

# Ultisil® AQ-C18

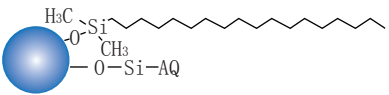
## --The most widely used column in food industry

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.

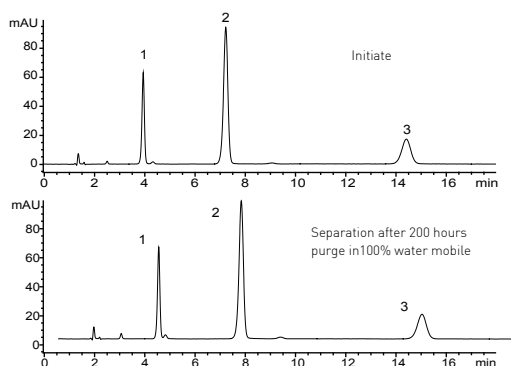
### Features:

- 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 <sup>2</sup> /g)	320(120 Å)
Carbon Loading[%]	12(120 Å)
USP List	L1/L96
Endcapped	Yes

### Phase collapse research

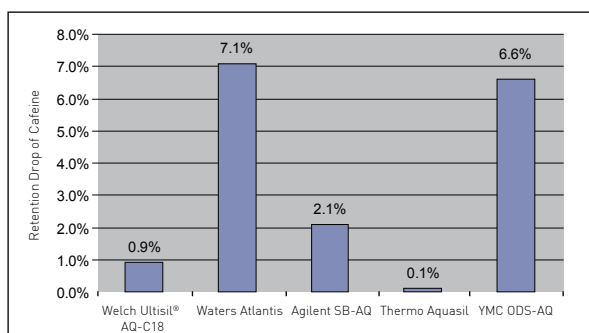


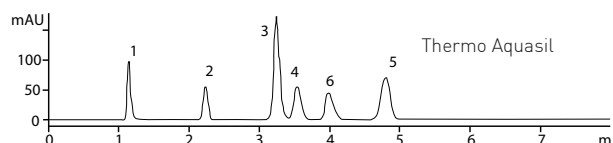
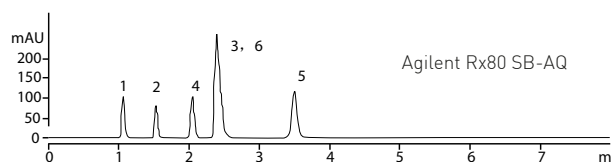
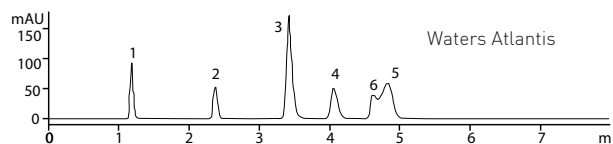
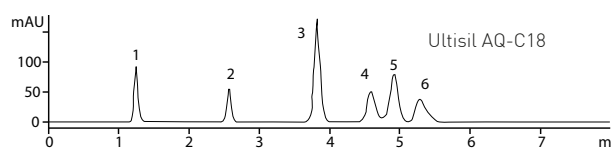
Column:	Ultisil® AQ-C18, 4.6 ×100 mm, 5 µm
Mobile Phase:	Acetonitrile/50 mM phosphate(pH 3.5)=10/90
Detector:	215nm
Temperature:	25°C
Flow Rate:	1.0 mL/min
Samples:	1.Theophylline 2.Caffeine 3.Phenol

### 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.



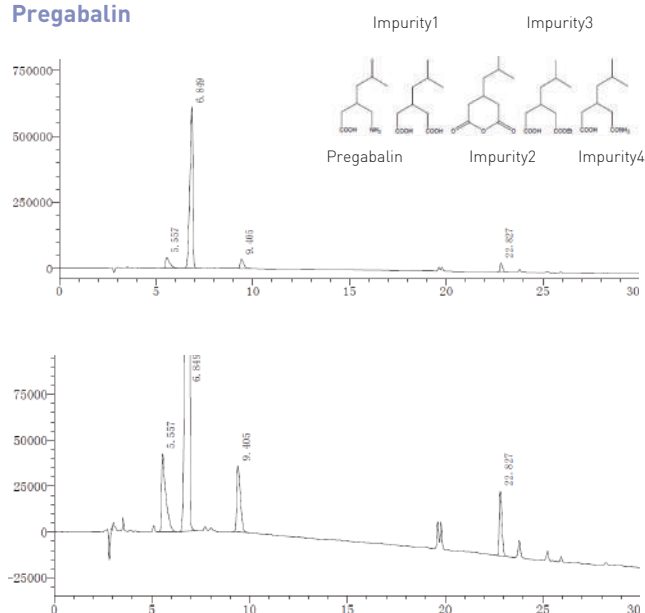


<b>Column:</b>	Ultisil® AQ-C18, 4.6 ×100 mm, 5 μm
<b>Mobile Phase:</b>	50 mM phosphate, pH2.5
<b>Detector:</b>	210 nm
<b>Temperature:</b>	25°C
<b>Flow Rate:</b>	1.0 mL/min
<b>Samples:</b>	1. Oxalic acid 2. Lactic acid 3. Maleic acid 4. Citric acid 5. Fumaric acid 6. Succinic acid

### How to choose XB-C18 and AQ-C18?

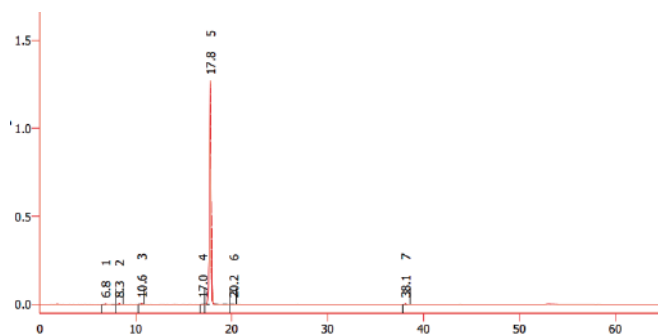
XB-C18	AQ-C18
<ul style="list-style-type: none"> <li>• Suitable for separation of most pharmaceuticals, environment and chemical compounds</li> <li>• Excellent peak shape for basic and polar samples</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable for water soluble strong polar samples, such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

### Pregabalin



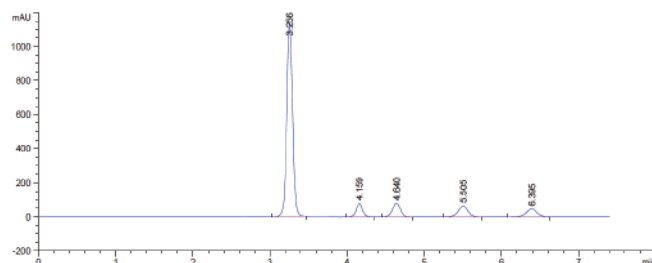
<b>Column:</b>	Ultisil® AQ-C18, 4.6 ×250 mm, 5 μm															
<b>Mobile Phase:</b>	A: 40 mM (NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub> /methanol=80/20 B: acetonitrile/methanol=90/10															
<b>Gradient Program:</b>	<table border="1"> <thead> <tr> <th>Time(min)</th> <th>A</th> <th>B</th>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

### Vilazodone hydrochloride



<b>Column:</b>	Ultisil® AQ-C18, 4.6 ×250 mm, 5 µm		
<b>Mobile Phase:</b>	Mobile phase A: 0.025 mol/L K <sub>2</sub> HPO <sub>4</sub> , adjust pH 6.0 with H <sub>3</sub> PO <sub>4</sub> Mobile Phase B: acetonitrile		
<b>Gradient Program:</b>	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	
<b>Flow Rate:</b>	1.0 mL/min		
<b>Detector:</b>	240 nm		
<b>Temperature:</b>	40°C		
<b>Injection Volume:</b>	20 µL		

### NMN(nicotinamide mononucleotide)



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

### Ordering Information

#### Ultisil® AQ-C18

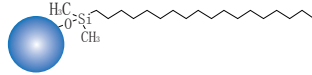
Particle size	Column ID (mm)	Column Length (mm)										Guard Cartridge	Cartridge holder
		30	33	50	75	100	125	150	200	250	300		
3 µm 120 Å	2.1	H00207-21009	H09207-21009	H00207-21010	H00207-21011	H00207-21012	H00207-21013	H00207-21014	H00207-21015	H00207-21016	-	H00808-23003	00808-01107
	3.0	H00207-21018	-	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.

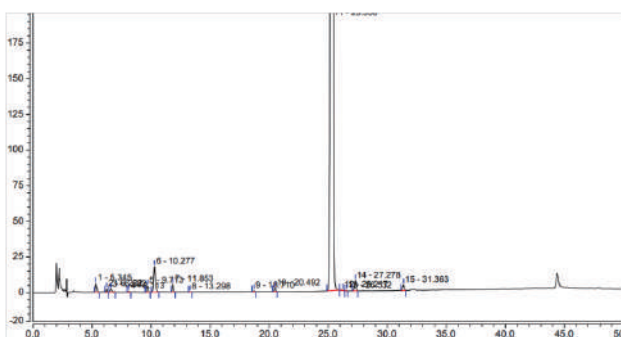
# Ultisil® Plus C18

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

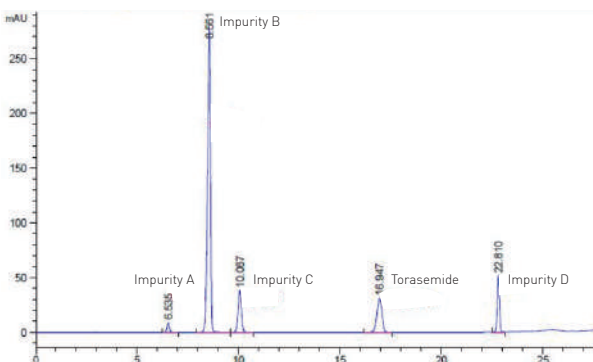
<b>Structural Formula</b>			
<b>pH Range</b>	2.0-8.0	<b>Carbon Loading(%)</b>	10(130 Å)
<b>Particle Size</b>	3.5 µm, 5 µm	<b>USP List</b>	L1
<b>Surface Area(m<sup>2</sup>/g)</b>	160(130 Å)	<b>Endcapped</b>	Yes

## Lansoprazole



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

## Toraseamide



<b>Column:</b>	Ultisil® Plus C18, 4.6 ×250 mm, 5 µm		
<b>Mobile Phase:</b>	A: 0.02 mol/L KH <sub>2</sub> PO <sub>4</sub> , adjust pH 3.5 with H <sub>3</sub> PO <sub>4</sub> B: methanol		
<b>Gradient Program:</b>	Time(min)	A(%)	B(%)
	0	60	40
	13	60	40
	27	20	80
	35	60	40
<b>Flow Rate:</b>	1 mL/min		
<b>Detector:</b>	288 nm		
<b>Temperature:</b>	40°C		
<b>Injection Volume:</b>	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.

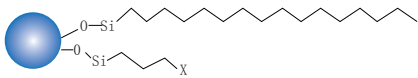
# Ultisil® ALK-C18

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:

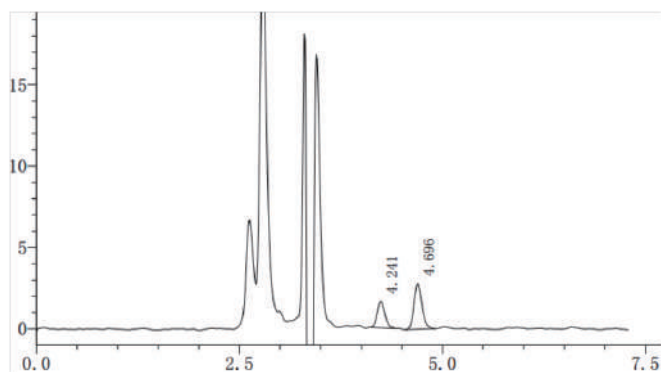
- Mixed solid phase with both hydrophobic and electrostatic interactions
- Excellent peak shape for basic compounds
- Fast separation of similar samples on a column

## Ultisil® ALK-C18

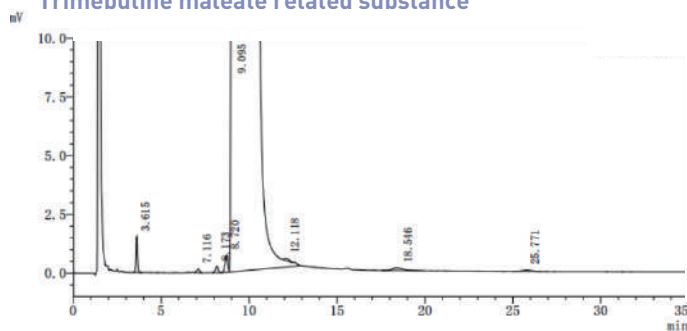
Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m <sup>2</sup> /g)	320(120 Å)
Carbon Loading(%)	12(120 Å)
USP List	L1
Endcapped	Yes

## 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.

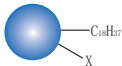
# Ultisil® ODS-3

## -- 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 <sup>2</sup> /g)	380(100 Å)
Carbon Loading(%)	15(100 Å)
USP List	L1
Endcapped	Yes

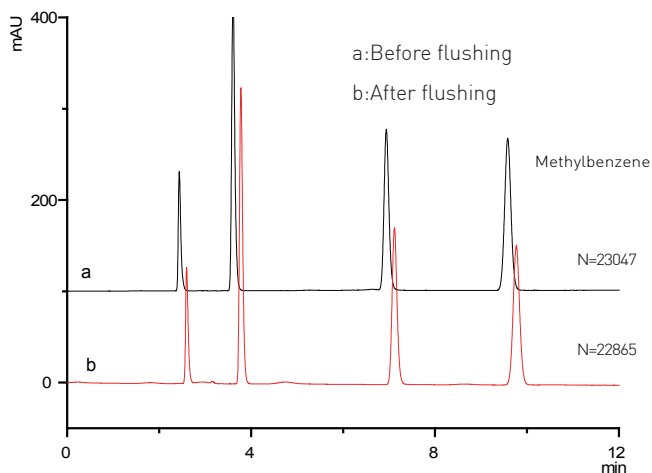
### Tests of 48-hour Pure Water Resistance

Mobile Phase: 20 mM K<sub>2</sub>HPO<sub>4</sub>, adjust pH 7.0 with phosphate

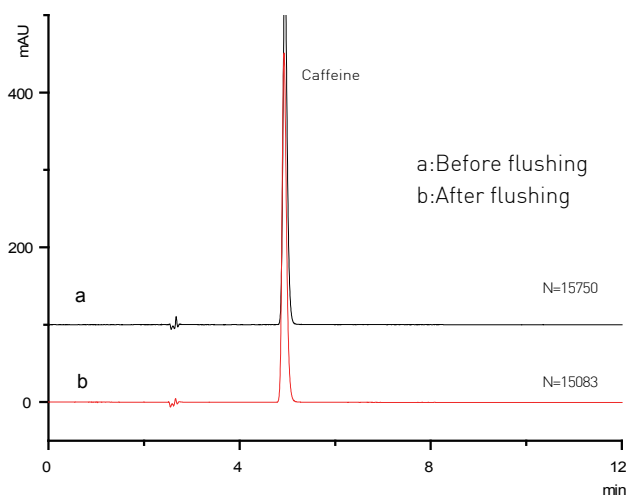
Temperature: 30°C

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.



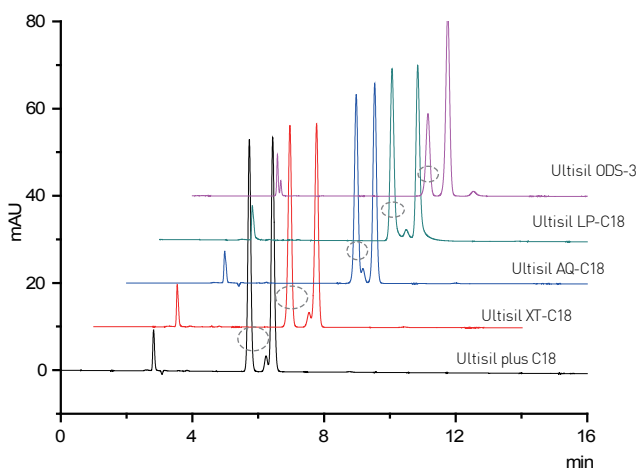
Column:	Ultisil® ODS-3, 4.6 × 250 mm, 5 μm
Mobile Phase:	Methanol/Water = 75/25
Flow Rate:	1.0 mL/min
Detector:	254 nm
Temperature:	30 °C
Injection Volume:	20 μL
Test Requirement:	N→20000, T (0.90-1.10)



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

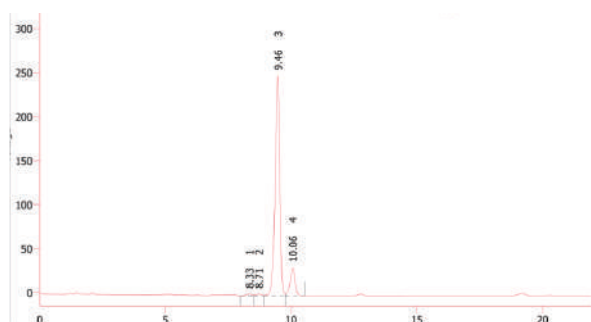
### Cefprozil Capsule

Unique selectivity



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

### Prostaglandin sample



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

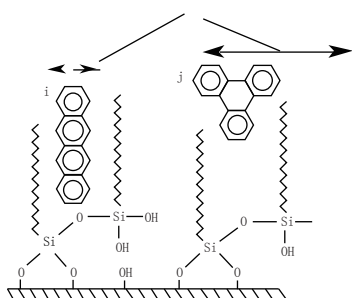
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.

# 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.

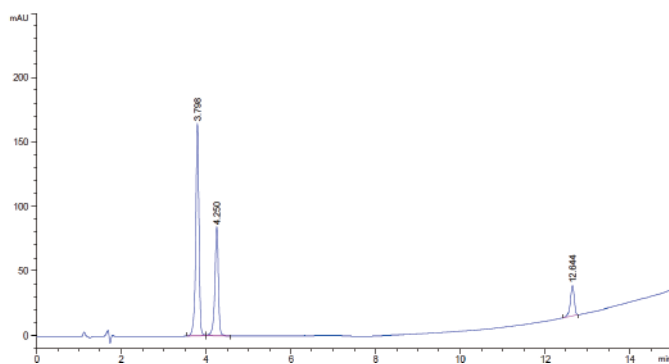
## Minimum cross- Section of Solute



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.

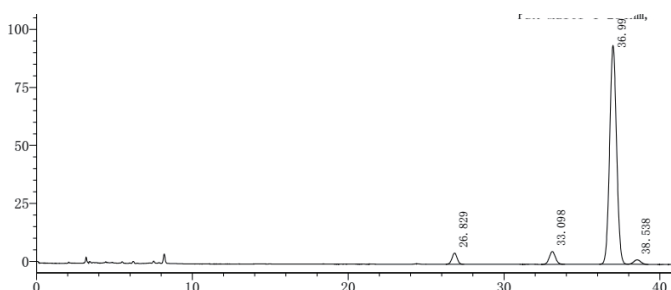
Structural Formula	
pH Range	2.0-10.0
Particle Size	3 µm, 5 µm
Surface Area(m <sup>2</sup> /g)	320(120 Å)
Carbon Loading(%)	23(120 Å)
USP List	L1
Endcapped	Yes

## 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															

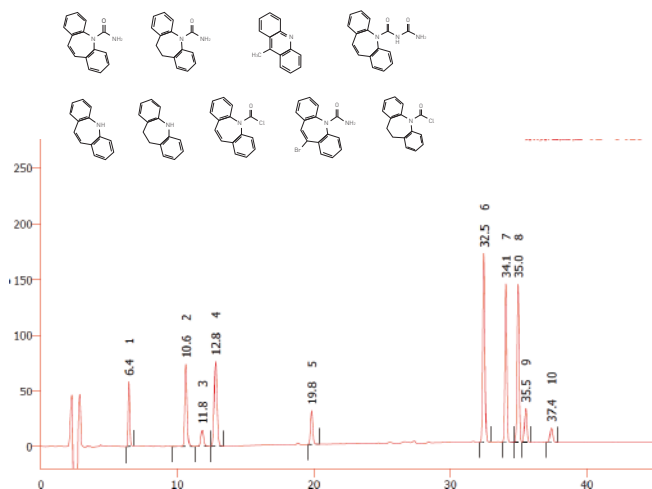
## Vitamin D3 and isomers



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



<b>Column:</b>	Ultisil® XS-C18, 4.6 × 250 mm, 5 μm																		
<b>Mobile Phase:</b>	A: water/triethylamine/formic acid=1000/0/5/0/5 B: methanol/formic acid=1000/0.25																		
<b>Gradient Program:</b>	<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																	
<b>Flow Rate:</b>	1.0 mL/min																		
<b>Injection Volume:</b>	230 nm																		
<b>Temperature:</b>	30°C																		
<b>Injection Volume:</b>	10 μL																		
<b>Samples in order:</b>	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

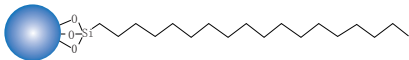
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



# Ultisil® PAH

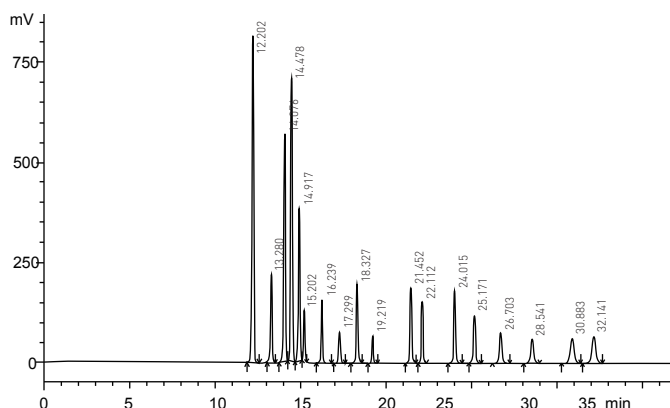
Ultisil® PAH Column is a special column recently designed by Welch for the separation of PAHs in EPA method 610. PAHs (Polycyclic Aromatic Hydrocarbon) are hydrocarbons with two or more benzene rings, and considered major pollutants. Therefore, the analysis of these potentially carcinogenic compounds 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 <sup>2</sup> /g)	320(120 Å)
Carbon Loading(%)	22(120 Å)
USP List	L1/L118
Endcapped	No

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

### Separation of 18 PAHs in EPA method 610



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

### Ordering Information

#### Ultisil® PAH

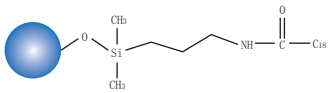
Particle size	Column ID (mm)	Column Length (mm)			Guard Cartridge	Cartridge holder
		150	200	250		
3 µm 120 Å	2.1	H00210-21014	H00210-21015	H00210-21016	H00808-23018	00808-01107
	3.0	H00210-21023	H00210-21024	H00210-21025	H00808-23018	00808-01107
	4.6	H00210-21041	H00210-21042	H00210-21043	H00808-03012	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.

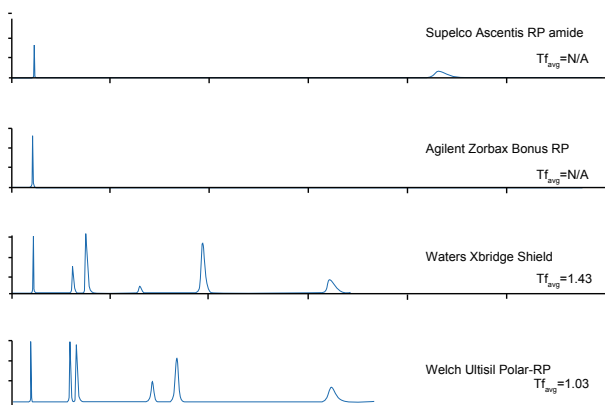
## Ultisil® Polar-RP

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

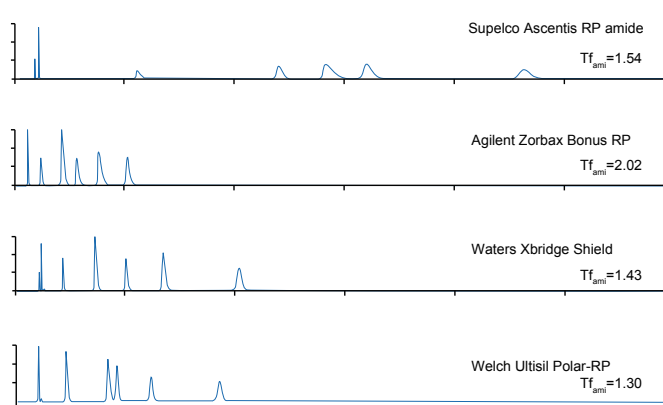
## Ultisil® Polar-RP HPLC Column

- 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

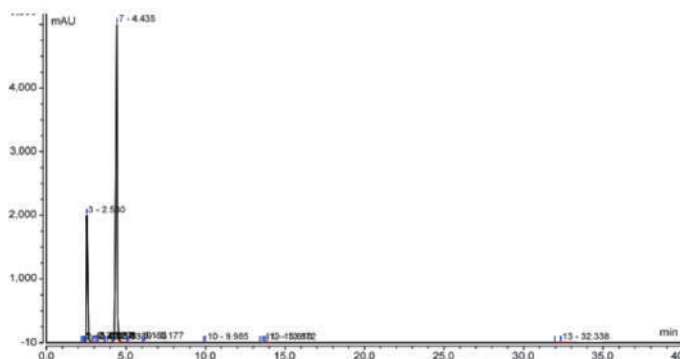
### Comparison of separation of acid compounds



### Comparison of separation of base compounds



## Amoxicillin and clavulanate potassium



<b>Column:</b>	Ultisil® Polar RP, 4.6 ×150 mm, 5 µm																		
<b>Mobile Phase:</b>	A: phosphate buffer * B: phosphate buffer/acetonitrile=20/80 *Dissolve 1.36 g KH <sub>2</sub> PO <sub>3</sub> in 900 mL water, adjust pH 6.0±0.1 with KOH, add water to 1000 mL																		
<b>Gradient Program:</b>	<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																	
<b>Flow Rate:</b>	1.0 mL/min																		
<b>Injection Volume:</b>	215 nm																		
<b>Temperature:</b>	30°C																		
<b>Injection Volume:</b>	20 µL																		

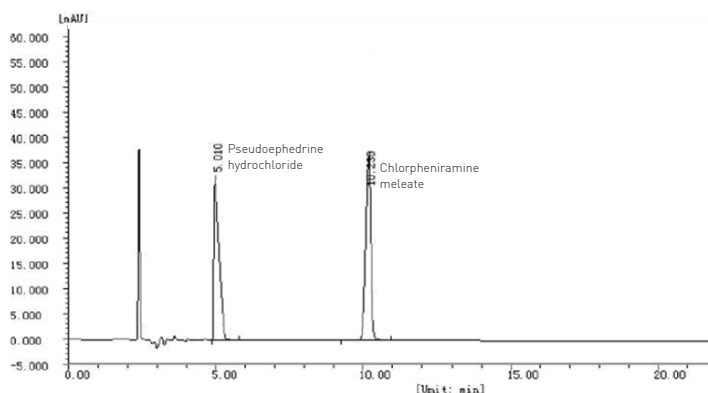
## Ultisil® Phenyl-Ether

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

### Ultisil® Phenyl-Ether HPLC Column

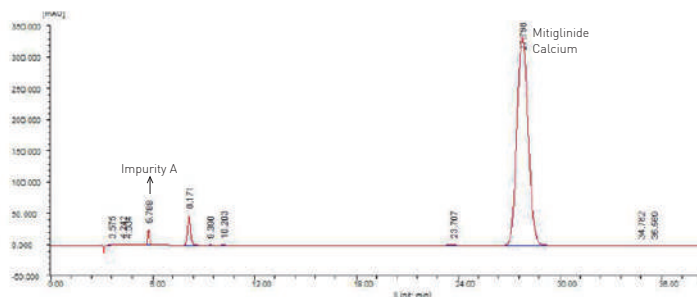
- Improved polar & aromatic reversed phases selectivity that complements the more conventional C18 column chemistries
- Better selectivity than phenyl phase for separation of nitrobenzene isomers
- Improved peak shape of highly acidic polar compounds, and different selectivity from other polar phases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

## Chlorphenamine Maleate Pseudoephedrine Hydrochloride Capsules



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

## Mitiglinide Calcium



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

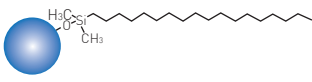
Don't see your needed size or format? Contact Welch or your local distributor for other dimensions.



# Ultisil® 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)

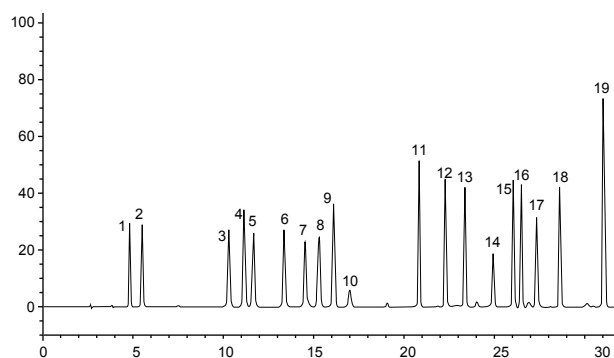
Structural Formula	
pH Range	1.5-10.0
Particle Size	5 µm
Surface Area(m <sup>2</sup> /g)	320(120 Å)
Carbon Loading(%)	17(120 Å)
USP List	L1
Endcapped	Yes

## Ultisil® Amino Acid Method Package

### Ultisil® Amino Acid Method Package

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

## Separation of 18 Amino Acids



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

## Ordering Information

	P/N	Description
Ultisil® Amino Acid Method Package (P/N 00840-01000)	H00211-31043	Ultisil® Amino Acid Column (4.6×250 mm, 5 µm), 1 pk
	H00814-01027 (A)	Derivatization reagent A, 1 bottle, 10 mL/bottle
	H00814-01027 (B)	Derivatization reagent B, 1 bottle, 10 mL/bottle
	H00814-01030	Derivatization reagent diluent, 6 bottles, 20 mL/bottle
	H00815-01001	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.

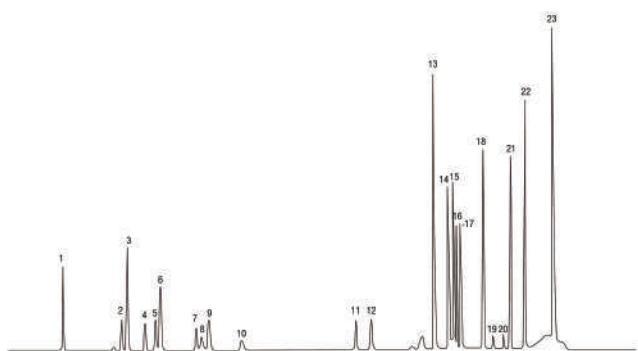
## Ultisil® Amino Acid Plus

pH Range	1.0-7.0
Particle Size	5 µm
Surface Area(m <sup>2</sup> /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.