



# ProSep<sup>®</sup> Chromatography Media

## **Protein A and G media solutions for high throughput affinity purification of antibodies**

- ▶ *High capacity for increased productivity*
- ▶ *Rigid adsorbent for low backpressure and ease of scale-up*
- ▶ *Stable ligand attachment for low leakage levels*

Suitable for antibody purification in the diagnostic market, Millipore's family of ProSep chromatography media is manufactured using the company's controlled pore glass (CPG<sup>®</sup>) media. The unique characteristics of Millipore's inorganic solid support, a porous borosilicate material, provide users with several advantages for a cost-effective solution to affinity chromatography.

### **ProSep-vA High Capacity and ProSep-vA Ultra Chromatography Media**

Used for the purification of monoclonal and polyclonal antibodies, the ProSep-vA High Capacity and ProSep-vA Ultra media are manufactured using a proprietary chemistry to immobilize natural, animal-free protein A (derived from *Staphylococcus aureus*) to CPG matrices. Millipore's chromatography media family exhibits high capacity for antibodies, with ProSep-vA Ultra media showing improved process economics for capture and purification. ProSep-vA Ultra Media has been specifically optimized to address high titer and large volume fermentation feedstock.

### **Proven Technology**

Improving process economics for the capture and purification of antibodies, ProSep-vA High Capacity media are used in the purification of more than thirty of today's biotherapeutic products. These include monoclonal antibodies, polyclonal antibodies and engineered antibodies. ProSep-vA Ultra media use the same immobilization chemistry as ProSep-vA High Capacity media. However, the pore size of its CPG base matrix is smaller. This provides significantly more surface area for an adsorbent with very high antibody binding capacity.

## Dynamic Capacity

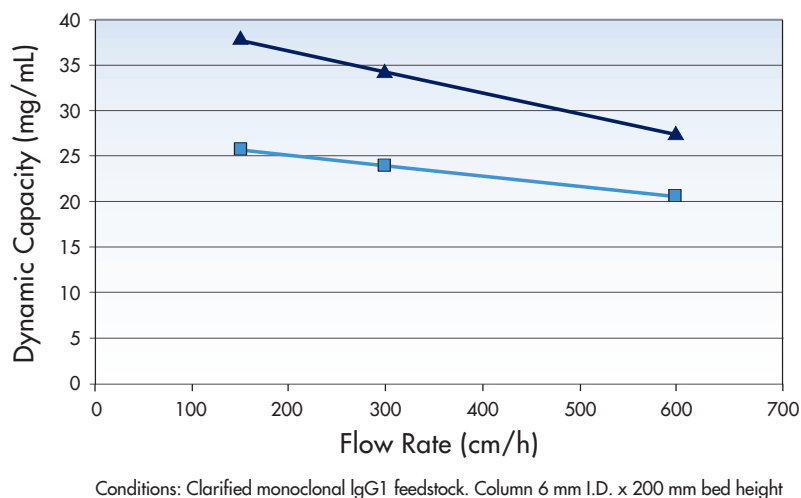


Figure 1. Dynamic capacity of ProSep-vA Ultra media

## Solid Support

The ProSep matrices consist of glass particles permeated by interconnecting pores of uniform and controlled size. The nature of the matrix allows high flow rates at relatively low backpressures. Due to a linear relationship between back pressure and flow rate, the response to increased flow rate of a column packed with ProSep-vA High Capacity or ProSep-vA Ultra media is predictable over different column lengths.

## Reusability

An important consideration when designing a cost effective purification protocol is the number of times a chromatography medium can be reused. ProSep-vA High Capacity and ProSep-vA Ultra media can be used in multiple cycles without loss of performance.

## Proprietary Chemistry

Millipore's proprietary immobilization chemistry employed in the manufacturing of protein A adsorbents ensures stable media with very low ligand leakage. Multipoint attachment, as opposed to single point attachment, is used to minimize protein A leakage from ProSep-vA High Capacity and ProSep-vA Ultra media during antibody purification cycles.

## Flat Rate Versus Pressure Drop

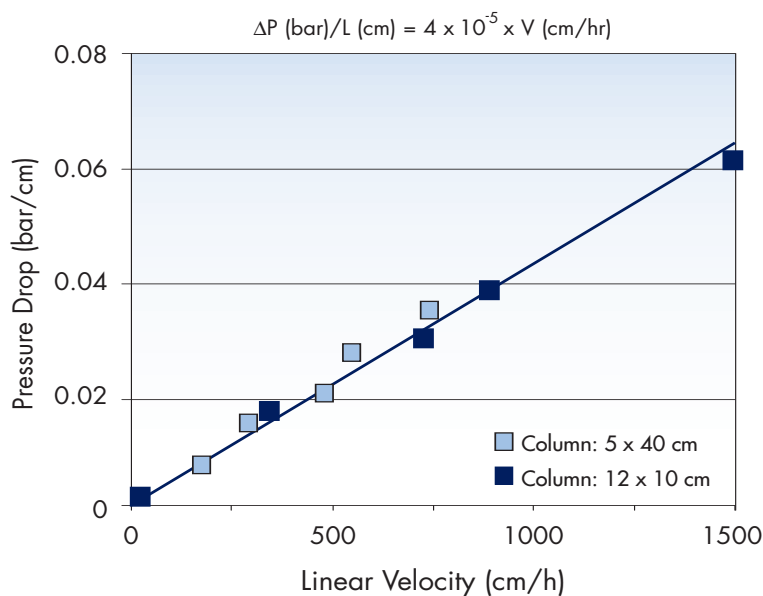


Figure 2. Illustrates the response of ProSep-vA chromatography media to increased flow rate. Bed lengths in excess of 45 cm are achievable with pressure drops under 2 bar at 1,000 cm/hr, even in a large diameter production column.

## SDS-PAGE Analysis of Purified Antibody

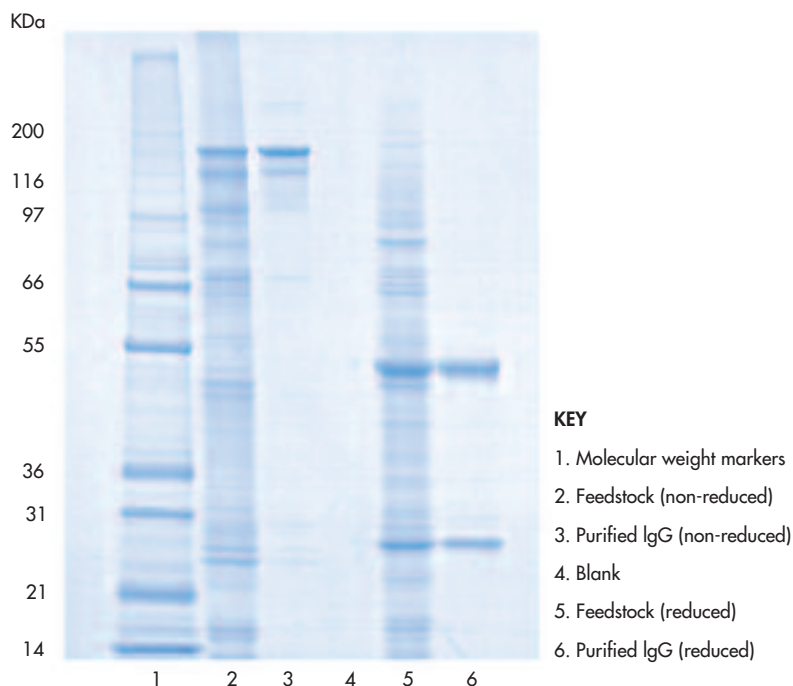


Figure 3. Analysis of purification of a monoclonal antibody on ProSep-vA Ultra media.

## ProSep-G Chromatography Media

ProSep-G media are produced from a recombinant engineered form of *Streptococcal* protein G that is immobilized to CPG matrices. They are designed for the purification of the small number of antibodies that do not bind efficiently to protein A adsorbents. Examples include human IgG<sub>3</sub>, rat IgGs and very low affinity mouse IgG<sub>1</sub>. In addition, ProSep-G media can be used to purify some antibody fragments and to remove contaminating antibodies, such as bovine IgG, from fetal calf serum. ProSep-G media also have been used successfully to detect IgG using fast performance liquid chromatography (FPLC) or high pressure liquid chromatography (HPLC) in analytical applications.

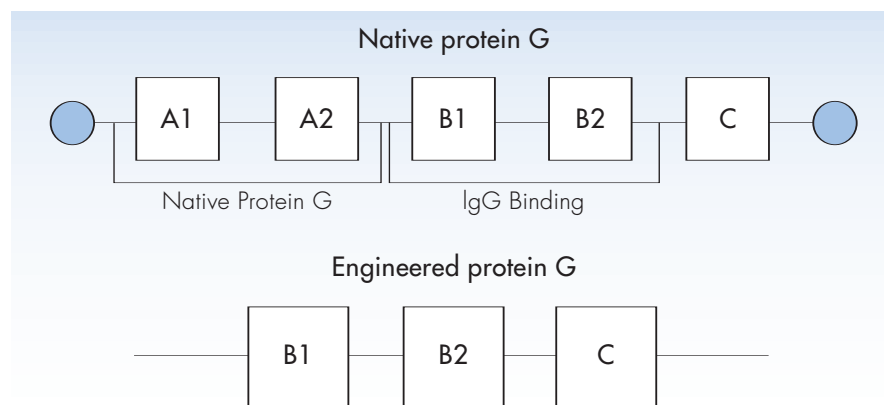
### Capacity

ProSep-G media binds antibodies over a pH range from 4 to 8 and the bound antibodies are eluted over a pH range from 2 to 3.

### Cleaning and Sanitization

Following recommended handling and cleaning procedures is critical to sustaining media performance. Millipore recommends routine use of low pH regeneration (e.g. phosphoric acid pH 1.5) and periodic cleaning as required (e.g. 6 M guanidine hydrochloride). Phosphoric acid and guanidine hydrochloride also can be effective sanitizing agents.

## Protein G Structure



## Typical Antibody Binding Capacities on ProSep-G Media

Human Polyclonal	IgG	20 – 24 mg/mL
Mouse	IgG <sub>1</sub> MAb	8 – 10 mg/mL
Human	IgG <sub>3</sub>	5 – 7 mg/mL
Rat	IgG <sub>2b</sub> MAb	8 – 10 mg/mL

## Storage and Handling

ProSep-vA High Capacity and ProSep-vA Ultra media are supplied in 0.1 M acetate buffer, pH 5.2, and 1% benzyl alcohol as a preservative. ProSep-G media are supplied in 0.1 M acetate buffer, pH 5.2, containing 0.5M NaCl and 1% benzyl alcohol. During use, the media may be stored in phosphate buffered saline (PBS) or other suitable buffers containing a preservative. The acceptable environmental storage temperature is 2 – 8 °C.

## Manufacturing Standards and Quality Assurance

Millipore recognizes the importance of providing regulatory support and meeting industry quality standards. All ProSep media products are manufactured in a dedicated facility certified to internationally recognized standards, BS EN ISO9001:2000. The facility is subject to routine independent surveillance audit.

## Ordering Information

Media Description	Pack Size	Catalogue No.
ProSep-vA High Capacity	2 mL	113115822
ProSep-vA High Capacity	10 mL	113115824
ProSep-vA High Capacity	50 mL	113115826
ProSep-vA High Capacity	100 mL	113115827
ProSep-vA High Capacity	500 mL	113115829
ProSep-vA High Capacity	1 L	113115830
ProSep-vA High Capacity	5 L	113115833
ProSep-vA High Capacity	10 L	113115835
ProSep-vA Ultra	2 mL	115115822
ProSep-vA Ultra	10 mL	115115824
ProSep-vA Ultra	50 mL	115115826
ProSep-vA Ultra	100 mL	115115827
ProSep-vA Ultra	500 mL	115115829
ProSep-vA Ultra	1 L	115115830
ProSep-vA Ultra	5 L	115115833
ProSep-vA Ultra	10 L	115115835
ProSep-G	2 mL	115113322
ProSep-G	10 mL	115113324
ProSep-G	50 mL	115113326
ProSep-G	100 mL	115113327
ProSep-G	500 mL	115113329
ProSep-G	1 L	115113330
ProSep-G	5 L	115113333
ProSep-G	10 L	115113335

## Contact Millipore for Technical Assistance and Ordering Information

In the U.S. and Canada, call toll-free 1-800-MILLIPORE (1-800-645-5476)

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