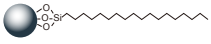
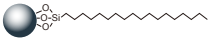
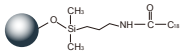
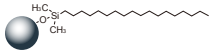
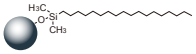
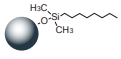
HPLC Columns and Consumables Selection Chart

Welch Materials

Reversed Phase

USP	Column	Features	Applications
C18 (L1) Octadecyl silane	Ultisil PAH (pH 2.0-8.0) 	■ High-density bonding with large carbon loading. ■ Strong spatial selectivity; exceptional separation of planar and stereoisomeric structures. Max temp: 60 °C (low pH)/40 °C (high pH)	Optimized for polycyclic aromatic hydrocarbons (EPA 610); aromatic compounds; hormones; and drugs like leflunomide, selamectin, cefprozil, and fenofibrate.
	Listed in the USP Database Ultisil XS-C18 (pH 2.0-8.0) 	■ Multi-layer bonding process with high bonding density and close ligand spacing; excellent spatial shape selectivity. ■ High column efficiency and capacity; strong retention for compounds. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for compounds such as carbamazepine, toluenesulfonate isomers, Liuwei Dihuang pills, verbena, and norfloxacin; exceptional selectivity for small molecule isomers, including structural and positional isomers.
	Ultisil Polar RP (pH 2.0-8.0) 	■ Embedded polar groups; tolerant of 100% aqueous phase. Max temp: 60 °C (low pH)/40 °C (high pH)	Optimal for nucleic acids, purine-based compounds, steroids, and vitamins D2 and D3; superior retention and selectivity for polar substances.
	Listed in the USP Database Xtimate C18 (pH 1.0-12.5) 	■ Uses Welch's patented organic-inorganic hybrid silica technology; supports a wide range of pH and temperature conditions for method development. ■ Offers a longer lifespan under standard conditions compared to conventional C18 columns. Max temp: 70 °C (low pH)/40 °C (high pH)	Preferred column for mobile phases with pH above 8.0; excellent for compounds such as levofloxacin, pantoprazole sodium, meropenem, betahistine hydrochloride, and ranitidine hydrochloride capsules; provides outstanding peak shapes for basic compounds prone to tailing under neutral conditions.
	Welchrom C18 (pH 2.0-8.0) 	■ Economical chromatography column with low backpressure. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for racemic anisodamine, enrofloxacin, Jinchan Zhiyang capsules, Yinhua Xiye lotion, and compound ketoconazole ointment.
C8 (L7) Octyl silane	Listed in the USP Database Ultisil XB-C8 (pH 2.0-8.0) 	■ Provides excellent peak shapes for acidic, basic, and neutral compounds. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for diketothiazine, detemir insulin, tacrolimus, adefovir dipivoxil, phenobarbital, and finasteride.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

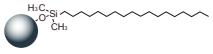
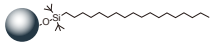
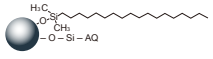
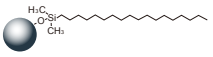
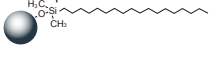
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HPLC Columns and Consumables Selection Chart

Welch Materials

Reversed Phase

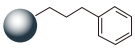
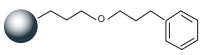
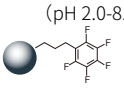
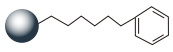
USP	Column	Features	Applications
C18 (L1) Octadecyl silane	Listed in the USP Database Ultisil XB-C18 (pH 2.0-8.0) 	■ Among the most versatile and well-rounded HPLC columns, renowned as a "classic star" product. ■ Engineered for optimal separation performance across a broad range of analytes. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal choice for fingerprinting and characteristic profiling; samples with complex mechanisms; mainstream choice in pharmacopeia applications; highly effective for the separation of acidic, basic, and polar compounds, providing well-defined peak shapes; preferred option for routine analytical methods.
	Listed in the USP Database Ultisil LP-C18 (pH 0.5-8.0) 	■ Designed with side-chain steric protection, effectively shielding hydroxyl groups without requiring end-capping. ■ Offers high selectivity in spatial positioning, displaying strong orthogonality to traditional C18 columns. ■ Minimal bonded phase loss under strong acidic conditions. Max temp: 70 °C (low pH)/40 °C (high pH)	Ideal for aminoglycoside sample analysis; compatible with detectors like ELSD and MS; especially effective for methods that require low pH and high aqueous phases.
	Listed in the USP Database Ultisil AQ-C18 (pH 2.0-8.0) 	■ Low alkyl bonding density with dual end-capping and moderate carbon loading. ■ Tolerant of 100%-0% aqueous phase ■ Moderate retention capacity with reduced impurity adsorption compared to XB-C18. Max temp: 60 °C (low pH)/40 °C (high pH)	Highly versatile column; ideal for cephalosporin antibiotics, water-soluble vitamins; preferred choice for chemical drug assays and food industry applications.
	Listed in the USP Database Ultisil Plus C18 (pH 2.0-8.0) 	■ Lower surface area, slightly larger pore size, and reduced carbon loading ■ Optimal choice for substances with excessive retention on XB-C18. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for samples with complex matrices, such as traditional Chinese medicine decoctions; excellent for detecting compounds like Salvia miltiorrhiza, torasemide, sulbactam sodium, Jingkang capsules, arginine hydrochloride, ginkgo biloba extract, and amikacin sulfate.
	Ultisil ODS-3 (pH 2.0-8.0) 	■ General-purpose column; compatible with 100% aqueous phases. Max temp: 60 °C (low pH)/40 °C (high pH)	Minimal adsorption for basic and acidic compounds, delivering excellent peak shapes; a viable alternative to other ODS-3 columns on the market, suitable for analytes like processed Aconitum.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

HPLC Columns and Consumables Selection Chart

Welch Materials

Size Exclusion

USP	Column	Features	Applications
Phenyl (L11)	Listed in the USP Database Ultisil XB-phenyl (pH 2.0-8.0) 	■ Its high surface coverage increases bonded phase chemical stability. Max temp: 60 °C (low pH)/40 °C (high pH)	Excellent separation selectivity for aromatic and polar compounds.
	Ultisil Phenyl-Ether (pH 2.0-8.0) 	■ Embedded ether groups in linear alkane chains; compatible with 100% aqueous phases. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for ephedra, luteolin glycosides in honeysuckle, and mixed polar and aromatic compounds; low UV and MS baseline noise.
	Listed in the USP Database Ultisil PFP (pH 2.0-8.0) 	■ Fluorine atoms replace hydrogen atoms on the bonded carbon chain, providing high selectivity for fluorinated and halogenated compounds. Max temp: 60 °C (low pH)/40 °C (high pH)	Optimized for paclitaxel (USP), anthocyanins, and compounds challenging to separate with alkyl-bonded phases; combines phenyl column traits with enhanced ion-exchange and polarity interactions, offering exceptional geometric and stereochemical selectivity.
	Xtimate Phenyl-Hexyl (pH 1.0-12.5) 	■ Xtimate-modified silica gel with hexyl (six-carbon) high-density bonding. ■ Significantly reduces stationary phase hydrolysis and improves chemical stability. Max temp: 70 °C (low pH)/40 °C (high pH)	Excellent for valacyclovir hydrochloride, phenyl-containing, and short-chain alkyl compounds; strong retention for polar and amine compounds; preferred phenyl column for MS and ELSD detection.
C4 (L26) Butyl silane	Xtimate C4 (pH 1.0-12.5) 	■ Utilizes Xtimate-modified silica gel with all the benefits of the Xtimate series. Max temp: 70 °C (low pH)/40 °C (high pH)	Preferred choice for MS and ELSD detectors.

Mixed-Mode

USP	Column	Features	Applications
C18+SCX	Ultisil MM C18/SCX (pH 2.0-8.0)	■ Combines the mechanisms of strong cation exchange and hydrophobic interaction. ■ Enables direct mass spectrometry analysis without the need for ion-pair reagents in the mobile phase. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for melamine analysis; Ideal for the study of unknown compounds, particularly in metabolite research.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

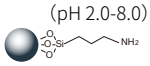
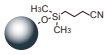
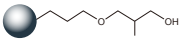
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HPLC Columns and Consumables Selection Chart

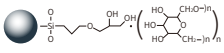
Welch Materials

Normal Phase

USP	Column	Features	Applications
SiO_2 (L3) Silica	Ultisil SiO_2 (pH 2.0-8.0) 	■ Made from type-B ultra-pure, fully porous spherical silica gel (purity > 99.999%). ■ Exhibits low acidity and minimal metal content. Max temp: 70 °C (low pH)/40 °C (high pH)	Suitable for both normal and reversed-phase modes, particularly effective for separating polar compounds prone to tailing; ideal for the separation of highly polar and lipophilic compounds.
NH_2 (L8) Amino/ Aminopropyl	Ultisil XB-NH_2 (pH 2.0-8.0) 	■ Designed for normal-phase, reversed-phase, and weak anion-exchange applications. Max temp: 70 °C (low pH)/40 °C (high pH)	Excellent for lactose, acetyl-L-carnitine, lactulose, acarbose, and matrine injection.
CN (L10) Cyano/ Cyanopropyl	Listed in the USP Database Ultisil XB-CN (pH 2.0-8.0) 	■ Ideal for compounds with no retention or excessive retention on C18 columns. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for olanzapine, oxiracetam, carbamazepine; in reversed-phase mode, offers unique selectivity for polar compounds and excellent peak shapes for strongly basic compounds, including ammonium salts.
Diol (L20) Diol/ Dihydroxypropanol	Ultisil Diol (pH 2.0-8.0) 	■ A superior normal-phase column with significantly improved stability and reproducibility compared to silica and amino columns. Max temp: 70 °C (low pH)/40 °C (high pH)	Ideal for ibuprofen sodium chloride, propofol, arginine, tacrolimus, dextrorphan, and arginine in ceftazidime injections.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

Size Exclusion

USP	Column	Features	Applications
SEC (L33/L59) Hydrophilic spherical silica gel	Xtimate SEC-120 (pH 2.0-7.5) 	■ Based on porous silica particles with surfaces derivatized by glycol-functional ligands, preventing interactions with proteins. ■ Dual bonding mechanism minimizes nonspecific adsorption of water-soluble polymers, proteins, enzymes, peptides, and other biological samples. ■ Widely applicable for the separation and analysis of water-soluble polymers and biological macromolecules. Max temp: 80 °C	Protein molecular weights: 500-150,000 Water-soluble polymers: 500-25,000
	Xtimate SEC-300 (pH 2.0-7.5)		Protein molecular weights: 5,000 – 1,250,000 Water-soluble polymers: 1,000-100,000
	Xtimate SEC-500 (pH 2.0-7.5)		Protein molecular weights: 10,000-3,500,000 Water-soluble polymers: 2,000-500,000

Note：200Å, 700Å, 1000Å, and 2000Å versions are also available for your inquiry.

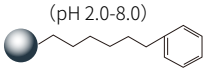
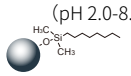
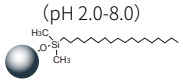
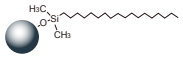
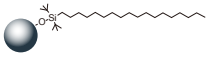
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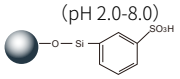
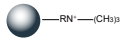
HPLC Columns and Consumables Selection Chart

Welch Materials

Core-Shell

USP	Column	Features	Applications
Phenyl (L11)	Boltimate Phenyl-Hexyl (pH 2.0-8.0) 	■ Phenyl-hexyl bonded core-shell HPLC column. Max temp: 60 °C (low pH)/40 °C (high pH)	Offers unique retention capabilities for aromatic hydrocarbons.
C8 (L7)	Boltimate C8 (pH 2.0-8.0) 	■ General-purpose C8 core-shell column. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for the analysis of various non-polar compounds, providing excellent peak shapes for acidic, basic, and neutral compounds.
C18 (L1)	Boltimate C18 (pH 2.0-8.0) 	■ General-purpose C18 core-shell column with high resolution. Max temp: 60 °C (low pH)/40 °C (high pH)	Provides appropriate retention for acidic, basic, and neutral compounds.
	Boltimate EXT-C18 (pH 1.5-12.0) 	■ Organic-inorganic hybridized porous layer, resistant to high pH.. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for high pH, high aqueous, and high-salt conditions.
	Boltimate LP-C18 (pH 1.0-8.0) 	■ Designed with side-chain steric protection, effectively shielding hydroxyl groups without requiring end-capping. ■ Offers high selectivity in spatial positioning, displaying strong orthogonality to traditional C18 columns. Max temp: 60 °C (low pH)/40 °C (high pH)	Preferred for strong acids, high aqueous phases, and ELSD or MS detection.

Ion-Exchange

USP	Column	Features	Applications
SCX(L9) Sulfonic acid group	Ultiail XB-SCX (pH 2.0-8.0) 	■ Silica-based column with aromatic sulfonic acid groups as the bonded phase. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for the separation of basic or water-soluble compounds such as basic amino acids, aniline, pharmaceutical salts, and nucleotides.
SAX(L14) Quaternary ammonium group	Ultisil XB-SAX (pH 2.0-8.0) 	■ Constructed with ammonium-functionalized silanes for anion exchange chromatography. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for the analysis of pesticides, herbicides, pharmaceuticals, biological samples (e.g., nucleotides and thioglycosides), organic acids, and terephthalic acid.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

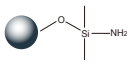
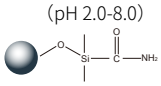
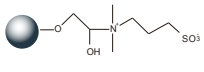
HPLC Columns and Consumables Selection Chart

Welch Materials

Ion-Exchange

USP	Column	Features	Applications
H^+(L22/L17) Sulfonated polystyrene divinylbenzene hydrogen type	Xtimate Sugar-H (pH 1.0-3.0) 	■ Ion exclusion chromatography material made from hydrogenated sulfonated polystyrene/ divinylbenzene for strong cation exchange. Max temp: 95 °C	Complies with USP 25 and Chinese Pharmacopoeia 2015 standards; resistant to acid and high temperatures, with improved efficiency at elevated column temperatures. Suitable for the separation of organic acids and sugars.
Ca^{2+}(L19) Sulfonated polystyrene divinylbenzene calcium type	Xtimate Sugar-Ca (pH 5.0-9.0) 	■ Packed with calcium-modified polystyrene/ divinylbenzene resins. Max temp: 95 °C	Ideal for quality control of sugar products and monitoring the reduction of fermentation sugars and production of ethanol during the alcohol fermentation process.

HILIC

USP	Column	Features	Applications
SiO_2 (L3)	Ultisil HILIC Silica (pH 2.0-8.0) 	■ Specially treated silica-based material designed for high aqueous-phase separations of highly polar compounds, offering excellent stability and extended column life. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for determining the content of glutamine-leucine dipeptides.
NH_2 (L8)	Ultisil HILIC-NH_2 (pH 2.0-8.0) 	■ Hydrophilic-treated silica with weak anion-exchange interactions and hydrophilic partitioning properties. Max temp: 60 °C (low pH)/40 °C (high pH)	Provides better stability and reproducibility for mixed monosaccharides compared to XB-NH_2; suitable for separating impurities in glycopyrronium bromide and alanine-glutamine injection.
Amide(L68) Polyacrylamide	Ultisil HILIC Amide (pH 2.0-8.0) 	■ Similar separation properties to HILIC-NH_2 but offers unique selectivity and longer column life. Max temp: 60 °C (low pH)/40 °C (high pH)	Suitable for L-carnitine and vitamin C; exhibits low carryover in ELSD and MS detection.
Amphion (Zwitterionic column)	Ultisil HILIC Amphion II (pH 2.0-8.0) 	■ Features patented covalent bonding of zwitterionic functional groups, eliminating the need for ion-pair reagents. Max temp: 60 °C (low pH)/40 °C (high pH)	Ideal for separating allantoin, melamine, aliphatic amino acids, dicyandiamide, oxalic acid, and 5-azacytosine.

Note: "low pH" and "high pH" refer to mobile phases of ⩽6.5 and ＞6.5, respectively.

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HPLC Columns and Consumables Selection Chart

Welch Materials

Ghost-buster Column

The Ghost-Buster Column is installed between the gradient mixer and the injector, effectively removing impurities from the mobile phase and mixers to eliminate ghost peaks. To minimize extra-column dead volume, the column is available in a range of IDs, including 2.1 mm, 3.0 mm, 4.0 mm, 4.6 mm, and 7.8 mm, catering to various analytical needs.



Precolumn Filter

ColumnShield Precolumn Filter



In-Line Precolumn Filter



Guard Column

Positioned ahead of the analytical column, guard columns protect against contamination and damage by adsorbing strongly retained, highly acidic, or highly basic substances from the mobile phase or samples.
Available in ID of 2.1 mm, 4.6 mm, 10 mm, 30 mm, and 50 mm.

Stand Alone Guard Column



Direct Connect Guard Column



Syringe Filter

P/N	Description	P/N	Description
S13PTL022E	PTFE/L 13mm*0.22μm 100/pk	S13NY022E	NY 13mm*0.22μm 100/pk
S25PVL022E	PVDF/L 25mm*0.22μm 100/pk	S13NY045E	NY 13mm*0.45μm 1000/pk
S25PTB045E	PTFE 25mm*0.45μm 100/pk	S25NY045E	NY 25mm*0.45μm 500/pk
S13PVB022E	PVDF 13mm*0.22μm 100/pk	S13MCE022E	MCE 13mm*0.22μm 100/pk
S13PES022E	PES 13mm*0.22μm 100/pk	S13MCE045E	MCE 13mm*0.45μm 100/pk
S25PES045E	PES 25mm*0.45μm 100/pk	S25MCE022E	MCE 25mm*0.22μm 100/pk
S25NY022E	NY 25mm*0.22μm 100/pk	S25MCE045E	MCE 25mm*0.45μm 100/pk

*Please contact us for more specifications!

Membrane Filter

P/N	Description
M47MCE022	MCE 47mm*0.22μm 50/pk
M47MCE045	MCE 47mm*0.45μm 50/pk
M47NY022	NY 47mm*0.22μm 100/pk
M47NY045	NY 47mm*0.45μm 100/pk
M47PTL022	PTFE/L 47mm*0.22μm 100/pk

*Please contact us for more specifications!

Sample Vial

P/N	Product Name	Descriptipn
DQ1018	Sample vial	2mL Clear Glass 12×32mm Flat Base 9-425 Screw Thread Vial with Label, 100pcs/pk.
DQ1111	Sample vial	2mL Amber Glass 12×32mm Flat Base 9-425 Screw Thread Vial with Label, 100pcs/pk.
DR1111	Cap + septum	9-425 Black Open Top Ribbed Screw Cap with Red PTFE/White Silicone Septa. 100pcs/pk.
DR1144	Cap + septum	9-425 Blue Open Top Screw Cap bonded with Red PTFE/White Silicone Septa. 100pcs/pk.
DR1148	Cap + septum	9-425 Blue Open Top Screw Cap with 9 mm Red PTFE/White Silicone Septa. Pre-Slit. 100pcs/pk.
DD1171	Insert	6×29mm Insert Clear Glass Conical Base with Polyspring. 100pcs/pk.
DE1136	Headspace vial	20mL Clear Glass 22.5×75mm Crimp Headspace Vial. 20mm Beveled Edge. Flat Bottom. 100pcs/pk.
DS1171	Sample vial kit	2mL Clear 9-425 Vial with Label. Blue Cap with Red PTFE/White Silicone Septa, PRE-SLIT. 100pcs/pk.
DS1170	Sample vial kit	2mL Clear 9-425 Vial with Label. Blue Cap with Red PTFE/White Silicone Septa, UltraClean. 100pcs/pk.











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