Ultra HPLC Columns: 3 or 5 µm particles; 100 Å pore size

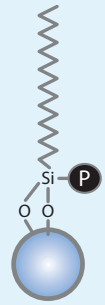
The Ultra line represents Restek's broadest selection of stationary phases on a single silica support. Made of high-purity, type-B silica that minimizes activity and creates high-density bonding, these columns are designed for selective and reliable HPLC applications.

Ultra Aqueous C18 Columns (USP L1)

Chromatographic Properties

The Restek® Aqueous C18 is a rugged, reversed-phase column with a well-balanced retention profile. It can effectively retain more types of solutes than a conventional C18 and is ideal for multicomponent LC-MS analyses. The general-purpose Aqueous C18 boasts high reproducibility and compatibility with many mobile phase conditions—even 100% aqueous. And when used with a gradient, it eliminates the all-too-common issue of multiple compounds eluting near the column void time.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9178332	917833E	9178335
50 mm	9178352	917835E	9178355
100 mm	9178312	917831E	9178315
150 mm	9178362	917836E	9178365
5 µm Columns			
30 mm	9178532	917853E	9178535
50 mm	9178552	917855E	9178555
100 mm	9178512	917851E	9178515
150 mm	9178562	917856E	9178565
200 mm	9178522	917852E	9178525
250 mm	9178572	917857E	9178575

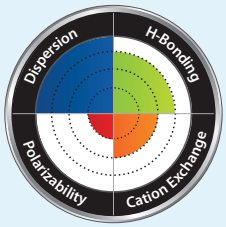


Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	15%
end-cap:	no
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L1
phase category:	modified C18
ligand type:	proprietary polar modified and functionally bonded C18

Aqueous C18

USLC® Column Interaction Profile
(See page 161 for more information.)

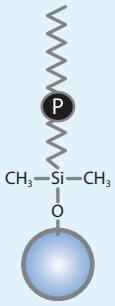


Ultra IBD Columns (USP L68)

Chromatographic Properties

The Restek® IBD is a polar-embedded column that acts as a strong hydrogen bonder and may be the most versatile column available today. With a unique polar group, this column is very retentive and selective for acids. It also provides symmetrical peak shape for strong bases. Restek's IBD is compatible with 100% aqueous mobile phases and can be used under reversed-phase or HILIC conditions to retain very polar, ionic compounds in highly organic mobile phases.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9175332	917533E	9175335
50 mm	9175352	917535E	9175355
100 mm	9175312	917531E	9175315
150 mm	9175362	917536E	9175365
5 µm Columns			
30 mm	9175532	917553E	9175535
50 mm	9175552	917555E	9175555
100 mm	9175512	917551E	9175515
150 mm	9175562	917556E	9175565
200 mm	9175522	917552E	9175525
250 mm	9175572	917557E	9175575



Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	12%
end-cap:	no
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L68
phase category:	polar-embedded alkyl
ligand type:	proprietary polar functional embedded alkyl

IBD

USLC® Column Interaction Profile
(See page 161 for more information.)

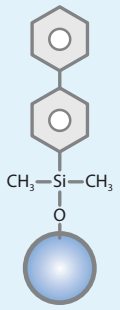
Ultra Biphenyl Columns (USP L11)

Chromatographic Properties

Since 2005, the Restek® Biphenyl has offered a greater degree of dispersion than conventional phenyls and a greater degree of polarizability than phenyl hexyls, creating higher selectivity and a greater range of usability. Because of these heightened interactions, this column shows substantial increases in retention—especially for dipolar, unsaturated, or conjugated solutes—and enhanced orthogonal selectivity when using methanol mobile phases. It is ideal for increasing sensitivity and selectivity in LC-MS analyses.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	15%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase:	L11
phase category:	phenyl
ligand type:	unique Biphenyl



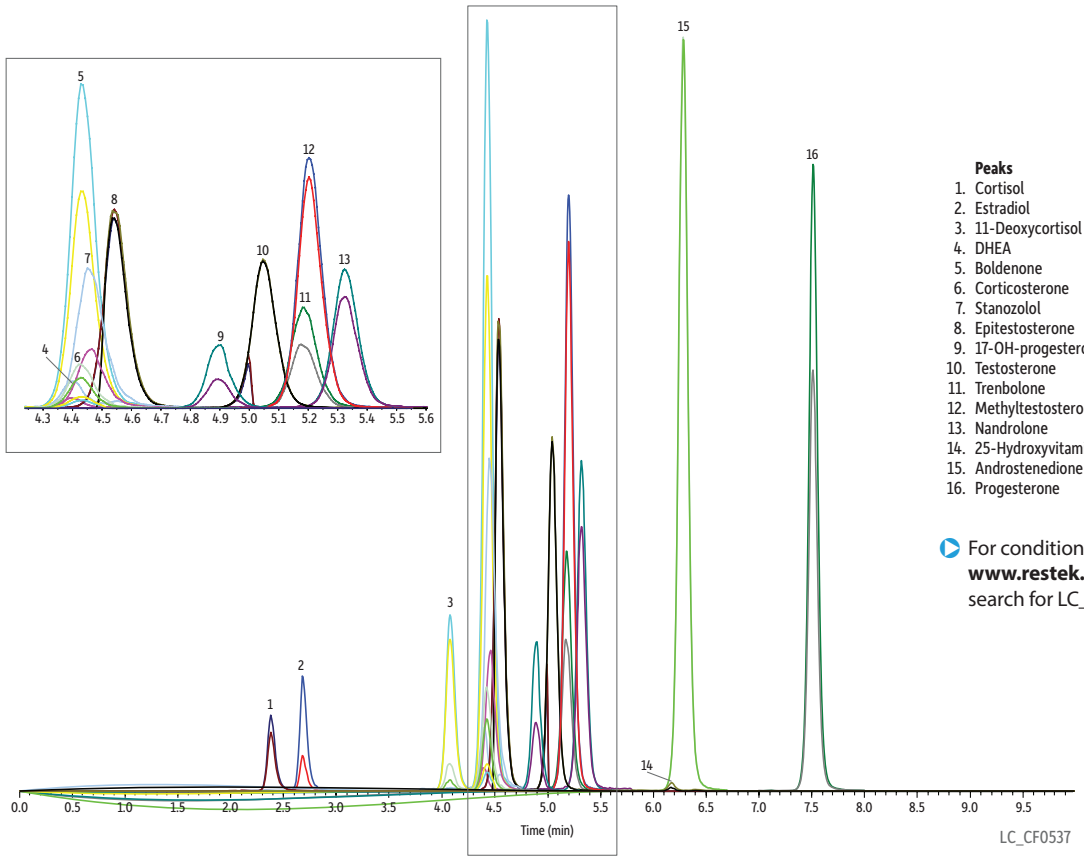
Biphenyl

USLC® Column Interaction Profile

(See page 161 for more information.)

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9109332	910933E	9109335
50 mm	9109352	910935E	9109355
100 mm	9109312	910931E	9109315
150 mm	9109362	910936E	9109365
5 µm Columns			
30 mm	9109532	910953E	9109535
50 mm	9109552	910955E	9109555
100 mm	9109512	910951E	9109515
150 mm	9109562	910956E	9109565
200 mm	9109522	910952E	9109525
250 mm	9109572	910957E	9109575

Steroid Panel Analysis on the Ultra Biphenyl



Peaks	tR (min)
1. Cortisol	2.3
2. Estradiol	2.6
3. 11-Deoxycortisol	4.0
4. DHEA	4.3
5. Boldenone	4.4
6. Corticosterone	4.4
7. Stanozolol	4.4
8. Epitestosterone	4.5
9. 17-OH-progesterone	4.8
10. Testosterone	5.0
11. Trenbolone	5.1
12. Methyltestosterone	5.1
13. Nandrolone	5.3
14. 25-Hydroxyvitamin D3	6.1
15. Androstenedione	6.2
16. Progesterone	7.5

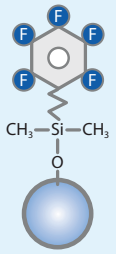
For conditions, visit **www.restek.com** and search for LC_CF0537.

Ultra PFP Propyl Columns (USP L43)

Chromatographic Properties

The Restek® PFP Propyl is a great choice for the retention and selectivity of charged bases, electronegative compounds, and amine-containing compounds. Unlike a conventional cyano column, the Restek® PFP Propyl is much more amenable to LC-MS because it is more reliable and efficient with acidic mobile phases. This versatile column is also compatible with highly aqueous mobile phases and HILIC separations.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9179332	917933E	9179335
50 mm	9179352	917935E	9179355
100 mm	9179312	917931E	9179315
150 mm	9179362	917936E	9179365
5 µm Columns			
30 mm	9179532	917953E	9179535
50 mm	9179552	917955E	9179555
100 mm	9179512	917951E	9179515
150 mm	9179562	917956E	9179565
200 mm	9179522	917952E	9179525
250 mm	9179572	917957E	9179575



Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	11%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L43
phase category:	fluorophenyl propyl
ligand type:	pentafluorophenyl propyl

PFP Propyl

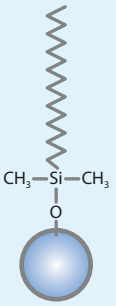
USLC® Column Interaction Profile
(See page 161 for more information.)

Ultra C18 Columns (USP L1)

Chromatographic Properties

The general-purpose Restek® C18 is a conventional monomeric octadecylsilane column suitable for analyses of a wide range of compounds from acidic through slightly basic.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns				
30 mm	9174332	917433E	—	9174335
50 mm	9174352	917435E	—	9174355
100 mm	9174312	917431E	—	9174315
150 mm	9174362	917436E	—	9174365
5 µm Columns				
30 mm	9174532	917453E	—	9174535
50 mm	9174552	917455E	—	9174555
100 mm	9174512	917451E	9174514	9174515
150 mm	9174562	917456E	9174564	9174565
200 mm	9174522	917452E	—	9174525
250 mm	9174572	917457E	—	9174575



Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	20%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L1
phase category:	C18, octadecylsilane
ligand type:	monomeric C18

C18

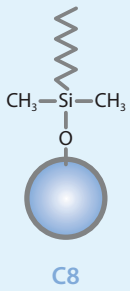
Ultra C8 Columns (USP L7)

Chromatographic Properties

Our C8 is a conventional monomeric octylsilane column offering a shorter alkyl chain to provide less hydrophobic retention and improved basic peak shape over a traditional C18 phase. Like our C18, this general-purpose Restek® C8 is suitable for a wide range of compounds from acidic through slightly basic.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	12%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L7
phase category:	C8, octylsilane
ligand type:	monomeric C8



Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns				
30 mm	9103332	910333E	—	9103335
50 mm	9103352	910335E	—	9103355
100 mm	9103312	910331E	—	9103315
150 mm	9103362	910336E	—	9103365
5 µm Columns				
30 mm	9103532	910353E	—	9103535
50 mm	9103552	910355E	—	9103555
100 mm	9103512	910351E	9103514	9103515
150 mm	9103562	910356E	9103564	9103565
200 mm	9103522	910352E	—	9103525
250 mm	9103572	910357E	—	9103575

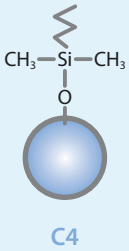
Ultra C4 Columns (USP L26)

Chromatographic Properties

Exceptionally stable C4 packing with high bonding coverage and base deactivation. Less retention than C18 or C8 phases.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	9%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L26
phase category:	C4, butylsilane
ligand type:	monomeric C4



Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9102332	910233E	9102335
50 mm	9102352	910235E	9102355
100 mm	9102312	910231E	9102315
150 mm	9102362	910236E	9102365
5 µm Columns			
30 mm	9102532	910253E	9102535
50 mm	9102552	910255E	9102555
100 mm	9102512	910251E	9102515
150 mm	9102562	910256E	9102565
200 mm	9102522	910252E	9102525
250 mm	9102572	910257E	9102575

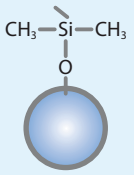
Our LC Manufacturing experts follow tightly controlled processes to ensure that you receive robust and reliable columns every time you order from Restek.

Ultra C1 Columns (USP L13)

Chromatographic Properties

This exceptionally stable C1 phase features our least-retentive reversed-phase hydrocarbon packing.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9101332	910133E	9101335
50 mm	9101352	910135E	9101355
100 mm	9101312	910131E	9101315
150 mm	9101362	910136E	9101365
5 µm Columns			
30 mm	9101532	910153E	9101535
50 mm	9101552	910155E	9101555
100 mm	9101512	910151E	9101515
150 mm	9101562	910156E	9101565
200 mm	9101522	910152E	9101525
250 mm	9101572	910157E	9101575



C1

Column Characteristics:

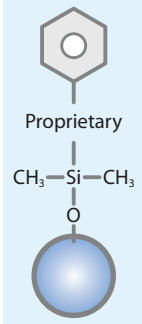
particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	5%
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L13
phase category:	trimethylsilane
ligand type:	monomeric C1

Ultra Aromax Columns (USP L11)

Chromatographic Properties

Ultra Aromax is a unique reversed-phase material that exhibits extreme retention and selectivity for aromatic and/or unsaturated compounds. This column is a great alternative to our Biphenyl phase when increased retention is required, and it's an excellent choice for gradient LC-MS analyses when conventional columns are not giving adequate retention or selectivity.

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9127332	912733E	9127335
50 mm	9127352	912735E	9127355
100 mm	9127312	912731E	9127315
150 mm	9127362	912736E	9127365
5 µm Columns			
30 mm	9127532	912753E	9127535
50 mm	9127552	912755E	9127555
100 mm	9127512	912751E	9127515
150 mm	9127562	912756E	9127565
200 mm	9127522	912752E	9127525
250 mm	9127572	912757E	9127575



Aromax

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	17%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L11
phase category:	phenyl
ligand type:	proprietary phenyl ligand

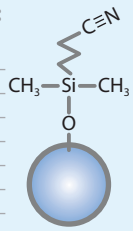
Ultra Cyano Columns (USP L10)

Chromatographic Properties

The Restek® Cyano is a traditional monomeric cyanopropylsilane that is recommended for assays where alternate selectivity, or confirmation, to a C18 or C8 column is desired. It can be used in normal-phase, reversed-phase (best with mobile phase pH between 5 and 7), and HILIC modes. It is an excellent choice for the analysis of protonated bases.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	8%
end-cap:	yes
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L10
phase category:	cyano
ligand type:	cyanopropylsilane



Cyano

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9106332	910633E	9106335
50 mm	9106352	910635E	9106355
100 mm	9106312	910631E	9106315
150 mm	9106362	910636E	9106365
5 µm Columns			
30 mm	9106532	910653E	9106535
50 mm	9106552	910655E	9106555
100 mm	9106512	910651E	9106515
150 mm	9106562	910656E	9106565
200 mm	9106522	910652E	9106525
250 mm	9106572	910657E	9106575

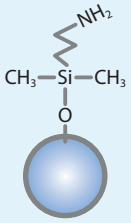
Ultra Amino Columns (USP L8)

Chromatographic Properties

The general-purpose Restek® Amino is an aminopropylsilane that offers reproducible retention and efficiency. It is a great choice for the normal-phase or HILIC analysis of simple sugars.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
carbon load:	2%
end-cap:	no
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L8
phase category:	amino
ligand type:	aminopropylsilane



Amino

Length	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns		
30 mm	910733E	9107335
50 mm	910735E	9107355
100 mm	910731E	9107315
150 mm	910736E	9107365
5 µm Columns		
30 mm	910753E	9107535
50 mm	910755E	9107555
100 mm	910751E	9107515
150 mm	910756E	9107565
200 mm	910752E	9107525
250 mm	910757E	9107575

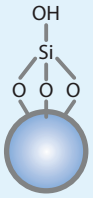
Ultra Silica Columns (USP L3)

Chromatographic Properties

Base-deactivated spherical silica is useful for normal-phase or HILIC separations.

Column Characteristics:

particle size:	3 µm or 5 µm, spherical
pore size:	100 Å
end-cap:	no
pH range:	2.5 to 8
temperature limit:	80 °C
USP phase code:	L3
phase category:	bare silica
ligand type:	none



Silica

Length	2.1 mm ID cat.#	3.0 mm ID cat.#	4.6 mm ID cat.#
3 µm Columns			
30 mm	9100332	910033E	9100335
50 mm	9100352	910035E	9100355
100 mm	9100312	910031E	9100315
150 mm	9100362	910036E	9100365
5 µm Columns			
30 mm	9100532	910053E	9100535
50 mm	9100552	910055E	9100555
100 mm	9100512	910051E	9100515
150 mm	9100562	910056E	9100565
200 mm	9100522	910052E	9100525
250 mm	9100572	910057E	9100575