surface Area(m^2/g)	320(120Å)
Carbon Loading(%)	6(120Å)
USP List	L68
Endcapped	N/A

Xtimate® UHPLC C18

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

Xtimate® UHPLC Phenyl-hexyl

Structural Formula		Carbon Loading(%)	12(120Å)
pH Range	1.0-12.5	USP List	L11
Particle Size	1.8 μm	Endcapped	Yes
Surface Area(m^2/g)	320(120Å)		

Column Packing Features

1. Unique column packing technique
2. Withstand ultra-high pressure of UHPLC instruments

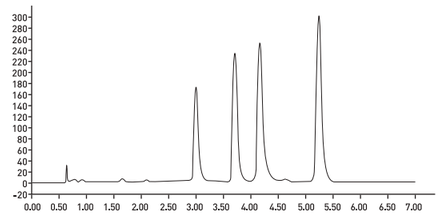
Hardware Features

New design
Low dead volume
New special frit

Packing Materials Features

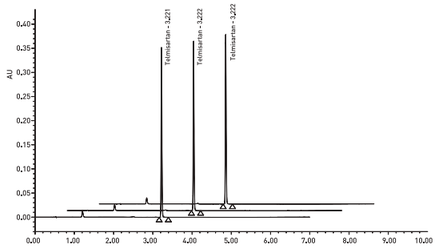
1. High efficiency 1.8μm particles
2. High column efficiency and excellent strength
3. Variety of bonding chemistries
4. Stable column bed, highest pressure: 15000psi

Analysis of Aflatoxin



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

Analysis of Telmisartan Tablets



Sample Name	Rt	Area	USP Theoretical Plate Number
Telmisartan	3.222	487938	126585
Telmisartan	3.222	487646	126607
Telmisartan	3.222	488317	126791

Inline Filter for UHPLC

	P/N	Description
	00808-01221	UltraShield inline Filter, SS, 0.5μm stainless steel frit, 15,000psi
	00808-01222	Direct Connect Precolumn inline Filter, with 0.2μm Replacement Frits×5, 18,000 psi
	00808-UF020	Replaceable frits (0.2μm)

Ordering Information—1.8μm UHPLC column

Phase	ID (mm)	Column Length (mm)					Guard Cartridge	Cartridge Holder
		30	50	75	100	150	5mm length	
Ultisil XB-C18	2.1	H00201-11009	H00201-11010	H00201-11011	H00201-11012	H00201-11014	HU808-201-25	00808-01109
	3.0	H00201-11018	H00201-11019	H00201-11020	H00201-11021	H00201-11023	HU808-201-25	00808-01109
	4.6	H00201-11036	H00201-11037	H00201-11038	H00201-11039	H00201-11041	HU808-201-45	00808-01109
Ultisil XB-C8	2.1	H00202-11009	H00202-11010	H00202-11011	H00202-11012	H00202-11014	HU808-202-25	00808-01109
	3.0	H00202-11018	H00202-11019	H00202-11020	H00202-11021	H00202-11023	HU808-202-25	00808-01109
	4.6	H00202-11036	H00202-11037	H00202-11038	H00202-11039	H00202-11041	HU808-202-45	00808-01109
Ultisil AQ-C18	2.1	H00207-11009	H00207-11010	H00207-11011	H00207-11012	H00207-11014	HU808-207-25	00808-01109
	3.0	H00207-11018	H00207-11019	H00207-11020	H00207-11021	H00207-11023	HU808-207-25	00808-01109
	4.6	H00207-11036	H00207-11037	H00207-11038	H00207-11039	H00207-11041	HU808-207-45	00808-01109
Ultisil XB -Phenyl	2.1	H00203-11009	H00203-11010	H00203-11011	H00203-11012	H00203-11014	HU808-203-25	00808-01109
	3.0	H00203-11018	H00203-11019	H00203-11020	H00203-11021	H00203-11023	HU808-203-25	00808-01109
	4.6	H00203-11036	H00203-11037	H00203-11038	H00203-11039	H00203-11041	HU808-203-45	00808-01109
Ultisil LP-C18	2.1	H00208-11009	H00208-11010	H00208-11011	H00208-11012	H00208-11014	HU808-208-25	00808-01109
	3.0	H00208-11018	H00208-11019	H00208-11020	H00208-11021	H00208-11023	HU808-208-25	00808-01109
	4.6	H00208-11036	H00208-11037	H00208-11038	H00208-11039	H00208-11041	HU808-208-45	00808-01109
Ultisil Polar-RP	2.1	H00215-11009	H00215-11010	H00215-11011	H00215-11012	H00215-11014	HU808-215-25	00808-01109
	3.0	H00215-11018	H00215-11019	H00215-11020	H00215-11021	H00215-11023	HU808-215-25	00808-01109
	4.6	H00215-11036	H00215-11037	H00215-11038	H00215-11039	H00215-11041	HU808-215-45	00808-01109
Ultisil HILIC	2.1	H00200-11009	H00200-11010	H00200-11011	H00200-11012	H00200-11014	HU808-209-25	00808-01109
	3.0	H00200-11018	H00200-11019	H00200-11020	H00200-11021	H00200-11023	HU808-209-25	00808-01109
	4.6	H00200-11036	H00200-11037	H00200-11038	H00200-11039	H00200-11041	HU808-209-45	00808-01109
Xtimate C18	2.1	00101-01009	00101-01010	00101-01011	00101-01012	00101-01014	U808-101-25	00808-01109
	3.0	00101-01018	00101-01019	00101-01020	00101-01021	00101-01023	U808-101-25	00808-01109
	4.6	00101-01036	00101-01037	00101-01038	00101-01039	00101-01041	U808-101-45	00808-01109
Ultisil XB-CN	2.1	H00205-01009	H00205-01010	H00205-01011	H00205-01012	H00205-01014	HU808-205-25	00808-01109
	3.0	H00205-01018	H00205-01019	H00205-01020	H00205-01021	H00205-01023	HU808-205-25	00808-01109
	4.6	H00205-01036	H00205-01037	H00205-01038	H00205-01039	H00205-01041	HU808-205-45	00808-01109
Ultisil PFP	2.1	H00224-01009	H00224-01010	H00224-01011	H00224-01012	H00224-01014	HU808-216-25	00808-01109
	3.0	H00224-01018	H00224-01019	H00224-01020	H00224-01021	H00224-01023	HU808-216-25	00808-01109
	4.6	H00224-01036	H00224-01037	H00224-01038	H00224-01039	H00224-01041	HU808-216-45	00808-01109
Ultisil HILIC Amphion II	2.1	H00274-01009	H00274-01010	H00274-01011	H00274-01012	H00274-01014	HU808-274-25	00808-01109
	3.0	H00274-01018	H00274-01019	H00274-01020	H00274-01021	H00274-01023	HU808-274-25	00808-01109
	4.6	H00274-01036	H00274-01037	H00274-01038	H00274-01039	H00274-01041	HU808-274-45	00808-01109
Ultisil Amide	2.1	H00240-01009	H00240-01010	H00240-01011	H00240-01012	H00240-01014	HU808-240-25	00808-01109
	3.0	H00240-01018	H00240-01019	H00240-01020	H00240-01021	H00240-01023	HU808-240-25	00808-01109
	4.6	H00240-01036	H00240-01037	H00240-01038	H00240-01039	H00240-01041	HU808-240-45	00808-01109
Xtimate Phenyl -hexyl	2.1	00104-01009	00104-01010	00104-01011	00104-01012	00104-01014	U808-102-25	00808-01109
	3.0	00104-01018	00104-01019	00104-01020	00104-01021	00104-01023	U808-102-25	00808-01109
	4.6	00104-01036	00104-01037	00104-01038	00104-01039	00104-01041	U808-102-45	00808-01109

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

09.

DIAMOND DLC SERIES HPLC COLUMN

DIAMOND DLC SERIES HPLC COLUMN

Features:

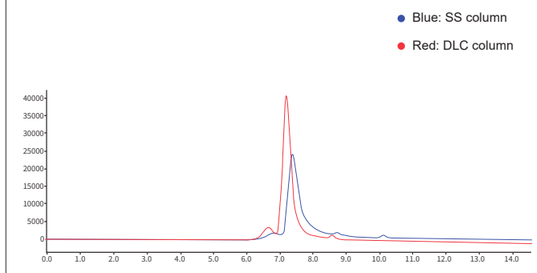
- The inert column tubes effectively reduce specific adsorption.
- Improves peak shape and enhances separation.
- Provides a flatter baseline and increased sensitivity.
- Significantly reduces sample carryover, shortens column activation and passivation times, and improves experimental efficiency.

Specifications:

Column specifications are identical to those of corresponding stainless-steel columns.

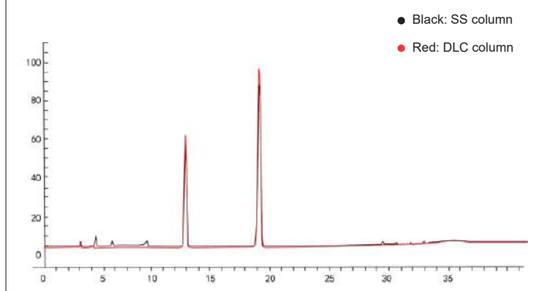
Determination of Bovine Serum Albumin (chromatograms stacked):

Overlap chromatogram:



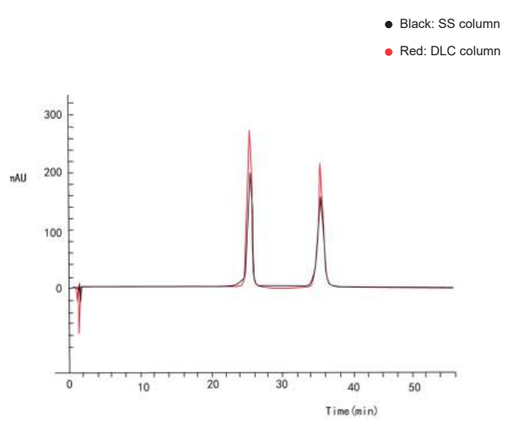
Column:	Xtimate SEC-300, 4.6×250 mm, 5 μm Xtimate DLC SEC-300, 4.6×250 mm, 5 μm
Mobile phase:	8.99 g anhydrous NaH_2PO_4+ 10.65 g anhydrous NaH_2PO_4, dissolved in 1000 mL water, pH adjusted to 6.80
Wavelength:	215 nm
Temperature:	30°C
Flow Rate:	0.35 mL/min
Injection Volume:	5 μL

Determination of Oligonucleotide (chromatograms stacked):



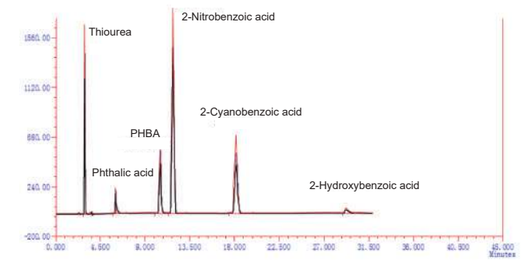
Column:	Xtimate C18, 4.6×250 mm, 5 μm Xtimate DLC C18, 4.6×250 mm, 5 μm
Mobile phase:	A: PB Solution / MeOH = 95/5; B: PB Solution / MeOH = 75/25
Wavelength:	260 nm
Temperature:	25°C
Flow Rate:	1.0 mL/min
Injection Volume:	10 μL

Determination of (R)-9-(2-Phosphonyl-methoxypropyly)adenine (chromatograms stacked):



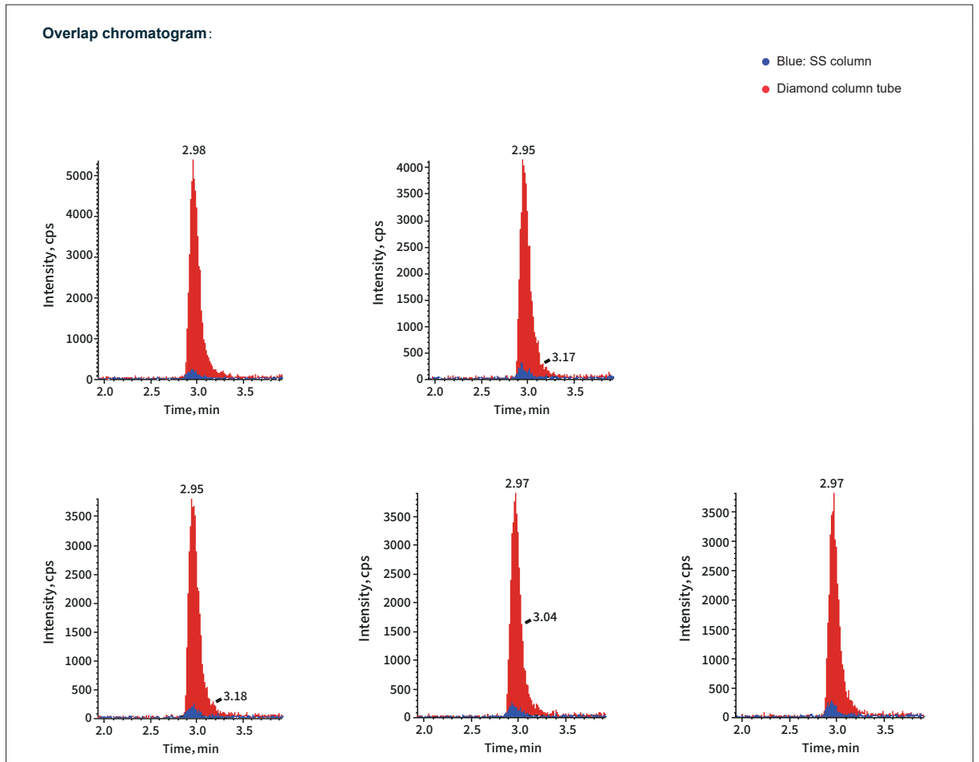
Column:	Ultisil LP-C18, 4.6×250 mm, 5 μm Ultisil DLC LP-C18, 4.6×250 mm, 5 μm
Mobile phase:	Dissolve 0.75 g $CuSO_4$ + 0.17 g L-phenylalanine + 2.3 g $NH_4H_2PO_4$ in 1000 mL water, pH adjusted to 4.0±0.05 by Et_3N
Wavelength:	260 nm
Temperature:	25°C
Flow Rate:	0.5 mL/min

Determination of Six Organic Acids (chromatograms stacked):



Column:	Ultisil Polar-RP, 4.6×250 mm, 5 μm Ultisil DLC Polar-RP, 4.6×250 mm, 5 μm
Mobile phase:	20 mM K_2HPO_4 (pH=2.7 by H_3PO_4) / ACN = 75/25
Wavelength:	254 nm
Temperature:	25 °C
Flow Rate:	1.0 mL/min
Injection Volume:	20 μL

Determination of Dexamethasone Sodium Phosphate (chromatograms stacked):



Column:	Column: Ultisil UHPLC XB-C18, 2.1×50 mm, 1.8 μm Ultisil DLC UHPLC XB-C18, 2.1×50 mm, 1.8 μm
Mobile phase:	A: 5 mmol/L Ammonium formate; B: ACN/MeOH (1:1)
Temperature:	30°C
Flow Rate:	0.2 mL/min
Injection Volume:	2 μL
Sample Concentration:	100 ng/mL
Ion Source:	ESI
Scan Mode:	Positive Ion Scan
Detection Mode:	MRM

Ordering Information—DLC Column

Name	Specification	P/N
Ultisil DLC XB-C4	4.6×250, 5 μm	H00216-31943
Ultisil DLC XB-C8	4.6×250, 5 μm	H00202-31943
Ultisil DLC XB-Phenyl	4.6×250, 5 μm	H00203-31943
Ultisil DLC SiO_2	4.6×250, 5 μm	H00200-31943
Ultisil DLC XB-NH_2	4.6×250, 5 μm	H00204-31943
Ultisil DLC XB-CN	4.6×250, 5 μm	H00205-31943
Xtimate DLC Bio SEC-300	7.8×300, 5 μm	00289-33952
Xtimate DLC Bio SEC-300	4.6×300 , 5 μm	00289-33944
Ultisil DLC Polar RP	4.6×250, 5 μm	H00215-31943
Ultisil DLC Plus C18	4.6×250, 5 μm	H00260-31943
Ultisil DLC Alk C18	4.6×250, 5 μm	H00253-31943
Ultisil DLC AQ-C18	4.6×250, 5 μm	H00207-31943
Ultisil DLC Diol	4.0×125, 5 μm	H00206-31931
Xtimate DLC C18	4.6×250, 5 μm	00101-21543
Ultisil DLC LP-C18	4.6×250, 5 μm	H00208-31943
Xtimate DLC SEC-300	4.6×250, 5 μm	00237-33943
Ultisil DLC UHPLC XB-C18	2.1×50 , 1.8 μm	H00201-11910

*Not all products are listed here; for more information, please contact our sales team.

10.

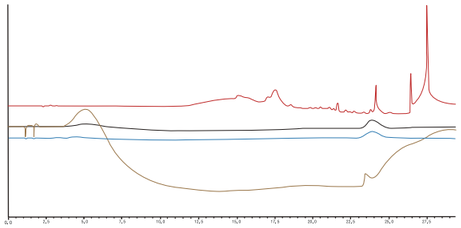
GHOST-BUSTER COLUMN

GHOST-BUSTER COLUMN

Product Features

- Ghost-Buster Columns not only remove impurities from the mobile phase but also effectively capture contaminants within the plumbing and mixer, eliminating interferences from ghost peaks in analyses, enhancing workflow efficiency, and extending the lifespans of columns and instruments to some extent.
- Through further upgrades and refinements, Ghost-Buster Columns II not only achieve superior adsorption of mobile-phase impurities to eliminate ghost peaks, but also address the baseline drift caused by an excessively high initial aqueous proportion in gradient runs, yielding a markedly more stable baseline.
- Ghost-Buster UP Columns, rated to withstand pressures up to 90 MPa, offer seamless compatibility with UHPLC systems.

Application Case



Column:	Ultisil AQ-C18, 4.6×100 mm, 3 μm
Flow Rate:	1.0 mL/min
Volume:	5 μL
Wavelength:	210 nm
Temperature:	25 °C
Mobile Phase A:	0.05% Phosphoric acid
Mobile Phase B:	Acetonitrile

Precautions

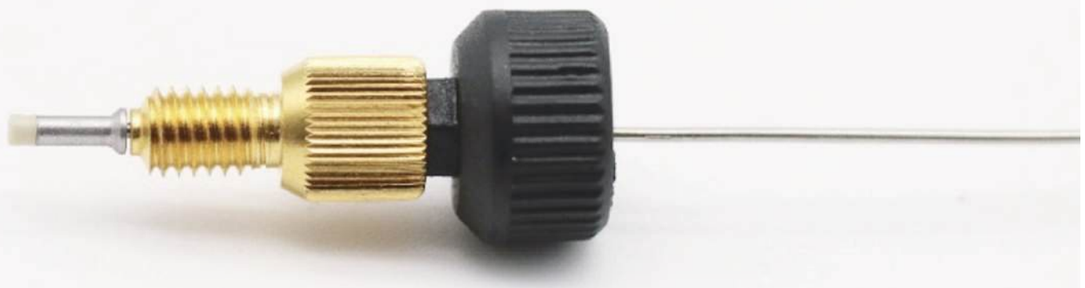
- 1. For a new column, flush with 80% methanol–in-water at 1.0 mL/min for 15 minutes before installation.
- 2. Not all impurities present in the mobile phase can be adsorbed by the Ghost-Buster Column.
- 3. When using ion-pairing reagents in the mobile phase, these reagents may be retained by the Ghost-Buster Column, potentially affecting analyte retention times or peak shapes. Under such conditions, evaluate chromatographic performance to determine whether to employ the Ghost-Buster Column.
- 4. If adsorption efficiency declines, replace the column promptly; it is not intended for unlimited reuse.

Ordering Information—Ghost-Buster Column

Name	P/N	Specification	Max. pressure	Applied Equipment
Ghost-Buster Column	06100-31000	4.6x50 mm	40 MPa	HPLC
Ghost-Buster Column	06100-31001	7.8x50 mm	40 MPa	HPLC
Ghost-Buster Column	06100-31018	3.0x33 mm	40 MPa	HPLC
Ghost-Buster HP Column	06100-31021	2.1x33 mm	40 MPa	HPLC
Ghost-Buster Column	06100-31025	2.1x50 mm	40 MPa	HPLC
Ghost-Buster Column II	06100-31008	4.0x50 mm	40 MPa	HPLC
Ghost-Buster Column II	06100-31016	3.0x50 mm	40 MPa	HPLC
Ghost-Buster Column II	06100-31026	4.6x30 mm	40 MPa	HPLC
Ghost-Buster Column II	06100-31027	4.0x30 mm	40 MPa	HPLC
Ghost-Buster UP Column	06100-31030	2.1x30 mm	90 MPa	UHPLC
Ghost-Buster UP Column	06100-31031	2.1x50 mm	90 MPa	UHPLC

11.

STAINLESS STEEL FITTING



STAINLESS STEEL FITTING

Features

- **Tool-free Installation:** User-friendly design for quick, hand-tight installation.
- **Excellent Sealing:** The PEEK ferrule deforms for a perfect seal, preventing leaks effectively.
- **Broad Compatibility:** The 10-32 screw thread is compatible with most analytical and ghost-catching columns.
- **High Pressure Resistance:**
  - 0.18 mm I.D.: Max pressure 40 MPa, covering most HPLC instruments.
  - 0.17 mm I.D.: Max pressure 60 MPa, covering common UHPLC systems.
  - 0.12 mm I.D.: Max pressure 130 MPa, meeting UPLC system requirements.

Ordering Information—Stainless Steel Fitting

Name	I.D.	Length	Max. Pressure
00808-01311	0.18 mm	105 mm	40 MPa
00808-01312		200 mm	
00808-01315		350 mm	
00808-01313		500 mm	
00808-01324		600 mm	
00808-01331	0.17 mm	105 mm	60 MPa
00808-01332		200 mm	
00808-01333		250 mm	
00808-01334		350 mm	
00808-01335		450 mm	
00808-01336		600 mm	
00808-01325	0.12 mm	105 mm	130 MPa
00808-01326		200 mm	
00808-01330		250 mm	
00808-01327		350 mm	
00808-01314		450 mm	
00808-01328		600 mm	

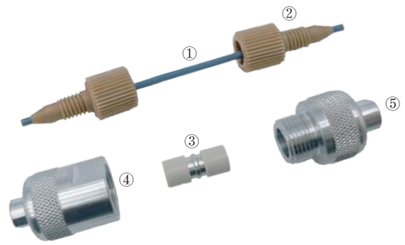
12.

COLUMN PROTECTION

COLUMN PROTECTION

Guard Column	Pre-Column Inline Filter
1. Between injector and analytical column. 2. All have column holders. 3. All have frit to retain solid particles.	
Packing materials inside a Guard Column cartridge.	Filter inside a Pre-column.
Remove strongly adsorbed sample components.	Trap particulate matter from the fluid path, but does not remove sample components or contaminants.
Internal diameters should match as closely as possible and packing material should be of the same particle size and chemistry as the analytical column	1) Can be used with other brands of columns 2) Designed to be wholly disposable or has replaceable filters in a re-useable holden

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



1. Peek tube 2. Peek fitting 3. Cartridge 4-5. Guard Column Holder

P/N	Description	Piece
H00808-01101	Stand Alone Analytical Guard Holder (φ: 4.6mm, 7,000psi)	1
H00808-04001	Ultisil® XB-C18, Cartridge: 5μm, 120Å, 4.6×10mm	2
00808-01301	1/16"Peek Tube, 7cm Length	1
00808-01303	PEEK Fitting, for 1/16" OD tubing	2

Picture	Description	Configuration	P/N	Instrument
	ColumnShield Precolumn Filter, PEEK, 0.5μm Ti frit, 5,000psi	ColumnShield Precolumn Filter, PEEK×1	00808-01220	HPLC
	In-Line Precolumn Filter Holder, 6,000psi	In-Line Precolumn Filter holder×1	00808-01201-1	
	Analytical Replacement Frits, 2μm	Analytical Replacement Frits, 2μm×1	00808-01202	
	Analytical Replacement Frits, 0.5μm	Analytical Replacement Frits, 0.5μm×1	00808-01203	
	In-Line Precolumn Filter Holder Kit (2μm)	In-Line Precolumn Filter holder, 6,000 psi×1 Analytical Replacement Frits, 2μm×2 1/16"Peek Tube, 7 cm Length×1 PEEK Fitting, for 1/16" OD tubing×2	00808-01201	
	In-Line Precolumn Filter Holder Kit (0.5μm)	In-Line Precolumn Filter holder, 6,000 psi×1 Analytical Replacement Frits, 0.5μm×2 1/16"Peek Tube, 7cm Length×1 PEEK Fitting, for 1/16" OD tubing×2	00808-01201-05	

Picture	Description	Configuration	P/N	Instrument
	UltraShield Precoumn Filter, SS, 0.5μm stainless steel frit, 15,000psi	Column Shield Precolumn Filter, SST×1, 5/16"solid wrench×1	00808-01221	UHPLC Core-shell
		Column Shield Precolumn Filter, SST, Waters Port×1, 5/16"solid wrench×1	00808-01201-W	
	Direct Connect Precolumn Filter, with 0.2μm Replacement Frits×5, 18,000psi	Direct Connect Precolumn Filter×1 0.2μm UHPLC Replacement Frits×5 3/8" solid wrench×2	00808-01222	
	UHPLC Replacement Frits, 0.2μm	0.2 μm UHPLC Replacement Frits×1	00808-UF020	
	Stand Alone Analytical Guard Holder (φ: 4.6 mm, 7,000psi)	Stand Alone Analytical Guard Holder×1	**00808-01101**	HPLC
	Stand Alone NarrowBore Guard Holder (φ: 2.1 mm, 7,000psi)	Stand Alone Narrow Bore Guard Holder×1	00808-01107	
	Direct Connect Analytical Guard Holder (φ: 4.6 mm, 7,000psi), compatible with Parker, Valco, Waters columns	Direct Connect Analytical Guard Holder×1 1/4" solid wrench×1	00808-01108	
	Holder: 316L Stainless Steel PEEK Ferrule, 15,000psi 5mm UHPLC Cartridges	Direct Connect UHPLC Analytical Guard Holder×1, 7/16"solid wrench×2	00808-01109	UHPLC Core-shell

Guard Column Cartridges

Phase	Xtimate Guard Column Cartridges				
	3μm, 2.1x10mm	5μm, 2.1x10mm	3μm, 4.6x10mm	5μm, 4.6x10mm	10μm, 4.6x10mm
C18	00808-23101	00808-24101	00808-03101	00808-04101	00808-05101
C8	00808-23102	00808-24102	00808-03102	00808-04102	00808-05102
Phenyl-Hexyl	00808-23106	00808-24106	00808-03106	00808-04106	-
C4	00808-23103	00808-24103	00808-03103	00808-04103	-
CN	-	00808-24105	-	00808-04105	-
Polar-RP	-	00808-24111	-	00808-04152	-
Lactose-NH_2	-	00808-24110	-	00808-04151	-
XB-SCX	-	00808-24112	-	00808-04153	-

Phase	Topsil Guard Column Cartridges			
	3μm, 2.1x10mm	5μm, 2.1x10mm	3μm, 4.6x10mm	5μm, 4.6x10mm
C18	00808-23301	00808-24301	00808-03301	00808-04301
C8	00808-23302	00808-24302	00808-03302	00808-04302
Phenyl-Hexyl	00808-23305	00808-24305	00808-03305	00808-04305
CN	-	00808-24304	-	00808-04304
NH_2	-	00808-24303	-	00808-04303
Silica	-	00808-24306	-	00808-04306
HILIC-NH_2	-	00808-24307	-	00808-04307

Phase	Ultisil Guard Column Cartridges				
	3μm, 2.1x10mm	5μm, 2.1x10mm	3μm, 4.6x10mm	5μm, 4.6x10mm	10μm, 4.6x10mm
XB-C18	H00808-23001	H00808-24001	H00808-03001	H00808-04001	H00808-05001
XB-C8	H00808-23002	H00808-24002	H00808-03002	H00808-04002	H00808-05002
XB-Phenyl	H00808-23006	H00808-24006	H00808-03006	H00808-04006	H00808-05006
XB-C4	H00808-23011	H00808-24008	H00808-03030	H00808-04008	H00808-05008
XB-C1	-	H00808-24023	-	H00808-04026	-
XB-CN	H00808-23005	H00808-24005	H00808-03005	H00808-04005	H00808-05005
SiO_2	H00808-23007	H00808-24007	H00808-03007	H00808-04007	H00808-05007
Diol	H00808-23020	H00808-24020	H00808-03020	H00808-04020	H00808-05020
XB-NH_2	H00808-23004	H00808-24004	H00808-03004	H00808-04004	H00808-05004
XB-SAX	H00808-23008	H00808-24009	H00808-03008	H00808-04009	H00808-05009
XB-SCX	H00808-23012	H00808-24011	H00808-03033	H00808-04011	H00808-05011
XB-C30	H00808-23013	H00808-24024	H00808-03035	H00808-04035	H00808-05013
AQ-C18	H00808-23003	H00808-24003	H00808-03003	H00808-04003	H00808-05003
LP-C18	H00808-23014	H00808-24015	H00808-03010	H00808-04015	H00808-05014
LP-C8	H00808-23015	H00808-24012	H00808-03011	H00808-04012	-
LP-AQ	-	H00808-24026	-	H00808-04042	-
LP-CN	-	H00808-24027	-	H00808-04049	-
LP-C3	-	H00808-24028	-	H00808-04050	-
Plus C18	H00808-23024(3.5μm)	H00808-24029	H00808-03036(3.5μm)	H00808-04036	-
ALK C18	-	H00808-24030	-	H00808-04033	-
ODS-3	H00808-23016	H00808-24031	H00808-03031	H00808-04043	-
PG-C18	-	-	-	H00808-04045	-
XS-C18	H00808-23017	H00808-24033	H00808-03034	H00808-04046	-
PAH	H00808-23018	H00808-24010	H00808-03012	H00808-04010	-
Polar-RP	H00808-23009	H00808-24017	H00808-03009	H00808-04017	H00808-05015
Phenyl-Ether	-	H00808-24034	-	H00808-04028	-
PFP	H00808-23019	H00808-24035	H00808-03024	H00808-04024	-
F-C8	H00808-23021	H00808-24036	H00808-03023	H00808-04038	-
HILIC Silica	H00808-23023	H00808-24037	H00808-03026	H00808-04044	H00808-05016
HILIC NH_2	H00808-23022	H00808-24038	H00808-03025	H00808-04047	H00808-05017
HILIC Amide	H00808-23010	H00808-24025	H00808-03021	H00808-04025	H00808-05018
HILIC Amphion II	-	H00808-24039	-	H00808-04029	-
Amino Acid	-	H00808-24040	-	H00808-04023	-
MM C18/SCX	-	H00808-24032	-	H00808-04032	-
MM NH_2/CN	-	H00808-24041	-	H00808-04037	-

	Welchrom Guard Column Cartridges	
Phase	5μm, 2.1×10mm	5μm, 4.6×10mm
C18	00808-24201	00808-04201
C8	00808-24202	00808-04202

Specification	Boltimate Guard Column Cartridges			
	Column ID (mm)	2.1×5.0mm	Column ID (mm)	4.0×5.0mm
Boltimate C18	2.0-3.0	U808-960-25	3.2-8.0	U808-960-45
Boltimate Phenyl- Hexyl		U808-961-25		U808-961-45
Boltimate EXT-C18		U808-962-25		U808-962-45
Boltimate EXT-PFP		U808-963-25		U808-963-45
Boltimate HILIC		U808-964-25		U808-964-45
Boltimate LP-C18		U808-965-25		U808-965-45
Boltimate C8		U808-966-25		U808-966-45
Boltimate Phenyl		U808-967-25		U808-967-45

Specification	UHPLC Guard Column Cartridges			
	Column ID (mm)	2.1×5.0mm	Column ID (mm)	4.0 ×5.0mm
Ultisil UHPLC XB-C18	2.0-3.0	HU808-201-25	3.2-8.0	HU808-201-45
Ultisil UHPLC AQ-C18		HU808-207-25		HU808-207-45
Ultisil UHPLC XB-C8		HU808-202-25		HU808-202-45
Ultisil UHPLC XB-Phenyl		HU808-203-25		HU808-203-45
Ultisil UHPLC Polar-RP		HU808-215-25		HU808-215-45
Ultisil UHPLC LP-C18		HU808-208-25		HU808-208-45
Ultisil UHPLC HILIC		HU808-209-25		HU808-209-45
Xtimate UHPLC C18		U808-101-25		U808-101-45
Ultisil UHPLC XB-CN		HU808-205-25		HU808-205-45
Ultisil UHPLC PFP		HU808-216-25		HU808-216-45
Ultisil UHPLC HILIC Amphion II		HU808-274-25		HU808-274-45
Ultisil UHPLC Amide		HU808-240-25		HU808-240-45
Xtimate UHPLC Phenyl-hexyl		U808-102-25		U808-102-45

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

13.

MULTI-BATCH HPLC COLUMN

MULTI-BATCH HPLC COLUMN

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

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

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

Different batches of columns to escort your method validation

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

Name	Inner diameter (mm)	Column length (mm)	Particle size (μm)	Pore size (Å)	Carbon load	Specific surface area (m^2/g)	End capping	pH range
Ultisil XB-C18	4.6	250	5	120	17%	320	Yes	2.0-8.0
Xtimate C18	4.6	250	5	120	14%	320	Yes	1.0-12.5
Ultisil LP-C18	4.6	250	5	120	10%	320	Yes	0.5-8.0
Welchrom C18	4.6	250	5	120	19%	320	Yes	2.0-8.0
Ultisil ODS-3	4.6	250	5	100	15%	380	Yes	2.0-8.0
Ultisil Plus C18	4.6	250	5	130	10%	160	Yes	2.0-8.0
Ultisil Polar RP	4.6	250	5	120	18%	320	Yes	2.0-8.0

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

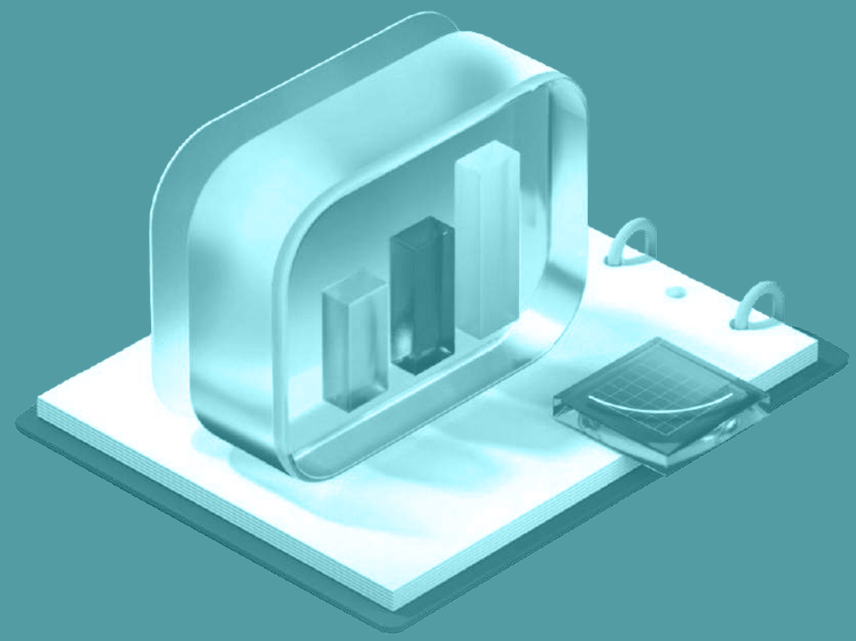
Ordering Information—Multi-Batch HPLC Column

Name	P/N	Specifications
Ultisil XB-C18	HK201-31043-3P	Ultisil XB-C18, 5μm, 4.6×250mm, 3pk
Xtimate C18	K101-21043-3P	Xtimate C18, 5μm, 4.6×250mm, 3pk
Ultisil LP-C18	HK208-31043-3P	Ultisil LP-C18, 5μm, 4.6×250mm, 3pk
Welchrom C18	K310-02043-3P	Welchrom C18, 5μm, 4.6×250mm, 3pk
Ultisil ODS-3	HK275-31043-3P	Ultisil ODS-3, 5μm, 4.6×250mm, 3pk
Ultisil Plus C18	HK260-31043-3P	Ultisil Plus C18, 5μm, 4.6×250mm, 3pk
Ultisil Polar RP	HK215-31043-3P	Ultisil Polar RP, 5μm, 4.6×250mm, 3pk

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

14.

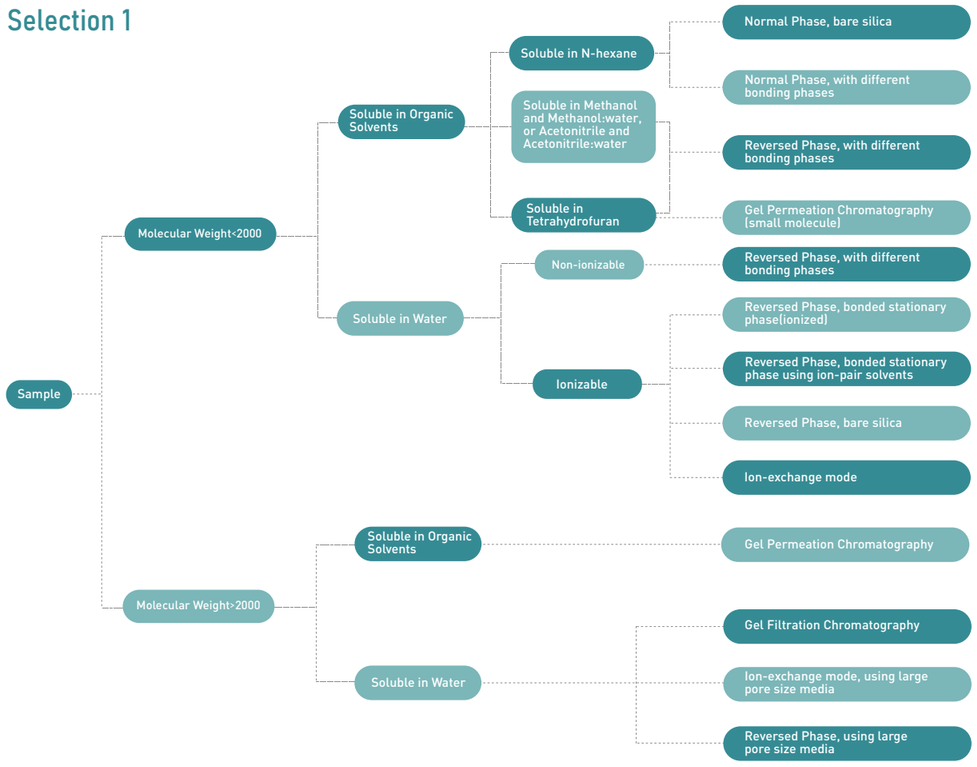
APPENDIX



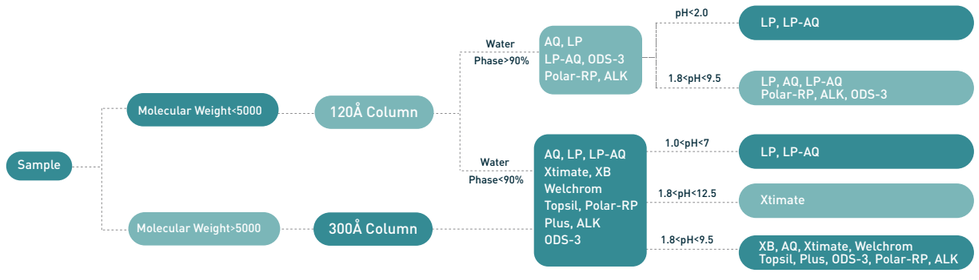
APPENDIX

1. Selection of Analysis Modes

Selection 1



Selection 2



2. Method Development Tool Kit for Pharmaceutical Industry

This kit consists of different columns with different bonding phases and selectivities. Please refer to details below for the application range. Besides columns, the tool kit also includes technical support from Welch technical team throughout the development of methods.

To develop a new method, purpose and requirements of the analysis shall first be confirmed, thus ideal parameters and results can be confirmed. First of all shall be the HPLC mode, which determined normally by following factors:

Factors

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

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

The "Universal" Kit

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

Tool Kits for "Special Application"

"High-Select & Universal" Kit

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

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

"Extended Selectivity" Kit

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

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

"Isomer Analysis" Kit

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

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

"Hydrophilic Substance Analysis" Kit

Contains: Ultisil® AQ-C18, Ultisil® Polar-RP, Ultisil® LP-C8 Dimension: 4.6×250mm,5um(other dimensions also available)

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

"Bio-samples Analysis" Kit

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

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

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

3. Welch HPLC Column Selection by USP Listing

Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L1: Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 1.5 to 10 μm in diameter, or a monolithic rod.					
Ultisil XB-C18	3, 5, 10 μm	2.0-8.0	17%(120Å), 8%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil AQ-C18	3, 5, 10 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil LP-C18	3, 5, 10 μm	0.5-8.0	10%(120Å), 5%(300Å)	320(120Å), 90(300Å)	No
Ultisil LP-AQ	5 μm	1.0-8.0	5%(120Å)	320(120Å)	No
Ultisil Polar-RP	3, 5,10 μm	2.0-8.0	18%(120Å)	320(120Å)	Yes
Ultisil Amino Acid	5 μm	2.0-8.0	17%(120Å)	320(120Å)	Yes
Ultisil Amino Acid Plus	5 μm	2.0-8.0	10%(120Å)	320(120Å)	Yes
Ultisil OAA	5 μm	2.0-8.0	10%(120Å)	320(120Å)	Yes
Ultisil PAH	3, 5 μm	2.0-8.0	22%(120Å)	320(120Å)	Yes
Ultisil ALK C18	5 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil Plus C18	3, 3.5, 5 μm	2.0-8.0	10%(130Å)	160(130Å)	Yes
Ultisil Plus LP-C18	5 μm	0.5-8.0	9%(130Å)	160(130Å)	Yes
Ultisil ODS-3	3, 5 μm	2.0-8.0	15%(100Å)	380(100Å)	Yes
Ultisil XS-C18	3, 5 μm	2.0-8.0	23%(120Å)	320(120Å)	Yes
Ultisil PG-C18	5 μm	2.0-8.0	10%(150Å)	260(150Å)	Yes
Xtimate C18	3, 5, 10 μm	1.0-12.5	14%(120Å)	320(120Å)	Yes
Xtimate Polar-RP	5 μm	1.0-12.5	16%(120Å)	320(120Å)	Yes
Welchrom C18	5 μm	2.0-8.0	19%(120Å)	320(120Å)	Yes
Welchrom Vantage C18	5 μm	2.0-8.0	13%(130Å)	280(130Å)	Yes
Topsil C18	3, 5 μm	2.0-8.0	12%(150Å)	260(150Å)	Yes
Boltimate C18(Core-shell)	2.7 μm	2.0-8.0	9%(90Å)	120(90Å)	Yes
Boltimate EXT-C18 (Core-shell)	2.7 μm	1.5-12.0	8%(90Å)	120(90Å)	Yes
Boltimate LP-C18 (Core-shell)	2.7 μm	1.0-8.0	7%(90Å)	120(90Å)	No
Blossmate C18	5 μm	2.0-8.0	14%(100Å)	300(100Å)	Yes
Blossmate Aqs C18	5 μm	2.0-8.0	10%(100Å)	300(100Å)	Yes
Blossmate ST C18	5 μm	1.0-11.0	12%(100Å)	300(100Å)	Yes
Ultisil UHPLC XB-C18	1.8 μm	2.0-8.0	17%(120Å)	320(120Å)	No
Ultisil UHPLC AQ-C18	1.8 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil UHPLC LP-C18	1.8 μm	0.5-8.0	10%(120Å)	320(120Å)	No
Ultisil UHPLC Polar-RP	1.8 μm	2.0-8.0	18%(120Å)	320(120Å)	Yes
Xtimate UHPLC C18	1.8 μm	1.0-12.5	14%(120Å)	320(120Å)	Yes
Advanchrom C18	5 μm	1.0-12.5	14%(180Å)	220 (180Å)	Yes
Blossmate PSV C18	5 μm	2.0-8.0	12% (120Å)	300 (120Å)	Yes
Blossmate PSV C18 Plus	5 μm	2.0-8.0	12% (120Å)	300 (120Å)	Yes
Welchrom PSV C18	5 μm	2.0-9.0	13% (150Å)	230 (150Å)	Yes
L3: Porous silica particles, 1.5 to 10 μm in diameter, or a mondithic silica rod.					
Ultisil SiO_2	3, 5, 10 μm	2.0-8.0	N/A	320(120Å),90(300Å)	No
Ultisil HILIC Silica	3, 5, 10 μm	2.0-8.0	N/A	320(120Å)	No
Ultisil UHPLC HILIC	1.8 μm	2.0-8.0	N/A	320(120Å)	No
Topsil Silica	5 μm	2.0-8.0	N/A	260(150Å)	No
Boltimate HILIC	2.7 μm	2.0-8.0	N/A	120(90Å)	No
L7: Octyl silane chemically bonded to totally porous silica particles, 1.5 to 10 μm in diameter, or a monolithic silca rod.					
Ultisil XB-C8	3, 5, 10 μm	2.0-8.0	12%(120Å), 4%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil LP-C8	3, 5 μm	1.0-8.0	5.5%(120Å), 3%(300Å)	320(120Å), 90(300Å)	No
Ultisil Plus C8	5 μm	2.0-8.0	7%(130Å)	160(130Å)	Yes
Ultisil F-C8	3, 5 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Xtimate C8	3, 5, 10 μm	1.0-12.5	10%(120Å), 5%(300Å)	320(120Å), 100(300Å)	Yes
Welchrom C8	5 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Topsil C8	3, 5 μm	2.0-8.0	10%(150Å)	260(150Å)	Yes
Boltimate C8	2.7 μm	2.0-8.0	5%(90Å)	120(90Å)	Yes
Ultisil UHPLC XB-C8	1.8 μm	2.0-8.0	12%(120Å)	320(120Å)	Yes
L8: An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 3 to 10μm in diameter.					
Ultisil XB-NH_2	3, 5, 10 μm	2.0-8.0	4%(120Å)	320(120Å)	No
Ultisil HILIC-NH_2	3, 5, 10 μm	2.0-8.0	4%(120Å)	320(120Å)	No
Xtimate NH_2	5 μm	2.0-8.0	7%(120Å)	450(120Å)	No
Topsil NH_2	5 μm	2.0-8.0	3%(150Å)	260(150Å)	No
Topsil Hilic-NH_2	5 μm	2.0-8.0	3%(150Å)	260(150Å)	No
Xtimate Lactose-NH_2	5 μm	2.0-8.0	7%(120Å)	450(120Å)	No

Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L9: Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10µm in diameter.					
Ultisil XB-SCX	3, 5,10 µm	2.0-8.0	12%(120Å), 5%(300Å)	320(120Å), 90(300Å)	No
Xtimate XB-SCX	5 µm	2.0-8.0	2%(120Å)	350(120Å)	No
L10: Nitrile groups chemically bonded to porous silica particles, 3 to 10µm in diameter.					
Ultisil XB-CN	3, 5, 10 µm	2.0-8.0	7%(120Å)	320(120Å)	Yes
Ultisil LP-CN	5 µm	1.0-8.0	6%(120Å)	320(120Å)	No
Xtimate CN	5 µm	1.0-12.5	7%(120Å)	320(120Å)	Yes
Topsil CN	5 µm	2.0-8.0	6%(150Å)	260(150Å)	Yes
Ultisil UHPLC XB-CN	1.8 µm	2.0-8.0	8%(120Å)	320(120Å)	Yes
L11: Phenyl groups chemically bonded to porous silica particles, 1.5 to 10µm in diameter.					
Ultisil XB-Phenyl	3, 5, 10 µm	2.0-8.0	12%(120Å), 4%(300Å)	320(120Å), 90(300Å)	Yes
Ultisil Phenyl-Ether	5 µm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil PFP	3, 5 µm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil Plus Phenyl	5 µm	2.0-8.0	8%(130Å)	160(130Å)	Yes
Xtimate Phenyl-hexyl	3, 5 µm	1.0-12.5	12%(120Å)	320(120Å)	Yes
Topsil Phenyl-hexyl	3, 5 µm	2.0-8.0	12%(150Å)	260(150Å)	Yes
Boltimate Phenyl-hexyl(Core-shell)	2.7 µm	2.0-8.0	7%(90Å)	120(90Å)	Yes
Boltimate EXT-PFP(Core-shell)	2.7 µm	1.5-10.0	5%(90Å)	120(90Å)	Yes
Boltimate Phenyl	2.7 µm	2.0-8.0	5%(90Å)	120(90Å)	Yes
Blossmate Phenyl	3.5 µm	2.0-8.0	1%(450Å)	15(450Å)	Yes
Ultisil UHPLC XB-Phenyl	1.8 µm	2.0-8.0	13%(120Å)	320(120Å)	Yes
Ultisil UHPLC PFP	1.8 µm	2.0-8.0	10%(120Å)	320(120Å)	Yes
Xtimate UHPLC Phenyl-hexyl	1.8 µm	1.0-12.5	12%(120Å)	320(120Å)	Yes
L13:Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.					
Ultisil XB-C1	5 µm	2.0-8.0	4%(120Å)	320(120Å)	Yes
L14: Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10µm in diameter.					
Ultisil XB-SAX	3, 5,10 µm	2.0-8.0	7.5%(120Å), 1.5%(300Å)	320(120Å), 90(300Å)	No
Blossmate SAX	5 µm	2.0-8.0	6.5%(300Å)	300(120Å)	No
L17: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter.					
Xtimate Sugar-H	5, 8 µm	1.0-3.0	N/A	N/A	N/A
L18:Amino and cyano groups chemically bonded to porous silica particles, 3 to 10 µm in diameter.					
Ultisil MM NH_2/CN	5 µm	2.0-8.0	N/A(120Å)	320(120Å)	N/A
L19: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 9 µm in diameter.					
Xtimate Sugar-Ca	5, 8 µm	5.0-9.0	N/A	N/A	N/A
L20: Dihydroxypropane groups chemically bonded to porous silica particles, 1.5 to 10µm in diameter.					
Ultisil Diol	3, 5, 10 µm	2.0-8.0	2.5%(120Å)	320(120Å)	No
Ultisil HILIC Diol	3, 5, 10 µm	2.0-8.0	2.5%(120Å)	320(120Å)	No
L21: A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter.					
Xtimate PS/DVB	5, 10 µm	1.0-14.0	N/A(100Å, 300Å)	N/A	N/A
L22: A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10µm in size.					
Xtimate Sugar-H	5, 8 µm	1.0-3.0	N/A	N/A	N/A
L26: Butyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.					
Ultisil XB-C4	3, 5, 10 µm	2.0-8.0	8%(120Å), 3%(300Å)	320(120Å), 90(300Å)	Yes
Xtimate C4	3, 5 µm	1.0-12.5	8%(120Å), 4%(300Å)	320(120Å), 100(300Å)	Yes
Blossmate C4	3.5 µm	2.0-8.0	0.5%(450Å)	15(450Å)	Yes
L33: Packing having the capacity to separate dextrans of 4,000 to 500,000 daltons. It is spherical, silica-based and processed to provide pH stability.					
Xtimate SEC-120	3, 5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate SEC-200	5 µm	2.0-7.5	N/A(200Å)	N/A	N/A
Xtimate SEC-300	3, 5 µm	2.0-7.5	N/A(300Å)	N/A	N/A
Xtimate SEC-700	5 µm	2.0-7.5	N/A(700Å)	N/A	N/A
Xtimate SEC-1000	5 µm	2.0-7.5	N/A(1000Å)	N/A	N/A
Xtimate SEC-2000	5 µm	2.0-7.5	N/A(2000Å)	N/A	N/A
Xtimate Bio SEC-100	3, 5 µm	2.0-8.0	N/A(100Å)	N/A	N/A
Xtimate Bio SEC-120	3, 5 µm	2.0-8.0	N/A(120Å)	N/A	N/A
Xtimate Bio SEC-150	3, 5 µm	2.0-8.0	N/A(150Å)	N/A	N/A
Xtimate Bio SEC-200	3, 5 µm	2.0-8.0	N/A(200Å)	N/A	N/A
Xtimate Bio SEC-300	3, 5 µm	2.0-8.0	N/A(300Å)	N/A	N/A
Xtimate Bio SEC-1000	3, 5 µm	2.0-8.0	N/A(1000Å)	N/A	N/A
Xtimate PEG SEC-120	5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate PEG SEC-200	5 µm	2.0-7.5	N/A(200Å)	N/A	N/A
Xtimate PEG SEC-300	5 µm	2.0-7.5	N/A(300Å)	N/A	N/A

Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
L40: Cellulose tris-3,5-dimethylphenylcarb-amate coated porous silica particles, 5 to 20 µm in diameter.					
Blossmate Cellu-D	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L43: Pentafluoro phenyl groups chemically bonded to silica particles 5 to 10 µm in diameter.					
Ultisil PFP	3, 5 µm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil UHPLC PFP	1.8 µm	2.0-8.0	10%(120Å)	320(120Å)	Yes
Boltimate EXT-PFP(Core-shell)	2.7 µm	1.5-10.0	5%(90Å)	120(90Å)	Yes
L51: Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10 µm in diameter.					
Blossmate Amy-D	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L56: Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter.					
Ultisil LP-C3	5 µm	1.0-8.0	4%(120Å)	320(120Å)	No
L59: Packing having the capacity to separate proteins by molecular weight over the range of 5 to 7000 kDa. It is spherical (1.5-10 µm), silica-based, and processed to provide hydrophilic characteristicsand pH stability.					
Xtimate SEC-120	3, 5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate SEC-200	5 µm	2.0-7.5	N/A(200Å)	N/A	N/A
Xtimate SEC-300	3, 5 µm	2.0-7.5	N/A(300Å)	N/A	N/A
Xtimate SEC-700	5 µm	2.0-7.5	N/A(700Å)	N/A	N/A
Xtimate SEC-1000	5 µm	2.0-7.5	N/A(1000Å)	N/A	N/A
Xtimate SEC-2000	5 µm	2.0-7.5	N/A(2000Å)	N/A	N/A
Xtimate Bio SEC-100	3, 5 µm	2.0-8.0	N/A(100Å)	N/A	N/A
Xtimate Bio SEC-120	3, 5 µm	2.0-8.0	N/A(120Å)	N/A	N/A
Xtimate Bio SEC-150	3, 5 µm	2.0-8.0	N/A(150Å)	N/A	N/A
Xtimate Bio SEC-200	3, 5 µm	2.0-8.0	N/A(200Å)	N/A	N/A
Xtimate Bio SEC-300	3, 5 µm	2.0-8.0	N/A(300Å)	N/A	N/A
Xtimate Bio SEC-1000	3, 5 µm	2.0-8.0	N/A(1000Å)	N/A	N/A
Xtimate PEG SEC-120	5 µm	2.0-7.5	N/A(120Å)	N/A	N/A
Xtimate PEG SEC-200	5 µm	2.0-7.5	N/A(200Å)	N/A	N/A
Xtimate PEG SEC-300	5 µm	2.0-7.5	N/A(300Å)	N/A	N/A
L60: Spherical, porous silica gel, 10 µm or less in diameter, surface has been covalently modified with alkyl amide groups and endcapped.					
Ultisil Polar-RP	3, 5,10 µm	2.0-8.0	18%(120Å)	320(120Å)	Yes
Xtimate Polar-RP	5 µm	1.0-12.5	16%(120Å)	320(120Å)	Yes
Ultisil UHPLC Polar-RP	1.8 µm	2.0-8.0	18%(120Å)	320(120Å)	Yes
L62: C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter.					
Ultisil XB-C30	3, 5, 10 µm	2.0-8.0	22%(120Å)	320(120Å)	Yes
L68: Spherical, porous silica, 10µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped.					
Ultisil HILIC Amide	3, 5,10 µm	2.0-8.0	7%(120Å)	320(120Å)	N/A
Ultisil UHPLC HILIC Amide	1.8 µm	2.0-8.0	6%(120Å)	320(120Å)	N/A
L80: Cellulose tris(4-methylbenzoate)-coated, porous, spherical, silicaparticles, 5 µm in diameter.					
Blossmate Cellu-J	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L90: Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter.					
Blossmate Amy-S	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L93: Cellulose tris(3,5-dimethylphenylcarbamate) reversed phase chiral stationary phase coated on 3 or 5 µm silica gel particles.					
Blossmate Cellu-DR	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L96: Alkyl chain, reversed-phase bonded totatlly or superficially porous silica designed to retain hydrophilic and other polar compounds when using highly aqueous mobile phases, including 100% aqueous, 1.5 µm to 10 µm in diameter.					
Ultisil AQ-C18	3, 5, 10 µm	2.0-8.0	12%(120Å)	320(120Å)	Yes
Ultisil LP-AQ	5 µm	1.0- 8.0	5%(120Å)	320(120Å)	No
L99: Amylose tris-(3,5-dimethylhenylcarbamate), immobilized on porous, spherical, silica particles, 3 to 5 µm in diameter.					
Blossmate IMMA	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L107: Cellulose tris(4-methylbenzoate)-coated porous spherical particles, 3 to 5 µm in diameter, for use with reversed phase mobile phases.					
Blossmate Cellu-JR	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L114: Sulfobetaine graft-polymerized to totally or superficially porous silica, 1.5 to 10 µm in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance.					
Ultisil HILIC Amphion II	5 µm	2.0-8.0	6%(120Å)	320(120Å)	N/A
Ultisil UHPLC HILIC Amphion II	1.8 µm	2.0-8.0	5%(120Å)	320(120Å)	N/A
L118: Aqueous polymerized C18 groups on silica particles, 1.2 to 5 µm in diameter.					
Ultisil PAH	3, 5 µm	2.0-8.0	22%(120Å)	320(120Å)	No
L119: Cellulose tris-(3,5-dichlorophenylcarbamate), immobilized on porous, spherical, silica particles, 3 to 5 µm in diameter.					
Blossmate IMMC	5, 10 µm	2.0-8.0	N/A	N/A	N/A
L123: Cellulose tris(3-chloro-4-methylphenylcarbamate) coated porous silica particles, 3 to 20 µm in diameter.					
Blossmate Cellu-Z	5, 10 µm	2.0-8.0	N/A	N/A	N/A

Column	Particle Size	pH Range	Carbon Loading	Surface Area(m^2/g)	Endcapped
Not included in USP List					
Ultisil MM C18/SCX	5 μm	2.0-8.0	N/A(120Å)	320(120Å)	N/A
Ultisil MM SCX/C18	5 μm	2.0-8.0	N/A(120Å)	320(120Å)	N/A
Ultisil Zn	N/A	N/A	N/A	N/A	N/A
Ultisil Lead oxide	N/A	N/A	N/A	N/A	N/A
Blossmate Amy-SR	5,10 μm	2.0-8.0	N/A	N/A	N/A
Blossmate Amy-DR	5,10 μm	2.0-8.0	N/A	N/A	N/A
Blossmate Cellu-ZR	5, 10 μm	2.0-8.0	N/A	N/A	N/A
Blossmate IMMB	5, 10 μm	2.0-8.0	N/A	N/A	N/A
Blossmate IMMG	5, 10 μm	2.0-8.0	N/A	N/A	N/A
Advanchrom HIC-Butyl	3 μm	2.0-8.0	N/A (1000Å)	N/A (1000Å)	N/A
Advanchrom Bio HIC-Butyl	5 μm	2.0-8.0	N/A (1000Å)	N/A (1000Å)	N/A
Blossmate Polar-Propylamide	5 μm	2.0-8.0	7%(120Å)	320(120Å)	N/A
Advanchrom Amine	5 μm		12% (120Å)	320(120Å)	N/A

4. Cross Reference

Ultisil XB-C18 is equivalent to:

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

Ultisil AQ-C18 is equivalent to:

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

Ultisil XB-C8 is equivalent to:

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

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

Xtimate (wide pH range) is equivalent to:

Waters	Xterra series	Xbridge series
Agilent	Extend series	
Phenomenex	Gemini series	

Chiral Column Reference Table

Company	Brand	Coated Normal Phase					Coated Reversed Phase					Immobilized Phase			
Welch	Blossmate	Cellu-D	Cellu-J	Cellu-Z	Amy-D	Amy-S	Cellu-DR	Cellu-JR	Amy-ZR	Amy-DR	Amy-SR	IMMA	IMMB	IMMC	IMMG
Daicel	Chiralcel	OD, OD-H	OJ, OJ-H	OZ, OZ-H			OD, OD-H	OJ-R, OJ-RH	OZ-R, OZ-RH						
	Chiralpak				AD, AD-H	AS, AS-H				OJ-R, OJ-RH	OZ-R, OZ-RH	IA	IB	IC	IG