

[OBD PREPARATIVE COLUMNS]

productivity comes from
predictability



Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

[OBD PREPARATIVE COLUMNS]

INCREASE YOUR PRODUCTIVITY THROUGH HIGHER RECOVERIES AND LONGER COLUMN LIFETIMES

**With Optimum Bed Density (OBD™) Preparative Columns
you have the ability to:**

- Achieve fast, efficient, lab-scale separations for greater throughput
- Directly scale from UPLC,™ UHPLC, or HPLC screening to lab-scale purification
- Select robust chromatographic particles designed for purification



HOW TO CHOOSE THE RIGHT OBD PREPARATIVE COLUMN

STEP 1

Once the analytical separation has been optimized, a loading study on the analytical column is performed to determine the capacity of the particular packing material. The large scale separation should be identical to the small scale separation, therefore the maximum sample load will be dependent upon the complexity of the analytical separation.

STEP 2

Determine how much mass you need to purify or isolate.

STEP 3

Use these simple equations to determine the required column size for purification.

Note: Preparative HPLC system maximum flow rate and backpressure need to be considered and can limit column size.

SCALE-UP FACTOR

$$\text{Scale-up factor} = \frac{(\text{Diameter preparative})^2 \times \text{Length preparative}}{(\text{Diameter analytical})^2 \times \text{Length analytical}}$$

Example: Scaling up from a **4.6 x 150 mm** column to a **19 x 150 mm** column:

$$\text{Scale-up factor} = \frac{(19)^2 \times 150}{(4.6)^2 \times 150} = 17.1$$

Applying the scale-up factor, you can predict that an approximate range of 17 to 135 mg of sample could be applied to the larger (19 x 150 mm) column (packed with the same material as the analytical column). This range is based on an analytical column (4.6 mm I.D.) mass load of 1 to 8 mg.

FLOW RATE

$$\text{Flow rate (prep)} = \text{Flow rate (analytical)} \times \frac{(\text{Diameter preparative})^2}{(\text{Diameter analytical})^2} \times \frac{\text{Particle size (analytical)}}{\text{Particle size (preparative)}}$$

The calculated flow rate may be used for the larger column to ensure the same linear velocity of the mobile phases as used in the analytical run. However, reasonable rates are based on column diameters. Systems will be limited by increasing backpressure with increasing column length and decreasing particle size.

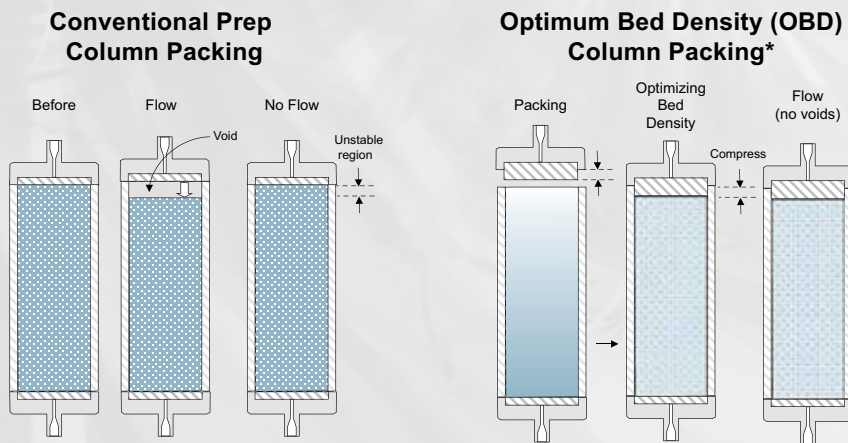
GRADIENT DURATION (GD)

$$\text{GD (prep)} = \frac{(\text{GD analytical}) \times (\text{Length preparative})}{(\text{Length analytical})} \times \frac{(\text{Diameter preparative})^2}{(\text{Diameter analytical})^2} \times \frac{(\text{Flow rate analytical})}{(\text{Flow rate preparative})}$$



Why struggle with inconsistencies in column-to-column performance, diminished column lifetimes, lost samples, repeat purification runs, and poor scalability from small to large volume columns?

THE OBD COLUMN DESIGN



The patented OBD Preparative Column design and packing process results in predictable, uniform density profiles throughout the column. During the final capping process, our established procedures do not over compress or disrupt, in any non-uniform way, this portion of the bed, eliminating the potential for voids.



An exploded view of the elements of an empty OBD Column.

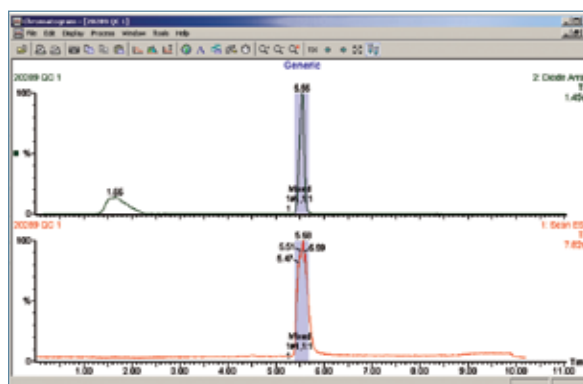
*US Patent No. 7,399,410 and UK Patent No. GB 240 8469

COLUMN STABILITY AND RELIABILITY – LONG, PREDICTABLE LIFETIMES

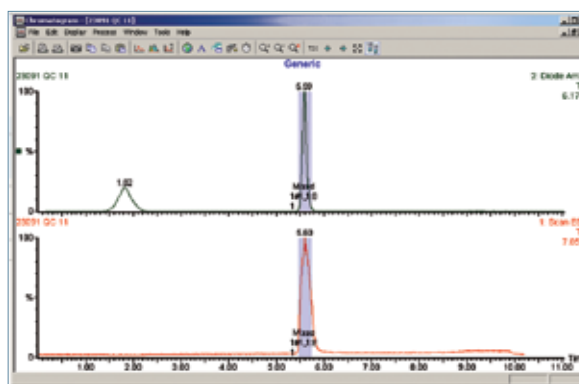
The demand for rapid, high-purity, compound isolation places strong emphasis on the integrity and stability of preparative columns. Complex, sparingly-soluble starting materials are often dissolved with strong solvents, such as DMSO. The combination of poor solubility and pressure shocks associated with large injection volumes of pure organic solvent are the primary contributors to early column failure and chromatographic bed collapse. The OBD design exhibits exceptional resistance to mechanical chromatographic bed failure and delivers consistent column-to-column performance, reducing cost through extended lifetimes.

Data from a high-throughput drug discovery laboratory:

7,000 injections on an XBridge™ BEH C₁₈ OBD Prep Column, 130 Å, 5 µm, 19 x 50 mm



First injection.



7,000 injection.

High Throughput in the Purification Laboratory

OBD Preparative Columns are designed to maximize your productivity when scaling up screening methods to preparative HPLC by:

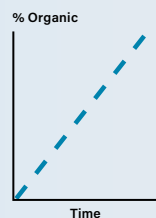
- Screening with high resolution and speed from UPLC/UHPLC technology
- Increasing laboratory throughput when directly scaling methods from UPLC to OBD Preparative HPLC Columns

UPLC Method

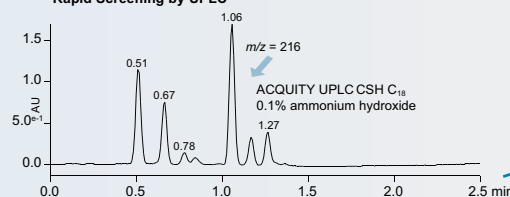
Column: ACQUITY™ UPLC CSH™ C₁₈, 1.7 µm, 2.1 x 30 mm (p/n: 186005295)
 Mobile phase A: 0.1% ammonium hydroxide in water
 Mobile phase B: 0.1% ammonium hydroxide in acetonitrile
 UPLC gradient: 2 to 98% B in 2.0 minutes, then 0.5 minute hold
 Flow rate: 0.9 mL/min
 Column temp.: 30 °C
 UV detector: 210 and 254 nm ToF-MS (in ES+ mode)

Rapid Screening by UPLC

UPLC linear gradient method for fast screening of purification samples. Determine elution time of target compound which is used to determine focused gradient method for purification run.



Rapid Screening by UPLC



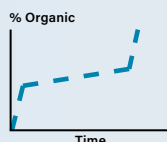
HPLC Prep Method

Column: XSelect™ CSH C₁₈ OBD Prep, 5 µm, 19 x 100 mm (p/n: 186005421)
 Gradient: 2 to 30% B in 0.81 min, 40% B at 10 min, 98% B at 11 min, hold for 1.0 min, and reset conditions for 3.0 min
 Flow rate: 25.0 mL/min
 Column temp.: Ambient
 Purification system: AutoPurification Prep HPLC with FractionLynx™
 UV detection: 210 and 254 nm ES+ MS

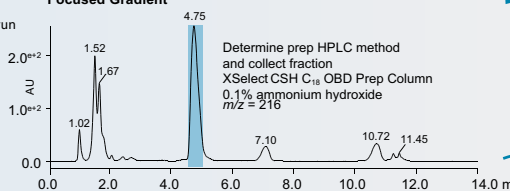
Determine HPLC Purification Method

Calculate Prep HPLC focused gradient method from the UPLC screen using the Waters Focused Gradient UPLC to Prep Calculator.

- Determine system volumes
- Enter elution time from screening run



Focused Gradient



Compounds

5-hydroxyindole acetic acid acetylation products

Target peak (UPLC): 1.06 min, m/z 216

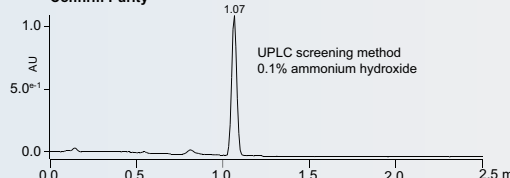
Mass-directed purification (50 mg): target mono-acetylated product at m/z 216

Collect Fractions

Purification run with Prep HPLC focused gradient method.

Confirm Purity by UPLC

Confirm Purity



SCALABILITY - BRIDGING THE GAP FROM ANALYTICAL TO PREPARATIVE CHROMATOGRAPHY

Successful scaling of methods from analytical to preparative dimensions requires the use of chromatographically equivalent columns. All too often, even when the same chemistry phase and particle size are used, methods do not scale either due to loss of resolution and/or lower than expected loading. By matching the analytical and preparative column bed densities, scalability is assured, eliminating the need for any time consuming method redevelopment.

OBD Preparative Columns are packed to bed densities which closely match the equivalent analytical column. This innovative procedure produces preparative columns with excellent stability, reproducibility, and efficiency.

UPLC Columns	HPLC Columns	OBD Preparative Columns
CSH Technology [Added selectivity, low pH loadability]		
ACQUITY UPLC CSH C ₁₈ , 130 Å, 1.7 µm	→ XSelect CSH C ₁₈ , 130 Å, [2.5, 3.5, and 5 µm]	→ XSelect CSH C ₁₈ , 130 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC CSH Phenyl-Hexyl, 130 Å, 1.7 µm	→ XSelect CSH Phenyl-Hexyl, 130 Å, [2.5, 3.5, and 5 µm]	→ XSelect CSH Phenyl-Hexyl, 130 Å, OBD Prep, 5 µm
ACQUITY UPLC CSH Fluoro-Phenyl, 130 Å, 1.7 µm	→ XSelect CSH Fluoro-Phenyl, 130 Å, [2.5, 3.5, and 5 µm]	→ XSelect CSH Fluoro-Phenyl, 130 Å, OBD Prep, 5 µm
BEH Technology™ [Excellent ruggedness and longevity at low and high pH]		
ACQUITY UPLC BEH C ₁₈ , 130 Å, 1.7 µm	→ XBridge BEH C ₁₈ , 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH C ₁₈ , 130 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC BEH C ₈ , 130 Å, 1.7 µm	→ XBridge BEH C ₈ , 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH C ₈ , 130 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC BEH Shield C ₁₈ , 130 Å, 1.7 µm	→ XBridge BEH Shield RP18, 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH Shield RP18, 130 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC BEH Phenyl, 130 Å, 1.7 µm	→ XBridge BEH Phenyl, 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH Phenyl, 130 Å, OBD Prep, 5 µm
ACQUITY UPLC BEH HILIC, 130 Å, 1.7 µm	→ XBridge BEH HILIC, 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH HILIC, 130 Å, OBD Prep, 5 µm
ACQUITY UPLC BEH Amide, 130 Å, 1.7 µm	→ XBridge BEH Amide, 130 Å, [2.5, 3.5, and 5 µm]	→ XBridge BEH Amide, 130 Å, OBD Prep, 5 µm
Oligonucleotide [Reversed-phase BEH Technology]		
ACQUITY UPLC Oligonucleotide BEH C ₁₈ , 130 Å, 1.7 µm	→ XBridge Oligonucleotide BEH C ₁₈ , 130 Å, 2.5 µm	→ XBridge Oligonucleotide BEH C ₁₈ , 130 Å, OBD Prep, 2.5 µm
Peptides [Reversed-phase BEH and CSH Technology quality controlled for peptides]		
ACQUITY UPLC Peptide BEH C ₁₈ , 300 Å, 1.7 µm	→ XBridge Peptide BEH C ₁₈ 300 Å, [3.5 and 5 µm]	→ XBridge Peptide BEH C ₁₈ , 300 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC Peptide BEH C ₁₈ , 300 Å, 1.7 µm	→ XBridge Peptide BEH C ₁₈ , 300 Å, [3.5 and 5 µm]	→ XBridge Peptide BEH C ₁₈ , 300 Å, OBD Prep, [5 and 10 µm]
ACQUITY UPLC Peptide CSH C ₁₈ , 130 Å, 1.7 µm	→ XSelect Peptide CSH C ₁₈ , 130 Å, [3.5 and 5 µm]	→ XSelect Peptide CSH C ₁₈ , 130 Å, OBD Prep, [5 and 10 µm]
Proteins [Reversed-phase wide pore BEH Technology]		
ACQUITY UPLC Protein BEH C ₄ , 300 Å, 1.7 µm	→ XBridge Protein BEH C ₄ , 300 Å, 3.5 µm	→ XBridge Protein BEH C ₄ , 300 Å, OBD Prep, [5 and 10 µm]
Silica [High mass loading]		
—	SunFire™ C ₁₈ , 100 Å, [2.5, 3.5, and 5 µm]	→ SunFire C ₁₈ , 100 Å, OBD Prep, [5 and 10 µm]
—	SunFire C ₈ , 100 Å, [2.5, 3.5, and 5 µm]	→ SunFire C ₈ , 100 Å, OBD Prep, [5 and 10 µm]
—	SunFire Silica, 100 Å, 5 µm	→ SunFire Silica, 100 Å, OBD Prep, [5 and 10 µm]
Silica [Polar retention]		
—	Atlantis™ T3, 100 Å, [3, 5, and 10 µm]	→ Atlantis T3, 100 Å, OBD Prep, [5 and 10 µm]
—	Atlantis dC ₁₈ , 100 Å, [3, 5, and 10 µm]	→ Atlantis dC ₁₈ , 100 Å, OBD Prep, [5 and 10 µm]
—	Atlantis HILIC, 100 Å, [3 and 5 µm]	→ Atlantis HILIC, 100 Å, OBD Prep, 5 µm

MASS LOADING

Many factors affect the mass capacity of preparative columns. The listed capacities represent an “average” estimate.

Capacity is:

- Higher for strongly retained material
- Higher for simple mixtures
- Lower where higher resolution is required
- Very strongly dependent on loading conditions
- Limited by loading volume
- Limited by diluent solvent strength

Approximate mass loading capacities (mg) for OBD Preparative Columns (Gradient mode)

Length (mm)	Diameter (mm)				
	4.6	10	19	30	50
50	3	15	45	110	310
75	-	-	-	165	-
100	5	25	90	225	620
150	8	40	135	335	930
250	13	60	225	560	1550
Reasonable flow rate (mL/min)	1.4	6.6	24	60	164
Reasonable injection volume (µL)	20	100	350	880	2450



Reasonable flow rates are based on column diameter. Systems will be limited by increasing backpressure with increasing column length and decreasing particle size.

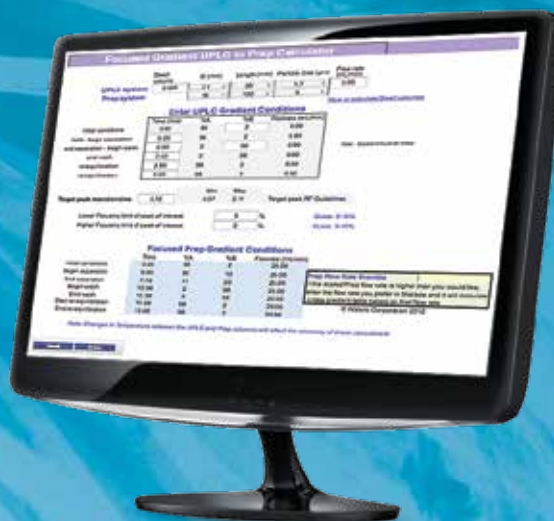
Reasonable injection volumes are based on column diameter at a length of 50 mm with relatively strong solvents. Increased length is compatible with larger injections, but not proportionately so. Weaker solvents significantly increase injection volume.

Mass loading capacities for peptide and purifications depend strongly on the sequence and may be estimated at 5 – 20% of listed values.

WATERS OBD PREPARATIVE COLUMNS CALCULATOR

This convenient scale-up tool provides:

- Mass load scaling
- Gradient scaling with appropriate flow rate scale-up and predicting volume consumption
- Calculations for split flow ratios for those using mass spectrometer driven chromatography
- Focused gradient UPLC or UHPLC to preparative method transfer



To try this tool, visit www.waters.com/prepcalculator

[PREPARATIVE OBD COLUMNS ORDERING INFORMATION]

XSelect Preparative Columns

Dimension	Type	Particle size	CSH C18	CSH Fluoro-Phenyl	CSH Phenyl-Hexyl	HSS C18	HSS C18 SB	HSS T3
10 x 10 mm	Guard	5 µm	186005491 ¹	186005498 ¹	186005505 ¹	186004776 ¹	186004758 ¹	186004795 ¹
10 x 50 mm	OBD Column	5 µm	186008236	186008240	186008244	186008222	186008219	186008225
10 x 100 mm	OBD Column	5 µm	186008237	186008241	186008245	186008223	186008220	186008226
10 x 150 mm	OBD Column	5 µm	186008238	186008242	186008246	186008224	186008221	186008227
10 x 250 mm	OBD Column	5 µm	186008239	186008243	186008247	—	—	186008280
19 x 10 mm	Guard	5 µm	186005418 ²	186005431 ²	186005444 ²	—	—	—
19 x 50 mm	OBD Column	5 µm	186005420	186005433	186005446	—	—	—
19 x 100 mm	OBD Column	5 µm	186005421	186005434	186005447	—	—	—
19 x 150 mm	OBD Column	5 µm	186005422	186005435	186005448	—	—	—
19 x 250 mm	OBD Column	5 µm	186005492	186005499	186005506	—	—	—
30 x 10 mm	Guard	5 µm	186006899 ³	186006900 ³	186006901 ³	—	—	—
30 x 50 mm	OBD Column	5 µm	186005423	186005436	186005520	—	—	—
30 x 75 mm	OBD Column	5 µm	186005424	186005437	186005450	—	—	—
30 x 100 mm	OBD Column	5 µm	186005425	186005438	186005451	—	—	—
30 x 150 mm	OBD Column	5 µm	186005426	186005439	186005452	—	—	—
30 x 250 mm	OBD Column	5 µm	186005493	186005500	186005507	—	—	—
50 x 50 mm	OBD Column	5 µm	186005494	186005501	186005508	—	—	—
50 x 100 mm	OBD Column	5 µm	186005495	186005502	186005509	—	—	—
50 x 150 mm	OBD Column	5 µm	186005496	186005503	186005510	—	—	—
50 x 250 mm	OBD Column	5 µm	186005497	186005504	186005511	—	—	—

Dimension	Type	Particle size	CSH C ₁₈
10 x 10 mm	Guard	10 µm	186007285 ¹
10 x 50 mm	OBD Column	10 µm	186008268
10 x 100 mm	OBD Column	10 µm	186008269
10 x 150 mm	OBD Column	10 µm	186008270
10 x 250 mm	OBD Column	10 µm	186008271
19 x 10 mm	Guard	10 µm	186007290 ²
19 x 50 mm	OBD Column	10 µm	186007291
19 x 100 mm	OBD Column	10 µm	186007292
19 x 150 mm	OBD Column	10 µm	186007293
19 x 250 mm	OBD Column	10 µm	186007294
30 x 10 mm	Guard	10 µm	186007295 ³
30 x 50 mm	OBD Column	10 µm	186007296
30 x 75 mm	OBD Column	10 µm	186007297
30 x 100 mm	OBD Column	10 µm	186007298
30 x 150 mm	OBD Column	10 µm	186007299
30 x 250 mm	OBD Column	10 µm	186007300
50 x 50 mm	OBD Column	10 µm	186007301
50 x 100 mm	OBD Column	10 µm	186007302
50 x 150 mm	OBD Column	10 µm	186007303
50 x 250 mm	OBD Column	10 µm	186007304

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912



XBridge Preparative Columns

Dimension	Type	Particle size	BEH C ₁₈	BEH C ₈	BEH Shield RP18	BEH Phenyl	BEH HILIC	BEH Amide
10 x 10 mm	Guard	5 µm	186002972 ¹	186002991 ¹	186002983 ¹	186003354 ¹	186004720 ¹	186006597 ¹
10 x 50 mm	OBD Column	5 µm	186008164	186008172	186008168	186008176	186008217	186008260
10 x 100 mm	OBD Column	5 µm	186008165	186008173	186008169	186008177	186008218	186008261
10 x 150 mm	OBD Column	5 µm	186008166	186008174	186008170	186008178	—	186008262
10 x 250 mm	OBD Column	5 µm	186008167	186008175	186008171	186008179	—	186008263
19 x 10 mm	Guard	5 µm	186002975 ²	186002992 ²	186002984 ²	186003355 ²	186004723 ²	186006598 ²
19 x 50 mm	OBD Column	5 µm	186002977	186002993	186002985	186003356	186004724	186006603
19 x 100 mm	OBD Column	5 µm	186002978	186002994	186002986	186003357	186004725	186006604
19 x 150 mm	OBD Column	5 µm	186002979	186002995	186002987	186003358	186004726	186006605
19 x 250 mm	OBD Column	5 µm	186004021	186004023	186004022	186004024	186004730	186006606
30 x 10 mm	Guard	5 µm	186006893 ³	186006895 ³	186006898 ³	186006891 ³	186006896 ³	186006890 ³
30 x 50 mm	OBD Column	5 µm	186002980	186002996	186002988	186003277	186004727	186006607
30 x 75 mm	OBD Column	5 µm	186002981	186003269	186003262	186003278	—	186006608
30 x 100 mm	OBD Column	5 µm	186002982	186002997	186002989	186003279	186004728	186006609
30 x 150 mm	OBD Column	5 µm	186003284	186003083	186002990	186003276	186004729	186006610
30 x 250 mm	OBD Column	5 µm	186004025	—	—	—	186004731	186006611
50 x 50 mm	OBD Column	5 µm	186003933	186003934	186003935	186003936	186004732	—
50 x 100 mm	OBD Column	5 µm	186003937	186003938	186003939	186003940	186004733	—
50 x 150 mm	OBD Column	5 µm	186003929	—	—	—	186004734	—
50 x 250 mm	OBD Column	5 µm	186004107	—	—	—	186004735	—
10 x 10 mm	Guard	10 µm	186003889 ¹	186004003 ¹	186003988 ¹	—	—	—
19 x 10 mm	Guard	10 µm	186003892 ²	186004006 ²	186003991 ²	—	—	—
30 x 10 mm	Guard	10 µm	186006892 ³	186006894 ³	186006897 ³	—	—	—
10 x 150 mm	OBD Column	10 µm	186008210	186008215	186008213	—	—	—
10 x 250 mm	OBD Column	10 µm	186008211	186008216	186008214	—	—	—
19 x 50 mm	OBD Column	10 µm	186003893	186004007	186003992	—	—	—
19 x 100 mm	OBD Column	10 µm	186003901	186004008	186003993	—	—	—
19 x 150 mm	OBD Column	10 µm	186003894	186004009	186003994	—	—	—
19 x 250 mm	OBD Column	10 µm	186003895	186004010	186003995	—	—	—
30 x 75 mm	OBD Column	10 µm	186004711	—	—	—	—	—
30 x 100 mm	OBD Column	10 µm	186003930	—	—	—	—	—
30 x 150 mm	OBD Column	10 µm	186003896	186004011	186003996	—	—	—
30 x 250 mm	OBD Column	10 µm	186003897	186004012	186003997	—	—	—
50 x 50 mm	OBD Column	10 µm	186003898	186004013	186003998	—	—	—
50 x 100 mm	OBD Column	10 µm	186003902	186004014	186003999	—	—	—
50 x 150 mm	OBD Column	10 µm	186003899	186004015	186004001	—	—	—
50 x 250 mm	OBD Column	10 µm	186003900	186004016	186004002	—	—	—

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912

[PREPARATIVE OBD COLUMNS ORDERING INFORMATION]

SunFire Preparative Columns

Dimension	Type	Particle size	C ₁₈	C ₈	Silica
10 x 10 mm	Guard	5 µm	186002565 ¹	186002750 ¹	186003429 ¹
10 x 50 mm	OBD Column	5 µm	186008152	186008158	186008180
10 x 100 mm	OBD Column	5 µm	186008153	186008159	186008181
10 x 150 mm	OBD Column	5 µm	186008154	186008160	186008182
10 x 250 mm	OBD Column	5 µm	186008155	186008161	186008183
19 x 10 mm	Guard	5 µm	186002569 ²	186002754 ²	186003434 ²
19 x 50 mm	OBD Column	5 µm	186002566	186002751	186003431
19 x 100 mm	OBD Column	5 µm	186002567	186002752	186003432
19 x 150 mm	OBD Column	5 µm	186002568	186002753	186003433
19 x 250 mm	OBD Column	5 µm	186004027	186004028	186004029
30 x 10 mm	Guard	5 µm	186006885 ³	186006887 ³	186006889 ³
30 x 50 mm	OBD Column	5 µm	186002570	186002755	186003435
30 x 75 mm	OBD Column	5 µm	186002571	186002756	186003436
30 x 100 mm	OBD Column	5 µm	186002572	186002757	186003437
30 x 150 mm	OBD Column	5 µm	186002797	186002795	186003438
30 x 250 mm	OBD Column	5 µm	186003969	—	—
50 x 50 mm	OBD Column	5 µm	186002867	186002868	186003439
50 x 100 mm	OBD Column	5 µm	186002869	186002870	186003440
50 x 150 mm	OBD Column	5 µm	186003941	—	—
50 x 250 mm	OBD Column	5 µm	186003970	—	—
10 x 10 mm	Guard	10 µm	186002663 ¹	186002758 ¹	186003441 ¹
10 x 50 mm	OBD Column	10 µm	186008208	186008209	—
10 x 150 mm	OBD Column	10 µm	186008156	186008162	186008184
10 x 250 mm	OBD Column	10 µm	186008157	186008163	186008185
19 x 10 mm	Guard	10 µm	186002666 ²	186002761 ²	186003444 ²
19 x 50 mm	OBD Column	10 µm	186002667	—	186003445
19 x 150 mm	OBD Column	10 µm	186002668	186002763	186003446
19 x 250 mm	OBD Column	10 µm	186002669	186002764	186003447
30 x 10 mm	Guard	10 µm	186006884 ³	186006886 ³	186006888 ³
30 x 50 mm	OBD Column	10 µm	186003854	186003853	186003855
30 x 100 mm	OBD Column	10 µm	186003971	—	—
30 x 150 mm	OBD Column	10 µm	186002670	186002765	186003448
30 x 250 mm	OBD Column	10 µm	186002671	186002766	186003449
50 x 50 mm	OBD Column	10 µm	186002871	186002872	186003450
50 x 100 mm	OBD Column	10 µm	186003972	—	—
50 x 150 mm	OBD Column	10 µm	186002672	186002767	186003451
50 x 250 mm	OBD Column	10 µm	186002673	186002768	186003452

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912

Atlantis Preparative Columns

Dimension	Type	Particle size	T3	HILIC	dC ₁₈
10 x 10 mm	Guard	5 µm	186003695 ¹	—	186002300 ¹
10 x 50 mm	OBD Column	5 µm	186008202	—	186008146
10 x 100 mm	OBD Column	5 µm	186008203	—	186008148
10 x 150 mm	OBD Column	5 µm	186008204	—	—
10 x 250 mm	OBD Column	5 µm	186008205	—	—
19 x 10 mm	Guard	5 µm	186003699 ²	186003956 ²	186001361 ²
19 x 50 mm	OBD Column	5 µm	186003696	186003957	186001365
19 x 100 mm	OBD Column	5 µm	186003697	186003958	186001367
19 x 150 mm	OBD Column	5 µm	186003698	186003959	186002800
19 x 250 mm	OBD Column	5 µm	186004026	—	186004030
30 x 10 mm	Guard	5 µm	186006879 ³	186006877 ³	186006876 ³
30 x 50 mm	OBD Column	5 µm	186003700	186003960	186001373
30 x 75 mm	OBD Column	5 µm	186003701	—	186002455
30 x 100 mm	OBD Column	5 µm	186003702	186003961	—
30 x 150 mm	OBD Column	5 µm	186003703	186003962	186002801
50 x 50 mm	OBD Column	5 µm	186004080	—	—
50 x 100 mm	OBD Column	5 µm	186004081	—	—
50 x 150 mm	OBD Column	5 µm	186004082	—	—
10 x 10 mm	Guard	10 µm	186003706 ¹	—	186002451 ¹
10 x 150 mm	OBD Column	10 µm	186008206	—	186008149
10 x 250 mm	OBD Column	10 µm	186008207	—	186008151
19 x 10 mm	Guard	10 µm	186003710 ²	—	186001363 ²
19 x 50 mm	OBD Column	10 µm	186003707	—	—
19 x 150 mm	OBD Column	10 µm	186003708	—	186001369
19 x 250 mm	OBD Column	10 µm	186003709	—	186001371
30 x 10 mm	Guard	10 µm	186006878 ³	—	186006875 ³
30 x 75 mm	OBD Column	10 µm	186004712	—	—
30 x 150 mm	OBD Column	10 µm	186003711	—	—
30 x 250 mm	OBD Column	10 µm	186003712	—	186002418
50 x 50 mm	OBD Column	10 µm	186004083	—	—
50 x 100 mm	OBD Column	10 µm	186004084	—	—
50 x 150 mm	OBD Column	10 µm	186004085	—	—
50 x 250 mm	OBD Column	10 µm	186004086	—	—

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912

Peptide Preparative Columns

Dimension	Type	Particle size	XBridge Peptide BEH C ₁₈ , 300 Å	XBridge Peptide BEH C ₁₈ , 300 Å	XSelect Peptide CSH C ₁₈ , 130 Å
10 x 10 mm	Guard	5 µm	186004469 ¹	186004471 ¹	186007015 ¹
10 x 50 mm	OBD Column	5 µm	186008186	186008190	186008264
10 x 100 mm	OBD Column	5 µm	186008187	186008191	186008265
10 x 150 mm	OBD Column	5 µm	186008188	186008192	186008266
10 x 250 mm	OBD Column	5 µm	186008189	186008193	186008267
19 x 10 mm	Guard	5 µm	186004468 ²	186004470 ²	186007019 ²
19 x 50 mm	OBD Column	5 µm	186003586	186003630	186007022
19 x 100 mm	OBD Column	5 µm	186003587	186003631	186007020
19 x 150 mm	OBD Column	5 µm	186003945	186003946	186007021
19 x 250 mm	OBD Column	5 µm	—	—	186007031
30 x 10 mm	Guard	5 µm	—	—	186007206 ³
30 x 50 mm	OBD Column	5 µm	—	—	186007026
30 x 100 mm	OBD Column	5 µm	—	—	186007025
30 x 150 mm	OBD Column	5 µm	—	—	186007023
30 x 250 mm	OBD Column	5 µm	—	—	186007024
50 x 50 mm	OBD Column	5 µm	—	—	186007030
50 x 100 mm	OBD Column	5 µm	—	—	186007027
50 x 150 mm	OBD Column	5 µm	—	—	186007028
50 x 250 mm	OBD Column	5 µm	—	—	186007029
4.6 x 50 mm	OBD Column	10 µm	186003648	186003663	—
4.6 x 100 mm	OBD Column	10 µm	186003649	186003664	—
4.6 x 150 mm	OBD Column	10 µm	186003650	186003665	—
4.6 x 250 mm	OBD Column	10 µm	186003651	186003666	—
10 x 50 mm	Guard	10 µm	186004465 ¹	186004467 ¹	—
10 x 100 mm	OBD Column	10 µm	186008194	186008198	—
10 x 150 mm	OBD Column	10 µm	186008195	186008199	—
10 x 250 mm	OBD Column	10 µm	186008196	186008200	—
10 x 250 mm	OBD Column	10 µm	186008197	186008201	—
19 x 10 mm	Guard	10 µm	186004464 ²	186004466 ²	—
19 x 50 mm	OBD Column	10 µm	186003656	186003671	—
19 x 150 mm	OBD Column	10 µm	186003657	186003672	—
19 x 250 mm	OBD Column	10 µm	186003658	186003673	—
30 x 10 mm	Guard	10 µm	186006880 ³	186006882 ³	—
30 x 50 mm	OBD Column	10 µm	186003659	186003674	—
30 x 100 mm	OBD Column	10 µm	186003660	186003675	—
30 x 150 mm	OBD Column	10 µm	186003661	186003676	—
30 x 250 mm	OBD Column	10 µm	186003662	186003677	—

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912

Protein Preparative Columns

Dimension	Type	XBridge Protein BEH C ₄ , 300 Å, 5 µm	XBridge Protein BEH C ₄ , 300 Å, 10 µm
10 x 10 mm	Guard	186007305 ¹	186007325 ¹
10 x 50 mm	OBD Column	186008272	186008276
10 x 100 mm	OBD Column	186008273	186008277
10 x 150 mm	OBD Column	186008274	186008278
10 x 250 mm	OBD Column	186008275	186008279
19 x 10 mm	Guard	186007310 ²	186007330 ²
19 x 50 mm	OBD Column	186007311	186007331
19 x 100 mm	OBD Column	186007312	186007332
19 x 150 mm	OBD Column	186007313	186007333
19 x 250 mm	OBD Column	186007314	186007334
30 x 10 mm	Guard	186007315 ³	186007335 ³
30 x 50 mm	OBD Column	186007316	186007336
30 x 75 mm	OBD Column	186007317	186007337
30 x 100 mm	OBD Column	186007318	186007338
30 x 150 mm	OBD Column	186007319	186007339
30 x 250 mm	OBD Column	186007320	186007340

¹ Requires 10 x 10 mm Prep Guard Holder, p/n: 289000779

² Requires 19 x 10 mm Prep Guard Holder, p/n: 186008745

³ Requires 30 x 10 mm Prep Guard Holder, p/n: 186006912

Oligonucleotide Preparative Columns

Dimension	Type	XBridge Oligonucleotide BEH C ₁₈ , 130 Å, 2.5 µm
10 x 50 mm	OBD Column	186008212
19 x 50 mm	OBD Column	186008962
30 x 50 mm	OBD Column	186008963
50 x 50 mm	OBD Column	186008964

Literature References

White Paper	Literature Code
BEH (Ethylene Bridged Hybrid) Technology	720001159EN
CSH (Charged Surface Hybrid) Technology	720003929EN
OBD (Optimum Bed Density) Technology	720001939EN

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Waters Corporation
34 Maple Street
Milford, MA 01757 U.S.A.
T: 1 508 478 2000
F: 1 508 872 1990
www.waters.com

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