BioSep™-SEC-S

guarantee

If BioSep analytical columns do not provide you with at least an equivalent separation as any other GFC column of similar porosity, type and dimensions, send in your comparative data within 45 days and keep the BioSep column for FREE.

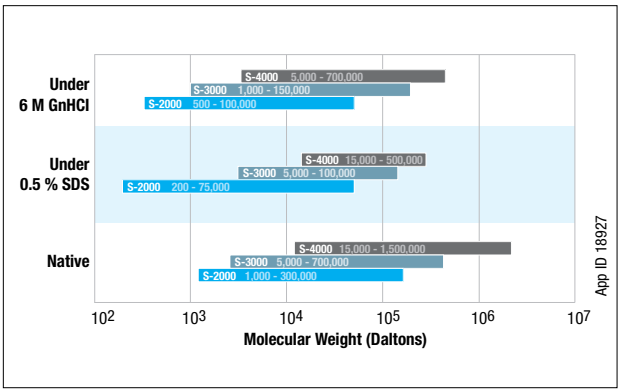
Aqueous Size Exclusion/ Gel Filtration for Protein and Peptide Analysis

Gel Filtration Chromatography is used for the analysis and/or characterization of proteins, peptides and other biomolecules; including antibodies, immunoglobulins, protein complexes, protein aggregates, and desalting. BioSep GFC columns offer many important benefits for your separation needs.

- Hydrophilically bonded rigid spherical silica gel has nominal adsorbtion and high sample recoveries
- Narrow defined pore size distribution produces exceptional separations for SEC
- Optimized packing specifications provide high resolution, maximized efficiencies, and exceptional peak asymmetry

Molecular Weight Separation Range for Proteins on BioSep-SEC-S

3 BioSep phase options to separate samples of varying molecular weight (MW) ranges: 2000, 3000, 4000, as described below:



High Efficiencies for Greater Resolution

Due to a tight particle size distribution and a specialized packing process and specifications, you will see greater baseline separation between your analytes.

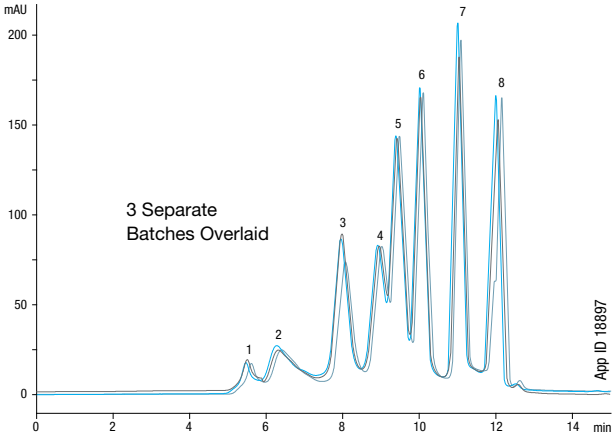
Efficiency

(minimum number theoretical plates on 300 x 7.8 mm column)

SEC-s2000	SEC-s3000	SEC-s4000
30,000 Plates	30,000 Plates	25,000 Plates

Batch-to-Batch Reproducibility

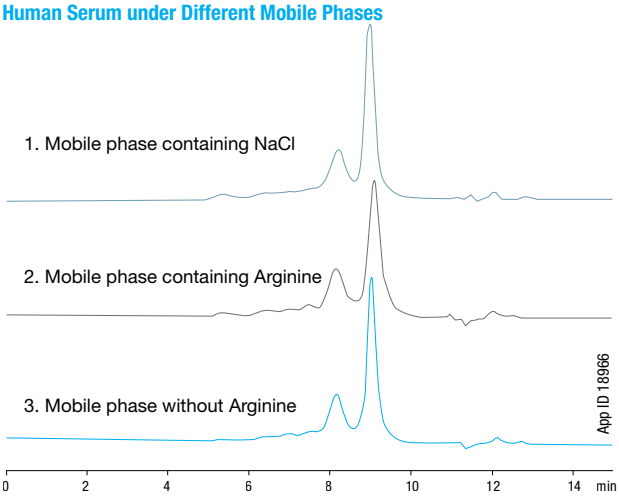
Batch-to-batch and column-to-column reproducibility is imperative. Each batch of BioSep media is carefully monitored and QC tested to ensure proper size, shape and pore characteristics, which ensures the same high quality separation time and time again.



Highly Inert Material for Better Recovery and Quantitation

BioSep columns experience a nominal amount of non-specific interactions which provides an extremely inert media demonstrating distinct advantages for accurate quantitation of your proteins and aggregates.

Human Serum under Different Mobile Phases



Equal recovery of proteins and aggregates under different mobile phase conditions is indicative of a highly inert column.

BioSep is a trademark of Phenomenex, Inc.

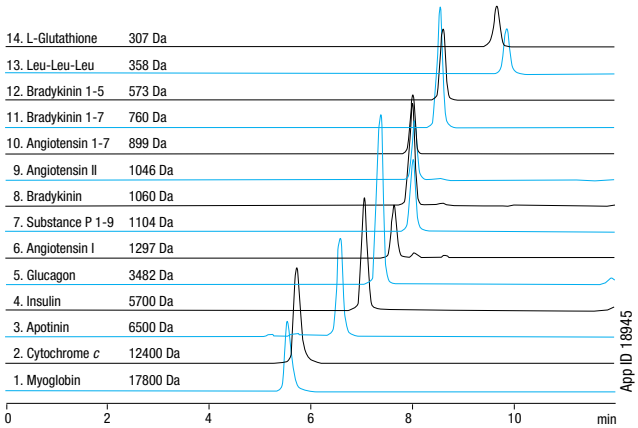
BioSep™-SEC-S

Low MW Proteins and Peptides on BioSep-SEC-s2000

BioSep-SEC-s2000 columns are used for peptide therapeutics, small proteins, PEGylated peptides and small PEGylated proteins, as well as biogeneric aggregate applications.

Low MW Protein and Peptide Mixture

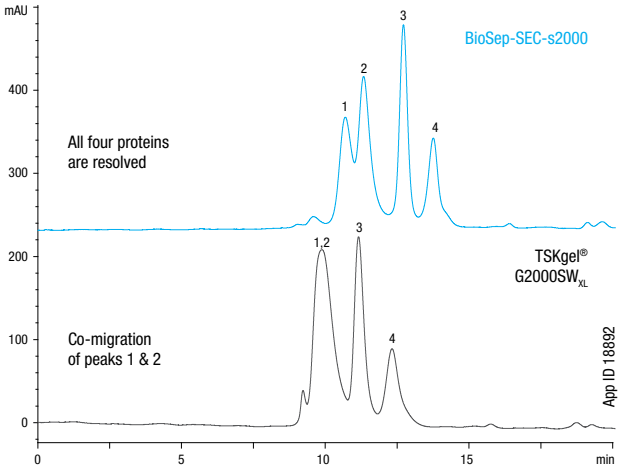
Column: BioSep-SEC-s2000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2145-K0
Mobile Phase: 45 % Acetonitrile, 0.1 % TFA
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 214 nm
Sample:



Protein Separation of 50-300,000 MW on BioSep-SEC-s2000 vs. TSKgel® G2000SW$_{XL}$

Conditions for both columns:

Columns: BioSep-SEC-s2000
TSKgel® G2000SW$_{XL}$
Dimensions: 300 x 7.8 mm
Mobile Phase: 10 mM Tris pH 7.4,
150 mM Sodium Chloride
Flow Rate: 0.6 mL/min
Temperature: Ambient
Detection: UV @ 214 nm
Sample: 1. Hu IgA 300 kDa
2. β-Amylase 200 kDa
3. BSA 66 kDa
4. Ovalbumin 45 kDa

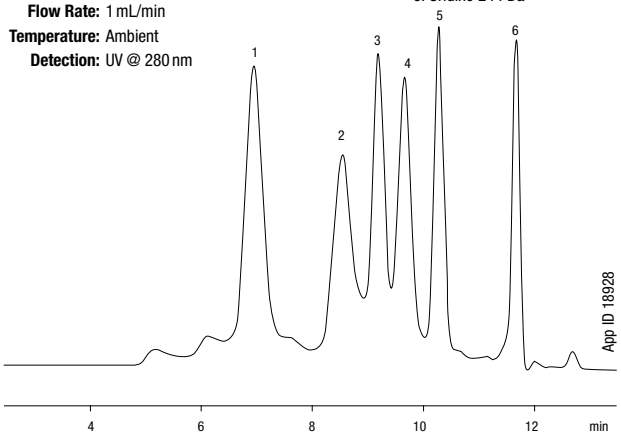


Medium MW Proteins on BioSep-SEC-s3000

BioSep-SEC-3000 columns are great for medium to large MW proteins, serum proteins, and immunoglobulin aggregate and applications.

Protein Mixture

Column: BioSep-SEC-s3000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2146-K0
Mobile Phase: 100 mM Sodium Phosphate pH 7.0,
300 mM Sodium Chloride
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 280 nm
Sample: 1. Thyroglobulin 669 kDa
2. IgG 156 kDa
3. BSA 66 kDa
4. Ovalbumin 45 kDa
5. Myoglobin 16.9 kDa
6. Uridine 244 Da

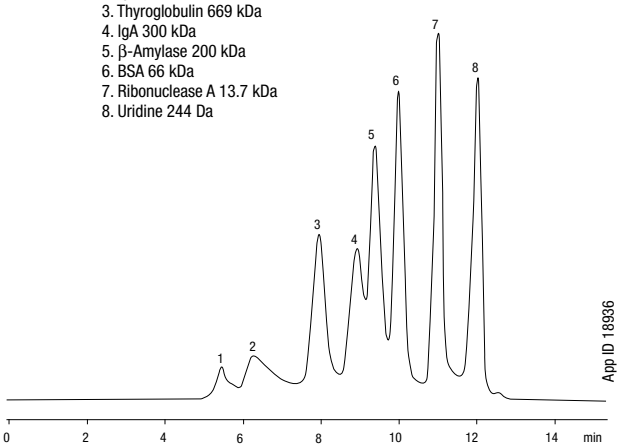


Large MW Proteins on BioSep-SEC-s4000

BioSep-SEC-s4000 is capable of resolving large MW proteins and PEGylated IgG applications.

High MW Protein Mixture

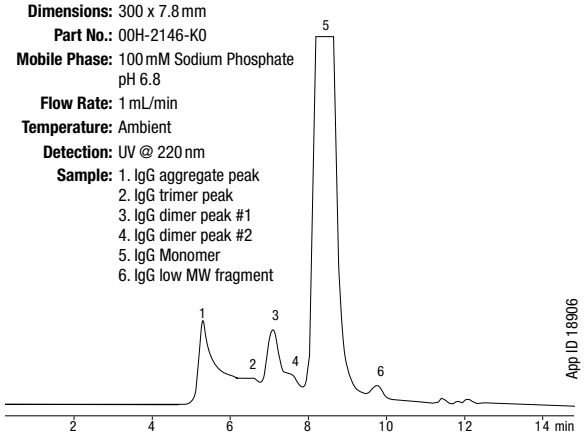
Column: BioSep-SEC-s4000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2147-K0
Mobile Phase: 100 mM Sodium Phosphate pH 7.0,
300 mM Sodium Chloride
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 214 nm
Sample: 1. HMW impurity
2. IgM 900 kDa
3. Thyroglobulin 669 kDa
4. IgA 300 kDa
5. β-Amylase 200 kDa
6. BSA 66 kDa
7. Ribonuclease A 13.7 kDa
8. Uridine 244 Da



BioSep™-SEC-S

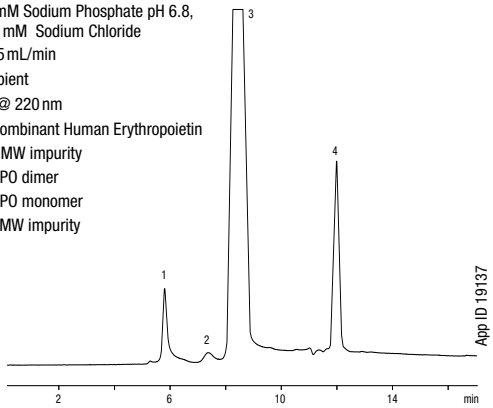
Human IgG2k Aggregates

Column: BioSep-SEC-s3000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2146-K0
Mobile Phase: 100 mM Sodium Phosphate pH 6.8
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 220 nm
Sample: 1. IgG aggregate peak
2. IgG trimer peak
3. IgG dimer peak #1
4. IgG dimer peak #2
5. IgG Monomer
6. IgG low MW fragment



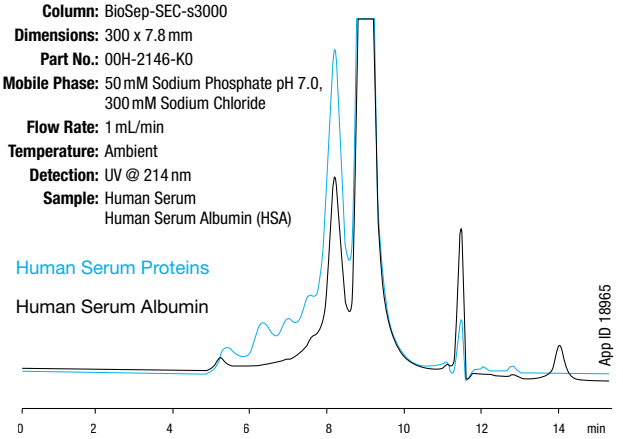
Recombinant Human Erythropoietin (HuEPO)

Column: BioSep-SEC-s2000
Dimensions: 300 x 4.6 mm
Part No.: 00H-2145-E0
Mobile Phase: 50 mM Sodium Phosphate pH 6.8, 300 mM Sodium Chloride
Flow Rate: 0.35 mL/min
Temperature: Ambient
Detection: UV @ 220 nm
Sample: Recombinant Human Erythropoietin
1. HMW impurity
2. EPO dimer
3. EPO monomer
4. LMW impurity



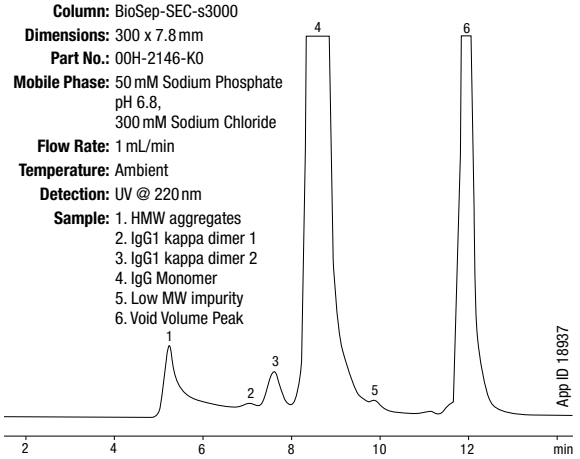
Human Serum and HSA

Column: BioSep-SEC-s3000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2146-K0
Mobile Phase: 50 mM Sodium Phosphate pH 7.0, 300 mM Sodium Chloride
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 214 nm
Sample: Human Serum
Human Serum Albumin (HSA)



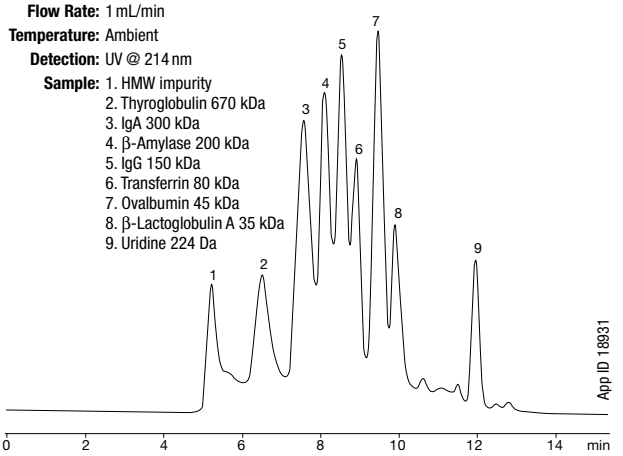
Murine IgG1k Aggregates

Column: BioSep-SEC-s3000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2146-K0
Mobile Phase: 50 mM Sodium Phosphate pH 6.8, 300 mM Sodium Chloride
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 220 nm
Sample: 1. HMW aggregates
2. IgG1 kappa dimer 1
3. IgG1 kappa dimer 2
4. IgG Monomer
5. Low MW impurity
6. Void Volume Peak



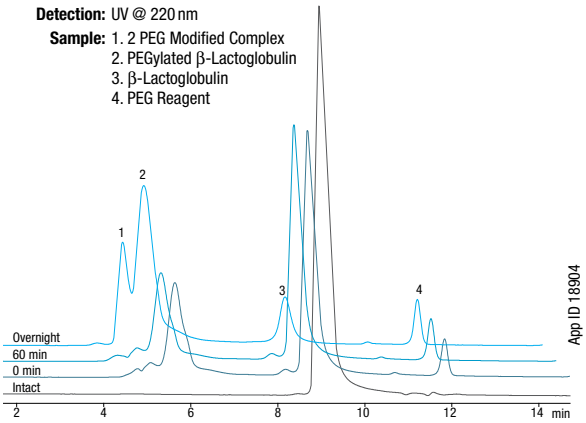
Medium MW Protein Mixture

Column: BioSep-SEC-s3000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2146-K0
Mobile Phase: 50 mM Sodium Phosphate pH 6.8, 300 mM Sodium Chloride
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 214 nm
Sample: 1. HMW impurity
2. Thyroglobulin 670 kDa
3. IgA 300 kDa
4. β-Amylase 200 kDa
5. IgG 150 kDa
6. Transferrin 80 kDa
7. Ovalbumin 45 kDa
8. β-Lactoglobulin A 35 kDa
9. Uridine 224 Da



PEGylated β-Lactoglobulin A (N-Terminal PEG 20 kDa)

Column: BioSep-SEC-s2000
Dimensions: 300 x 7.8 mm
Part No.: 00H-2145-K0
Mobile Phase: 100 mM Sodium Phosphate pH 6.8
Flow Rate: 1 mL/min
Temperature: Ambient
Detection: UV @ 220 nm
Sample: 1. 2 PEG Modified Complex
2. PEGylated β-Lactoglobulin
3. β-Lactoglobulin
4. PEG Reagent



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- **Global support and availability in over 65 countries**
- **3 batches available for validation**
- **Large inventory for immediate shipment**

Technical Data and Specifications

	BioSep SEC-s2000	BioSep SEC-s3000	BioSep SEC-s4000
Resin Type	Silica	Silica	Silica
Particle Size (µm)	5	5	5
Pore Size (Å)	145	290	500
pH Range	2.5 - 7.5	2.5 - 7.5	2.5 - 7.5
Maximum Backpressure (psi)	1,500	1,500	1,500
Typical Backpressure (psi)	800	800	700
Efficiency (minimum number theoretical plates 300 x 7.8 mm)	30,000	30,000	25,000
Maximum Flow Rate	This is a function of pressure. Columns can withstand up to 1,500 psi, but avoid sudden pressure changes.		
Column Hardware	Standard: 316 stainless steel column with stainless steel frits. Titanium frits available.		
Maximum Temp.	50 °C		
Maximum Salt Conc.	1 M		
Denaturants	0.5 % SDS, 6 M Guanidine HCl, or 8 M urea		
Regeneration	After exposure to denaturants, wash with water overnight.		
Max. Organic Modifier	Up to 100 % CH_3CN. Start with 100 % H_2O, linear gradient to 100 % CH_3CN over 50 min. Up to 90 % CH_3CN, 10 % DMSO or 500 mM β-mercaptoethanol.		
Cleaning Procedure	General protein removal: wash with 30 mL of 0.1 M NaH_2PO_4, pH 3.0. Hydrophobic protein removal: use acetonitrile gradient. Strongly adsorbed proteins: wash with 30 mL of 0.5 % SDS or 6 M Guanidine thiocyanate or 10 % DMSO.		
Storage	Overnight storage: run mobile phase at 0.2 mL/minute. Prolonged storage: use 0.05 % NaN_3 in H_2O or 10 % methanol in H_2O.		
Column Protection	Use of a SecurityGuard is recommended to prolong column lifetime.		

Cross Reference Chart

Phenomenex BioSep Phases	TSK-Gel®	Shodex®	Sepax	Bio-Rad®	Waters® BioSuite™	Zorbax®
SEC-s2000	G2000SW G2000SW$_{XL}$	PROTEIN KW-802.5	SRT®-100* SRT®-150	Bio-Sil® SEC 125	BioSuite™ 125	GF-250
SEC-s3000	G3000SW G3000SW$_{XL}$	PROTEIN KW-803	SRT®-300	Bio-Sil® SEC 250	BioSuite™ 250	GF-450
SEC-s4000	G4000SW G4000SW$_{XL}$	PROTEIN KW-804	SRT®-500**	Bio-Sil® SEC 400	BioSuite™ 450**	

*** Only up to 1,500,000 MW*
** Only above 1,000 MW*

Ordering Information

*SecurityGuard Analytical cartridges require holder, Part No.: KJ0-4282
** PREP SecurityGuard Cartridges require holder, Part No.: AJ0-8223

Stainless Steel Columns (mm):	Narrow Bore	Analytical		Preparative	Security Guard™ Cartridges (mm)	
Phases	300 x 4.6	300 x 7.8	600 x 7.8	300 x 21.2	4 x 3.0*	15 x 21.2**
					/10pk	ea
BioSep-SEC-s2000	00H-2145-E0	00H-2145-K0	00K-2145-K0	00H-2145-P0	AJ0-4487	AJ0-8588
BioSep-SEC-s3000	00H-2146-E0	00H-2146-K0	00K-2146-K0	00H-2146-P0	AJ0-4488	AJ0-8589
BioSep-SEC-s4000	00H-2147-E0	00H-2147-K0	00K-2147-K0	00H-2147-P0	AJ0-4489	AJ0-8590
					for ID: 4.6-7.8 mm	for ID: 21.2 mm

Stainless Steel Guard Columns (mm)	Narrow Bore	Express	Analytical
Phases	30 x 4.6	35 x 7.8	75 x 7.8
BioSep-SEC-s2000	03A-2145-E0	03Q-2145-K0	03C-2145-K0
BioSep-SEC-s3000	03A-2146-E0	03Q-2146-K0	03C-2146-K0
BioSep-SEC-s4000	03A-2147-E0	03Q-2147-K0	03C-2147-K0

Aqueous SEC 1 Column Check Standard
(for BioSep-SEC-S and other protein SEC columns)

Part No.: AL0-3042 Price:

Unit quantity: Dry; reconstituted to 2 mL
Contains: Bovine thyroglobulin; Human gamma globulin; Ovalbumin; Myoglobin; Uridine (reconstitute with 1 mL of 100 mM Sodium phosphate pH 6.8)
Diluent: 100 mM Sodium phosphate pH 6.8
Storage: Add 0.1 % NaN_3 to the solution and refrigerate

Test Conditions
Mobile phase: 100 mM Sodium phosphate, pH 6.8
Flow rate: 1.0 mL/min for a 300 x 7.8 mm column
Injection volume: 10 µL
Detection: UV @ 280 nm

For Column Heaters, see p. 343.

Other column dimensions available upon request.