

# HPLC COLUMNS



## HPLC Columns & Bulk Resins



**HAMILTON**   
THE MEASURE OF EXCELLENCE™

# The Measure of Excellence

## Hamilton

For nearly 50 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. About 25 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/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp) or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@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 uses for each of the column packings.

<b>Recommended Uses</b>		
<b>Reversed Phase</b>	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
<b>Anion Exchange</b>	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
<b>Cation Exchange</b>	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
<b>Ion Exclusion</b>	PRP-X300	Organic acids and alcohols

# USP "L" Numbers & Bulk Resins

## USP "L" Number and Hamilton HPLC Columns

USP "L" Number		HAMILTON Column
L1	Octadecylsilane chemically bonded to porous silica or ceramic micro-particles, 3 to 10 µm in diameter.	<b>HxSil C18</b>
L7	Octylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	<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>
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9 µm in diameter.	<b>HC-75 Calcium Form</b>
L21	A rigid, spherical styrene-divinylbenzene copolymer, 5 to 10 µm in diameter.	<b>PRP-1 PRP-3</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>

## 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			71942	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(methacrylamidopropyl Trimethyl-ammonium chloride)	1.6 meq/gm	Superficially porous			79594		79595	79596	
PRP-X600	Poly(dimethylamidopropyl-methacrylamide)	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

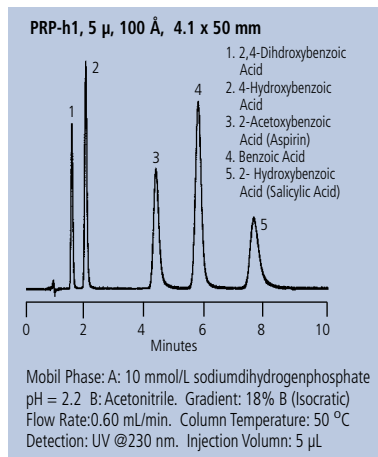
Polymeric 100 Å columns for reversed phase, LC/MS applications.

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

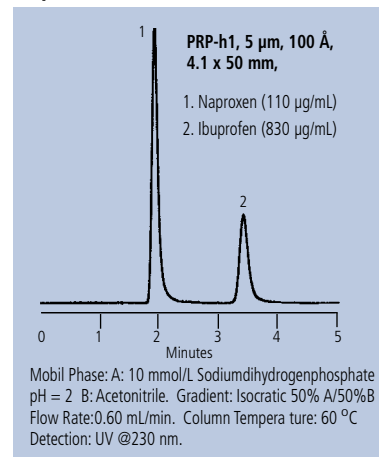


- One particle size: 5 µm.
- Four column diameters: 2.1, 4.6, 10 and 100 mm.
- Analytical and semiprep/preparative guard columns.

### Benzoic Acid and its Derivatives



### Naproxen Sodium



## 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)	For Steel Columns*
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)	For Steel Columns***
79275	
Replacement Cartridges (2/pk)	79276

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

# PRP-h5 Reversed Phase HPLC Columns

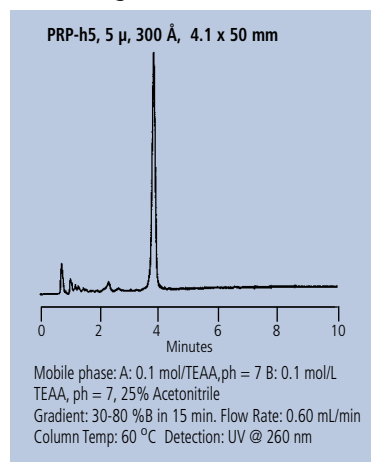
Polymeric 300 Å columns for oligonucleotide purification and protein separations.

- 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.
- Three column diameters: 2.1, 4.6 and 10 mm.
- Analytical and semiprep/preparative guard columns.

## 21-mer Oligonucleotide Purification



## 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		79255	79266	

Visit the HAMILTON Application Compound Index at [www.hamiltoncompany.com/hplc/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp) or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@hamiltoncompany.com) for a complete list of compounds that have been separated.

### 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

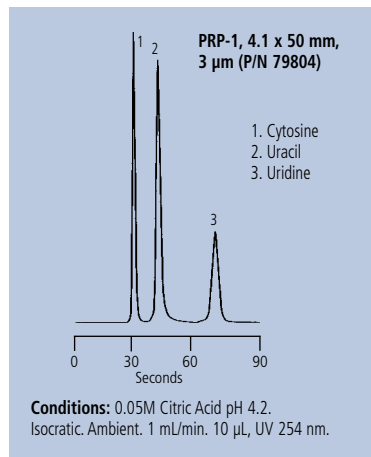
Polymeric 100 Å columns for general reversed phase separations.

- 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).

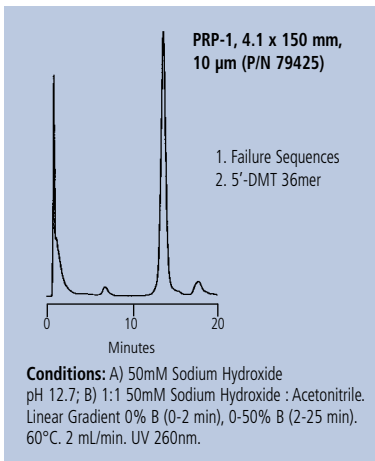


- Five particle sizes: 5, 7, 10, 12-20 and 30-50  $\mu\text{m}$ .
- Eleven column internal diameters: 1.0 to 101.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

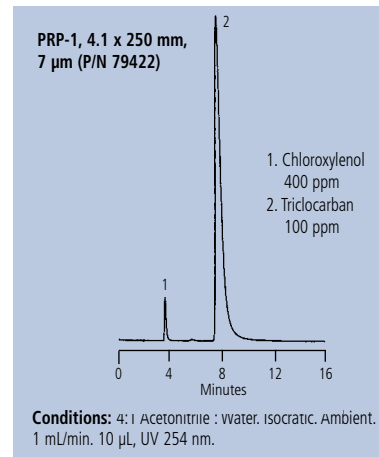
## Small Molecules



## DNA with Secondary Structure

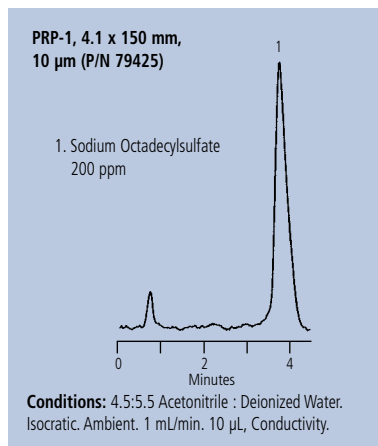


## Biocides found in Soap

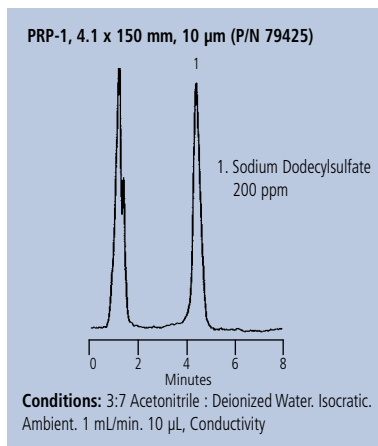


# PRP-1 Reversed Phase HPLC Columns

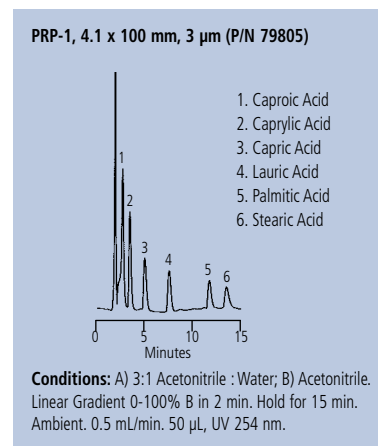
## Surfactant



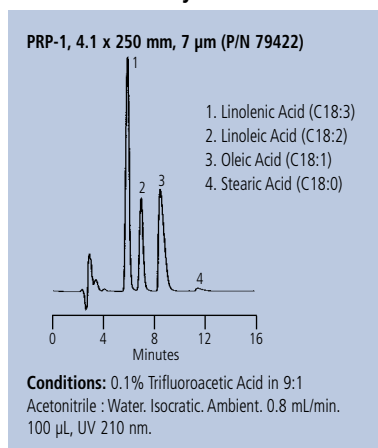
## Surfactant



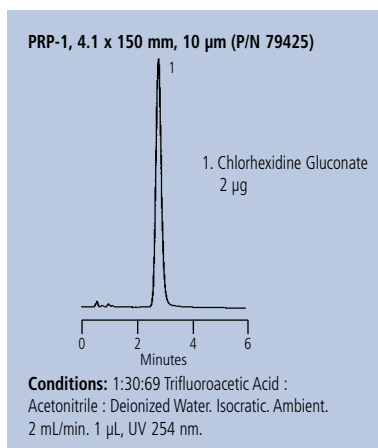
## Fatty Acids



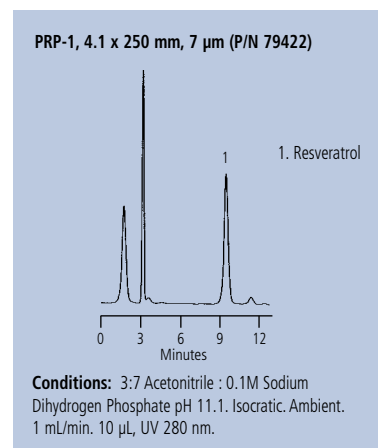
## Isomeric C18 Fatty Acids-



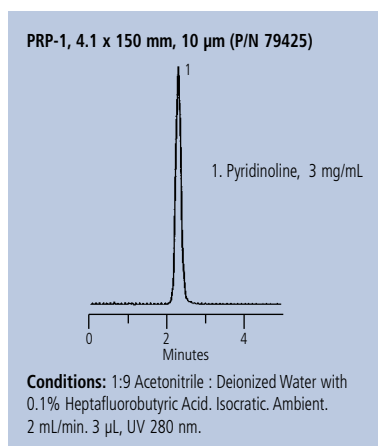
## Chlorhexidine Gluconate



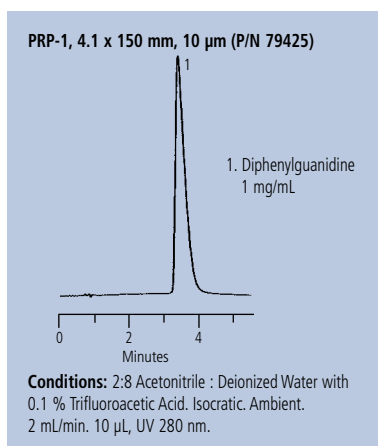
## Resveratrol



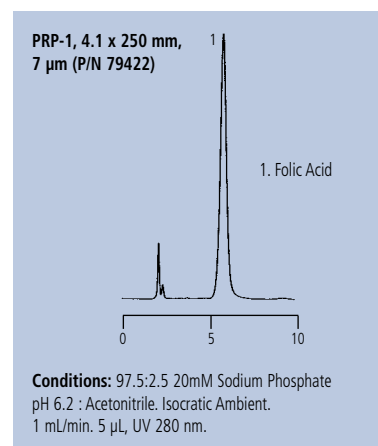
## Pyridinoline



## Diphenylguanidine



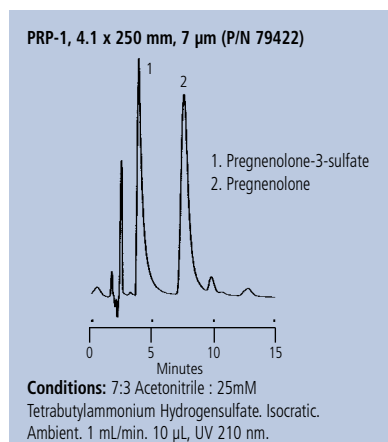
## Folic Acid



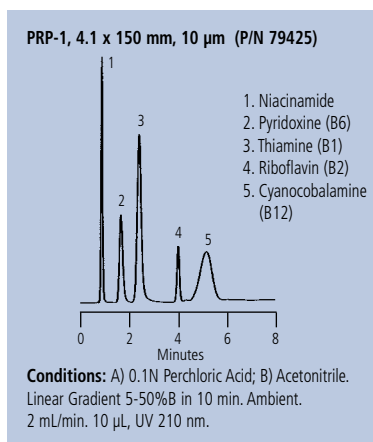


# PRP-1 Reversed Phase HPLC Columns

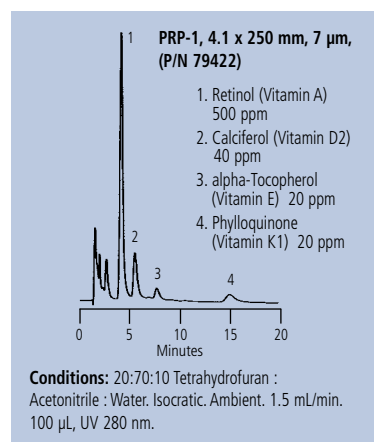
## Pregnenolone and Pregnenolone-3-sulfate



## 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	79759	
1.0 x 100 mm	79752	79756	79760	
1.0 x 150 mm	79753	79757	79761	
1.0 x 250 mm	79754	79758	79762	
2.1 x 50 mm	79195	79554		
2.1 x 100 mm	79790			
2.1 x 150 mm	79366		79480	
2.1 x 150 mm*	79796			
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		79565	
4.1 x 150 mm	79444	79529	79425	79714
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 300 mm				79919	
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	79204		79349		
10.0 x 250 mm		79531	79496		
21.5 x 100 mm		79791			
21.5 x 150 mm			79532	79497	
21.5 x 250 mm		79352	79478	79428	
30.0 x 300 mm				79718	
50.8 x 100 mm				79498	
50.8 x 150 mm				79716	
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

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

Visit the HAMILTON Application Compound Index at [http://www.hamiltoncompany.com/hplc/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp) or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@hamiltoncompany.com) for a complete list of compounds that have been separated.

# PRP-3 Reversed Phase HPLC Columns

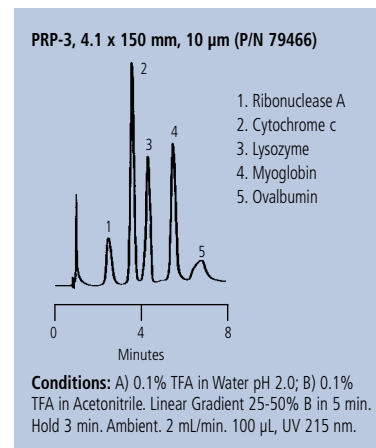
Polymeric 300 Å columns for protein separations.

- 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).

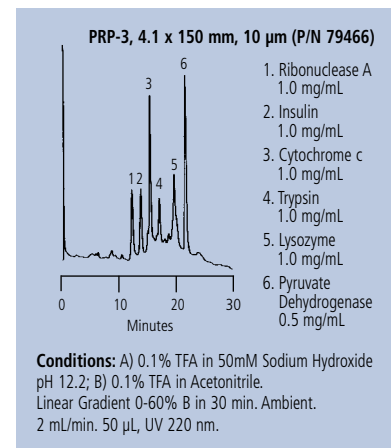


- Two particle sizes: 10 and 12-20 µm.
- Eight column internal diameters: 1.0 to 50.8 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

## Proteins



## Proteins at pH 12.2



## Ordering Information

HPLC Columns		I.D. x Length		10 µm	12-20 µm
1.0 x 50 mm	79763	4.1 x 150 mm		79466	
1.0 x 100 mm	79764	4.1 x 250 mm		79794	
1.0 x 150 mm	79765	4.6 x 50 mm*		79539	
1.0 x 250 mm	79766	4.6 x 150mm*		79382	
2.1 x 50 mm		4.6 x 250 mm*		79574	
2.1 x 100 mm	79863	7.0 x 305 mm		79468	
2.1 x 150 mm	79392	10.0 x 250 mm		79526	
4.1 x 50 mm	79467	21.5 x 250 mm			79469
4.1 x 100 mm		50.8 x 250 mm			79875

\* PEEK hardware

Analytical Guard Columns	For Steel Columns*	For PEEK Columns**	Semiprep/Preparative Guard Column	For Steel Columns*
Starter Kits (1 holder, 2 cartridges)	79461	79393	Starter Kit (1 holder, 1 cartridge)	79123
Replacement Cartridges (5/pk)	79454	79395	Replacement Cartridges (2/pk)	79124

\* 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 is 4.6 x 20 mm

# PRP-Infinity Reversed Phase HPLC Columns

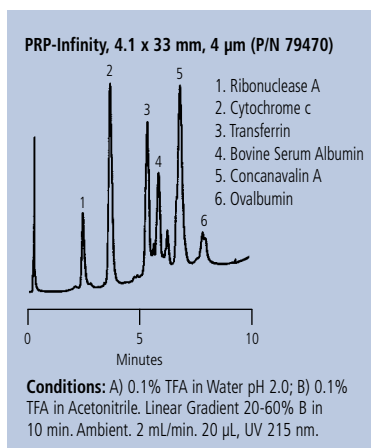
Polymeric nonporous packing for fast gradient separation of large proteins.

- 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).

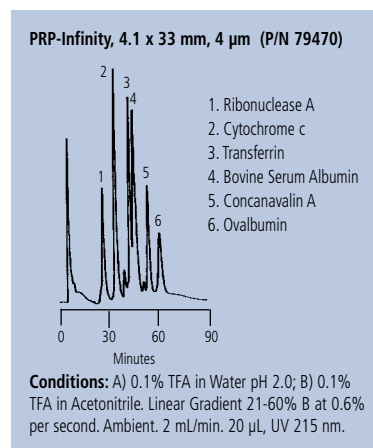


- One particle size: 4  $\mu\text{m}$ .
- Three column internal diameters: 2.1 to 10.0 mm.
- One column material: 316 stainless steel.

## Proteins



## Proteins



## Ordering Information

### HPLC Columns

I.D. x Length	4 $\mu\text{m}$
2.1 x 33 mm	79576
2.1 x 100 mm	79748
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 the HAMILTON Application Compound Index at  
[http://www.hamiltoncompany.com/hplc/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp)  
 or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@hamiltoncompany.com)  
 for a complete list of compounds that have been separated.

# HxSil C8 & C18 Reversed Phase HPLC Columns

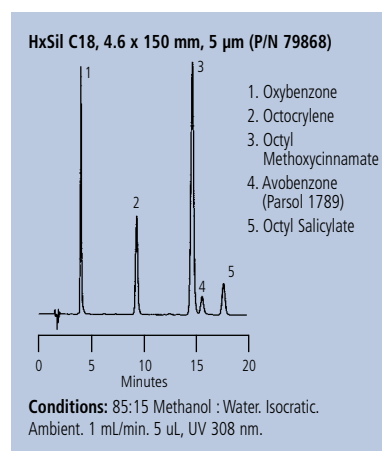
Silica-based 100 Å columns for general reversed phase separations.

- 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).

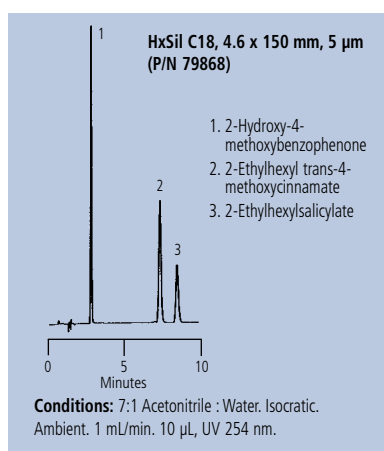


- Two particle sizes: 3 and 5 µm.
- Five column internal diameters: 2.1 to 21.5 mm.
- Analytical and semiprep/preparative guard columns in 316 stainless steel.

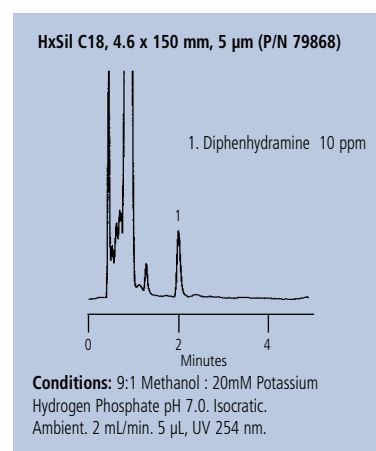
## Sunscreens in Lip Balm



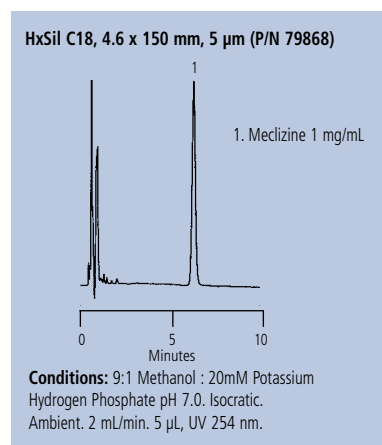
## Sunscreen Compounds



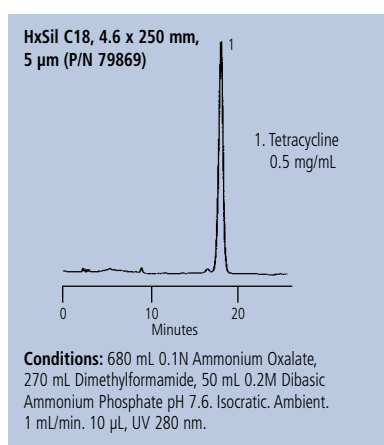
## Diphenhydramine in Itch Relief Gel



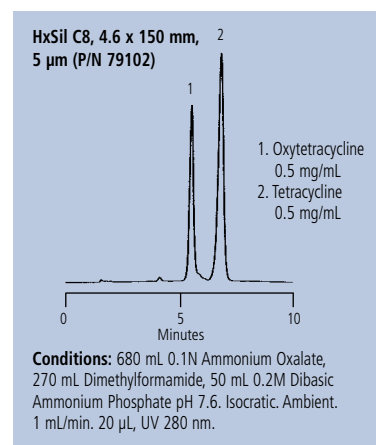
## Mecizine in Tablets



## Tetracycline by USP Method



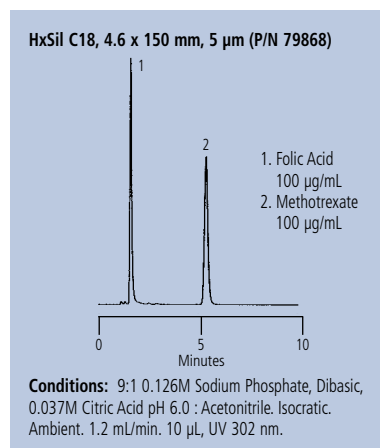
## Oxytetracycline and Tetracycline



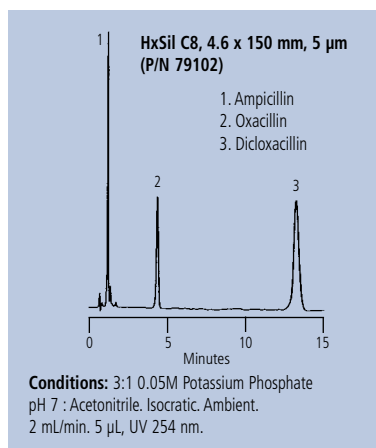


# HxSil C8 & C18 Reversed Phase HPLC Columns

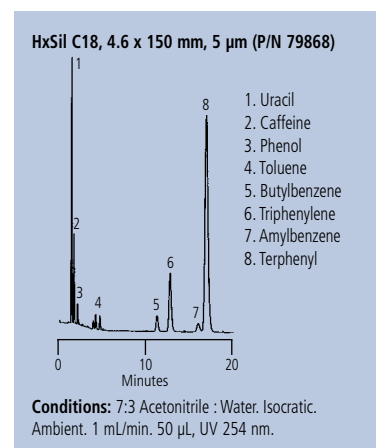
## Folic Acid, Methotrexate by USP Method



## 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 75 mm	79118	79108		
2.1 x 100 mm	79119	79109		
2.1 x 150 mm	79120	79110		
2.1 x 250 mm		79111		
4.6 x 33 mm	79112			
			4.6 x 50 mm	79113
			4.6 x 100 mm	79114
			4.6 x 150 mm	79115
			4.6 x 250 mm	
			7.0 x 250 mm	79104
			10.0 x 250 mm	79105
			21.5 x 250 mm	79106

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 33 mm	79888			
2.1 x 50 mm	79889	79881		
2.1 x 75 mm	79890	79882		
2.1 x 100 mm	79891	79883		
2.1 x 150 mm	79892	79884		
2.1 x 250 mm		79885		
4.6 x 33 mm	79886			
			4.6 x 50 mm	79872/79867
			4.6 x 100 mm	79887
			4.6 x 150 mm	79873
			4.6 x 250 mm	79869
			7.0 x 250 mm	79880
			10.0 x 250 mm	79870
			21.5 x 250 mm	79871

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 the HAMILTON Application Compound Index at [http://www.hamiltoncompany.com/hplc/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp) or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@hamiltoncompany.com) for a complete list of compounds that have been separated.

# Anion Exchange HPLC Columns

## PRP-X100

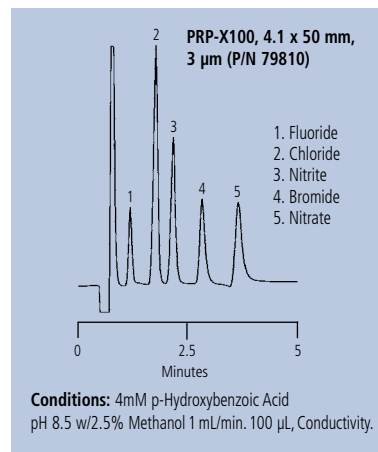
Polymeric anion exchange packings for separation of inorganic and organic anions.

- 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.

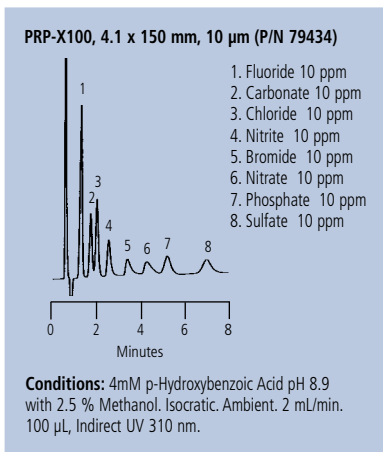


- Three particle sizes: 5, 10 and 12-20  $\mu\text{m}$ .
- Eight column internal diameters: 1.0 to 50.8 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

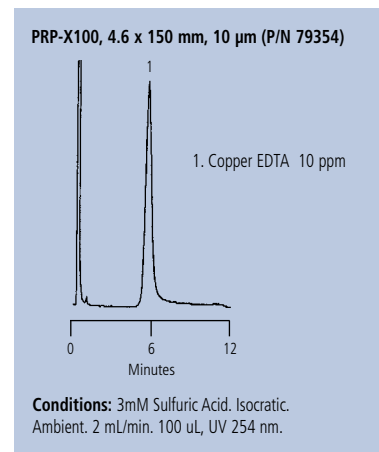
### Common Anions



### Anions by Indirect UV Detection

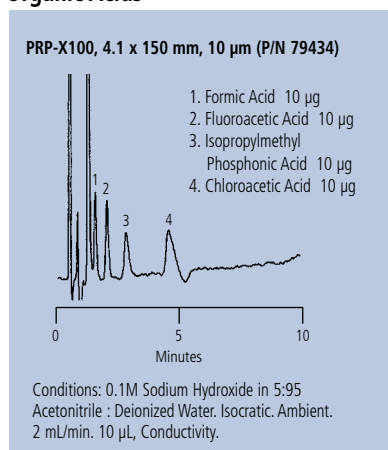


### EDTA

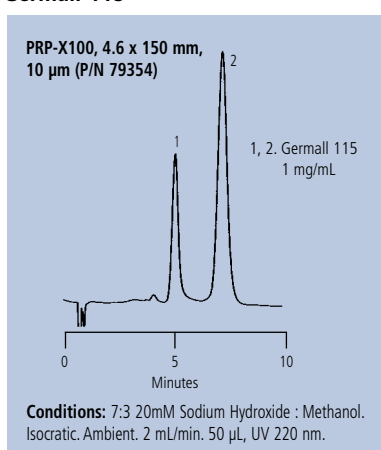


# PRP-X100 Anion Exchange HPLC Columns

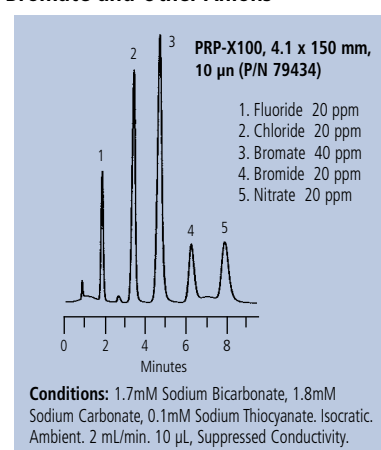
## Organic Acids



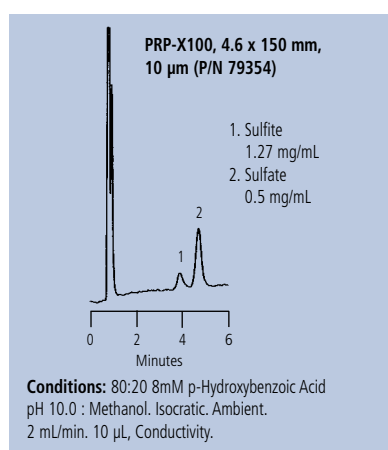
## Germall 115



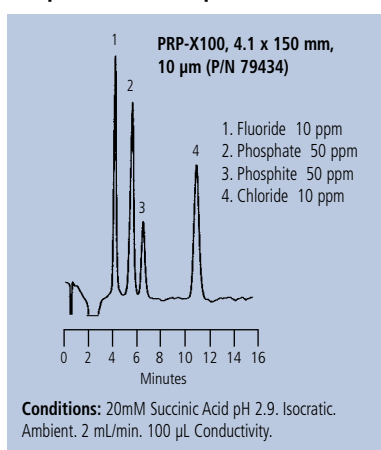
## Bromate and Other Anions



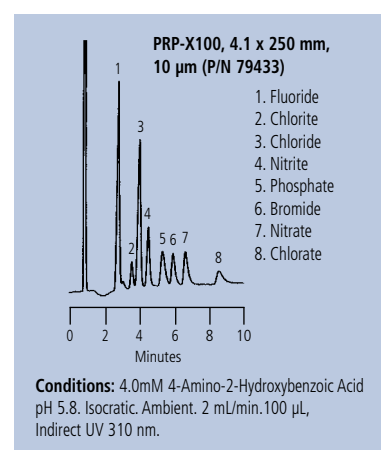
## Sulfite and Sulfate



## Phosphate and Phosphite



## Chlorite and Chlorate



## Ordering Information

### HPLC Columns

I.D. x Length	5 µm	10 µm
1.0 x 50 mm	79767	79771
1.0 x 100 mm	79768	79772
1.0 x 150 mm	79769	79773
1.0 x 250 mm	79770	79774
2.1 x 50 mm	79150	79749
2.1 x 150 mm		79421
2.1 x 150 mm*	79852	79853
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	5 µm	10 µm	12-20 µm
4.1 x 250 mm		79433	79359
4.6 x 150 mm*	79174	79354	
4.6 x 250 mm*	79181	79455	
7.0 x 305 mm		79364	
10.0 x 150 mm		79715	
10.0 x 250 mm		79534	
21.5 x 100 mm			79543
21.5 x 150 mm			79542
21.5 x 250 mm		79535	79353
50.8 x 150 mm			79551

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

# PRP-X110 Anion Exchange HPLC Columns

Polymeric anion exchange packings for separation of inorganic and organic anions from 20 ppb to 20 ppm.

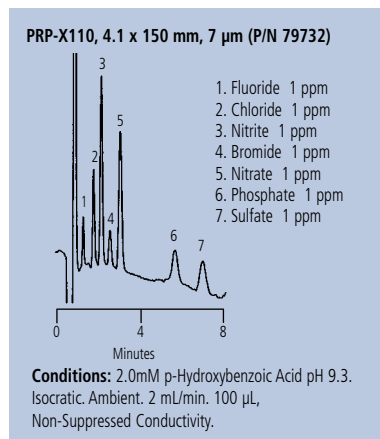
- Good separation of fluoride from the water dip.

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

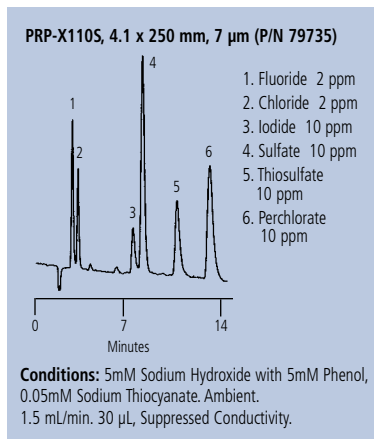


- One particle size: 7  $\mu\text{m}$ .
- Two column materials: 316 stainless steel and PEEK.
- Four column internal diameters: 1.0 to 4.6 mm.
- Analytical guard columns.

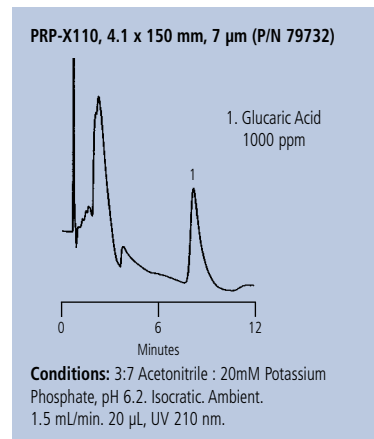
## Anions



## Polarizable Anions



## Glucuric Acid



## Ordering Information

HPLC Columns I.D. x Length	PRP-X110 7 $\mu\text{m}$	PRP-X110S 7 $\mu\text{m}$
1.0 x 50 mm	79775	
1.0 x 100 mm	79776	
1.0 x 150 mm	79777	
1.0 x 250 mm	79778	
2.1 x 100 mm*	79742	79743
2.1 x 150 mm*	79744	79745
2.1 x 250 mm*	79746	79747
4.1 x 100 mm	79730	79731
4.1 x 150 mm	79732	79733
4.1 x 250 mm	79734	79735

I.D. x Length	PRP-X110 7 $\mu\text{m}$	PRP-X110S 7 $\mu\text{m}$
4.6 x 100 mm*	79736	79737
4.6 x 150 mm*	79738	79739
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

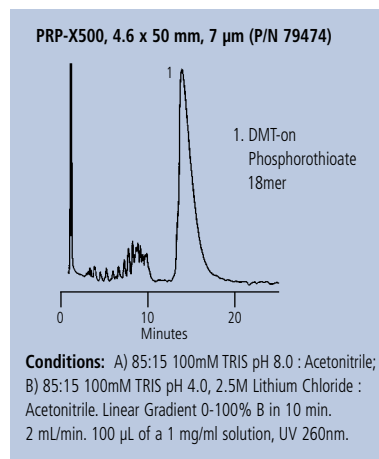
Polymeric strong-base anion exchange packing with limited porosity for separation of proteins.

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

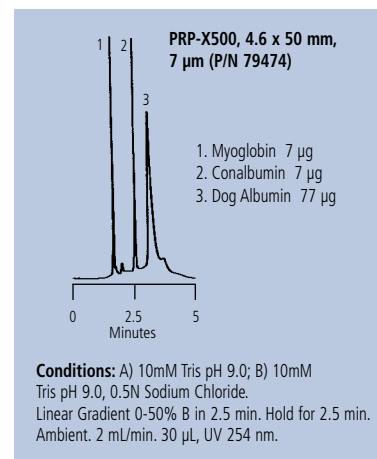


- One particle size: 7  $\mu\text{m}$ .
- Three column internal diameters: 2.1 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Higher sample capacity than nonporous supports.

## DMT-on Antisense Phosphorothioate 18mer



## Proteins



## Ordering Information

HPLC Columns I.D. x Length	7 $\mu\text{m}$
2.1 x 50 mm*	79864
2.1 x 250 mm	79555
4.6 x 50 mm*	79474
4.6 x 150 mm*	79573
10.0 x 100 mm	79348

\* PEEK hardware

Analytical Guard Column	For PEEK Columns*
Starter Kit (1 holder, 2 cartridges)	79319
Replacement Cartridges (5/pk)	79320

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

# PRP-X600 Anion Exchange HPLC Columns

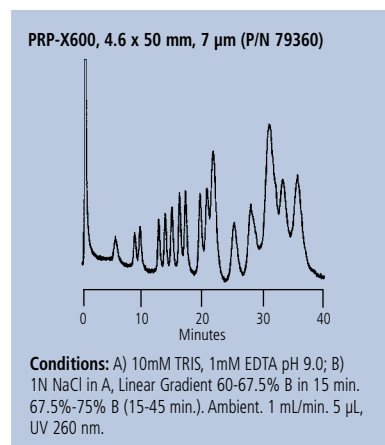
Polymeric weak-base anion exchange packing for gradient separation of proteins and DNA oligomers.

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

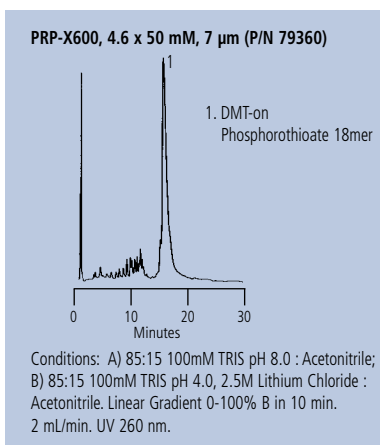


- One particle size: 7  $\mu\text{m}$ .
- Column material: PEEK.
- Guard column in PEEK.
- Higher sample capacity than nonporous supports.

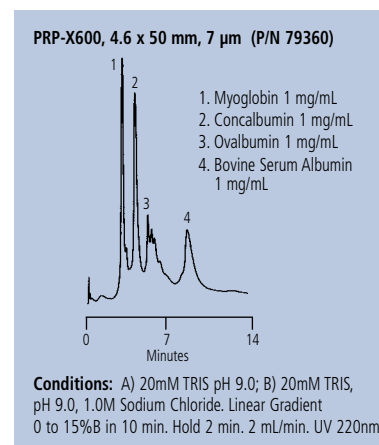
## Separation of DNA Fragments



## DMT-on Phosphorothioate 18mer



## Proteins



## Ordering Information

HPLC Columns	
I.D. x Length	7 $\mu\text{m}$
4.6 x 50 mm*	79360
4.6 x 100 mm*	79187
4.6 x 150 mm*	79188
4.6 x 250 mm*	79189

\* PEEK hardware

Analytical Guard Column	For PEEK Columns*
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

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# RCX-10 Anion Exchange HPLC Columns

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

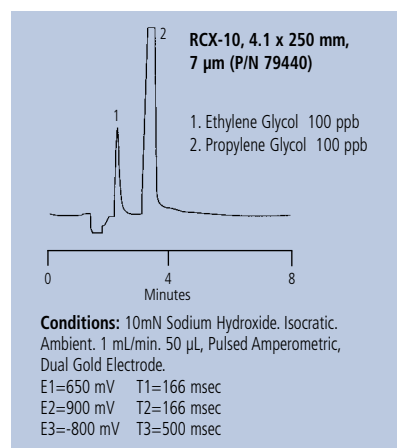
- pH stable from 1 to 13.

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

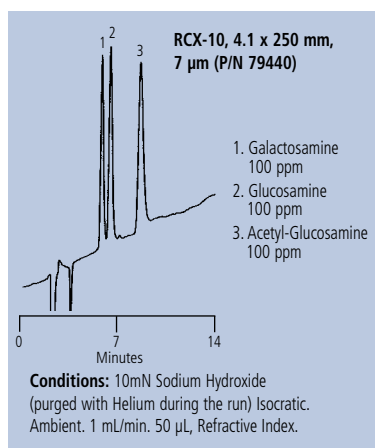


- One particle size: 7  $\mu$ m.
- Three column internal diameters: 2.1 to 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Guard columns in stainless steel and PEEK.

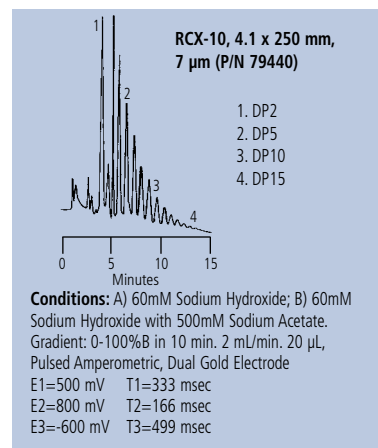
## Glycols in Water



## Acetyl Glucosamine



## Artichoke Tubers



## Ordering Information

HPLC Columns	
I.D. x Length	7 $\mu$ m
2.1 x 250 mm	79399
4.1 x 250 mm	79440
4.6 x 250 mm*	79388

Analytical Guard Columns	For Steel Columns*	For PEEK Columns**
Starter Kits (1 holder, 2 cartridges)	79462	79378
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



# RCX-30 Anion Exchange HPLC Columns

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

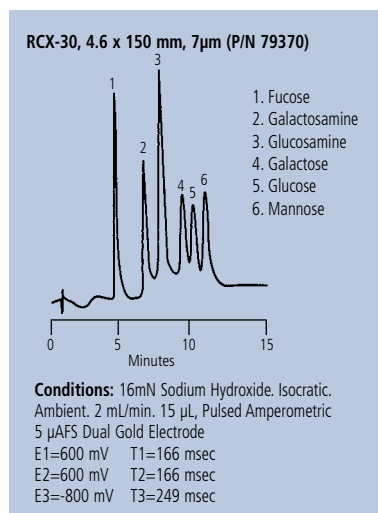
- pH stable from 1 to 13.
- Isocratic or gradient modes.

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

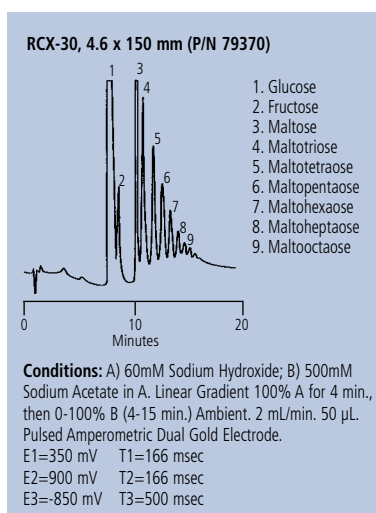


- One particle size: 7  $\mu$ m.
- Three column internal diameters: 2.1, 4.1 and 4.6 mm.
- Two column materials: Stainless steel and PEEK.
- Guard column in PEEK.

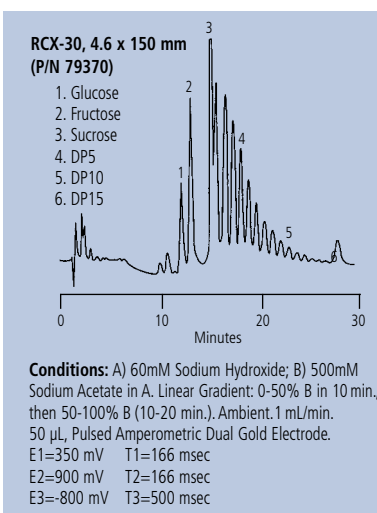
## Glycoprotein Monosaccharides



## Corn Syrup



## Artichoke Tubers



## Ordering Information

HPLC Columns	
I.D. x Length	7 $\mu$ m
2.1 x 250 mm	79170
4.1 x 250 mm	79803
4.6 x 150 mm*	79370
4.6 x 250 mm*	79877

\* PEEK hardware

Analytical Guard Column	For PEEK Columns*
Starter Kit (1 holder, 2 cartridges)	79371
Replacement Cartridges (5/pk)	79372

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

Visit the HAMILTON Application Compound Index at  
[http://www.hamiltoncompany.com/hplc/app\\_index\\_1.asp](http://www.hamiltoncompany.com/hplc/app_index_1.asp)  
 or e-mail [chromatography@hamiltoncompany.com](mailto:chromatography@hamiltoncompany.com)  
 for a complete list of compounds that have been separated.



# Cation Exchange HPLC Columns

## PRP-X200

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

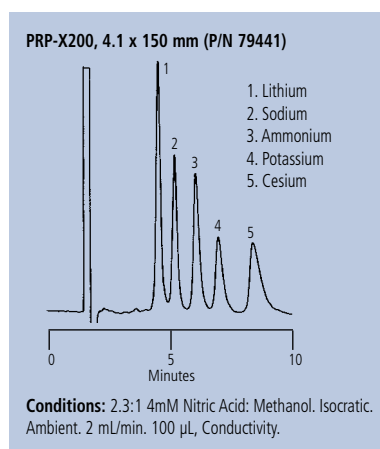
- Easily separate mono or divalent cations.
- pH stable from 1 to 13.

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

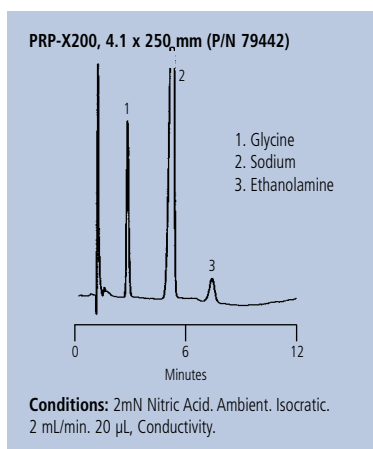


- One particle size: 10  $\mu\text{m}$ .
- Six column internal diameters: 1.0 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

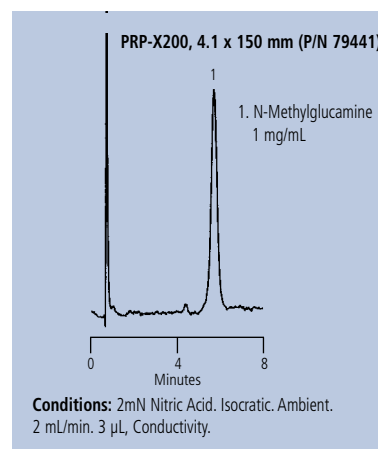
### Monovalent Cations



### Glycine and Ethanolamine



### N-Methylglucamine



## Ordering Information

### HPLC Columns

I.D. x Length	10 $\mu\text{m}$	I.D. x Length	10 $\mu\text{m}$
1.0 x 50 mm	79779	4.1 x 150 mm	79441
1.0 x 100 mm	79780	4.1 x 250 mm	79442
1.0 x 150 mm	79781	4.6 x 50 mm*	79153
1.0 x 250 mm	79782	4.6 x 150 mm*	79384
2.1 x 150 mm	79394	4.6 x 250 mm*	79357
2.1 x 250 mm	79347	7.0 x 305 mm	79489
4.1 x 100 mm	79363	10.0 x 250 mm	79549

\* PEEK hardware

\* PEEK hardware

### Analytical Guard Columns

	For Steel Columns*	For PEEK Columns**
Starter Kits (1 holder, 2 cartridges)	79456	79368
Replacement Cartridges (5/pk)	79449	79369

### Semiprep/Preparative Guard Column

	For Steel Columns***
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

# 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.

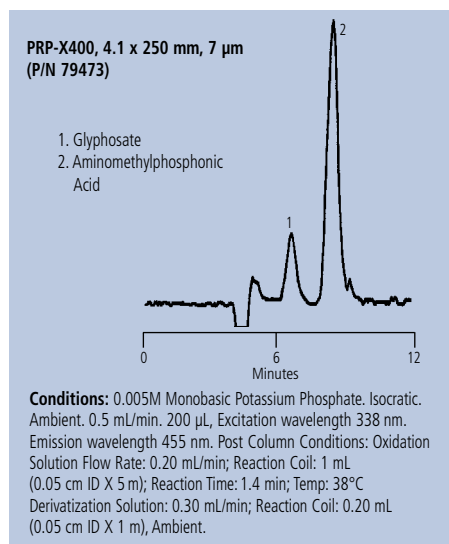
Detection levels of less than 10 ppb when using the post column, OPA derivatization technique.

- Applicable to other separations, such as inositol and sugar alcohols.

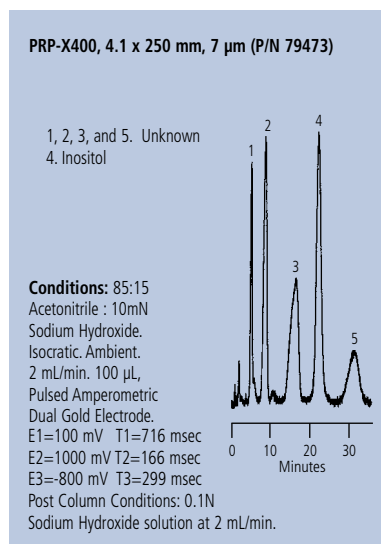


- Two particle sizes: 7 and 12-20  $\mu\text{m}$ .
- Two column materials: 316 stainless steel and PEEK.
- Five column internal diameters: 2.1 to 21.5 mm.
- Analytical and semiprep/preparative guard columns.

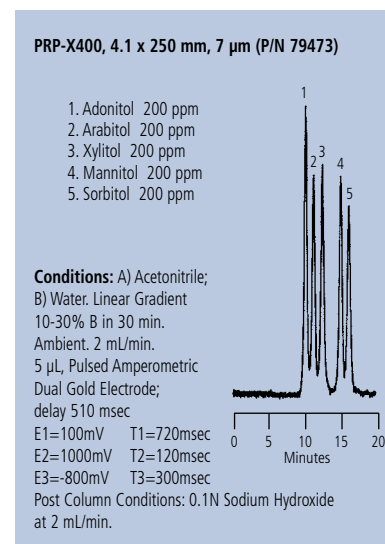
## Glyphosate and Metabolite



## Inositol in Vitamin Matrix



## Sugar Alcohols



## Ordering Information

HPLC Columns		
I.D. x Length	7 $\mu\text{m}$	12-20 $\mu\text{m}$
2.1 x 250 mm	79398	
4.1 x 50 mm	79893	
4.1 x 150 mm	79717	
4.1 x 250 mm	79473	79563
4.6 x 250 mm*	79387	
10.0 x 250 mm		79575
21.5 x 250 mm		79553

\* PEEK hardware

### Analytical Guard Column

Starter Kit (1 holder, 2 cartridges)

Replacement Cartridges (5/pk)

### C18 Guard Column for EPA Glyphosate Application

Starter Kit (1 holder, 2 cartridges)

Replacement Cartridges (5/pk)

### PRP-X400 Semiprep/Preparative Guard Column

Starter Kit (1 holder, 1 cartridge)

Replacement Cartridges (2/pk)

### For PEEK Columns\*

79376

79377

### For Steel Columns\*\*

79459

79452

### For Steel Columns\*\*\*

79131

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.

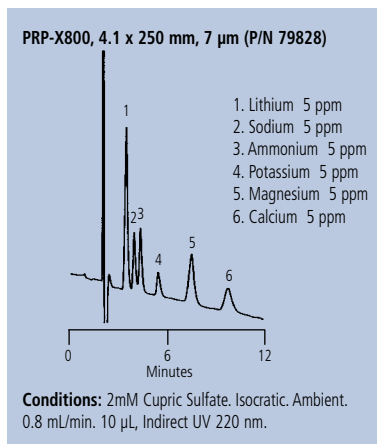
- Isocratic separation of lithium, sodium, ammonium, potassium, magnesium and calcium.

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

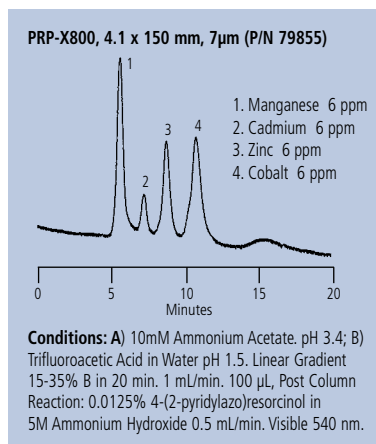


- One particle size: 7  $\mu$ m.
- Two column internal diameters: 4.1 to 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Guard columns in 316 stainless steel and PEEK.

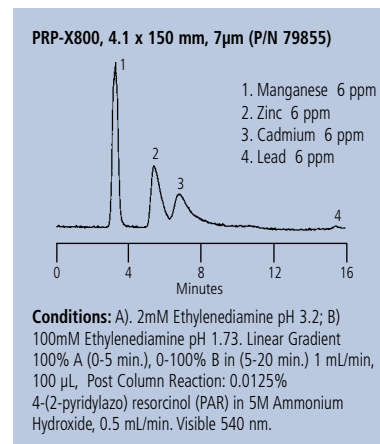
## Mono and Divalent Cations



## Transition Metals



## Transition Metals



## Ordering Information

HPLC Columns	
I.D. x Length	7 $\mu$ m
4.1 x 150 mm	79855
4.1 x 250 mm	79828
4.6 x 150 mm*	79851
4.6 x 250 mm*	79829

\* PEEK hardware

Analytical Guard Columns	For Steel Columns*	For PEEK Columns**
Starter Kits (1 holder, 2 cartridges)	79830	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

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# HC-40 Cation Exchange HPLC Columns

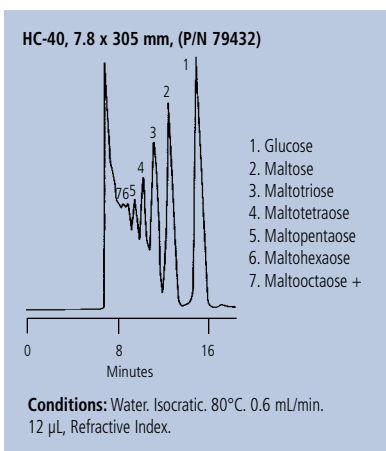
Polymeric 4% cross-linked soft-gel column for cation, ligand exchange separation of carbohydrates.

- Separate oligosaccharides up to DP8.
- Water mobile phase.
- Compatible with RI detectors.

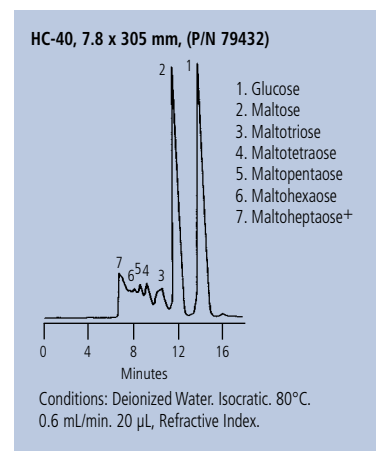


- One particle size: 10 - 15  $\mu\text{m}$ .
- One column internal diameter: 7.8 mm.
- One column material: 316 stainless steel.

## Corn Syrup



## High Conversion Corn Syrup



## Ordering Information

### Gel-Type Cation Exchange Column

I.D. x Length	10-15 $\mu\text{m}$
7.8 x 305 mm	79432

### Guard Columns

	For Steel 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-40 guard column for steel columns is 4.6 x 20 mm



# HC-75 Cation Exchange HPLC Columns

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

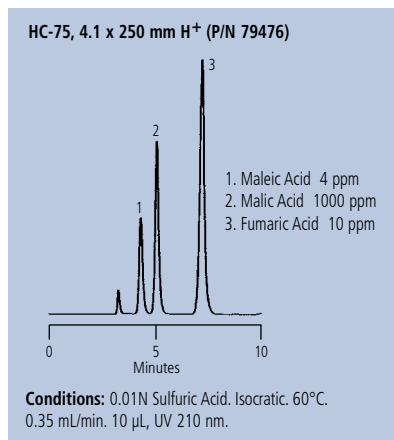
- Compatible with UV and RI detectors.

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

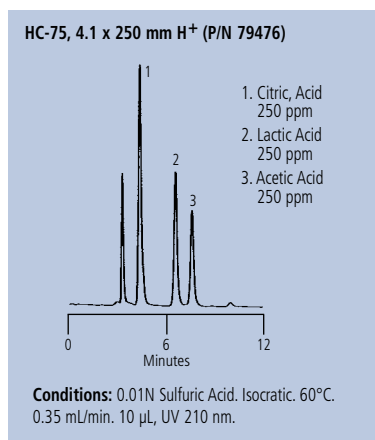


- One particle size: 9  $\mu\text{m}$ .
- Three column internal diameters: 4.1, 7.8 and 10.0 mm.
- One column material: 316 stainless steel.
- Three forms: calcium, lead and hydrogen.

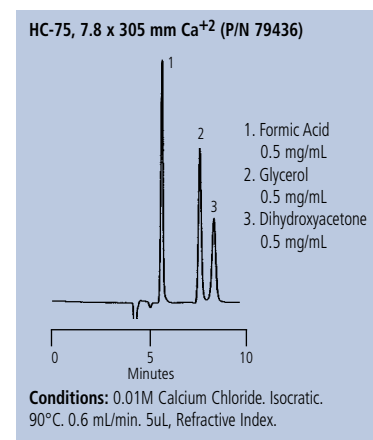
## Malic Acid



## Citric, Lactic and Acetic Acids



## Dihydroxyacetone



## Ordering Information

Gel-Type Cation Exchange Columns			
I.D. x Length	9 $\mu\text{m}$ , Calcium	9 $\mu\text{m}$ , Lead	9 $\mu\text{m}$ , Hydrogen
4.1 x 250 mm	79431		79476
7.8 x 100 mm			79547
7.8 x 305 mm	79436	79438	79544
10.0 x 250 mm	79528		

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Guard Columns	For Steel 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

# Ion Exclusion HPLC Columns

## PRP-X300

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

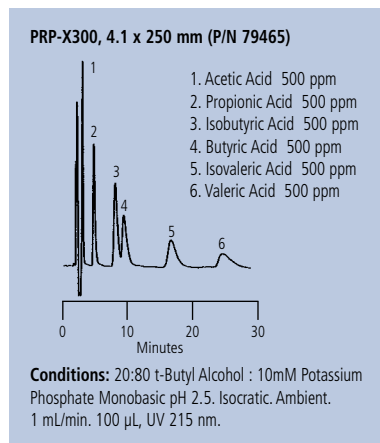
- Separate structurally similar alcohols.

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

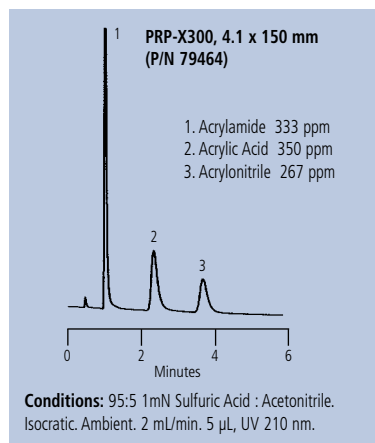


- One particle size: 7  $\mu$ m.
- Five column internal diameters: 1.0 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

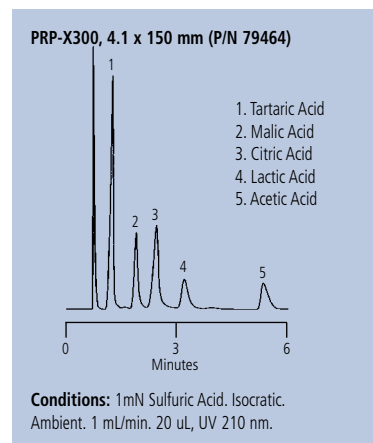
### Fatty Acids



### Acrylamide and Acrylic Acid



### Organic Acids



## Ordering Information

HPLC Columns	
I.D. x Length	7 $\mu$ m
1.0 x 50 mm	79783
1.0 x 100 mm	79784
1.0 x 150 mm	79785
1.0 x 250 mm	79786
2.1 x 150 mm	79396
2.1 x 250 mm	79397
4.1 x 33 mm	79536
4.1 x 50 mm	79356
4.1 x 150 mm	79464
4.1 x 250 mm	79465
4.6 x 150 mm*	79475
4.6 x 250 mm*	79386
10.0 x 250 mm	79572

\* 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 the HAMILTON Application Compound Index at  
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