Availability

In quantities by gram or kilogram - it doesn't matter. We supply the quantity you need in the quality you need. Do you need material for an analytical test? Do you have up-scaling to 20 kg stationary phase in mind? Contact us. We will support you. Just let the application dictate your requirements - not the availability.

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	79180	
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-ammoniun Exchanger	0.19 meq/gm	100 Å	79823	79584		79585	79586		
PRP-X500	Poly(methacryl-amidopropryl Trimethyl-ammonium chloride	1.6 meq/gm	Superfi-cially porous			79594		79595	79596	
PRP-X600	Poly(dimethyl-amidopropyl-methacryl-amide)	1.6 meq/gm	Superfi-cially porous	79193	79192	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.

Recommended Uses

Reversed Phase	PRP®-1	General purpose pH stable long life column, synthesized DNA
	PRP-3	Gradient protein and peptide separations
Anion Exchange	PRP-X100	Anions, inorganic and organic using conductivity or UV detection. 0 to 100 % solvent compatible.
	PRP-X500	Gradient separation of large proteins and labeled DNA
	PRP-X600	Gradient separation of labeled and unlabeled DNA
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

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POLYMERIC BULK RESINS

Analytical & Preparative LC

Distributed by:

HAMILTON
THE MEASURE OF EXCELLENCE™

Hamilton Polymeric Bulk Resins

Consistent Performance

Hamilton

Hamilton is one of the few companies that manufacture their own HPLC grade polymeric supports. We offer many different stationary phases for a wide range of HPLC applications, including reversed phase, anion exchange, cation exchange, ion exclusion and normal phase chromatography.

Columns packed with Hamilton polymeric supports combine great versatility with a long column life. As a result, you can let your sample dictate the necessary separation conditions, not the column.

Inertness & Durability

The high cross-linking of Hamilton LC resins yields a pressure stability comparable to silica. Even when a column is packed and repacked several times with the same resin, the pressure rating, efficiency and particle size distribution are not affected (table 1).

Cross-linking and the chemical nature of the supports allow practically any combination of aqueous eluents and organic modifiers from 0 to 100 % without shrinking and swelling. The outstanding chemical resistance ensures safe operation without bleeding or any other chemical degradation and across a pH range from 1 to 13. Cleaning of the support beyond these pH limits is possible as well.

Table 1
Packing/Repacking of PRP-1, 8-10 µm, 4.1 x 250 mm

	Column 1	Column 2	Column 3
Pressure after 1st packing (psi)	600	600	600
Pressure after 10th packing (psi)	700	700	700
Plates after 1st packing	1468	1583	1447
Plates after 10th packing	1802	1679	1668

Particle size remained unchanged in all columns (8.4 µm, no fines)

High Sample Recovery

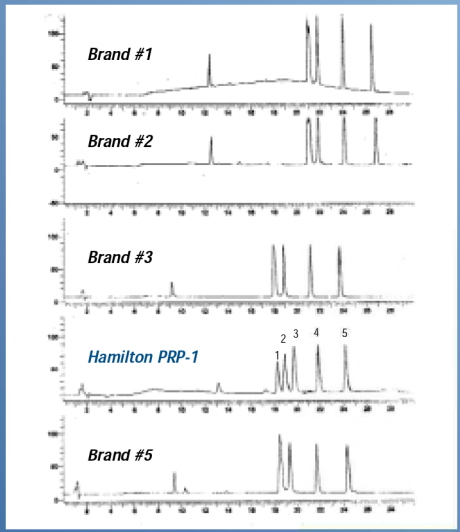
In contrast to silica supports, polymeric resins reveal no unwanted chemical functionalization on the surface. In the case of silica-based packing materials, highly sophisticated methods of encapsulating the support are applied in order to reduce the irreversible adsorption effects caused by silanol groups. However, a 100 % suppression of silanol activity has not been achieved so far with any commercially available silica-based stationary phase. As a result, peak deformation and poor sample recovery are not unusual for a lot of silica supports, particularly when used for determining basic compounds and proteins.

Selectivity Beats Efficiency

A lot of chromatographers ask first for efficiency when confronted with a stationary phase which is unknown to them. The reason is based on a long tradition of working with C18 silica materials which have their strength in efficiency. This advantage has doubtlessly been the key to market leadership in silica phases. But is there a justification for this attitude? From a chromatographic point of view the answer should clearly be no! What you should ask first is selectivity. It tells you the relationship between the net retention times of two compounds which have to be separated. Only good selectivity grants a rugged and reliable separation. Silica-based stationary phases have no inherent advantage regarding selectivity. Often polymeric supports work better in this respect (figure 1).

Figure 1
Mixture of 5 closely related decapeptides

Chromatograms 1, 2, 3 and 5 are achieved by means of high efficient silica C18 stationary phases with poor selectivity or none. Chromatogram 4 is PRP-1, 5 µm, and good selectivity.



Consistent Performance

We manufacture our supports from the monomer precursors. In doing so, we are able to control every aspect of the polymer's sythesis, sizing and eventual packing. With this control, we are able to ensure reproducible resin performance, batch after batch.

Table 2

Lot Number	Median Diameter of PRP-1, 50-75 µm
#664	60.74
#647	65.54
#648	62.45
#616M	60.30
#619M	55.87
#604M	56.8
#611M	54.62
609M1	55.23
691	56.60
597	63.79
573M	60.39

Table 2 shows a typical selection of several lots of PRP-1, 50-75 µm, which is typically used for preparative applications. In the case of repeat orders for larger quantities we can tailor the resin size to the individual customer to some degree. For instance, if it is preferred to use particles with an average around 65 µm within 3 µm, we try to fulfill the customer's wish. In all cases it can be taken as granted that there are practically no fines - that means particles below 1 µm - present in the bulk material.

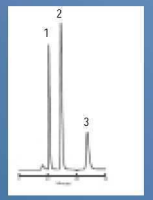
The reliability which can be assumed for average particle size is also valid for porosity. A narrow partition of the pore width can be ensured in different lots over a period of years (table 3).

Table 3

Lot Number		Average Pore Diameter in Å by BET
#21	12/86	81.8
#546	09/95	72.4
#603	09/97	74.5
#615M	04/98	72.7
#644	12/99	69.7
#645	12/99	69.6
#654B	06/00	71.2

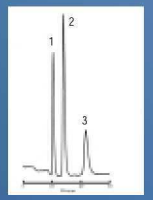
Scaleability

Easy scale-up from the analytical to technical range is no problem with Hamilton resins. Just scale up flow and sample injection volume in relation to the square of the column's cross-section.



PRP-1, 10 µm, 4.1 x 250 mm

Flow: 0.26 mL/min
Sample: 10 µL
0.05 M Citric Acid pH=4.2
Isocratic, UV at 254 nm
1. Cytosine
2. Uracil
3. Uridine



PRP-1, 12-20 µm, 101.6 x 250 mm

Flow: 160 mL/min
Sample: 10 mL
0.05 M Citric Acid pH=4.2
Isocratic, UV at 254 nm
1. Cytosine
2. Uracil
3. Uridine