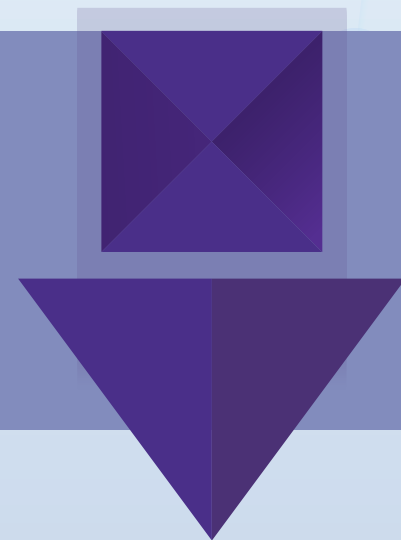


welch



CHROMATOGRAPHY

PRODUCTS CATALOG

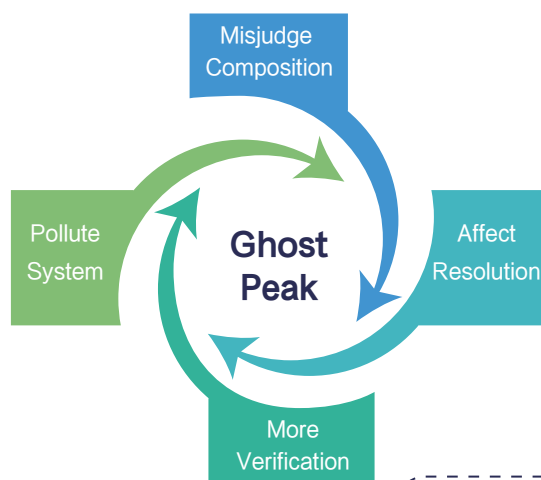


- ◆ **Ghost-Buster Column**
- ◆ **HPLC Column**
- ◆ **UHPLC Column**
- ◆ **Core-Shell Column**

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Ghost-Buster Column



What is Ghost Peak?

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

Where is Ghost Peak from?

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

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

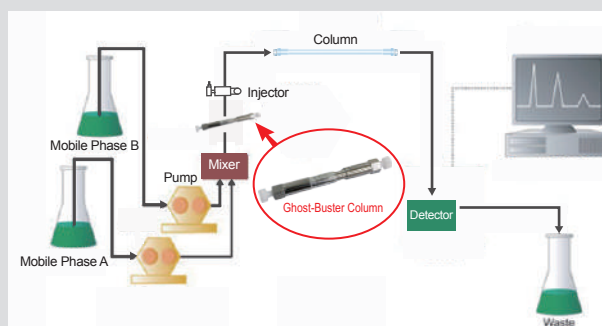
○ Operation Principles

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

○ Precautions

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

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



Application and Results

Column: Ultisil® XB-C18, 4.6×250 mm, 5 μm

Flow Rate: 1.0 mL/min

Injection Volume: 10 μL

Detection: 210 nm

Temperature: 40 C

Sample Preparation: Ultra-pure water

Mobile Phase A: Ultra-pure water

Mobile Phase B: Acetonitrile

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

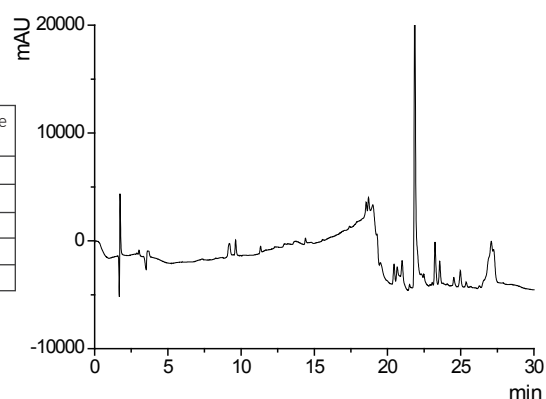


Figure 1: without Ghost-Buster column

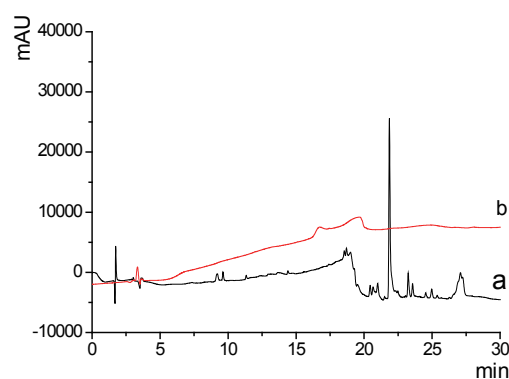


Figure 3: without Ghost-Buster column(a) and with Ghost-Buster column(b)

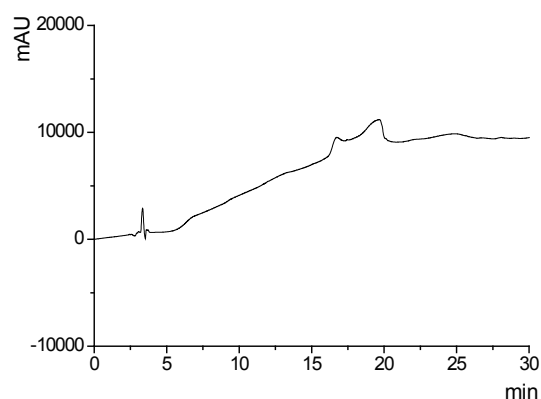


Figure 2: with Ghost-Buster column

Ordering Information

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

Q&A

Q: For different samples and gradient conditions, should the Ghost-Buster column be removed or changed?

A: Not necessary. But it needs to be removed only for special circumstances like changing of peak position or ion-pair solvents mobile phase.

Q: When gradient elution changed to isocratic, should the Ghost-Buster column be removed?

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

Q: In gradient system, Ghost-Buster column increases the mixed dwell volume. Will this affect the separation?

A: The packing volume of a 4.6×50mm column is ~400 μL and the column is installed before the injector, which would cause little influence on the analysis. If it does, connect Ghost-Buster column to the water phase path before the mixer or switching valve.

Q: Any requirements for the connecting of Ghost-Buster column?

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

Ghost-Buster II Column

Further improvement, excellent performance!

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

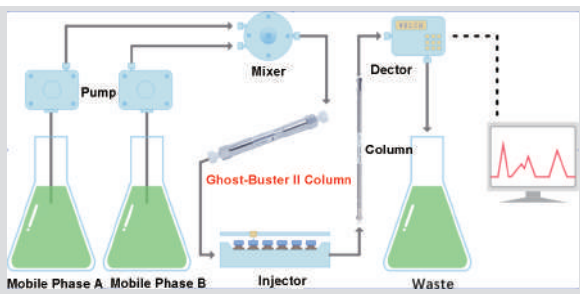
Welch Materials is delighted to announce the launch of Ghost-Buster II Column, an upgraded and improved Ghost-Buster column, which can absorb mobile phase impurities and eliminate ghost peaks. At the same time, baseline drift caused by a high proportion of aqueous solvent in the gradient program will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

Precautions

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



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



Stronger Capturing Effect

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

Column: C18 column

GB Column: Ghost-Buster II Column, 3.0x50mm

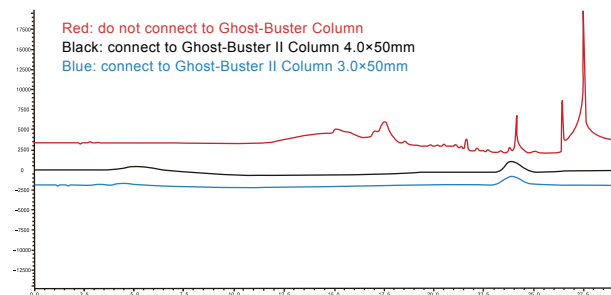
Ghost-Buster II Column, 4.0x50mm

Mobile phase: A: 0.05% phosphoric acid solution B: acetonitrile

Gradient program:

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

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



More Stable Baseline

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

Column: C18 column

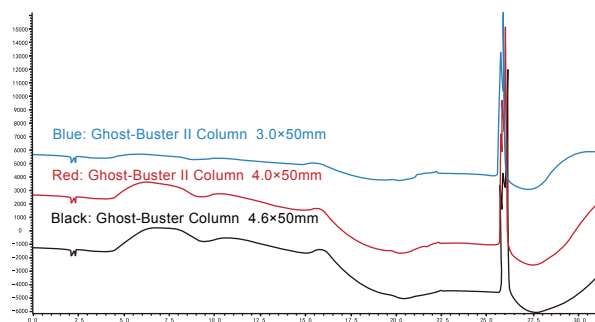
GB Column: Ghost-Buster II Column, 3.0×50mm

Mobile phase: A: phosphoric acid buffer B: acetonitrile

Gradient program:

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

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



Ordering Information

| Name | P/N | Dimension | Pressure |
|------------------------|-------------|-----------|----------|
| Ghost-Buster II Column | 06100-31008 | 4.0×50mm | 40MPa |
| Ghost-Buster II Column | 06100-31016 | 3.0×50mm | 40MPa |

Q&A

Q: What's the lifetime of GB column?

A: Not necessary. But it needs to be removed only for special circumstances like changing of peak position or ion-pair solvents mobile phase. The lifetime of GB column is related to the analysis conditions, brand of the solvents and purity of the mobile phase. If the mobile phase composition (such as water/methanol) is simple, and GB column is carefully used, the lifetime of the GB column is over one year and the number of injections is around 3000 times.

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

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

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

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

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

- In most cases, it may not be compatible with the mobile phase which contains ion pair reagent such as sodium 1 heptanesulfonate, tetrabutylammonium hydroxide etc.
- However, in some cases, GB column might not affect the retention and peak shape. In these cases, this GB column must be the dedicated column for this ion pair reagent and can't be used for another ion pair reagent mobile phase.

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

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

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

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

Ultisil® Series HPLC Column

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

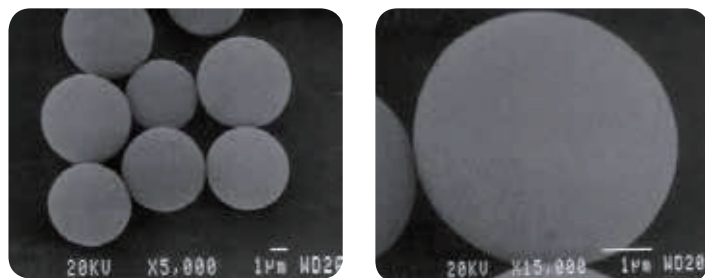
Features:

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

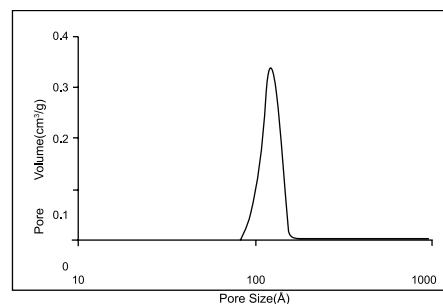
Ultisil® HPLC Column Packing Materials

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

SEM Pictures of Ultisil® Particles

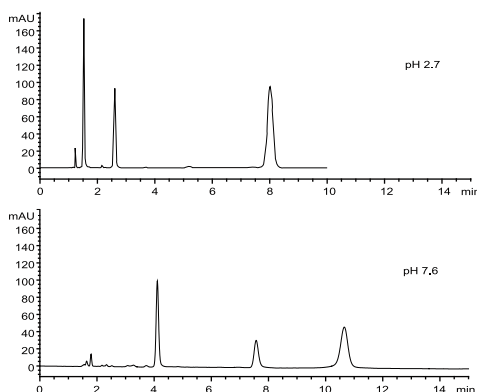


Ultisil® Pore Size Distribution



Trace Amount Metal Contents Test

A useful chromatographic test of trace amount of metal contents in the column is to compare the peak symmetry of one pair of positional isomers, 4,4'-dipyridyl and 2,2'-dipyridyl, and a neutral chelating reagent, 1,2-dihydroxynaphthalene. 4,4'-dipyridyl, which cannot form chelating complex with metal, is used as a reference. 2,2'-dipyridyl and 1,2-dihydroxynaphthalene, 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-dihydroxynaphthalene would tail or even totally disappear.



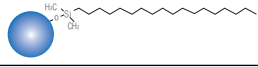
| | |
|-------------------|---|
| Column: | Ultisil® XB-C18, 4.6 × 150 mm, 5 µm |
| Mobile Phase: | 20 mM phosphate(pH 7.6) / methanol=55/45 |
| Flow rate: | 1.0 mL/min |
| Detector: | 215 nm |
| Temperature: | 25°C |
| Injection Volume: | 1 µL |
| Samples: | 1) 4,4'-Dipyridyl 2) 2,2'-Dipyridyl 3) 1,2-Dihydroxynaphthalene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

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.

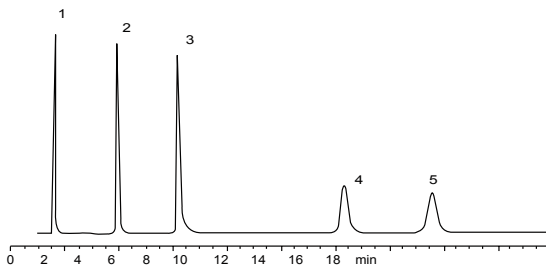
Ultisil® XB-C18—Universal HPLC Analytical Column

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

Ultisil®XB-C18

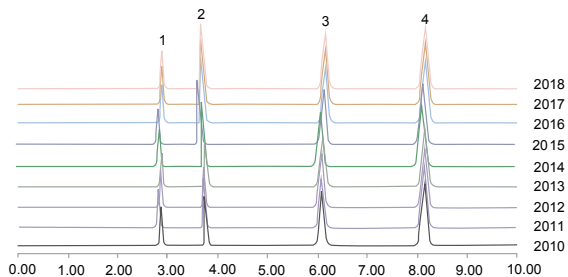
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.5-10.0 |
| Particle Size | 3 μm, 5 μm, 10 μm |
| Surface Area(m ² /g) | 320(120 Å), 90(300 Å) |
| Carbon Loading(%) | 17(120 Å), 8(300 Å) |
| USP List | L1 |
| Endcapped | Yes |

Separation of Basic Compounds Antidepressant at pH 7.0



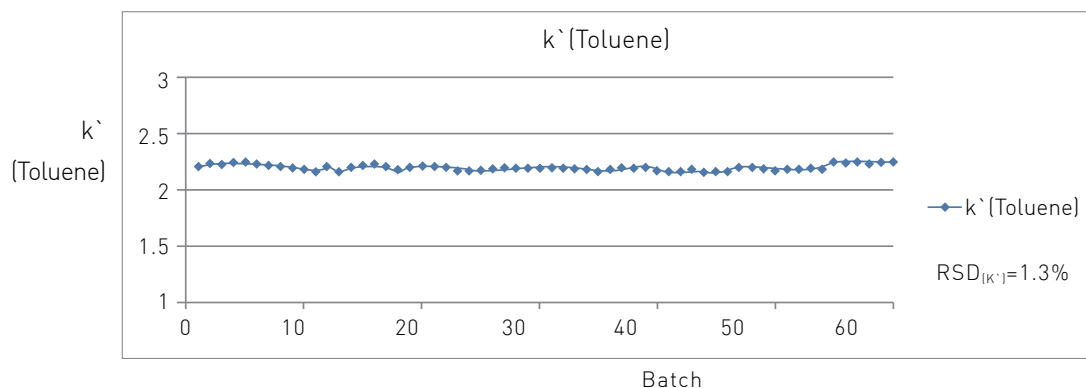
| | | |
|---------------|---|-----------------------------------|
| Column: | Ultisil®XB-C18, 4.6 ×150 mm, 5 μm | |
| Mobile Phase: | 20 mM phosphate(pH 7.0) / methanol=20 / 80 | |
| Flow rate: | 1.0 mL/min | |
| Detector: | 215 nm | |
| Temperature: | 25°C | |
| Samples: | 1) Uracil 3) Ortriptyline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

Comparison of Peak Shape between Batch to Batch

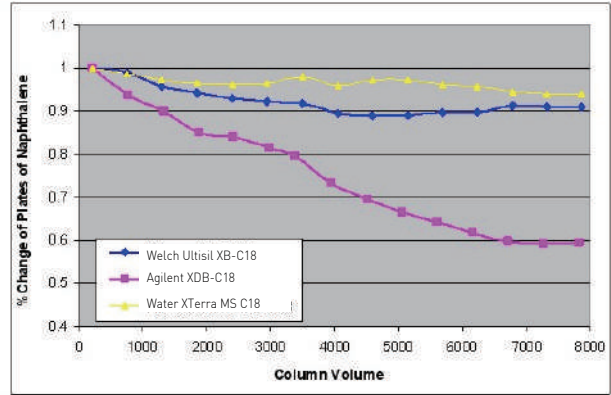
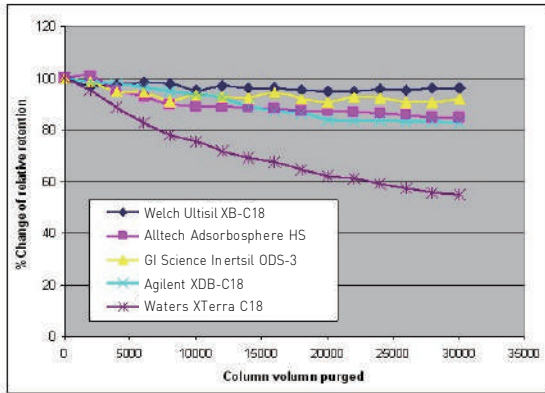


| | | |
|---------------|-------------------------------------|-------------------------------|
| Column: | Ultisil®XB-C18, 4.6 ×250 mm, 5 μm | |
| Mobile Phase: | Methanol / water=75 / 25 | |
| Flow rate: | 1.0 mL/min | |
| Detector: | 254 nm | |
| Temperature: | 25°C | |
| Samples: | 1) Uracil 3) 4-chloronitrobenzen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

Capacity Factor(K') of Batch to Batch Reproducibility

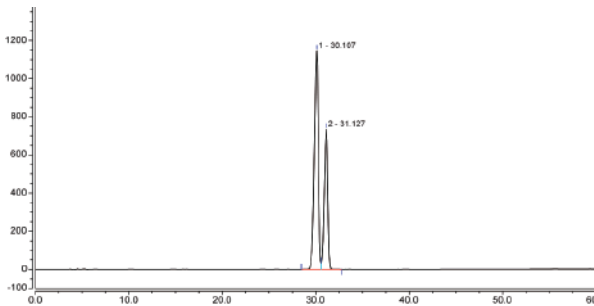


Excellent Stability at Low pH and High pH



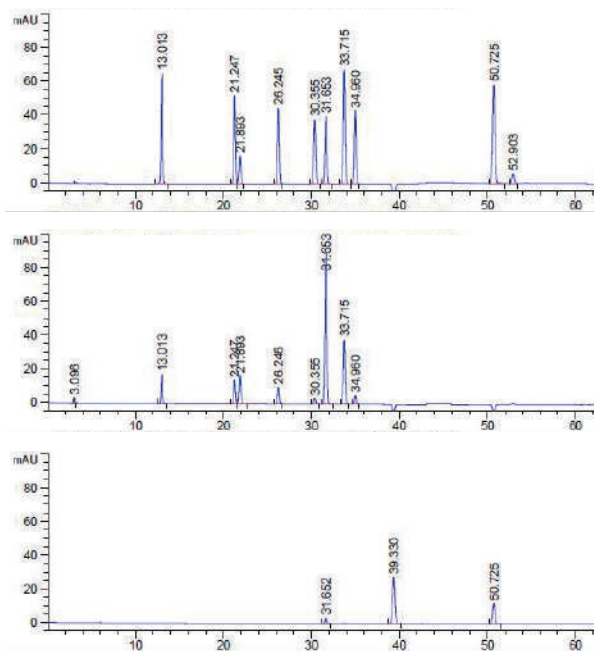
The stability of XB-C18 is better than other brand columns under pH 1.3 or under pH 10.

Argatroban



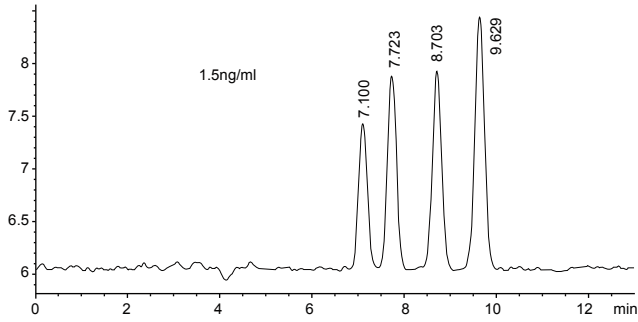
| | | | |
|-------------------|---|----|----|
| Column: | Ultisil® XB-C18, 4.6 ×250 mm, 3 µm | | |
| Mobile Phase: | Mobile Phase A: 10 mmol/L ammonium acetate Mobile Phase B: acetonitrile/methanol=50/30 | | |
| Gradient Program: | Time(min) | A | B |
| | 0 | 60 | 40 |
| | 20 | 60 | 40 |
| | 35 | 50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

Paracetamol Injection USP 36



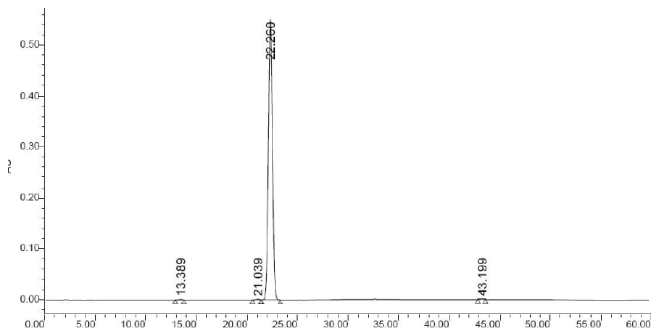
| | | | |
|-------------------|--|----|-----|
| Column: | Ultisil® XB-C18, 4.6 ×250 mm, 5 µm | | |
| Mobile Phase: | A: methanol / water / acetic acid =50/950/1 B: methanol / water / acetic acid =50/500/1 | | |
| Gradient Program: | Time(min) | A | B |
| | 0 | 82 | 18 |
| | 8 | 82 | 18 |
| | 53 | 0 |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

Aflatoxin



| | |
|---|--|
| Column: | Ultisil® XB-C18, 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Water / methanol / acetonitrile=46/40/14 |
| Flow Rate: | 1.0 mL/min |
| Detector: | Excitation wavelength: 360 nm Emission wavelength: 450 nm Gain:17 |
| Temperature: | 30°C |
| Injection Volume: | Post-column photo chemical derivation (254 nm) |
| Aflatoxin B1, B2, G1, G2 mixed standards, meets separation requirements | |

Progesterone(EP 5.0)



| Column: | Ultisil® XB-C18, 4.6 × 150 mm, 5 μm | | | | | | | | | | | | | | | |
|--------------------------|--|-----------|---|---|------|----|----|-------|-------|-------|-------|----|----|-------|----|----|
| Mobile Phase: | A: water B: acetonitrile | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>0-20</td> <td>50</td> <td>50</td> </tr> <tr> <td>20-27</td> <td>50-20</td> <td>50-80</td> </tr> <tr> <td>27-45</td> <td>20</td> <td>80</td> </tr> <tr> <td>45-50</td> <td>50</td> <td>50</td> </tr> </tbody> </table> | Time(min) | A | B | 0-20 | 50 | 50 | 20-27 | 50-20 | 50-80 | 27-45 | 20 | 80 | 45-50 | 50 | 50 |
| Time(min) | A | B | | | | | | | | | | | | | | |
| 0-20 | 50 | 50 | | | | | | | | | | | | | | |
| 20-27 | 50-20 | 50-80 | | | | | | | | | | | | | | |
| 27-45 | 20 | 80 | | | | | | | | | | | | | | |
| 45-50 | 50 | 50 | | | | | | | | | | | | | | |
| Flow Rate: | 0.9 mL/min | | | | | | | | | | | | | | | |
| Detector: | 254 nm, 275 nm, 317 nm | | | | | | | | | | | | | | | |
| Temperature: | 40°C | | | | | | | | | | | | | | | |
| Injection Volume: | 20 μL | | | | | | | | | | | | | | | |
| Reference Sample: | L-hydroxyproline, glycine, alanine, L-proline | | | | | | | | | | | | | | | |

Ordering Information Ultisil® XB-C18

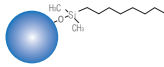
| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00201-21009 | H09201-21009 | H00201-21010 | H00201-21011 | H00201-21012 | H00201-21013 | H00201-21014 | H00201-21015 | H00201-21016 | - | H00808-23001 | 00808-01107 |
| | 3.0 | H00201-21018 | - | H00201-21019 | H00201-21020 | H00201-21021 | H00201-21022 | H00201-21023 | H00201-21024 | H00201-21025 | - | H00808-23001 | 00808-01107 |
| | 4.0 | H00201-21027 | - | H00201-21028 | H00201-21029 | H00201-21030 | H00201-21031 | H00201-21032 | H00201-21033 | H00201-21034 | - | H00808-03001 | 00808-01101 |
| | 4.6 | H00201-21036 | H11201-21036 | H00201-21037 | H00201-21038 | H00201-21039 | H00201-21040 | H00201-21041 | H00201-21042 | H00201-21043 | - | H00808-03001 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00201-31009 | H09201-31009 | H00201-31010 | H00201-31011 | H00201-31012 | H00201-31013 | H00201-31014 | H00201-31015 | H00201-31016 | - | H00808-24001 | 00808-01107 |
| | 3.0 | H00201-31018 | - | H00201-31019 | H00201-31020 | H00201-31021 | H00201-31022 | H00201-31023 | H00201-31024 | H00201-31025 | - | H00808-24001 | 00808-01107 |
| | 4.0 | H00201-31027 | - | H00201-31028 | H00201-31029 | H00201-31030 | H00201-31031 | H00201-31032 | H00201-31033 | H00201-31034 | H00201-31035 | H00808-04001 | 00808-01101 |
| | 4.6 | H00201-31036 | H11201-31036 | H00201-31037 | H00201-31038 | H00201-31039 | H00201-31040 | H00201-31041 | H00201-31042 | H00201-31043 | H00201-31044 | H00808-04001 | 00808-01101 |
| 10 μm 120 Å | 4.0 | - | - | - | - | - | - | H00201-41032 | H00201-41033 | H00201-41034 | H00201-41035 | H00808-05001 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | H00201-41041 | H00201-41042 | H00201-41043 | H00201-41044 | H00808-05001 | 00808-01101 |

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

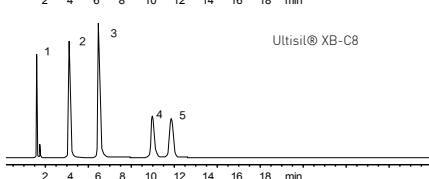
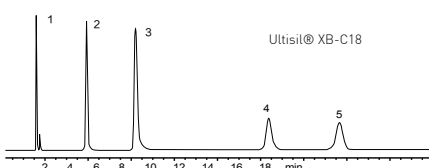
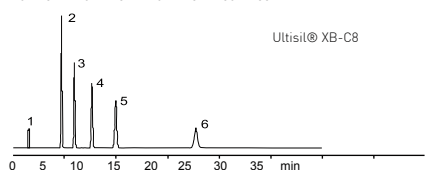
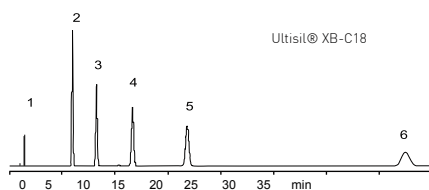
Ultisil® XB-C8--Less retentive than XB-C18

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

Ultisil® XB-C8

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

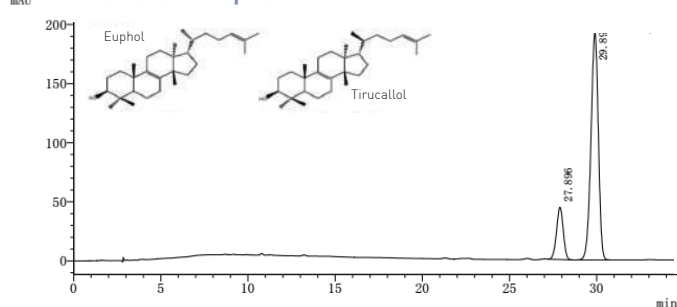
Comparison of Retention of XB-C18 and XB-C8



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

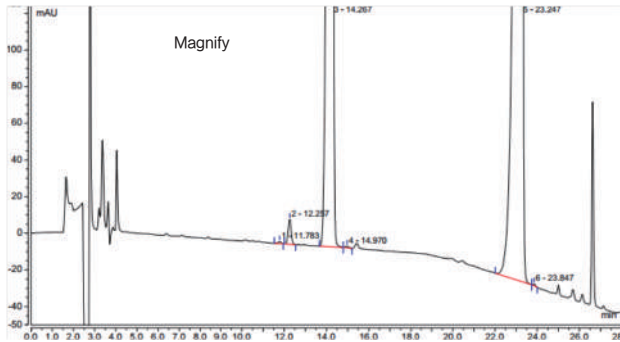
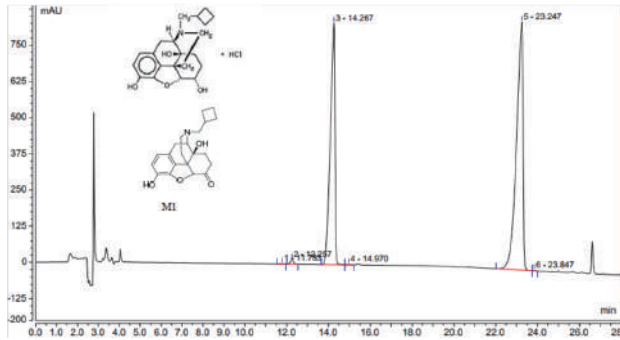
| | | |
|---------------|---|-------------------------------------|
| Column: | 4.6 × 150 mm, 5 μm | |
| Mobile Phase: | 20 mM phosphate(pH 7.0) / methanol=20 / 80 | |
| Flow rate: | 1.0 mL/min | |
| Detector: | 215 nm | |
| Temperature: | 25°C | |
| Samples: | 1) Uracil 2) Ropranolol 3) Ortriptyline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

Tirucalol and Euphol



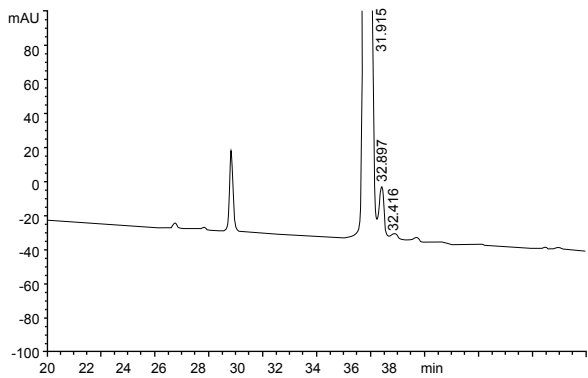
| | |
|-------------------|------------------------------------|
| Column: | Ultisil® XB-C8, 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Acetonitrile/water=90/10 |
| Flow Rate: | 1.0 mL/min |
| Detector: | 210 nm |
| Temperature: | 30°C |
| Injection Volume: | 10 μL |

Nalbuphine HCl



| | | | |
|-------------------|--|----|----|
| Column: | Ultisil® XB-C8, 4.6 ×250 mm, 5 µm | | |
| Mobile Phase: | A: 0.02 mol/L KH ₂ PO ₄ buffer(pH 6.5)(%) B: acetonitrile | | |
| Gradient Program: | Time(min) | A | B |
| | 0 | 80 | 20 |
| | 15 | 70 | 30 |
| | 25 | 40 | 60 |
| | 28 | 40 | 60 |
| | 30 | 80 | 20 |
| | 45 | 80 | 20 |
| Flow Rate: | 1.0 mL/min | | |
| Detector: | 220 nm | | |
| Temperature: | 30°C | | |
| Injection Volume: | 10 µL | | |

Analysis of Insulin Detemir



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

Ordering Information

Ultisil® XB-C8

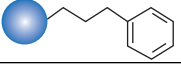
| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | | |
| 3 µm 120 Å | 2.1 | H00202-21009 | H09202-21009 | H00202-21010 | H00202-21011 | H00202-21012 | H00202-21013 | H00202-21014 | H00202-21015 | H00202-21016 | - | H00808-23002 | 00808-01107 | |
| | 3.0 | H00202-21018 | - | H00202-21019 | H00202-21020 | H00202-21021 | H00202-21022 | H00202-21023 | H00202-21024 | H00202-21025 | - | H00808-23002 | 00808-01107 | |
| | 4.0 | H00202-21027 | - | H00202-21028 | H00202-21029 | H00202-21030 | H00202-21031 | H00202-21032 | 00202-21033 | H00202-21034 | - | H00808-03002 | 00808-01101 | |
| | 4.6 | H00202-21036 | H11202-21036 | H00202-21037 | H00202-21038 | H00202-21039 | H00202-21040 | H00202-21041 | H00202-21042 | H00202-21043 | - | H00808-03002 | 00808-01101 | |
| 5 µm 120 Å | 2.1 | H00202-31009 | H09202-31009 | H00202-31010 | H00202-31011 | H00202-31012 | H00202-31013 | H00202-31014 | H00202-31015 | H00202-31016 | - | H00808-24002 | 00808-01107 | |
| | 3.0 | H00202-31018 | - | H00202-31019 | H00202-31020 | H00202-31021 | H00202-31022 | H00202-31023 | H00202-31024 | H00202-31025 | - | H00808-24002 | 00808-01107 | |
| | 4.0 | H00202-31027 | - | H00202-31028 | H00202-31029 | H00202-31030 | 00202-31031 | H00202-31032 | H00202-31033 | H00202-31034 | H00202-31035 | H00808-04002 | 00808-01101 | |
| | 4.6 | H00202-31036 | H11202-31036 | H00202-31037 | H00202-31038 | H00202-31039 | 00202-31040 | H00202-31041 | H00202-31042 | H00202-31043 | H00202-31044 | H00808-04002 | 00808-01101 | |
| 10 µm 120 Å | 4.0 | - | - | - | - | - | H00202-41032 | H00202-41033 | H00202-41034 | H00202-41035 | H00808-05002 | 00808-01101 | | |
| | 4.6 | - | - | - | - | - | H00202-41041 | H00202-41042 | H00202-41043 | H00202-41044 | H00808-05002 | 00808-01101 | | |

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

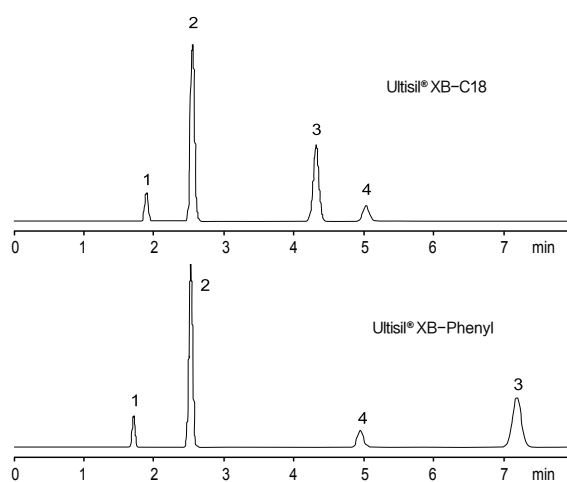
Ultisil® XB-Phenyl--Different Selectivity to Alkyl Phase

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

Ultisil® XB-Phenyl

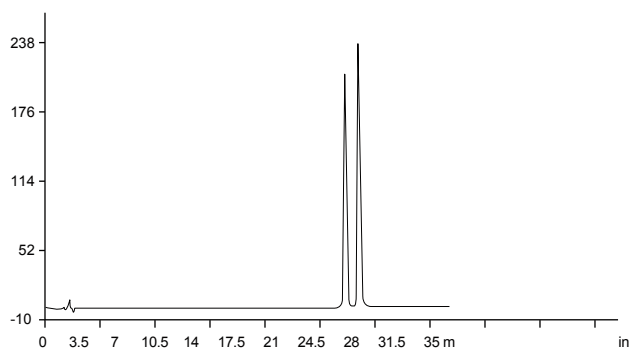
| | |
|---------------------------------------|---|
| Structural Formula |  |
| pH Range | 1.5-10.0 |
| Particle Size | 3 μm , 5 μm , 10 μm |
| Surface Area(m^2/g) | 320(120 Å), 90(300 Å) |
| Carbon Loading(%) | 12(120 Å), 4(300 Å) |
| USP List | L11 |
| Endcapped | Yes |

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



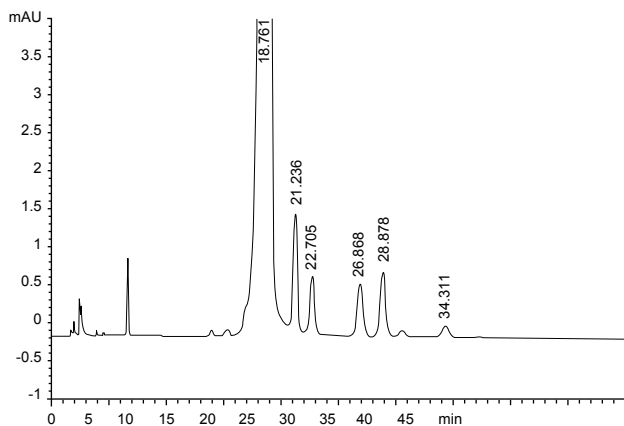
| | |
|---------------|---|
| Column: | 4.6 × 150 mm, 5 μm |
| Mobile Phase: | Methanol / water=70/30 |
| Flow Rate: | 1.0 mL/min |
| Detector: | 254 nm |
| Temperature: | 24°C |
| Samples: | 1. Uracil 2. Phenol 3. Paranitrotoluene 4. Toluene |

Montelukast Sodium Isomers



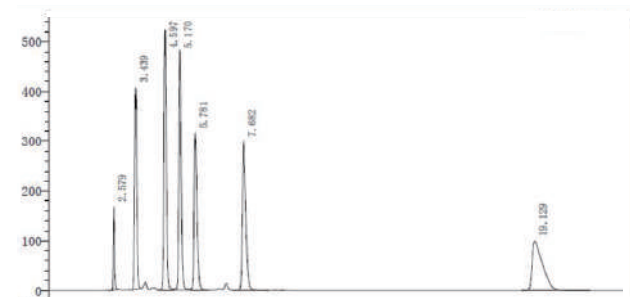
| Column: | Ultisil® XB-Phenyl, 4.6 × 150 mm, 3 μm | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--|-----------|------|------|---|----|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mobile Phase: | A: 0.2% TFA B: methanol / acetonitrile=60/40 | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr><td>0</td><td>48</td><td>52</td></tr> <tr><td>5</td><td>45</td><td>55</td></tr> <tr><td>12</td><td>45</td><td>55</td></tr> <tr><td>22</td><td>25</td><td>75</td></tr> <tr><td>23</td><td>25</td><td>75</td></tr> <tr><td>25</td><td>48</td><td>52</td></tr> <tr><td>30</td><td>48</td><td>52</td></tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 48 | 52 | 5 | 45 | 55 | 12 | 45 | 55 | 22 | 25 | 75 | 23 | 25 | 75 | 25 | 48 | 52 | 30 | 48 | 52 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 48 | 52 | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 45 | 55 | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 45 | 55 | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 25 | 75 | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | 25 | 75 | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 48 | 52 | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 48 | 52 | | | | | | | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | | | | | | | |
| Detector: | 255 nm | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature: | 30°C | | | | | | | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 10 μL | | | | | | | | | | | | | | | | | | | | | | | | |

Moxifloxacin Hydrochloride



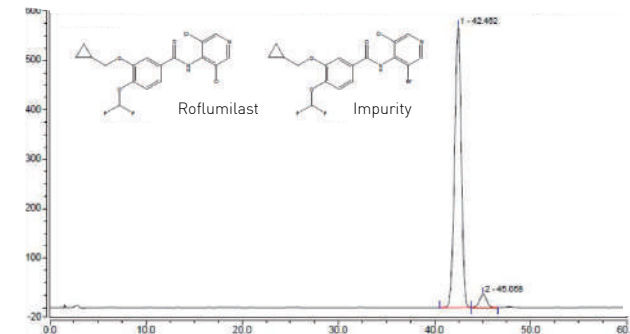
| | |
|---------------|--|
| Column: | Ultisil® XB-Phenyl, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | (0.5g TBAHS, 1g KH ₂ PO ₄ , 3.4 g(2 mL) H ₃ PO ₄ , 1000 mL water) / methanol=72/28 |
| Flow Rate: | 1.3 mL/min |
| Detector: | 293 nm |
| Temperature: | 45°C |
| Samples: | 10 μL |

Fenticonazole Nitrate



| | |
|-------------------|---|
| Column: | Ultisil® XB-Phenyl, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | KH ₂ PO ₄ buffer solution*/acetonitrile=30/70 *Dissolve 3.4 g of KH ₂ PO ₄ in 900 mL water, adjust pH 3.3 with H ₃ PO ₄ , then add water to 1000 mL. |
| Flow Rate: | 1.0 mL/min |
| Detector: | 229nm |
| Temperature: | 30°C |
| Injection Volume: | 20 μL |

Roflumilast



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

Ordering Information

Ultisil® XB-Phenyl

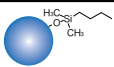
| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00203-21009 | H09203-21009 | H00203-21010 | H00203-21011 | H00203-21012 | H00203-21013 | H00203-21014 | H00203-21015 | H00203-21016 | - | H00808-23006 | 00808-01107 |
| | 3.0 | H00203-21018 | - | H00203-21019 | H00203-21020 | H00203-21021 | H00203-21022 | H00203-21023 | H00203-21024 | H00203-21025 | - | H00808-23006 | 00808-01107 |
| | 4.0 | H00203-21027 | - | H00203-21028 | H00203-21029 | H00203-21030 | H00203-21031 | H00203-21032 | H00203-21033 | H00203-21034 | - | H00808-03006 | 00808-01101 |
| | 4.6 | H00203-21036 | H11203-21036 | H00203-21037 | H00203-21038 | H00203-21039 | H00203-21040 | H00203-21041 | H00203-21042 | H00203-21043 | - | H00808-03006 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00203-31009 | H09203-31009 | H00203-31010 | H00203-31011 | H00203-31012 | H00203-31013 | H00203-31014 | H00203-31015 | H00203-31016 | - | H00808-24006 | 00808-01107 |
| | 3.0 | H00203-31018 | - | H00203-31019 | H00203-31020 | H00203-31021 | H00203-31022 | H00203-31023 | H00203-31024 | H00203-31025 | - | H00808-24006 | 00808-01107 |
| | 4.0 | H00203-31027 | - | H00203-31028 | H00203-31029 | H00203-31030 | H00203-31031 | H00203-31032 | H00203-31033 | H00203-31034 | H00203-31035 | H00808-04006 | 00808-01101 |
| | 4.6 | H00203-31036 | H11203-31036 | H00203-31037 | H00203-31038 | H00203-31039 | H00203-31040 | H00203-31041 | H00203-31042 | H00203-31043 | H00203-31044 | H00203-31045 | H00808-04006 |
| 10 μm 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 |

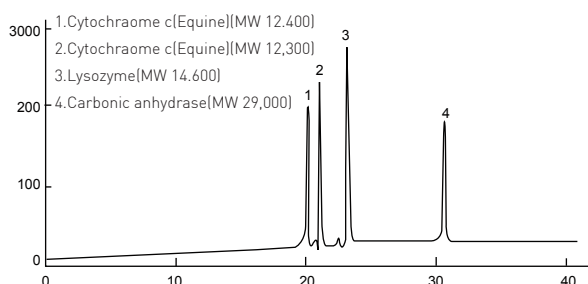
300 Å HPLC column provided. Please contact Welch or your local distributor for other dimensions.

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

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

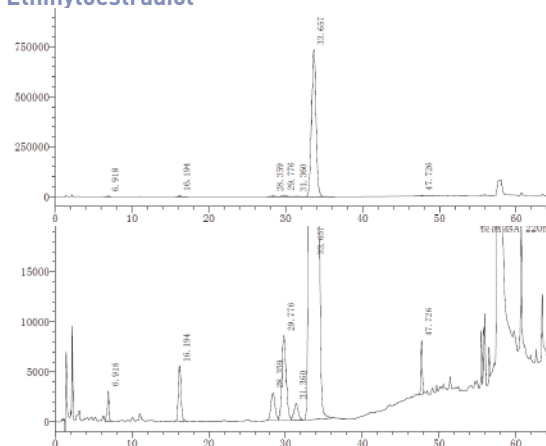
Ultisil® XB-C4

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



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

Ethinylestradiol



| Column: | Ultisil® XB-C4, 4.6 ×250 mm, 5 µm | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|-----|---|----|-----|---|----|---|-----|
| Mobile Phase: | Mobile phase A: acetonitrile/water=30/70 Mobile phase B: acetonitrile/water=75/25 | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> <td>0</td> </tr> <tr> <td>35</td> <td>100</td> <td>0</td> </tr> <tr> <td>65</td> <td>0</td> <td>100</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 100 | 0 | 35 | 100 | 0 | 65 | 0 | 100 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | |
| 0 | 100 | 0 | | | | | | | | | | | |
| 35 | 100 | 0 | | | | | | | | | | | |
| 65 | 0 | 100 | | | | | | | | | | | |
| Flow Rate: | 1.5 mL/min | | | | | | | | | | | | |
| Detector: | 220 nm | | | | | | | | | | | | |
| Temperature: | 30°C | | | | | | | | | | | | |
| Injection Volume: | 30 µL | | | | | | | | | | | | |

Ordering Information

Ultisil® XB-C4


| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 10mm length | | |
| 3 µm 120 Å | 2.1 | H00216-21009 | H09216-21009 | H00216-21010 | H00216-21011 | H00216-21012 | H00216-21013 | H00216-21014 | H00216-21015 | H00216-21016 | H00808-23011 | 00808-01107 | |
| | 3.0 | H00216-21018 | - | H00216-21019 | H00216-21020 | H00216-21021 | H00216-21022 | H00216-21023 | H00216-21024 | H00216-21025 | H00808-23011 | 00808-01107 | |
| | 4.0 | H00216-21027 | - | H00216-21028 | H00216-21029 | H00216-21030 | H00216-21031 | H00216-21032 | H00216-21033 | H00216-21034 | H00808-03030 | 00808-01101 | |
| | 4.6 | H00216-21036 | H11216-21036 | H00216-21037 | H00216-21038 | H00216-21039 | H00216-21040 | H00216-21041 | H00216-21042 | H00216-21043 | H00808-03030 | 00808-01101 | |
| 5 µm 120 Å | 2.1 | H00216-31009 | H09216-31009 | H00216-31010 | H00216-31011 | H00216-31012 | H00216-31013 | H00216-31014 | H00216-31015 | H00216-31016 | H00808-24008 | 00808-01107 | |
| | 3.0 | H00216-31018 | - | H00216-31019 | H00216-31020 | H00216-31021 | H00216-31022 | H00216-31023 | H00216-31024 | H00216-31025 | H00808-24008 | 00808-01107 | |
| | 4.0 | H00216-31027 | - | H00216-31028 | H00216-31029 | H00216-31030 | H00216-31031 | H00216-31032 | H00216-31033 | H00216-31034 | H00808-04008 | 00808-01101 | |
| | 4.6 | H00216-31036 | H11216-31036 | H00216-31037 | H00216-31038 | H00216-31039 | H00216-31040 | H00216-31041 | H00216-31042 | H00216-31043 | H00808-04008 | 00808-01101 | |
| 10 µm 120 Å | 4.0 | - | - | - | - | - | - | - | H00216-41032 | H00216-41033 | H00216-41034 | H00808-05008 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | H00216-41041 | H00216-41042 | H00216-41043 | H00808-05008 | 00808-01101 | |

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

Ultisil® XB-C1

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

Ultisil® XB-C1

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

Ordering Information

Ultisil® XB-C1

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 µm 120 Å | 2.1 | H00217-31009 | H09217-31009 | H00217-31010 | H00217-31011 | H00217-31012 | H00217-31013 | H00217-31014 | H00217-31015 | H00217-31016 | - | H00808-24023 | 00808-01107 |
| | 3.0 | H00217-31018 | - | H00217-31019 | H00217-31020 | H00217-31021 | H00217-31022 | H00217-31023 | H00217-31024 | H00217-31025 | - | H00808-24023 | 00808-01107 |
| | 4.0 | H00217-31027 | - | H00217-31028 | H00217-31029 | H00217-31030 | H00217-31031 | H00217-31032 | H00217-31033 | H00217-31034 | H00217-31035 | H00808-04026 | 00808-01101 |
| | 4.6 | H00217-31036 | H11217-31036 | H00217-31037 | H00217-31038 | H00217-31039 | H00217-31040 | H00217-31041 | H00217-31042 | H00217-31043 | H00217-31044 | H00808-04026 | 00808-01101 |

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



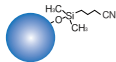
Ultisil® XB-CN--unique selectivity for polar compounds

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

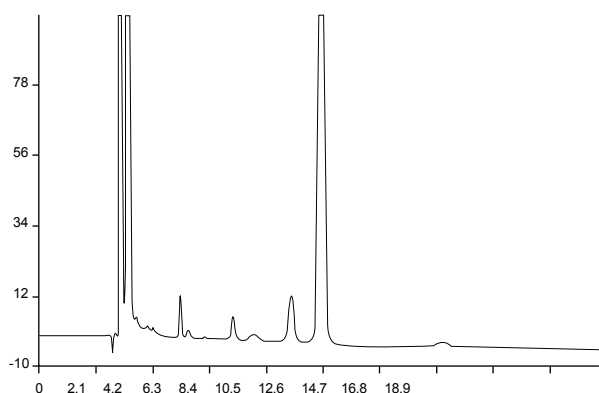
Normal phase CN column can replace SiO₂ column. Equilibrium of normal phase column is fast, and the silica surface activity is better than that of silica column. To prolong column life time, alternation between reversed phase and normal phase uses should be avoided. While XB-CN column can be used in either reversed or normal phase, elution sequence is different in different separation mode.

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

Ultisil®XB-CN

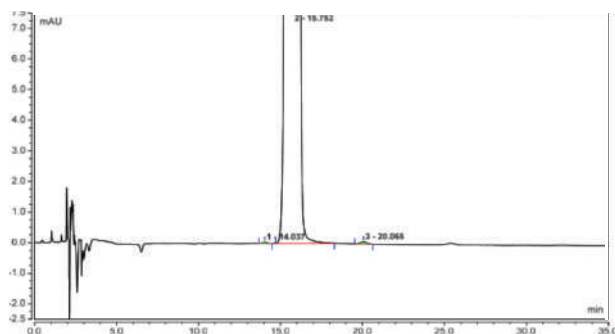
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.5-9.0 |
| Particle Size | 3 μm, 5 μm, 10 μm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 7(120 Å) |
| USP List | L10 |
| Endcapped | Yes |

Rifampicin Isoniazid and Pyrazinamide



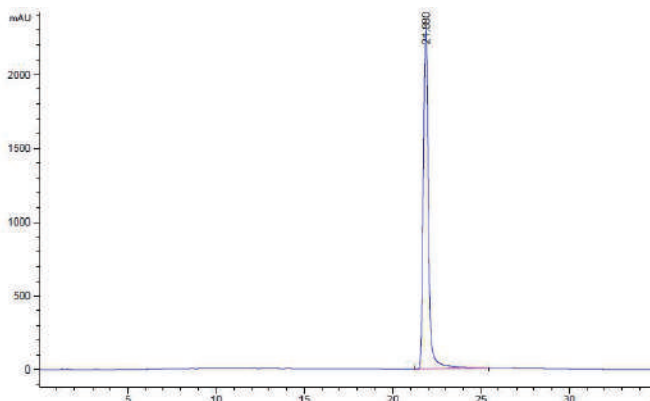
| | |
|-------------------|--|
| Column: | Ultisil® XB-CN, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | 0.01 mol/L sodium heptanesulfonate solution* / acetonitrile=54/46 * Dissolve 2.0225 g of sodium heptanesulfonate in 1000 mL water, adjust pH 1.85 with H ₃ PO ₄ |
| Flow Rate: | 0.6 mL/min |
| Detector: | 254 nm |
| Temperature: | 30°C |
| Injection Volume: | 20 μL |

Carbamazepine



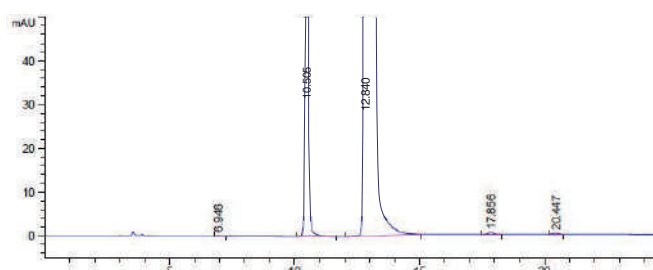
| | |
|-------------------|---|
| Column: | Ultisil® XB-CN, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | Water/methanol/tetrahydrofuran = 850/120/30 Add 0.2ml formic acid and 0.5ml triethylamine for every 1000ml |
| Flow Rate: | 1.5 mL/min |
| Detector: | 230 nm |
| Temperature: | 40°C |
| Injection Volume: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

Cetilistat



| Column: | Ultisil®XB-CN, 4.6 ×250 mm, 5 μm | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|----|----|----|----|----|----|
| Mobile Phase: | Mobile phase A: water Mobile Phase B: acetonitrile | | | | | | | | | | | | |
| | <table border="1"> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> <tr> <td>0</td> <td>60</td> <td>40</td> </tr> <tr> <td>30</td> <td>20</td> <td>80</td> </tr> <tr> <td>40</td> <td>20</td> <td>80</td> </tr> </table> | Time(min) | A(%) | B(%) | 0 | 60 | 40 | 30 | 20 | 80 | 40 | 20 | 80 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | |
| 0 | 60 | 40 | | | | | | | | | | | |
| 30 | 20 | 80 | | | | | | | | | | | |
| 40 | 20 | 80 | | | | | | | | | | | |
| Flow Rate: | 1.0 ml/min | | | | | | | | | | | | |
| Detector: | 221 nm | | | | | | | | | | | | |
| Temperature: | 35°C | | | | | | | | | | | | |
| Injection Volume: | 10 μL | | | | | | | | | | | | |

Alogliptin Benzoate



| Column: | Ultisil®XB-CN, 4.6 ×250 mm, 5 μm | | | | | | | | | | | | | | | |
|-------------------|--|-----------|------|------|---|----|---|----|----|----|----|----|----|----|----|---|
| Mobile Phase: | Mobile phase A: acetonitrile/water/TFA=100/1900/1 Mobile Phase B: acetonitrile/water/TFA=1900/100/1 | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> <tr> <td>0</td> <td>99</td> <td>1</td> </tr> <tr> <td>30</td> <td>80</td> <td>20</td> </tr> <tr> <td>50</td> <td>10</td> <td>90</td> </tr> <tr> <td>51</td> <td>99</td> <td>1</td> </tr> </table> | Time(min) | A(%) | B(%) | 0 | 99 | 1 | 30 | 80 | 20 | 50 | 10 | 90 | 51 | 99 | 1 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | |
| 0 | 99 | 1 | | | | | | | | | | | | | | |
| 30 | 80 | 20 | | | | | | | | | | | | | | |
| 50 | 10 | 90 | | | | | | | | | | | | | | |
| 51 | 99 | 1 | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | |
| Detector: | 278 nm | | | | | | | | | | | | | | | |
| Temperature: | 35°C | | | | | | | | | | | | | | | |
| Injection Volume: | 20 μL | | | | | | | | | | | | | | | |

Ordering Information

Ultisil® XB-CN


| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00205-21009 | H09205-21009 | H00205-21010 | H00205-21011 | H00205-21012 | H00205-21013 | H00205-21014 | H00205-21015 | H00205-21016 | - | H00808-23005 | 00808-01107 |
| | 3.0 | H00205-21018 | - | H00205-21019 | H00205-21020 | H00205-21021 | H00205-21022 | H00205-21023 | H00205-21024 | H00205-21025 | - | H00808-23005 | 00808-01107 |
| | 4.0 | H00205-21027 | - | H00205-21028 | H00205-21029 | H00205-21030 | H00205-21031 | H00205-21032 | H00205-21033 | H00205-21034 | - | H00808-03005 | 00808-01101 |
| | 4.6 | H00205-21036 | H11205-21036 | H00205-21037 | H00205-21038 | H00205-21039 | H00205-21040 | H00205-21041 | H00205-21042 | H00205-21043 | - | H00808-03005 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00205-31009 | H09205-31009 | H00205-31010 | H00205-31011 | H00205-31012 | H00205-31013 | H00205-31014 | H00205-31015 | H00205-31016 | - | H00808-24005 | 00808-01107 |
| | 3.0 | H00205-31018 | - | H00205-31019 | H00205-31020 | H00205-31021 | H00205-31022 | H00205-31023 | H00205-31024 | H00205-31025 | - | H00808-24005 | 00808-01107 |
| | 4.0 | H00205-31027 | - | H00205-31028 | H00205-31029 | H00205-31030 | H00205-31031 | H00205-31032 | H00205-31033 | H00205-31034 | H00205-31035 | H00808-04005 | 00808-01101 |
| | 4.6 | H00205-31036 | H11205-31036 | H00205-31037 | H00205-31038 | H00205-31039 | H00205-31040 | H00205-31041 | H00205-31042 | H00205-31043 | H00205-31044 | H00808-04005 | 00808-01101 |
| 10 μm 120 Å | 4.0 | - | - | - | - | - | - | H00205-41032 | H00205-41033 | H00205-41034 | H00205-41035 | H00808-05005 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | H00205-41041 | H00205-41042 | H00205-41043 | H00205-41044 | H00808-05005 | 00808-01101 |

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

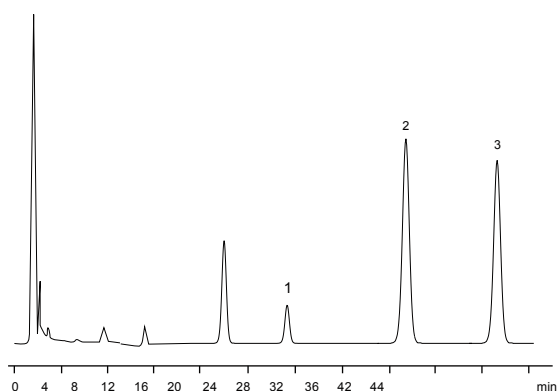
Ultisil® SiO₂

Ultisil SiO₂ column uses ultra-high purity type B silica particles with no metal contents. SiO₂ column can separate strong hydrophilic compounds in high concentration organic solvent in reversed phase. Good result can be obtained for the analysis of polar compounds which are prone to peak tailing in reversed phase.

Ultisil® SiO₂

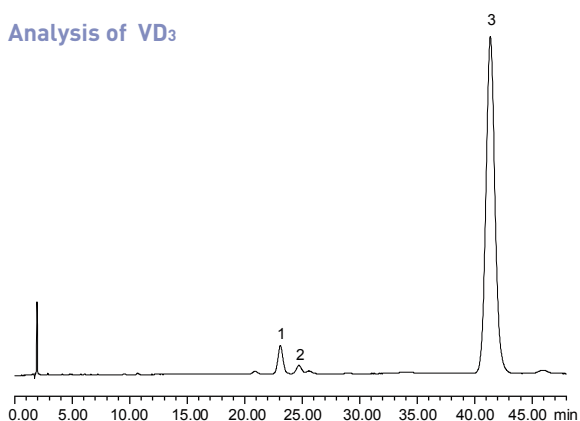
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 3 μm, 5 μm, 10 μm |
| Surface Area(m ² /g) | 320(120 Å), 90(300Å) |
| Carbon Loading(%) | N/A |
| USP List | L3 |
| Endcapped | No |

Analysis of VD₂



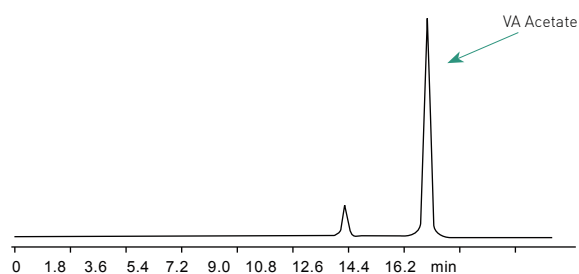
| | |
|-------------------|---|
| Column: | Ultisil® SiO ₂ , 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Hexane / isopropanol=997/3 |
| Flow Rate: | 2.0 mL/min |
| Detector: | 254 nm |
| Temperature: | 30°C |
| Injection Volume: | 1. Facade VD ₂ 2. Internal Standard 3. VD ₂ |

Analysis of VD₃



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

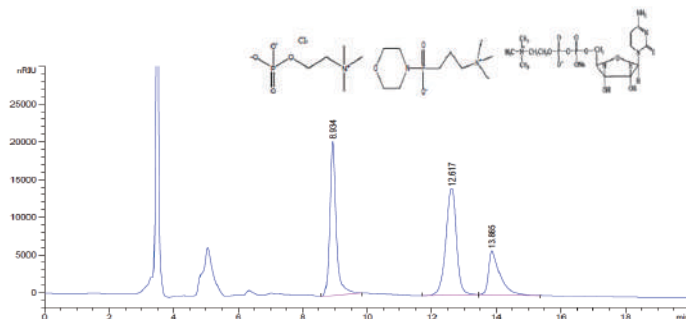
Analysis of VA Acetate



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

Sample is dissolved with n-hexane.

Separation of chlorophosphorylcholine, Phosphorylcholine morpholine and Citicoline Sodium



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

Ordering Information

Ultisil® SiO₂

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00200-21009 | H09200-21009 | H00200-21010 | H00200-21011 | H00200-21012 | H00200-21013 | H00200-21014 | H00200-21015 | H00200-21016 | - | H00808-23007 | 00808-01107 |
| | 3.0 | H00200-21018 | - | H00200-21019 | H00200-21020 | H00200-21021 | H00200-21022 | H00200-21023 | H00200-21024 | H00200-21025 | - | H00808-23007 | 00808-01107 |
| | 4.0 | H00200-21027 | - | H00200-21028 | H00200-21029 | H00200-21030 | H00200-21031 | H00200-21032 | H00200-21033 | H00200-21034 | - | H00808-03007 | 00808-01101 |
| | 4.6 | H00200-21036 | H11200-21036 | H00200-21037 | H00200-21038 | H00200-21039 | H00200-21040 | H00200-21041 | H00200-21042 | H00200-21043 | - | H00808-03007 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00200-31009 | H09200-31009 | H00200-31010 | H00200-31011 | H00200-31012 | H00200-31013 | H00200-31014 | H00200-31015 | H00200-31016 | - | H00808-24007 | 00808-01107 |
| | 3.0 | H00200-31018 | - | H00200-31019 | H00200-31020 | H00200-31021 | H00200-31022 | H00200-31023 | H00200-31024 | H00200-31025 | - | H00808-24007 | 00808-01107 |
| | 4.0 | H00200-31027 | - | H00200-31028 | H00200-31029 | H00200-31030 | H00200-31031 | H00200-31032 | H00200-31033 | H00200-31034 | H00200-31035 | H00808-04007 | 00808-01101 |
| | 4.6 | H00200-31036 | H11200-31036 | H00200-31037 | H00200-31038 | H00200-31039 | H00200-31040 | H00200-31041 | H00200-31042 | H00200-31043 | H00200-31044 | H00808-04007 | 00808-01101 |
| 10 μm 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 |

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



Ultisil® Diol

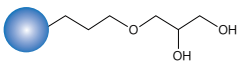
Ultisil® Diol Column is based on ultra-pure porous spherical silica bonded with 1,2-dihydroxypropyl functional group silica. Ultisil® Diol is used in normal phase mostly, suitable for separation of peptides, proteins, polar molecules, and organic acids and its polymers.

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

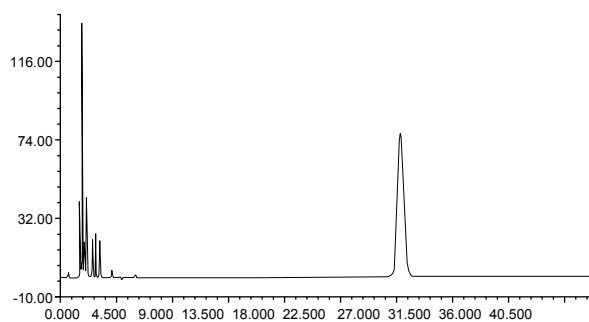
Ultisil® Diol column is more stable than traditional normal phase columns, such as NH₂, SiO₂. Compared with NH₂/SiO₂ column, Diol column is not sensitive to water. Ultisil® Diol column can also be used in reversed phase analysis.

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

Ultisil® Diol

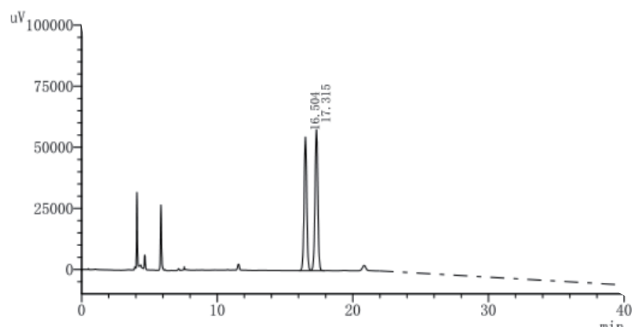
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 3 µm, 5 µm, 10 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 2.5(120 Å) |
| USP List | L20 |
| Endcapped | No |

Tacrolimus



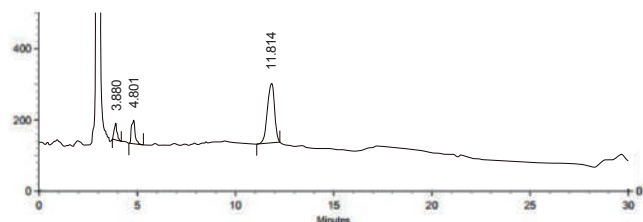
| | |
|-------------------|--|
| Column: | Ultisil® Diol, 4.6 × 250 mm, 5 µm |
| Mobile Phase: | N-hexane/ butyl chloride/ acetonitrile=7/2/1 |
| Detector: | 225 nm |
| Temperature: | Ambient |
| Flow Rate: | 1.7 mL/min |
| Injection Volume: | 5 µL |

Cloprostenol Sodium



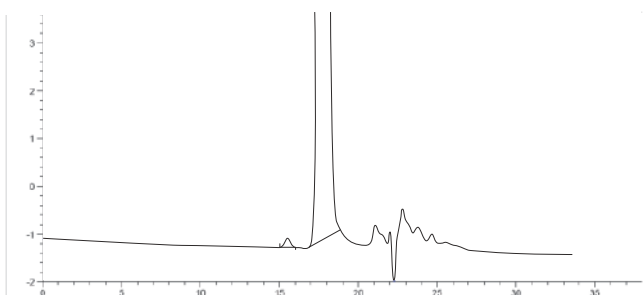
| | |
|-------------------|---|
| Column: | Ultisil® Diol, 4.6 × 300 mm, 3 µm |
| Mobile Phase: | N-hexane/isopropanol =99.5/0.5 (volume ratio) |
| Detector: | 220 nm |
| Temperature: | Ambient |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 10 µL |

Propofol



| Column: | Ultisil® Diol, 4.6 ×250 mm, 5 μm | | | | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|---|----|----|----|----|----|----|----|----|----|----|----|---|----|
| Mobile Phase: | Mobile phase A: methanol/water/glacial acetic acid/triethylamine=85/15/0.5/0.05 Mobile Phase B: n-hexane/isopropanol/ mobile phase A=20/48/32 | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5</td> <td>95</td> </tr> <tr> <td>10</td> <td>22</td> <td>78</td> </tr> <tr> <td>22</td> <td>22</td> <td>78</td> </tr> <tr> <td>23</td> <td>90</td> <td>10</td> </tr> <tr> <td>27</td> <td>5</td> <td>95</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 5 | 95 | 10 | 22 | 78 | 22 | 22 | 78 | 23 | 90 | 10 | 27 | 5 | 95 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 5 | 95 | | | | | | | | | | | | | | | | | |
| 10 | 22 | 78 | | | | | | | | | | | | | | | | | |
| 22 | 22 | 78 | | | | | | | | | | | | | | | | | |
| 23 | 90 | 10 | | | | | | | | | | | | | | | | | |
| 27 | 5 | 95 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | |
| Detector: | ELSD: gas flow rate=2.5 L/min, drift tube temperature: 70°C | | | | | | | | | | | | | | | | | | |
| Temperature: | 40°C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 20 μL | | | | | | | | | | | | | | | | | | |

Insulin



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

Ordering Information

Ultisil® Diol

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder | |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|-------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | | |
| 3 μm 120 Å | 2.1 | H00206-21009 | H09206-21009 | H00206-21010 | H00206-21011 | H00206-21012 | H00206-21013 | H00206-21014 | H00206-21015 | H00206-21016 | - | H00808-23020 | 00808-01107 | |
| | 3.0 | H00206-21018 | - | H00206-21019 | H00206-21020 | H00206-21021 | H00206-21022 | H00206-21023 | H00206-21024 | H00206-21025 | - | H00808-23020 | 00808-01107 | |
| | 4.0 | H00206-21027 | - | H00206-21028 | H00206-21029 | H00206-21030 | H00206-21031 | H00206-21032 | H00206-21033 | H00206-21034 | - | H00808-03020 | 00808-01101 | |
| | 4.6 | H00206-21036 | H11206-21036 | H00206-21037 | H00206-21038 | H00206-21039 | H00206-21040 | H00206-21041 | H00206-21042 | H00206-21043 | - | H00808-03020 | 00808-01101 | |
| 5 μm 120 Å | 2.1 | H00206-31009 | H09206-31009 | H00206-31010 | H00206-31011 | H00206-31012 | H00206-31013 | H00206-31014 | H00206-31015 | H00206-31016 | - | H00808-24020 | 00808-01107 | |
| | 3.0 | H00206-31018 | - | H00206-31019 | H00206-31020 | H00206-31021 | H00206-31022 | H00206-31023 | H00206-31024 | H00206-31025 | - | H00808-24020 | 00808-01107 | |
| | 4.0 | H00206-31027 | - | H00206-31028 | H00206-31029 | H00206-31030 | H00206-31031 | H00206-31032 | H00206-31033 | H00206-31034 | H00206-31035 | H00808-04020 | 00808-01101 | |
| | 4.6 | H00206-31036 | H11206-31036 | H00206-31037 | H00206-31038 | H00206-31039 | H00206-31040 | H00206-31041 | H00206-31042 | H00206-31043 | H00206-31044 | H00808-04020 | 00808-01101 | |
| 10 μm 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 | |

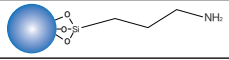
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® XB-NH₂

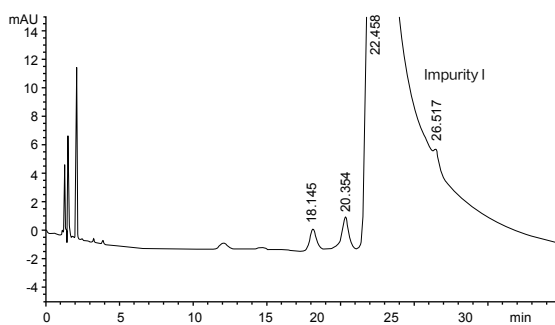
Ultisil® XB-NH₂ column is based on propyl-amino silane, mostly used in normal phase, but can also be used in reversed phase.

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

Ultisil® XB-NH₂

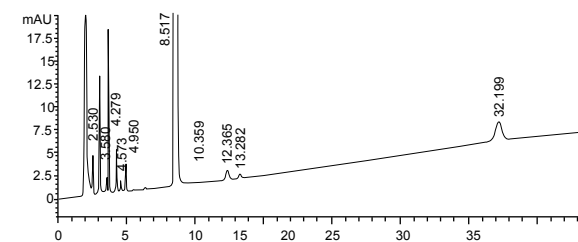
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 3 μm, 5 μm, 10 μm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 4(120 Å) |
| USP List | L8 |
| Endcapped | No |

Acarbose



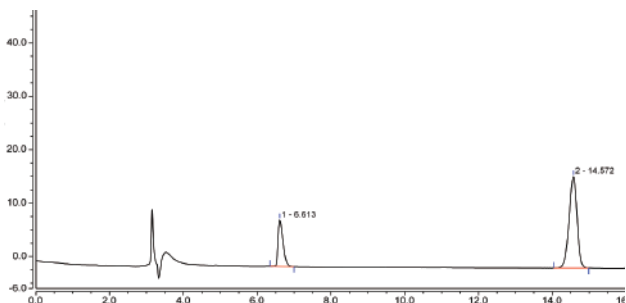
| | |
|-------------------|--|
| Column: | Ultisil® XB-NH ₂ , 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Phosphate buffer */ acetonitrile=28/72 * Dissolve 600 mg of s KH ₂ PO ₄ and 279 mg of ADSP in 100 mL water, add water to make 1000 mL |
| Detector: | 210 nm |
| Temperature: | 35°C |
| Flow Rate: | 2.0 mL/min |
| Injection Volume: | 10 μL |

Acetyl-L-carnitine



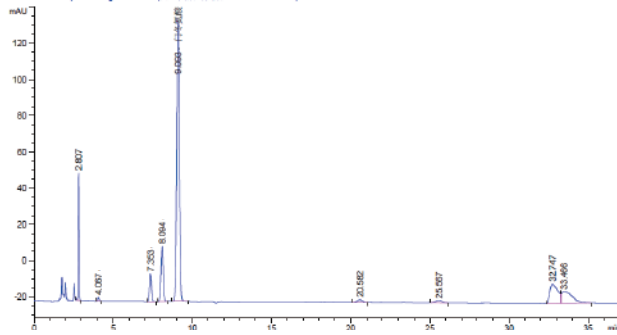
| | |
|-------------------|--|
| Column: | Ultisil® XB-NH ₂ , 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Buffer/acetonitrile=30/70 |
| Detector: | 205 nm 210 nm |
| Temperature: | 20°C |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 10 μL |

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



| | |
|-------------------|--|
| Column: | Ultisil® XB-NH ₂ , 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Methanol/isopropanol=80/20 |
| Detector: | 210 nm |
| Temperature: | 30°C |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 5 μL |

Ornithine Aspartate



| | |
|--------------------------|---|
| Column: | Ultisil® XB-NH ₂ , 4.6 ×250 mm, 5 μm |
| Mobile Phase: | KH ₂ PO ₄ buffer solution*/acetonitrile=40/60 * Dissolve 2.72 g of KH ₂ PO ₄ in 500 mL water, add 5 mL of concentrated ammonia solution, add water to 1000 mL, adjust pH 5.60±0.05 with H ₃ PO ₄ |
| Detector: | 205 nm |
| Temperature: | 30°C |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 20 μL |

Ordering Information Ultisil® XB-NH₂

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3μm | 2.1 | H00204-21009 | H09204-21009 | H00204-21010 | H00204-21011 | H00204-21012 | H00204-21013 | H00204-21014 | H00204-21015 | H00204-21016 | - | H00808-23004 | 00808-01107 |
| | 3.0 | H00204-21018 | - | H00204-21019 | H00204-21020 | H00204-21021 | H00204-21022 | H00204-21023 | H00204-21024 | H00204-21025 | - | H00808-23004 | 00808-01107 |
| | 4.0 | H00204-21027 | - | H00204-21028 | H00204-21029 | H00204-21030 | H00204-21031 | H00204-21032 | H00204-21033 | H00204-21034 | - | H00808-03004 | 00808-01101 |
| | 4.6 | H00204-21036 | H11204-21036 | H00204-21037 | H00204-21038 | H00204-21039 | H00204-21040 | H00204-21041 | H00204-21042 | H00204-21043 | - | H00808-03004 | 00808-01101 |
| 5μm | 2.1 | H00204-31009 | H09204-31009 | H00204-31010 | H00204-31011 | H00204-31012 | H00204-31013 | H00204-31014 | H00204-31015 | H00204-31016 | - | H00808-24004 | 00808-01107 |
| | 3.0 | H00204-31018 | - | H00204-31019 | H00204-31020 | H00204-31021 | H00204-31022 | H00204-31023 | H00204-31024 | H00204-31025 | - | H00808-24004 | 00808-01107 |
| | 4.0 | H00204-31027 | - | H00204-31028 | H00204-31029 | H00204-31030 | H00204-31031 | H00204-31032 | H00204-31033 | H00204-31034 | H00204-31035 | H00808-04004 | 00808-01101 |
| | 4.6 | H00204-31036 | H11204-31036 | H00204-31037 | H00204-31038 | H00204-31039 | H00204-31040 | H00204-31041 | H00204-31042 | H00204-31043 | H00204-31044 | H00808-04004 | 00808-01101 |
| 10μm | 4.0 | - | - | - | - | - | - | H00204-41032 | H00204-41033 | H00204-41034 | H00204-41035 | H00808-05004 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | H00204-41041 | H00204-41042 | H00204-41043 | H00204-41044 | H00808-05004 | 00808-01101 |

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

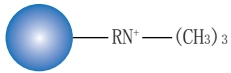


Ultisil® Ion Exchange Column (XB-SAX&XB-SCX)

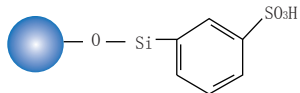
Ultisil® ion exchange columns are available for both Strong Anion Exchange (SAX) and Strong Cation Exchange (SCX) columns. The SCX/SAX columns are silica based with high resolution and high efficiency. Ultisil® SAX is a polar bonded phase, consisting of an ammonium-functionalized silane, while Ultisil® SCX is a classical strong cation exchange, consisting of a covalently bonded aromatic sulfonic acid moiety.

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

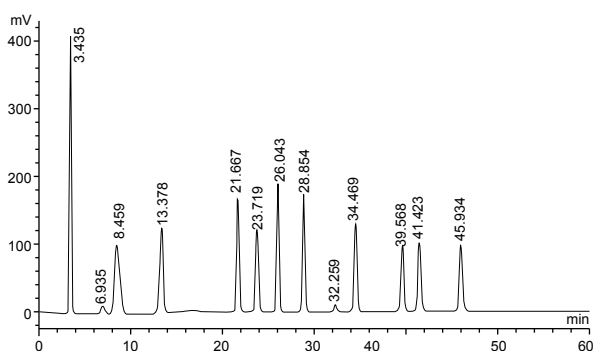
Ultisil® XB-SAX

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

Ultisil® XB-SCX

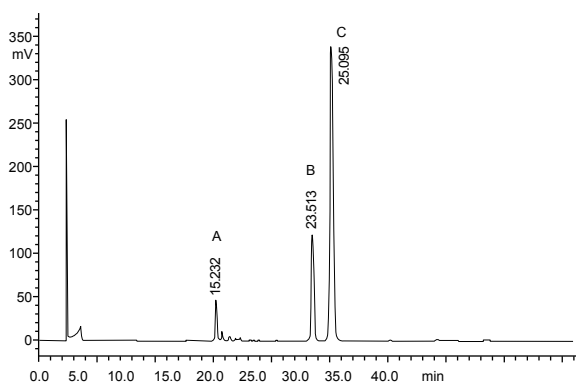
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 3 µm, 5 µm, 10 µm |
| Surface Area(m ² /g) | 320(120 Å), 90(300 Å) |
| Carbon Loading(%) | 12(120 Å), 5(300 Å) |
| USP List | L9 |
| Endcapped | No |

13 Heparin Disaccharides



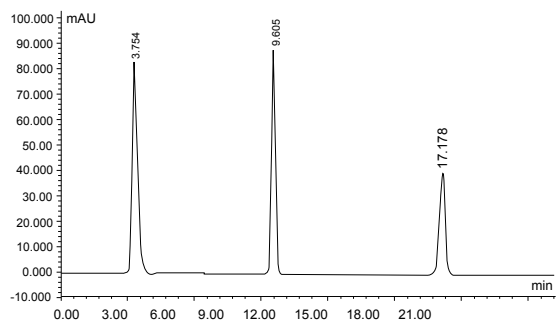
| | |
|-------------------|--|
| Column: | Ultisil® XB-SAX, 3.0 ×250 mm, 5 µm |
| Mobile Phase: | A: weight 0.308 g NaH ₂ PO ₄ to 1000 mL volumetric flask, add 950 mL water to dissolve it, adjust pH 2.9 with H ₃ PO ₄ , then add water to scale mark B: weight 122 g NaClO ₄ to 1000 mL volumetric flask,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

Chondroitin Sulfate



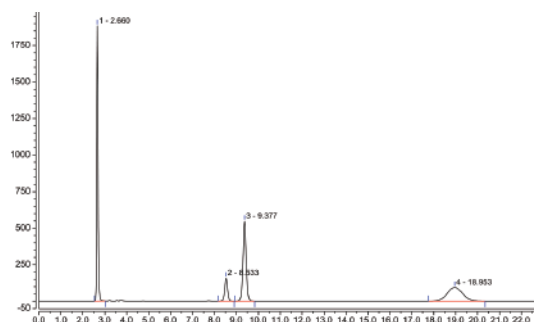
| | |
|-------------------|---|
| Column: | Ultisil® XB-SAX, 4.6 ×250 mm, 5 µm |
| Mobile Phase: | A: water, adjust pH 3.5 with diluted HCl B: 2 mol/L NaCl, adjust pH 3.5 with diluted HCl |
| Detector: | 232 nm |
| Temperature: | Ambient |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 20 µL |
| Mixed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

Metformin HCL



| | |
|--------------------------|---|
| Column: | Ultisil® XB-SCX, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | 1.7% NH ₄ H ₂ PO ₄ (pH 3.0 adjusted by H ₃ PO ₄) |
| Detector: | 218nm |
| Temperature: | Ambient |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 10 μL |
| Samples In Order: | Icyandiamide, melamine, metformin HCL |

Orazamide



| | |
|--------------------------|---|
| Column: | Ultisil® XB-SCX, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | 1.0% NH ₄ H ₂ PO ₄ (pH 3.0 adjusted by H ₃ PO ₄) |
| Detector: | 215 nm |
| Temperature: | 30 °C |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 10 μL |
| Samples In Order: | Orotic acid, Pyridinepropanimidamide, 4-Amino-5-imidazolecarboxamide hydrochloride and AZO |

Ordering Information

Ultisil® XB-SAX

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

Ultisil® XB-SCX

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

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

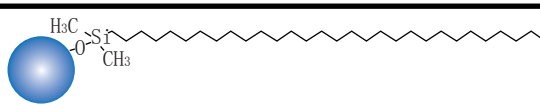
Ultisil® XB-C30

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

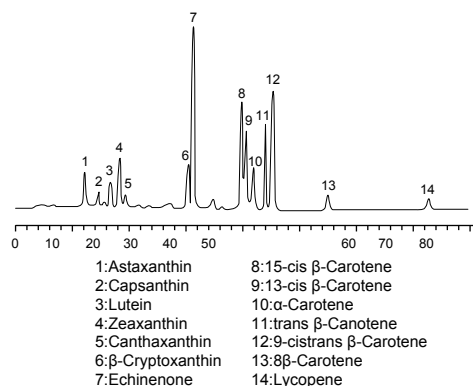
Compared to classical C18 stationary phases, the C30 phase is much more hydrophobic and retaining. Even when pure organic eluent is applied, many sample solutes, such as carotenoids, are able to retain. Ultisil® C30 is designed for the separation of geometric isomers, polar carotenes, polar and nonpolar xanthophylls, steroids, retinols and fat-soluble vitamins (A, D, K and E).

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

Ultisil® XB-C30

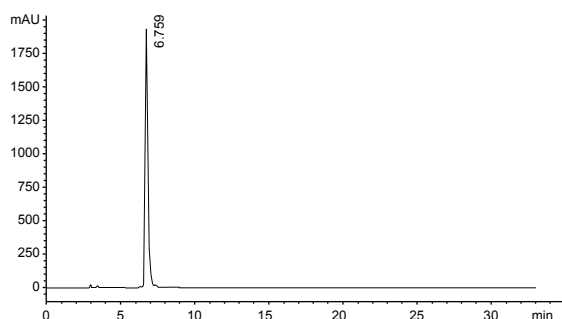
| | |
|---------------------------------|--|
| Structural Formula |  |
| pH Range | 1.5-10.0 |
| Particle Size | 3 µm, 5 µm, 10 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 22(120 Å) |
| USP List | L62 |
| Endcapped | Yes |

Separation of Carotenoids



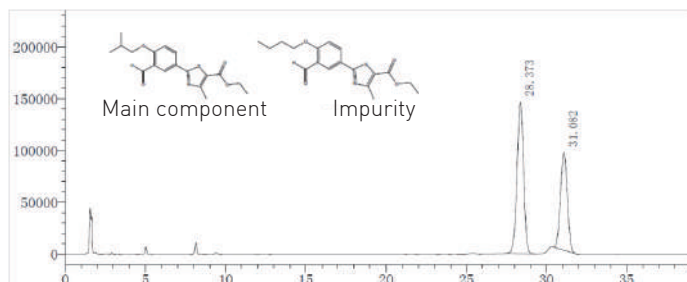
| | |
|-------------------|--|
| Column: | Ultisil® XB-C30, 4.6 ×250 mm, 5 µm |
| Mobile Phase: | A: methanol / MTBE / water=81/15/4 B: methanol / MTBE=10/90 |
| Gradient Program: | 0-90 min [0%B-100%B] |
| Detector: | 450 nm |
| Temperature: | Ambient |
| Flow Rate: | 1.0 mL/min |

Analysis of All-trans Astaxanthin



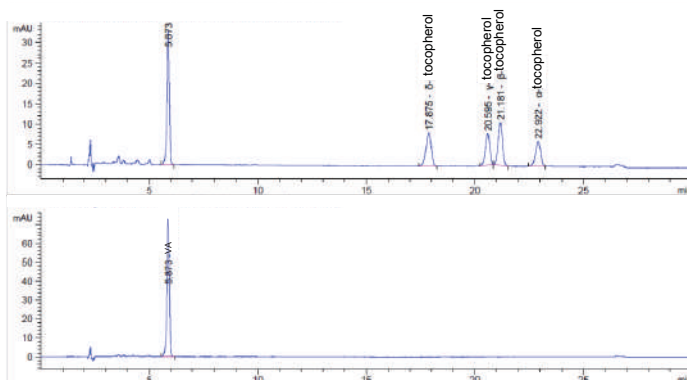
| Column: | Ultisil® XB-C30, 4.6 ×250 mm, 5 µm | | | | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|----|----|----|----|---|-----|----|----|----|----|----|----|
| Mobile Phase: | A: methanol / 1% H ₃ PO ₄ =94/6 B: methanol / TBME / 1% H ₃ PO ₄ =16/80/4 | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>67</td> <td>23</td> </tr> <tr> <td>15</td> <td>52</td> <td>48</td> </tr> <tr> <td>23</td> <td>0</td> <td>100</td> </tr> <tr> <td>27</td> <td>67</td> <td>33</td> </tr> <tr> <td>30</td> <td>67</td> <td>33</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 67 | 23 | 15 | 52 | 48 | 23 | 0 | 100 | 27 | 67 | 33 | 30 | 67 | 33 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 67 | 23 | | | | | | | | | | | | | | | | | |
| 15 | 52 | 48 | | | | | | | | | | | | | | | | | |
| 23 | 0 | 100 | | | | | | | | | | | | | | | | | |
| 27 | 67 | 33 | | | | | | | | | | | | | | | | | |
| 30 | 67 | 33 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | |
| Detector: | 474 nm | | | | | | | | | | | | | | | | | | |
| Temperature: | 30 °C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 20 µL | | | | | | | | | | | | | | | | | | |

Febuxostat Intermediate



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

VE(α, β, γ, δ -tocopherol) and VA



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

Ordering Information

Ultisil® XB-C30

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 200 | 150 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00223-21009 | H09223-21009 | H00223-21010 | H00223-21011 | H00223-21012 | H00223-21013 | H00223-21015 | H00223-21014 | H00223-21016 | - | H00808-23013 | 00808-01107 |
| | 3.0 | H00223-21018 | - | H00223-21019 | H00223-21020 | H00223-21021 | H00223-21022 | H00223-21024 | H00223-21023 | H00223-21025 | - | H00808-23013 | 00808-01107 |
| | 4.0 | H00223-21027 | - | H00223-21028 | H00223-21029 | H00223-21030 | H00223-21031 | H00223-21033 | H00223-21032 | H00223-21034 | - | H00808-03035 | 00808-01101 |
| | 4.6 | H00223-21036 | H11223-21036 | H00223-21037 | H00223-21038 | H00223-21039 | H00223-21040 | H00223-21042 | H00223-21041 | H00223-21043 | - | H00808-03035 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00223-31009 | H09223-31009 | H00223-31010 | H00223-31011 | H00223-31012 | H00223-31013 | H00223-31015 | H00223-31014 | H00223-31016 | - | H00808-24024 | 00808-01107 |
| | 3.0 | H00223-31018 | - | H00223-31019 | H00223-31020 | H00223-31021 | H00223-31022 | H00223-31024 | H00223-31023 | H00223-31025 | - | H00808-24024 | 00808-01107 |
| | 4.0 | H00223-31027 | - | H00223-31028 | H00223-31029 | H00223-31030 | H00223-31031 | H00223-31033 | H00223-31032 | H00223-31034 | H00223-31035 | H00808-04035 | 00808-01101 |
| | 4.6 | H00223-31036 | H11223-31036 | H00223-31037 | H00223-31038 | H00223-31039 | H00223-31040 | H00223-31042 | H00223-31041 | H00223-31043 | H00223-31044 | H00808-04035 | 00808-01101 |
| 10 μm 120 Å | 4.6 | - | - | - | - | - | - | H00223-41042 | H00223-41041 | H00223-41043 | H00223-41044 | H00808-05013 | 00808-01101 |

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

Ultisil® AQ-C18

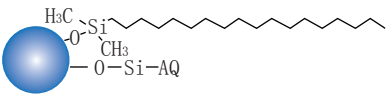
--The most widely used column in food industry

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

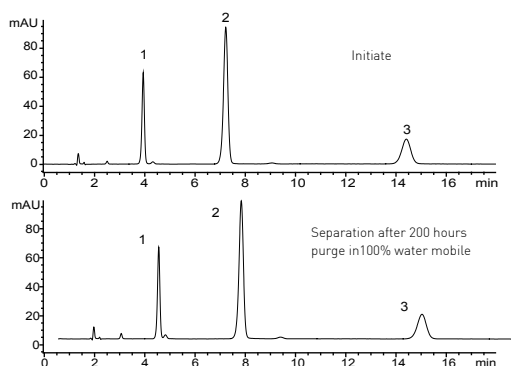
Features:

- 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

Ultisil® AQ-C18

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

Phase collapse research

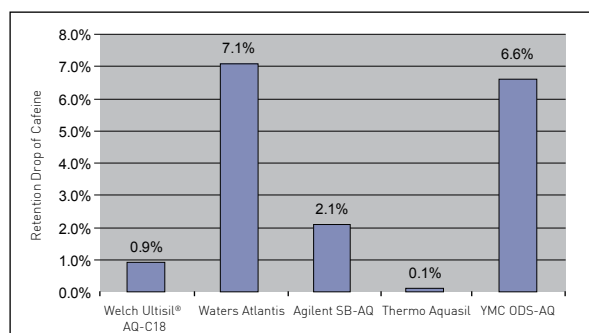


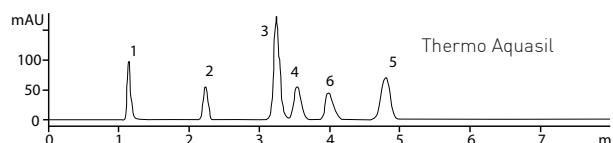
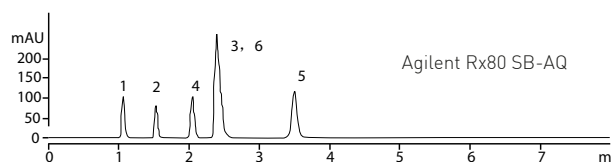
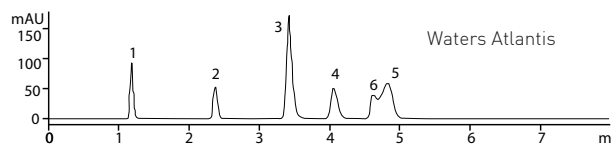
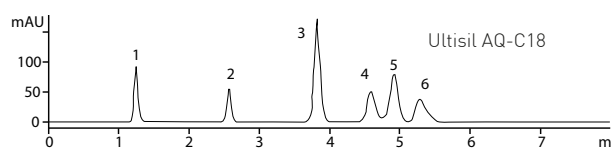
| | |
|---------------|--|
| Column: | Ultisil® AQ-C18, 4.6 ×100 mm, 5 µm |
| Mobile Phase: | Acetonitrile/50 mM phosphate(pH 3.5)=10/90 |
| Detector: | 215nm |
| Temperature: | 25°C |
| Flow Rate: | 1.0 mL/min |
| Samples: | 1.Theophylline 2.Caffeine 3.Phenol |

Phase Collapse Comparison with Other Brands

Peak shape is excellent for acid, basic and neutral samples on AQ-C18. When in highly aqueous mobile phase, retention for polar compounds such as organic acids, peptides, nucleosides and water soluble vitamins is strong.

Under the same condition, when compared with other brands in highly aqueous mobile phase, Ultisil® AQ-C18 shows excellent resistance to phase collapse.



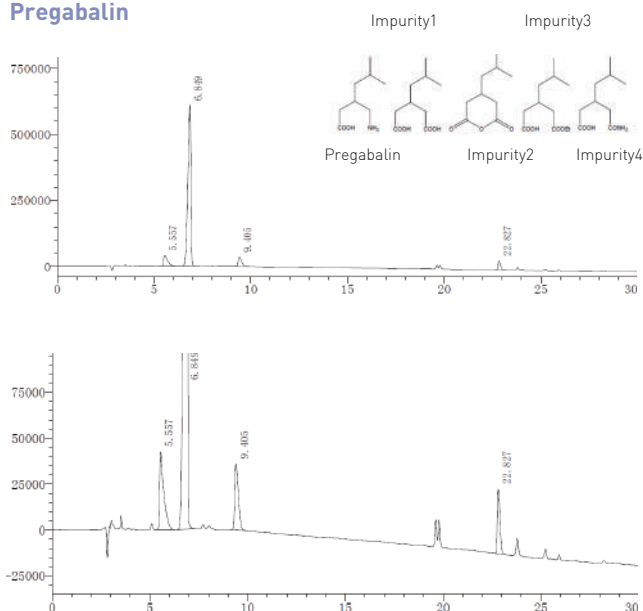


| | |
|----------------------|---|
| Column: | Ultisil® AQ-C18, 4.6 ×100 mm, 5 μm |
| Mobile Phase: | 50 mM phosphate, pH2.5 |
| Detector: | 210 nm |
| Temperature: | 25°C |
| Flow Rate: | 1.0 mL/min |
| Samples: | 1. Oxalic acid 2. Lactic acid 3. Maleic acid 4. Citric acid 5. Fumaric acid 6. Succinic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

How to choose XB-C18 and AQ-C18?

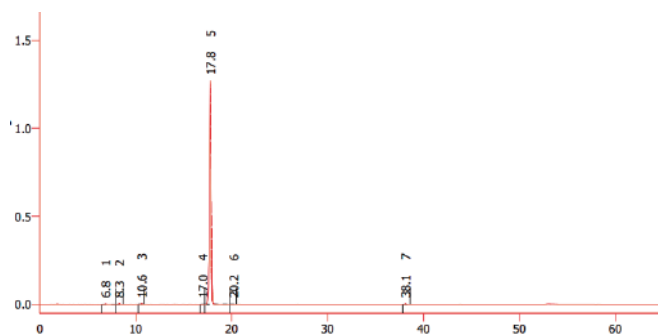
| XB-C18 | AQ-C18 |
|---|---|
| <ul style="list-style-type: none"> • Suitable for separation of most pharmaceuticals, environment and chemical compounds • Excellent peak shape for basic and polar samples | <ul style="list-style-type: none"> • Suitable for water soluble strong polar samples, such as traditional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

Pregabalin



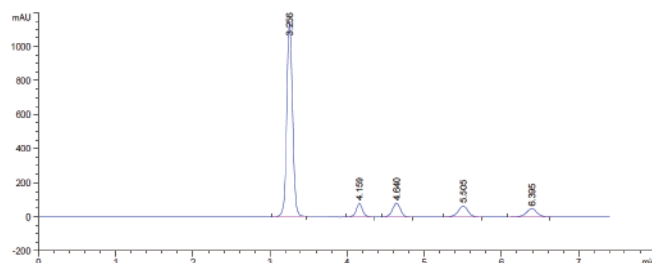
| Column: | Ultisil® AQ-C18, 4.6 ×250 mm, 5 μm | | | | | | | | | | | | | | | |
|--------------------------|--|-----------|---|---|---|----|---|---|----|---|----|----|----|----|----|---|
| Mobile Phase: | A: 40 mM (NH ₄) ₂ HPO ₄ /methanol=80/20 B: acetonitrile/methanol=90/10 | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>98</td> <td>2</td> </tr> <tr> <td>5</td> <td>98</td> <td>2</td> </tr> <tr> <td>30</td> <td>50</td> <td>50</td> </tr> <tr> <td>31</td> <td>50</td> <td>2</td> </tr> </tbody> </table> | Time(min) | A | B | 0 | 98 | 2 | 5 | 98 | 2 | 30 | 50 | 50 | 31 | 50 | 2 |
| Time(min) | A | B | | | | | | | | | | | | | | |
| 0 | 98 | 2 | | | | | | | | | | | | | | |
| 5 | 98 | 2 | | | | | | | | | | | | | | |
| 30 | 50 | 50 | | | | | | | | | | | | | | |
| 31 | 50 | 2 | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | |
| Detector: | 210 nm | | | | | | | | | | | | | | | |
| Temperature: | 35°C | | | | | | | | | | | | | | | |
| Injection Volume: | 20 μL | | | | | | | | | | | | | | | |

Vilazodone hydrochloride



| | | | |
|--------------------------|---|----|----|
| Column: | Ultisil® AQ-C18, 4.6 ×250 mm, 5 µm | | |
| Mobile Phase: | Mobile phase A: 0.025 mol/L K ₂ HPO ₄ , adjust pH 6.0 with H ₃ PO ₄ Mobile Phase B: acetonitrile | | |
| Gradient Program: | Time(min) | A | B |
| | 0 | 75 | 25 |
| | 3 | 75 | 25 |
| | 25 | 60 | 40 |
| | 40 | 35 | 65 |
| | 50 | 35 | 65 |
| | 50.1 | 75 | 25 |
| 65 | 75 | 25 | |
| Flow Rate: | 1.0 mL/min | | |
| Detector: | 240 nm | | |
| Temperature: | 40°C | | |
| Injection Volume: | 20 µL | | |

NMN(nicotinamide mononucleotide)



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

Ordering Information

Ultisil® AQ-C18

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm 120 Å | 2.1 | H00207-21009 | H09207-21009 | H00207-21010 | H00207-21011 | H00207-21012 | H00207-21013 | H00207-21014 | H00207-21015 | H00207-21016 | - | H00808-23003 | 00808-01107 |
| | 3.0 | H00207-21018 | - | H00207-21019 | H00207-21020 | H00207-21021 | H00207-21022 | H00207-21023 | H00207-21024 | H00207-21025 | - | H00808-23003 | 00808-01107 |
| | 4.0 | H00207-21027 | - | H00207-21028 | H00207-21029 | H00207-21030 | H00207-21031 | H00207-21032 | H00207-21033 | H00207-21034 | - | H00808-03003 | 00808-01101 |
| | 4.6 | H00207-21036 | H11207-21036 | H00207-21037 | H00207-21038 | H00207-21039 | H00207-21040 | H00207-21041 | H00207-21042 | H00207-21043 | - | H00808-03003 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00207-31009 | H09207-31009 | H00207-31010 | H00207-31011 | H00207-31012 | H00207-31013 | H00207-31014 | H00207-31015 | H00207-31016 | - | H00808-24003 | 00808-01107 |
| | 3.0 | H00207-31018 | - | H00207-31019 | H00207-31020 | H00207-31021 | H00207-31022 | H00207-31023 | H00207-31024 | H00207-31025 | - | H00808-24003 | 00808-01107 |
| | 4.0 | H00207-31027 | - | H00207-31028 | H00207-31029 | H00207-31030 | H00207-31031 | H00207-31032 | H00207-31033 | H00207-31034 | H00207-31035 | H00808-04003 | 00808-01101 |
| 10 µm 120 Å | 4.6 | H00207-31036 | H11207-31036 | H00207-31037 | H00207-31038 | H00207-31039 | H00207-31040 | H00207-31041 | H00207-31042 | H00207-31043 | H00207-31044 | H00808-04003 | 00808-01101 |
| | 4.0 | - | - | - | - | - | - | H00207-41032 | H00207-41033 | H00207-41034 | H00207-41035 | H00808-05003 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | H00207-41041 | H00207-41042 | H00207-41043 | H00207-41044 | H00808-05003 | 00808-01101 |

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

Ultisil® LP Series HPLC Column

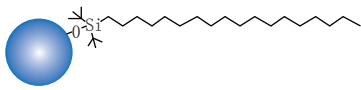
LP is abbreviation for **Low pH**. LP phases are designed for use at low pH conditions. LP phase consists of two very bulky hydrophobic protective groups to prevent siloxane bond from hydrolysis at low pH condition. So Ultisil® LP column is extremely stable in very low pH mobile phase and at high temperature,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

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

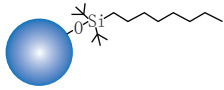
How to choose XB-C18 and LP-C18

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

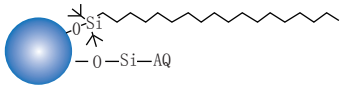
Ultisil® LP-C18

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

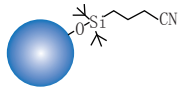
Ultisil® LP-C8

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

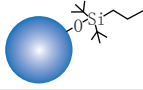
Ultisil® LP-AQ

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

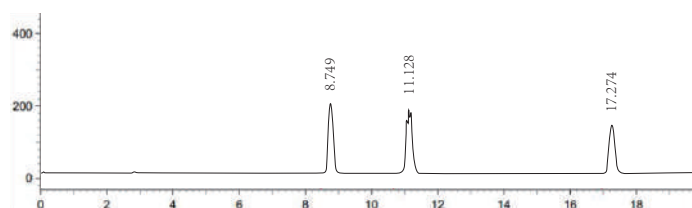
Ultisil® LP-CN

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

Ultisil® LP-C3

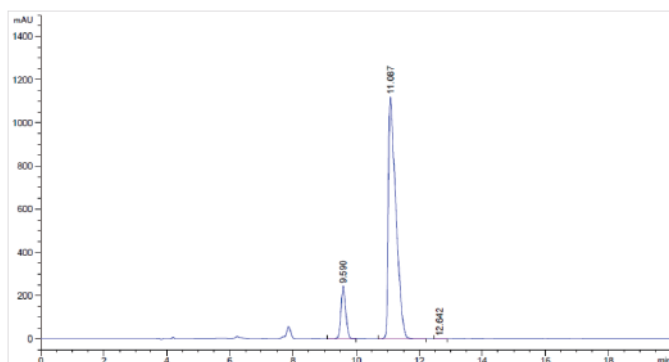
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.0-8.0 |
| Particle Size | 5 μm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 4(120 Å) |
| USP List | L56 |
| Endcapped | No |

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



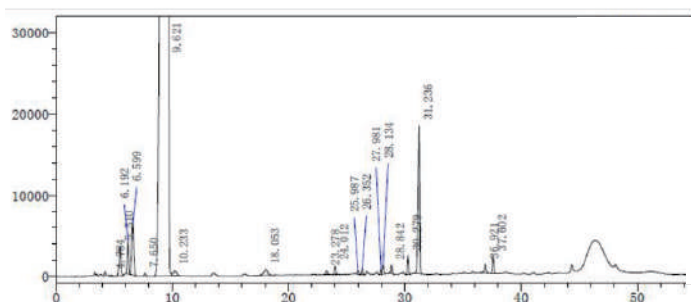
| | |
|--------------------------|---|
| Column: | Ultisil® LP-C18, 4.6 ×250 mm, 5 µm |
| Mobile Phase: | A: 0.1% heptafluorobutyric acid B: methanol |
| Gradient Program: | Time(min) A(%) B(%) |
| | 0 95 5 |
| | 10 95 5 |
| | 20 60 40 |
| | 21 95 5 |
| 30 95 5 | |
| Flow Rate: | 1.0 mL/min |
| Detector: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

Cefuroxime Sodium



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

Ampicillin Capsules



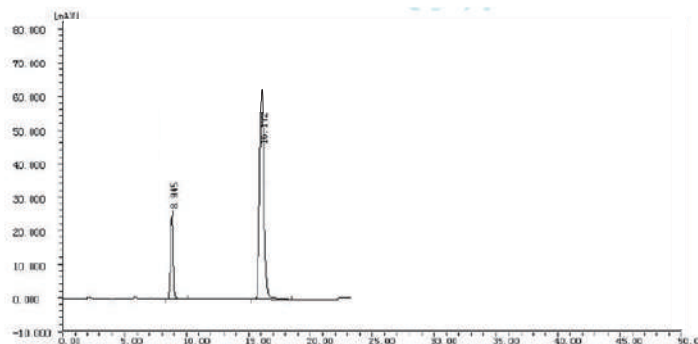
| | |
|---------------------------|---|
| Column: | Ultisil® LP-AQ, 4.6 ×250 mm, 5 µm |
| Mobile Phase: | A: 12% acetum/0.2 mol/L KH ₂ PO ₄ /acetonitrile/water=0.5/50/50/900 B: 12% acetum/0.2 mol/L KH ₂ PO ₄ /acetonitrile/water=0.5/50/400/550 |
| Gradient Program: | Time(min) A(%) B(%) |
| | 0 85 15 |
| | 10 85 15 |
| | 40 0 100 |
| | 55 0 100 |
| | 60 85 15 |
| 70 85 15 | |
| Flow Rate: | 1.0 mL/min |
| Detector: | 254 nm |
| Temperature: | 30°C |
| Injection Volume: | 20 µL |

Peptides



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

Hydralazine Hydrochloride



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

Ordering Information

Ultisil® LP-C18

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm 120 Å | 2.1 | H00208-21009 | H09208-21009 | H00208-21010 | H00208-21011 | H00208-21012 | H00208-21013 | H00208-21014 | H00208-21015 | H00208-21016 | - | H00808-23014 | 00808-01107 |
| | 3.0 | H00208-21018 | - | H00208-21019 | H00208-21020 | H00208-21021 | H00208-21022 | H00208-21023 | H00208-21024 | H00208-21025 | - | H00808-23014 | 00808-01107 |
| | 4.0 | H00208-21027 | - | H00208-21028 | H00208-21029 | H00208-21030 | H00208-21031 | H00208-21032 | H00208-21033 | H00208-21034 | - | H00808-03010 | 00808-01101 |
| | 4.6 | H00208-21036 | H11208-21036 | H00208-21037 | H00208-21038 | H00208-21039 | H00208-21040 | H00208-21041 | H00208-21042 | H00208-21043 | - | H00808-03010 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00208-31009 | H09208-31009 | H00208-31010 | H00208-31011 | H00208-31012 | H00208-31013 | H00208-31014 | H00208-31015 | H00208-31016 | - | H00808-24015 | 00808-01107 |
| | 3.0 | H00208-31018 | - | H00208-31019 | H00208-31020 | H00208-31021 | H00208-31022 | H00208-31023 | H00208-31024 | H00208-31025 | - | H00808-24015 | 00808-01107 |
| | 4.0 | H00208-31027 | - | H00208-31028 | H00208-31029 | H00208-31030 | H00208-31031 | H00208-31032 | H00208-31033 | H00208-31034 | H00208-31035 | H00808-04015 | 00808-01101 |
| | 4.6 | H00208-31036 | H11208-31036 | H00208-31037 | H00208-31038 | H00208-31039 | H00208-31040 | H00208-31041 | H00208-31042 | H00208-31043 | H00208-31044 | H00808-04015 | 00808-01101 |
| 10 µm 120 Å | 4.6 | - | - | - | - | - | - | H00208-41041 | H00208-41042 | H00208-41043 | H00208-41044 | H00808-05014 | 00808-01101 |

Ultisil® LP-C8

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm 120 Å | 2.1 | H00209-21009 | H09209-21009 | H00209-21010 | H00209-21011 | H00209-21012 | H00209-21013 | H00209-21014 | H00209-21015 | H00209-21016 | - | H00808-23015 | 00808-01107 |
| | 3.0 | H00209-21018 | - | H00209-21019 | H00209-21020 | H00209-21021 | H00209-21022 | H00209-21023 | H00209-21024 | H00209-21025 | - | H00808-23015 | 00808-01107 |
| | 4.0 | H00209-21027 | - | H00209-21028 | H00209-21029 | H00209-21030 | H00209-21031 | H00209-21032 | H00209-21033 | H00209-21034 | - | H00808-03011 | 00808-01101 |
| | 4.6 | H00209-21036 | H11209-21036 | H00209-21037 | H00209-21038 | H00209-21039 | H00209-21040 | H00209-21041 | H00209-21042 | H00209-21043 | - | H00808-03011 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00209-31009 | H09209-31009 | H00209-31010 | H00209-31011 | H00209-31012 | H00209-31013 | H00209-31014 | H00209-31015 | H00209-31016 | - | H00808-24012 | 00808-01107 |
| | 3.0 | H00209-31018 | - | H00209-31019 | H00209-31020 | H00209-31021 | H00209-31022 | H00209-31023 | H00209-31024 | H00209-31025 | - | H00808-24012 | 00808-01107 |
| | 4.0 | H00209-31027 | - | H00209-31028 | H00209-31029 | H00209-31030 | H00209-31031 | H00209-31032 | H00209-31033 | H00209-31034 | H00209-31035 | H00808-04012 | 00808-01101 |
| | 4.6 | H00209-31036 | H11209-31036 | H00209-31037 | H00209-31038 | H00209-31039 | H00209-31040 | H00209-31041 | H00209-31042 | H00209-31043 | H00209-31044 | H00808-04012 | 00808-01101 |

5 µm Ultisil® LP-CN, LP-C3, LP-AQ

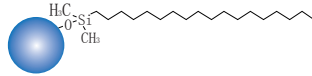
| Bonded phase | Column ID (mm) | Column Length (mm) | | | Guard Cartridge | Cartridge holder |
|--------------|----------------|--------------------|--------------|--------------|-----------------|------------------|
| | | 150 | 200 | 250 | | |
| LP-CN | 4.6 | H00247-31041 | H00247-31042 | H00247-31043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

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

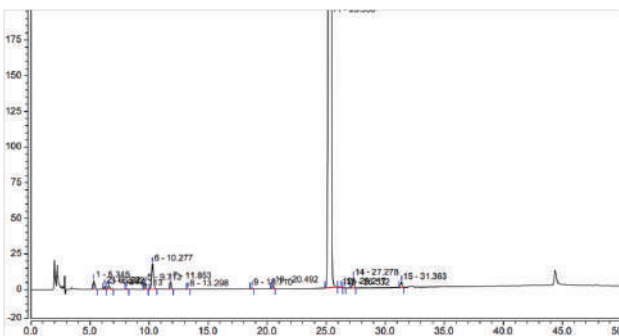
Ultisil® Plus C18

Ultisil® Plus C18 HPLC Column is a new generation of C18 column introduced by Welch. Plus C18 adopts unique bonding technique and double endcapping technique, leading to excellent peak shape, separation efficiency, stability and reproducibility.

Ultisil® Plus C18

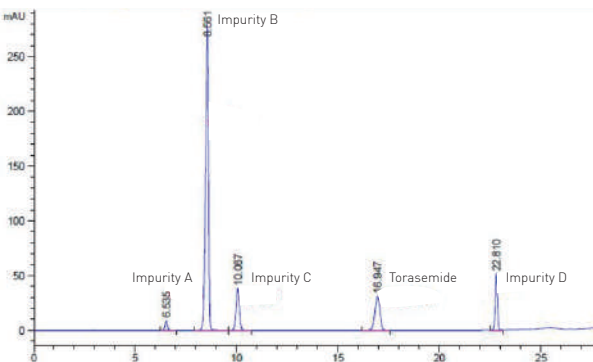
| | | | |
|---------------------------------|---|-------------------|-----------|
| Structural Formula |  | | |
| pH Range | 2.0-8.0 | Carbon Loading(%) | 10(130 Å) |
| Particle Size | 3.5 µm, 5 µm | USP List | L1 |
| Surface Area(m ² /g) | 160(130 Å) | Endcapped | Yes |

Lansoprazole



| Column: | Ultisil® Plus C18, 4.6 ×150 mm, 5 µm | | | | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mobile Phase: | A: water B: acetonitrile/water/ triethylamine=160 /40/1(adjust pH 7.0 with H ₃ PO ₄) | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>90</td> <td>10</td> </tr> <tr> <td>40</td> <td>20</td> <td>80</td> </tr> <tr> <td>50</td> <td>20</td> <td>80</td> </tr> <tr> <td>51</td> <td>90</td> <td>10</td> </tr> <tr> <td>65</td> <td>90</td> <td>10</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 90 | 10 | 40 | 20 | 80 | 50 | 20 | 80 | 51 | 90 | 10 | 65 | 90 | 10 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 90 | 10 | | | | | | | | | | | | | | | | | |
| 40 | 20 | 80 | | | | | | | | | | | | | | | | | |
| 50 | 20 | 80 | | | | | | | | | | | | | | | | | |
| 51 | 90 | 10 | | | | | | | | | | | | | | | | | |
| 65 | 90 | 10 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 0.8 mL/min | | | | | | | | | | | | | | | | | | |
| Detector: | 285 nm | | | | | | | | | | | | | | | | | | |
| Temperature: | 25°C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 40 µL | | | | | | | | | | | | | | | | | | |

Toraseamide



| Column: | Ultisil® Plus C18, 4.6 ×250 mm, 5 µm | | | | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mobile Phase: | A: 0.02 mol/L KH ₂ PO ₄ , adjust pH 3.5 with H ₃ PO ₄ B: methanol | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>60</td> <td>40</td> </tr> <tr> <td>13</td> <td>60</td> <td>40</td> </tr> <tr> <td>27</td> <td>20</td> <td>80</td> </tr> <tr> <td>31</td> <td>60</td> <td>40</td> </tr> <tr> <td>35</td> <td>60</td> <td>40</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 60 | 40 | 13 | 60 | 40 | 27 | 20 | 80 | 31 | 60 | 40 | 35 | 60 | 40 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 60 | 40 | | | | | | | | | | | | | | | | | |
| 13 | 60 | 40 | | | | | | | | | | | | | | | | | |
| 27 | 20 | 80 | | | | | | | | | | | | | | | | | |
| 31 | 60 | 40 | | | | | | | | | | | | | | | | | |
| 35 | 60 | 40 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1 mL/min | | | | | | | | | | | | | | | | | | |
| Detector: | 288 nm | | | | | | | | | | | | | | | | | | |
| Temperature: | 40°C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 20 µL | | | | | | | | | | | | | | | | | | |

Ordering Information

Ultisil® Plus C18

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|-----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3.5 µm 120 Å | 2.1 | H00260-20009 | H09260-20009 | H00260-20010 | H00260-20011 | H00260-20012 | H00260-20013 | H00260-20014 | H00260-20015 | H00260-20016 | - | H00808-23024 | 00808-01107 |
| | 3.0 | H00260-20018 | - | H00260-20019 | H00260-20020 | H00260-20021 | H00260-20022 | H00260-20023 | H00260-20024 | H00260-20025 | - | H00808-23024 | 00808-01107 |
| | 4.0 | H00260-20027 | - | H00260-20028 | H00260-20029 | H00260-20030 | H00260-20031 | H00260-20032 | H00260-20033 | H00260-20034 | - | H00808-03036 | 00808-01101 |
| | 4.6 | H00260-20036 | H11260-20036 | H00260-20037 | H00260-20038 | H00260-20039 | H00260-20040 | H00260-20041 | H00260-20042 | H00260-20043 | - | H00808-03036 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00260-31009 | H09260-31009 | H00260-31010 | H00260-31011 | H00260-31012 | H00260-31013 | H00260-31014 | H00260-31015 | H00260-31016 | - | H00808-24029 | 00808-01107 |
| | 3.0 | H00260-31018 | - | H00260-31019 | H00260-31020 | H00260-31021 | H00260-31022 | H00260-31023 | H00260-31024 | H00260-31025 | - | H00808-24029 | 00808-01107 |
| | 4.0 | H00260-31027 | - | H00260-31028 | H00260-31029 | H00260-31030 | H00260-31031 | H00260-31032 | H00260-31033 | H00260-31034 | H00260-31035 | H00808-04036 | 00808-01101 |
| | 4.6 | H00260-31036 | H11260-31036 | H00260-31037 | H00260-31038 | H00260-31039 | H00260-31040 | 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.

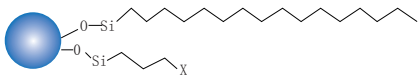
Ultisil® ALK-C18

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

Features:

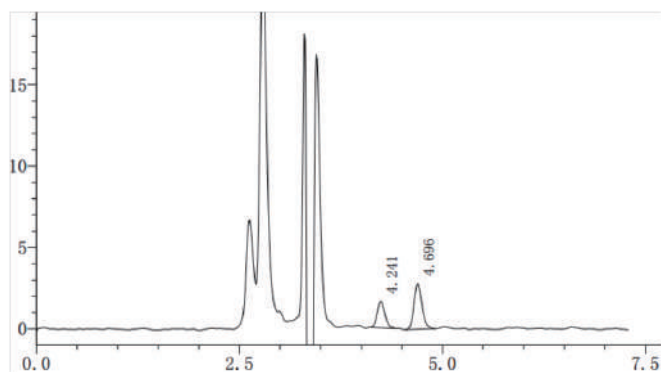
- Mixed solid phase with both hydrophobic and electrostatic interactions
- Excellent peak shape for basic compounds
- Fast separation of similar samples on a column

Ultisil® ALK-C18

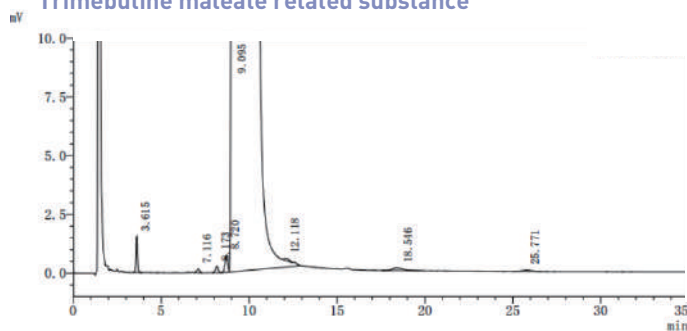
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.5-10.0 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 12(120 Å) |
| USP List | L1 |
| Endcapped | Yes |

AspartanL-aspartyl-L-phenylalanine

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



Trimebutine maleate related substance



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

Ordering Information

Ultisil® ALK-C18

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

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

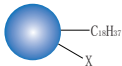
Ultisil® ODS-3

-- High Water-resistance Octadecyl HPLC Column

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

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

Ultisil® ODS-3

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

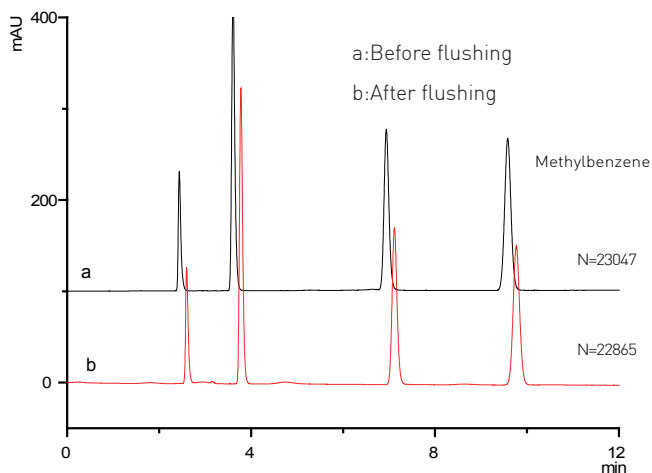
Tests of 48-hour Pure Water Resistance

Mobile Phase: 20 mM K₂HPO₄, adjust pH 7.0 with phosphate

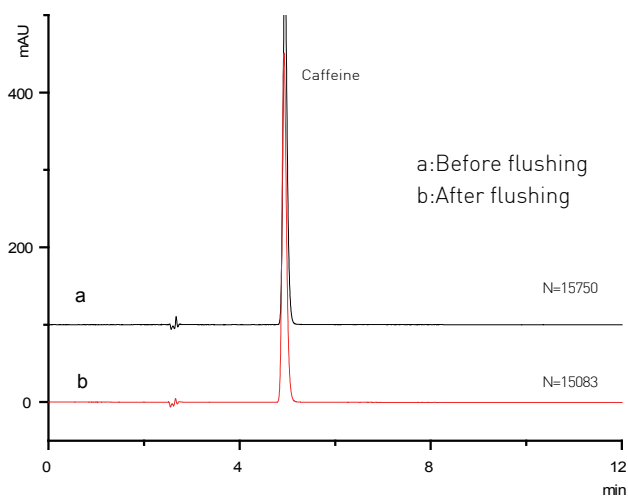
Temperature: 30°C

Flow Rate: 1.0 mL/min

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



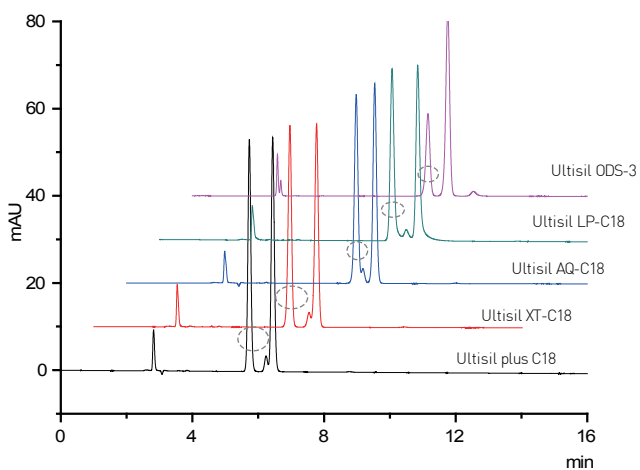
| | |
|-------------------|------------------------------------|
| Column: | Ultisil® ODS-3, 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Methanol/Water = 75/25 |
| Flow Rate: | 1.0 mL/min |
| Detector: | 254 nm |
| Temperature: | 30 °C |
| Injection Volume: | 20 μL |
| Test Requirement: | N→20000, T (0.90-1.10)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



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

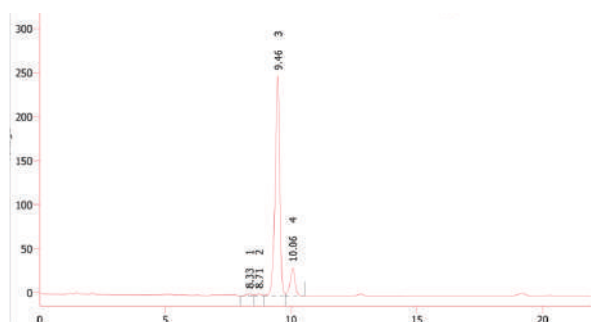
Cefprozil Capsule

Unique selectivity



| | |
|--------------------------|--|
| Column: | Welch C18 columns, 4.6×250 mm, 5 µm |
| Mobile Phase: | 0.05 mol/L NH ₄ H ₂ PO ₄ /acetonitrile=95/5 adjust pH 4 with H ₃ PO ₄ |
| Flow Rate: | 1.0 mL/min |
| Detector: | 225 nm |
| Temperature: | 35 °C |
| Injection Volume: | 20 µL |

Prostaglandin sample



| | |
|--------------------------|--|
| Column: | Ultisil® ODS-3, 4.6 ×250 mm, 5 µm |
| Mobile Phase: | Acetonitrile/water/H ₃ PO ₄ =35/65/0/1 |
| Flow Rate: | 1.0 mL/min |
| Detector: | 200 nm |
| Temperature: | 25 °C |
| Injection Volume: | 10 µL |

Ordering Information

Ultisil® ODS-3

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

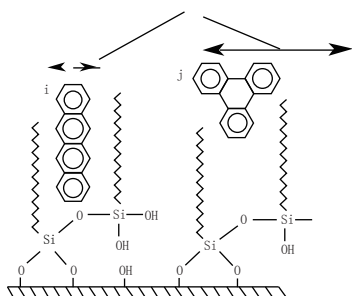
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® XS-C18

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

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

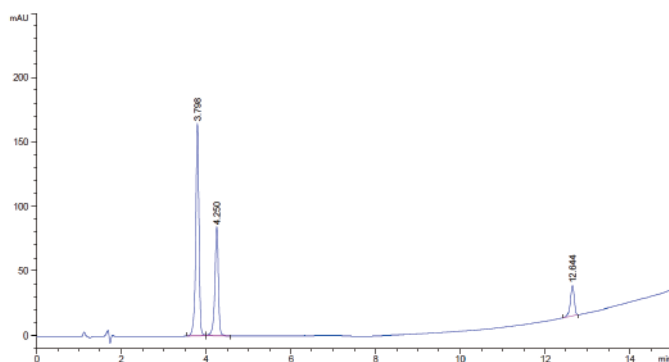
Minimum cross- Section of Solute



Compound i has more narrow size, with smaller cross-sectional area, which allows it go into the ligands and provides 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 compounds separated. Normal bonded columns have bigger interstices between ligands, which allows both compounds through and results in poor resolution.

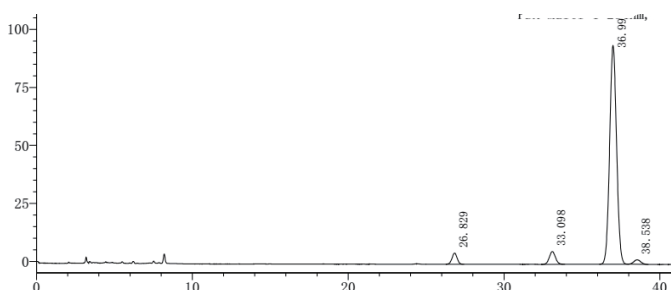
| | |
|---------------------------------|------------|
| Structural Formula | |
| pH Range | 2.0-10.0 |
| Particle Size | 3 µm, 5 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 23(120 Å) |
| USP List | L1 |
| Endcapped | Yes |

Isocyanate mononitrate



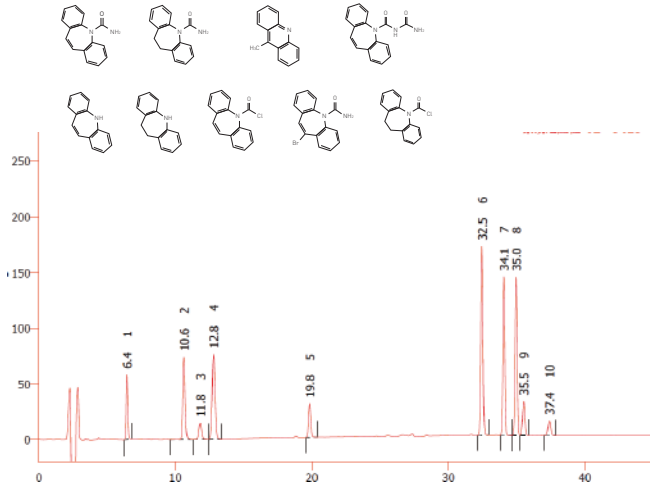
| Column: | Ultisil® XS-C18, 4.6 ×150 mm, 5 µm | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|---|----|----|----|----|----|------|----|----|
| Mobile Phase: | A: water B: methanol | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>75</td> <td>25</td> </tr> <tr> <td>5</td> <td>75</td> <td>25</td> </tr> <tr> <td>15</td> <td>30</td> <td>70</td> </tr> <tr> <td>15.1</td> <td>75</td> <td>25</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 75 | 25 | 5 | 75 | 25 | 15 | 30 | 70 | 15.1 | 75 | 25 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | |
| 0 | 75 | 25 | | | | | | | | | | | | | | |
| 5 | 75 | 25 | | | | | | | | | | | | | | |
| 15 | 30 | 70 | | | | | | | | | | | | | | |
| 15.1 | 75 | 25 | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | |
| Injection Volume: | 210 nm | | | | | | | | | | | | | | | |
| Temperature: | 35°C | | | | | | | | | | | | | | | |
| Injection Volume: | 10 µL | | | | | | | | | | | | | | | |
| Samples in order: | 2-isosorbide mononitrate, isocyanate mononitrate, isocyanate nitrate | | | | | | | | | | | | | | | |

Vitamin D3 and isomers



| | |
|-------------------|---|
| Column: | Ultisil® XS-C18, 4.6 ×250 mm, 3 µm |
| Mobile Phase: | Water/methanol=5/95 |
| Flow Rate: | 1.0 mL/min |
| Detector: | 264 nm |
| Temperature: | 30°C |
| Injection Volume: | 20 µL |
| Samples: | Previtamin D3, Trans vitamin D3, vitamin D3, tachysterol D3 |

Carbamazepine



| Column: | Ultisil® XS-C18, 4.6 × 250 mm, 5 μm | | | | | | | | | | | | | | | | | | |
|--------------------------|---|-----------|------|------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Mobile Phase: | A: water/triethylamine/formic acid=1000/0/5/0/5 B: methanol/formic acid=1000/0.25 | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>65</td> <td>35</td> </tr> <tr> <td>10</td> <td>65</td> <td>35</td> </tr> <tr> <td>30</td> <td>40</td> <td>60</td> </tr> <tr> <td>45</td> <td>40</td> <td>60</td> </tr> <tr> <td>46</td> <td>65</td> <td>35</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 65 | 35 | 10 | 65 | 35 | 30 | 40 | 60 | 45 | 40 | 60 | 46 | 65 | 35 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 65 | 35 | | | | | | | | | | | | | | | | | |
| 10 | 65 | 35 | | | | | | | | | | | | | | | | | |
| 30 | 40 | 60 | | | | | | | | | | | | | | | | | |
| 45 | 40 | 60 | | | | | | | | | | | | | | | | | |
| 46 | 65 | 35 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 230 nm | | | | | | | | | | | | | | | | | | |
| Temperature: | 30°C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 10 μL | | | | | | | | | | | | | | | | | | |
| Samples in order: | Impurity B, Carbamazepine, impurity A, impurity C, impurity G, impurity D, impurity F, iminodibenzylcarbonyl chloride, impurity F, impurity E | | | | | | | | | | | | | | | | | | |

Ordering Information

Ultisil® XS-C18

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

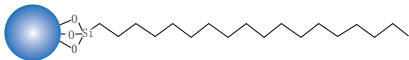
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



Ultisil® PAH

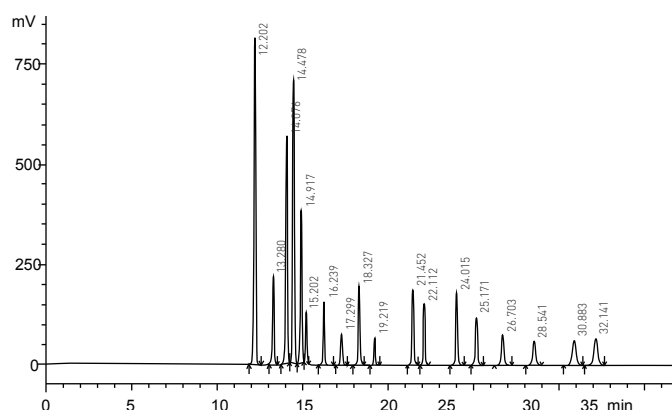
Ultisil® PAH Column is a special column recently designed by Welch for the separation of PAHs in EPA method 610. PAHs (Polycyclic Aromatic Hydrocarbon) are hydrocarbons with two or more benzene rings, and considered major pollutants. Therefore, the analysis of these potentially carcinogenic compounds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

Ultisil® PAH

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

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

Separation of 18 PAHs in EPA method 610



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

Ordering Information

Ultisil® PAH

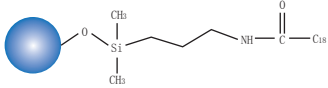
| Particle size | Column ID (mm) | Column Length (mm) | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|-----------------|------------------|
| | | 150 | 200 | 250 | | |
| 3 µm 120 Å | 2.1 | H00210-21014 | H00210-21015 | H00210-21016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

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

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

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

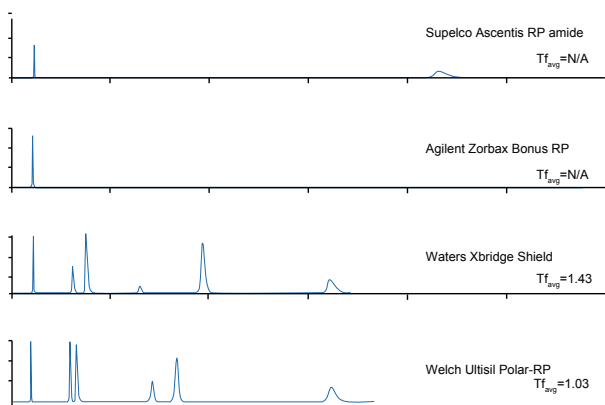
Ultisil® Polar-RP

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

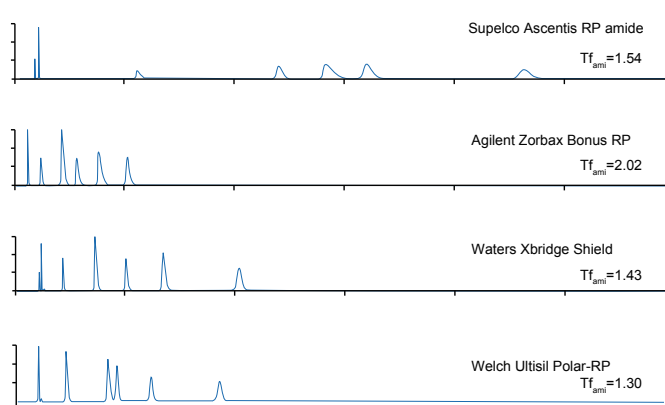
Ultisil® Polar-RP HPLC Column

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

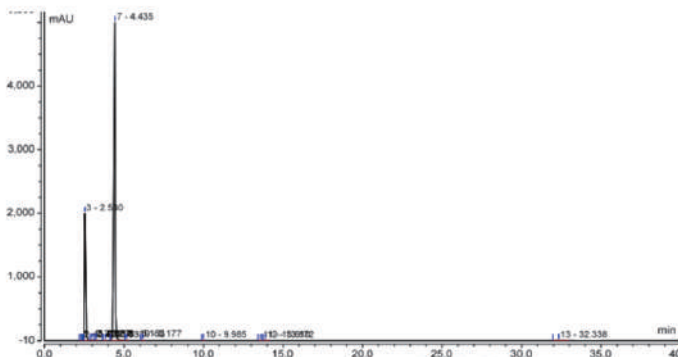
Comparison of separation of acid compounds



Comparison of separation of base compounds



Amoxicillin and clavulanate potassium



| Column: | Ultisil [®] Polar RP, 4.6 × 150 mm, 5 μm | | | | | | | | | | | | | | | | | | |
|-------------------|--|-----------|------|------|---|----|---|-----|----|---|------|----|----|----|----|---|----|----|---|
| Mobile Phase: | A: phosphate buffer * B: phosphate buffer/acetonitrile=20/80 *Dissolve 1.36 g KH ₂ PO ₃ in 900 mL water, adjust pH 6.0±0.1 with KOH, add water to 1000 mL | | | | | | | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>95</td> <td>5</td> </tr> <tr> <td>0.5</td> <td>95</td> <td>5</td> </tr> <tr> <td>30.5</td> <td>59</td> <td>41</td> </tr> <tr> <td>32</td> <td>95</td> <td>5</td> </tr> <tr> <td>40</td> <td>95</td> <td>5</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 95 | 5 | 0.5 | 95 | 5 | 30.5 | 59 | 41 | 32 | 95 | 5 | 40 | 95 | 5 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | |
| 0 | 95 | 5 | | | | | | | | | | | | | | | | | |
| 0.5 | 95 | 5 | | | | | | | | | | | | | | | | | |
| 30.5 | 59 | 41 | | | | | | | | | | | | | | | | | |
| 32 | 95 | 5 | | | | | | | | | | | | | | | | | |
| 40 | 95 | 5 | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 215 nm | | | | | | | | | | | | | | | | | | |
| Temperature: | 30°C | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 20 μL | | | | | | | | | | | | | | | | | | |

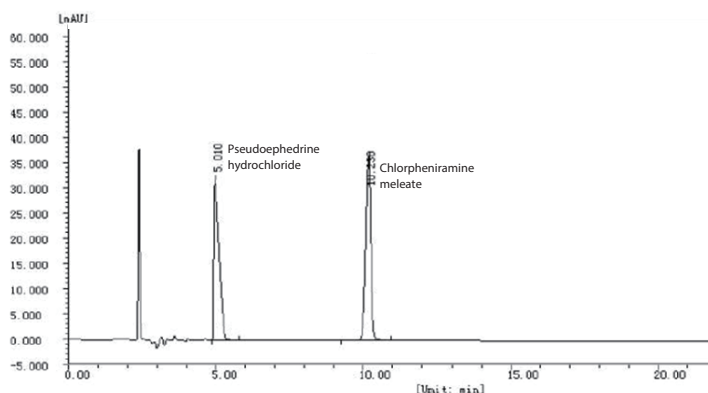
Ultisil[®] Phenyl-Ether

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

Ultisil[®] Phenyl-Ether HPLC Column

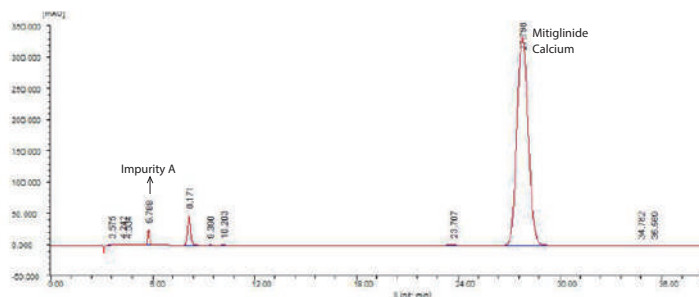
- Improved polar & aromatic reversed phases selectivity that complements the more conventional C18 column chemistries
- Better selectivity than phenyl phase for separation of nitrobenzene isomers
- Improved peak shape of highly acidic polar compounds, and different selectivity from other polar phases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

Chlorphenamine Maleate Pseudoephedrine Hydrochloride Capsules



| | |
|-------------------|--|
| Column: | Ultisil [®] Phenyl-Ether, 4.6 × 250 mm, 5 μm |
| Mobile Phase: | Acetonitrile/methanol/tetrahydrofuran/ H ₃ PO ₄ /water=320/80/50/1/550 Add 0.43 g lauryl sodium sulfate, adjust pH 3.5 with concentrated ammonia solution |
| Flow Rate: | 1.0 mL/min |
| Detector: | 254 nm |
| Temperature: | 25°C |
| Injection Volume: | 10 μL |

Mitiglinide Calcium



| | |
|-------------------|---|
| Column: | Ultisil® Phenyl-Ether, 4.6 × 250 mm, 5 μm |
| Mobile Phase: | 0.02 mol/L KH ₂ PO ₃ buffer*/methanol=38/62 *Dissolve 2.72 g KH ₂ PO ₃ in water, add 5mL of triethylamine, add water to 1000 mL, adjust pH 2.5 with H ₃ PO ₄ |
| Flow Rate: | 1.0mL/min |
| Detector: | 210 nm |
| Temperature: | Ambient |
| Injection Volume: | 10 μL |

Ordering Information

Ultisil® Polar RP

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|----------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00215-21009 | H09215-21009 | H00215-21010 | H00215-21011 | H00215-21012 | H00215-21013 | H00215-21014 | H00215-21015 | H00215-21016 | - | H00808-23009 | 00808-01107 |
| | 3.0 | H00215-21018 | - | H00215-21019 | H00215-21020 | H00215-21021 | H00215-21022 | H00215-21023 | H00215-21024 | H00215-21025 | - | H00808-23009 | 00808-01107 |
| | 4.0 | H00215-21027 | - | H00215-21028 | H00215-21029 | H00215-21030 | H00215-21031 | H00215-21032 | H00215-21033 | H00215-21034 | - | H00808-03009 | 00808-01101 |
| | 4.6 | H00215-21036 | H11215-21036 | H00215-21037 | H00215-21038 | H00215-21039 | H00215-21040 | H00215-21041 | H00215-21042 | H00215-21043 | - | H00808-03009 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00215-31009 | H09215-31009 | H00215-31010 | H00215-31011 | H00215-31012 | H00215-31013 | H00215-31014 | H00215-31015 | H00215-31016 | - | H00808-24017 | 00808-01107 |
| | 3.0 | H00215-31018 | - | H00215-31019 | H00215-31020 | H00215-31021 | H00215-31022 | H00215-31023 | H00215-31024 | H00215-31025 | - | H00808-24017 | 00808-01107 |
| | 4.0 | H00215-31027 | - | H00215-31028 | H00215-31029 | H00215-31030 | H00215-31031 | H00215-31032 | H00215-31033 | H00215-31034 | H00215-31035 | H00808-04017 | 00808-01101 |
| | 4.6 | H00215-31036 | H11215-31036 | H00215-31037 | H00215-31038 | H00215-31039 | H00215-31040 | H00215-31041 | H00215-31042 | H00215-31043 | H00215-31044 | H00808-04017 | 00808-01101 |
| 10 μm 120 Å | 4.6 | - | - | - | - | - | - | H00215-41041 | H00215-41042 | H00215-41043 | H00215-41044 | H00808-05015 | 00808-01101 |

Ultisil® Phenyl-Ether

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 μm 120 Å | 2.1 | H00214-31009 | H09214-31009 | H00214-31010 | H00214-31011 | H00214-31012 | H00214-31013 | H00214-31014 | H00214-31015 | H00214-31016 | - | H00808-24034 | 00808-01107 |
| | 3.0 | H00214-31018 | - | H00214-31019 | H00214-31020 | H00214-31021 | H00214-31022 | H00214-31023 | H00214-31024 | H00214-31025 | - | H00808-24034 | 00808-01107 |
| | 4.0 | H00214-31027 | - | H00214-31028 | H00214-31029 | H00214-31030 | H00214-31031 | H00214-31032 | H00214-31033 | H00214-31034 | H00214-31035 | H00808-04028 | 00808-01101 |
| | 4.6 | H00214-31036 | H11214-31036 | H00214-31037 | H00214-31038 | H00214-31039 | H00214-31040 | H00214-31041 | H00214-31042 | H00214-31043 | H00214-31044 | H00808-04028 | 00808-01101 |

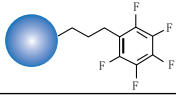
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



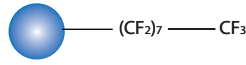
Ultisil® Fluorinated Phase(PFP&F-C8)

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

Ultisil® PFP

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

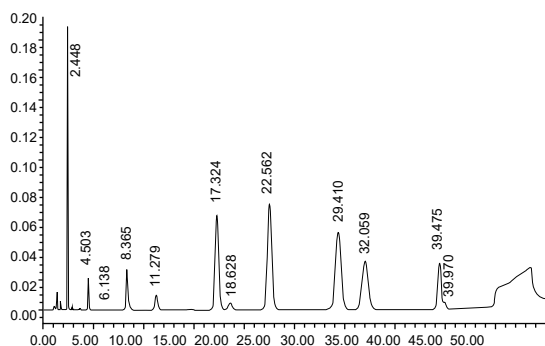
Ultisil® F-C8

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

Ultisil® PFP

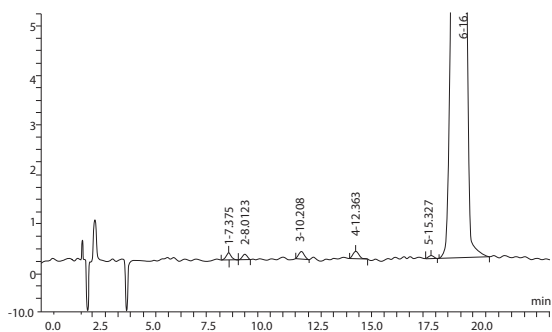
Ultisil® PF-Phenyl is a phase primarily used in the separation of molecules bearing fluorine atoms, but may also be in the separation of non-fluorinated compounds such as Taxol and its derivatives. Because of its phenyl ring, it has a higher selectivity for aromatic molecules than for other alkyl-fluorinated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

Analysis of Taxol



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

Parecoxib Sodium

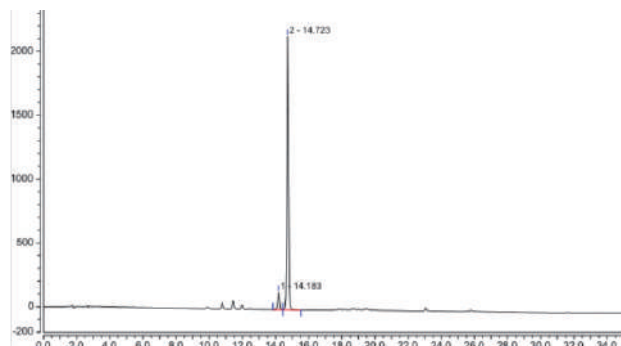


| | | | |
|-------------------|--|------|------|
| Column: | Ultisil® PFP, 4.6 × 250 mm, 5 µm | | |
| Mobile Phase: | A: 0.1% TFA water solution B: methanol | | |
| Gradient Program: | Time(min) | A(%) | B(%) |
| | 0 | 55 | 45 |
| | 20 | 45 | 55 |
| | 40 | 10 | 90 |
| Flow Rate: | 1.0 mL/min | | |
|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

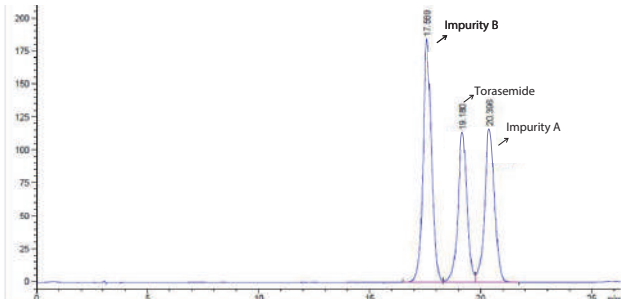
Ultisil® F-C8

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

Dolasetron Mesylate



Toraseamide



Ordering Information

Ultisil® PFP

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm 120 Å | 2.1 | H00224-21009 | H09224-21009 | H00224-21010 | H00224-21011 | H00224-21012 | H00224-21013 | H00224-21014 | H00224-21015 | H00224-21016 | - | H00808-23019 | 00808-01107 |
| | 3.0 | H00224-21018 | - | H00224-21019 | H00224-21020 | H00224-21021 | H00224-21022 | H00224-21023 | H00224-21024 | H00224-21025 | - | H00808-23019 | 00808-01107 |
| | 4.0 | H00224-21027 | - | H00224-21028 | H00224-21029 | H00224-21030 | H00224-21031 | H00224-21032 | H00224-21033 | H00224-21034 | - | H00808-03024 | 00808-01101 |
| | 4.6 | H00224-21036 | H11224-21036 | H00224-21037 | H00224-21038 | H00224-21039 | H00224-21040 | H00224-21041 | H00224-21042 | H00224-21043 | - | H00808-03024 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00224-31009 | H09224-31009 | H00224-31010 | H00224-31011 | H00224-31012 | H00224-31013 | H00224-31014 | H00224-31015 | H00224-31016 | - | H00808-24035 | 00808-01107 |
| | 3.0 | H00224-31018 | - | H00224-31019 | H00224-31020 | H00224-31021 | H00224-31022 | H00224-31023 | H00224-31024 | H00224-31025 | - | H00808-24035 | 00808-01107 |
| | 4.0 | H00224-31027 | - | H00224-31028 | H00224-31029 | H00224-31030 | H00224-31031 | H00224-31032 | H00224-31033 | H00224-31034 | H00224-31035 | H00808-04024 | 00808-01101 |
| | 4.6 | H00224-31036 | H11224-31036 | H00224-31037 | H00224-31038 | H00224-31039 | H00224-31040 | H00224-31041 | H00224-31042 | H00224-31043 | H00224-31044 | H00808-04024 | 00808-01101 |

Ultisil® F-C8


| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm 120 Å | 2.1 | H00222-21009 | H09222-21009 | H00222-21010 | H00222-21011 | H00222-21012 | H00222-21013 | H00222-21014 | H00222-21015 | H00222-21016 | - | H00808-23021 | 00808-01107 |
| | 3.0 | H00222-21018 | - | H00222-21019 | H00222-21020 | H00222-21021 | H00222-21022 | H00222-21023 | H00222-21024 | H00222-21025 | - | H00808-23021 | 00808-01107 |
| | 4.0 | H00222-21027 | - | H00222-21028 | H00222-21029 | H00222-21030 | H00222-21031 | H00222-21032 | H00222-21033 | H00222-21034 | - | H00808-03023 | 00808-01101 |
| | 4.6 | H00222-21036 | H11222-21036 | H00222-21037 | H00222-21038 | H00222-21039 | H00222-21040 | H00222-21041 | H00222-21042 | H00222-21043 | - | H00808-03023 | 00808-01101 |
| 5 µm 120 Å | 2.1 | H00222-31009 | H09222-31009 | H00222-31010 | H00222-31011 | H00222-31012 | H00222-31013 | H00222-31014 | H00222-31015 | H00222-31016 | - | H00808-24036 | 00808-01107 |
| | 3.0 | H00222-31018 | - | H00222-31019 | H00222-31020 | H00222-31021 | H00222-31022 | H00222-31023 | H00222-31024 | H00222-31025 | - | H00808-24036 | 00808-01107 |
| | 4.0 | H00222-31027 | - | H00222-31028 | H00222-31029 | H00222-31030 | H00222-31031 | H00222-31032 | H00222-31033 | H00222-31034 | H00222-31035 | H00808-04038 | 00808-01101 |
| | 4.6 | H00222-31036 | H11222-31036 | H00222-31037 | H00222-31038 | H00222-31039 | H00222-31040 | H00222-31041 | H00222-31042 | H00222-31043 | H00222-31044 | H00808-04038 | 00808-01101 |

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

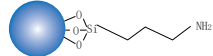
Ultisil® HILIC Column (HILIC Silica&HILIC NH₂)

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

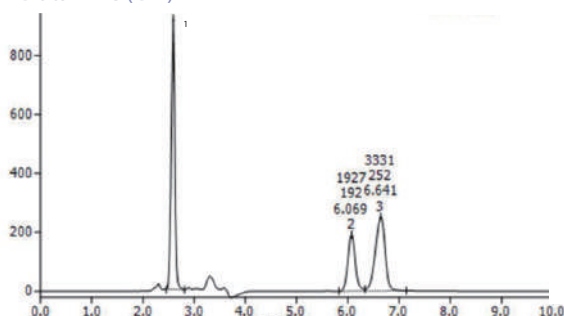
Ultisil® HILIC Silica

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

Ultisil® HILIC-NH₂

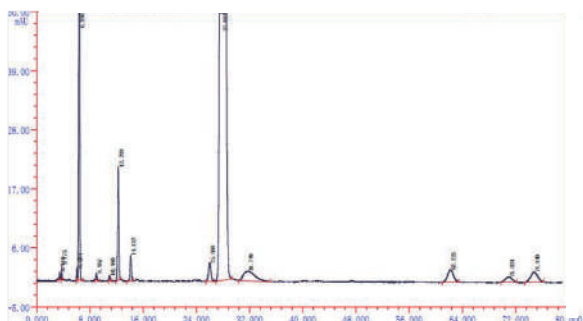
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 3 µm, 5 µm, 10 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 4(120 Å) |
| USP List | L8 |
| Endcapped | No |

Glutamine (Gln)



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

Alanyl Glutamine Injection



| | |
|-------------------|---|
| Column: | Ultisil® HILIC-NH ₂ , 4.6 ×250 mm, 5µm |
| Mobile Phase: | Acetonitrile/0.05 mol/L KH ₂ PO ₄ (adjust pH 4.0 with H ₃ PO ₄) =65/35 |
| Flow Rate: | 0.7 mL/min |
| Detector: | 215 nm |
| Temperature: | 30°C |
| Injection Volume: | 20 µL |
| Note: | Use the mobile phase to fully activate the column before testing the sample on the column |

Ordering Information

Ultisil® HILIC Silica

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

Ultisil® HILIC NH₂

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

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

Ultisil® HILIC Amide

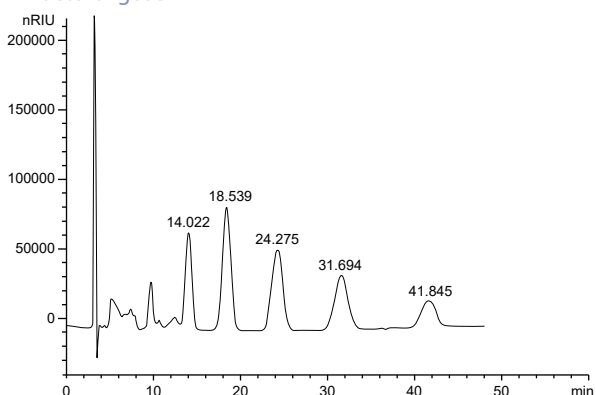
Ultisil® HILIC Amide column is a special column designed for HILIC mode. As amide group has strong hydrophilicity, stability and electrically neutral, Ultisil® Amide has longer life, better separation repeatability and peak shape than NH₂ phase does.

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

Ultisil® HILIC Amide

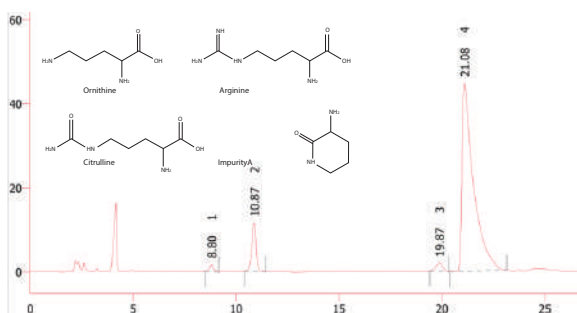
| | | | |
|---------------------------------|-------------------|-------------------|----------|
| pH Range | 2.0-8.0 | Carbon Loading(%) | 7(120 Å) |
| Particle Size | 3 μm, 5 μm, 10 μm | USP List | L68 |
| Surface Area(m ² /g) | 320(120 Å) | Endcapped | N/A |

Fructo-oligose



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

Ornithine hydrochloride



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

Ordering Information

Ultisil® HILIC Amide

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 μm 120 Å | 2.1 | H00240-21009 | H09240-21009 | H00240-21010 | H00240-21011 | H00240-21012 | H00240-21013 | H00240-21014 | H00240-21015 | H00240-21016 | - | H00808-23010 | 00808-01107 |
| | 3.0 | H00240-21018 | - | H00240-21019 | H00240-21020 | H00240-21021 | H00240-21022 | H00240-21023 | H00240-21024 | H00240-21025 | - | H00808-23010 | 00808-01107 |
| | 4.0 | H00240-21027 | - | H00240-21028 | H00240-21029 | H00240-21030 | H00240-21031 | H00240-21032 | H00240-21033 | H00240-21034 | - | H00808-03021 | 00808-01101 |
| | 4.6 | H00240-21036 | H11240-21036 | H00240-21037 | H00240-21038 | H00240-21039 | H00240-21040 | H00240-21041 | H00240-21042 | H00240-21043 | - | H00808-03021 | 00808-01101 |
| 5 μm 120 Å | 2.1 | H00240-31009 | H09240-31009 | H00240-31010 | H00240-31011 | H00240-31012 | H00240-31013 | H00240-31014 | H00240-31015 | H00240-31016 | - | H00808-24025 | 00808-01107 |
| | 3.0 | H00240-31018 | - | H00240-31019 | H00240-31020 | H00240-31021 | H00240-31022 | H00240-31023 | H00240-31024 | H00240-31025 | - | H00808-24025 | 00808-01107 |
| | 4.0 | H00240-31027 | - | H00240-31028 | H00240-31029 | H00240-31030 | H00240-31031 | H00240-31032 | H00240-31033 | H00240-31034 | H00240-31035 | H00808-04025 | 00808-01101 |
| | 4.6 | H00240-31036 | H11240-31036 | H00240-31037 | H00240-31038 | H00240-31039 | H00240-31040 | H00240-31041 | H00240-31042 | H00240-31043 | H00240-31044 | H00808-04025 | 00808-01101 |
| 10 μm 120 Å | 4.6 | - | - | - | - | - | - | H00240-41041 | H00240-41042 | H00240-41043 | H00240-41044 | H00808-05018 | 00808-01101 |

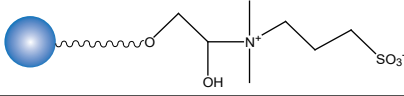
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® HILIC Amphion II

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

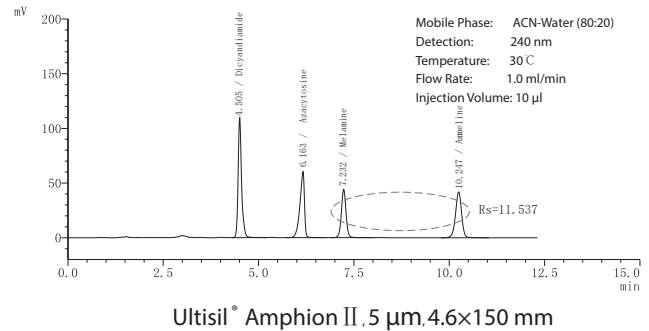
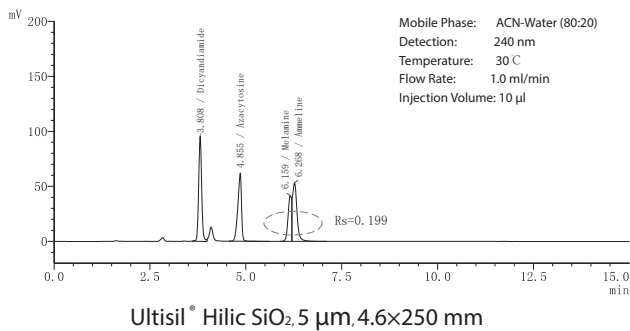
- Amphion-bonded silica stationary phase
- Enhanced hydrophilic interaction brings higher retention for polar and hydrophilic compounds
- Different selectivity from common HILIC packing materials
- Simple mobile phase used for the separation of polar compounds

Ultisil® HILIC Amphion

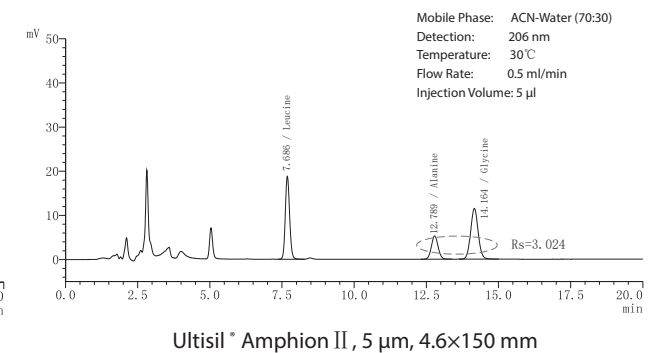
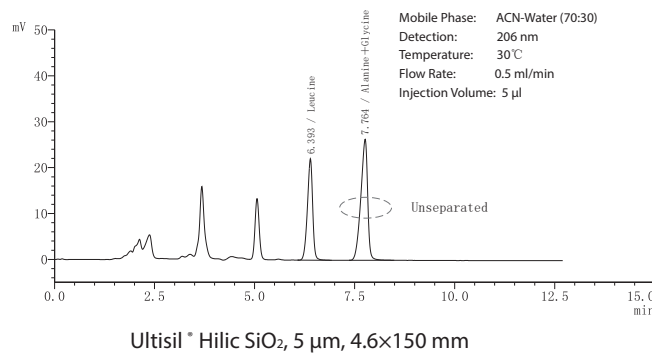
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 6(120 Å) |
| USP List | L114 |
| Endcapped | N/A |

Comparison

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

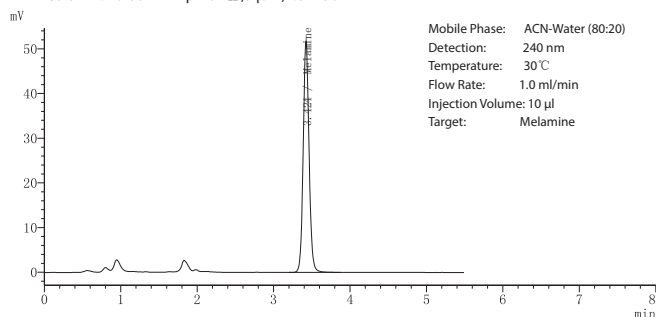


Separation of 3 Aliphatic Amino Acids (Leucine, Alanine, Glycine)



Determination of Melamine

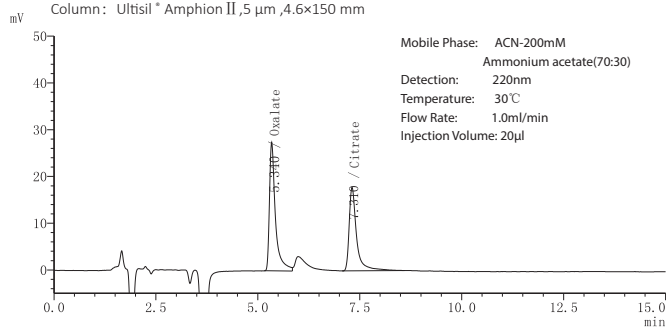
Column: Ultisil® Amphion II, 5 µm, 4.6x150 mm



| Rt | Plates | Tailing Factor |
|-------|--------|----------------|
| 3.424 | 8087 | 1.094 |

Separation of Citrate and Oxalate

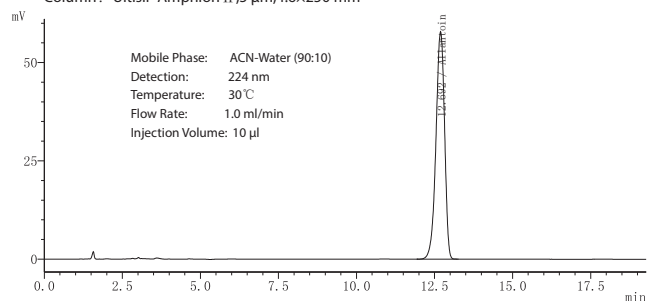
Column: Ultisil® Amphion II, 5 µm, 4.6x150 mm



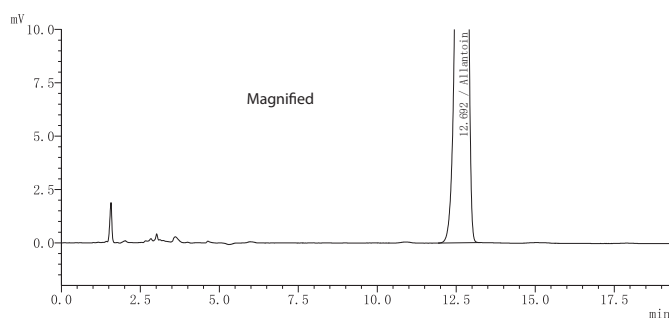
| Compound | Rt | Plates | Resolution |
|----------|-------|--------|------------|
| Oxalate | 5.340 | 7540 | -- |
| Citrate | 7.310 | 9487 | 7.214 |

Determination of Allantoin

Column: Ultisil® Amphion II, 5 µm, 4.6x250 mm



| Rt | Plates | Tailing Factor |
|--------|--------|----------------|
| 12.692 | 10196 | 0.892 |



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.

Note:

- Shifts of retention time may occur, if not sufficiently equilibrated.
- 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.
- Long-period equilibration required, after using buffer salt mobile phase (like ammonium formate, ammonium acetate etc.) and buffer salt being flushed off.
- After use, flush off the buffer salt in the column and store in 100% acetonitrile solvent.

Ultisil® HILIC Amphion II

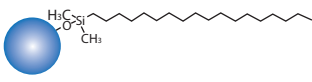
| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 µm 120 Å | 2.1 | H00274-31009 | H09274-31009 | H00274-31010 | H00274-31011 | H00274-31012 | H00274-31013 | H00274-31014 | H00274-31015 | H00274-31016 | | H00808-24039 | 00808-01107 |
| | 3.0 | H00274-31018 | - | H00274-31019 | H00274-31020 | H00274-31021 | H00274-31022 | H00274-31023 | H00274-31024 | H00274-31025 | - | H00808-24039 | 00808-01107 |
| | 4.0 | H00274-31027 | - | H00274-31028 | H00274-31029 | H00274-31030 | H00274-31031 | H00274-31032 | H00274-31033 | H00274-31034 | H00274-31035 | H00808-04029 | 00808-01101 |
| | 4.6 | H00274-31036 | H11274-31036 | H00274-31037 | H00274-31038 | H00274-31039 | H00274-31040 | H00274-31041 | H00274-31042 | H00274-31043 | H00274-31044 | H00808-04029 | 00808-01101 |

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

Ultisil® Amino Acid HPLC Column

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

Ultisil® AA(Amino Acid)

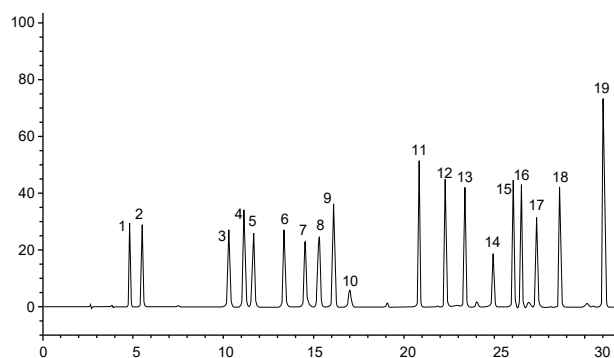
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.5-10.0 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 17(120 Å) |
| USP List | L1 |
| Endcapped | Yes |

Ultisil® Amino Acid Method Package

Ultisil® Amino Acid Method Package

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

Separation of 18 Amino Acids



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

Ordering Information

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

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

Ultisil® Amino Acid Plus Column

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

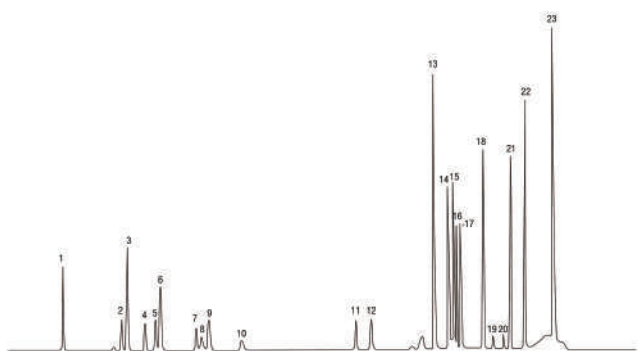
Ultisil® Amino Acid Plus

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

Characteristics

- 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 chromatographic column had been tested with 23 amino acids before sold, ensuring the reliability of the results

Separation of 23 Amino Acids



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

Ordering Information

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

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

Ultisil® OAA Column

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

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

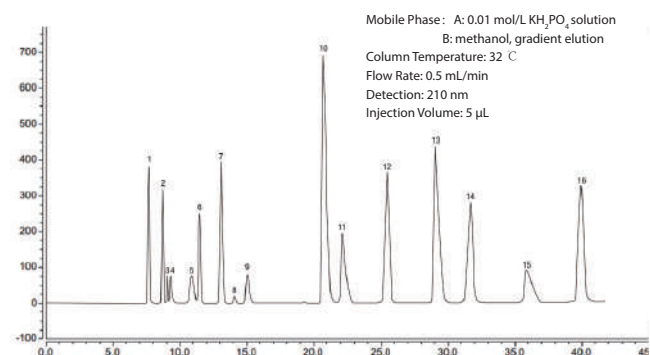
Ultisil® OAA

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

Characteristics

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

Separation of 16 kinds of organic acids



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

Ordering Information

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

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

Ultisil® Mixed Mode Phase(MM C18/SCX&MM NH₂/CN)

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

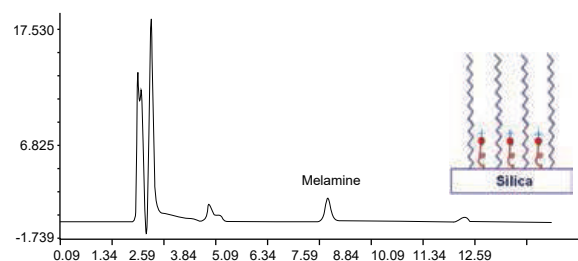
Ultisil® MM C18/SCX

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

Ultisil® MM NH₂/CN

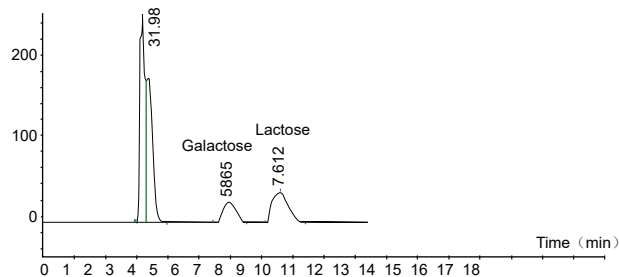
| | |
|---------------------------------|------------|
| pH Range | 2.0-8.0 |
| Particle Size | 5 μm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | N/A |
| USP List | / |
| Endcapped | N/A |

Analysis of Melamine



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

Separation of Lactose and Galactose



| | |
|-------------------|--|
| Column: | Ultisil® MM NH ₂ /CN, 4.6 ×250 mm, 5 μm |
| Mobile Phase: | Acetonitrile/water =70/30 |
| Detector: | RID (40°C) |
| Temperature: | 45°C |
| Flow Rate: | 1.0 mL/min |
| Injection Volume: | 20 μL |

Ultisil® MM C18/SCX

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 μm 120 Å | 2.1 | H00235-31009 | H09235-31009 | H00235-31010 | H00235-31011 | H00235-31012 | H00235-31013 | H00235-31014 | H00235-31015 | H00235-31016 | - | H00808-24032 | 00808-01107 |
| | 3.0 | H00235-31018 | - | H00235-31019 | H00235-31020 | H00235-31021 | H00235-31022 | H00235-31023 | H00235-31024 | H00235-31025 | - | H00808-24032 | 00808-01107 |
| | 4.0 | H00235-31027 | - | H00235-31028 | H00235-31029 | H00235-31030 | H00235-31031 | H00235-31032 | H00235-31033 | H00235-31034 | H00235-31035 | H00808-04032 | 00808-01101 |
| | 4.6 | H00235-31036 | H11235-31036 | H00235-31037 | H00235-31038 | H00235-31039 | H00235-31040 | H00235-31041 | H00235-31042 | H00235-31043 | H00235-31044 | H00808-04032 | 00808-01101 |

Ultisil® MM NH₂/CN

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 μm 120 Å | 2.1 | H00243-31009 | H09243-31009 | H00243-31010 | H00243-31011 | H00243-31012 | H00243-31013 | H00243-31014 | H00243-31015 | H00243-31016 | - | H00808-24041 | 00808-01107 |
| | 3.0 | H00243-31018 | - | H00243-31019 | H00243-31020 | H00243-31021 | H00243-31022 | H00243-31023 | H00243-31024 | H00243-31025 | - | H00808-24041 | 00808-01107 |
| | 4.0 | H00243-31027 | - | H00243-31028 | H00243-31029 | H00243-31030 | H00243-31031 | H00243-31032 | H00243-31033 | H00243-31034 | H00243-31035 | H00808-04037 | 00808-01101 |
| | 4.6 | H00243-31036 | H11243-31036 | H00243-31037 | H00243-31038 | H00243-31039 | H00243-31040 | H00243-31041 | H00243-31042 | H00243-31043 | H00243-31044 | H00808-04037 | 00808-01101 |

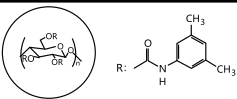
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® Chiral Column

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

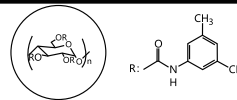
Ultisil® Cellu-D/Cellu-DR

Cellulose tris (3,5-dimethylphenylcarbamate) coated silica

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

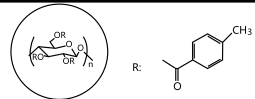
Ultisil® AMY-D/AMY-DR

Amylose tris (3,5-dimethylphenylcarbamate) coated silica

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

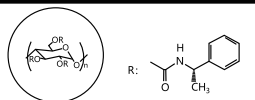
Ultisil® Cellu-J/Cellu-JR

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

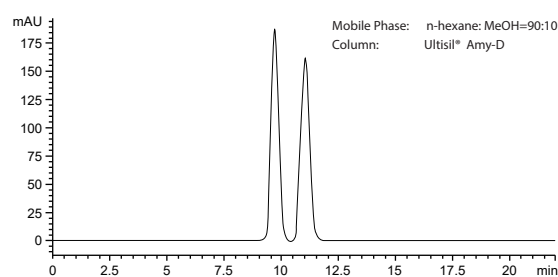
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-9.0 |
| Particle Size | 5 µm, 10 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | N/A |
| USP List | L80(Cellu-J), L107(Cellu-JR) |
| Endcapped | N/A |

Ultisil® Amy-S/Amy-SR

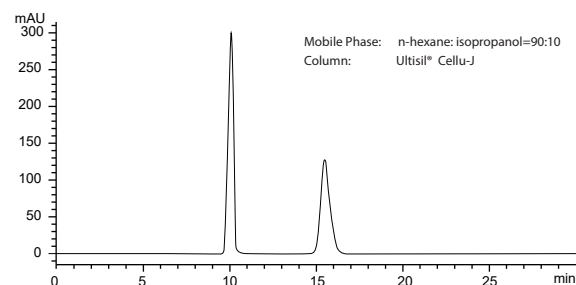
Amylose tris [(S)- α -methylphenyl carbamate] coated Silica

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

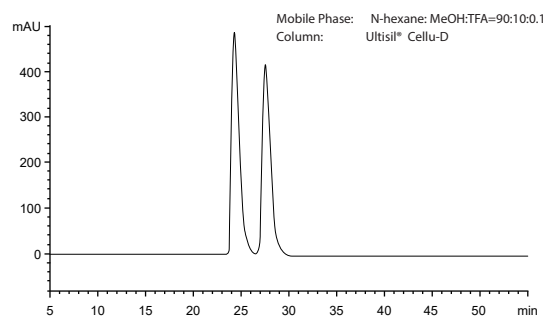
Fenamiphos



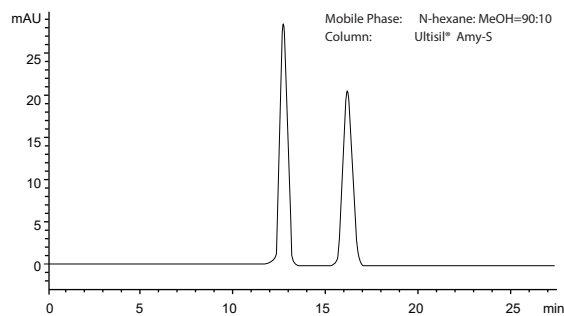
Tröger's Base



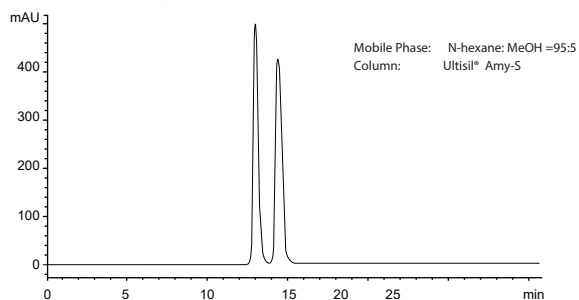
DL-Repaglinide



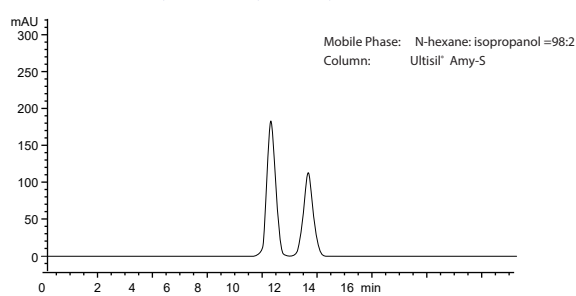
Myclobutanil



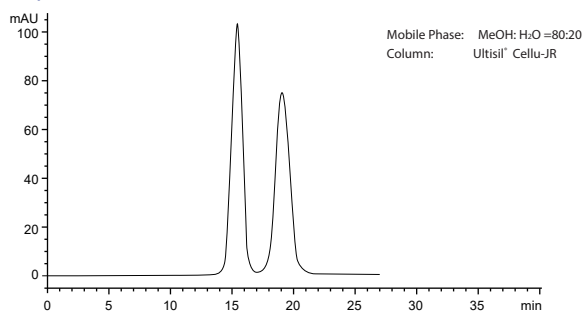
Quizalofop-ethyl



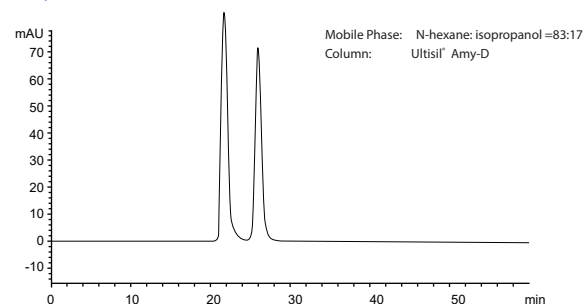
Oxirane,2-[(phenylmethoxy)methyl]-



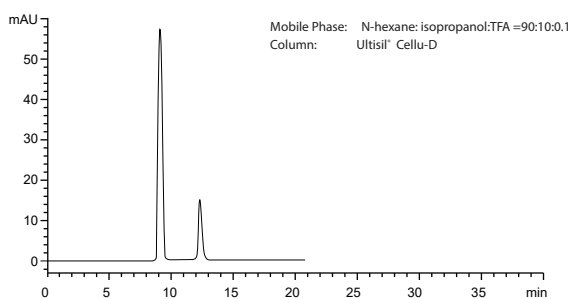
Llaprazole



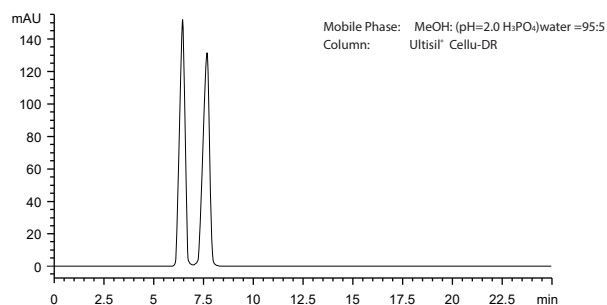
Omeprazole



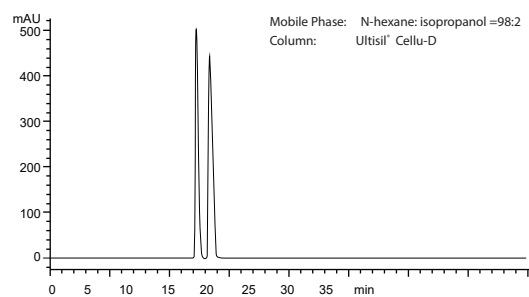
Alkannin



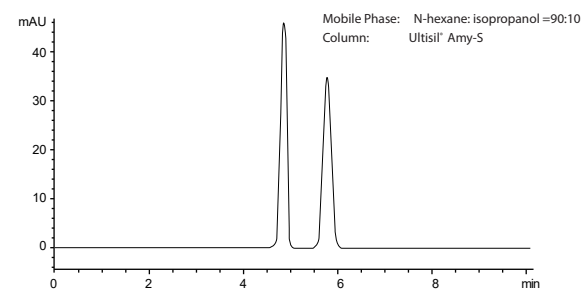
Fmoc-Leu-OH



Butylphthalide



Hexaconazole



Ordering Information

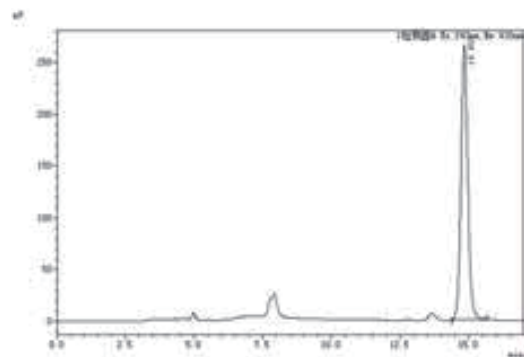
| | Particle size | Column ID(mm) | Column Length (mm) | | Guard Cartridge | Cartridge holder |
|----------|---------------|---------------|--------------------|--------------|-----------------|------------------|
| | | | 150 | 250 | | |
| | | | | | 10mm length | |
| Cellu-D | 5 µm | 4.6 | H00219-31041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

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

Ultisil® Zn Column

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

Determination of vitamin K1 in spinach



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

Ordering Information

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

Ultisil® Lead Oxide Column

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

Ordering Information

| Specification | Ultisil® Lead Oxide | |
|---------------|---------------------|---------------------|
| | 25%PbO ₂ | 50%PbO ₂ |
| 4.6×35 mm | H00238-51036 | H00239-51036 |
| 4.6×50 mm | H00238-51037 | H00239-51037 |
| 4.0×50 mm | H00238-51028 | H00239-51028 |

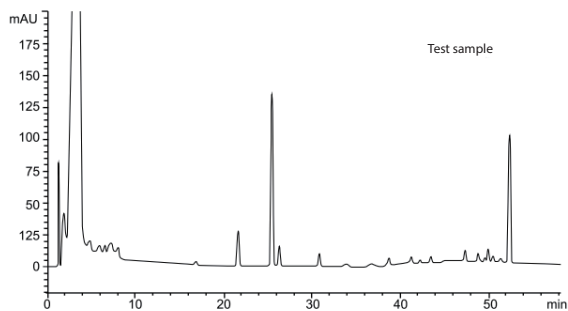
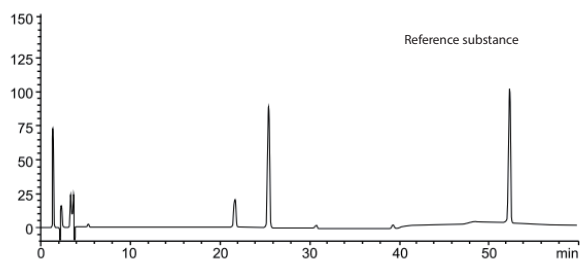
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

Ultisil® PG-C18

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

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

Panax Notoginseng Saponins



| Column: | Ultisil® PG-C18, 4.6 × 250 mm, 5 µm | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|----|----|----|----|----|----|----|
| Mobile Phase: | A: water B: acetonitrile | | | | | | | | | | | | |
| Gradient Program: | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>81</td> <td>19</td> </tr> <tr> <td>12</td> <td>81</td> <td>19</td> </tr> <tr> <td>60</td> <td>64</td> <td>36</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 81 | 19 | 12 | 81 | 19 | 60 | 64 | 36 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | |
| 0 | 81 | 19 | | | | | | | | | | | |
| 12 | 81 | 19 | | | | | | | | | | | |
| 60 | 64 | 36 | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | |
| Injection Volume: | 203 nm | | | | | | | | | | | | |
| Temperature: | 25°C | | | | | | | | | | | | |

Ordering Information

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

Xtimate® Series HPLC Column

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

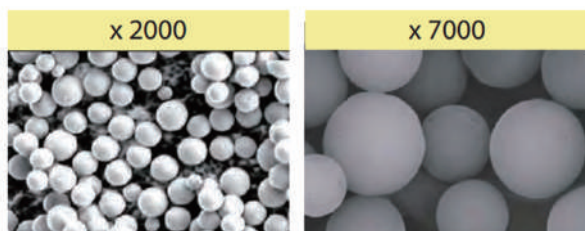
X features of Xtimate® column

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

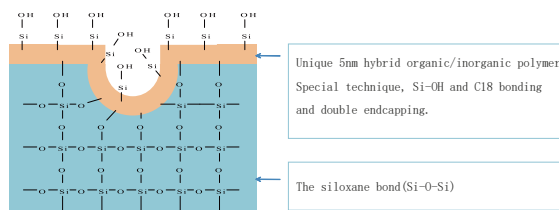
Xtimate® Silica Based HPLC Column

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

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

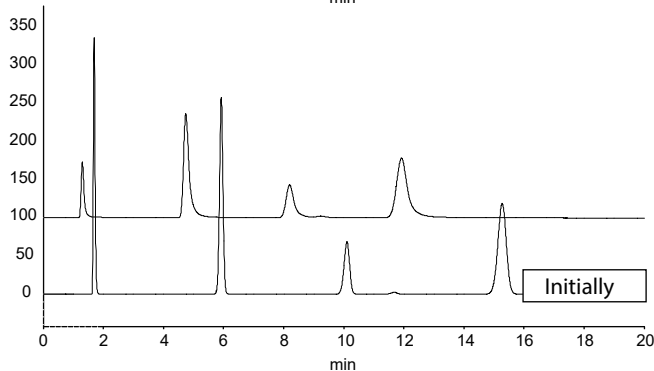
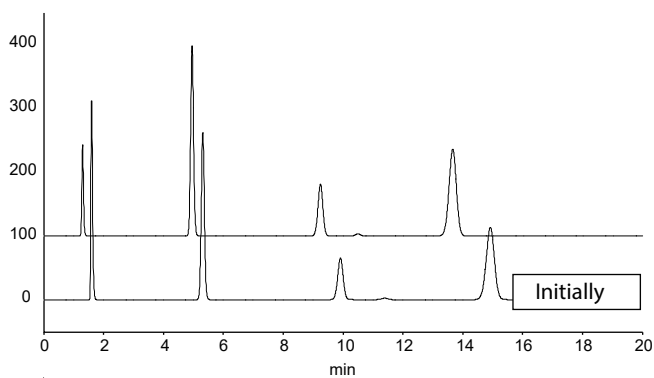


SEM of Hybrid particle



Hybrid Particles Based Xtimate® Technology

Comparison of Peak Shape After Soaking In Base

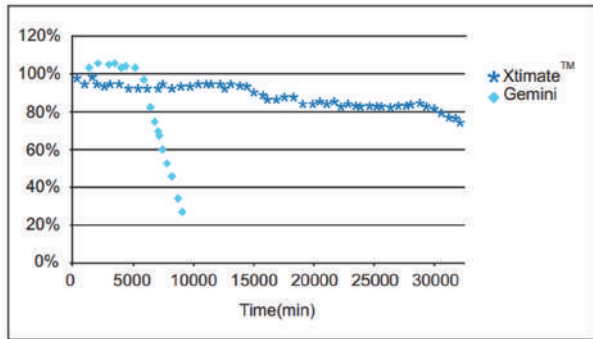


After test at pH 12 condition for 4h, the peak shape of hybrid particles based Xtimate® column shows no difference.

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

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

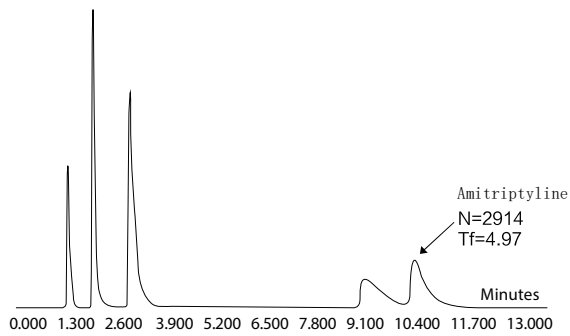
Lifetime Test Comparison: 5 Times Longer Than Gemini



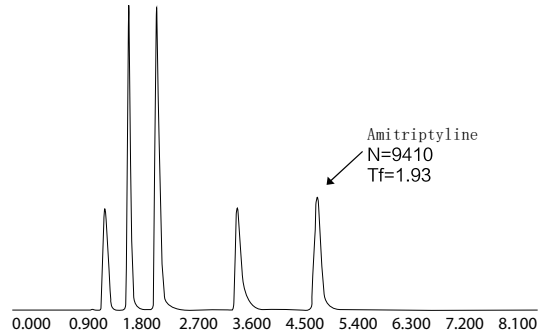
| | |
|-------------------|--|
| Column: | Xtimate® C18, 5 µm, 150x4.6 mm / Gemini C18, 5 µm, 150x4.6 mm |
| Mobile Phase: | A: 10mM Ammonium Bicarbonate pH 10.5 B: 90:10 Acetonitrile/buffer |
| Gradient Program: | 0% to 100% B in 10min. 100% B for 7min. 0% B for 3min. |
| Flow Rate: | 1.0 mL/min |
|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

Unprecedented Peak Shape

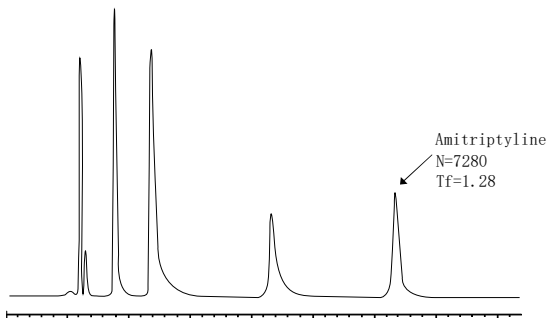
At mid pH, strong bases usually exhibit bad tailing due to secondary interactions between the analytes and the surface silanols. In Welch's unique technique, the hybrid layer totally covers the surface silanols and blocks analytes' access to these surface silanols. Improved bonding and endcapping further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



The detection of amitriptyline by poor endcapping product



The detection of Amitriptyline by Symmetry C18



The detection of amitriptyline by Xtimate® C18



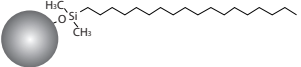
Xtimate® HPLC Column

Besides C18 and C8 bonded phases, Xtimate also provides C4, CN, Phenyl bonded phases.

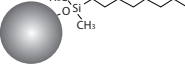
Xtimate® applies a new special Smoothpak™ technique to C18, C8, C4, CN, Phenyl and amino phases, different than the bonding method of other series. As a result, Xtimate® provides a different selectivity, improved stability and reproducibility. In particular, for the Phenyl phase of Phenyl-Hexyl, Xtimate® is totally different from Ultisil® Phenyl. Xtimate® Phenyl 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.

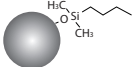
Xtimate® C18

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

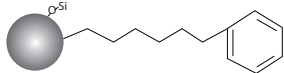
Xtimate® C8

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

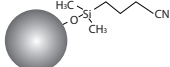
Xtimate® C4

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

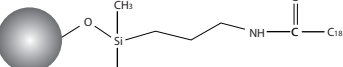
Xtimate® Phenyl-Hexyl

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

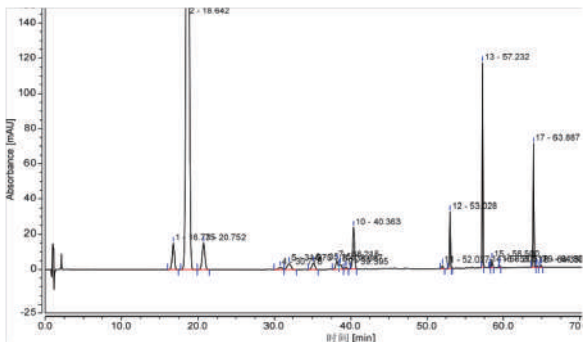
Xtimate® CN

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

Xtimate® Polar-RP

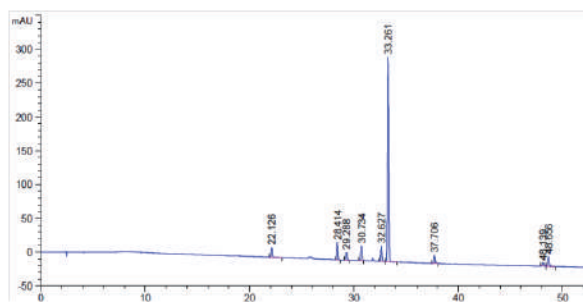
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 1.0-12.5 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 320(120 Å) |
| Carbon Loading(%) | 16(120 Å) |
| USP List | L1 |
| Endcapped | Yes |

Rosuvastatin Calcium



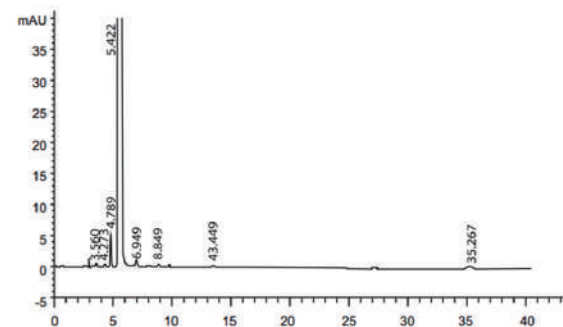
| Column: | Xtimate® C18, 3.0 ×150 mm, 3 μm | | | | | | | | | | | | | | | |
|-------------------|--|-----------|------|------|------|-----|---|-------|--------|------|-------|------|--------|-------|---|-----|
| Mobile Phase: | A: 1% TFA/acetonitrile/water=1/29/70 B: 1% TFA/acetonitrile/water=1/75/24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

Cangrelor



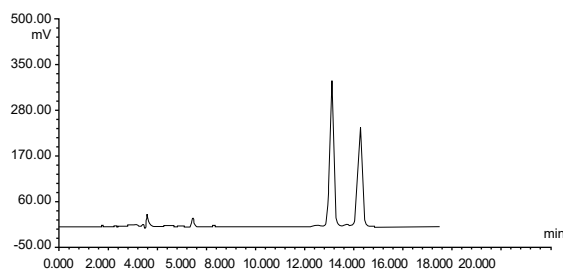
| Column: | Xtimate® C18, 4.6 ×250 mm, 5 μm | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|---|-----------|------|------|---|----|---|---|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|----|----|---|
| Mobile Phase: | Mobile phase A: 0.05 mol/L K ₂ HPO ₄ (pH 8.5) Mobile Phase B: acetonitrile | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Time(min)</th> <th>A(%)</th> <th>B(%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>95</td> <td>5</td> </tr> <tr> <td>3</td> <td>95</td> <td>5</td> </tr> <tr> <td>35</td> <td>67</td> <td>33</td> </tr> <tr> <td>50</td> <td>60</td> <td>40</td> </tr> <tr> <td>60</td> <td>35</td> <td>65</td> </tr> <tr> <td>65</td> <td>35</td> <td>65</td> </tr> <tr> <td>66</td> <td>95</td> <td>5</td> </tr> <tr> <td>75</td> <td>95</td> <td>5</td> </tr> </tbody> </table> | Time(min) | A(%) | B(%) | 0 | 95 | 5 | 3 | 95 | 5 | 35 | 67 | 33 | 50 | 60 | 40 | 60 | 35 | 65 | 65 | 35 | 65 | 66 | 95 | 5 | 75 | 95 | 5 |
| Time(min) | A(%) | B(%) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 95 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 95 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | 67 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | 60 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | 35 | 65 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | 35 | 65 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | 95 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | 95 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flow Rate: | 1.0 mL/min | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature: | 25°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Detector: | 242 nm | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Injection Volume: | 5 μL | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Valaciclovir Hydrochloride



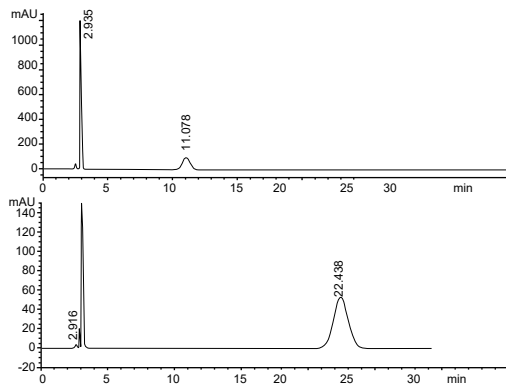
| | |
|-------------------|---|
| Column: | Xtimate® Phenyl-Hexyl, 250 x 4.6 mm, 5 μm |
| Mobile Phase: | Methanol/0.01 mol/L KH ₂ PO ₄ (pH3.0)=15/85 |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 35°C |
| Detector: | 251 nm |
| Injection Volume: | 20 μL |

Omeprazole



| | |
|-------------------|---|
| Column: | Xtimate® C8, 250 x 4.6 mm, 5 μm |
| Mobile Phase: | 10 mmol/L Na ₂ HPO ₄ (pH7.4)/ Acetonitrile=70/30 |
| Flow Rate: | 1.0 mL/min |
| Temperature: | Ambient |
| Detector: | 280 nm |
| Injection Volume: | 20 μL |

Enalapril Maleate



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

Ordering Information

Xtimate® C18

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm | 2.1 | 00101-11009 | 09101-11009 | 00101-11010 | 00101-11011 | 00101-11012 | 00101-11013 | 00101-11014 | 00101-11015 | 00101-11016 | - | 00808-23101 | 00808-01107 |
| | 3.0 | 00101-11018 | - | 00101-11019 | 00101-11020 | 00101-11021 | 00101-11022 | 00101-11023 | 00101-11024 | 00101-11025 | - | 00808-23101 | 00808-01107 |
| | 4.0 | 00101-11027 | - | 00101-11028 | 00101-21029 | 00101-11030 | 00101-11031 | 00101-11032 | 00101-11033 | 00101-11034 | - | 00808-03101 | 00808-01101 |
| | 4.6 | 00101-11036 | 11101-11036 | 00101-11037 | 00101-21038 | 00101-11039 | 00101-11040 | 00101-11041 | 00101-11042 | 00101-11043 | - | 00808-03101 | 00808-01101 |
| 5 µm | 2.1 | 00101-21009 | 09101-21009 | 00101-21010 | 00101-21011 | 00101-21012 | 00101-21013 | 00101-21014 | 00101-21015 | 00101-21016 | - | 00808-24101 | 00808-01107 |
| | 3.0 | 00101-21018 | - | 00101-21019 | 00101-21020 | 00101-21021 | 00101-21022 | 00101-21023 | 00101-21024 | 00101-21025 | - | 00808-24101 | 00808-01107 |
| | 4.0 | 00101-21027 | - | 00101-21028 | 00101-21029 | 00101-21030 | 00101-21031 | 00101-21032 | 00101-21033 | 00101-21034 | 00101-21035 | 00808-04101 | 00808-01101 |
| | 4.6 | 00101-21036 | 11101-21036 | 00101-21037 | 00101-21038 | 00101-21039 | 00101-21040 | 00101-21041 | 00101-21042 | 00101-21043 | 00101-21044 | 00101-21045 | 00808-04101 |
| 10 µm | 4.0 | - | - | - | - | - | - | 00101-31032 | 00101-31033 | 00101-31034 | 00101-31035 | 00808-05101 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | 00101-31041 | 00101-31042 | 00101-31043 | 00101-31044 | 00808-05101 | 00808-01101 |

Xtimate® C8

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm | 2.1 | 00102-11009 | 09102-11009 | 00102-11010 | 00102-11011 | 00102-11012 | 00102-11013 | 00102-11014 | 00102-11015 | 00102-11016 | - | 00808-23102 | 00808-01107 |
| | 3.0 | 00102-11018 | - | 00102-11019 | 00102-11020 | 00102-11021 | 00102-11022 | 00102-11023 | 00102-11024 | 00102-11025 | - | 00808-23102 | 00808-01107 |
| | 4.0 | 00102-11027 | - | 00102-11028 | 00102-21029 | 00102-11030 | 00102-11031 | 00102-11032 | 00102-11033 | 00102-11034 | - | 00808-03102 | 00808-01101 |
| | 4.6 | 00102-11036 | 11102-11036 | 00102-11037 | 00102-21038 | 00102-11039 | 00102-11040 | 00102-11041 | 00102-11042 | 00102-11043 | - | 00808-03102 | 00808-01101 |
| 5 µm | 2.1 | 00102-21009 | 09102-21009 | 00102-21010 | 00102-21011 | 00102-21012 | 00102-21013 | 00102-21014 | 00102-21015 | 00102-21016 | - | 00808-24102 | 00808-01107 |
| | 3.0 | 00102-21018 | - | 00102-21019 | 00102-21020 | 00102-21021 | 00102-21022 | 00102-21023 | 00102-21024 | 00102-21025 | - | 00808-24102 | 00808-01107 |
| | 4.0 | 00102-21027 | - | 00102-21028 | 00102-21029 | 00102-21030 | 00102-21031 | 00102-21032 | 00102-21033 | 00102-21034 | 00102-21035 | 00808-04102 | 00808-01101 |
| | 4.6 | 00102-21036 | 11102-21036 | 00102-21037 | 00102-21038 | 00102-21039 | 00102-21040 | 00102-21041 | 00102-21042 | 00102-21043 | 00102-21044 | 00808-04102 | 00808-01101 |
| 10 µm | 4.0 | - | - | - | - | - | - | 00102-31032 | 00102-31033 | 00102-31034 | 00102-31035 | 00808-05102 | 00808-01101 |
| | 4.6 | - | - | - | - | - | - | 00102-31041 | 00102-31042 | 00102-31043 | 00102-31044 | 00808-05102 | 00808-01101 |

Xtimate® Phenyl-Hexyl

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm | 2.1 | 00104-11009 | 09104-11009 | 00104-11010 | 00104-11011 | 00104-11012 | 00104-11013 | 00104-11014 | 00104-11015 | 00104-11016 | - | 00808-23106 | 00808-01107 |
| | 3.0 | 00104-11018 | - | 00104-11019 | 00104-11020 | 00104-11021 | 00104-11022 | 00104-11023 | 00104-11024 | 00104-11025 | - | 00808-23106 | 00808-01107 |
| | 4.0 | 00104-11027 | - | 00104-11028 | 00104-21029 | 00104-11030 | 00104-11031 | 00104-11032 | 00104-11033 | 00104-11034 | - | 00808-03106 | 00808-01101 |
| | 4.6 | 00104-11036 | 11104-11036 | 00104-11037 | 00104-21038 | 00104-11039 | 00104-11040 | 00104-11041 | 00104-11042 | 00104-11043 | - | 00808-03106 | 00808-01101 |
| 5 µm | 2.1 | 00104-21009 | 09104-21009 | 00104-21010 | 00104-21011 | 00104-21012 | 00104-21013 | 00104-21014 | 00104-21015 | 00104-21016 | - | 00808-24106 | 00808-01107 |
| | 3.0 | 00104-21018 | - | 00104-21019 | 00104-21020 | 00104-21021 | 00104-21022 | 00104-21023 | 00104-21024 | 00104-21025 | - | 00808-24106 | 00808-01107 |
| | 4.0 | 00104-21027 | - | 00104-21028 | 00104-21029 | 00104-21030 | 00104-21031 | 00104-21032 | 00104-21033 | 00104-21034 | 00104-21035 | 00808-04106 | 00808-01101 |
| | 4.6 | 00104-21036 | 11104-21036 | 00104-21037 | 00104-21038 | 00104-21039 | 00104-21040 | 00104-21041 | 00104-21042 | 00104-21043 | 00104-21044 | 00808-04106 | 00808-01101 |

Xtimate® C4

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 3 µm | 2.1 | 00107-11009 | 09107-11009 | 00107-11010 | 00107-11011 | 00107-11012 | 00107-11013 | 00107-11014 | 00107-11015 | 00107-11016 | - | 00808-23103 | 00808-01107 |
| | 3.0 | 00107-11018 | - | 00107-11019 | 00107-11020 | 00107-11021 | 00107-11022 | 00107-11023 | 00107-11024 | 00107-11025 | - | 00808-23103 | 00808-01107 |
| | 4.0 | 00107-11027 | - | 00107-11028 | 00107-21029 | 00107-11030 | 00107-11031 | 00107-11032 | 00107-11033 | 00107-11034 | - | 00808-03103 | 00808-01101 |
| | 4.6 | 00107-11036 | 11107-11036 | 00107-11037 | 00107-21038 | 00107-11039 | 00107-11040 | 00107-11041 | 00107-11042 | 00107-11043 | - | 00808-03103 | 00808-01101 |
| 5 µm | 2.1 | 00107-21009 | 09107-21009 | 00107-21010 | 00107-21011 | 00107-21012 | 00107-21013 | 00107-21014 | 00107-21015 | 00107-21016 | - | 00808-24103 | 00808-01107 |
| | 3.0 | 00107-21018 | - | 00107-21019 | 00107-21020 | 00107-21021 | 00107-21022 | 00107-21023 | 00107-21024 | 00107-21025 | - | 00808-24103 | 00808-01107 |
| | 4.0 | 00107-21027 | - | 00107-21028 | 00107-21029 | 00107-21030 | 00107-21031 | 00107-21032 | 00107-21033 | 00107-21034 | 00107-21035 | 00808-04103 | 00808-01101 |
| | 4.6 | 00107-21036 | 11107-21036 | 00107-21037 | 00107-21038 | 00107-21039 | 00107-21040 | 00107-21041 | 00107-21042 | 00107-21043 | 00107-21044 | 00808-04103 | 00808-01101 |

Xtimate® CN

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 µm | 2.1 | 00105-21009 | 09105-21009 | 00105-21010 | 00105-21011 | 00105-21012 | 00105-21013 | 00105-21014 | 00105-21015 | 00105-21016 | - | 00808-24105 | 00808-01107 |
| | 3.0 | 00105-21018 | - | 00105-21019 | 00105-21020 | 00105-21021 | 00105-21022 | 00105-21023 | 00105-21024 | 00105-21025 | - | 00808-24105 | 00808-01107 |
| | 4.0 | 00105-21027 | - | 00105-21028 | 00105-21029 | 00105-21030 | 00105-21031 | 00105-21032 | 00105-21033 | 00105-21034 | 00105-21035 | 00808-04105 | 00808-01101 |
| | 4.6 | 00105-21036 | 11105-21036 | 00105-21037 | 00105-21038 | 00105-21039 | 00105-21040 | 00105-21041 | 00105-21042 | 00105-21043 | 00105-21044 | 00808-04105 | 00808-01101 |

Xtimate® Polar-RP

| Particle size | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|---------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 33 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| 5 µm | 2.1 | 00118-21009 | 09118-21009 | 00118-21010 | 00118-21011 | 00118-21012 | 00118-21013 | 00118-21014 | 00118-21015 | 00118-21016 | - | 00808-24111 | 00808-01107 |
| | 3.0 | 00118-21018 | - | 00118-21019 | 00118-21020 | 00118-21021 | 00118-21022 | 00118-21023 | 00118-21024 | 00118-21025 | - | 00808-24111 | 00808-01107 |
| | 4.0 | 00118-21027 | - | 00118-21028 | 00118-21029 | 00118-21030 | 00118-21031 | 00118-21032 | 00118-21033 | 00118-21034 | 00118-21035 | 00808-04152 | 00808-01101 |
| | 4.6 | 00118-21036 | 11118-21036 | 00118-21037 | 00118-21038 | 00118-21039 | 00118-21040 | 00118-21041 | 00118-21042 | 00118-21043 | 00118-21044 | 00808-04152 | 00808-01101 |

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

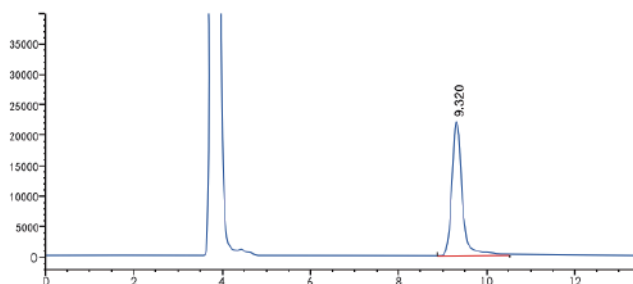


Xtimate® Lactose-NH₂ Column

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

Xtimate® Lactose-NH₂

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



| | |
|-------------------|---|
| Column: | Xtimate® Lactose-NH ₂ , 4.6×250mm, 5μm |
| Mobile Phase: | Acetonitrile/water=70/30 |
| Flow Rate: | 1 mL/min |
| Detector: | RID (45°C) |
| Temperature: | 40°C |
| Injection Volume: | 10 μL |

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

Ordering Information

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

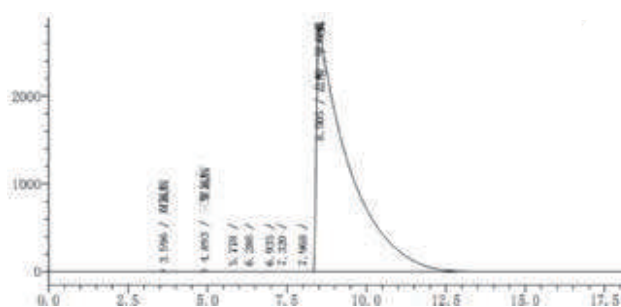
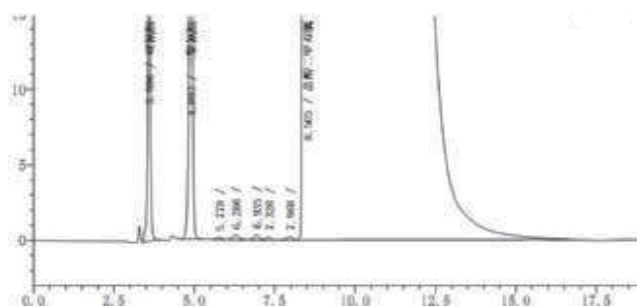
Xtimate® XB-SCX

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

Xtimate® XB-SCX

| | |
|---------------------------------|------------|
| pH Range | 2.0-8.0 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 300(120 Å) |
| Carbon Loading(%) | 2(120 Å) |
| USP List | L9 |
| Endcapped | No |

Determination of content of metformin hydrochloride



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

Ordering Information

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

Xtimate® Polymer Based Column

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

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

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

Xtimate® Sugar-H

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

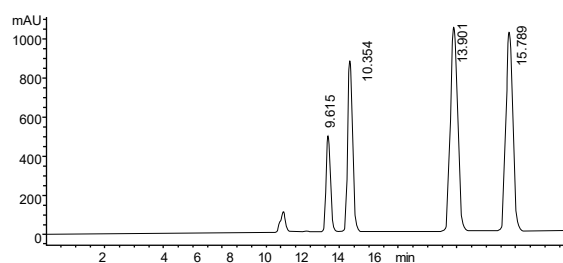
Xtimate® Sugar-Ca

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

Xtimate® PS/DVB

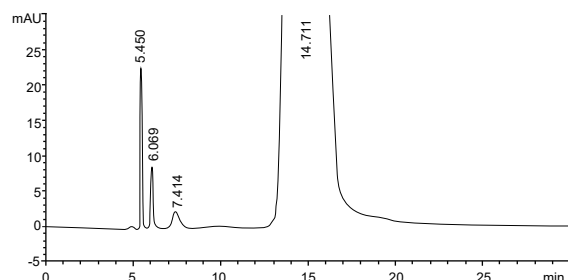
| | |
|---------------------------------|-------------|
| pH Range | 1.0-14.0 |
| Particle Size | 5 µm, 10 µm |
| Surface Area(m ² /g) | 450(300 Å) |
| USP List | L21 |
| Max. Temp. | 75°C |

Separation of Organic Acids



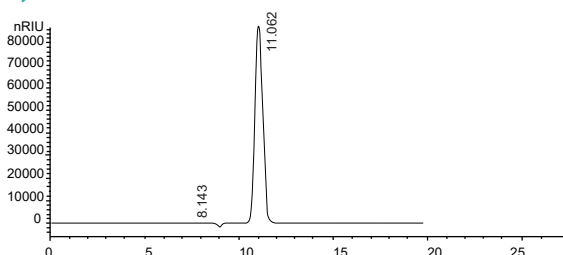
| | |
|-------------------|--|
| Column: | Xtimate® Sugar-H, 5 µm, 300 x 7.8 mm |
| Mobile Phase: | H ₂ SO ₄ water solution (pH 2.0) |
| Flow Rate: | 0.5 mL/min |
| Temperature: | 60°C |
| Detector: | RID |
| Injection Volume: | 20 µL |
| Organic Acids: | Maleic acid, L-malic acid, fumaric acid, sodium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

Ketophenylalanine Calcium



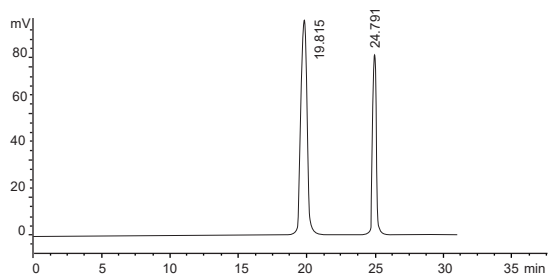
| | |
|-------------------|---|
| Column: | Xtimate® Sugar-H, 5 µm, 300 x 7.8 mm |
| Mobile Phase: | 0.025 mol/L H ₂ SO ₄ water solution |
| Flow Rate: | 0.8 mL/min |
| Temperature: | 20°C |
| Detector: | 205 nm |
| Injection Volume: | 20 µL |

Xylose



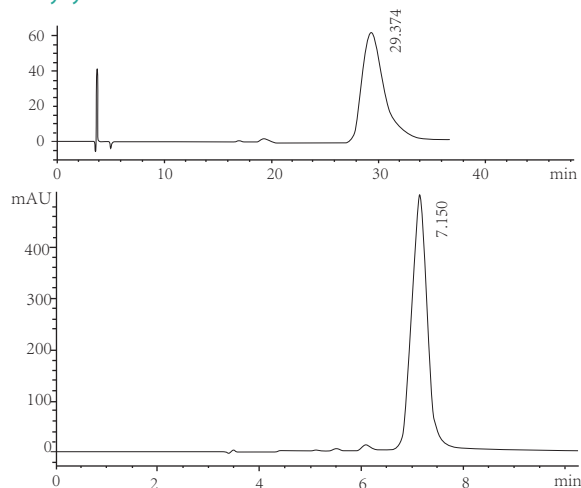
| | |
|-------------------|---------------------------------------|
| Column: | Xtimate® Sugar-Ca, 5 µm, 300 x 7.8 mm |
| Mobile Phase: | Ultra-pure water |
| Flow Rate: | 0.6 mL/min |
| Temperature: | 85°C |
| Detector: | RID 55°C |
| Injection Volume: | 20 µL |

Mannitol



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

Doxycycline HCl



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

Ordering Information

Xtimate® PS/DVB

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

Xtimate® Sugar-H

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

Xtimate® Sugar-Ca

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

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

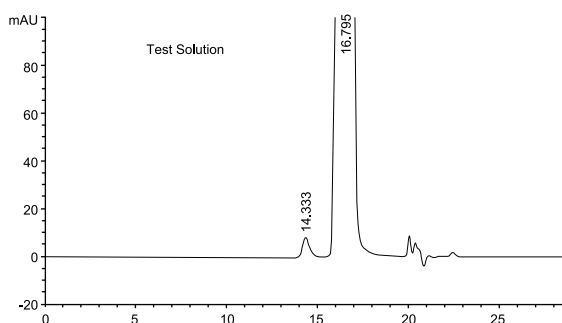
Xtimate® SEC

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

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

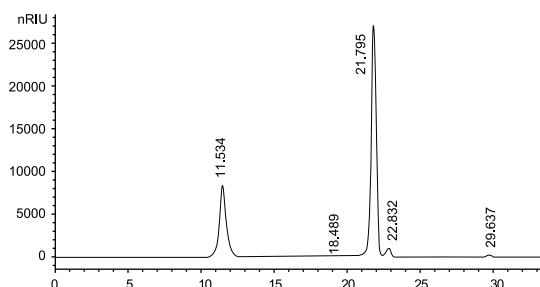
| Phase | Xtimate® SEC-120 | Xtimate® SEC-300 | Xtimate® SEC-500 | Xtimate® SEC-700 | Xtimate® SEC-1000 |
|-------------------------------------|--|--|--|--|--|
| Materials | Silica particles bonding hydrophilic polymer | Silica particles bonding hydrophilic polymer | Silica particles bonding hydrophilic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

Sex Hormone in Cosmetics



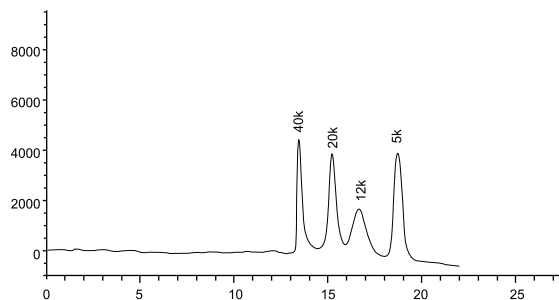
| | |
|-------------------|--|
| Column: | Xtimate® SEC-120, 3 µm, 300 x 7.8 mm |
| Mobile Phase: | Acetic acid/acetonitrile/ 0.1%arginine=15/20/65 |
| Flow Rate: | 0.5 mL/min |
| Temperature: | 35°C |
| Detector: | 276 nm |
| Injection Volume: | 100 µL |

Iron Dextran



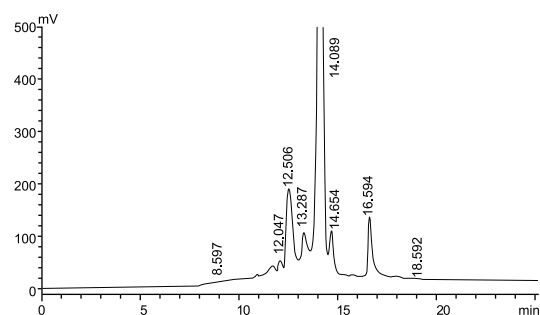
| | |
|-------------------|---|
| Column: | Xtimate® SEC-300, 5 µm, 300 x 7.8 mm |
| Mobile Phase: | Dissolve 7.1g Na ₂ SO ₄ to 1000 mL water, filter |
| Flow Rate: | 0.5 mL/min |
| Temperature: | Ambient |
| Detector: | RID |
| Injection Volume: | 20 µL |

Analysis of Molecular Weight of Polyethylene Glycol



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

Cefoxitin Sodium



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

Ordering Information

Xtimate® SEC

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

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

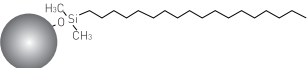
Topsil® Series HPLC Column

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

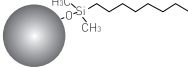
Features:

- High purity silica (99.99%) with 150 Å pore size and 260 m²/g surface area
- 12% carbon loading for C18 phase
- Because of large pore and moderate carbon loading, Topsil® C18 phase can also be used as AQ-C18 without phase collapse
- Endcapped for excellent peak shape and lifetime
- Lower back pressure than Ultisil®, almost the same column efficiency as Ultisil®
- Good for small molecules and peptides
- Topsil phases including C18, C8, Phenyl-Hexyl, Silica, NH₂ and CN

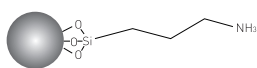
Topsil® C18

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

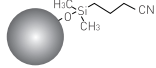
Topsil® C8

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


Topsil® NH₂

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

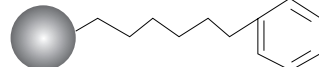
Topsil® CN

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

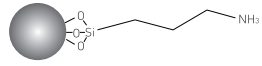
Topsil® Silica

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

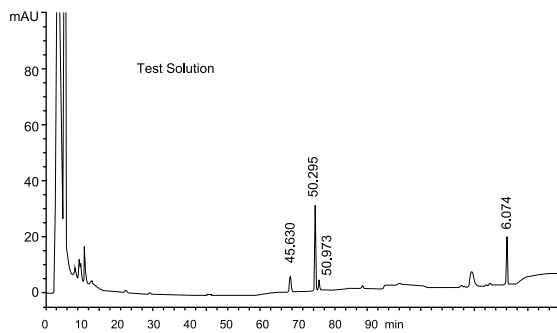
Topsil® Phenyl-Hexyl

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

Topsil® HILIC NH₂

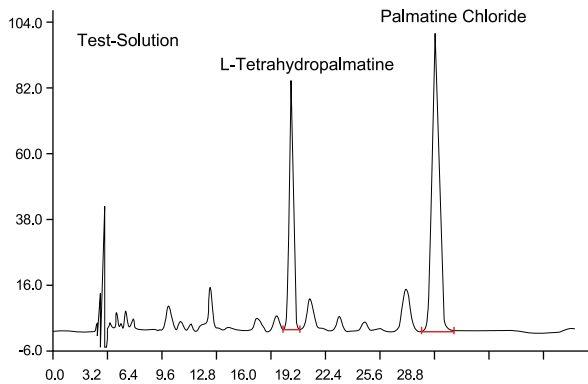
| | |
|---------------------------------|---|
| Structural Formula |  |
| pH Range | 2.0-8.0 |
| Particle Size | 5 µm |
| Surface Area(m ² /g) | 260(150 Å) |
| Carbon Loading(%) | 3(150 Å) |
| USP List | L8 |
| Endcapped | No |

Compound Salvia Tablets



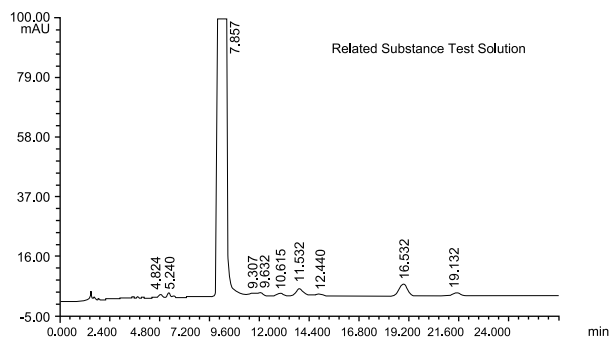
| | |
|-------------------|-------------------------------|
| Column: | Topsil® C18, 250x4.6 mm, 5 µm |
| Mobile Phase: | A: acetonitrile B: water |
| Gradient Program: | Time(min) A(%) B(%) |
| | 0 19 81 |
| | 35 19 81 |
| | 55 71 29 |
| | 70 71 29 |
| 100 40 60 | |
| Flow Rate: | 1.0 mL/min |
| Temperature: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

Epigeal Srephaia Root



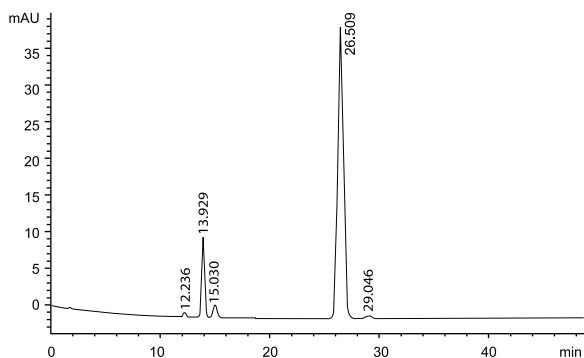
| | |
|-------------------|--|
| Column: | Topsil® C18, 250x4.6 mm, 5 µm |
| Mobile Phase: | 25 mM sodium acetate buffer(2% trimethylamine, adjust pH to 3.50 with acetic acid) |
| Flow Rate: | 1.5 mL/min |
| Temperature: | 40°C |
| Detector: | 280 nm |
| Injection Volume: | 20 µL |

Ketoprofen



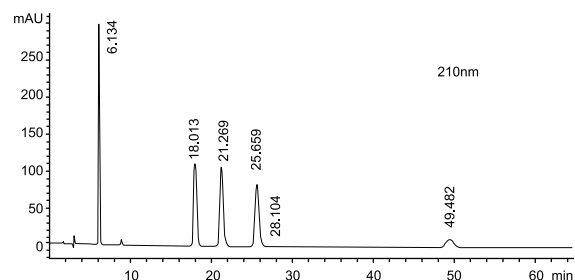
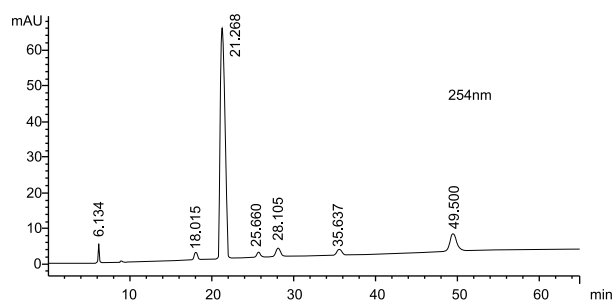
| | |
|-------------------|---|
| Column: | Topsil® C18, 150x4.6 mm, 5 µm |
| Mobile Phase: | Phosphate buffer (68g KH ₂ PO ₄ dissolve in 1000 mL water, adjust pH to 3.5 with H ₃ PO ₄) |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 30°C |
| Detector: | 233 nm |
| Injection Volume: | 20 µL |

Vitamin D3



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

Sex hormone in Cosmetics



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

Ordering Information

3 µm Topsil analytical columns

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

5 µm Topsil analytical columns

| Bonded phase | Column ID (mm) | Column Length (mm) | | | | | | | | | Guard Cartridge | Cartridge holder |
|-----------------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | | |
| C18 | 2.1 | 00410-01009 | 00410-01010 | 00410-01011 | 00410-01012 | 00410-01013 | 00410-01014 | 00410-01015 | 00410-01016 | | 00808-24301 | 00808-01107 |
| | 3.0 | 00410-01018 | 00410-01019 | 00410-01020 | 00410-01021 | 00410-01022 | 00410-01023 | 00410-01024 | 00410-01025 | - | 00808-24301 | 00808-01107 |
| | 4.0 | 00410-01027 | 00410-01028 | 00410-01029 | 00410-01030 | 00410-01031 | 00410-01032 | 00410-01033 | 00410-01034 | 00410-01035 | 00808-04301 | 00808-01101 |
| | 4.6 | 00410-01036 | 00410-01037 | 00410-01038 | 00410-01039 | 00410-01040 | 00410-01041 | 00410-01042 | 00410-01043 | 00410-01044 | 00808-04301 | 00808-01101 |
| C8 | 2.1 | 00420-01009 | 00420-01010 | 00420-01011 | 00420-01012 | 00420-01013 | 00420-01014 | 00420-01015 | 00420-01016 | - | 00808-24302 | 00808-01107 |
| | 3.0 | 00420-01018 | 00420-01019 | 00420-01020 | 00420-01021 | 00420-01022 | 00420-01023 | 00420-01024 | 00420-01025 | - | 00808-24302 | 00808-01107 |
| | 4.0 | 00420-01027 | 00420-01028 | 00420-01029 | 00420-01030 | 00420-01031 | 00420-01032 | 00420-01033 | 00420-01034 | 00420-01035 | 00808-04302 | 00808-01101 |
| | 4.6 | 00420-01036 | 00420-01037 | 00420-01038 | 00420-01039 | 00420-01040 | 00420-01041 | 00420-01042 | 00420-01043 | 00420-01044 | 00808-04302 | 00808-01101 |
| Phenyl-Hexyl | 2.1 | 00460-01009 | 00460-01010 | 00460-01011 | 00460-01012 | 00460-01013 | 00460-01014 | 00460-01015 | 00460-01016 | - | 00808-24305 | 00808-01107 |
| | 3.0 | 00460-01018 | 00460-01019 | 00460-01020 | 00460-01021 | 00460-01022 | 00460-01023 | 00460-01024 | 00460-01025 | - | 00808-24305 | 00808-01107 |
| | 4.0 | 00460-01027 | 00460-01028 | 00460-01029 | 00460-01030 | 00460-01031 | 00460-01032 | 00460-01033 | 00460-01034 | 00460-01035 | 00808-04305 | 00808-01101 |
| | 4.6 | 00460-01036 | 00460-01037 | 00460-01038 | 00460-01039 | 00460-01040 | 00460-01041 | 00460-01042 | 00460-01043 | 00460-01044 | 00808-04305 | 00808-01101 |
| CN | 2.1 | 00440-01009 | 00440-01010 | 00440-01011 | 00440-01012 | 00440-01013 | 00440-01014 | 00440-01015 | 00440-01016 | - | 00808-24304 | 00808-01107 |
| | 3.0 | 00440-01018 | 00440-01019 | 00440-01020 | 00440-01021 | 00440-01022 | 00440-01023 | 00440-01024 | 00440-01025 | - | 00808-24304 | 00808-01107 |
| | 4.0 | 00440-01027 | 00440-01028 | 00440-01029 | 00440-01030 | 00440-01031 | 00440-01032 | 00440-01033 | 00440-01034 | 00440-01035 | 00808-04304 | 00808-01101 |
| | 4.6 | 00440-01036 | 00440-01037 | 00440-01038 | 00440-01039 | 00440-01040 | 00440-01041 | 00440-01042 | 00440-01043 | 00440-01044 | 00808-04304 | 00808-01101 |
| NH ₂ | 2.1 | 00430-01009 | 00430-01010 | 00430-01011 | 00430-01012 | 00430-01013 | 00430-01014 | 00430-01015 | 00430-01016 | - | 00808-24303 | 00808-01107 |
| | 3.0 | 00430-01018 | 00430-01019 | 00430-01020 | 00430-01021 | 00430-01022 | 00430-01023 | 00430-01024 | 00430-01025 | - | 00808-24303 | 00808-01107 |
| | 4.0 | 00430-01027 | 00430-01028 | 00430-01029 | 00430-01030 | 00430-01031 | 00430-01032 | 00430-01033 | 00430-01034 | 00430-01035 | 00808-04303 | 00808-01101 |
| | 4.6 | 00430-01036 | 00430-01037 | 00430-01038 | 00430-01039 | 00430-01040 | 00430-01041 | 00430-01042 | 00430-01043 | 00430-01044 | 00808-04303 | 00808-01101 |
| Silica | 2.1 | 00450-01009 | 00450-01010 | 00450-01011 | 00450-01012 | 00450-01013 | 00450-01014 | 00450-01015 | 00450-01016 | - | 00808-24306 | 00808-01107 |
| | 3.0 | 00450-01018 | 00450-01019 | 00450-01020 | 00450-01021 | 00450-01022 | 00450-01023 | 00450-01024 | 00450-01025 | - | 00808-24306 | 00808-01107 |
| | 4.0 | 00450-01027 | 00450-01028 | 00450-01029 | 00450-01030 | 00450-01031 | 00450-01032 | 00450-01033 | 00450-01034 | 00450-01035 | 00808-04306 | 00808-01101 |
| | 4.6 | 00450-01036 | 00450-01037 | 00450-01038 | 00450-01039 | 00450-01040 | 00450-01041 | 00450-01042 | 00450-01043 | 00450-01044 | 00808-04306 | 00808-01101 |
| HILIC NH ₂ | 2.1 | 00431-01009 | 00431-01010 | 00431-01011 | 00431-01012 | 00431-01013 | 00431-01014 | 00431-01015 | 00431-01016 | - | 00808-24307 | 00808-01107 |
| | 3.0 | 00431-01018 | 00431-01019 | 00431-01020 | 00431-01021 | 00431-01022 | 00431-01023 | 00431-01024 | 00431-01025 | - | 00808-24307 | 00808-01107 |
| | 4.0 | 00431-01027 | 00431-01028 | 00431-01029 | 00431-01030 | 00431-01031 | 00431-01032 | 00431-01033 | 00431-01034 | 00431-01035 | 00808-04307 | 00808-01101 |
| | 4.6 | 00431-01036 | 00431-01037 | 00431-01038 | 00431-01039 | 00431-01040 | 00431-01041 | 00431-01042 | 00431-01043 | 00431-01044 | 00808-04307 | 00808-01101 |

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

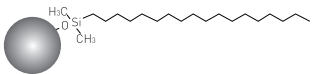


Welchrom® Seires HPLC Column

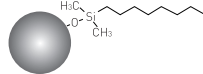
-- Combination of perfect peak shape and lowest back pressure

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

Welchrom® C18

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

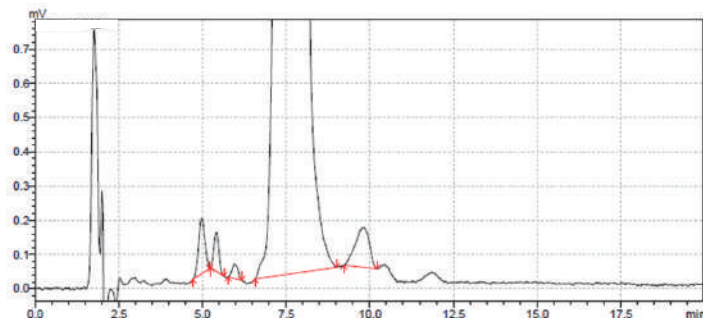
Welchrom® C8

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

Comparison with other brands

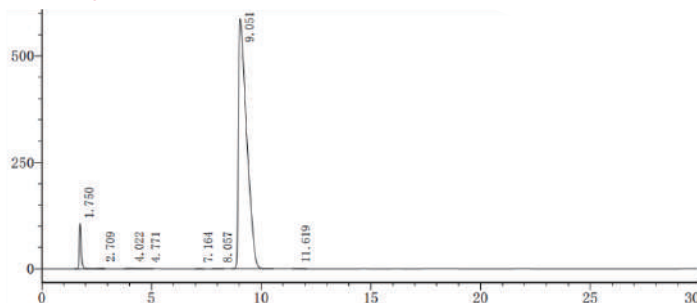
| Brands | Tailing factor(amitriptyline) | Back pressure(Methanol/H ₂ O)=75/25 |
|------------------|--------------------------------|--|
| Welchrom® XB-C18 | 1.29 | 77 bar |
| Chrom C18 | 1.52 | 108 bar |
| Sino Chrom C18 | 1.71 | 106 bar |
| BinChrom C18 | 1.67 | 102 bar |

Butenafine HCL



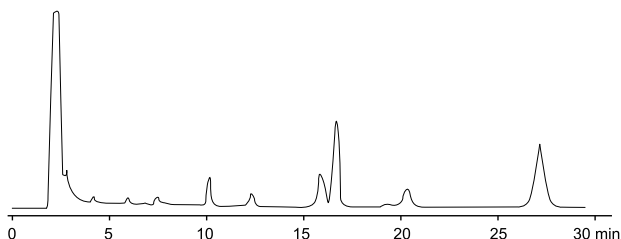
| | |
|-------------------|--|
| Column: | Welchrom® C18, 4.6x250 mm, 5 µm |
| Mobile Phase: | Acetate buffer/methanol/ isopropanol=17/70/13 |
| Flow Rate: | 1.0 mL/min |
| Temperature: | Ambient |
| Detector: | 282 nm |
| Injection Volume: | 10 µL |

Pentoxiverine citrate



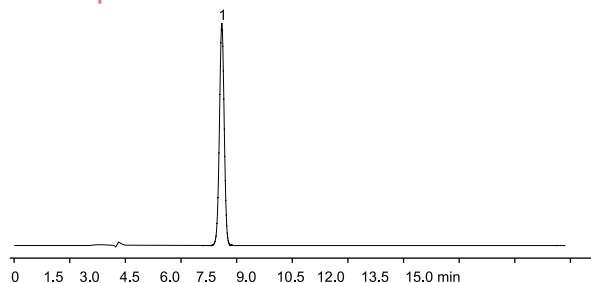
| | |
|-------------------|---|
| Column: | Welchrom® C18, 4.6x150 mm, 5 µm |
| Mobile Phase: | Water*/methanol=45/55 * Dilute 10 mL triethylamine to 1000 mL, adjust pH 3.0 with H ₃ PO ₄ |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 30°C |
| Detector: | 215 nm |
| Injection Volume: | 20 µL |

Tanshinone IIA in Salvia Miltiorrhiza



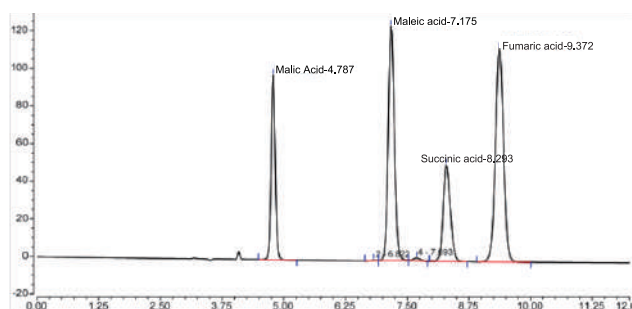
| | |
|----------------------|---------------------------------|
| Column: | Welchrom® C18, 4.6x250 mm, 5 µm |
| Mobile Phase: | Methanol/water=75/25 |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 22°C |
| Detector: | 270 nm |

Imidacloprid



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

Malic acid



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

Ordering Information

5 µm Welchrom Analytical Column

| Bonded phase | Column ID (mm) | Column Length (mm) | | | | | | | | | | Guard Cartridge | Cartridge holder |
|--------------|----------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------|------------------|
| | | 30 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 | 10mm length | | |
| C18 | 2.1 | 00310-02009 | 00310-02010 | 00310-02011 | 00310-02012 | 00310-02013 | 00310-02014 | 00310-02015 | 00310-02016 | - | 00808-24201 | 00808-01107 | |
| | 3.0 | 00310-02018 | 00310-02019 | 00310-02020 | 00310-02021 | 00310-02022 | 00310-02023 | 00310-02024 | 00310-02025 | - | 00808-24201 | 00808-01107 | |
| | 4.0 | 00310-02027 | 00310-02028 | 00310-02029 | 00310-02030 | 00310-02031 | 00310-02032 | 00310-02033 | 00310-02034 | 00310-02035 | 00808-04201 | 00808-01101 | |
| | 4.6 | 00310-02036 | 00310-02037 | 00310-02038 | 00310-02039 | 00310-02040 | 00310-02041 | 00310-02042 | 00310-02043 | 00310-02044 | 00808-04210 | 00808-01101 | |
| C8 | 2.1 | 00320-02009 | 00320-02010 | 00320-02011 | 00320-02012 | 00320-02013 | 00320-02014 | 00320-02015 | 00320-02016 | - | 00808-24202 | 00808-01107 | |
| | 3.0 | 00320-02018 | 00320-02019 | 00320-02020 | 00320-02021 | 00320-02022 | 00320-02023 | 00320-02024 | 00320-02025 | - | 00808-24202 | 00808-01107 | |
| | 4.0 | 00320-02027 | 00320-02028 | 00320-02029 | 00320-02030 | 00320-02031 | 00320-02032 | 00320-02033 | 00320-02034 | 00320-02035 | 00808-04202 | 00808-01101 | |
| | 4.6 | 00320-02036 | 00320-02037 | 00320-02038 | 00320-02039 | 00320-02040 | 00320-02041 | 00320-02042 | 00320-02043 | 00320-02044 | 00808-04202 | 00808-01101 | |

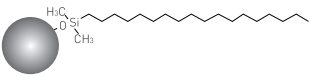
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

UHPLC Column

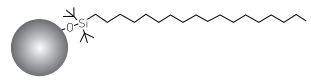
Welch also offers Ultisil® UHPLC (1.8 µm) columns. With high column efficiency and good lot-to-lot reproducibility, Ultisil® UHPLC can generate high quality data, decreasing the probability of repeated sample analyses while reducing the consumption of solvent at the same time. Ultisil® UHPLC series offer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

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

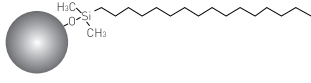
Ultisil® UHPLC XB-C18

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

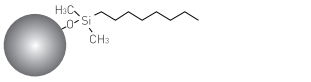
Ultisil® UHPLC LP-C18

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

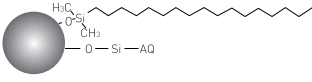
Xtimate® UHPLC C18

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

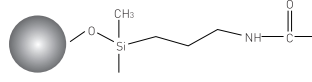
Ultisil® UHPLC XB-C8

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

Ultisil® UHPLC AQ-C18

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

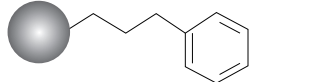
Ultisil® UHPLC Polar-RP

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

Ultisil® UHPLC HILIC

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

Ultisil® UHPLC XB-Phenyl

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



Ordering Information

1.8 µm UHPLC column

| Bonded phase | Column ID (mm) | Column Length (mm) | | | | | Guard Cartridge | Guard Column |
|-------------------|----------------|--------------------|--------------|--------------|--------------|--------------|-----------------|--------------|
| | | 30 | 50 | 75 | 100 | 150 | | |
| Ultisil XB-C18 | 2.1 | H00201-11009 | H00201-11010 | H00201-11011 | H00201-11012 | H00201-11014 | HU808-201-25 | 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 |

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

Inline Filter for UHPLC

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

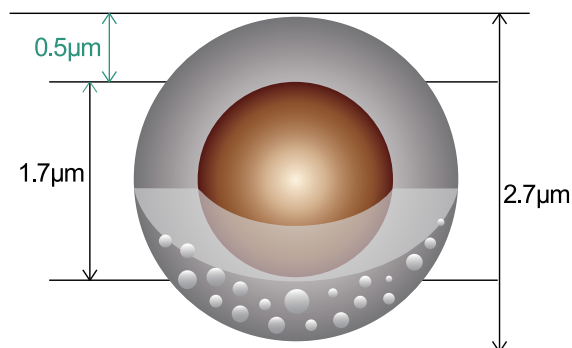
Boltimate® Core-Shell HPLC Column

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

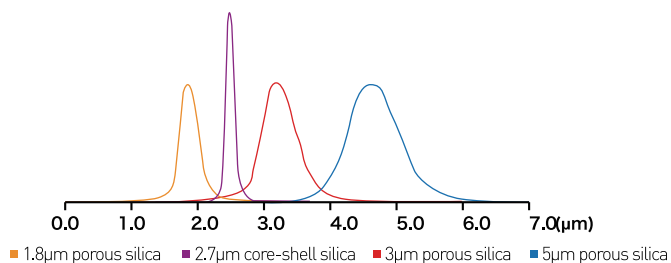
This kind of column can provide sub-2 µm efficiencies (~200000 p/m) and high resolution at much lower back pressure. Boltimate core-shell column can be used on both HPLC and UHPLC system, and method optimization is also very easy.

Features

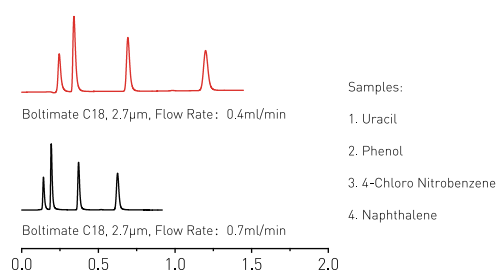
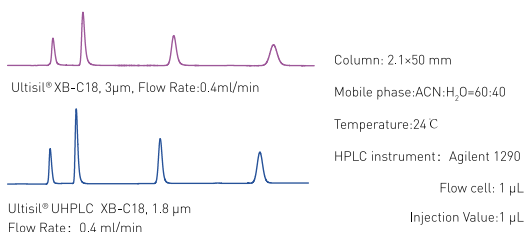
- Provide sub-2 µm efficiencies (~200000 p/m) and ultra-high resolution at much lower back pressure
- Ultra fast separation
- Compatible with both HPLC and UHPLC system
- Narrow particle size distribution
- A standard 2 µm inlet frit is used to resist plugging with dirty samples, suitable for complex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



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



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



| Column | Theoretical plates | Column Pressure [bar] | Time |
|--|--------------------|-----------------------|---------|
| Ultisil® XB-C18, 3 µm, 2.1x50 mm | 5600 | 85 | 2.0 min |
| Ultisil® UHPLC XB-C18, 1.8 µm, 2.1x50 mm | 10500 | 260 | 1.8 min |
| Boltimate® C18, 2.7 µm, 2.1x50 mm | 10100 | 108 | 1.5 min |
| Boltimate® C18, 2.7 µm, 2.1x50 mm | 9500 | 190 | 0.8 min |

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

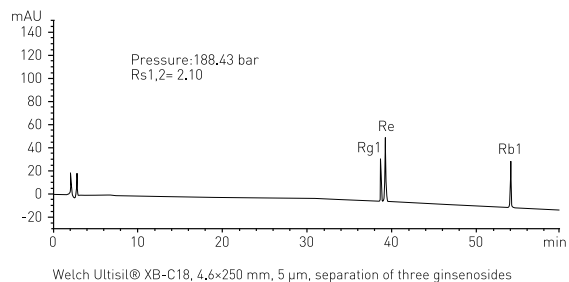
Detection of Ginsenosides:

Chromatographic conditions:

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

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

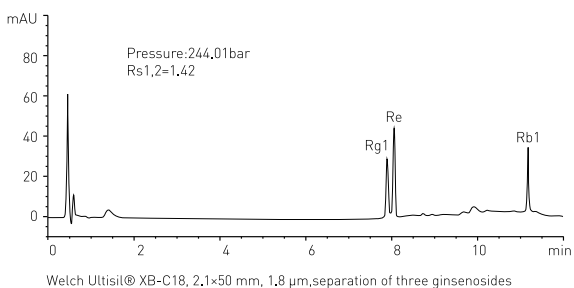
Flow Rate: 1.3 mL/min Injection Volume: 10 µL



Gradient program:

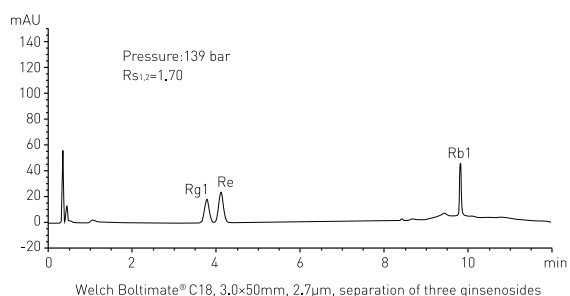
| Time(min) | Mobile Phase A (%) | Mobile Phase B (%) |
|-----------|--------------------|--------------------|
| 0 | 81 | 19 |
| 30 | 81 | 19 |
| 35 | 76 | 24 |
| 60 | 60 | 40 |
| 60.1 | 0 | 100 |
| 70 | 0 | 100 |
| 70.1 | 81 | 19 |
| 78 | 81 | 19 |

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



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

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



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

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

Welch provides a variety of bonding phases

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

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



Ordering Information

2.7 μm , 90 \AA , Boltimate Core-shell Column

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

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 Filter, SS, 0.5 μm stainless steel frit, 15000 psi |
|  | 00808-01222 | Direct Connect Precolumn inline Filter, with 0.2 μm Replacement Frits \times 5, 18000 psi |
| | 00808-UF020 | Replaceable frits (0.2 μm) |

Blossmate® Seires HPLC Column

Blossmate® PSV C18 Column

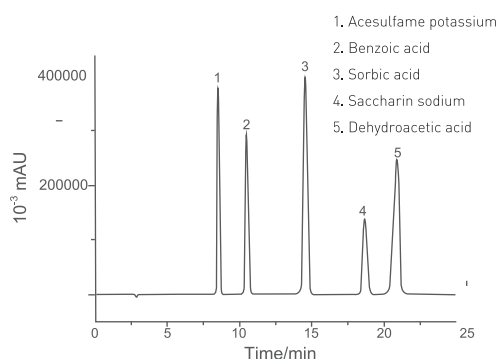
Blossmate® PSV C18 is a newly developed HPLC column which can be compatible with high proportion of aqueous phase. Taking super high purity spherical silica as matrix, it bonded high-density alkyl functional groups. Its packing materials have high selectivity and strong retention ability for hydrophilic 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.

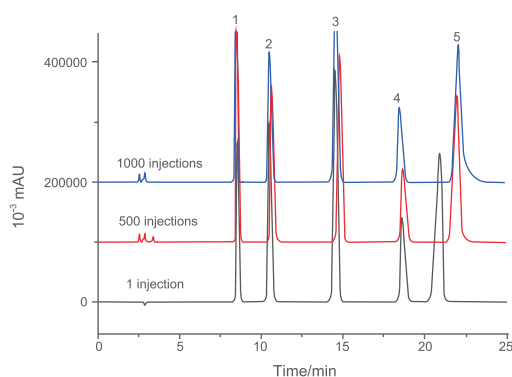
| | |
|--------------------------------------|-----------------|
| Bonded phase | Octadecyl group |
| pH Range | 2-8 |
| Particle Size | 5 μm |
| Surface Area(m²/g) | 300(120 Å) |
| Carbon Loading(%) | 12(120 Å) |
| USP List | L1 |
| Endcapped | Yes |

Five food additives

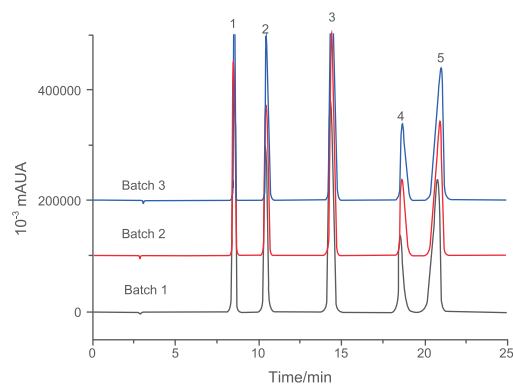


| | |
|--------------------------|---|
| Column: | Blossmate® PSV C18 4.6×250 mm, 5 μm |
| Mobile Phase: | 20 mM ammonium acetate solution: methanol=93: 7(on-line blending) |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 30°C |
| Detector: | 230nm |
| Injection Volume: | 5 μL |

High stability, longer lifetime



Excellent batch-to-batch stability



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

Ordering Information

Blossmate® PSV C18 Column

| P/N | Particle size | Specification |
|-------------|---------------|---------------|
| 00605-21043 | 5 µm | 4,6×250 mm |
| 00605-21041 | 5 µm | 4,6×150 mm |

Blossmate® SAX Column

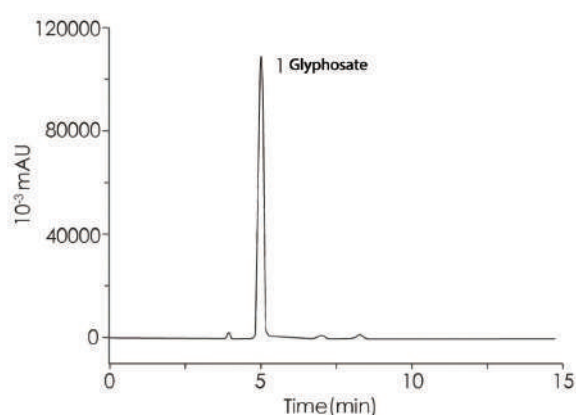
Blossmate®SAX column can be used under the condition of high flow rate and high pressure. It is compatible with ionic strength change of various mobile phase to achieve fast equilibrium and suitable for the separation and purification of polar small molecules and other biological macromolecules compounds,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

Features:

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

| | |
|--------------------------------------|--------------------------------------|
| Bonded phase | Quaternary ammonium functional group |
| pH Range | 2-8 |
| Particle Size | 5 µm |
| Surface Area(m²/g) | 300(120 Å) |
| Carbon Loading(%) | 6.5(120 Å) |
| USP List | L14 |
| Endcapped | No |

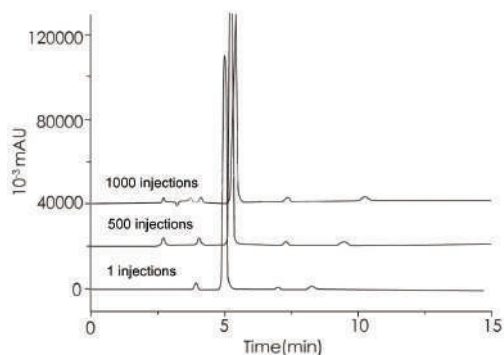
Glyphosate



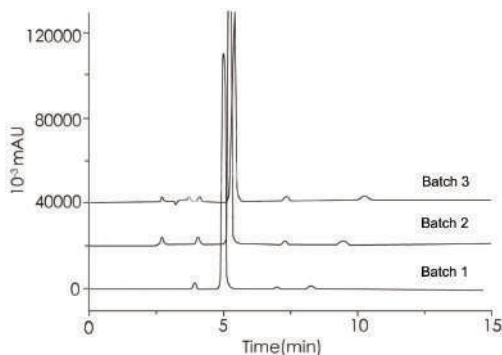
| | |
|--------------------------|--|
| Column: | Blossmate®SAX, 4.6×250mm, 5µm |
| Mobile Phase: | 100mM KH ₂ PO ₄ :CH ₃ OH=85: 15 (adjust pH to 2) |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 25°C |
| Detector: | 195nm |
| Injection Volume: | 20 µL |

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

High stability, longer lifetime



Excellent batch-to-batch stability



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

Ordering Information Blossmate® SAX Column

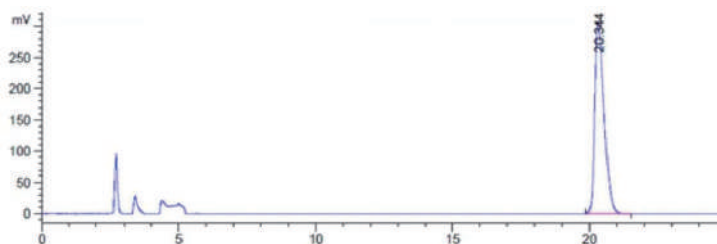
| P/N | Particle size | Specification |
|-------------|---------------|---------------|
| 00606-21041 | 5 µm | 4.6×150 mm |
| 00606-21043 | 5 µm | 4.6×250mm |

Blossmate® Polar-Propylamide Column

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

| | |
|--------------------------------------|--------------------------|
| Bonded phase | Polar propyl amide group |
| pH Range | 2-8 |
| Particle Size | 5 µm |
| Surface Area(m²/g) | 300(120 Å) |
| Carbon Loading(%) | 7(120 Å) |
| USP List | L68 |
| Endcapped | N/A |

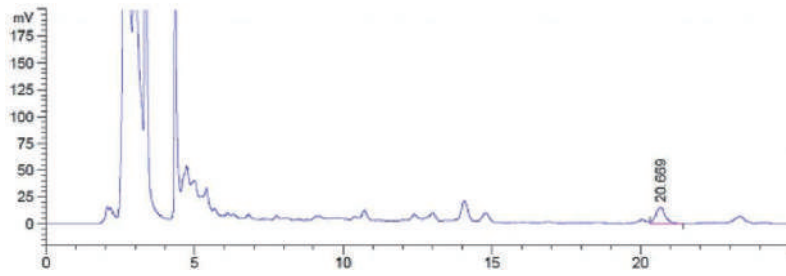
Systematic adaptability



| Rt | Symmetry factor | Plates |
|--------|-----------------|--------|
| 20.344 | 0.71 | 16867 |

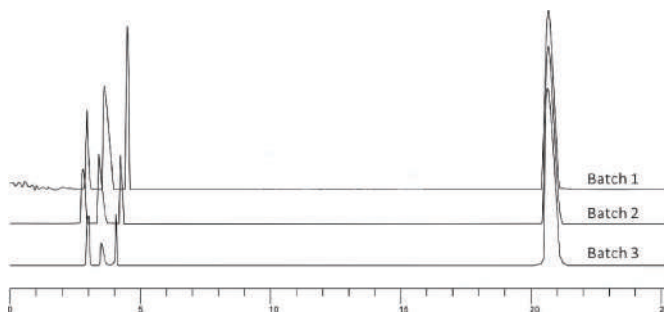
| | |
|--------------------------|--|
| Column: | Blossmate® Polar-Propylamide, 4.6×250mm, 5µm |
| Mobile Phase: | Acetonitrile: 0.2% glacial acetic acid = 80:20 (V/V) |
| Flow Rate: | 1.0 mL/min |
| Temperature: | 30°C |
| Detector: | ELSD |
| Injection Volume: | 10 µL |

Sample



| Rt | Symmetry factor | Plates |
|--------|-----------------|--------|
| 20.669 | 0.89 | 22579 |

Batch to batch stability



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

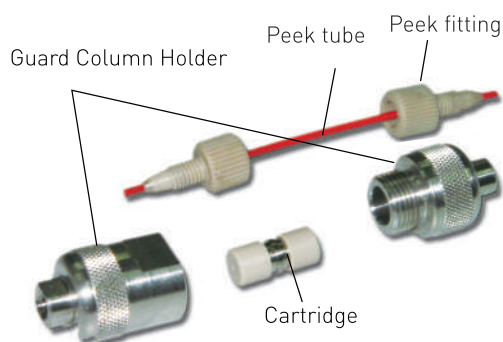
Ordering Information

Blossmate® Polar-Propylamide Column

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

Guard Column and Pre-Column Inline Filter

| Guard column | Pre-column Inline Filter |
|--|---|
| <ul style="list-style-type: none"> • Between injector and analytical column • All have column holders • All have frit to retain solid particles | |
| Packing materials inside a Guard Column cartridge. | Filter inside a Pre-column. |
| Remove strongly adsorbed sample components | Trap particulate matter from the fluid path, but does not remove sample components or contaminants. |
| Internal diameters should match as closely as possible and packing material should be of the same particle size and chemistry as the analytical column | i) Can be used with other brands of columns ii) Designed to be wholly disposable or has replaceable filters in a re-useable holder |






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

| P/N | Description | Piece |
|--------------|---|-------|
| 00808-01101 | Stand Alone Analytical Guard Holder (φ: 4.6mm, 7000psi) | 1 |
| H00808-04001 | Ultisil® XB-C18, Cartridge: 5µm, 120Å, 4.6x10mm | 2 |
| 00808-01301 | 1/16" Peek Tube, 7cm Length | 1 |
| 00808-01303 | PEEK Fitting, for 1/16" OD tubing | 2 |

Pre-Column Inline Filter

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

Guard Column Holder

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

Guard Column Cartridges

| Xtimate Guard Column Cartridges | | | | | |
|---------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|
| Specification | 3 μm, 2.1×10 mm [Cartridges] | 5 μm, 2.1×10 mm [Cartridges] | 3 μm, 4.6×10 mm [Cartridges] | 5 μm, 4.6×10 mm [Cartridges] | 10 μm, 4.6×10 mm [Cartridges] |
| C18 | 00808-23101 | 00808-24101 | 00808-03101 | 00808-04101 | 00808-05101 |
| C8 | 00808-23102 | 00808-24102 | 00808-03102 | 00808-04102 | 00808-05102 |
| Phenyl-Hexyl | 00808-23106 | 00808-24106 | 00808-03106 | 00808-04106 | - |
| C4 | 00808-23103 | 00808-24103 | 00808-03103 | 00808-04103 | - |
| CN | - | 00808-24105 | - | 00808-04105 | - |
| Polar-RP | - | 00808-24111 | - | 00808-04152 | - |
| Lactose-NH ₂ | - | 00808-24110 | - | 00808-04151 | - |
| XB-SCX | - | 00808-24112 | - | 00808-04153 | - |

| Ultisil Guard Column Cartridges | | | | | |
|---------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|
| Specification | 3 μm, 2.1×10 mm [Cartridges] | 5 μm, 2.1×10 mm [Cartridges] | 3 μm, 4.6×10 mm [Cartridges] | 5 μm, 4.6×10 mm [Cartridges] | 10 μm, 4.6×10 mm [Cartridges] |
| XB-C18 | H00808-23001 | H00808-24001 | H00808-03001 | H00808-04001 | H00808-05001 |
| XB-C8 | H00808-23002 | H00808-24002 | H00808-03002 | H00808-04002 | H00808-05002 |
| XB-Phenyl | H00808-23006 | H00808-24006 | H00808-03006 | H00808-04006 | H00808-05006 |
| XB-C4 | H00808-23011 | H00808-24008 | H00808-03030 | H00808-04008 | H00808-05008 |
| XB-C1 | - | H00808-24023 | - | H00808-04026 | - |
| XB-CN | H00808-23005 | H00808-24005 | H00808-03005 | H00808-04005 | H00808-05005 |
| SiO ₂ | H00808-23007 | H00808-24007 | H00808-03007 | H00808-04007 | H00808-05007 |
| Diol | H00808-23020 | H00808-24020 | H00808-03020 | H00808-04020 | H00808-05020 |
| XB-NH ₂ | H00808-23004 | H00808-24004 | H00808-03004 | H00808-04004 | H00808-05004 |
| XB-SAX | H00808-23008 | H00808-24009 | H00808-03008 | H00808-04009 | H00808-05009 |
| XB-SCX | H00808-23012 | H00808-24011 | H00808-03033 | H00808-04011 | H00808-05011 |
| XB-C30 | H00808-23013 | H00808-24024 | H00808-03035 | H00808-04035 | H00808-05013 |
| AQ-C18 | H00808-23003 | H00808-24003 | H00808-03003 | H00808-04003 | H00808-05003 |
| LP-C18 | H00808-23014 | H00808-24015 | H00808-03010 | H00808-04015 | H00808-05014 |
| LP-C8 | H00808-23015 | H00808-24012 | H00808-03011 | H00808-04012 | - |
| LP-AQ | - | H00808-24026 | - | H00808-04042 | - |
| LP-CN | - | H00808-24027 | - | H00808-04049 | - |
| LP-C3 | - | H00808-24028 | - | H00808-04050 | - |
| Plus C18 | H00808-23024(3.5μm) | H00808-24029 | H00808-03036(3.5μm) | H00808-04036 | - |
| ALK C18 | - | H00808-24030 | - | H00808-04033 | - |
| ODS-3 | H00808-23016 | H00808-24031 | H00808-03031 | H00808-04043 | - |
| PG-C18 | - | - | - | H00808-04045 | - |

Ultisil Guard Column Cartridges

| Specification | 3 µm, 2.1×10 mm (Cartridges) | 5 µm, 2.1×10 mm (Cartridges) | 3 µm, 4.6×10 mm (Cartridges) | 5 µm, 4.6×10 mm (Cartridges) | 10 µm, 4.6×10 mm (Cartridges) |
|------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------------------------|
| XS-C18 | H00808-23017 | H00808-24033 | H00808-03034 | H00808-04046 | - |
| PAH | H00808-23018 | H00808-24010 | H00808-03012 | H00808-04010 | - |
| Polar-RP | H00808-23009 | H00808-24017 | H00808-03009 | H00808-04017 | H00808-05015 |
| Phenyl-Ether | - | H00808-24034 | - | H00808-04028 | - |
| PFP | H00808-23019 | H00808-24035 | H00808-03024 | H00808-04024 | - |
| F-C8 | H00808-23021 | H00808-24036 | H00808-03023 | H00808-04038 | - |
| HILIC Silica | H00808-23023 | H00808-24037 | H00808-03026 | H00808-04044 | H00808-05016 |
| HILIC NH ₂ | H00808-23022 | H00808-24038 | H00808-03025 | H00808-04047 | H00808-05017 |
| HILIC Amide | H00808-23010 | H00808-24025 | H00808-03021 | H00808-04025 | H00808-05018 |
| HILIC Amphion | - | H00808-24039 | - | H00808-04029 | - |
| Amino Acid | - | H00808-24040 | - | H00808-04023 | - |
| MM C18/SCX | - | H00808-24032 | - | H00808-04032 | - |
| MM NH ₂ /CN | - | H00808-24041 | - | H00808-04037 | - |
| Cellu-D | - | H00808-24042 | - | H00808-04014 | H00808-05021 |
| Cellu-DR | - | H00808-24042-R | - | H00808-04014-R | H00808-05021-R |
| Amy-D | - | H00808-24043 | - | H00808-04040 | H00808-05022 |
| Amy-DR | - | H00808-24043-R | - | H00808-04040-R | H00808-05022-R |
| Cellu-J | - | H00808-24044 | - | H00808-04039 | H00808-05023 |
| Cellu-JR | - | H00808-24044-R | - | H00808-04039-R | H00808-05023-R |
| Amy-S | - | H00808-24045 | - | H00808-04041 | H00808-05024 |
| Amy-SR | - | H00808-24045-R | - | H00808-04041-R | H00808-05024-R |

Topsil Guard Column Cartridges

| Specification | 3 µm, 2.1×10 mm (Cartridges) | 5 µm, 2.1×10 mm (Cartridges) | 3 µm, 4.6×10 mm (Cartridges) | 5 µm, 4.6×10 mm (Cartridges) |
|-----------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| C18 | 00808-23301 | 00808-24301 | 00808-03301 | 00808-04301 |
| C8 | 00808-23302 | 00808-24302 | 00808-03302 | 00808-04302 |
| Phenyl-Hexyl | 00808-23305 | 00808-24305 | 00808-03305 | 00808-04305 |
| CN | - | 00808-24304 | - | 00808-04304 |
| NH ₂ | - | 00808-24303 | - | 00808-04303 |
| Silica | - | 00808-24306 | - | 00808-04306 |
| Hilic-NH ₂ | - | 00808-24307 | - | 00808-04307 |

Welchrom Guard Column Cartridges

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

UHPLC Guard Column Cartridges

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

Boltimate Guard Column Cartridges

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

Description

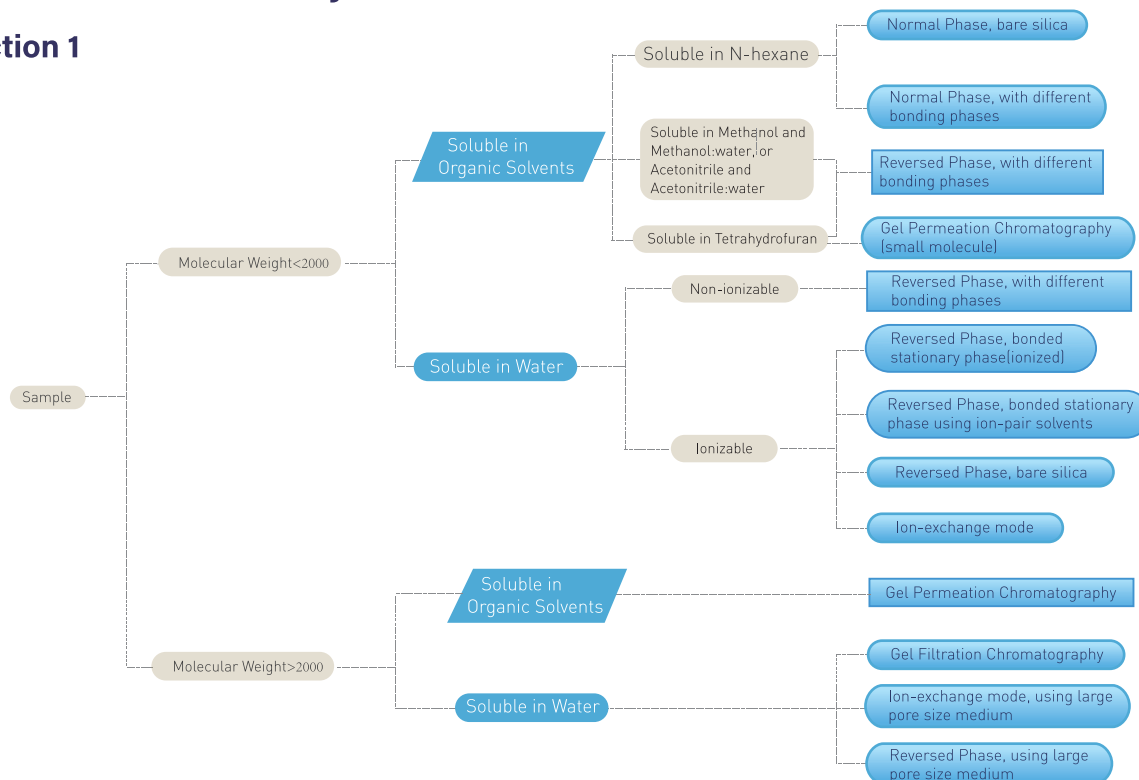
P/N

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

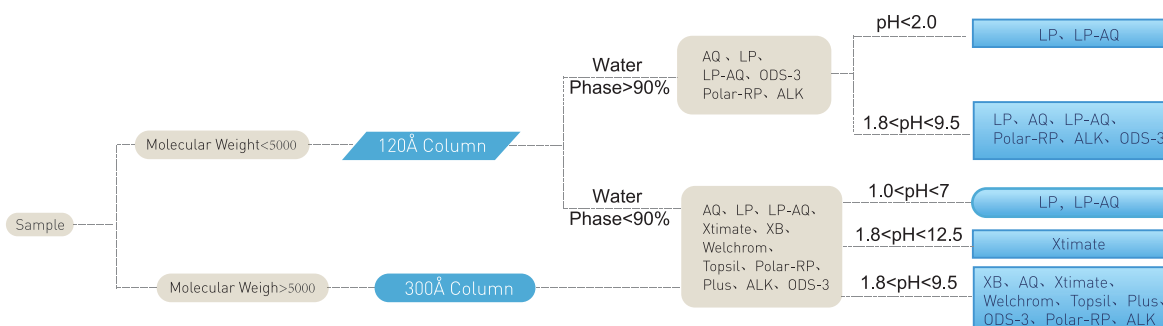
Appendix

1. Selection of Analysis Modes

Selection 1



Selection 2



2. Method Development Tool Kit for Pharmaceutical Industry

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

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

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

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

The "Universal" Kit

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

Tool Kits for "Special Application"

"High-Select & Universal" Kit

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

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

"Isomer Analysis" Kit

Contains: Ultisil® PFP, Ultisil® PAH, Ultisil® Hilic SiO₂
Dimension: 4.6*250mm, 5µm (other dimensions also available)

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

"Bio-samples Analysis" Kit

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

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

"Extended Selectivity" Kit

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

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

"Hydrophilic Substance Analysis" Kit

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

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

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

3. Welch HPLC Column Selection by USP Listing

| HPLC Column | Particle Size | pH Range | Carbon Loading | Surface Area(m ² /g) | Endcapped |
|---|---------------|----------|----------------------|---------------------------------|-----------|
| L1: Octadecyl silane chemically bonded to porous silica or ceramic microparticles, 1.5 to 10 μm in diameter, or a monolithic rod. | | | | | |
| Ultisil XB-C18 | 3, 5, 10 μm | 1.5-10.0 | 17%(120Å), 8%(300Å) | 320(120Å), 90(300Å) | Yes |
| Ultisil AQ-C18 | 3, 5, 10 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Ultisil LP-C18 | 3, 5, 10 μm | 0.5-8.0 | 10%(120Å), 5%(300Å) | 320(120Å), 90(300Å) | No |
| Ultisil LP-AQ | 5 μm | 1.0-8.0 | 5%(120Å) | 320(120Å) | No |
| Ultisil Polar-RP | 3, 5, 10 μm | 1.5-10.0 | 18%(120Å) | 320(120Å) | Yes |
| Ultisil AA(Amino Acid) | 5 μm | 1.5-10.0 | 17%(120Å) | 320(120Å) | Yes |
| Ultisil Amino Acid Plus | 5 μm | 1.0-7.0 | 10%(120Å) | 320(120Å) | Yes |
| Ultisil OAA | 5 μm | 1.0-7.0 | 10%(120Å) | 320(120Å) | Yes |
| Ultisil PAH | 3, 5 μm | 1.5-10.0 | 22%(120Å) | 320(120Å) | No |
| Ultisil ALK C18 | 5 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Ultisil Plus C18 | 3.5, 5 μm | 2.0-8.0 | 10%(130Å) | 160(130Å) | Yes |
| Ultisil ODS-3 | 3, 5 μm | 2.0-8.0 | 15%(100Å) | 380(100Å) | Yes |
| Ultisil XS-C18 | 3, 5 μm | 2.0-10.0 | 23%(120Å) | 320(120Å) | Yes |
| Ultisil PG-C18 | 5 μm | 2.0-8.0 | 10%(150Å) | 260(150Å) | No |
| Xtimate C18 | 3, 5, 10 μm | 1.0-12.5 | 14%(120Å) | 320(120Å) | Yes |
| Xtimate Polar-RP | 5 μm | 1.0-12.5 | 16%(120Å) | 320(120Å) | Yes |
| Welchrom C18 | 5 μm | 1.5-10.0 | 19%(120Å) | 320(120Å) | Yes |
| Topsil C18 | 3, 5 μm | 2.0-9.5 | 12%(150Å) | 260(150Å) | Yes |
| Boltimate C18(Core-shell) | 2.7 μm | 2.0-8.5 | 9%(90Å) | 120(90Å) | Yes |
| Boltimate EXT-C18 (Core-shell) | 2.7 μm | 1.5-12.0 | 8%(90Å) | 120(90Å) | Yes |
| Boltimate LP-C18 (Core-shell) | 2.7 μm | 1.0-8.5 | 7%(90Å) | 120(90Å) | No |
| Blossmate PSV C18 | 5 μm | 2.0-8.0 | 12%(120Å) | 300(120Å) | Yes |
| Ultisil UHPLC XB-C18 | 1.8 μm | 1.5-10.0 | 17%(120Å) | 320(120Å) | Yes |
| Ultisil UHPLC AQ-C18 | 1.8 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Ultisil UHPLC LP-C18 | 1.8 μm | 0.5-8.0 | 10%(120Å) | 320(120Å) | No |
| Ultisil UHPLC Polar-RP | 1.8 μm | 1.5-10.0 | 18%(120Å) | 320(120Å) | Yes |
| Xtimate UHPLC C18 | 1.8 μm | 1.0-12.5 | 14%(120Å) | 320(120Å) | Yes |
| L3: Porous silica particles, 1.5 to 10 μm in diameter, or a monolithic silica rod. | | | | | |
| Ultisil SiO ₂ | 3, 5, 10 μm | 2.0-8.0 | N/A | 320(120Å), 90(300Å) | No |
| Ultisil HILIC Silica | 3, 5, 10 μm | 2.0-8.0 | N/A | 320(120Å) | No |
| Ultisil UHPLC HILIC | 1.8 μm | 2.0-8.0 | N/A | 320(120Å) | No |
| Topsil Silica | 5 μm | 2.0-8.0 | N/A | 260(150Å) | No |
| Boltimate HILIC | 2.7 μm | 2.0-8.5 | N/A | 120(90Å) | No |
| L7: Octyl silane chemically bonded to totally porous silica particles, 1.5 to 10 μm in diameter, or a monolithic silica rod. | | | | | |
| Ultisil XB-C8 | 3, 5, 10 μm | 1.5-10.0 | 12%(120Å), 4%(300Å) | 320(120Å), 90(300Å) | Yes |
| Ultisil LP-C8 | 3, 5 μm | 1.0-8.0 | 5.5%(120Å), 3%(300Å) | 320(120Å), 90(300Å) | No |
| Ultisil F-C8 | 3, 5 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Xtimate C8 | 3, 5, 10 μm | 1.0-12.5 | 10%(120Å) | 320(120Å) | Yes |
| Welchrom C8 | 5 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Topsil C8 | 3, 5 μm | 2.0-9.5 | 10%(150Å) | 260(150Å) | Yes |
| Ultisil UHPLC XB-C8 | 1.8 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| L8: An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 3 to 10 μm in diameter. | | | | | |
| Ultisil XB-NH ₂ | 3, 5, 10 μm | 2.0-8.0 | 4%(120Å) | 320(120Å) | No |
| Ultisil HILIC-NH ₂ | 3, 5, 10 μm | 2.0-8.0 | 4%(120Å) | 320(120Å) | No |
| Topsil NH ₂ | 5 μm | 2.0-8.0 | 3%(150Å) | 260(150Å) | No |
| Topsil Hilic-NH ₂ | 5 μm | 2.0-8.0 | 3%(150Å) | 260(150Å) | No |
| Xtimate Lactose-NH ₂ | 5 μm | 2.0-8.0 | 7%(120Å) | 450(120Å) | No |
| L9: Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 μm in diameter. | | | | | |
| Ultisil XB-SCX | 3, 5, 10 μm | 2.0-8.0 | 12%(120Å), 5%(300Å) | 320(120Å), 90(300Å) | No |
| Xtimate XB-SCX | 5 μm | 2.0-8.0 | 2%(120Å) | 300(120Å) | No |
| L10: Nitrile groups chemically bonded to porous silica particles, 3 to 10 μm in diameter. | | | | | |
| Ultisil XB-CN | 3, 5, 10 μm | 1.5-9.0 | 7%(120Å) | 320(120Å) | Yes |
| Ultisil LP-CN | 5 μm | 1.0-8.0 | 6%(120Å) | 320(120Å) | No |
| Xtimate CN | 5 μm | 1.0-12.5 | 7%(120Å) | 320(120Å) | Yes |
| Topsil CN | 5 μm | 2.0-8.0 | 6%(150Å) | 260(150Å) | Yes |
| L11: Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 μm in diameter. | | | | | |
| Ultisil XB-Phenyl | 3, 5, 10 μm | 1.5-10.0 | 12%(120Å), 4%(300Å) | 320(120Å), 90(300Å) | Yes |
| Ultisil Phenyl-Ether | 5 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Ultisil PFP | 3, 5 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Xtimate Phenyl-hexyl | 3, 5 μm | 1.0-12.5 | 12%(120Å) | 320(120Å) | Yes |
| Topsil Phenyl-hexyl | 3, 5 μm | 2.0-9.5 | 12%(150Å) | 260(150Å) | Yes |
| Boltimate Phenyl-hexyl(Core-shell) | 2.7 μm | 2.0-8.5 | 7%(90Å) | 120(90Å) | Yes |
| Boltimate EXT-PFP(Core-shell) | 2.7 μm | 1.5-12.0 | 5%(90Å) | 120(90Å) | Yes |
| Ultisil UHPLC XB-Phenyl | 1.8 μm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |

| HPLC Column | Particle Size | pH Range | Carbon Loading | Surface Area(m ² /g) | Endcapped |
|--|---------------|----------|------------------------|---------------------------------|-----------|
| L13: Trimethylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter. | | | | | |
| Ultisil XB-C1 | 5 µm | 1.5-10.0 | 4%(120Å) | 320(120Å) | Yes |
| L14: Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 µm in diameter. | | | | | |
| Ultisil XB-SAX | 3, 5, 10 µm | 2.0-8.0 | 7.5%(120Å), 1.5%(300Å) | 320(120Å), 90(300Å) | No |
| Blossmate SAX | 5 µm | 2.0-8.0 | 12%(300Å) | 300(120Å) | No |
| L17: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter. | | | | | |
| Xtimate Sugar-H | 5, 8 µm | 1.0-3.0 | N/A | N/A | N/A |
| L19: Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 9 µm in diameter. | | | | | |
| Xtimate Sugar-Ca | 5, 8 µm | 5.0-9.0 | N/A | N/A | N/A |
| L20: Dihydroxypropane groups chemically bonded to porous silica particles, 1.5 to 10 µm in diameter. | | | | | |
| Ultisil Diol | 3, 5, 10 µm | 2.0-8.0 | 2.5%(120Å) | 320(120Å) | No |
| L21: A rigid, spherical styrene-divinylbenzene copolymer, 3 to 30 µm in diameter. | | | | | |
| Xtimate PS/DVB | 5, 10 µm | 1.0-14.0 | N/A(100Å, 300Å) | N/A | N/A |
| L22: A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10 µm in size. | | | | | |
| Xtimate Sugar-H | 5, 8 µm | 1.0-3.0 | N/A | N/A | N/A |
| L26: Butyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter. | | | | | |
| Ultisil XB-C4 | 3, 5, 10 µm | 1.5-10.0 | 8%(120Å), 3%(300Å) | 320(120Å), 90(300Å) | Yes |
| Xtimate C4 | 3, 5 µm | 1.0-12.5 | 8%(120Å) | 320(120Å) | Yes |
| L33: Packing having the capacity to separate dextrans of 4,000 to 500,000 daltons. It is spherical, silica-based and processed to provide pH stability. | | | | | |
| Xtimate SEC-120 | 3, 5 µm | 2.0-7.5 | N/A(120Å) | N/A | N/A |
| Xtimate SEC-300 | 3, 5 µm | 2.0-7.5 | N/A(300Å) | N/A | N/A |
| Xtimate SEC-500 | 5 µm | 2.0-7.5 | N/A(500Å) | N/A | N/A |
| Xtimate SEC-700 | 5 µm | 2.0-7.5 | N/A(700Å) | N/A | N/A |
| Xtimate SEC-1000 | 5 µm | 2.0-7.5 | N/A(1000Å) | N/A | N/A |
| L40: Cellulose tris-3,5-dimethylphenylcarb-amate coated porous silica particles, 5 to 20 µm in diameter. | | | | | |
| Ultisil Cellu-D | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |
| L43: Pentafluorophenyl groups chemically bonded to silica particles 5 to 10 µm in diameter. | | | | | |
| Ultisil PFP | 3, 5 µm | 1.5-10.0 | 13%(120Å) | 320(120Å) | Yes |
| Boltimate EXT-PFP(Core-shell) | 2.7 µm | 1.5-12.0 | 5%(90Å) | 120(90Å) | Yes |
| L51: Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10 µm in diameter. | | | | | |
| Ultisil Amy-D | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |
| L56: Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter. | | | | | |
| Ultisil LP-C3 | 5 µm | 1.0-8.0 | 4%(120Å) | 320(120Å) | No |
| L59: Packing having the capacity to separate proteins by molecular weight over the range of 5 to 7000 kDa. It is spherical (1.5-10 µm), silica-based, and processed to provide hydrophilic characteristics and pH stability. | | | | | |
| Xtimate SEC-120 | 3, 5 µm | 2.0-7.5 | N/A(120Å) | N/A | N/A |
| Xtimate SEC-300 | 3, 5 µm | 2.0-7.5 | N/A(300Å) | N/A | N/A |
| Xtimate SEC-500 | 5 µm | 2.0-7.5 | N/A(500Å) | N/A | N/A |
| Xtimate SEC-700 | 5 µm | 2.0-7.5 | N/A(700Å) | N/A | N/A |
| Xtimate SEC-1000 | 5 µm | 2.0-7.5 | N/A(1000Å) | N/A | N/A |
| L60: Spherical, porous silica gel, 10 µm or less in diameter, surface has been covalently modified with alkyl amide groups and endcapped. | | | | | |
| Ultisil Polar-RP | 3, 5, 10 µm | 1.5-10.0 | 18%(120Å) | 320(120Å) | Yes |
| Xtimate Polar-RP | 5 µm | 1.0-12.5 | 16%(120Å) | 320(120Å) | Yes |
| Ultisil UHPLC Polar-RP | 1.8 µm | 1.5-10.0 | 18%(120Å) | 320(120Å) | Yes |
| L62: C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter. | | | | | |
| Ultisil XB-C30 | 3, 5, 10 µm | 1.5-10.0 | 22%(120Å) | 320(120Å) | Yes |
| L68: Spherical, porous silica, 10 µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped. | | | | | |
| Ultisil HILIC Amide | 3, 5, 10 µm | 2.0-8.0 | 7%(120Å) | 320(120Å) | N/A |
| Blossmate Polar-Propylamide | 5 µm | 2.0-8.0 | 7%(120Å) | 300(120Å) | N/A |
| L80: Cellulose tris(4-methylbenzoate)-coated, porous, spherical, silica particles, 5 µm in diameter. | | | | | |
| Ultisil Cellu-J | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |
| L90: Amylose tris-[(S)-alpha-methylbenzylcarbamate] coated on porous, spherical silica particles, 3 to 10 µm in diameter. | | | | | |
| Ultisil Amy-S | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |

| HPLC Column | Particle Size | pH Range | Carbon Loading | Surface Area(m ² /g) | Endcapped |
|--|---------------|----------|----------------|---------------------------------|-----------|
| L93: Cellulose tris(3,5-dimethylphenylcarbamate) reversed phase chiral stationary phase coated on 3 or 5 µm silica gel particles. | | | | | |
| Ultisil Cellu-DR | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |
| L96: Alkyl chain, reversed-phase bonded totally or superficially porous silica designed to retain hydrophilic and other opolar compounds when using highly aqueous mobile phases, including 100% aqueous, 1.5 µm to 10 µm in diameter. | | | | | |
| Ultisil AQ-C18 | 3, 5, 10 µm | 1.5-10.0 | 12%(120Å) | 320(120Å) | Yes |
| Ultisil LP-AQ | 5 µm | 1.0- 8.0 | 5%(120Å) | 320(120Å) | No |
| L107: Cellulose tris(4-methylbenzoate)-coated porous spherical particles, 3 to 5 µm in diameter, for use with reversed phase mobile phases. | | | | | |
| Ultisil Cellu-JR | 5, 10 µm | 2.0-9.0 | N/A | 320(120Å) | N/A |
| L114: Sulfobetaine graft-polymerized to totally or superficially porous silica, 1.5 to 10 µm in diameter, or a monolithic rod. Packing having densely bonded zwitterionic groups with 1:1 charge balance. | | | | | |
| Ultisil HILIC Amphion II | 5 µm | 2.0-8.0 | 6%(120Å) | 320(120Å) | N/A |
| L118: Aqueous polymerized C18 groups on silica particles, 1.2 to 5 µm in diameter. | | | | | |
| Ultisil PAH | 3, 5 µm | 1.5-10.0 | 22%(120Å) | 320(120Å) | No |
| Not included in USP List | | | | | |
| Ultisil MM NH ₂ /CN | 5 µm | 2.0-8.0 | N/A(120Å) | 320(120Å) | N/A |
| Ultisil MM C18/SCX | 5 µm | 2.0-8.0 | N/A(120Å) | 320(120Å) | N/A |
| Ultisil Zn | N/A | N/A | N/A(120Å) | N/A(120Å) | N/A |
| Ultisil Lead oxide | N/A | N/A | N/A(120Å) | N/A(120Å) | N/A |

4. Cross Reference

Ultisil XB-C18 can substitute:

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

Ultisil AQ-C18 can substitute:

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

Ultisil XB-C8 can substitute:

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

Other Ultisil Columns: XB-CN, XB-Phenyl, XB-CN, SiO₂ and Polar RP can replace the most of the same type columns of other brands.

Xtimate (wide pH range) can substitute:

| | | |
|------------|---------------|----------------|
| Waters | Xterra series | Xbridge series |
| Agilent | Extend series | |
| Phenomenex | Gemini series | |

Chiral Column Reference Table

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



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