

Particle/Ligand







Neutrals QC

Reversed-Phase QC









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

GTxResolve

SEC 450 Å

UPLC: 2.5 µm

SEC 1000 Å

UPLC: 3 µm

HPLC/UHPLC Columns

GTxResolve™ Premier

GTxResolve™ Premier BEH

HPLC: 2.5 µm

HPLC: 3 µm

Particle/Ligand

4.8 µmol/m²

1.9 µmol/m²

medium sized nucleic acids.

improved MALS sensitivity.

1.25%

Optimum Bed Density (OBD™) Preparative Columns streamline the successful transition from analysis to lab-scale separation.

The OBD Column design and packing process results in predictable, uniform density profiles throughout the column (akin to the density of analytical columns). Achieve fast and efficient scale-ups with select, robust particles designed for the challenges of purification. Those options are represented in this guide with the triangle symbol and the available particle sizes designated by 'PREP'. Visit waters.com/prep to discover more about Waters OBD Technology, access the column mass loading chart or get scale-up aid with the Preparative OBD Column Calculator.



The MaxPeak™ Premier Columns utilize MaxPeak High Performance Surfaces (HPS) Technology which increases reproducibility, improves peak shape, and enables more accurate recovery by minimizing unwanted analyte/surface interactions. These columns are available in select column configurations and particle sizes. Those options are represented in this guide with the hexagon symbol and the available particle sizes written in bold and blue. Visit waters.com/tothemax to learn more about MaxPeak HPS Technology.

C ₁₈ +		-0	2.4 μmol/m²	5.7%	Yes	L1	2-8	Low pH = $60 ^{\circ}\text{C}$ High pH = $45 ^{\circ}\text{C}$ 100 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7, 5 μm	si ~~~~~	efficiency. A charge basic compounds a	ed-surface-silica sol at low pH, especially	lid-core particle er ; in low concentrat	e column designed to m nables excellent peak sl tion modifier mobile ph	hape for	Bonding : Trifunctional C ₁₈ , fully endcapped, bonded to a charged surface-silica solid-core substrate.		
C ₁₈			Offers complement 2.7 µmol/m²	tary selectivity to tra 6.6%	aditional C ₁₈ colum	ns. L1	2-8	Low pH = 60 °C 100 m²/g	Neutrals QC	Reversed-Phase QC
•	UDI O OT 5	-0 -0-5i	Performance Bene	efits: General purpos	se reversed-phase	column designed to		Bonding: Trifunctional C ₁₈ , fully	Reference Material P/N: 186006360	Reference Material P/N: 186006363
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7, 5 μm		maximize efficiency at low- and mid-rar		d retention of acids	s, bases, and neutrals		endcapped bonded to a silica solid-core substrate.		
T3		@- ⁰ -^^^^	1.6 μmol/m²	4.7%	Yes	L1	2-8	Low pH = $60 ^{\circ}$ C High pH = $45 ^{\circ}$ C	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7, 5 μm	0-si ~~~~~	Performance Bene			le column designed to d non-polar compounds		Bonding: Intermediate T3 (C ₁₈) bonding and endcapping, bonded to		
<u> </u>			3.4 µmol/m²	4.5%	Yes	L7	2-8	a silica solid-core particle substrate. Low pH = 60 °C 100 m²/g	Neutrals QC	Reversed-Phase QC Reference Material
C ₈ UPLC: 1.6 μm	HPLC: 2.7 μm	°,'si ~~~~				ed to maximize efficience		High pH = 45 °C Bonding: Trifunctional C ₈ , fully	Reference Material P/N: 186006360	P/N: 186006363
UHPLC: 2.7 μm	Π					I to typical C ₁₈ phases.		endcapped, bonded to a silica solid-core substrate.		
Shield RP18		CH.	3.2 μmol/m²	6.4%	Yes	L1	2-8	Low pH = $60 ^{\circ}\text{C}$ High pH = $45 ^{\circ}\text{C}$ 100 m ² /g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7 μm	O Si Polor Group	maximum efficienc		ive selectivity wher	olumn designed to given compared to typical (Bonding : Monofunctional embedded polar C ₁₈ , fully endcapped, bonded to a silica	P/N: 186006360	P/N: 186006363
στι εσ. 2.7 μπ				<u> </u>				solid-core substrate.	Neutrals QC	Reversed-Phase QC
Phenyl		°	3.2 µmol/m² Performance Bene	5.9%	Yes nod development c	L11 olumn designed to give	2-8	High pH = 45 °C $100 \text{ m}^2/\text{g}$ Bonding: Trifunctional C ₆ phenyl,	Reference Material P/N: 186006360	Reference Material P/N: 186006363
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7 μm	ó		y as well as alternat			•	fully endcapped, bonded to a silica solid-core substrate.		
HILIC			N/A	Unbonded	No	L3	1-5	Low pH = $45 ^{\circ}$ C High pH = $45 ^{\circ}$ C 100 m ² /g	HILIC QC Reference Material	HILIC QC Reference Material
UPLC: 1.6 μm UHPLC: 2.7 μm	HPLC: 2.7 μm		Performance Bene polar, basic, water-s		y column designed	for retention of extrem	ely	Bonding: Unbonded, high-purity, silica solid-core substrate.	P/N: 186007226	P/N: 186007226
ACCUITY UE	N.O. and V.D. idea									
HPLC/UHPL	PLC and XBridge C Columns	Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Surface Limits Area	Performance Standards	Application Standards
BEH C ₁₈			3.1 µmol/m²	18%	Yes	L1	1–12	Low pH = 80 °C High pH = 60 °C 185 m^2/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
UPLC: 1.7 μm	HPLC: 3.5, 5, 10 μ	m -5°, si ~~~~~	development due	enefits: General purp e to extreme pH stab				Bonding : Trifunctional C ₁₈ , fully endcapped, bonded to an Ethylene	P/N: 186006360 Preparative	P/N: 186006363
UHPLC: 2.5 μm	PREP: 3.5, 5, 10 μ	m	range of compou					Bridged Hybrid (BEH) substrate.	Chromatography Mix P/N: 186006703	
BEH C ₈		-0	3.2 μmol/m²	13%	Yes	L7	1-12	Low pH = $60 ^{\circ}$ C High pH = $60 ^{\circ}$ C 185 m ² /g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5, 10 μ PREP: 5, 10 μm	o-si ~~~	C ₁₈ , suited for me		due to extreme pH	shorter retentivity than stability and applicabi		Bonding: Trifunctional C ₈ , fully endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.	Preparative Chromatography Mix	110000
BEH Shield R						11	O 11	Low pH = 50 °C	P/N: 186006703 Neutrals QC	Reversed-Phase QC
		O Si Polar Group				L1 to straight chain C ₁₈ ,	2-11	High pH = 45 °C Bonding: Monofunctional	Reference Material P/N: 186006360	Reference Material P/N: 186006363
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5, 10 μ PREP: 5, 10 μm	m cH ₃				0% aqueous-phase co	mposition.	embedded polar C ₁₈ , fully endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.	Preparative Chromatography Mix P/N: 186006703	
BEH Phenyl			3.0 μmol/m²	15%	Yes	L11	1-12	Low pH = 80 °C High pH = 60 °C	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
UPLC: 1.7 μm	HPLC: 3.5, 5 μm					t column for alternate s		Bonding : Trifunctional C ₆ phenyl,	P/N: 186006360	P/N: 186006363
UHPLC: 2.5 μm	PREP: 5 μm	- 0	for a phenyl bond		c compounds. Pov	ides unique level of pH	stability	fully endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.		
BEH HILIC			N/A	Unbonded	No	L3	1-9	Low pH = 45 $^{\circ}$ C High pH = 45 $^{\circ}$ C	HILIC QC Reference Material	HILIC QC Reference Material
UPLC: 1.7 μm	HPLC: 3.5, 5 μm		Specifically design	gned and tested for I	HILIC separations	polar, basic, water-solul using mobile phases c		Bonding: Unbonded Ethylene Bridged Hybrid (BEH) substrate.	P/N: 186007226	P/N: 186007226
UHPLC: 2.5 μm BEH Amide	PREP: 5 μm			ons of organic solve		1.00	0.11	Low pH = 90 °C	HILIC QC	HILIC QC
A •		-0-Si — <u>Linker</u>	7.5 µmol/m² Performance Be	12% enefits: Rugged HILI	No IC stationary phase	L68 e designed to separate	2-11 a wide	$E = 90^{\circ} C$ $E = 90^{\circ} C$ $E = 185^{\circ} m^2/g$ $E = 185^{\circ} m^2/g$ $E = 185^{\circ} m^2/g$	Reference Material P/N: 186007226	Reference Material P/N: 186007226
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 5 μm	o NH 2	(saccharides) usi	ing high concentrati	ions of organic mo	parating carbohydrates difier, elevated tempera ng MS, ELSD, UV, and fl		bonded to an Ethylene Bridged Hybrid (BEH) substrate.		
AccQ-Tag Ult	tra BEH C ₁₈ , 130 /	Å	3.1 µmol/m²	18%	Yes	L1	1–12	Low pH = 80 °C High pH = 60 °C	Amino Acids Standard P/N: WAT088122	Amino Acids Standard P/N: WAT088122
UPLC: 1.7 μm	HPLC: 2.5 μm		renormance be	enefits: pH and temp		nall pore (130 Å), C ₁₈ LC acid standard.	column	Bonding: Trifunctional C ₁₈ , fully endcapped, bonded to an Ethylene	Amino Acid Cell Culture Std.	Amino Acid Cell Culture Std.
UHPLC: 2.5 μm Peptide BEH	C ₁₀ , 130 Å						1 10	Bridged Hybrid (BEH) substrate.	P/N: 186009300 Cytochrome <i>c</i>	P/N: 186009300 Peptide Retention
A •	0 187 100 71	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.1 µmol/m² ✓ Performance Be	18% enefits: pH and temp	Yes perature stable, sm	L1 nall pore, C ₁₈ LC columr	1-12 	High pH = $60 ^{\circ}$ C Bonding: Trifunctional C ₁₈ , fully	Digestion Standard P/N: 186006371	Standard P/N: 186006555
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5, 10 μ PREP: 3.5, 5, 10 μ	m -0	for peptides. Spe 0.1% TFA contain	ecifically QC tested v	with a tryptic diges	t of cytochrome <i>c</i> using	g	endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.	Preparative Chromatography Mix P/N: 186006703	
Peptide BEH	C ₁₈ , 300 Å		3.1 µmol/m²	12%	Yes	L1	1–12	Low pH = 80 °C 90 m²/g High pH = 60 °C	Cytochrome <i>c</i> Digestion Standard	Peptide Retention Standard
UPLC: 1.7 μm	PREP: 5, 10 μm	-0-5i	Performance Be for peptides. Spe	:nefits: pH and temp ecifically QC tested v	perature stable, wie with a tryptic diges	de pore, C ₁₈ LC column st of cytochrome <i>c</i> using	g	Bonding: Trifunctional C ₁₈ , fully endcapped, bonded to an Ethylene	P/N: 186006371 Preparative	P/N: 186006555
HPLC: 3.5, 5, 10 μι UHPLC: 2.5 μm	m		0.1% TFA contain	ing eluents.				Bridged Hybrid (BEH) substrate.	Chromatography Mix P/N: 186006703	
Protein BEH	C ₄ , 300 Å	CH ₃	2.4 μmol/m²	8%	No	L26	2–10	Low pH = 80 °C $= 90 \text{ m}^2/\text{g}$ High pH = 50 °C	MassPREP Protein Standard Mix	MassPREP Protein Standard Mix
UPLC: 1.7 μm	HPLC: 3.5, 5, 10 μ	—O - Si ——— C₄H ₉ ——— CH₁		enefits: pH and temp cifically QC tested w		de pore, C ₄ LC column e.		Bonding : Proprietary monofunctional C ₄ bonding to an Ethylene Bridged Hybrid (BEH) substrate.	P/N: 186004900	P/N: 186004900
UHPLC: 2.5 μm Protein BEH	PREP: 5, 10 μm SEC, 125 Å		4.9 μmol/m²	15%	No	L33	2.5-8	Low pH = 60 °C 395 m ² /g	BEH125 Protein	BEH125 Protein
•		-0-5i ~0 ~0	Performance Be	enefits: Mid-size por	re SEC column for	proteins from 1000	<u>-</u> .∪-0	Bonding: Diol bonded to a high	Standard Mix P/N: 186006519	Standard Mix P/N: 186006519
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5 μm	- ОН		s. Specifically QC tes				pore volume Ethylene Bridged Hybrid (BEH) substrate.		
Protein BEH	SEC, 200 Å	~°\ ~-o-si~~o~~	5.5 µmol/m²	12%	No	L33	2.5-8	Low pH = $60 ^{\circ}\text{C}$ High pH = $60 ^{\circ}\text{C}$ 220 m ² /g	BEH200 SEC Protein Standard Mix	BEH200 SEC Protein Standard Mix
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5 μm	ОН		enefits: Mid-size por ns. Specifically QC to		proteins from 10,000 standards.		Bonding: Diol bonded to a high pore volume Ethylene Bridged Hybrid (BEH) substrate.	P/N: 186006518	P/N: 186006518
Protein BEH	SEC, 250 Å		1.5 µmol/m²	12%	No	L33	2.5-8	Low pH = 60 °C 174 m²/g High pH = 60 °C	mAb Size Variant Standard	mAb Size Variant Standard
UPLC: 1.7 μm	HPLC: 2.5 μm	0, 0, 0, 0,				t delivers less non-desi to 650,000 daltons. Spe		Bonding: Polyethyloxide (PEO)	P/N: 186009429	P/N: 186009429
UHPLC: 2.5 μm	0. 2.0 µш			ers mAb Size Variant		a, 200 duitoris. Ope	. July QU	Ethylene Bridged Hybrid (BEH) substrate.		
Protein BEH	SEC, 450 Å	-0-Si ~0 ~0H	4.8 µmol/m² он	9%	No	L33	2.5-8	Low pH = $60 ^{\circ}$ C High pH = $60 ^{\circ}$ C $80 \text{m}^2/\text{g}$	BEH450 SEC Protein Standard Mix P/N: 186006842	BEH450 SEC Protein Standard Mix P/N: 186006842
UPLC: 2.5 μm HPLC: 3.5 μm		ОН		enefits: Wide pore Sl cons. Specifically QC				Bonding: Diol bonded to a high pore volume Ethylene Bridged Hybrid (BEH) substrate.	171N: 180UU6842	i /ivi idouuo842
Oligonucleot	tide BEH C ₁₈ , 130	Å	3.1 µmol/m²	18%	Yes	L1	1–12	Low pH = 80 °C High pH = 60 °C 185 m²/g	MassPREP Oligonucleotide	ssDNA 10 to 60 Ladder P/N: 186009449
WPLC: 1.7 μm	PREP: 2.5, 5 μm	<u></u>	Performance Be	nefits: pH and temp	perature stable, sm	nall pore (130 Å), C ₁₈ LC n synthetic DNA ladder.	column	Bonding: Trifunctional C ₁₈ , fully endcapped, bonded to an Ethylene	Standard P/N: 186004135	i /iv. 100009449
HPLC: 2.5 μm	2.5, 5 µп1	-0	.s. synthetic DIVA	ram opecial	, 40 word Will	-,ouo DIVA lauder.		endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.	ssDNA 20-mer LC-MS Standard	
	ide BEH C ₁₈ , 300	Å	3.1 µmol/m²	18%	Yes	L1	1-12	Low pH = 80 °C 185 m²/g	P/N: 186009451 MassPREP Oligonycleotide	MassPREP OST
WPLC: 1.7 μm	PREP: 2.5 µm		Performance Be	enefits: pH and temp	perature stable, lar	ger pore (300 Å) C ₁₈ LC n synthetic DNA ladder.	column for	Bonding: Trifunctional C ₁₈ , fully	Oligonucleotide Standard P/N: 186004135	Standard P/N: 186004135 20 to 100 ssDNA
HPLC: 2.5 μm	(upon request) 5 µm (available)	~0	ionger synthetic	מוע הועA speci	cs. ע∪ tested With	. aynınlenc DINA ladder.		endcapped, bonded to an Ethylene Bridged Hybrid (BEH) substrate.	ssDNA 20-mer LC-MS Standard	Ladder P/N: 186009448
Glycan BEH /	Amide, 130 Å		7.15 µmol/m²	N/A	No	L68	2-11	Low pH = 90 °C 194 m²/g	P/N: 186009451 Glycan Performance	Glycan Performance
		0 -0 -Si — Linker — 0 NH 2	Performance Be	enefits: A HILIC base		and LC-MS analysis of	- "	Bonding: Trifunctional amide	Test Standard P/N: 186006349	Test Standard P/N: 186006349 Deytran Calibration
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5 μm	→ U NH₂	fluorescently lab	eled glycans.				bonded to an Ethylene Bridged Hybrid (BEH) substrate.		Dextran Calibration Standard P/N: 186006841
Glycoprotein	BEH Amide, 300	Å	7.15 µmol/m²	N/A	No	L68	2-11	Low pH = 90 °C 93 m²/g High pH = 90 °C	Glycoprotein Performance Test	Glycoprotein Performance Test
•		O-SiNH		enefits: A HILIC colu gments, glycopeptide		MS analyses of glycop nd labeled glycans.	roteins,	Bonding: Trifunctional amide bonded to an Ethylene Bridged	Standard P/N: 186008010	Standard P/N: 186008010
UPLC: 1.7 μm		. INT 2	9					Hybrid (BEH) substrate.		
Glycan BEH	C ₁₈ AX, 95 Å		1.6 μmol/m²	17%	Yes	L78	2-10	Low pH = 60 °C High pH = 60 °C 270 m ² /g	Sialylated Glycan Performance Test	Sialylated Glycan Performance Test
UPLC: 1.7 μm	HPLC: 2.5 μm		i ci ioi illance be			dic analytes, and an alt		Bonding: Mixed-mode C ₁₈ /anion -exchange bonding, fully endcapped,	Standard P/N: 186007983	Standard P/N: 186007983
UHPLC: 2.5 μm	_0. 2.0 pm					mn that is designed for glycan performance sta		bonded to a highly retentive BEH 95 Å particle.		

USP

Class No.

L33

low adsorption MaxPeak HPS hardware and novel bridged ethyle HO-PEO particles to HO-PEO surface chemistry on

produce high recovery analyses of 200 to 800 Å diameter GTx drugs, such as mRNA, LNPs, widepore, high strength silica

Performance Benefits: Widepore SEC columns manufactured with low adsorption

Performance Benefits: GTxResolve Premier SEC 1000 Å Columns are manufactured with

and viral vectors. This also ensures long column lifetimes, low secondary interactions and particles.

MaxPeak HPS hardware and application robustness studied for AAVs and small to

	[™] and XSelect		Ligand	Carbon		USP	рН	Temperature	Surface	Performance	Application
HPLC/UHPLC CSH C ₁₈	Columns	Particle/Ligand	Density 2.3 µmol/m²	Load	Endcapped	Class No.	Range	Limits Low pH = 80 °C	Area	Standards Neutrals QC	Standards Reversed-Phase QC
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5, 10 μm PREP: 3.5, 5, 10 μm	-0-5i	Performance Bene excellent pH stabili	efits: General pur ty and rapid mob ybrid (CSH™) Tec	pose reversed-phas ile-phase re-equilib hnology enables su	e column that offer ration for method d	s evelopment.	High pH = 45 °C Bonding: Trifunction endcapped, bonded Surface Hybrid (CSH	al C ₁₈ , fully to a Charged	P/N: 186006360 Preparative Chromatography Mix P/N: 186006703	Reference Material P/N: 186006363
CSH Phenyl-H	exyl		2.3 µmol/m²	14%	Yes	L11	1–11	Low pH = 80 °C High pH = 45 °C	185 m²/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 5 μm	-0-5si	pi-pi interactions w reproducibility at p	rith polyaromatic H extremes. Char	pose alternative selo compounds, while r ged Surface Hybrid loading capacity for	maintaining excelle (CSH) Technology	nt	Bonding: Trifunction fully endcapped, bon Charged Surface Hyb substrate.	ded to a	P/N: 186006360	P/N: 186006363
CSH Fluoro-Ph	nenyl		2.3 µmol/m²	10%	No	L43	1–8	Low pH = 60 °C High pH = 45 °C	185 m²/g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 5 μm	-0-5i ~~ F	of analyte selectivi	ty, especially whe nology enables su	pose column that pr on using low pH mob uperior peak shape a	oile phases. Charge	d Surface	Bonding: Trifunction fluorophenyl, non-en bonded to a Charged Hybrid (CSH) substra	dcapped, I Surface	17N. 100000300	17N. 100000303
Peptide CSH C	₁₈ , 130 Å	© 5°55	2.3 µmol/m² Performance Bene	15% efits: Works partic	Yes	L1 6 formic acid for LC	1-11 or LC-MS	Low pH = 80 °C High pH = 45 °C Bonding: Trifunction	185 m²/g al C ₁₈ , fully	Cytochrome c Digestion Standard P/N: 186006371	Peptide Retention Standard P/N: 186006555
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 3.5, 5 μm		applications. Speci acid containing elu	fically QC tested	with a tryptic digest			endcapped, bonded Surface Hybrid (CSH	to a Charged		
HSS C ₁₈			3.2 µmol/m² Performance Bend		Yes acid hydrolysis at lo	L1 ow pH, this column	1–8 offers increased	Low pH = $45 ^{\circ}$ C High pH = $45 ^{\circ}$ C Bonding: High cover	•	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
UPLC: 1.8 μm UHPLC: 2.5 μm HSS C ₁₈ SB	HPLC: 3.5, 5 μm PREP: 5 μm	-6	retention and supe					trifunctional C ₁₈ , fully bonded to a High Str (HSS) substrate. Low pH = 45 °C	ength Silica	Neutrals QC	Reversed-Phase QC
A	LIDI Co 2.5. 5 turn	•\frac{1}{2}\frac{1}{2	1.6 µmol/m² Performance Bendance Bendance	efits: Unique, non	-endcapped C ₁₈ che	L1 emistry designed sp	2-8	High pH = 45 °C Bonding : Intermedia		Reference Material P/N: 186006360	Reference Material P/N: 186006363
UPLC: 1.8 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 5 μm	, and the second	under low pH cond	itions.	ers unique selectivit			trifunctionally bonde endcapped, bonded to Strength Silica (HSS)	to a High substrate.	Neutrals QC	Reversed-Phase QC
HSS T3 Δ UPLC: 1.8 μm	HPLC: 3.5, 5 μm	-0°s	1.6 µmol/m² Performance Bene exceptional polar of	11% efits: Aqueous mo	Yes obile-phase compati	L1 ible column designe	2-8 ed for	High pH = 45 °C Bonding : Intermedia (C_{18}) bonding and en		Reference Material P/N: 186006360	Reference Material P/N: 186006363
UHPLC: 2.5 μm Peptide HSS T	PREP: 5 μm							bonded to a High Str (HSS) substrate. Low pH = $45 ^{\circ}$ C		Cytochrome c	Peptide Retention
UPLC: 1.8 μm UHPLC: 2.5 μm	HPLC: 3.5, 5 μm PREP: 5 μm		exceptional polar of	ompound retention	Yes obile-phase compation in proteins. SpeciFA containing eluen	ifically QC tested w		High pH = 45 °C Bonding: T3 (C ₁₈) bo endcapping, bonded Strength Silica (HSS)	to a High	Digestion Standard P/N: 186006371	Standard P/N: 186006555
HSS PFP	- FREF. 5 μιιι		3.2 µmol/m²	7%	No	L43	2-8	Low pH = 45 °C High pH = 45 °C	230 m²/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
UPLC: 1.8 μm	HPLC: 3.5, 5 μm	0-Si F F	differences for Lew	is bases through	urpose column desiç pi-pi interactions. T	he rigid aromatic ri	ng provides	Bonding: Trifunction phenyl, non-endcapp	oed, bonded to a	P/N: 186006360	P/N: 186006363
UHPLC: 2.5 μm			2.0 µmol/m²	ty based on shap	e, dipole moment, a	nd hydrogen bondii 	ng interactions.	High Strength Silica	(HSS) substrate.	Neutrals QC	-
HSS CN UPLC: 1.8 μm	HPLC: 3.5, 5 μm	-0-Si ~ CN	Performance Bend	efits: A general pu	urpose column that so C ₁₈ phases. This c	shows contrasting		High pH = 45 °C Bonding : Sterically h mono-functional cya	indered,	Reference Material P/N: 186006360	
UHPLC: 2.5 μm	·		for both reversed-					non-endcapped, bon Strength Silica (HSS)	ded to a High		
Atlantis™ UPLO and HPLC Col		Particle/Ligand	Ligand	Carbon	Endcapped	USP Class No.	pH	Temperature Limits	Surface	Performance	Application
BEH C ₁₈ AX			Density 1.6 µmol/m²	Load 17%	Yes	L78	Range 2-10	Low pH = 60 °C High pH = 60 °C	Area 270 m²/g	Standards Neutrals QC Reference Material	Standards Reversed-Phase QC Reference Material
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 5 µm PREP: 5 µm (upon request)	0.5s ~~~~~	selectivity when co	mpared to tradition	ention of polar acidi onal C ₁₈ phases, esp low MS bleed, and c	ecially for ionizable	analytes.	Bonding: Mixed-mod -exchange bonding, f bonded to a high rete BEH 95 Å particle.	ully endcapped,	P/N: 186006360	P/N: 186006363
BEH Z-HILIC	(upon request)		3.0 µmol/m²	17%	No	L122	2–10	Low pH = 60 °C High pH = 60 °C	270 m²/g	HILIC QC Reference Material	HILIC QC Reference Material
UPLC: 1.7 μm UHPLC: 2.5 μm	HPLC: 5 µm PREP: 5 µm (upon request)	O-SI-Linker	Performance Bene of polar compound Excellent low- and	s using HILIC. Ide	al for wide panel me	nentary selectivity f etabolite methods d	or a wide range evelopment.	Bonding: Trifunctional zwitterionic sulfobeta group to a high retentional particle.	ine functional	P/N: 186007226	P/N: 186007226
Silica T3			1.6 µmol/m²	14%	Yes	L1	2-8	Low pH = 45 °C High pH = 45 °C	330 m²/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
HPLC: 3, 5, 10 μm PREP: 5, 10 μm		-6'si	Performance Bene superior stability ur mobile phases.					Bonding: Intermediate bonding and endcapt to a high purity silica	oing, bonded	P/N: 186006360 Preparative Chromatography Mix	P/N: 186006363
Silica HILIC			No	Unbonded	No	L3	1-5	Low pH = 45 °C High pH = 45 °C	330 m²/g	P/N: 186006703 HILIC QC Reference Material	HILIC QC Reference Material
HPLC: 3, 5 μm PREP: 5, 10 μm			Performance Bene analytes. Specifical containing high cor	ly designed and t	ested for HILIC sepa			Bonding: Unbonded silica substrate.	high purity	P/N: 186007226	P/N: 186007226
Silica dC ₁₈			1.6 µmol/m²	12%	Yes	L1	3-7	Low pH = 45 °C High pH = 45 °C	330 m²/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
HPLC: 3, 5, 10 μm PREP: 5, 10 μm			Performance Bene with 100% aqueous		polar compounds. [Designed for compa	tibility	Bonding: Difunctiona fully endcapped, bond	ded to a high	P/N: 186006360 Preparative Chromatography Mix	P/N: 186006363
-, το μπι								purity silica substrate		P/N: 186006703	
SunFire™ HPL(Columns		Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
Silica C ₁₈		-0	3.5 µmol/m²	16%	Yes	L1	2-8	Low pH = 50 °C High pH = 40 °C	340 m²/g	Neutrals QC Reference Material P/N: 186006360	Reversed-Phase QC Reference Material P/N: 186006363
HPLC: 2.5, 3.5, 5, 10 PREP: 5, 10 μm	μm		Performance Bene loading capacity, po- suited for purification	articularly for bas	ic analytes in low pl			Bonding : Difunctional endcapped, bonded to silical substrate.	al C ₁₈ , fully to a high purity	Preparative Chromatography Mix P/N: 186006703	
Silica C ₈			3.5 µmol/m²	12%	Yes	L7	2-8	Low pH = 40 °C High pH = 40 °C	340 m²/g	Neutrals QC Reference Material	Reversed-Phase QC Reference Material
HPLC: 3.5, 5, 10 μm PREP: 5, 10 μm		° 5i ~~~~	Performance Bene loading capacity, po hydrophobic, there	articularly for bas	ic analytes in low pl	I mobile phases. Le		Bonding: Difunctional endcapped, bonded to silica substrate.		P/N: 186006360 Preparative Chromatography Mix	P/N: 186006363
Silica			No	Unbonded	No	L3	2-8	45 °C	340 m²/g	P/N: 186006703 Neutrals QC Reference Material	HILIC QC Reference Material P/N
HPLC: 5, 10 μm PREP: 5, 10 μm			Performance Bene					Bonding: Unbonded silica substrate.	high purity	P/N: 186006360 Preparative Chromatography Mix	P/N: 186006363
- 1			separations and is	efficient for scale	-up.					P/N:186006703	
BioResolve™ L and HPLC Col		Particle/Ligand	Ligand Density	Carbon Load	Endcapped	USP Class No.	pH Range	Temperature Limits	Surface Area	Performance Standards	Application Standards
RP mAb Polyp	henyl	(5)	5.5 µmol/m²	0.95%	Yes	L11	2-7	Low pH = 90 °C High pH = 50 °C	22.2 m²/g	mAb Subunit Standard	mAb Subunit Standard
UPLC: 2.7 μm UHPLC: 2.7 μm	HPLC: 2.7 μm	-0 - Si - (\(\)_n	Performance Benedigested monoclon LC-UV and LC-MS.		reversed-phase ana bs) and antibody-dr			Bonding : Polyphenyl a solid-core, silica par 450 Å pores, fully end	rticle with	P/N: 186008927	P/N: 186008927
SCX mAb	Up. 5	(so;) _n	N/A	N/A	N/A	N/A	2-12	Recommended to maintain at 30 °C	2-3 m²/g	mAb Charge Variant Standard P/N: 186009057	mAb Charge Variant Standard P/N: 186009057
UPLC: 3 μm UHPLC: 3 μm	HPLC: 3 μm	√3°/n	Performance Bene oclonal antibodies Specifically QC test	mAb) or IdeS dig	est charge variants	using LC-UV or LC-		Bonding: SO ₃			
SEC mAb, 200		0-5i ~ O ~ OH	5.5 µmol/m²	12%	No	L33	1-8	Low pH = 60 °C High pH = 60 °C	220 m²/g	mAb Size Variant Standard P/N: 186009429	mAb Size Variant Standard P/N: 186009429
UPLC: 2.5 μm UHPLC: 2.5 μm	HPLC: 2.5 μm	OH OH	of monoclonal antib Specifically QC test	ody (mAb) aggre		nd fragments on ar		Bonding: Diol bonded pore volume Ethylene Hybrid (BEH) substrat	Bridged	Humanized mAb Mass	Humanized mah Ma
Protein A Affin		— Protein A	N/A	N/A	N/A	N/A	2–10	40 °C	2–3 m²/g	Check Standard P/N: 186009125	Check Standard P/N: 186009125
UPLC: 3.5 μm UHPLC: 3.5 μm	HPLC: 3.5 μm		Performance Bene low-concentration analysis output, acc	samples. It also su	upports simplified 21			Bonding: Protein A			

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Primary Manufacturer of Chromatographic Media

- Primary Manufacturer of Chromatographic Media
 Waters maintains a Quality Management System in compliance with ISO 9001.
- 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.



Surface

24 m²/g

Temperature

Low pH = $60 \,^{\circ}$ C

High pH = 60 °C

Low pH = $60 \,^{\circ}$ C

High pH = 60 °C

2.5-8

Bonding: Diol bonded to a high pore

volume Ethylene Bridged Hybrid

Performance

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