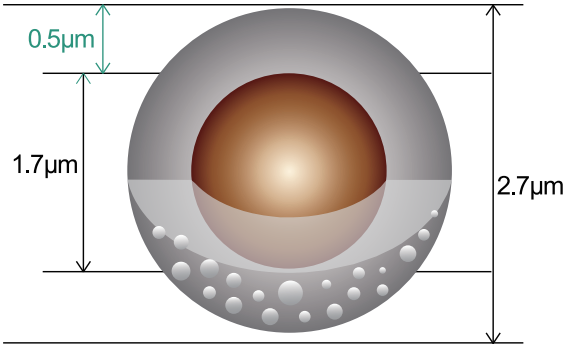
Boltimate™ Core-Shell HPLC Column

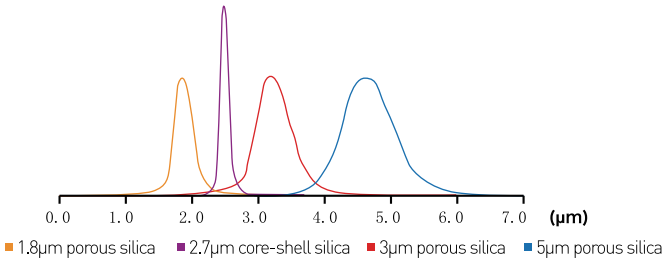
Welch Boltimate™ core-shell HPLC column particle size is 2.7 μm, which consists of 1.7 μm solid core and 0.5 μm porous layer(porous shell).
This kind of column can provide sub-2 μm efficiencies (~200000 p/m) and high resolution at much lower back pressure. Bolt imate core-shell column can be used on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

Features

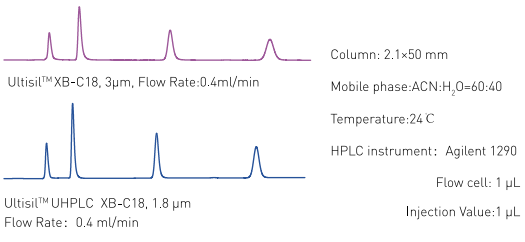
- Provide sub-2 μm efficiencies (~200000 p/m) and ultra-high resolution at much lower back pressure
- Ultra fast separation
- Compatible with both HPLC and UHPLC system
- Narrow particle size distribution
- A standard 2 μm inlet firt is used to resist plugging with dirty samples, suitable for complex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

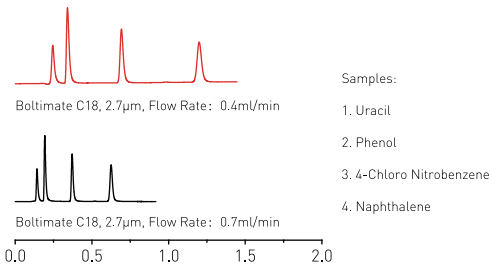


With the solid core and thin porous layer, the diffusion distance of sample molecular deceased, which means fast mobile phase flow rate can be used to increase the analytical speed. Compared with traditional porous HPLC columns, Boltimate core-shell column has the narrower particle size distribution,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



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





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

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

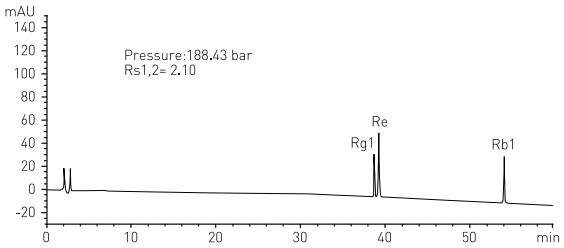
Detection of Ginsenosides:

Chromatographic conditions:

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

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

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

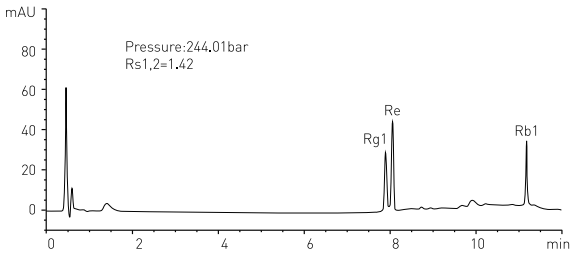


Welch Ultisil™ XB-C18, 4.6×250 mm, 5 μm, separation of three ginsenosides

Gradient program:

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

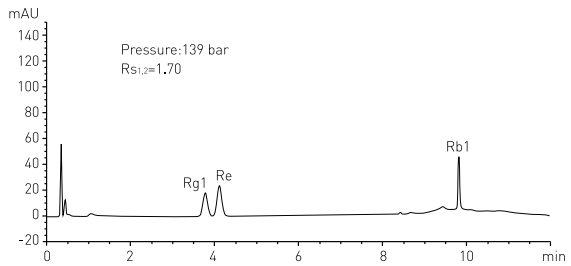
2.Welch Ultisil™ UHPLC XB-C18 (2.1×5 mm, 1.8 μm)



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

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

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



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

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

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

Welch provides a variety of bonding phases

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

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

Ordering Information

2.7μm, 90Å, Boltimate Core-shell Column

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

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

Inline Filter for Boltimate:

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