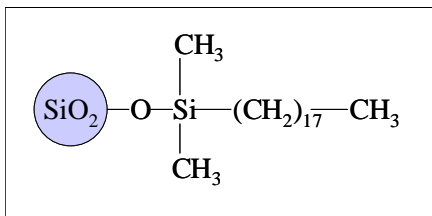


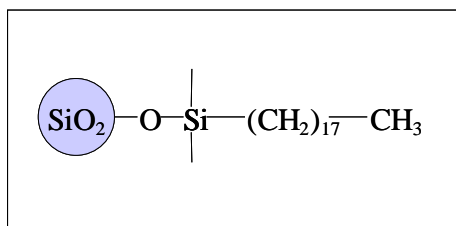
# Preparative and Process Chromatography

## GP-C18



Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 7, 10, 15 and 20 µm  
Pore volume: 1.0 mL/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: Monomeric and fully endcapped  
% Carbon: 17%

## BR-C18



*C18 phase formed by special bonding chemistry for applications in wide range of pH (1.5-10.5)*

Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5 and 10 µm  
Pore volume: 1.0 mL/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: fully endcapped  
% Carbon: 19%

## HP-C18

*ODS monolayer formed by special bonding chemistry does not collapse in pure aqueous solution.*

Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 7, 10, 15 and 20 µm  
Pore volume: 1.0 mL/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: Monomeric and fully endcapped  
% Carbon: 17%

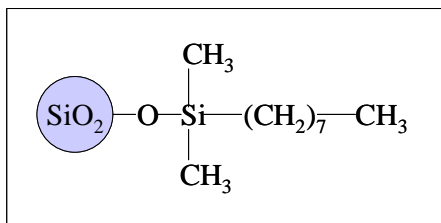
## Bio-C18

*C18 monolayer formed by special bonding chemistry does not collapse in pure aqueous solution.*

Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 200 Å  
Particle size: 5 and 10 µm  
Pore volume: 1.0 mL/g  
Surface area: 200 m<sup>2</sup>/g  
Phase structure: Monomeric and fully endcapped  
% Carbon: 10%

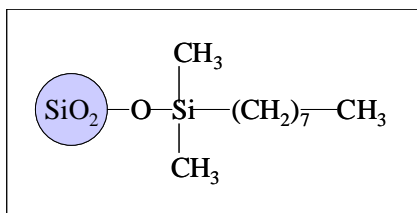
Pore size: 300 Å  
Particle size: 5 and 10 µm  
Pore volume: 0.95 mL/g  
Surface area: 105 m<sup>2</sup>/g  
Phase structure: Monomeric and fully endcapped  
% Carbon: 7.0%

## GP-C8



Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 7, 10, 15 and 20 µm  
Pore volume: 1.0 mL/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: Monomeric and fully endcapped  
% Carbon: 11.0%

## Bio-C8



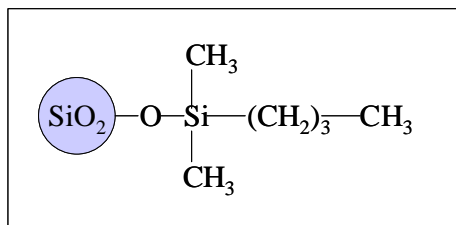
Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 300 Å  
Particle size: 5 and 10 µm  
Pore volume: 1.0 mL/g

Surface area: 105 m<sup>2</sup>/g

Phase structure: Monomeric and fully endcapped

% Carbon: 4.0%

### GP-C4



Silica: Spherical, high purity (<10 ppm metals)

Pore size: 120 Å

Particle size: 5, 7, 10, 15 and 20 μm

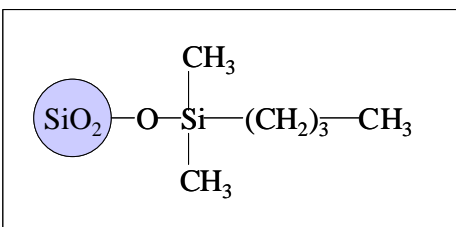
Pore volume: 1.0 mL/g

Surface area: 300 m<sup>2</sup>/g

Phase structure: Monomeric and fully endcapped

% Carbon: 8.0%

### Bio-C4



Silica: Spherical, high purity (<10 ppm metals)

Pore size: 300 Å

Particle size: 5 and 10 μm

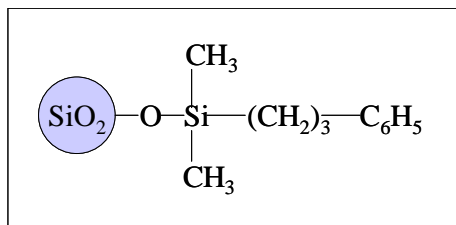
Pore volume: 1.0 mL/g

Surface area: 105 m<sup>2</sup>/g

Phase structure: Monomeric and fully endcapped

% Carbon: 3.0%

### GP-Phenyl



Silica: Spherical, high purity (<10 ppm metals)

Pore size: 120 Å

Particle size: 5, 7, 10, 15 and 20 μm

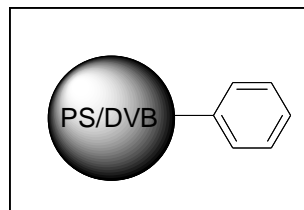
Pore volume: 1.0 mL/g

Surface area: 300 m<sup>2</sup>/g

Phase structure: Monomeric and fully endcapped

% Carbon: 11%

### PolyRP



PS/DVB Particles: spherical, 80% cross-linking

Pore size: 100, 300, 500 and 1000 Å

Particle size: 5, 10 and 15 μm

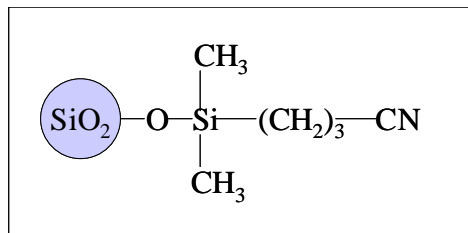
Pore volume: 1.0 mL/g

Surface area: 280 m<sup>2</sup>/g for 100 Å pore size

Phase structure: phenyl group

Separation mechanism: hydrophobic interaction

### HP-Cyano



Silica: Spherical, high purity (<10 ppm metals)

Pore size: 120 Å

Particle size: 5, 7, 10, 15 and 20 μm

Pore volume: 1.0 mL/g

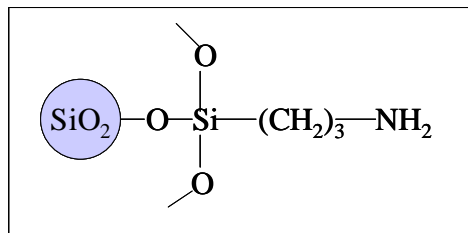
Surface area: 300 m<sup>2</sup>/g

Phase structure: Monomeric and fully endcapped

% Carbon: 7.0%

Coverage: ~3.5 μmol/m<sup>2</sup>

### HP-Amino



Silica: Spherical, high purity (<10 ppm metals)

Pore size: 120 Å

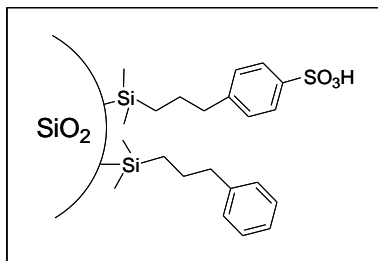
Particle size: 5, 7, 10, 15 and 20 μm

Pore volume: 1.0 mL/g

Surface area: 300 m<sup>2</sup>/g

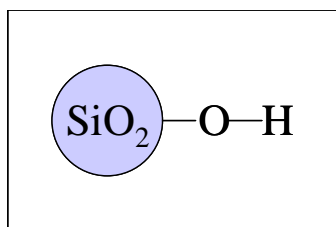
Phase structure: Polymeric and no endcapping  
% Carbon: 4.0%

### HP-SCX



Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 7, 10, and 20 µm  
Pore volume: 1.0 mL/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: Polymeric and mixed mode  
% Carbon: 11.0%

### HP-Silica



Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 7, 10, 20, and 45 µm  
Pore volume: 1.0 ml/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: hydroxyl (-OH)  
% Carbon: 0%

### HILIC Polar-100

Silica: Spherical, high purity (<10 ppm metals)  
Pore size: 120 Å  
Particle size: 5, 10 and 15 µm  
Pore volume: 1.0 ml/g  
Surface area: 300 m<sup>2</sup>/g  
Phase structure: chemically bonded highly hydrophilic monolayer

## Characteristics

- Highly controlled chemistry of monolayer formation and end-capping
- Excellent column-to-column reproducibility
- Easy scale-up from analytical to preparative columns
- High mechanical stability
- Wide range of selection of particle size, pore size, and bonding chemistry

## Guidelines Recommended for Preparative Separation

Development of a preparative separation method usually starts from an analytical separation with an appropriate stationary phase. C18 is the most widely used packing media for preparative separation. The capacity factor, *k*, of a sample component is recommended in the range of 2.5 and 20. The preparative separation usually overloads the column to achieve highest yield with some sacrifices to resolution. The selectivity and resolution could be optimized by tuning the slope of the operating mobile phase gradient and the mobile phase composition. To maximize the yield and achieve highest purity, the following guidelines are commended:

- Sample solubility in the starting mobile phase is critical (>0.1M or >50mg/mL).
- Selectivity ( $\alpha$ ):  $\alpha < 1.25$  should be avoided; allows for minimal overloading (<1 mg/g packing sorbent).
- Selectivity ( $\alpha$ ):  $\alpha > 1.5$  allows overloading up to 15 mg/g packing sorbent.



## Applications

Phases	Chemistry	Applications
C18	GP-C18	Reversed phase separations for pharmaceuticals, nutraceuticals, natural products, acidic, neutral and basic compounds
	BR-C18	Basic compounds or separations required high pH durability
	HP-C18	Separations at high aqueous mobile phase, pharmaceuticals, vitamins, natural products, peptides, and polar compounds
	Bio-C18	Separations required large pore size or at high aqueous mobile phase, pharmaceuticals, vitamins, natural products, peptides, and polar compounds
C8	GP-C8	Reversed phase separations for pharmaceuticals, estrogens, acidic, neutral and basic compounds
	Bio-C8	Separations required large pore size for pharmaceuticals, vitamins, proteins, peptides, and polar compounds
C4	GP-C4	Proteins and peptides
	Bio-C4	Separations required large pore size for proteins and peptides
Phenyl	GP-Phenyl	Aromatic compounds, antibiotics, lipids, ring-structured compounds
PS/DVB	PolyRP	Reversed phase separations required extreme pH (1-14) or different selectivity for pharmaceuticals, nutraceuticals, peptides, acidic, neutral and basic compounds
CN	HP-Cyano	Normal phase separations for pharmaceuticals and polar organic compounds
NH <sub>2</sub>	HP-Amino	Sugars, alcohols, vitamins, nucleosides, oligonucleotides, and anionic compounds
SCX (Strong Cation Exchange)	HP-SCX	Sugars, alcohols, vitamins, nucleosides, oligonucleotides, and anionic compounds
Silica	HP-Silica	Normal phase or HILIC mode separation for basic compounds, pharmaceuticals, nutraceuticals, and metabolites
HILIC	Polar-100	Polar compounds which are not well retained by other phases

## Test Chromatograms

Figure 1 is the typical test chromatogram for a 21.2x250 mm GP-C18 (5 μm) column.

Column: GP-C18 (21.2x250 mm, 10 μm)

Mobile phase: 70% ACN and 30% H<sub>2</sub>O

Flow rate: 20 mL/min

Detector: UV 254 nm

Injection volume: 100 μL

Temperature: Ambient (23 °C)

Sample: 1.0 mg/mL

Results

Compounds	Efficiency	Symmetry	Resolution
(1) Anisole	20540	1.132	9.695
(2) Toluene	23902	1.109	12.433
(3) Naphthalene	24900	1.055	7.398

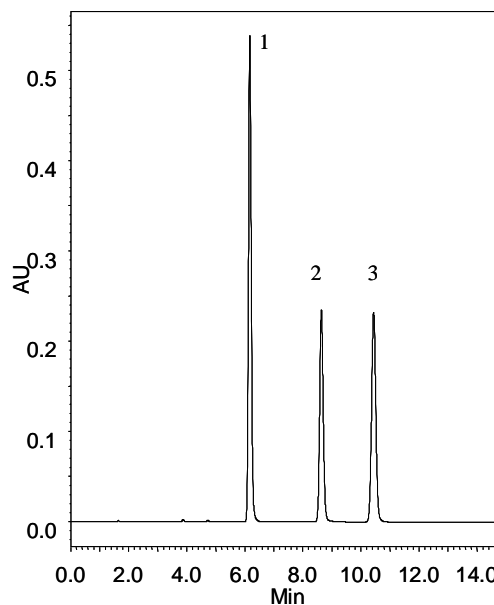


Figure 2 is the typical test chromatogram for a 21.2x100 mm HP-C18 (10  $\mu$ m) column. The results using toluene as the test compound are the following:

Efficiency: 5,000  
 Asymmetry: 1.08  
 Selectivity (K'): 1.95

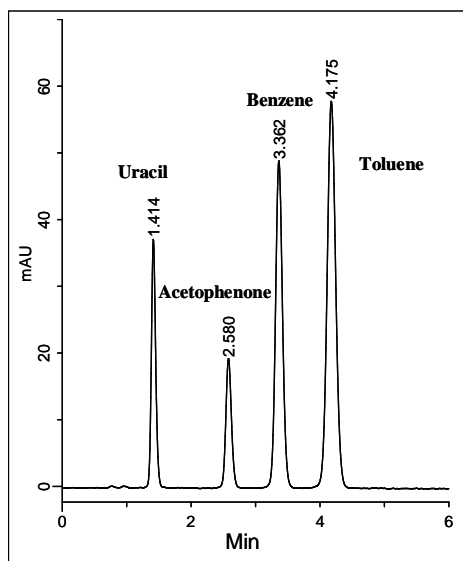


Figure 2. Column: HP-C18 (21.2x100 mm, 10  $\mu$ m)  
 Mobile phase: 70% ACN and 30% H<sub>2</sub>O  
 Flow rate: 15 mL/min  
 Detector: UV 254 nm  
 Injection volume: 100  $\mu$ L  
 Temperature: Ambient (23 °C)  
 Sample: 1.0 mg/mL for each compound



## Natural Product Purification

Nature products are very important for medicine and other utilities. High efficiency and high resolution separation is crucial for isolation and purification of new compounds from nature resources, such as plants. Figure 3 and 4 are the examples of preparative separation of nature products from plant roots. For each of the plant root extracts, more than 100 compounds are isolated and purified.

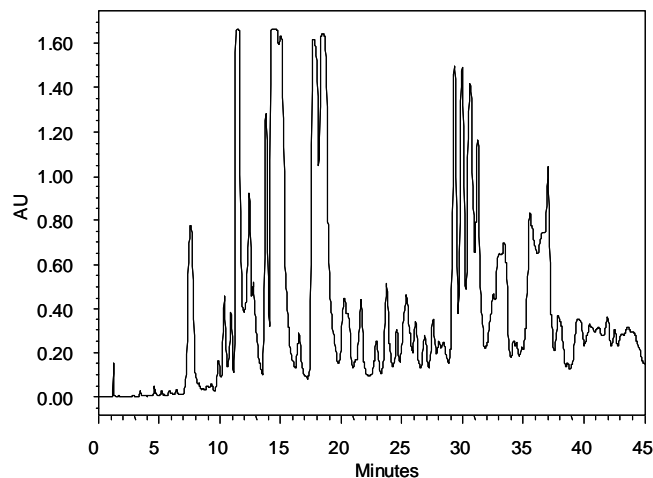


Figure 3. Separation of 333 mg (in 800  $\mu$ L ACN) extract from a plant root by a GP-C18 column (10  $\mu$ m, 21.2x250 mm). Mobile phase: (A) 20% ACN in water; (B) 100% ACN. Gradient: 45%-100% B (35 min); 100% B (20 min). Flow rate: 20 mL/min. Temperature: Ambient (23 °C).

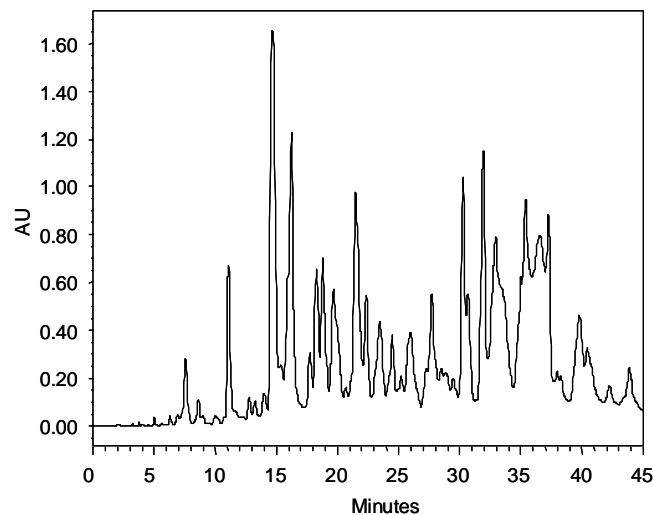


Figure 4. Separation of 400 mg (in 800  $\mu$ L CAN) extract from a plant root by a GP-C18 column (10  $\mu$ m, 21.2x250 mm). Mobile phase: (A) 20% ACN in water; (B) 100% ACN. Gradient: 45%-100% B (35 min); 100% B (20 min). Flow rate: 20 mL/min. Temperature: Ambient (23 °C).

### Ordering Information

<b>5 µm preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	150x7.8	250x7.8	100x10	150x10	250x10	50x10
GP-C18 (120 Å)	101185-7815	101185-7825	101185-10010	101185-10015	101185-10025	101185-10005
BR-C18 (120 Å)	102185-7815	102185-7825	102185-10010	102185-10015	102185-10025	102185-10005
HP-C18 (120 Å)	103185-7815	103185-7825	103185-10010	103185-10015	103185-10025	103185-10005
HP-C18 (200 Å)	104185-7815	104185-7825	104185-10010	104185-10015	104185-10025	104185-10005
Bio-C18 (200 Å)	105185-7815	105185-7825	105185-10010	105185-10015	105185-10025	105185-10005
Bio-C18 (300 Å)	106185-7815	106185-7825	106185-10010	106185-10015	106185-10025	106185-10005
GP-C8 (120 Å)	107085-7815	107085-7825	107085-10010	107085-10015	107085-10025	107085-10005
Bio-C8 (300 Å)	108085-7815	108085-7825	108085-10010	108085-10015	108085-10025	108085-10005
GP-C4 (120 Å)	109045-7815	109045-7825	109045-10010	109045-10015	109045-10025	109045-10005
Bio-C4 (300 Å)	110045-7815	110045-7825	110045-10010	110045-10015	110045-10025	110045-10005
GP-Ph <sup>1</sup> (120 Å)	111365-7815	111365-7825	111365-10010	111365-10015	111365-10025	111365-10005
HP-CN <sup>2</sup> (120 Å)	113315-7815	113315-7825	113315-10010	113315-10015	113315-10025	113315-10005
HP-NH <sub>2</sub> (120 Å)	115305-7815	115305-7825	115305-10010	115305-10015	115305-10025	115305-10005
HP-SCX (120 Å)	120365-7815	120365-7825	120365-10010	120365-10015	120365-10025	120365-10005
HP-Silica (120 Å)	117005-7815	117005-7825	117005-10010	117005-10015	117005-10025	117005-10005
HILIC Polar-100	131585-7815	131585-7825	131585-10010	131585-10015	131585-10025	131585-10005

<b>5 µm preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	50x21.2	100x21.2	150x21.2	250x21.2	50x30	10x21.2*
GP-C18 (120 Å)	101185-21205	101185-21210	101185-21215	101185-21225	101185-30025	101185-21201
BR-C18 (120 Å)	102185-21205	102185-21210	102185-21215	102185-21225	102185-30025	102185-21201
HP-C18 (120 Å)	103185-21205	103185-21210	103185-21215	103185-21225	103185-30025	103185-21201
HP-C18 (200 Å)	104185-21205	104185-21210	104185-21215	104185-21225	104185-30025	104185-21201
Bio-C18 (200 Å)	105185-21205	105185-21210	105185-21215	105185-21225	105185-30025	105185-21201
Bio-C18 (300 Å)	106185-21205	106185-21210	106185-21215	106185-21225	106185-30025	106185-21201
GP-C8 (120 Å)	107085-21205	107085-21210	107085-21215	107085-21225	107085-30025	107085-21201
Bio-C8 (300 Å)	108085-21205	108085-21210	108085-21215	108085-21225	108085-30025	108085-21201
GP-C4 (120 Å)	109045-21205	109045-21210	109045-21215	109045-21225	109045-30025	109045-21201
Bio-C4 (300 Å)	110045-21205	110045-21210	110045-21215	110045-21225	110045-30025	110045-21201
GP-Ph <sup>1</sup> (120 Å)	111365-21205	111365-21210	111365-21215	111365-21225	111365-30025	111365-21201
HP-CN <sup>2</sup> (120 Å)	113315-21205	113315-21210	113315-21215	113315-21225	113315-30025	113315-21201
HP-NH <sub>2</sub> (120 Å)	115305-21205	115305-21210	115305-21215	115305-21225	115305-30025	115305-21201
HP-SCX (120 Å)	120365-21205	120365-21210	120365-21215	120365-21225	120365-30025	120365-21201
HP-Silica (120 Å)	117005-21205	117005-21210	117005-21215	117005-21225	117005-30025	117005-21201
HILIC Polar-100	131585-21205	131585-21210	131585-21215	131585-21225	131585-30025	131585-21201

<b>5 µm preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	100x30	150x30	250x30	50x50	250x50	10x21.2*
GP-C18 (120 Å)	101185-30010	101185-30015	101185-30025	101185-50005	101185-50025	101185-21201
BR-C18 (120 Å)	102185-30010	102185-30015	102185-30025	102185-50005	102185-50025	102185-21201
HP-C18 (120 Å)	103185-30010	103185-30015	103185-30025	103185-50005	103185-50025	103185-21201
HP-C18 (200 Å)	104185-30010	104185-30015	104185-30025	104185-50005	104185-50025	104185-21201
Bio-C18 (200 Å)	105185-30010	105185-30015	105185-30025	105185-50005	105185-50025	105185-21201
Bio-C18 (300 Å)	106185-30010	106185-30015	106185-30025	106185-50005	106185-50025	106185-21201
GP-C8 (120 Å)	107085-30010	107085-30015	107085-30025	107085-50005	107085-50025	107085-21201
Bio-C8 (300 Å)	108085-30010	108085-30015	108085-30025	108085-50005	108085-50025	108085-21201
GP-C4 (120 Å)	109045-30010	109045-30015	109045-30025	109045-50005	109045-50025	109045-21201
Bio-C4 (300 Å)	110045-30010	110045-30015	110045-30025	110045-50005	110045-50025	110045-21201
GP-Ph <sup>1</sup> (120 Å)	111365-30010	111365-30015	111365-30025	111365-50005	111365-50025	111365-21201
HP-CN <sup>2</sup> (120 Å)	113315-30010	113315-30015	113315-30025	113315-50005	113315-50025	113315-21201
HP-NH <sub>2</sub> (120 Å)	115305-30010	115305-30015	115305-30025	115305-50005	115305-50025	115305-21201
HP-SCX (120 Å)	120365-30010	120365-30015	120365-30025	120365-50005	120365-50025	120365-21201
HP-Silica (120 Å)	117005-30010	117005-30015	117005-30025	117005-50005	117005-50025	117005-21201
HILIC Polar-100	131585-30010	131585-30015	131585-30025	131585-50005	131585-50025	131585-21201

1. Phenyl phase; 2. Cyano phase

\* Guard column holder

P/N# 102000-21201



<b>7 <math>\mu\text{m}</math> preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	150x7.8	250x7.8	100x10	150x10	250x10	50x10
GP-C18 (120 Å)	101187-7815	101187-7825	101187-10010	101187-10015	101187-10025	101187-10005
HP-C18 (120 Å)	103187-7815	103187-7825	103187-10010	103187-10015	103187-10025	103187-10005
GP-C8 (120 Å)	107087-7815	107087-7825	107087-10010	107087-10015	107087-10025	107087-10005
GP-C4 (120 Å)	109047-7815	109047-7825	109047-10010	109047-10015	109047-10025	109047-10005
GP-Ph <sup>1</sup> (120 Å)	111367-7815	111367-7825	111367-10010	111367-10015	111367-10025	111367-10005
HP-CN <sup>2</sup> (120 Å)	113317-7815	113317-7825	113317-10010	113317-10015	113317-10025	113317-10005
HP-NH <sub>2</sub> (120 Å)	115307-7815	115307-7825	115307-10010	115307-10015	115307-10025	115307-10005
HP-SCX (120 Å)	120367-7815	120367-7825	120367-10010	120367-10015	120367-10025	120367-10005
HP-Silica (120 Å)	117007-7815	117007-7825	117007-10010	117007-10015	117007-10025	117007-10005

<b>7 <math>\mu\text{m}</math> preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	50x21.2	100x21.2	150x21.2	250x21.2	250x30	10x21.2*
GP-C18 (120 Å)	101187-21205	101187-21210	101187-21215	101187-21225	101187-30025	101187-21201
HP-C18 (120 Å)	103187-21205	103187-21210	103187-21215	103187-21225	103187-30025	103187-21201
GP-C8 (120 Å)	107087-21205	107087-21210	107087-21215	107087-21225	107087-30025	107087-21201
GP-C4 (120 Å)	109047-21205	109047-21210	109047-21215	109047-21225	109047-30025	109047-21201
GP-Ph <sup>1</sup> (120 Å)	111367-21205	111367-21210	111367-21215	111367-21225	111367-30025	111367-21201
HP-CN <sup>2</sup> (120 Å)	113317-21205	113317-21210	113317-21215	113317-21225	113317-30025	113317-21201
HP-NH <sub>2</sub> (120 Å)	115307-21205	115307-21210	115307-21215	115307-21225	115307-30025	115307-21201
HP-SCX (120 Å)	120367-21205	120367-21210	120367-21215	120367-21225	120367-30025	120367-21201
HP-Silica (120 Å)	117007-21205	117007-21210	117007-21215	117007-21225	117007-30025	117007-21201

1. Phenyl phase; 2. Cyano phase

\* Guard column holder  
P/N# 102000-21201



<b>10 <math>\mu\text{m}</math> preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	150x7.8	250x7.8	100x10	150x10	250x10	50x10
GP-C18 (120 Å)	101189-7815	101189-7825	101189-10010	101189-10015	101189-10025	101189-10005
BR-C18 (120 Å)	102189-7815	102189-7825	102189-10010	102189-10015	102189-10025	102189-10005
HP-C18 (120 Å)	103189-7815	103189-7825	103189-10010	103189-10015	103189-10025	103189-10005
HP-C18 (200 Å)	104189-7815	104189-7825	104189-10010	104189-10015	104189-10025	104189-10005
Bio-C18 (200 Å)	105189-7815	105189-7825	105189-10010	105189-10015	105189-10025	105189-10005
Bio-C18 (300 Å)	106189-7815	106189-7825	106189-10010	106189-10015	106189-10025	106189-10005
GP-C8 (120 Å)	107089-7815	107089-7825	107089-10010	107089-10015	107089-10025	107089-10005
Bio-C8 (300 Å)	108089-7815	108089-7825	108089-10010	108089-10015	108089-10025	108089-10005
GP-C4 (120 Å)	109049-7815	109049-7825	109049-10010	109049-10015	109049-10025	109049-10005
Bio-C4 (300 Å)	110049-7815	110049-7825	110049-10010	110049-10015	110049-10025	110049-10005
GP-Ph <sup>1</sup> (120 Å)	111369-7815	111369-7825	111369-10010	111369-10015	111369-10025	111369-10005
HP-CN <sup>2</sup> (120 Å)	113319-7815	113319-7825	113319-10010	113319-10015	113319-10025	113319-10005
HP-NH <sub>2</sub> (120 Å)	115309-7815	115309-7825	115309-10010	115309-10015	115309-10025	115309-10005
HP-SCX (120 Å)	120369-7815	120369-7825	120369-10010	120369-10015	120369-10025	120369-10005
HP-Silica (120 Å)	117009-7815	117009-7825	117009-10010	117009-10015	117009-10025	117009-10005
HILIC Polar-100	131589-7815	131589-7825	131589-10010	131589-10015	131589-10025	131589-10005

<b>10 <math>\mu\text{m}</math> preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	50x21.2	100x21.2	150x21.2	250x21.2	50x30	10x21.2*
GP-C18 (120 Å)	101189-21205	101189-21210	101189-21215	101189-21225	101189-30025	101189-21201
BR-C18 (120 Å)	102189-21205	102189-21210	102189-21215	102189-21225	102189-30025	102189-21201
HP-C18 (120 Å)	103189-21205	103189-21210	103189-21215	103189-21225	103189-30025	103189-21201
HP-C18 (200 Å)	104189-21205	104189-21210	104189-21215	104189-21225	104189-30025	104189-21201
Bio-C18 (200 Å)	105189-21205	105189-21210	105189-21215	105189-21225	105189-30025	105189-21201
Bio-C18 (300 Å)	106189-21205	106189-21210	106189-21215	106189-21225	106189-30025	106189-21201
GP-C8 (120 Å)	107089-21205	107089-21210	107089-21215	107089-21225	107089-30025	107089-21201
Bio-C8 (300 Å)	108089-21205	108089-21210	108089-21215	108089-21225	108089-30025	108089-21201
GP-C4 (120 Å)	109049-21205	109049-21210	109049-21215	109049-21225	109049-30025	109049-21201
Bio-C4 (300 Å)	110049-21205	110049-21210	110049-21215	110049-21225	110049-30025	110049-21201
GP-Ph <sup>1</sup> (120 Å)	111369-21205	111369-21210	111369-21215	111369-21225	111369-30025	111369-21201
HP-CN <sup>2</sup> (120 Å)	113319-21205	113319-21210	113319-21215	113319-21225	113319-30025	113319-21201
HP-NH <sub>2</sub> (120 Å)	115309-21205	115309-21210	115309-21215	115309-21225	115309-30025	115309-21201
HP-SCX (120 Å)	120369-21205	120369-21210	120369-21215	120369-21225	120369-30025	120369-21201
HP-Silica (120 Å)	117009-21205	117009-21210	117009-21215	117009-21225	117009-30025	117009-21201
HILIC Polar-100	131589-21205	131589-21210	131589-21215	131589-21225	131589-30025	131589-21201

<b>10 <math>\mu\text{m}</math> preparative and semi-preparative Columns (length x ID mm)</b>						Guard column
Phases	100x30	150x30	250x30	50x50	250x50	10x21.2*
GP-C18 (120 Å)	101189-30010	101189-30015	101189-30025	101189-50005	101189-50025	101189-21201
BR-C18 (120 Å)	102189-30010	102189-30015	102189-30025	102189-50005	102189-50025	102189-21201
HP-C18 (120 Å)	103189-30010	103189-30015	103189-30025	103189-50005	103189-50025	103189-21201
HP-C18 (200 Å)	104189-30010	104189-30015	104189-30025	104189-50005	104189-50025	104189-21201
Bio-C18 (200 Å)	105189-30010	105189-30015	105189-30025	105189-50005	105189-50025	105189-21201
Bio-C18 (300 Å)	106189-30010	106189-30015	106189-30025	106189-50005	106189-50025	106189-21201
GP-C8 (120 Å)	107089-30010	107089-30015	107089-30025	107089-50005	107089-50025	107089-21201
Bio-C8 (300 Å)	108089-30010	108089-30015	108089-30025	108089-50005	108089-50025	108089-21201
GP-C4 (120 Å)	109049-30010	109049-30015	109049-30025	109049-50005	109049-50025	109049-21201
Bio-C4 (300 Å)	110049-30010	110049-30015	110049-30025	110049-50005	110049-50025	110049-21201
GP-Ph <sup>1</sup> (120 Å)	111369-30010	111369-30015	111369-30025	111369-50005	111369-50025	111369-21201
HP-CN <sup>2</sup> (120 Å)	113319-30010	113319-30015	113319-30025	113319-50005	113319-50025	113319-21201
HP-NH <sub>2</sub> (120 Å)	115309-30010	115309-30015	115309-30025	115309-50005	115309-50025	115309-21201
HP-SCX (120 Å)	120369-30010	120369-30015	120369-30025	120369-50005	120369-50025	120369-21201
HP-Silica (120 Å)	117009-30010	117009-30015	117009-30025	117009-50005	117009-50025	117009-21201
HILIC Polar-100	131589-30010	131589-30015	131589-30025	131589-50005	131589-50025	131589-21201

1. Phenyl phase; 2. Cyano phase

\* Guard column holder

P/N# 102000-21201

