

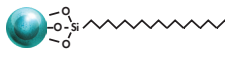

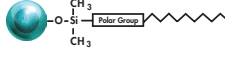


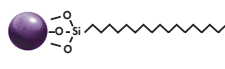
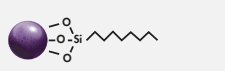

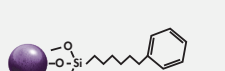


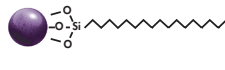
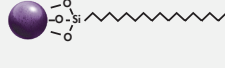
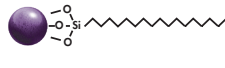
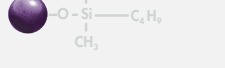

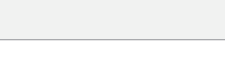
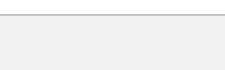


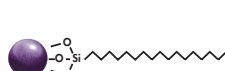
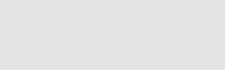
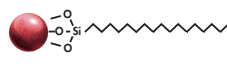

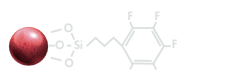
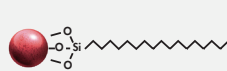
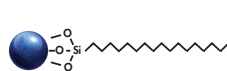

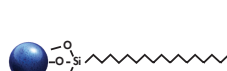
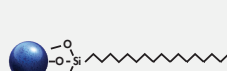
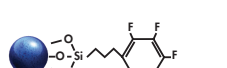
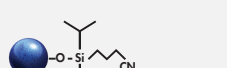


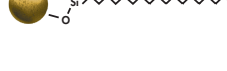


WATERS COLUMNS AND ANALYTICAL STANDARDS AND REAGENTS SELECTION GUIDE

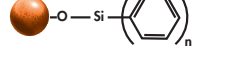
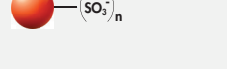
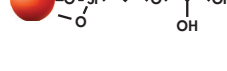
Waters' comprehensive family of columns offer scientists a diverse range of selectivity and particle size choices that provide exceptional scalability within UPLC, UHPLC, HPLC, and preparative LC applications. In addition, Waters' growing family of QC Reference Materials and application-specific standards help users to effortlessly confirm column and system performance.

CORTECS UPLC, UHPLC, and HPLC Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
C₁₈+ UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		2.4 µmol/m ²	5.7%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
C₁₈ UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		2.7 µmol/m ²	6.6%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
T3 UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		1.6 µmol/m ²	4.7%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
C₈ UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		3.4 µmol/m ²	4.5%	Yes	L7	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Shield RP18 UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		3.2 µmol/m ²	6.4%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Phenyl UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		3.2 µmol/m ²	5.9%	Yes	L11	2-8	Low pH = 45 °C High pH = 45 °C	100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
HILIC UPLC: 1.6 µm UHPLC: 2.7 µm HPLC: 2.7 µm		N/A	Unbonded	No	L3	1-5	Low pH = 45 °C High pH = 45 °C	100 m ² /g	HILIC QC Reference Material P/N: 186007226	HILIC QC Reference Material P/N: 186007226
Performance Benefits: High efficiency column designed for retention of extremely polar, basic, water-soluble analytes.										

ACQUITY UPLC and XBridge HPLC/UHPLC Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
BEH C₁₈ UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5, 10 µm		3.1 µmol/m ²	18%	Yes	L1	1-12	Low pH = 80 °C High pH = 60 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
BEH C₈ UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5, 10 µm		3.2 µmol/m ²	13%	Yes	L7	1-12	Low pH = 60 °C High pH = 60 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
BEH Shield RP18 UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5, 10 µm		3.3 µmol/m ²	17%	Yes	L1	2-11	Low pH = 50 °C High pH = 45 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
BEH Phenyl UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		3.0 µmol/m ²	15%	Yes	L11	1-12	Low pH = 80 °C High pH = 60 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
BEH HILIC UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		N/A	Unbonded	No	L3	1-9	Low pH = 45 °C High pH = 45 °C	185 m ² /g	HILIC QC Reference Material P/N: 186007226	HILIC QC Reference Material P/N: 186007226
BEH Amide UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		7.5 µmol/m ²	12%	No	L68	2-11	Low pH = 90 °C High pH = 90 °C	185 m ² /g	HILIC QC Reference Material P/N: 186007226	HILIC QC Reference Material P/N: 186007226
Amino Acid BEH C₁₈, 130 Å UPLC: 1.7 µm		3.1 µmol/m ²	18%	Yes	L1	1-12	Low pH = 80 °C High pH = 60 °C	185 m ² /g	Amino Acids Standard P/N: WAT088122 MassPREP OST Standard P/N: 186004135	Amino Acids Standard P/N: WAT088122 MassPREP OST Standard P/N: 186004135
Peptide BEH C₁₈, 130 Å UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5, 10 µm		3.1 µmol/m ²	18%	Yes	L1	1-12	Low pH = 80 °C High pH = 60 °C	185 m ² /g	Cytochrome c Digestion Standard P/N: 186006371	Peptide Retention Standard P/N: 186006555
Peptide BEH C₁₈, 300 Å UPLC: 1.7 µm HPLC: 3.5, 5, 10 µm		3.1 µmol/m ²	12%	Yes	L1	1-12	Low pH = 80 °C High pH = 60 °C	90 m ² /g	Cytochrome c Digestion Standard P/N: 186006371	Peptide Retention Standard P/N: 186006555
Protein BEH C₄, 300 Å UPLC: 1.7 µm HPLC: 3.5, 5, 10 µm		2.4 µmol/m ²	8%	No	L26	1-10	Low pH = 80 °C High pH = 50 °C	90 m ² /g	MassPREP Protein Standard Mix P/N: 186004900	MassPREP Protein Standard Mix P/N: 186004900
Protein BEH SEC, 125 Å UPLC: 1.7 µm UHPLC: 2.5 µm HPLC: 3.5 µm		4.9 µmol/m ²	15%	No	L33	1-8	Low pH = 60 °C High pH = 60 °C	395 m ² /g	BEH125 Protein Standard Mix P/N: 186006519	BEH125 Protein Standard Mix P/N: 186006519
Protein BEH SEC, 200 Å UPLC: 1.7 µm UHPLC: 2.5 µm HPLC: 3.5 µm		5.5 µmol/m ²	12%	No	L33	1-8	Low pH = 60 °C High pH = 60 °C	220 m ² /g	BEH200 SEC Protein Standard Mix P/N: 186006518	BEH200 SEC Protein Standard Mix P/N: 186006518
Protein BEH SEC, 450 Å UPLC: 2.5 µm HPLC: 3.5 µm		4.8 µmol/m ²	9%	No	L33	1-8	Low pH = 60 °C High pH = 60 °C	80 m ² /g	BEH450 SEC Protein Standard Mix P/N: 186006842	BEH450 SEC Protein Standard Mix P/N: 186006842
Oligonucleotide BEH C₁₈, 130 Å UPLC: 1.7 µm UHPLC: 2.5 µm		3.1 µmol/m ²	18%	Yes	L1	1-12	Low pH = 80 °C High pH = 60 °C	185 m ² /g	MassPREP OST Standard P/N: 186004135	MassPREP OST Standard P/N: 186004135
Glycan BEH Amide, 130 Å UPLC: 1.7 µm UHPLC: 2.5 µm HPLC: 3.5 µm		7.15 µmol/m ²	N/A	No	L68	2-11	Low pH = 90 °C High pH = 90 °C	194 m ² /g	Glycan Performance Test Standard P/N: 186006349	Glycan Performance Test Standard P/N: 186006349 Dextran Calibration Standard P/N: 186006841
Glycoprotein BEH Amide, 300 Å UPLC: 1.7 µm		7.15 µmol/m ²	N/A	No	L68	2-11	Low pH = 90 °C High pH = 90 °C	93 m ² /g	Glycoprotein Performance Test Standard P/N: 186008010	Glycoprotein Performance Test Standard P/N: 186008010
Glycan BEH C₁₈ AX, 95 Å UPLC: 1.7 µm UHPLC: 2.5 µm		1.6 µmol/m ²	17%	Yes	L78	2-10	Low pH = 60 °C High pH = 60 °C	270 m ² /g	Sialylated Glycan Performance Test Standard P/N: 186007983	Sialylated Glycan Performance Test Standard P/N: 186007983
Performance Benefits: Excellent retention of polar acidic analytes, and an alternative selectivity compared to traditional C ₁₈ phases. LC column that is designed for acidic glycan analysis. Specifically QC tested with sialylated glycan performance standard.										

ACQUITY UPLC and XSelect HPLC/UHPLC Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
CSH C₁₈ UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5, 10 µm		2.3 µmol/m ²	15%	Yes	L1	1-11	Low pH = 80 °C High pH = 45 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
CSH Phenyl-Hexyl UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		2.3 µmol/m ²	14%	Yes	L11	1-11	Low pH = 80 °C High pH = 45 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
CSH Fluoro-Phenyl UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		2.3 µmol/m ²	10%	No	L43	1-8	Low pH = 60 °C High pH = 45 °C	185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Peptide CSH C₁₈, 130 Å UPLC: 1.7 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		2.3 µmol/m ²	15%	Yes	L1	1-11	Low pH = 80 °C High pH = 45 °C	185 m ² /g	Cytochrome c Digestion Standard P/N: 186006371	Peptide Retention Standard P/N: 186006555
HSS C₁₈ UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		3.2 µmol/m ²	15%	Yes	L1	1-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
HSS C₁₈ SB UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		1.6 µmol/m ²	8%	No	L1	2-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
HSS T3 UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		1.6 µmol/m ²	11%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Peptide HSS T3, 100 Å UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		1.6 µmol/m ²	11%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Cytochrome c Digestion Standard P/N: 186006371	Peptide Retention Standard P/N: 186006555
HSS PFP UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		3.2 µmol/m ²	7%	No	L43	2-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
HSS CN UPLC: 1.8 µm UHPLC: 2.5 µm XP HPLC: 3.5, 5 µm		2.0 µmol/m ²	5%	No	L10	2-8	Low pH = 45 °C High pH = 45 °C	230 m ² /g	Neutrals QC Reference Material P/N: 186006360	-
Performance Benefits: Sterically hindered, mono-functional cyanopropyl, non-encapped, bonded to a High Strength Silica (HSS) substrate.										

SunFire HPLC Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
Silica C₁₈ HPLC: 3.5, 5, 10 µm		1.6 µmol/m ²	14%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	330 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Silica HILIC HPLC: 3, 5 µm		No	Unbonded	No	L3	1-5	Low pH = 45 °C High pH = 45 °C	330 m ² /g	HILIC QC Reference Material P/N: 186007226	HILIC QC Reference Material P/N: 186007226
Silica dC₁₈ HPLC: 3, 5, 10 µm		1.6 µmol/m ²	12%	Yes	L1	3-7	Low pH = 45 °C High pH = 45 °C	330 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
Performance Benefits: Retention of polar compounds. Designed for compatibility with 100% aqueous mobile phases.										

BioResolve UPLC, UHPLC and HPLC Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
RP mAb Polyphenyl UPLC: 2.7 µm UHPLC: 2.7 µm HPLC: 2.7 µm		5.5 µmol/m ²	0.95%	Yes	L11	2-7	Low pH = 90 °C High pH = 50 °C	22.2 m ² /g	mAb Subunit Standard P/N: 186008927	mAb Subunit Standard P/N: 186008927
SCX mAb UPLC: 3 µm UHPLC: 3 µm HPLC: 3 µm		N/A	N/A	N/A	N/A	2-12	Recommended to maintain at 30 °C	2-3 m ² /g	mAb Charge Variant Standard P/N: 186009057	mAb Charge Variant Standard P/N: 186009057
SEC mAb UPLC: 3 µm UHPLC: 3 µm HPLC: 3 µm		5.5 µmol/m ²	12%	No	L33	1-8	Low pH = 60 °C High pH = 60 °C	220 m ² /g	mAb Size Variant Standard P/N: 186009429	mAb Size Variant Standard P/N: 186009429
Performance Benefits: Specifically designed and QC tested for reliable SEC separations of monoclonal antibody (mAb) aggregates, monomers, and fragments on any LC platform.										

Select column configurations for chemistries that show the MaxPeak™ Premier symbol are available in the MaxPeak Premier Column format. The MaxPeak Premier Columns utilize MaxPeak High Performance Surface (HPS) Technology which increases reproducibility, improves peak shape, and enables more accurate recovery by minimizing unwanted analyte/surface interactions.

► Waters Analytical Standards and Reagents eCatalog [asr.waters.com](https://www.waters.com)

Primary Manufacturer of Chromatographic Media

- Waters maintains a Quality Management System in compliance with ISO 9001:2008.
- Waters owns and controls every step of the process, from raw materials to final product (few suppliers are capable of doing this). Understanding and controlling our processes makes the difference in product performance in your laboratory.

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