

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 16 different polymer-based HPLC columns for reversed phase, anion exchange, cation exchange, ion exclusion and amino 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 <http://www.hamiltoncompany.com/product/hplc/myappindex.html> or e-mail 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, ion exclusion, and amino.

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

Recommended Uses		
Reversed Phase	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 Calcium Form	Mono and disaccharides in corn syrup. Max pressure 1,000 psi
	HC-75 Hydrogen Form	Organic acids and sugars. Max pressure 1,000 psi
	HC-75 Lead Form	Sugar alcohols. Max pressure 1,000 psi
Ion Exclusion	PRP-X300	Organic acids and alcohols
Amino	PRP-X700	Normal phase separation of mono and disaccharides

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.	HxSil C18
L7	Octylsilane chemically bonded to porous silica particles, 3 to 10 µm in diameter.	HxSil C8
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11 µm in diameter.	HC-75 Hydrogen Form
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9 µm in diameter.	HC-75 Calcium Form
L21	A rigid, spherical styrene-divinylbenzene copolymer, 5 to 10 µm in diameter.	PRP-1 PRP-3
L23	An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 10 µm in size.	PRP-X500
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, about 9 µm in diameter.	HC-75 Lead Form

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-1	PSDVB*	N/A	100 Å	79821	79578	79579	79580	79581	79582	79583
PRP-3	PSDVB*	N/A	300 Å	79822			79701	79702		
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	79823	79584		79585	79586		
PRP-X500	Poly(methacrylamidopropyl Trimethyl-ammonium chloride)	1.6 meq/gm	Superficially porous			79594		79595	79596	
PRP-X600	Poly(dimethyl-amidopropyl-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®-1

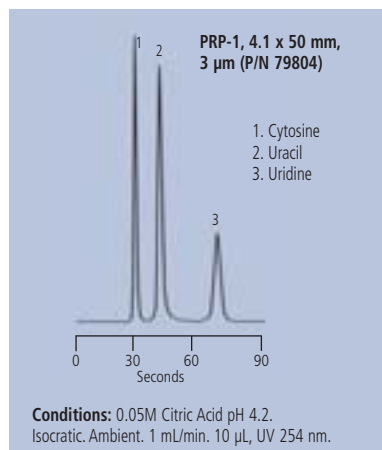
Polymeric 100 Å columns for general reversed phase separations.

- pH stable from 0 to 14.
- Better sample recovery than silica-based columns (there are no silanol groups).
- Excellent durability (stable to any concentration of water or organic solvent).

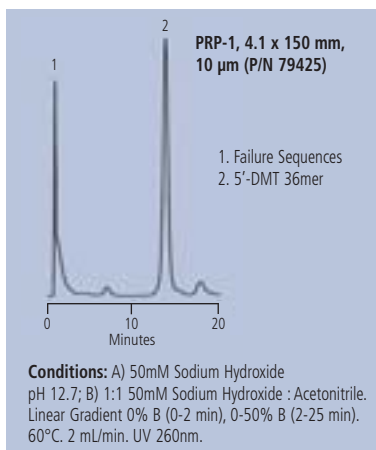


- Five particle sizes: 3, 5, 7, 10 and 12-20 µm.
- Eleven column internal diameters: 1.0 to 101.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

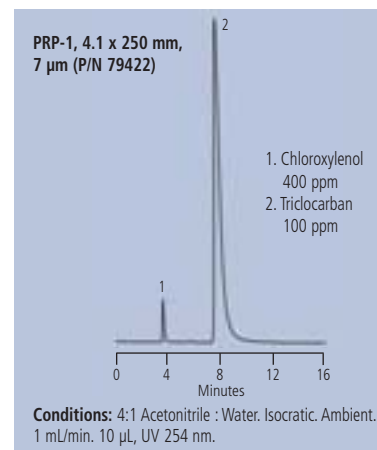
Small Molecules



DNA with Secondary Structure

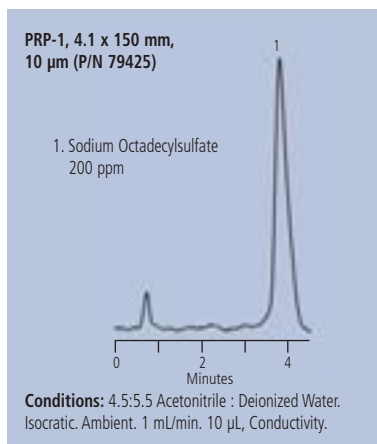


Biocides found in Soap

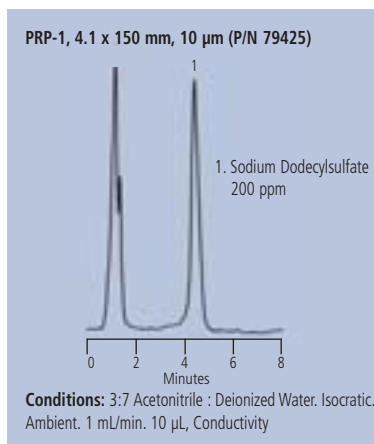


PRP-1 Reversed Phase HPLC Columns

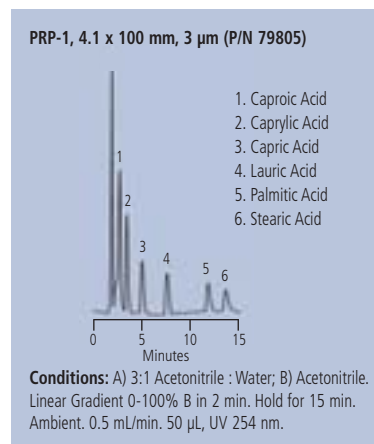
Surfactant



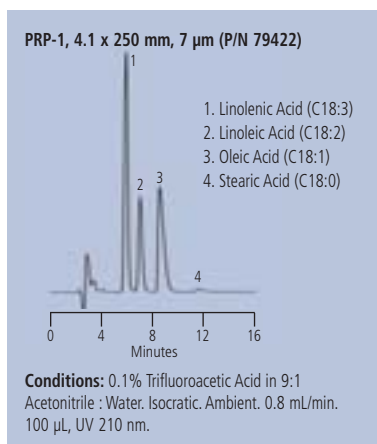
Surfactant



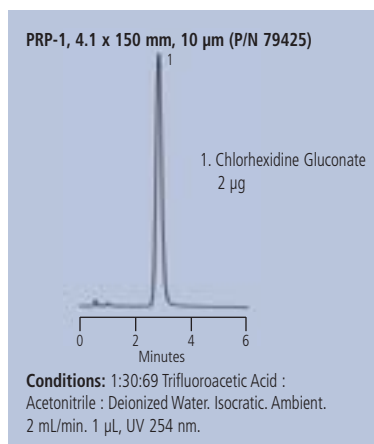
Fatty Acids



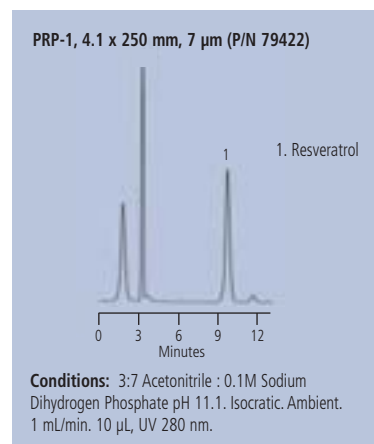
Isomeric C18 Fatty Acids



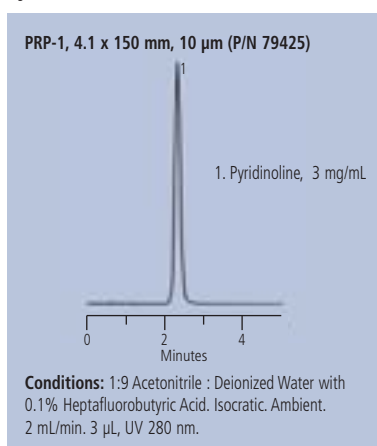
Chlorhexidine Gluconate



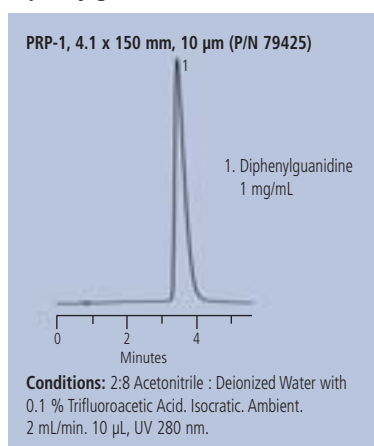
Resveratrol



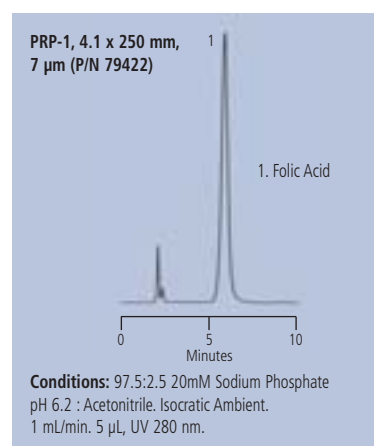
Pyridinoline



Diphenylguanidine

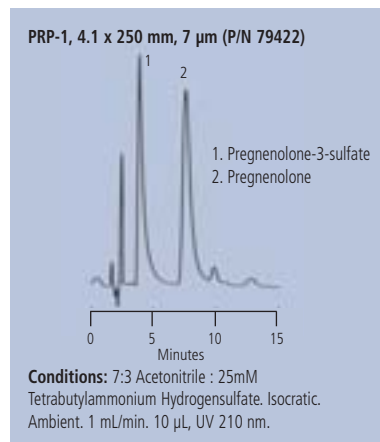


Folic Acid

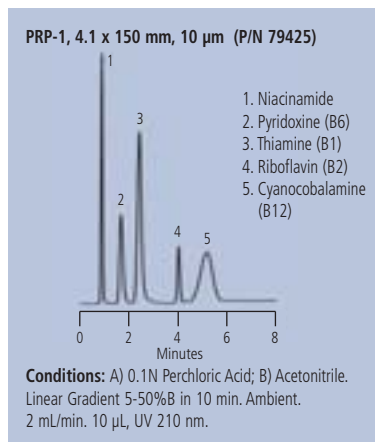


PRP-1 Reversed Phase HPLC Columns

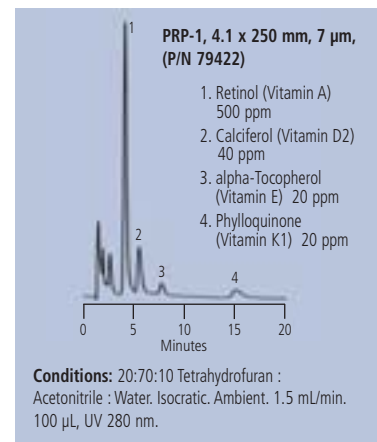
Pregnenolone and Pregnenolone-3-sulfate



Water Soluble Vitamins



Fat Soluble Vitamins



Ordering Information

HPLC Columns

I.D. x Length	3 µm	5 µm	7 µm	10 µm	12-20 µm
1.0 x 50 mm		79751	79755	79759	
1.0 x 100 mm	79169	79752	79756	79760	
1.0 x 150 mm	79847	79753	79757	79761	
1.0 x 250 mm		79754	79758	79762	
2.1 x 50 mm	79854	79195	79554		
2.1 x 100 mm	79844	79790			
2.1 x 150 mm	79845	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	79804	79443			
4.1 x 100 mm	79805	79479		79565	
4.1 x 150 mm	79806	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	3 µm	5 µm	7 µm	10 µm	12-20 µm
4.6 x 250 mm*		79571	79380	79381	
7.0 x 100 mm				79495	79713
7.0 x 300 mm					79719
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/product/hplc/myappindex.html> or e-mail hplc@hamiltoncompany.com for a complete list of compounds that have been separated.

PRP-3 Reversed Phase HPLC Columns

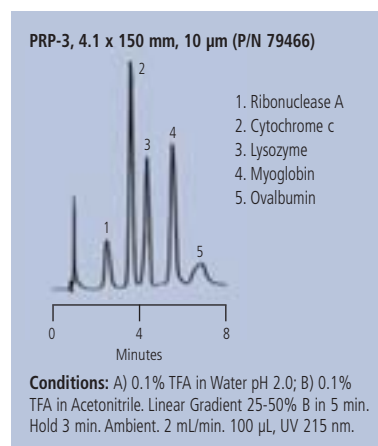
Polymeric 300 Å columns for protein separations.

- pH stable from 0 to 14.
- 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).

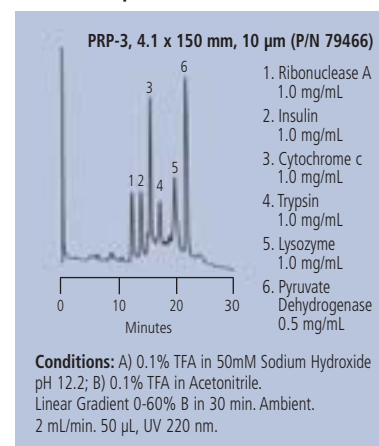


- Three particle sizes: 3, 10 and 12-20 µm.
- Eight column internal diameters: 1.0 to 50.8 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

Proteins



Proteins at pH 12.2



Ordering Information

HPLC Columns		3 µm		10 µm		12-20 µm	
I.D. x Length				I.D. x Length			
1.0 x 50 mm			79763	4.1 x 150 mm	79809	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	79858			4.6 x 250 mm*		79574	
2.1 x 100 mm	79196	79863		7.0 x 305 mm		79468	
2.1 x 150 mm	79846	79392		10.0 x 250 mm		79526	
4.1 x 50 mm	79807	79467		21.5 x 250 mm			79469
4.1 x 100 mm	79808			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

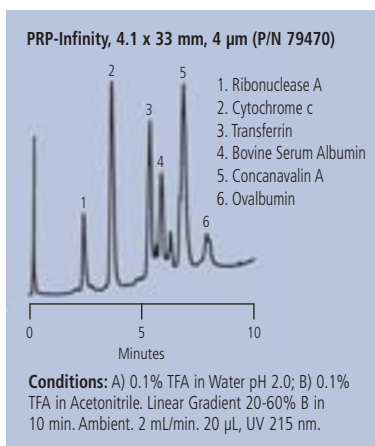
Polymeric nonporous packing for fast gradient separation of large proteins.

- pH stable from 0 to 14.
- 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).

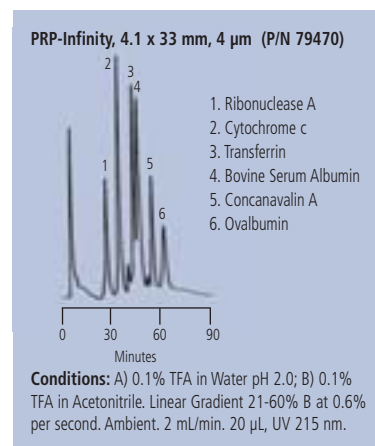


- One particle size: 4 μm .
- Three column internal diameters: 2.1 to 10.0 mm.
- One column material: 316 stainless steel.

Proteins



Proteins



Ordering Information

HPLC Columns I.D. x Length	4 μm
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/product/hplc/myappindex.html>
 or e-mail hplc@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.

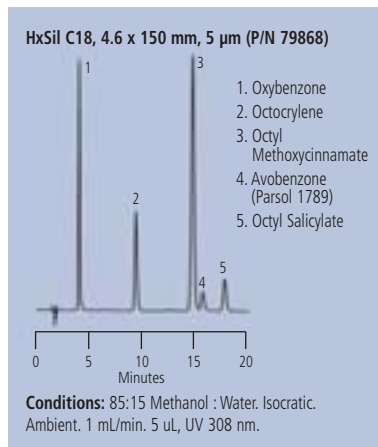
- Separation of closely related PAHs.
- Better retention of poorly retained compounds.
- Separation of neutral, acidic and basic compounds without tailing (tailing factor of less than 2.0).



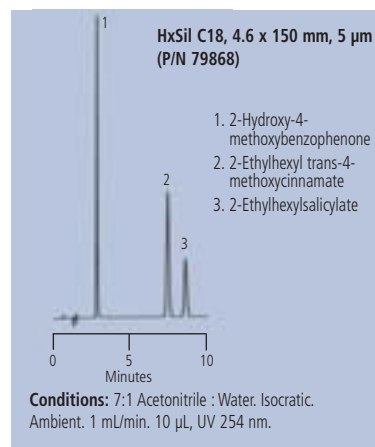
- Two particle sizes: 3 and 5 µm.
- Five column internal diameters: 2.1 to 21.5 mm.

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

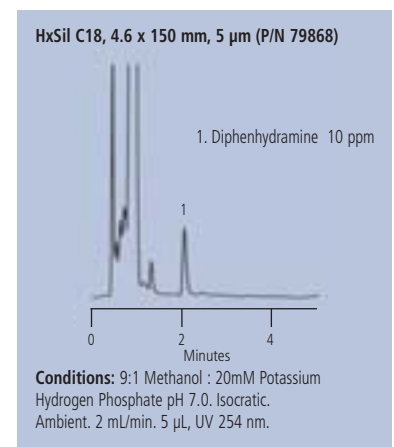
Sunscreens in Lip Balm



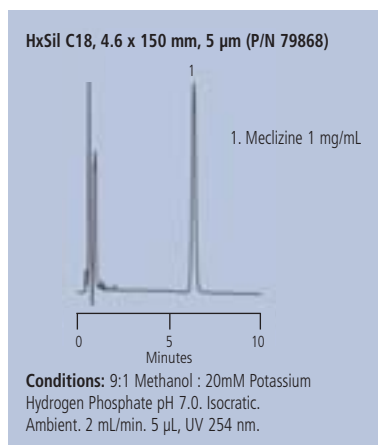
Sunscreen Compounds



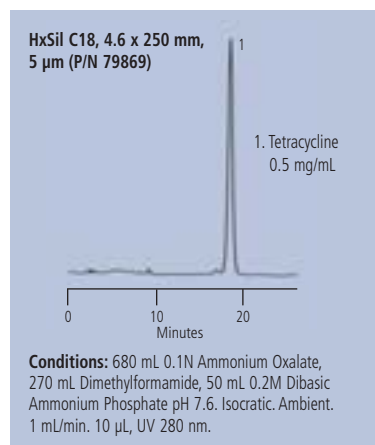
Diphenhydramine in Itch Relief Gel



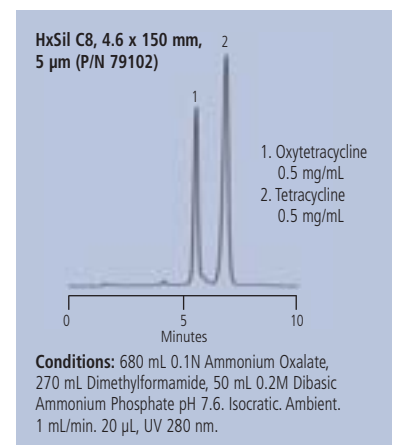
Mecizine in Tablets



Tetracycline by USP Method

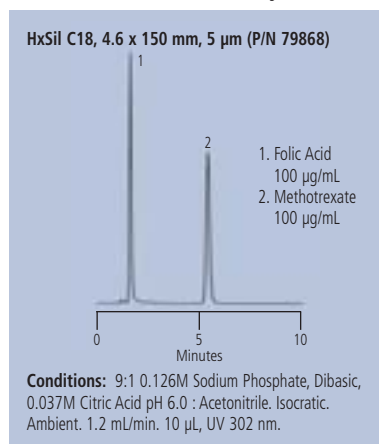


Oxytetracycline and Tetracycline

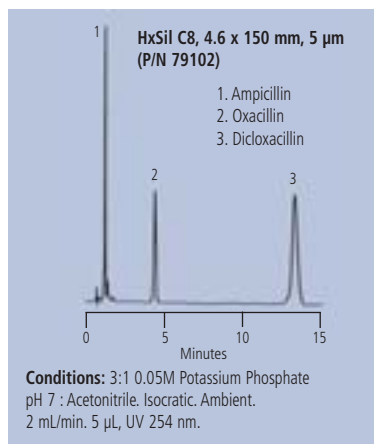


HxSil C8 & C18 Reversed Phase HPLC Columns

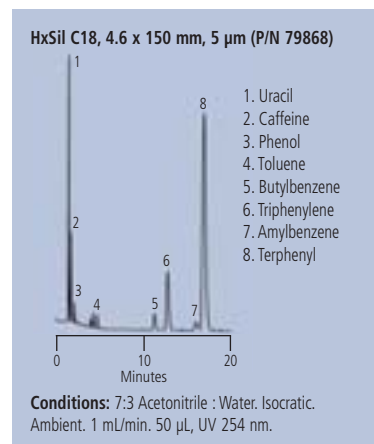
Folic Acid, Methotrexate by USP Method



Antibiotics



Small Molecules



HxSil C8 Ordering Information

HPLC Columns			HPLC Columns		
I.D. x Length	3 µm	5 µm	I.D. x Length	3 µm	5 µm
2.1 x 33 mm	79116		4.6 x 50 mm	79113	79100
2.1 x 50 mm	79117	79107	4.6 x 100 mm	79114	79101
2.1 x 75 mm	79118	79108	4.6 x 150 mm	79115	79102
2.1 x 100 mm	79119	79109	4.6 x 250 mm		79103
2.1 x 150 mm	79120	79110	7.0 x 250 mm		79104
2.1 x 250 mm		79111	10.0 x 250 mm		79105
4.6 x 33 mm	79112		21.5 x 250 mm		79106

Analytical Guard Column	For Steel Columns*	Semiprep/Preparative Guard Column	For Steel Columns*
Starter Kit (1 holder, 2 cartridges)	79458	Starter Kit (1 holder, 1 cartridge)	79135
Replacement Cartridges (5/pk)	79451	Replacement Cartridges (2/pk)	79136

* 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

HxSil C18 Ordering Information

HPLC Columns			HPLC Columns		
I.D. x Length	3 µm	5 µm	I.D. x Length	3 µm	5 µm
2.1 x 33 mm	79888		4.6 x 50 mm	79872	79867
2.1 x 50 mm	79889	79881	4.6 x 100 mm	79887	79879
2.1 x 75 mm	79890	79882	4.6 x 150 mm	79873	79868
2.1 x 100 mm	79891	79883	4.6 x 250 mm		79869
2.1 x 150 mm	79892	79884	7.0 x 250 mm		79880
2.1 x 250 mm		79885	10.0 x 250 mm		79870
4.6 x 33 mm	79886		21.5 x 250 mm		79871

Analytical Guard Column	For Steel Columns*	miprep/Preparative Guard Column	For Steel Columns*
Starter Kit (1 holder, 2 cartridges)	79459	Starter Kit (1 holder, 1 cartridge)	79137
Replacement Cartridges (5/pk)	79452	Replacement Cartridges (2/pk)	79138

* 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

Visit the HAMILTON Application Compound Index at
<http://www.hamiltoncompany.com/product/hplc/myappindex.html>
 or e-mail hplc@hamiltoncompany.com for a complete list of compounds
 that have been separated.

Anion Exchange HPLC Columns

PRP-X100

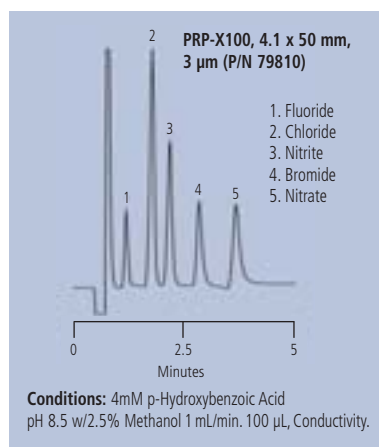
Polymeric anion exchange packings for separation of inorganic and organic anions.

- 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 0 to 14.
- Use conductivity or UV detection.

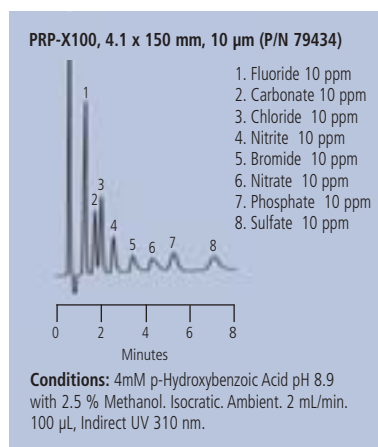


- Four particle sizes: 3, 5, 10 and 12-20 μm .
- Two column materials: 316 stainless steel and PEEK.
- Eight column internal diameters: 1.0 to 50.8 mm.
- Analytical and semiprep/preparative guard columns.

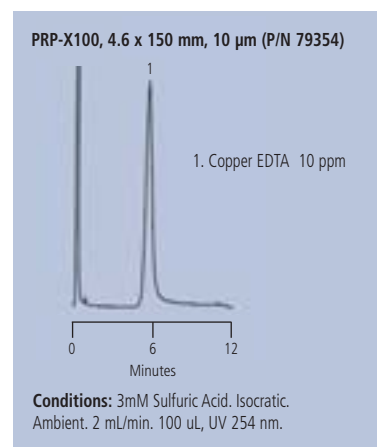
Common Anions



Anions by Indirect UV Detection

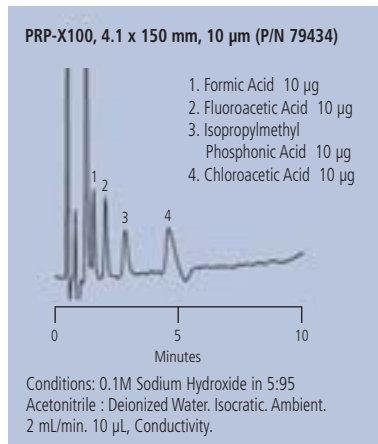


EDTA

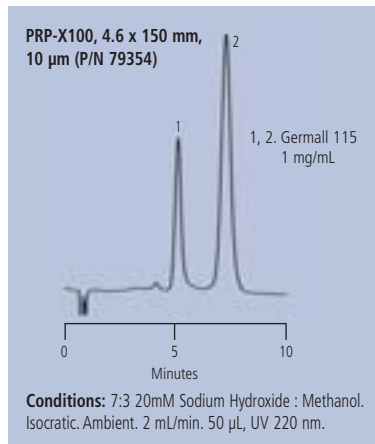


PRP-X100 Anion Exchange HPLC Columns

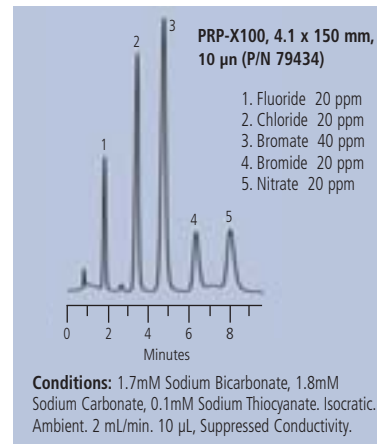
Organic Acids



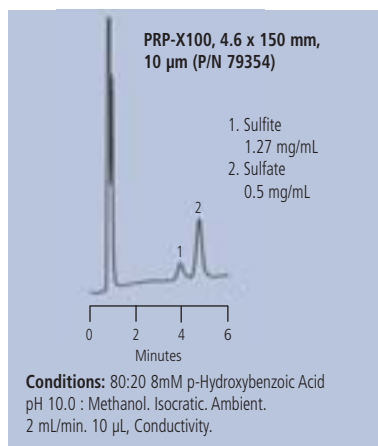
Germall 115



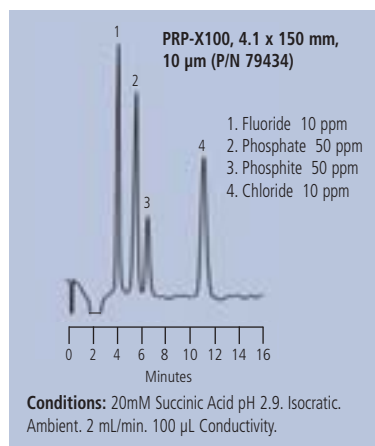
Bromate and Other Anions



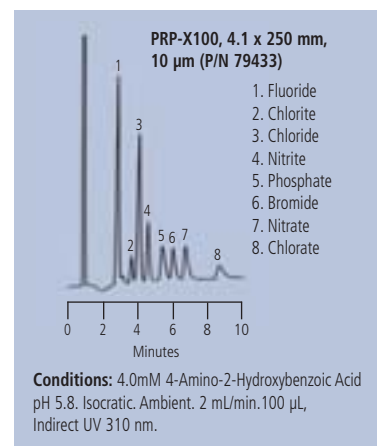
Sulfite and Sulfate



Phosphate and Phosphite



Chlorite and Chlorate



Ordering Information

HPLC Columns				HPLC Columns			
I.D. x Length	3 µm	5 µm	10 µm	I.D. x Length	5 µm	10 µm	12-20 µm
1.0 x 50 mm		79767	79771	4.1 x 250 mm		79433	79359
1.0 x 100 mm		79768	79772	4.6 x 150 mm*	79174	79354	
1.0 x 150 mm	79878	79769	79773	4.6 x 250 mm*	79181	79455	
1.0 x 250 mm		79770	79774	7.0 x 305 mm		79364	
2.1 x 50 mm		79150	79749	10.0 x 150 mm		79715	
2.1 x 150 mm	79146		79421	10.0 x 250 mm		79534	
2.1 x 150 mm*		79852	79853	21.5 x 100 mm			79543
2.1 x 250 mm		79190	79346	21.5 x 150 mm			79542
4.1 x 50 mm	79810		79365	21.5 x 250 mm		79535	79353
4.1 x 100 mm	79811	79538	79439	50.8 x 150 mm			79551
4.1 x 150 mm	79812		79434	50.8 x 250 mm			79550

* PEEK hardware

Analytical Guard Columns	For Steel Columns**	For PEEK Columns***	Semiprep/Preparative Guard Column	For Steel Columns****
Starter Kits (1 holder, 2 cartridges)	79448	79383	Starter Kit (1 holder, 1 cartridge)	79125
Replacement Cartridges (5/pk)	79446	79385	Replacement Cartridges (2/pk)	79126

** 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-X110 Anion Exchange HPLC Columns

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

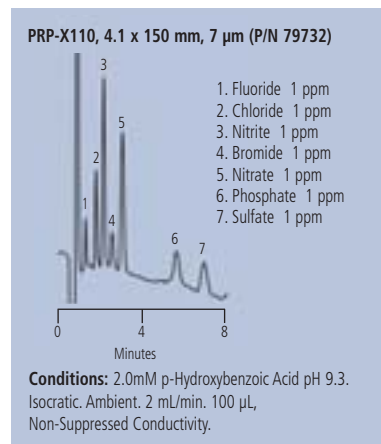
- Good separation of fluoride from the water dip.

- Compatible with conductivity or UV detectors.
- Use with organic solvent up to 100%
- pH stable from 0 to 14.

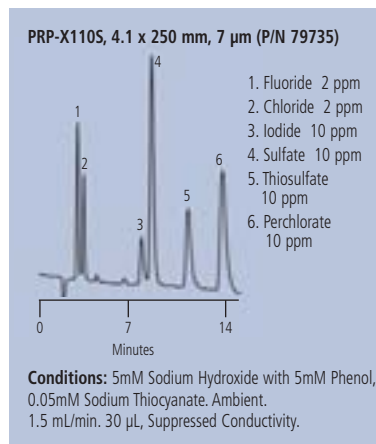


- Two particle sizes: 3 and 7 μm .
- Four column internal diameters: 1.0 to 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical guard columns.

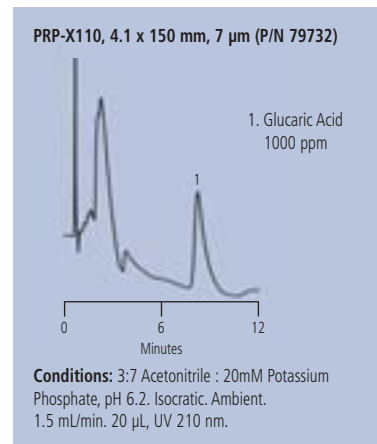
Anions



Polarizable Anions



Glucaric Acid



Ordering Information

HPLC Columns I.D. x Length	PRP-X110 3 μm	PRP-X110 7 μm	PRP-X110S 7 μm
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	79814	79730	79731
4.1 x 150 mm	79815	79732	79733
4.1 x 250 mm		79734	79735

I.D. x Length	PRP-X110 7 μm	PRP-X110S 7 μm
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 Starter Kits (1 holder, 2 cartridges)	For Steel Columns*	For PEEK Columns**
Replacement Cartridges (5/pk)	79726	79727
	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

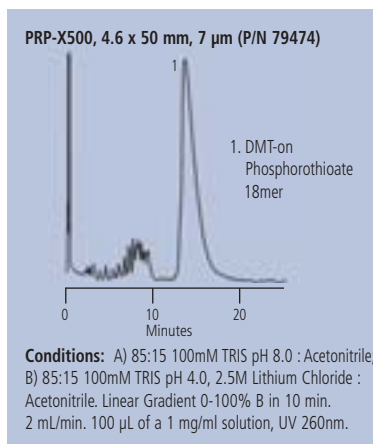
Polymeric strong-base anion exchange packing with limited porosity for separation of proteins.

- Fast separation of large proteins.
- pH stable from 0 to 9.

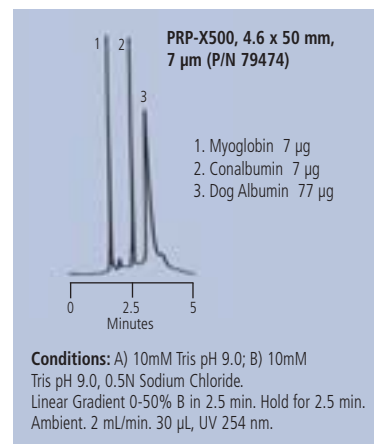


- One particle size: 7 μm .
- Three column internal diameters: 2.1 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Higher sample capacity than nonporous supports.

DMT-on Antisense Phosphorothioate 18mer



Proteins



Ordering Information

HPLC Columns I.D. x Length	7 μm
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

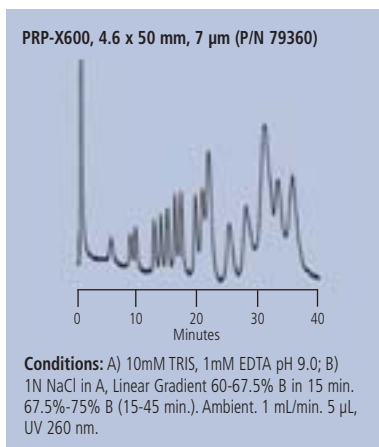
Polymeric weak-base anion exchange packing for gradient separation of proteins and DNA oligomers.

- Limited porosity allows separation of large DNA fragments.
- pH stable from 0 to 14.

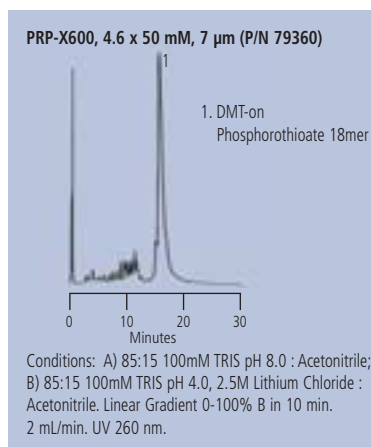


- Particle size: 7 μ m.
- Column material: PEEK.
- Guard column in PEEK.
- Higher sample capacity than nonporous supports

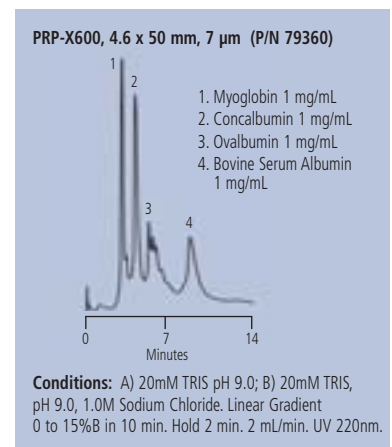
Separation of DNA Fragments



DMT-on Phosphorothioate 18mer



Proteins



Ordering Information

HPLC Columns

I.D. x Length	7 μ 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

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

For PEEK Columns*

79361
79362

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

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or e-mail hplc@hamiltoncompany.com for a complete list of compounds that have been separated.

RCX-10 Anion Exchange HPLC Columns

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

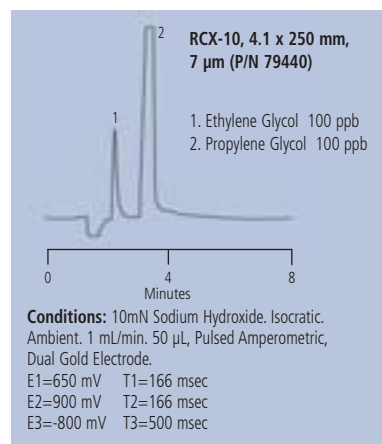
- pH stable from 0 to 14.

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

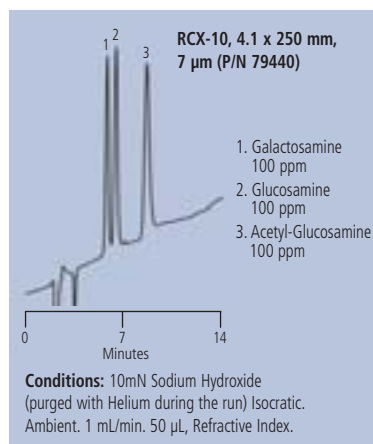


- Particle size: 7 μm .
- Three column internal diameters: 2.1 to 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Guard columns in stainless steel and PEEK.

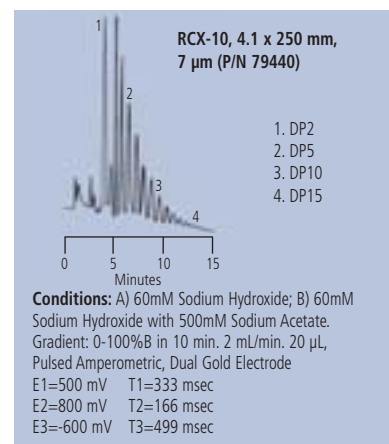
Glycols in Water



Acetyl Glucosamine



Artichoke Tubers



Ordering Information

HPLC Columns

I.D. x Length	7 μm
2.1 x 250 mm	79399
4.1 x 250 mm	79440
4.6 x 250 mm*	79388

* PEEK hardware

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

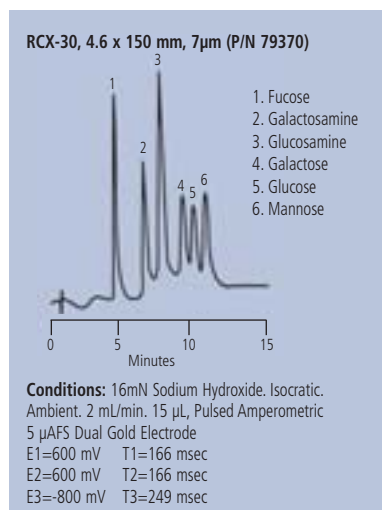
Polymeric anion exchange packing for isocratic or gradient separation of complex carbohydrates.

- pH stable from 0 to 14.
- Isocratic or gradient modes.
- Higher ion exchange capacity support for separation of closely related carbohydrates.
- Compatible with PAD and RI detectors.

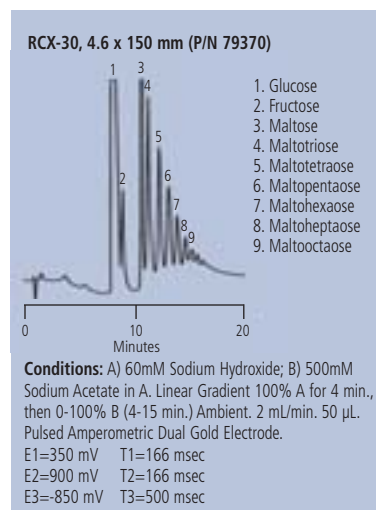


- Particle size: 7 μm .
- Two column internal diameters: 4.1 to 4.6 mm.
- Two column materials: Stainless steel and PEEK.
- Guard column in PEEK.

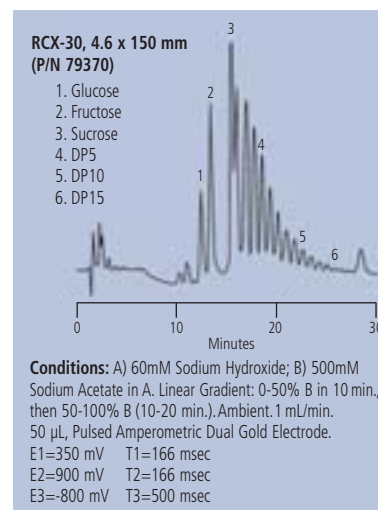
Glycoprotein Monosaccharides



Corn Syrup



Artichoke Tubers



Ordering Information

HPLC Columns	
I.D. x Length	7 μm
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

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 or e-mail hplc@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.

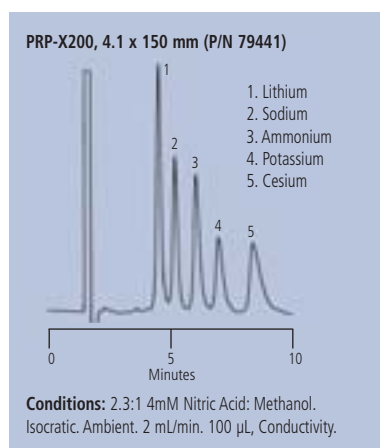
- Easily separate mono or divalent cations.
- pH stable from 0 to 14.

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

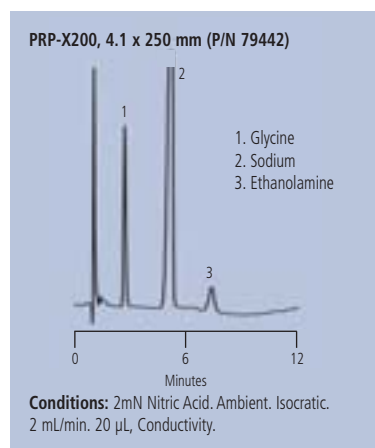


- Particle size: 10 μ m.
- Six column internal diameters: 1.0 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

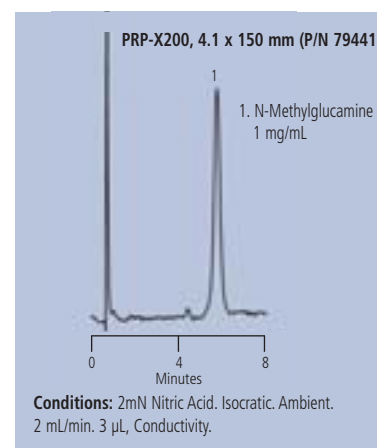
Monovalent Cations



Glycine and Ethanolamine



N-Methylglucamine



Ordering Information

HPLC Columns				Analytical Guard Columns		
I.D. x Length	10 μ m	I.D. x Length	10 μ m		For Steel Columns*	For PEEK Columns**
1.0 x 50 mm	79779	4.1 x 150 mm	79441	Starter Kits (1 holder, 2 cartridges)	79456	79368
1.0 x 100 mm	79780	4.1 x 250 mm	79442	Replacement Cartridges (5/pk)	79449	79369
1.0 x 150 mm	79781	4.6 x 50 mm*	79153	Semiprep/Preparative Guard Column		
1.0 x 250 mm	79782	4.6 x 150 mm*	79384	Starter Kits (1 holder, 1 cartridge)		For Steel Columns***
2.1 x 150 mm	79394	4.6 x 250 mm*	79357	Replacement Cartridges (2/pk)		79127
2.1 x 250 mm	79347	7.0 x 305 mm	79489			79128
4.1 x 100 mm	79363	10.0 x 250 mm	79549			

* PEEK hardware

* 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.

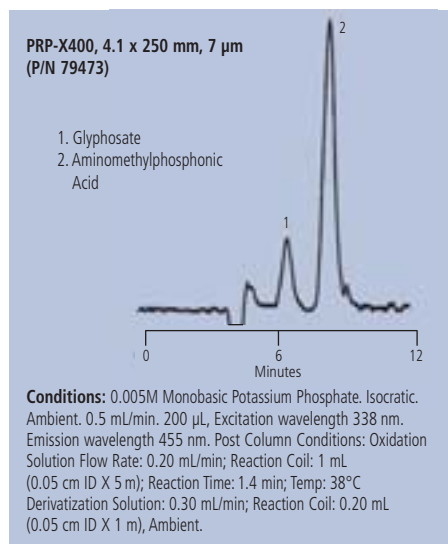
- Faster analysis when compared to competitor's columns.

- 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.

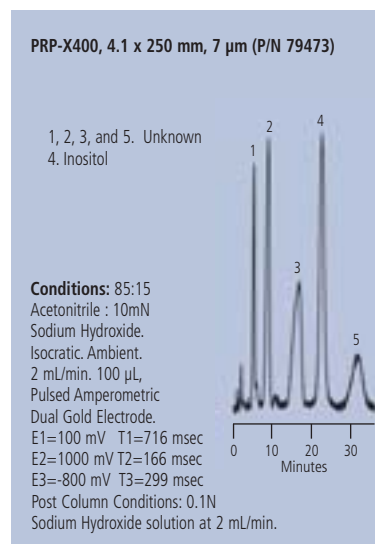


- Two particle sizes: 7 and 12-20 μm .
- Five column internal diameters: 2.1 to 21.5 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

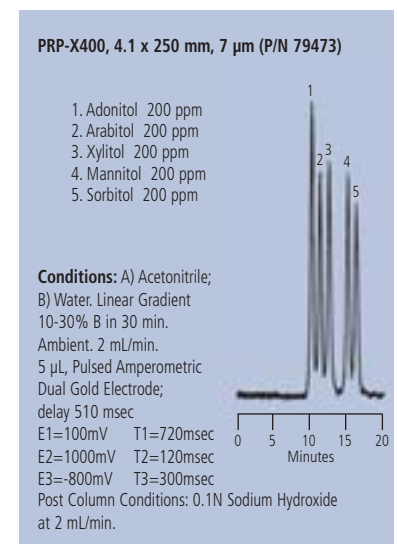
Glyphosate and Metabolite



Inositol in Vitamin Matrix



Sugar Alcohols



Ordering Information

HPLC Columns	7 μm	12-20 μm
I.D. x Length		
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	For PEEK Columns*
Starter Kit (1 holder, 2 cartridges)	79376
Replacement Cartridges (5/pk)	79377
C18 Guard Column for EPA Glyphosate Application	For Steel Columns**
Starter Kit (1 holder, 2 cartridges)	79459
Replacement Cartridges (5/pk)	79452
PRP-X400 Semiprep/Preparative Guard Column	For Steel Columns***
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.

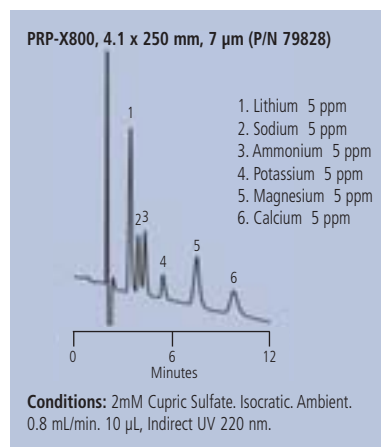
- Isocratic separation of lithium, sodium, ammonium, potassium, magnesium and calcium.

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

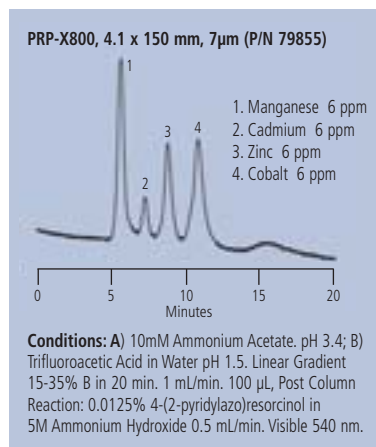


- Particle size: 7 μm .
- Two column internal diameters: 4.1 to 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Guard columns in 316 stainless steel and PEEK.

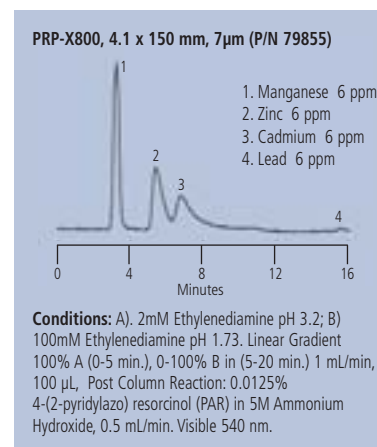
Mono and Divalent Cations



Transition Metals



Transition Metals



Ordering Information

HPLC Columns I.D. x Length	7 μm
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

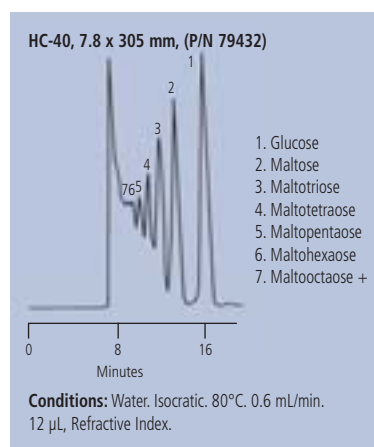
Polymeric 4% cross-linked soft-gel column for cation, ligand exchange separation of carbohydrates.

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

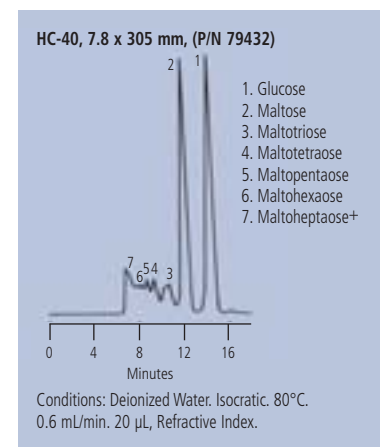


- Particle size: 10 - 15 μm .
- One column internal diameter: 7.8 mm.
- One column material: 316 stainless steel.

Corn Syrup



High Conversion Corn Syrup



Ordering Information

Gel-Type Cation Exchange Column I.D. x Length	10 - 15 μm
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.

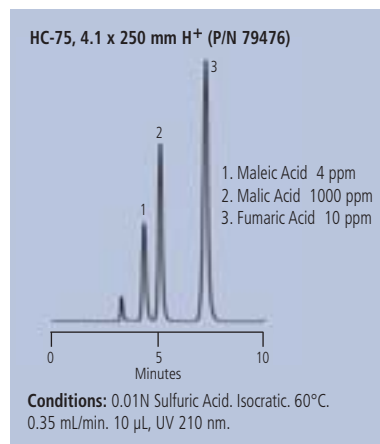
- Compatible with UV and RI detectors.

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

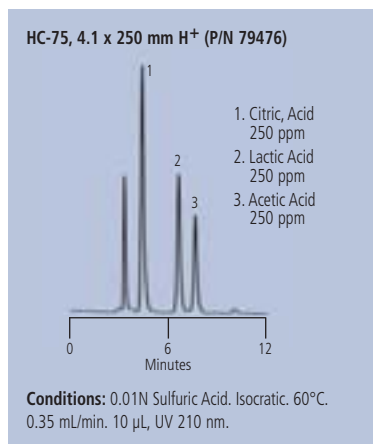


- Particle size: 9 μ m.
- Three column internal diameters: 4.1, 7.8 and 10.0 mm.
- One column material: 316 stainless steel.
- Three forms: calcium, lead and hydrogen.

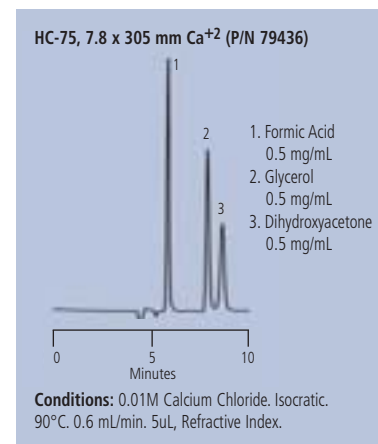
Malic Acid



Citric, Lactic and Acetic Acids



Dihydroxyacetone



Ordering Information

Gel-Type Cation Exchange Columns

I.D. x Length	9 μ m, Calcium	9 μ m, Lead	9 μ 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		

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

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* 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.

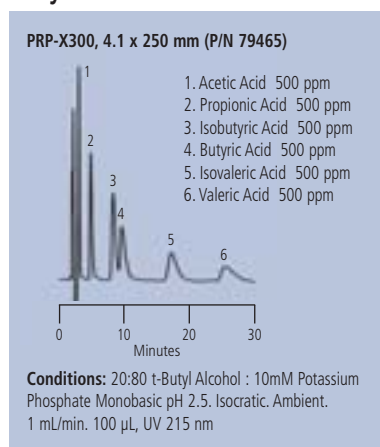
- Separate structurally similar alcohols.

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

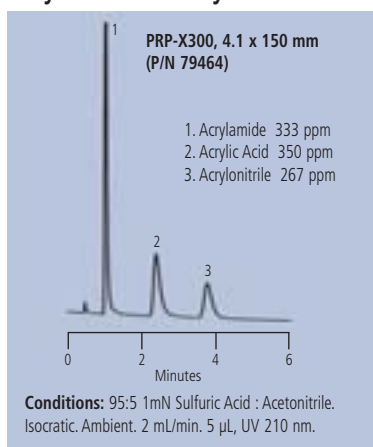


- Two particle sizes: 3 and 7 μm .
- Five column internal diameters: 1.0 to 10.0 mm.
- Two column materials: 316 stainless steel and PEEK.
- Analytical and semiprep/preparative guard columns.

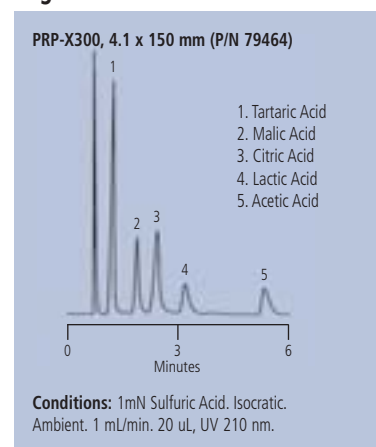
Fatty Acids



Acrylamide and Acrylic Acid



Organic Acids



Ordering Information

HPLC Columns		
I.D. x Length	3 μm	7 μm
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	79817	79536
4.1 x 50 mm	79818	79356
4.1 x 150 mm	79819	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

Amino HPLC Columns

PRP-X700

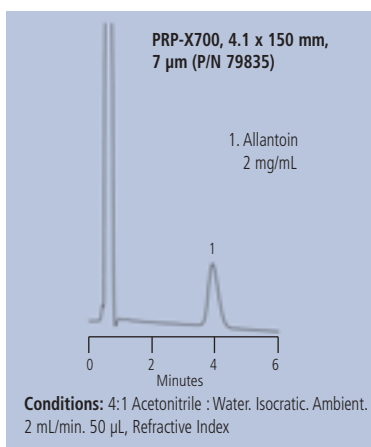
Polymeric normal phase, columns for separation of carbohydrates.

- pH stable from 0 to 14.
- 7 minute separation of fructose, glucose, sucrose and maltose.

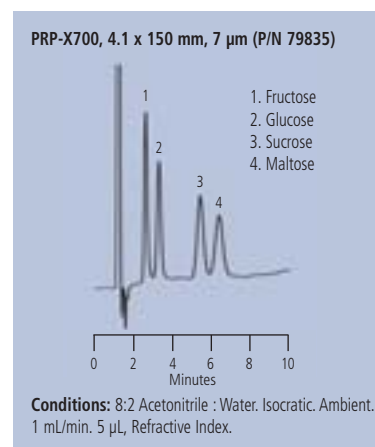


- Two particle sizes: 5 and 7 μm .
- Three column internal diameters: 2.1, 4.1 and 4.6 mm.
- Two column materials: 316 stainless steel and PEEK.
- Guard columns in 316 stainless steel and PEEK.

Allantoin



Mono and Disaccharides



Ordering Information

HPLC Columns I.D. x Length	5 μm	7 μm
2.1 x 250 mm	79173	
4.1 x 150 mm	79834	79835
4.1 x 250 mm		79836
4.6 x 150 mm*	79837	79838
4.6 x 250 mm*		79839

* PEEK hardware

Analytical Guard Columns

Starter Kit (1 holder, 2 cartridges)

Replacement Cartridges (5/pk)

For Steel Columns*

79840

79842

For PEEK Columns**

79841

79843

* 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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General Ordering Information



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Restocking Charges:**

Any product returned to Hamilton Company for repair, evaluation, or exchange must be accompanied by an assigned Returned Goods Authorization (RGA) tracking number. Unauthorized returns will be refused.

Products returned for credit must also have an assigned RGA tracking number and are subject to a 20% restocking fee. All returns must be sent to the following address:

Hamilton Company
4990 Energy Way
Reno, Nevada 89502

Standard Conditions of Sales

STANDARD CONDITIONS OF SALE (of Hamilton Company, "The Company")

1. GENERAL

All orders are accepted and executed on the understanding that the Purchaser is bound by the following Standard Conditions of Sale. Where there is any inconsistency between these Standard Conditions of Sale and any conditions which the Purchaser seeks to impose, these Standard Conditions of Sale shall prevail.

Any deviations from these Standard Conditions of Sale shall only be binding upon the Company if the latter has expressly agreed thereto in writing.

2. VALIDITY OF QUOTATIONS

The Company reserves the right to refuse the Purchaser's acceptance of a quotation unless such quotation is stated to be open for a specific period and is not withdrawn in such period.

3. PRICES AND DISCOUNTS

The published prices of the Company's Products are those ruling on the date of publication and are subject to alteration without notice. Prices and currency transactions are in U.S.A. dollars.

4. PAYMENT

Unless otherwise agreed by the Company in writing, the goods shall be paid for in cash within 30 days following the date of the relevant invoice. The Company's prices are net and are not subject to any settlement terms.

The Purchaser may not claim any set-off against the Company. In the event of a delay in payment, the Company shall be entitled to claim, without any notice of default being required and without prejudice to any further rights it may have, interest at a rate of one and a half percent (1 1/2%) per month or at the legal interest rate, whichever is the higher value. All costs of collection shall be fully for the Purchaser's account; extrajudicial costs shall be fixed at ten percent (10%) of the amount owed by the Purchaser and shall be at least fifteen hundred U.S. dollars (USD 1,500.00).

In the event that any payment in respect of Products supplied becomes overdue, the Company may immediately terminate the Purchaser's power of sale under clause 14 of this document and may without prior notice to the Purchaser enter upon the premises of the Purchaser to repossess unpaid goods.

5. NEW ACCOUNTS

Where a credit account is desired, a bank and as many as five trade references may be required. The Company reserves the right not to grant credit to any Purchaser for any reason whatsoever.

6. CARRIAGE

Unless otherwise agreed by the parties, goods are delivered by the Company FOB Reno, Nevada, U.S.A. to the Purchaser's registered office exclusive of duty, insurance, taxes, and VAT. When special delivery arrangements are requested, special rates will be charged.

All delivery times shall be approximate, except if a fixed time of delivery has been specifically agreed to in writing by the Company, in which case a delay in the delivery shall solely entitle the Purchaser to cancel, without costs, the order for the goods not delivered.

7. PACKING

A charge is made when it is necessary to dispatch goods in crates or cases, but this amount will be credited in full on the return, within one month, of the crates or cases in good condition carriage paid. No charge is made for any other form of packing and no credit will be allowed for its return.

8. LOSS OR DAMAGE IN TRANSIT

Clear receipts should be given only if goods have been examined, as an unqualified signature may react to the disadvantage of the Purchaser if the consignment should become the subject of a claim. In the event of short delivery or damage in transit, it is essential that the Company's dispatching depot be advised within two days of receipt of goods.

The following details should be sent in writing to the Company:

- Advice note number
- Carrier's name
- Condition of package
- Date of consignment received
- Extent of damage or shortage

In the event of non-delivery, the Company's dispatching depot should be advised within seven (7) days of the date of invoice. The Company will not be responsible for goods lost or damaged in transit unless the above conditions are observed.

9. DELIVERY

The Purchaser shall be obliged to cooperate in the delivery of the Products and to take receipt of same. The Company may keep any goods refused or not accepted by the Purchaser at the latter party's disposal for account and at the risk of the Purchaser.

10. LIABILITY FOR DELAY

Any times quoted for dispatch, delivery, repair, or replacement are to be treated as estimates only and the Company shall not be liable for failure to dispatch, deliver, repair, or replace within such time unless the Purchaser has suffered loss thereby and the amount payable in respect thereof shall have been agreed in writing as liquidated damages, in which case the Company's liability shall be limited to the amount so agreed to be paid.

In all cases, whether a time for dispatch, delivery, repair, or replacement be quoted or not, the time for dispatch, delivery, repair, or replacement shall be extended by a reasonable period if delay in dispatch, delivery, repair, or replacement is caused by instructions or lack of instructions from the Purchaser or by industrial dispute or by any cause whatsoever beyond the Company's reasonable control.

11. DEFAULT

The Company shall have the right to discontinue delivery and also at its discretion to terminate any agreement in respect of any undelivered goods if the Purchaser defaults in payment as stated under clause 4 of this document or in respect of its other obligations to the Company.

12. DEFECTS AFTER DELIVERY

The Company will make good, by repair at the Company's option, or by the supply of replacement, defects, which under proper use, appear in the goods within a period of 12 calendar months after the goods have been delivered and arise solely from faulty design, materials or workmanship; provided that no complaints shall be admissible unless submitted in writing to the Company within five (5) days after

the time of discovery of the defect or after the time the defect should have been discovered, whichever time comes first, it being understood that the Purchaser shall take reasonable care to discover any defect of whatever nature as soon as possible after taking delivery.

Provided further that in respect of parts or components not of the Company's manufacture, the Company will give the Purchaser a guarantee equivalent to the guarantee (if any) that the Company may have received from the supplier of such parts or components in respect thereof but not so as to impose on the Company in respect of such parts or components a liability greater than that imposed on it by the aforesaid period of this clause.

Save as aforesaid and as provided in clauses 8 and 10, the Company shall not be under any liability in respect of defects in goods delivered or for any injury, damage, or loss resulting from such defects or from any work done in connection therewith and its liability under this clause shall be in lieu of any warranty or condition implied by law as to the quality of fitness for any particular purpose of such goods.

13. SPECIAL ORDERS

All orders for non-standard products or package quantities not included in current Company catalogues and literature, are considered to be special orders and will be dealt with at the discretion of the Company.

14. RESERVATION OF OWNERSHIP/PASSING OF RISK

Products supplied to the Purchaser by way of sale shall remain the property of the Company until payment in full of all its claims on the Purchaser on whatsoever account has been received by the Company but risk in the same shall pass upon delivery.

The Purchaser acting as bailee shall deal with the goods separately and store according to the agreed methods of storage so that the goods not paid for may be clearly identified and shall not be mixed with other goods.

The Purchaser shall be entitled to pass ownership in unpaid goods to third parties provided that all sums received shall be held for the account of the Company.

15. RETURN OF GOODS

The Company does not accept the return of goods for credit unless it is a justified warranty claim. All returns must be authorized in advance. Unauthorized returns will be refused. In no circumstances may goods supplied against a firm order be returned without the Purchaser having first applied for and obtained both written consent and a Returned Goods Authorization (RGA) number from the Company.

The Company reserves the right to refuse the return of any Product that has been used with infectious, microbiological, or radioactive substances or other materials that may be deemed hazardous to the employees of the Company.

A handling charge amounting to not more than 20 percent of the invoice value of the returned goods may be deducted from any credit allowed where it is established that the reason for their return is not subject to the provision of clause 8 or 12 hereof or through any error on the part of the Company.

Goods approved for return must be received by the Company within 30 (thirty) days of the Company's written consent.

16. DESCRIPTIVE MATTER AND ILLUSTRATIONS

All descriptive and forwarding specifications, drawings, and particulars of weights and dimensions issued by the Company are approximate only, and are intended only to present a general idea of the goods to which they refer and shall not form part of a contract.

17. FORCE MAJEURE

Any party will be excused from performing under a sale agreement or any other agreement of which these Standard Conditions of Sale are part if prevented by an event of force majeure including strike, lockout, or other major trouble affecting labor relations.

If any such event of force majeure should last for more than two (2) consecutive months, any party may elect to terminate this Agreement immediately upon giving a written notice to the other party.

18. PATENTS

In the event of any claim being made or action being brought against the Purchaser in respect of infringement of local patents by the user or sale of goods supplied hereunder, the Purchaser is to notify the Company immediately, and the Company shall be at liberty with the Purchaser's assistance if required, but at the Company's expense, to conduct through the Company's own lawyers and experts all negotiations for the settlement of the same or any litigation that may arise therefrom; subject to such notifications and provided that no such goods, or any part thereof, shall be used for any purpose other than that for which the Company supply them, the Company will indemnify the Purchaser in respect of any such claims.

19. TRADEMARKS

- The only Hamilton trademarks that the Purchaser may display to advertise and sell the Products shall be those trademarks under which the Products are sold by the Company to the Purchaser hereunder or such other trademarks expressly authorized by the Company (hereinafter called "the said trademarks") and the Purchaser shall comply with the Company's instructions as to the manner and context in which the said trademarks and the statements to accompany them are displayed.
- No trademarks of the Products shall be undertaken by the Purchaser or any person on the Purchaser's behalf without the Company's prior written consent nor will the Purchaser alter, obliterate, add to, or otherwise interfere with the said trademarks.

20. LEGAL CONSTRUCTION

These Standard Conditions of Sale and all sale contracts to which the same apply shall be construed in accordance with the laws of the State of Nevada, U.S.A., and the authoritative text shall be that in the English language set out herein. Any disputes arising in connection with these Standard Conditions of Sale and all sale contracts to which the same apply shall be finally settled by arbitration in accordance with the laws and rules of the State of Nevada and such proceedings held and located in Reno, Nevada, U.S.A.



HAMILTON
THE MEASURE OF EXCELLENCE™

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Quality Hamilton Products:

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Syringes for Life Science
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Miniature Valves
Modular Valve Positioner
Laboratory Fittings, Adapters & Tubing
Precision Syringe Pumps
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TRADEMARKS:

PRP® is a registered trademark of the Hamilton Company