

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 oplar 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