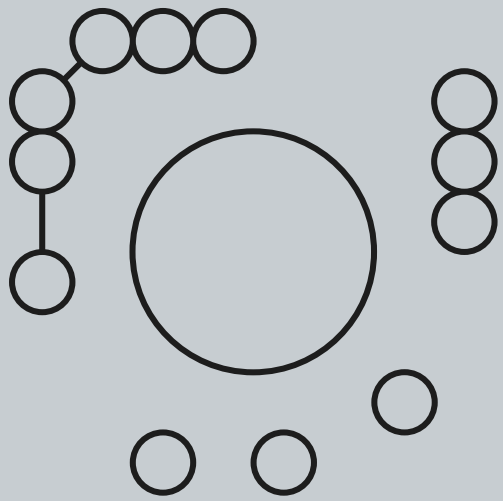
Bio-Works

WorkBeads
Size Exclusion Resins

WorkBeads – Next generation chromatography resins

WorkBeads™ are Bio-Works' advanced agarose- based resins, designed for purification of biomolecules.

They are produced in several different bead sizes and porosities for both preparative research and bioprocess manufacturing scales. This allows seamless scalability and reproducible results.



WorkBeads Size Exclusion Resins

WorkBeads Size Exclusion (SEC) resins are designed for research and industrial scale purification based on the sizes and geometries of your target molecules. Larger molecules such as virus-like particles and antibodies will follow a shorter path through the resin and elute before smaller molecules as they have reduced access to the pores in the resin. Molecules like smaller proteins and peptides will enter into the pore space to a greater extent and thus follow a longer path through the resin, eluting later. However, it is important to remember that properties such as shape/geometry can also influence the elution volume. Buffer components such as salts will follow the longest path through the resin, and elute at the column volume.

WorkBeads SEC resins are available in a wide range of porosities and bead sizes which enable various separation ranges, exclusion limits and flow rates. WorkBeads SEC resins are also provided prepacked into GoBio™ Prep column formats for convenience, reproducibility, and reliability.

Advantages of WorkBeads SEC resins:

- **Available in prepacked column formats, GoBio 16x600 and GoBio 26x100**
- **Choice of separation ranges and bead sizes**
- **Narrow pore size distribution**
- **Excellent chemical stability for efficient cleaning-in-place (CIP) and buffer compatibility**

WorkBeads SEC resins offer a choice of separation ranges and exclusion limits

Separation range is an important consideration for selecting SEC resins (Table 1). Pore sizes and pore size distributions of the resin determine the size range a particular resin can effectively separate (Fig .1). The exclusion limit refers to the maximum size of molecules the resin is designed for. Molecules larger than the exclusion limit will not enter the pore space and thus elute first, so they cannot be effectively separated from each other. WorkBeads SEC resins have different porosities (and in the case of WorkBeads 200 SEC a larger bead size) which give different separation ranges for different sized target molecules.

Table 1. Comparison of WorkBeads SEC resins.

	Average bead size, µm	Separation range, kD	Exclusion limit, kD	Separation range, D 10^4	10^5	10^6	10^7
WorkBeads 40/100 SEC	45	10–150	150				
WorkBeads 40/1000 SEC	45	10–1200	1200				
WorkBeads 40/10 000 SEC	45	10–10 000	10 000				
WorkBeads Macro SEC	45	10–30 000	30 000				
WorkBeads 200 SEC	180	10–6000	6000				

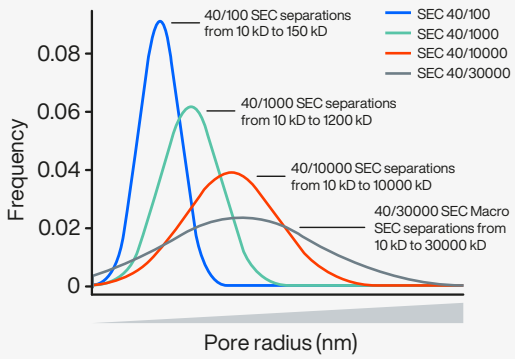


Figure 1. Pore size distribution (PSD) of WorkBeads 40 SEC resins measured with pre-defined sizes of dextran.

Optimized operational parameters for optimal resolution

In addition to porosity and bead size, the intended application is also an important factor in resin selection. Furthermore, optimization of operational conditions, such as sample volume and flow rate, will have a considerable effect on the resolution achieved.

Below are examples of the influences of flow rates (Fig. 2A, B and Fig 3A) and sample volumes (Fig. 2 C, D and Fig. 3 B). When increasing flow rate and sample volume, the resolution of the tested set of proteins (Fig. 2) and the desalting of the RNA (Fig. 3) is continuously decreased. Depending on the purity and yield requirements of target molecules, it is important to optimize the flow rate and sample volume to achieve target molecule separation from impurities.

For preparative SEC separations, the **recommended sample volumes are between 0.5–4% of the column volume (CV) with 15–45 cm/h flow rate.**

Prepacked columns:	A & C: GoBio Prep 16x600 40/100 SEC B & D: GoBio Prep 16x600 40/1000 SEC
Column volume:	120 mL (16 × 600 mm)
Samples:	A & C: Myoglobin (M_r 17 600), Apo-transferrin (M_r 78 300) B & D: Ribonuclease A (M_r 13 700), BSA (M_r 66 300)
Sample volumes:	A & B: 0.5 mL (≈ 0.4% of column volume (CV)) C & D: 1.2 mL, 3.6 mL and 6 mL (1%, 3% and 5% of CV)
Buffer:	20 mM sodium phosphate, 150 mM sodium chloride, pH 7.4
Flow rates:	A & B: 0.5 mL/min (15 cm/h), 2 mL/min (60 cm/h) and 5 mL/min (150 cm/h) C & D: 1 ml/min (30 cm/h)

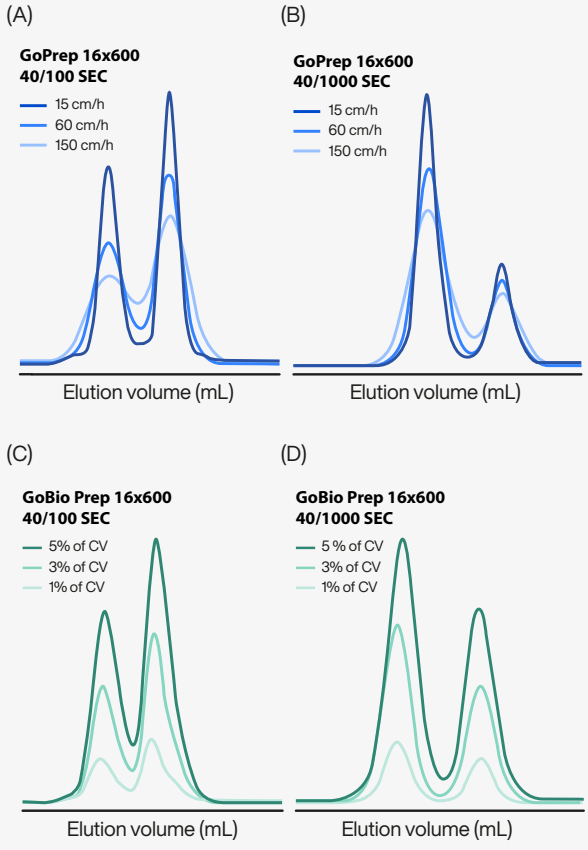


Figure 2. Influence of different flow rates (A, B) and different sample volumes (C, D) for the tested set of proteins.

Resin:	WorkBeads 40/100 SEC
Column volume:	23.6 mL (10 × 100 mm)
Samples:	AIEX-eluted 45 nt RNA feed (300 OD/mL, 12 mg/mL)
Sample volumes:	A. 1 mL (4% of CV) B. 0.2 mL, 1 mL, 2 mL and 5 mL (0.8%, 4%, 8% and 21% of CV)
Buffer:	50 mM sodium phosphate, 7% acetonitrile, pH 7.0
Flow rates:	A. 0.65 mL/min (50 cm/h), 2 mL/min (150 cm/h) and 4 mL/min (300 cm/h) B. 2 mL/min (150 cm/h)

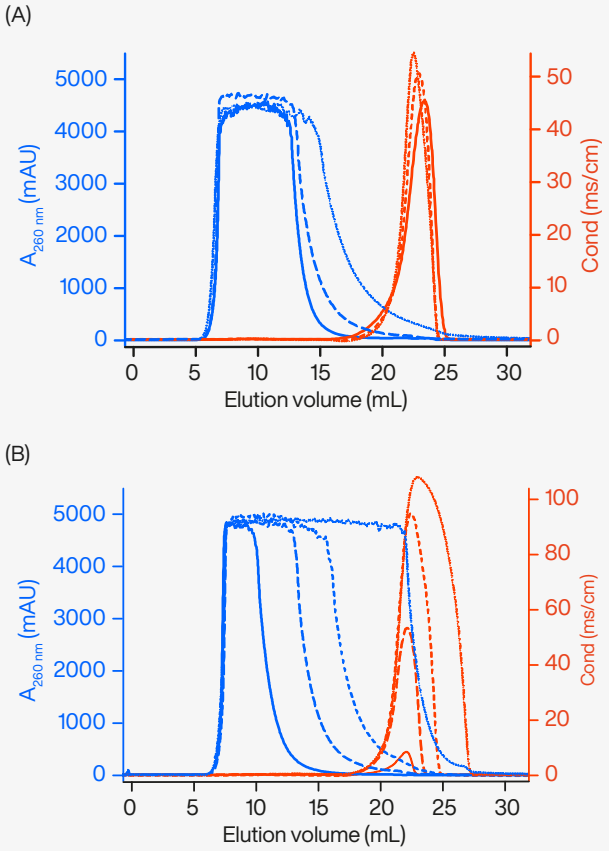


Figure 3. Influence of different flow rates (A) and different sample volumes (B) for desalting of the 45 nt RNA.

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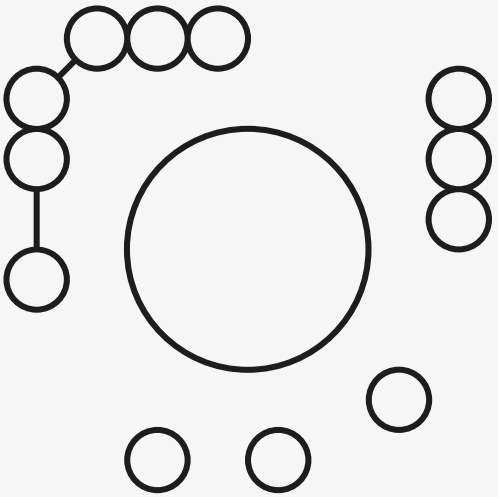
WorkBeads resins are available in a variety of formats for research, process development, scale-up and production. Bulk packages are available from 25 mL up to 10 L. GoBio prepacked formats enable turnkey operation in both lab and process-scale environments.

Free Consultation

Have a specialist walk you through the details.

Find your local representative on **bio-works.com/contact**

Scan the QR code for a quick way to contact us.



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Our headquarters is located in Uppsala, Sweden, with production and R&D departments in the same facility. This enables us to offer high flexibility and technical service. The company is certified according to the ISO 9001:2015 quality management system. Bio-Works supplies product information, quality documents, technical support, certificates, statements, vendor audits and regulatory support information.

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