

# HPLC COLUMNS



**HPLC Columns & Bulk Resins**



**HAMILTON**

# The Measure of Excellence

## Hamilton

For nearly 60 years, Hamilton Company has been satisfying customer needs in the field of precision fluid measuring. It all started with syringes. Not commercial, mass produced medical syringes, but precision measuring instruments. Over 30 years ago Hamilton was the first company to develop and manufacture pressure stable polymeric HPLC columns.

## Columns

We now offer 19 different polymer-based HPLC columns for reversed phase, anion exchange, cation exchange and ion exclusion separations. Two silica-based C8 and C18 columns are available for reversed phase separations.

## Choosing the Right HPLC Column

Before you select an HPLC column to separate your sample please check the Hamilton Company HPLC web site at [www.hamiltoncompany.com/HPLC/applicationIndex.php](http://www.hamiltoncompany.com/HPLC/applicationIndex.php) or e-mail [hplc@hamiltoncompany.com](mailto:hplc@hamiltoncompany.com) for a complete list of compounds that have been separated on Hamilton HPLC columns.



This brochure only contains a few of the applications which have been performed on Hamilton HPLC columns. In the brochure, columns are grouped by separation mechanism: Reversed phase, anion exchange, cation exchange and ion exclusion.

The Recommended Uses Table below lists a few of the possible applications for each of the column packings.

### Recommended Uses

Reversed Phase	PRP®-h1	Long life column for LC/MS applications, synthesized DNA, and small molecule
	PRP-h5	Reduced system pressure for protein and peptide separations and enhanced oligonucleotide recovery
	PRP-1	General purpose pH stable long life column, synthesized DNA
	PRP-3	Gradient protein and peptide separations
	PRP-Infinity	Nonporous support for very fast gradient separation of large proteins
	HxSil C8, C18	General purpose silica-based reversed phase
Anion Exchange	PRP-X100	Anions, inorganic and organic using conductivity or UV detection. 0 to 100% solvent compatible.
	PRP-X110	Similar to PRP-X100 but for lower level anions (20 ppb to 20 ppm)
	PRP-X500	Gradient separation of large proteins and labeled DNA
	PRP-X600	Gradient separation of labeled and unlabeled DNA
	RCX-10	Isocratic or gradient separation of carbohydrate oligomers up to DP8
	RCX-30	Gradient separation of complex carbohydrates
Cation Exchange	PRP-X200	Inorganic and organic cations using conductivity or UV detection. Separate mono or divalent cations depending on mobile phase conditions.
	PRP-X400	Glyphosate and metabolite in drinking water. Also unique hydrophilic interaction separations
	PRP-X800	Mono and divalent cations in the same run. Transition metals
	HC-40	Sugar oligomers up to DP8. Max pressure 1,000 psi
	HC-75	Mono and disaccharides in corn syrup. Max pressure 1,000 psi Calcium Form
	HC-75	Organic acids and sugars. Max pressure 1,000 psi Hydrogen Form
	HC-75	Sugar alcohols. Max pressure 1,000 psi Lead Form
Ion Exclusion	PRP-X300	Organic acids and alcohols

# USP "L" Numbers & Bulk Resins

## USP "L" Number and Hamilton HPLC Columns

USP "L" Number	HAMILTON Column
L1 Octadecyl silane chemically bonded to porous silica or ceramic micro-particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	<b>HxSil C18</b>
L7 Octylsilane chemically bonded to totally porous silica particles, 1.5 to 10 µm in diameter, or a monolithic silica rod.	<b>HxSil C8</b>
L17 Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter.	<b>HC-75 Hydrogen Form</b> <b>PRP-X200</b> <b>PRP-X300</b>
L19 Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9 µm in diameter.	<b>HC-40</b> <b>HC-75 Calcium Form</b>
L21 A rigid, spherical styrene-divinylbenzene copolymer, 3 to 10 µm in diameter.	<b>PRP-1</b> <b>PRP-3</b>
L22 A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10 µm in size.	<b>PRP-X200</b> <b>PRP-X300</b>
L23 An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 10 µm in size.	<b>PRP-X500</b>
L34 Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, about 9 µm in diameter.	<b>HC-75 Lead Form</b>
L47 High capacity anion-exchange microporous substrate, fully functionalized with trimethylamine groups, 8 µm in diameter.	<b>PRP-X100</b> <b>PRP-X110</b> <b>RCX-10</b> <b>RCX-30</b>

## Bulk Resins

Reversed Phase Supports	Support Material	Exchange Capacity	Pore Size	3 µm	5 µm	7 µm	10 µm	12-20 µm	30-50 µm	50-75µm
PRP-h1	PSDVB*	N/A	100 Å					79279		
PRP-h5	PSDVB*	N/A	300 Å					79280		
PRP-1	PSDVB*	N/A	100 Å		79578	79579	79580	79581	79582	79583
PRP-3	PSDVB*	N/A	300 Å					79701	79702	
HxSil C8	Silica			79142	79143		79144			
HxSil C18	Silica			79139	79140		79141			
Anion Exchange Supports	Support Material	Exchange Capacity	Pore Size	3 µm	5 µm	7 µm	10 µm	12-20 µm	30-50 µm	50-75µm
PRP-X100	PSDVB* with Trimethyl-ammonium Exchanger	0.19 meq/gm	100 Å		79584		79585	79586		
PRP-X500	Poly(methacryl-amidopropyl Trimethyl-ammonium chloride)	1.6 meq/gm	Superficially porous		79594			79595	79596	
PRP-X600	Poly(dimethyl-amidopropyl-methacryl-amide)	1.6 meq/gm	Superficially porous		79597			79598	79599	
Cation Exchange Supports	Support Material	Exchange Capacity	Pore Size	3 µm	5 µm	7 µm	10 µm	12-20 µm	30-50 µm	50-75µm
PRP-X200	PSDVB* with Sulfonate Exchanger	35 µeq/gm	100 Å				79587	79588		
PRP-X400	PSDVB* with Sulfonate Exchanger	2.5 meq/gm	N/A		79591			79592	79593	

\* PSDVB is Poly(styrene-divinylbenzene)  
Bulk resin is sold by the gram.

# Reversed Phase HPLC Columns

## PRP®-h1

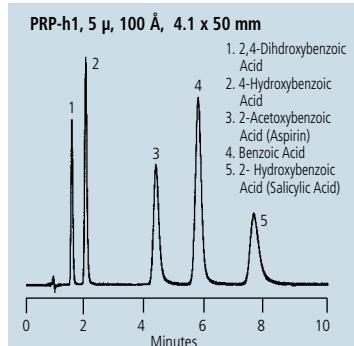
Polymeric 100 Å columns for reversed phase, LC/MS applications.

- pH stable from 1 to 13.
- Low bleed (ideal for mass spectrometry).
- Robust (virtually any HPLC solvent can be used).



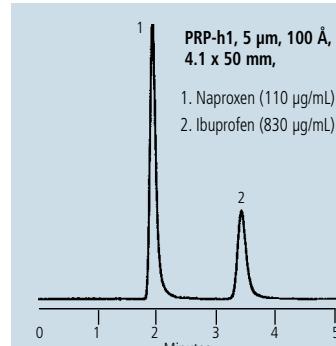
- One particle size: 5 µm.
- Analytical and semiprep/preparative guard columns.
- Available in stainless steel and PEEK hardware.

### Benzoic Acid and its Derivatives



Mobil Phase: A: 10 mmol/L sodiumdihydrogenphosphate pH = 2.2 B: Acetonitrile. Gradient: 18% B (Isocratic) Flow Rate: 0.60 mL/min. Column Temperature: 50 °C Detection: UV @230 nm. Injection Volume: 5 µL

### Naproxen Sodium



Mobil Phase: A: 10 mmol/L Sodiumdihydrogenphosphate pH = 2 B: Acetonitrile. Gradient: Isocratic 50% A/50% B Flow Rate: 0.60 mL/min. Column Temperature: 60 °C Detection: UV @230 nm.

## Ordering Information

### HPLC Columns

I.D.	50 mm	100 mm	150 mm	250 mm
2.1 mm		79250	79249	
4.6 mm	79251	79252	79253	79256
10 mm		79255	79266	
100 mm				79523

### Analytical Guard Columns

Starter Kit (1 holder, 2 cartridges)	79257
Replacement Cartridges (5/pk)	79258

\* Analytical guard column for steel columns is 2.3 x 20 mm

### Semiprep/Preparative Guard Column

Starter Kit (1 holder, 1 cartridge)	79275
Replacement Cartridges (2/pk)	79276

\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# PRP-h5 Reversed Phase HPLC Columns

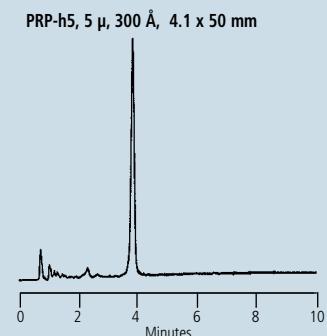
Polymeric 300 Å columns for oligonucleotide purification and protein separations.

- pH stable from 1 to 13.
- Robust (virtually any HPLC solvent can be used).
- Hydrophilic polymer structure delivers faster oligonucleotide purification.



- One particle size: 5 µm.
- Analytical and semiprep/preparative guard columns.
- Available in stainless steel and PEEK hardware.

## 21-mer Oligonucleotide Purification



Mobile phase: A: 0.1 mol/TEAA, pH = 7 B: 0.1 mol/L TEAA, pH = 7, 25% Acetonitrile  
Gradient: 30-80 %B in 15 min. Flow Rate: 0.60 mL/min  
Column Temp: 60 °C Detection: UV @ 260 nm

## Ordering Information

### HPLC Columns

I.D.	50 mm	100 mm	150 mm	250 mm
2.1 mm		79270	79271	
4.6 mm	79261	79262	79272	79273
10 mm		79263	79274	

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

### Analytical Guard Columns

	For Steel Columns*
Starter Kit (1 holder, 2 cartridges)	79267
Replacement Cartridges (5/pk)	79268

\* Analytical guard column for steel columns is 2.3 x 20 mm

Semiprep/Preparative Guard Column	For Steel Columns**
Starter Kits (1 holder, 1 cartridge)	79277
Replacement Cartridges (2/pk)	79278

\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

# PRP-1 Reversed Phase HPLC Columns

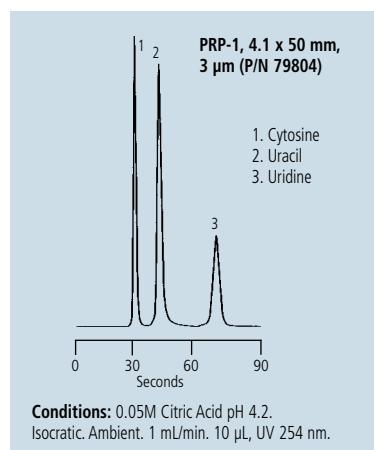
Polymeric 100 Å columns for general reversed phase separations.

- pH stable from 1 to 13.
- Better sample recovery than silica-based columns (there are no silanol groups).
- Excellent durability (stable to any concentration of water or organic solvent).

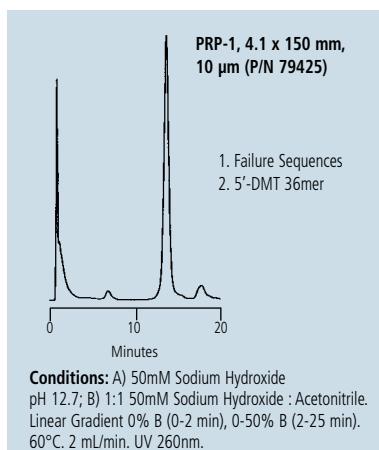


- Five particle sizes: 5, 7, 10, 12-20 and 30-50 µm.
- Analytical and semiprep/preparative guard columns.
- Available in stainless steel and PEEK hardware.

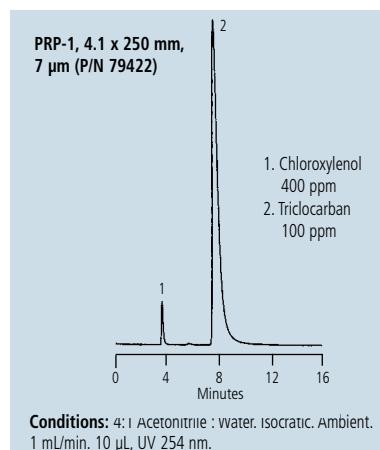
## Small Molecules



## DNA with Secondary Structure

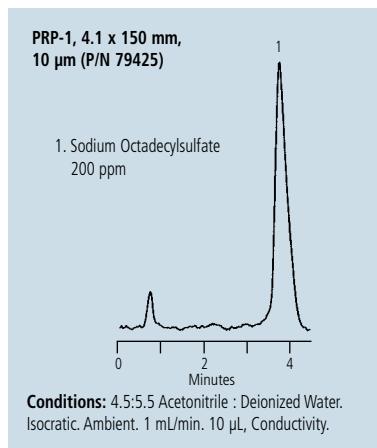


## Biocides found in Soap

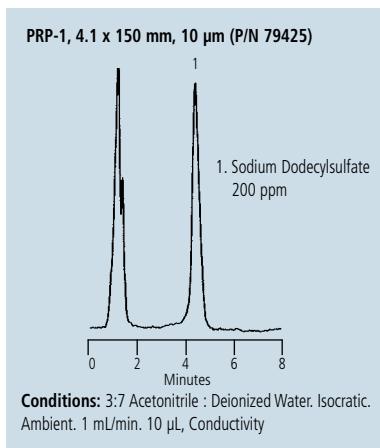


# PRP-1 Reversed Phase HPLC Columns

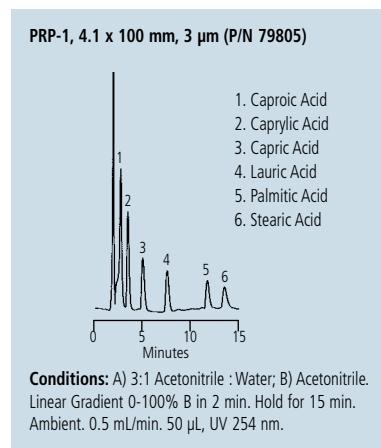
## Surfactant



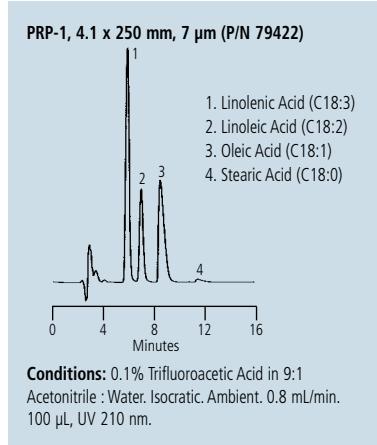
## Surfactant



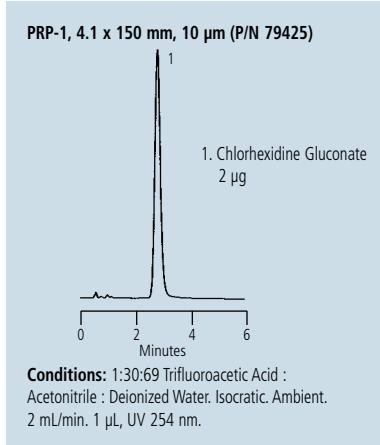
## Fatty Acids



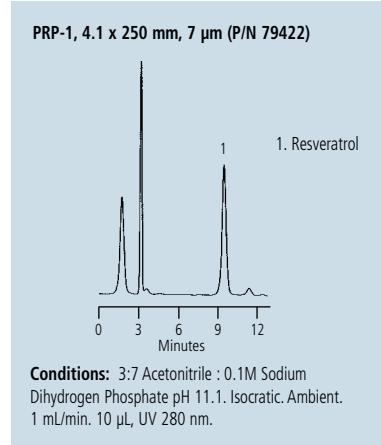
## Isomeric C18 Fatty Acids-



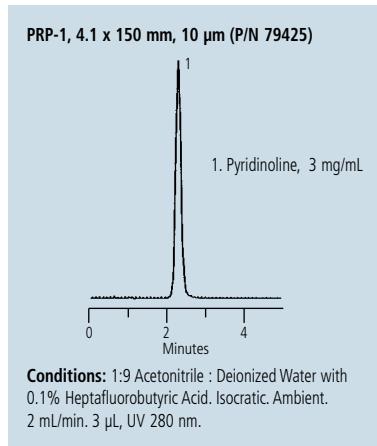
## Chlorhexidine Gluconate



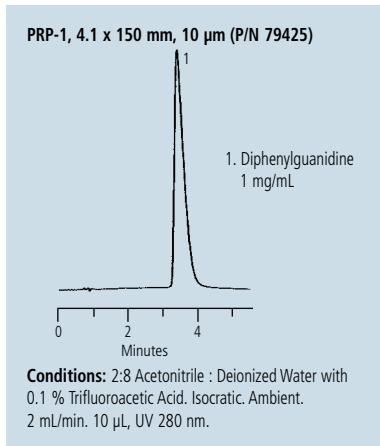
## Resveratrol



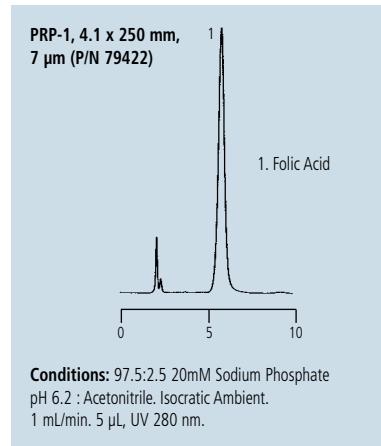
## Pyridinoline



## Diphenylguanidine

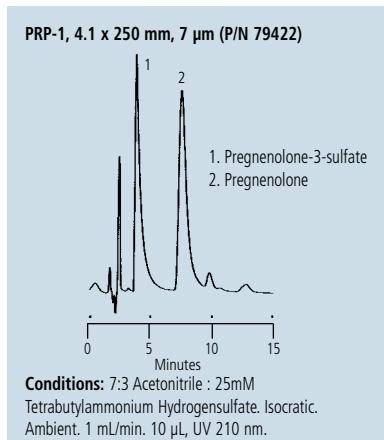


## Folic Acid

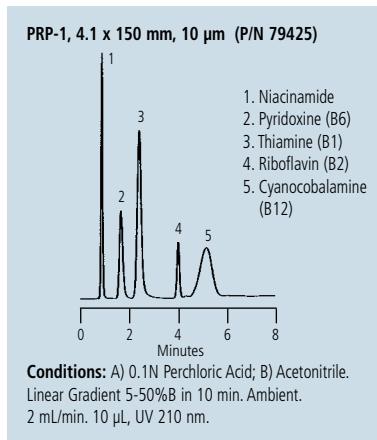


# PRP-1 Reversed Phase HPLC Columns

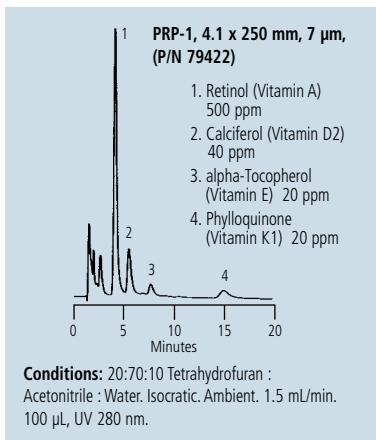
## Pregnenolone and Pregnenolone-3-sulfate



## Water Soluble Vitamins



## Fat Soluble Vitamins



## Ordering Information

### HPLC Columns

I.D. x Length	5 µm	7 µm	10 µm	12-20 µm
1.0 x 50 mm	79751	79755		
1.0 x 150 mm	79753			
1.0 x 250 mm	79754			
2.1 x 50 mm		79554		
2.1 x 100 mm	79790			
2.1 x 150 mm	79366		79480	
2.1 x 250 mm		79390	79391	
2.3 x 25 mm	79789**			
4.1 x 50 mm	79443			
4.1 x 100 mm	79479			
4.1 x 150 mm	79444	79529	79425	
4.1 x 250 mm	79820	79422	79427	79358
4.6 x 50 mm*	79850			79874
4.6 x 100 mm*	79558			
4.6 x 150 mm*	79423		79351	

\* PEEK hardware

\*\* Cartridge Column, Cartridge Holder P/N 32908 must be purchased separately.

I.D. x Length	5 µm	7 µm	10 µm	12-20 µm	30-50 µm
4.6 x 250 mm*	79571	79380	79381		79848
7.0 x 100 mm			79495	79713	
7.0 x 305 mm	79795	79545	79426		
10.0 x 50 mm		79367			
10.0 x 100 mm	79355		79499		
10.0 x 150 mm			79349		
10.0 x 250 mm	79531		79496		
21.5 x 100 mm	79791				
21.5 x 250 mm	79352	79478	79428		
50.8 x 250 mm		79567	79493		
101.6 x 250 mm			79525		

### Analytical Guard Columns

	For Steel Columns***	For PEEK Columns****
Starter Kits (1 holder, 2 cartridges)	79447	79317
Replacement Cartridges (5/pk)	79445	79318

\*\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

### Semiprep/Preparative Guard Column

	For Steel Columns*****
Starter Kit (1 holder, 1 cartridge)	79121
Replacement Cartridges (2/pk)	79122

Visit our HPLC Application Index at

<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# PRP-3 Reversed Phase HPLC Columns

Polymeric 300 Å columns for protein separations.

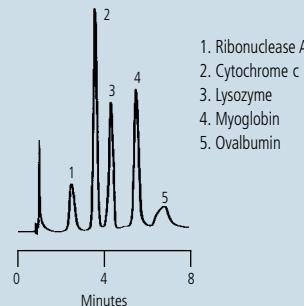
- pH stable from 1 to 13.
- Better sample recovery than silica-based columns (there are no silanol groups).
- Excellent durability (the support can be cleaned with strong acid or base to remove any sample residue).



- Two particle sizes: 10 and 12-20 µm.
- Available in stainless steel and PEEK hardware.
- Analytical and semiprep/preparative guard columns.

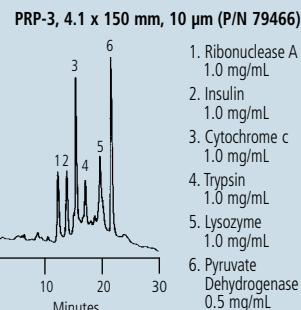
## Proteins

PRP-3, 4.1 x 150 mm, 10 µm (P/N 79466)



Conditions: A) 0.1% TFA in Water pH 2.0; B) 0.1% TFA in Acetonitrile. Linear Gradient 25-50% B in 5 min. Hold 3 min. Ambient. 2 mL/min. 100 µL, UV 215 nm.

## Proteins at pH 12.2



Conditions: A) 0.1% TFA in 50mM Sodium Hydroxide pH 12.2; B) 0.1% TFA in Acetonitrile. Linear Gradient 0-60% B in 30 min. Ambient. 2 mL/min. 50 µL, UV 220 nm.

## Ordering Information

### HPLC Columns

I.D. x Length	10 µm
2.1 x 100 mm	79863
2.1 x 150 mm	79392
4.1 x 50 mm	79467
4.1 x 150 mm	79466
4.1 x 250 mm	79794

### I.D. x Length

I.D. x Length	10 µm	12-20 µm
4.6 x 150mm*	79382	
4.6 x 250 mm*	79574	
7.0 x 305 mm	79468	
10.0 x 250 mm	79526	
21.5 x 250 mm		79469

\* PEEK hardware

### Analytical Guard Columns

For Steel Columns**	For PEEK Columns***
Starter Kits (1 holder, 2 cartridges)	79461
Replacement Cartridges (5/pk)	79454

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

### Semiprep/Preparative Guard Column

For Steel Columns****
Starter Kit (1 holder, 1 cartridge)
Replacement Cartridges (2/pk)

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

# PRP-Infinity Reversed Phase HPLC Columns

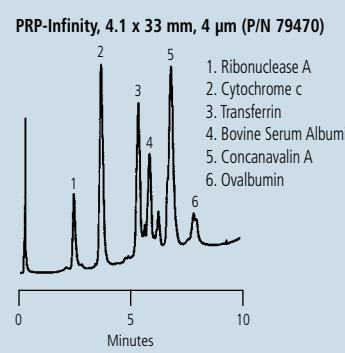
Polymeric nonporous packing for fast gradient separation of large proteins.

- pH stable from 1 to 13.
- Better sample recovery than silica-based columns (there are no silanol groups).
- Excellent durability (the support can be cleaned with strong acid or base to remove any sample residue).



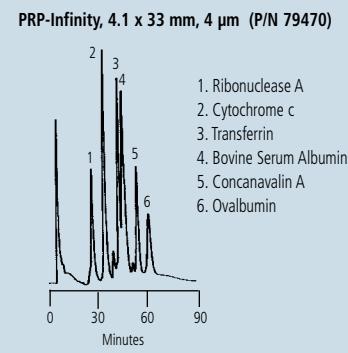
- One particle size: 4 µm.
- Available in stainless steel and PEEK hardware.

## Proteins



Conditions: A) 0.1% TFA in Water pH 2.0; B) 0.1% TFA in Acetonitrile. Linear Gradient 20-60% B in 10 min. Ambient. 2 mL/min. 20 µL, UV 215 nm.

## Proteins



Conditions: A) 0.1% TFA in Water pH 2.0; B) 0.1% TFA in Acetonitrile. Linear Gradient 21-60% B at 0.6% per second. Ambient. 2 mL/min. 20 µL, UV 215 nm.

## Ordering Information

### HPLC Columns

I.D. x Length	4 µm
4.1 x 33 mm	79470
4.1 x 50 mm	79533
10.0 x 60 mm	79527

For PRP-Infinity columns an in-line filter is recommended as a guard column is not available.

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# HxSil C8 & C18 Reversed Phase HPLC Columns

Silica-based 100 Å columns for general reversed phase separations.

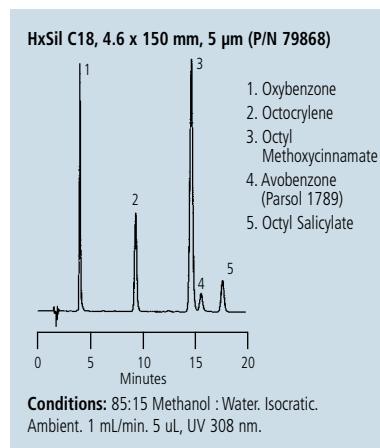
- Separation of closely related PAHs.
- Better retention of poorly retained compounds.
- Separation of neutral, acidic and basic compounds without tailing (tailing factor of less than 2.0).



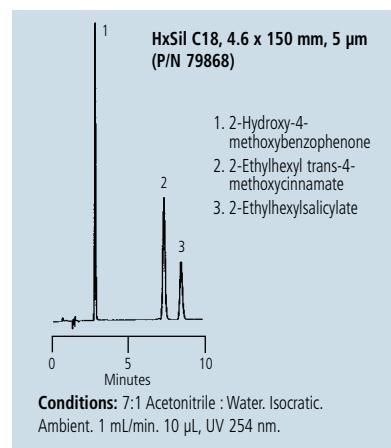
- Two particle sizes: 3 and 5 µm.
- Available in stainless steel and PEEK hardware.

- Analytical and semiprep/preparative guard columns in 316 stainless steel.

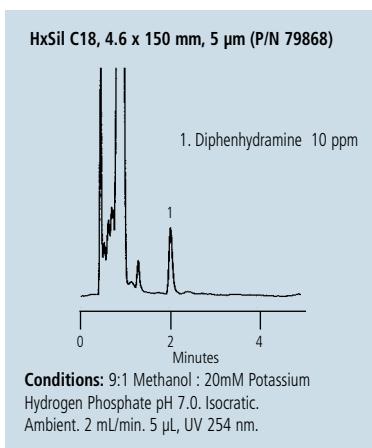
## Sunscreens in Lip Balm



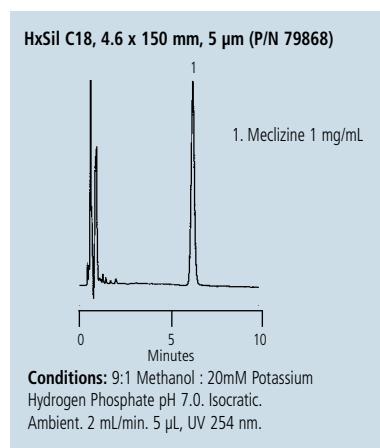
## Sunscreen Compounds



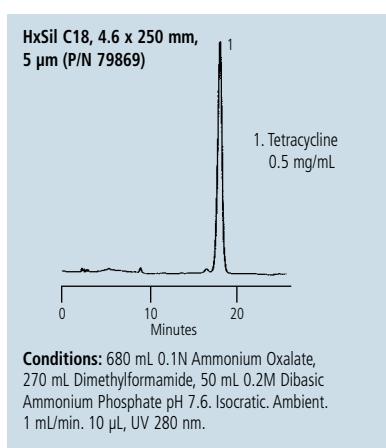
## Diphenhydramine in Itch Relief Gel



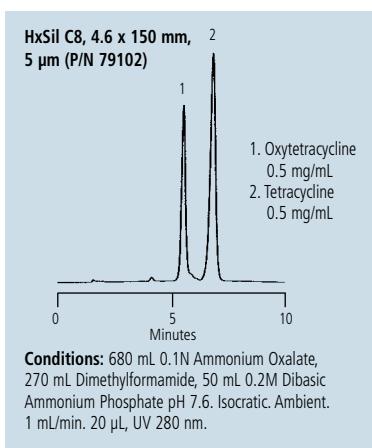
## Meclizine in Tablets



## Tetracycline by USP Method

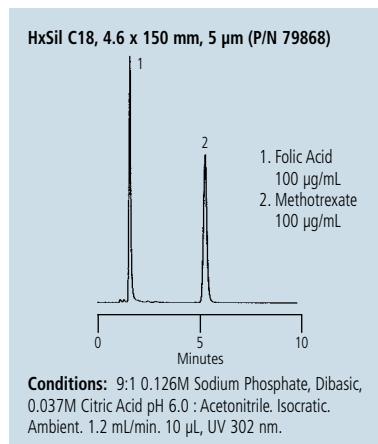


## Oxytetracycline and Tetracycline

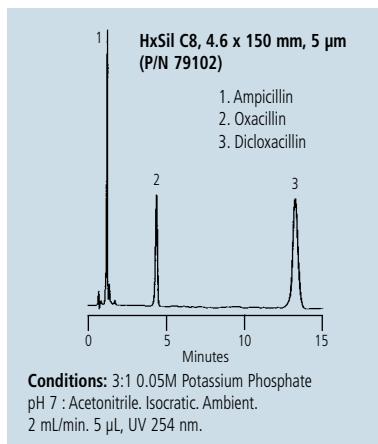


# HxSil C8 & C18 Reversed Phase HPLC Columns

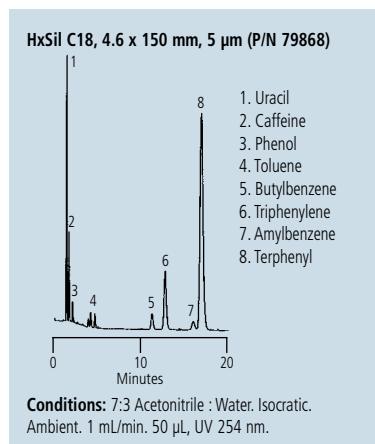
## Folic Acid, Methotrexate by USP Method



## Antibiotics



## Small Molecules



## HxSil C8 Ordering Information

### HPLC Columns

I.D. x Length	3 µm	5 µm
2.1 x 33 mm	79116	
2.1 x 50 mm	79117	79107
2.1 x 100 mm		79109
4.6 x 100 mm		79101

### Analytical Guard Column

	For Steel Columns*
Starter Kit (1 holder, 2 cartridges)	79458
Replacement Cartridges (5/pk)	79451

\* Analytical guard column for steel columns is 2.3 x 20 mm

### Semiprep/Preparative Guard Column

	For Steel Columns**
Starter Kit (1 holder, 1 cartridge)	79135
Replacement Cartridges (2/pk)	79136

\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

## HxSil C18 Ordering Information

### HPLC Columns

I.D. x Length	3 µm	5 µm
2.1 x 50 mm	79889	
4.6 x 100 mm		79879
4.6 x 150 mm		79868
4.6 x 250 mm		79869

### Analytical Guard Column

	For Steel Columns***
Starter Kit (1 holder, 2 cartridges)	79459
Replacement Cartridges (5/pk)	79452

\*\*\* Analytical guard column for steel columns is 2.3 x 20 mm

### Semiprep/Preparative Guard Column

	For Steel Columns****
Starter Kit (1 holder, 1 cartridge)	79137
Replacement Cartridges (2/pk)	79138

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
 for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# Anion Exchange HPLC Columns

## PRP-X100

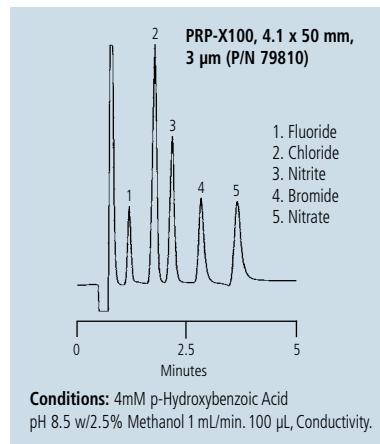
Polymeric anion exchange packings for separation of inorganic and organic anions.

- Easily separate the eight common anions (fluoride through sulfate).
- Good separation of fluoride from the water dip.
- Use with organic solvent from 0 to 100 % for elution of hydrophobic anions or column cleaning.
- pH stable from 1 to 13.
- Use conductivity or UV detection.

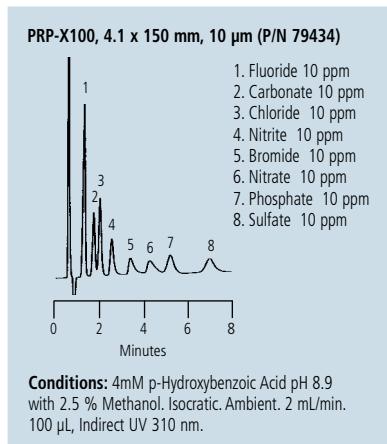


- Three particle sizes: 5, 10 and 12-20  $\mu\text{m}$ .
- Available in stainless steel and PEEK hardware.
- Analytical and semiprep/preparative guard columns.

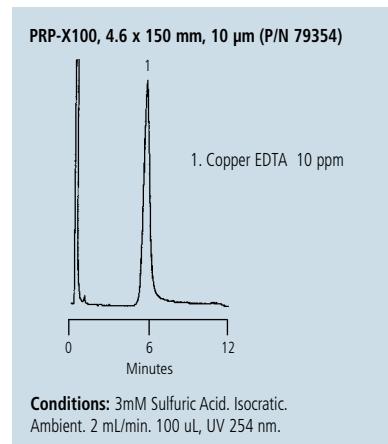
### Common Anions



### Anions by Indirect UV Detection



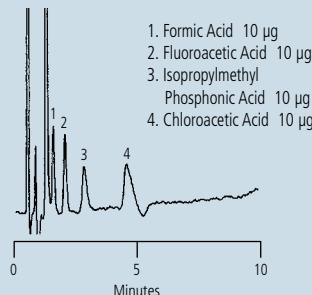
### EDTA



# PRP-X100 Anion Exchange HPLC Columns

## Organic Acids

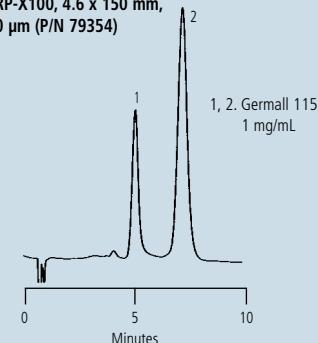
PRP-X100, 4.1 x 150 mm, 10 µm (P/N 79434)



Conditions: 0.1M Sodium Hydroxide in 5:95 Acetonitrile : Deionized Water. Isocratic. Ambient. 2 mL/min. 10 µL, Conductivity.

## Germall 115

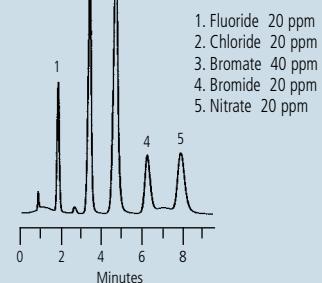
PRP-X100, 4.6 x 150 mm, 10 µm (P/N 79354)



Conditions: 7:3 20mM Sodium Hydroxide : Methanol. Isocratic. Ambient. 2 mL/min. 50 µL, UV 220 nm.

## Bromate and Other Anions

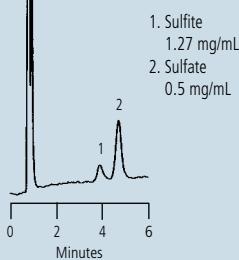
PRP-X100, 4.1 x 150 mm, 10 µm (P/N 79434)



Conditions: 1.7mM Sodium Bicarbonate, 1.8mM Sodium Carbonate, 0.1mM Sodium Thiocyanate. Isocratic. Ambient. 2 mL/min. 10 µL, Suppressed Conductivity.

## Sulfite and Sulfate

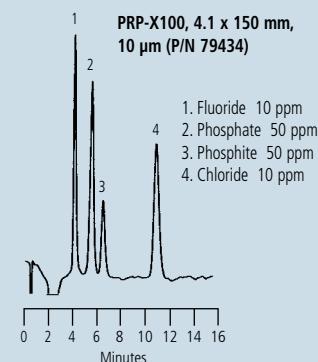
PRP-X100, 4.6 x 150 mm, 10 µm (P/N 79354)



Conditions: 80:20 8mM p-Hydroxybenzoic Acid pH 10.0 : Methanol. Isocratic. Ambient. 2 mL/min. 10 µL, Conductivity.

## Phosphate and Phosphite

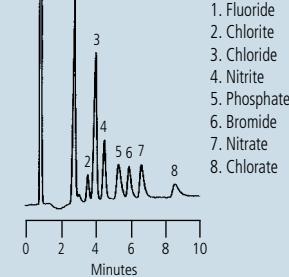
PRP-X100, 4.1 x 150 mm, 10 µm (P/N 79434)



Conditions: 20mM Succinic Acid pH 2.9. Isocratic. Ambient. 2 mL/min. 100 µL, Conductivity.

## Chlorite and Chlorate

PRP-X100, 4.1 x 250 mm, 10 µm (P/N 79433)



Conditions: 4.0mM 4-Amino-2-Hydroxybenzoic Acid pH 5.8. Isocratic. Ambient. 2 mL/min. 100 µL, Indirect UV 310 nm.

## Ordering Information

### HPLC Columns

I.D. x Length	5 µm	10 µm
2.1 x 150 mm		79421
2.1 x 150 mm*	79852	
2.1 x 250 mm	79190	79346
4.1 x 50 mm		79365
4.1 x 100 mm	79538	79439
4.1 x 150 mm	79434	

\*PEEK hardware

Analytical Guard Columns	For Steel Columns**	For PEEK Columns**
Starter Kits (1 holder, 2 cartridges)	79448	79383
Replacement Cartridges (5/pk)	79446	79385

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

### I.D. x Length

I.D. x Length	5 µm	10 µm	12-20 µm
4.1 x 250 mm		79433	
4.6 x 150 mm*	79174	79354	
4.6 x 250 mm*	79181	79455	
10.0 x 150 mm		79715	
21.5 x 100 mm			79543
21.5 x 250 mm		79535	

### Semiprep/Preparative Guard Column

Semiprep/Preparative Guard Column	For Steel Columns****
Starter Kit (1 holder, 1 cartridge)	79125
Replacement Cartridges (2/pk)	79126

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# PRP-X110 Anion Exchange HPLC Columns

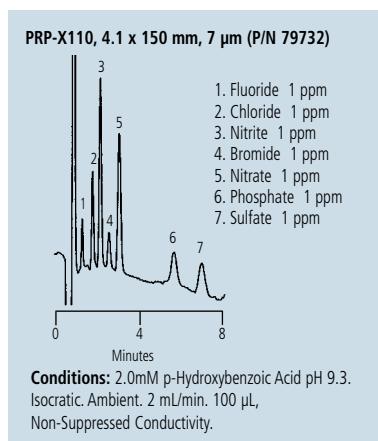
Polymeric anion exchange packings for separation of inorganic and organic anions from 20 ppb to 20 ppm.  
• Good separation of fluoride from the water dip.

- Compatible with conductivity or UV detectors.
- Use with organic solvent up to 100%
- pH stable from 1 to 13.

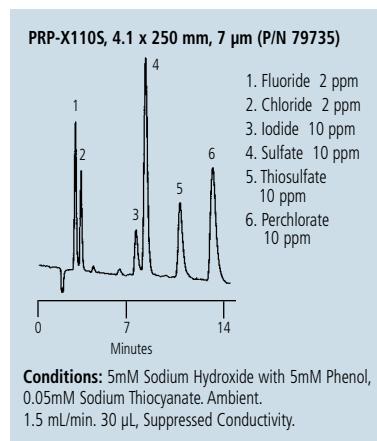


- One particle size: 7 µm.
- Available in stainless steel and PEEK hardware.
- Analytical guard columns.

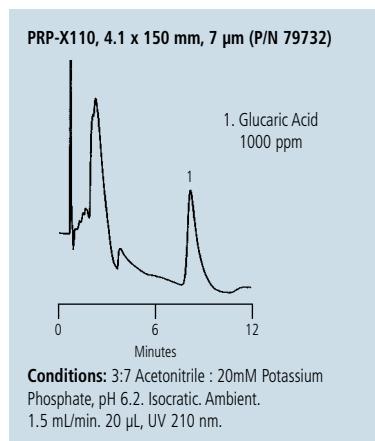
## Anions



## Polarizable Anions



## Glucaric Acid



## Ordering Information

HPLC Columns	PRP-X110 7 µm	PRP-X110S 7 µm
I.D. x Length		
1.0 x 50 mm	79775	
1.0 x 100 mm	79776	
2.1 x 100 mm*		79743
2.1 x 150 mm*	79744	
2.1 x 250 mm*	79746	
4.1 x 100 mm		79731
4.1 x 150 mm	79732	79733
4.1 x 250 mm	79734	79735

I.D. x Length	PRP-X110 7 µm	PRP-X110S 7 µm
4.6 x 150 mm*	79738	
4.6 x 250 mm*	79740	79741
* PEEK hardware		
Analytical Guard Columns	For Steel Columns**	For PEEK Columns**
Starter Kits (1 holder, 2 cartridges)	79726	79727
Replacement Cartridges (5/pk)	79728	79729

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

# PRP-X500 Anion Exchange HPLC Columns

Polymeric strong-base anion exchange packing with limited porosity for separation of proteins.

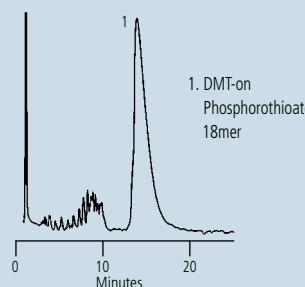
- Fast separation of large proteins.
- pH stable from 1 to 13.



- One particle size: 7  $\mu\text{m}$ .
- Available in stainless steel and PEEK hardware.
- Higher sample capacity than nonporous supports.

## DMT-on Antisense Phosphorothioate 18mer

PRP-X500, 4.6 x 50 mm, 7  $\mu\text{m}$  (P/N 79474)



Conditions: A) 85:15 100mM TRIS pH 8.0 : Acetonitrile; B) 85:15 100mM TRIS pH 4.0, 2.5M Lithium Chloride : Acetonitrile. Linear Gradient 0-100% B in 10 min. 2 mL/min. 100  $\mu\text{L}$  of a 1 mg/ml solution, UV 260nm.

## Proteins

PRP-X500, 4.6 x 50 mm, 7  $\mu\text{m}$  (P/N 79474)

1. Myoglobin 7  $\mu\text{g}$   
2. Conalbumin 7  $\mu\text{g}$   
3. Dog Albumin 77  $\mu\text{g}$



Conditions: A) 10mM Tris pH 9.0; B) 10mM Tris pH 9.0, 0.5N Sodium Chloride. Linear Gradient 0-50% B in 2.5 min. Hold for 2.5 min. Ambient. 2 mL/min. 30  $\mu\text{L}$ , UV 254 nm.

## Ordering Information

### HPLC Columns

I.D. x Length	7 $\mu\text{m}$
4.6 x 150 mm*	79573

\* PEEK hardware

### Analytical Guard Column

Starter Kit (1 holder, 2 cartridges)

### For PEEK Columns\*\*

79319

Replacement Cartridges (5/pk)

79320

\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# PRP-X600 Anion Exchange HPLC Columns

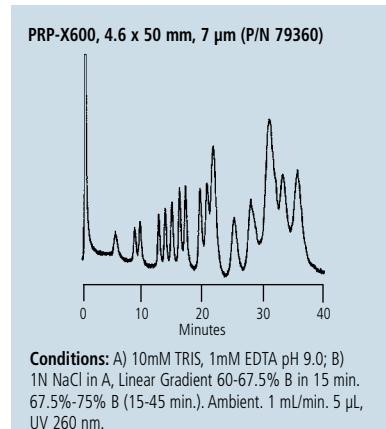
Polymeric weak-base anion exchange packing for gradient separation of proteins and DNA oligomers.

- Limited porosity allows separation of large DNA fragments.
- pH stable from 1 to 13.

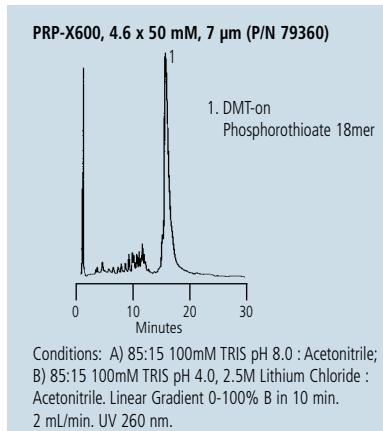


- Guard column in PEEK.
- Higher sample capacity than nonporous supports.
- One particle size: 7 µm.
- Available in stainless steel and PEEK hardware.

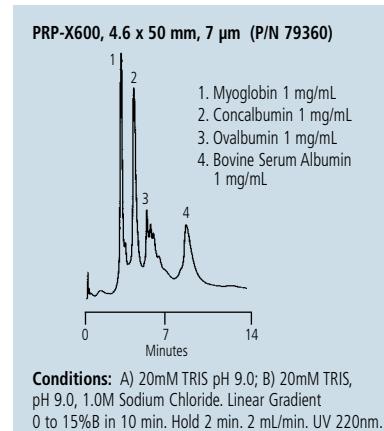
## Separation of DNA Fragments



## DMT-on Phosphorothioate 18mer



## Proteins



## Ordering Information

### HPLC Columns

I.D. x Length	7 µm
4.6 x 50 mm*	79360
4.6 x 250 mm*	79189

\* PEEK hardware

### Analytical Guard Column

Starter Kit (1 holder, 2 cartridges)	79361
Replacement Cartridges (5/pk)	79362

\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# RCX-10 Anion Exchange HPLC Columns

Polymeric anion exchange packing for isocratic or gradient separation of carbohydrates.

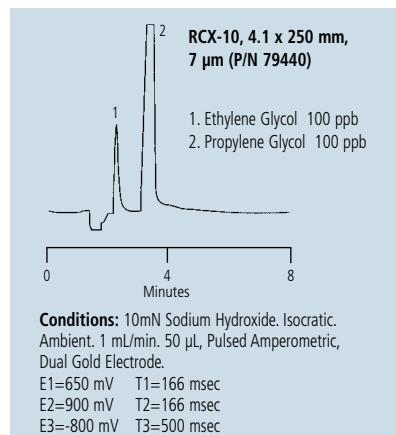
- pH stable from 1 to 13.

- Isocratic separation of mono and disaccharides.
- Gradient separation of oligomers up to DP8.
- Compatible with PAD, conductivity and RI detectors.

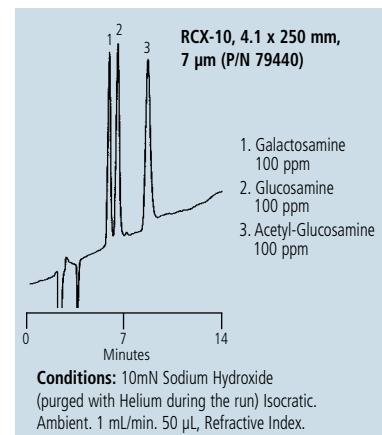


- One particle size: 7  $\mu\text{m}$ .
- Available in stainless steel and PEEK hardware.
- Guard columns in stainless steel and PEEK.

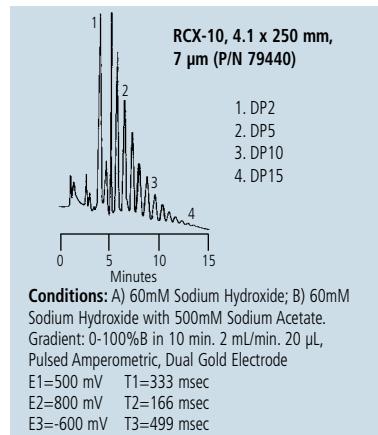
## Glycols in Water



## Acetyl Glucosamine



## Artichoke Tubers



## Ordering Information

### HPLC Columns

I.D. x Length	7 $\mu\text{m}$
4.1 x 250 mm	79440
4.6 x 250 mm*	79388

\* PEEK hardware

### Analytical Guard Columns

Starter Kits (1 holder, 2 cartridges)	For Steel Columns**	For PEEK Columns***
Replacement Cartridges (5/pk)	79463	79379

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# RCX-30 Anion Exchange HPLC Columns

Polymeric anion exchange packing for isocratic or gradient separation of complex carbohydrates.

- pH stable from 1 to 13.
- Isocratic or gradient modes.

- Higher ion exchange capacity support for separation of closely related carbohydrates.
- Compatible with PAD and RI detectors.

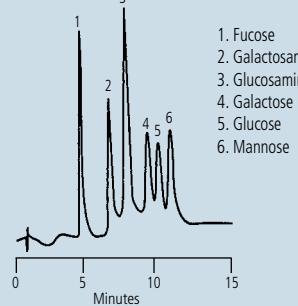


- One particle size: 7 µm.
- Available in stainless steel and PEEK hardware.

- Guard column in PEEK.

## Glycoprotein Monosaccharides

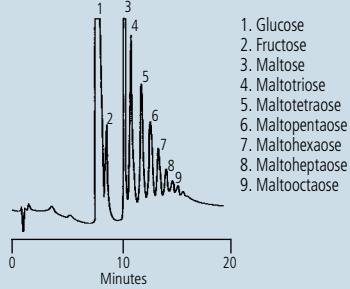
RCX-30, 4.6 x 150 mm, 7µm (P/N 79370)



**Conditions:** 16mN Sodium Hydroxide. Isocratic. Ambient. 2 mL/min. 15 µL, Pulsed Amperometric 5 µAFS Dual Gold Electrode  
E1=600 mV T1=166 msec  
E2=600 mV T2=166 msec  
E3=-800 mV T3=249 msec

## Corn Syrup

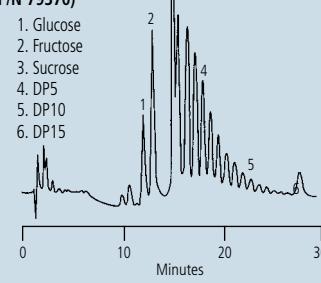
RCX-30, 4.6 x 150 mm (P/N 79370)



**Conditions:** A) 60mM Sodium Hydroxide; B) 500mM Sodium Acetate in A. Linear Gradient 100% A for 4 min., then 0-100% B (4-15 min.). Ambient. 2 mL/min. 50 µL. Pulsed Amperometric Dual Gold Electrode.  
E1=350 mV T1=166 msec  
E2=900 mV T2=166 msec  
E3=-850 mV T3=500 msec

## Artichoke Tubers

RCX-30, 4.6 x 150 mm (P/N 79370)



**Conditions:** A) 60mM Sodium Hydroxide; B) 500mM Sodium Acetate in A. Linear Gradient: 0-50% B in 10 min., then 50-100% B (10-20 min.). Ambient. 1 mL/min. 50 µL, Pulsed Amperometric Dual Gold Electrode.  
E1=350 mV T1=166 msec  
E2=900 mV T2=166 msec  
E3=-800 mV T3=500 msec

## Ordering Information

### HPLC Columns

I.D. x Length	7 µm
4.1 x 250 mm	79803
4.6 x 150 mm*	79370
4.6 x 250 mm*	79877

\* PEEK hardware

### Analytical Guard Column

Starter Kit (1 holder, 2 cartridges)

### For PEEK Columns\*\*

79371

Replacement Cartridges (5/pk)

79372

\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

# Cation Exchange HPLC Columns

## PRP-X200

Polymeric cation exchange packing for separation of inorganic cations and organic cations.

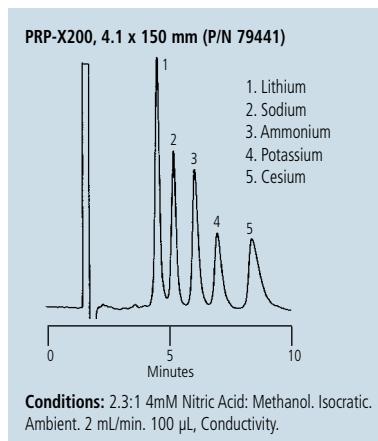
- Easily separate mono or divalent cations.
- pH stable from 1 to 13.

- Use with organic solvent up to 100% for elution of hydrophobic cations and column cleaning.
- Compatible with conductivity and UV detectors.

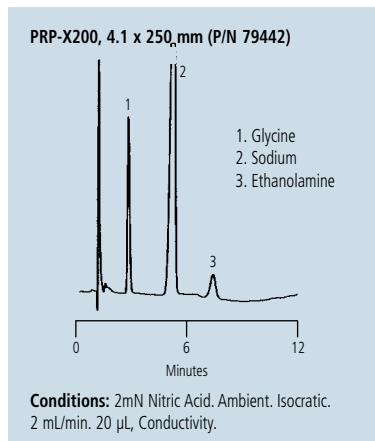


- One particle size: 10 µm.
- Available in stainless steel and PEEK hardware.
- Analytical and semiprep/preparative guard columns.

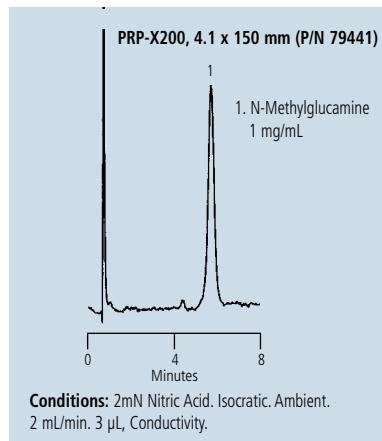
### Monovalent Cations



### Glycine and Ethanolamine



### N-Methylglucamine



## Ordering Information

### HPLC Columns

I.D. x Length	10 µm
1.0 x 50 mm	
1.0 x 100 mm	
1.0 x 250 mm	
2.1 x 150 mm	79394
4.1 x 100 mm	79363
4.1 x 150 mm	79441

I.D. x Length	10 µm
4.1 x 250 mm	79442
4.6 x 50 mm*	
4.6 x 150 mm*	79384
4.6 x 250 mm*	79357
7.0 x 305 mm	
10.0 x 250 mm	

\* PEEK hardware

\* PEEK hardware

### Analytical Guard Columns

Starter Kits (1 holder, 2 cartridges)	79456	79368
Replacement Cartridges (5/pk)	79449	79369

### Semiprep/Preparative Guard Column

Starter Kits (1 holder, 1 cartridge)	79127
Replacement Cartridges (2/pk)	79128

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 m

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# PRP-X400 Cation Exchange HPLC Columns

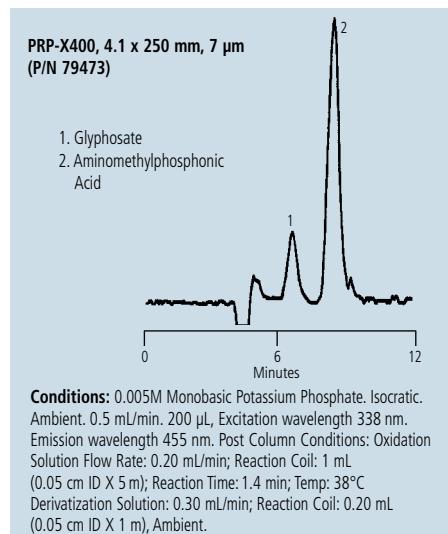
- Polymeric cation exchange packing for separation of glyphosate and its metabolite in drinking water.
- Faster analysis when compared to competitor's columns.

- Detection levels of less than 10 ppb when using the post column, OPA derivatization technique.
- Applicable to other separations, such as inositol and sugar alcohols.

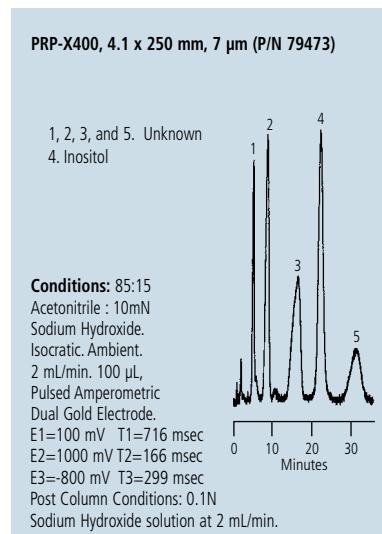


- Two particle sizes: 7 and 12-20 µm.
- Available in stainless steel and PEEK hardware.
- Analytical and semiprep/preparative guard columns.

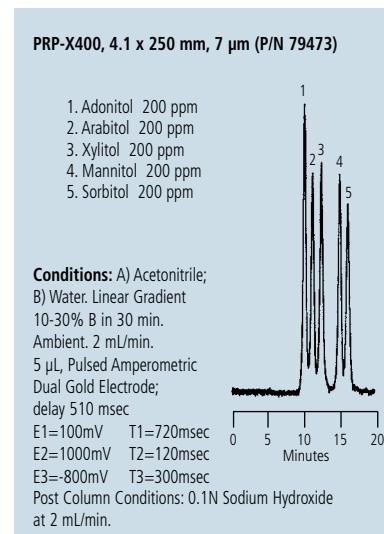
## Glyphosate and Metabolite



## Inositol in Vitamin Matrix



## Sugar Alcohols



## Ordering Information

### HPLC Columns

I.D. x Length	7 µm	12-20 µm
2.1 x 250 mm	79398	
4.1 x 150 mm	79717	
4.1 x 250 mm	79473	
4.6 x 250 mm*	79387	

\* PEEK hardware

### Analytical Guard Column

Starter Kit (1 holder, 2 cartridges)	79376
Replacement Cartridges (5/pk)	79377

### C18 Guard Column for EPA Glyphosate Application

Starter Kit (1 holder, 2 cartridges)	79459
Replacement Cartridges (5/pk)	79452

### PRP-X400 Semiprep/Preparative Guard Column

Starter Kit (1 holder, 1 cartridge)	79131
Replacement Cartridges (2/pk)	79132

\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 m

\*\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

# PRP-X800 Cation Exchange HPLC Columns

Polymeric cation exchange columns for the isocratic separation of mono and divalent cations.

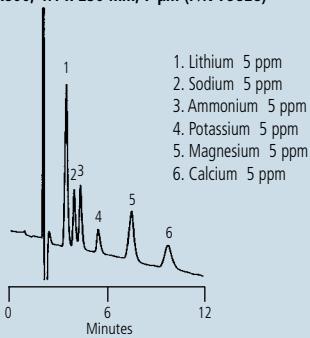
- Isocratic separation of lithium, sodium, ammonium, potassium, magnesium and calcium.

- Gradient separation of transition metals.
- Excellent durability (stable to any concentration of water or organic solvent).



## Mono and Divalent Cations

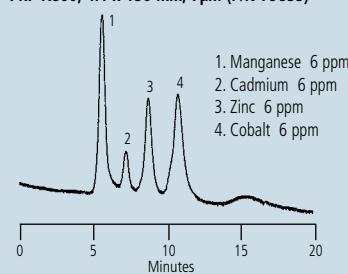
PRP-X800, 4.1 x 250 mm, 7 µm (P/N 79828)



Conditions: 2mM Cupric Sulfate. Isocratic. Ambient. 0.8 mL/min. 10 µL, Indirect UV 220 nm.

## Transition Metals

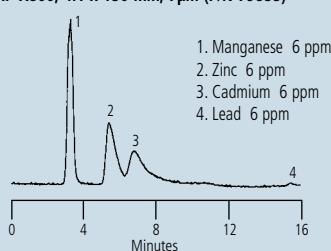
PRP-X800, 4.1 x 150 mm, 7µm (P/N 79855)



Conditions: A) 10mM Ammonium Acetate, pH 3.4; B) Trifluoroacetic Acid in Water pH 1.5. Linear Gradient 15-35% B in 20 min. 1 mL/min. 100 µL, Post Column Reaction: 0.0125% 4-(2-pyridylazo)resorcinol in 5M Ammonium Hydroxide 0.5 mL/min. Visible 540 nm.

## Transition Metals

PRP-X800, 4.1 x 150 mm, 7µm (P/N 79855)



Conditions: A) 2mM Ethylenediamine pH 3.2; B) 100mM Ethylenediamine pH 1.73. Linear Gradient 100% A (0-5 min.), 0-100% B in (5-20 min.) 1 mL/min., 100 µL, Post Column Reaction: 0.0125% 4-(2-pyridylazo) resorcinol (PAR) in 5M Ammonium Hydroxide, 0.5 mL/min. Visible 540 nm.

## Ordering Information

### HPLC Columns

I.D. x Length	7 µm
4.1 x 150 mm	79855
4.1 x 250 mm	79828

\* PEEK hardware

### Analytical Guard Columns

Starter Kits (1 holder, 2 cartridges)

### For Steel Columns\*\*

79830

### For PEEK Columns\*\*\*

79831

Replacement Cartridges (5/pk)

79832

79833

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# HC-40 Cation Exchange HPLC Columns

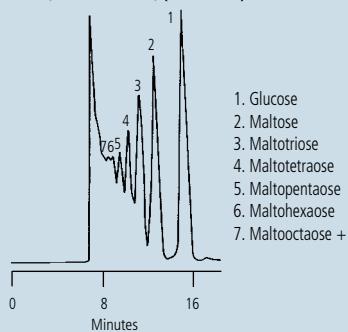
Polymeric 4% cross-linked soft-gel column for cation, ligand exchange separation of carbohydrates.

- Separate oligosaccharides up to DP8.
- Water mobile phase.
- Compatible with RI detectors.
- One particle size: 10 - 15  $\mu\text{m}$ .



## Corn Syrup

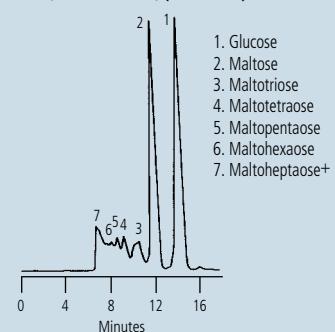
HC-40, 7.8 x 305 mm, (P/N 79432)



Conditions: Water. Isocratic. 80°C. 0.6 mL/min.  
12  $\mu\text{L}$ , Refractive Index.

## High Conversion Corn Syrup

HC-40, 7.8 x 305 mm, (P/N 79432)



Conditions: Deionized Water. Isocratic. 80°C.  
0.6 mL/min. 20  $\mu\text{L}$ , Refractive Index.

## Guard Columns

Hydrogen Form Cation Exchange Starter Kit  
(1 holder, 1 cartridge)

## For Steel Columns\*

79133

Hydrogen Form Cation Exchange Replacement  
Cartridges (2/pk)

79134

Carbonate Form Anion Exchange Starter Kit  
(1 holder, 1 cartridge)

79866

Carbonate Form Anion Exchange Replacement  
Cartridges (2/pk)

79865

\* HC-40 guard column for steel columns is 4.6 x 20 mm

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# HC-75 Cation Exchange HPLC Columns

Polymeric 7.5% cross-linked soft-gel columns for cation, ligand exchange separations of carbohydrates.

- Compatible with UV and RI detectors.

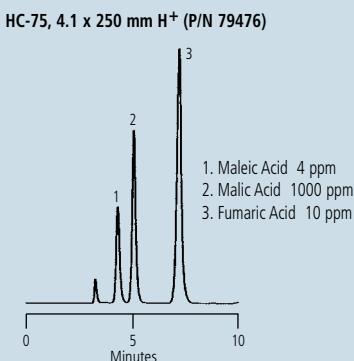
- Hydrogen form columns for USP L17 applications.
- Calcium form columns for USP L19 applications.
- Lead form columns for USP L34 applications.



- One particle size: 9 µm.
- Available in stainless steel and PEEK hardware.

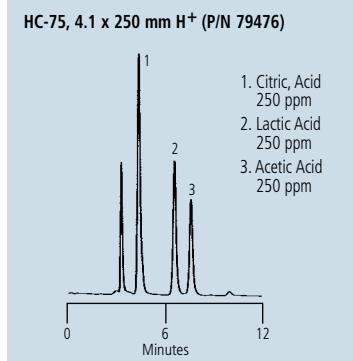
- Three forms: calcium, lead and hydrogen.

## Malic Acid



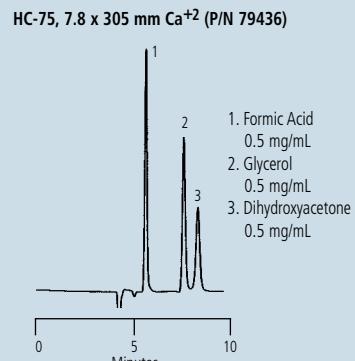
Conditions: 0.01N Sulfuric Acid. Isocratic. 60°C.  
0.35 mL/min. 10 µL, UV 210 nm.

## Citric, Lactic and Acetic Acids



Conditions: 0.01N Sulfuric Acid. Isocratic. 60°C.  
0.35 mL/min. 10 µL, UV 210 nm.

## Dihydroxyacetone



Conditions: 0.01M Calcium Chloride. Isocratic.  
90°C. 0.6 mL/min. 5µL, Refractive Index.

## Ordering Information

### Gel-Type Cation Exchange Columns

I.D. x Length	9 µm, Calcium	9 µm, Lead	9 µm, Hydrogen
4.1 x 250 mm	79431		79476
7.8 x 100 mm			79547
7.8 x 305 mm	79436	79438	79544

### Guard Columns

Hydrogen Form Cation Exchange Starter Kit (1 holder, 1 cartridge)	79133
Hydrogen Form Cation Exchange Replacement Cartridges (2/pk)	79134
Carbonate Form Anion Exchange Starter Kit (1 holder, 1 cartridge)	79866
Carbonate Form Anion Exchange Replacement Cartridges (2/pk)	79865

\* HC-75 guard column for steel columns is 4.6 x 20 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.

If you don't see the column dimensions you need for any of our stationary phases, Hamilton can make a custom column for you! Contact us for details on how to order.

# Ion Exclusion HPLC Columns

## PRP-X300

Polymeric ion exclusion packing for separation of alcohols and organic acids.

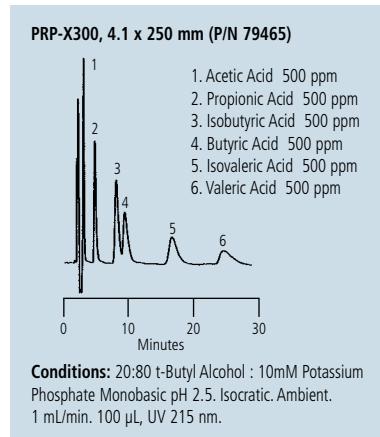
- Separate structurally similar alcohols.

- Separate similar organic acids.
- Use with organic solvent from 0 to 100% for elution of highly retained compounds.

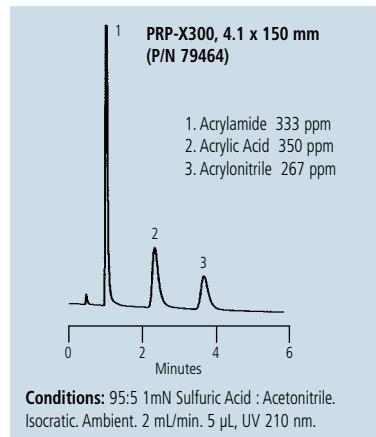


- One particle size: 7 µm.
- Available in stainless steel and PEEK hardware.
- Analytical and semiprep/preparative guard columns.

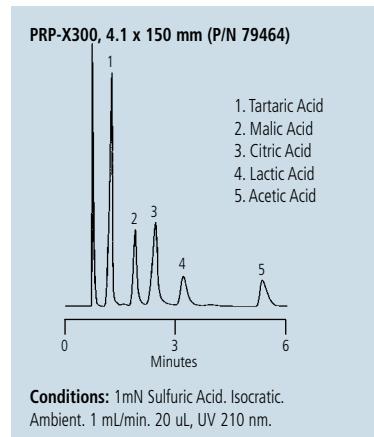
### Fatty Acids



### Acrylamide and Acrylic Acid



### Organic Acids



## Ordering Information

### HPLC Columns

I.D. x Length	7 µm
1.0 x 50 mm	79783
4.1 x 150 mm	79464
4.1 x 250 mm	79465
4.6 x 150 mm*	79475

\* PEEK hardware

### Analytical Guard Columns

	For Steel Columns**	For PEEK Columns***
Starter Kits (1 holder, 2 cartridges)	79460	79373
Replacement Cartridges (5/pk)	79453	79374

\*\* Analytical guard column for steel columns is 2.3 x 20 mm

\*\*\* Analytical guard column for PEEK columns is 3.0 x 8.0 mm

### Semiprep/Preparative Guard Column

	For Steel Columns****
Starter Kit (1 holder, 1 cartridge)	79129
Replacement Cartridges (2/pk)	79130

\*\*\*\* Semiprep/preparative guard column for steel columns is 4.6 x 20 mm

Visit our HPLC Application Index at  
<http://www.hamiltoncompany.com/HPLC/applicationIndex.php>  
for a complete list of compounds that have been separated on our columns.





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