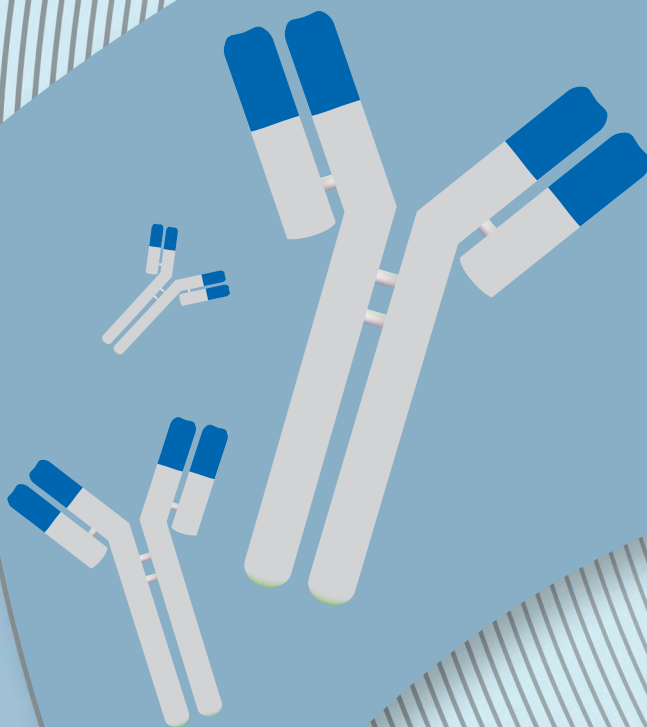
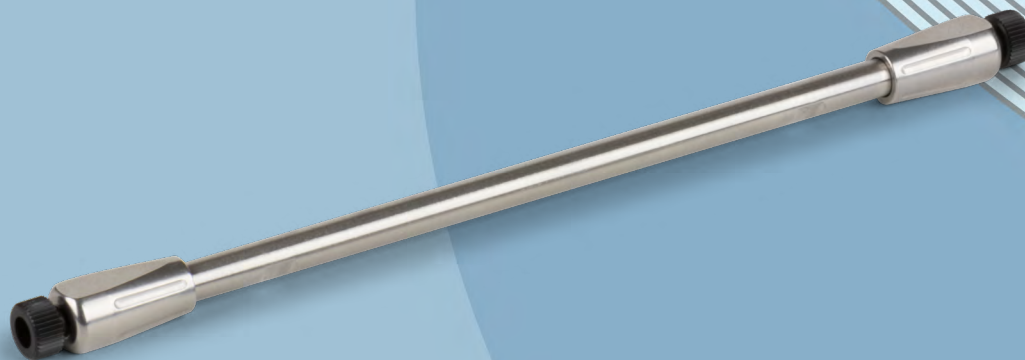


dSEC



New Biozen Size Exclusion Chromatography Columns

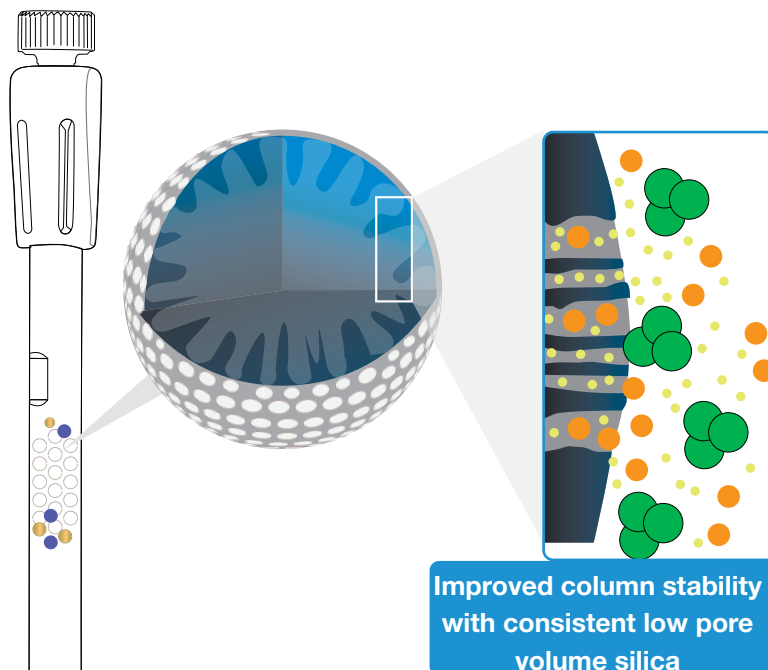
- Exceptionally Robust SEC Particle
- Extreme Stability and Exceptional Lifetime
- Reproducible Separations



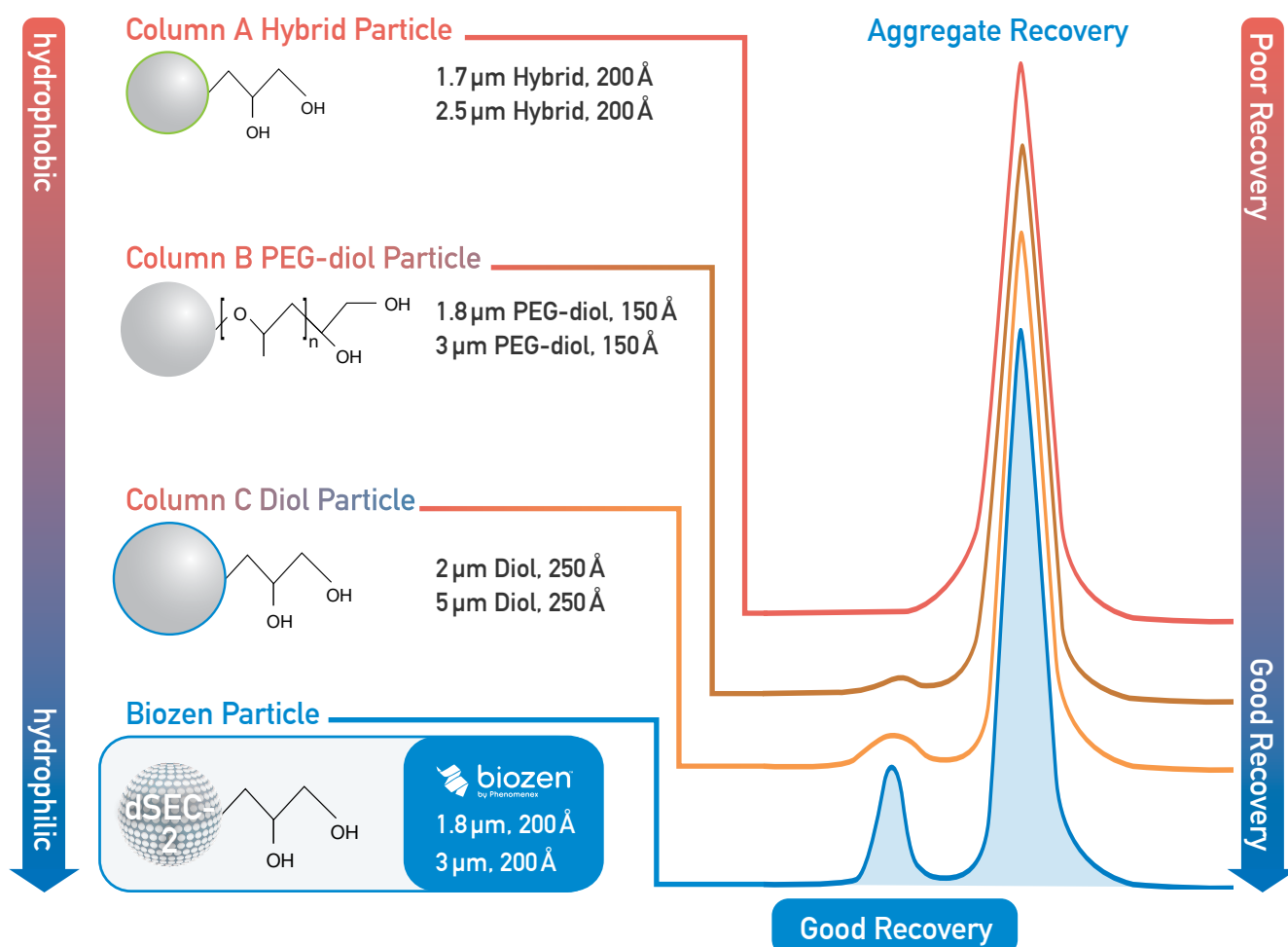
Advanced SEC Silica Particle Technology and Surface Chemistry for Characterizing Biomolecules

Biozen SEC Proprietary Silica Particle Technology

The Biozen dSEC columns are packed with low pore volume silica coupled with a proprietary hydrophilic diol-type bonded surface chemistry that prevents the silica surface from interacting with protein samples.



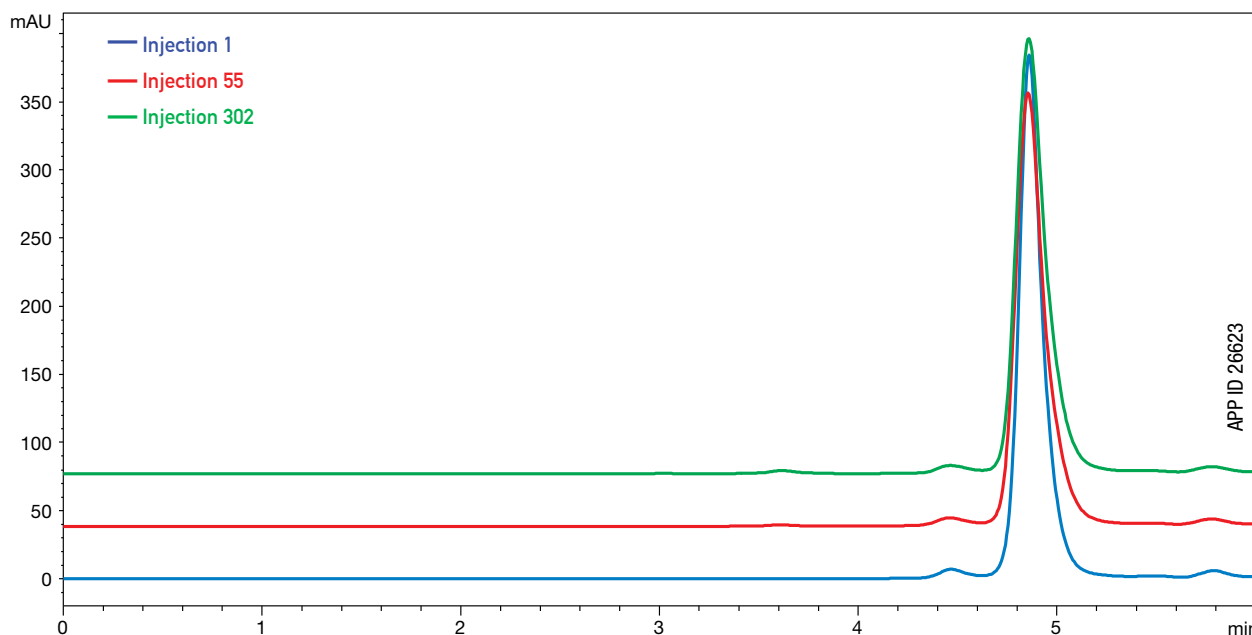
Biozen SEC Hydrophilic Surface Chemistry Improves Aggregate Analysis



Improved Column Lifetime and Performance Stability

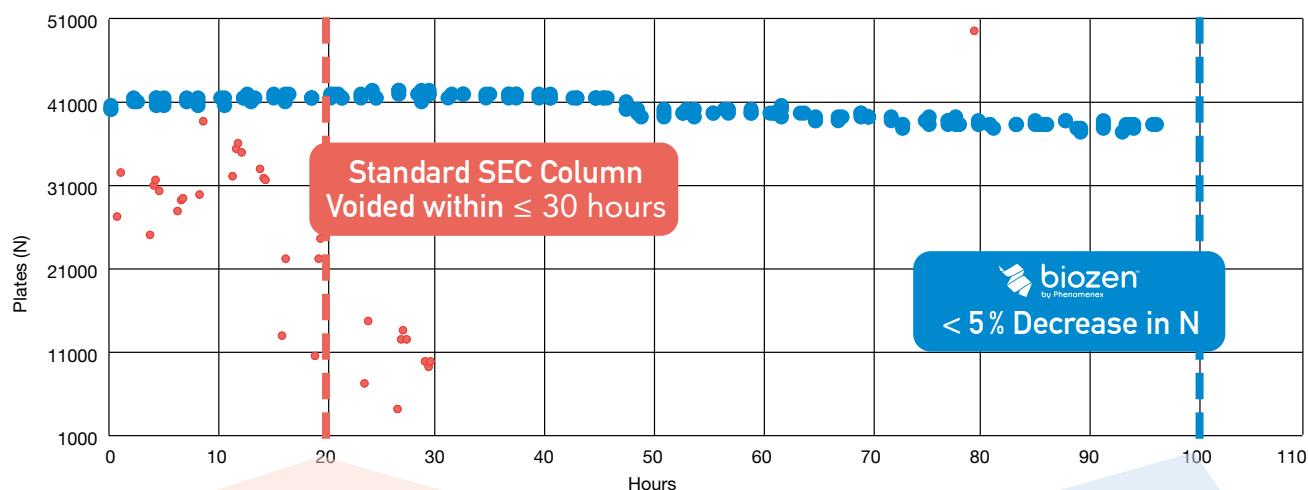
Phenomenex's optimized SEC column loading technology has significantly improved the overall packing density and silica distribution of the columns leading to improved chromatographic lifetime and stability.

Unchanged Performance After 300 Injections



Unchanged Performance After 100 Hours of Extreme Running Conditions

- Efficiency, Uridine (Biozen dSEC-2, 1.8 μ m, 200 Å)
- Efficiency, Uridine (SEC Column 1.8 μ m)



Premature Failure with Standard Silica

High pore volume silica cannot withstand rigorous running conditions, leading to **erratic results** and eventually formation of column "void", leading to **premature failure**.



Biozen SEC Consistent Results

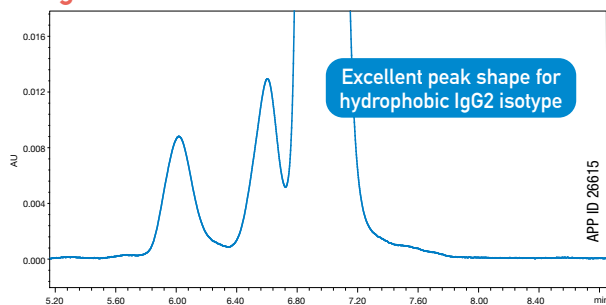
> 50% increase in **column stability** versus standard SEC column media



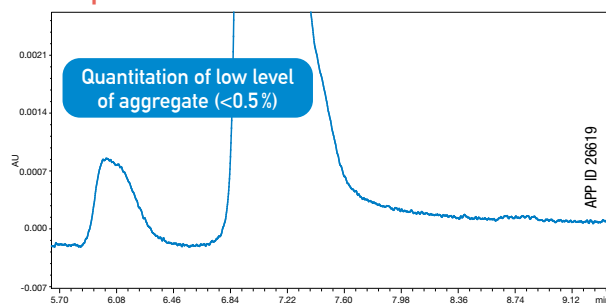
New Standard for Platform SEC Methods

Whether IgG2 or IgG4 isotypes, bispecifics, or Fc-Fusions, dSEC-2 provides excellent separation and sample recovery for many different classes of antibodies and related recombinant proteins.

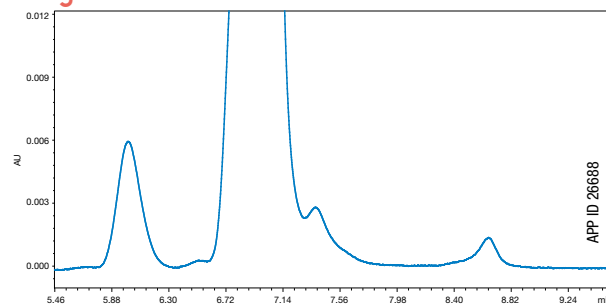
IgG2 Panitumumab



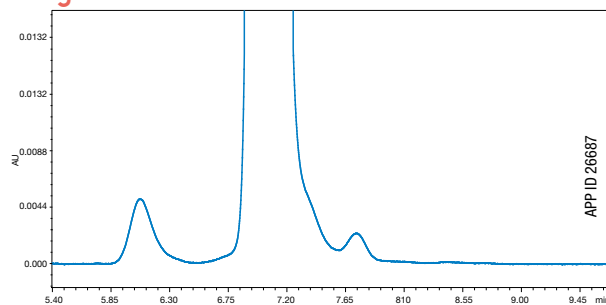
Bispecific Emicizumab



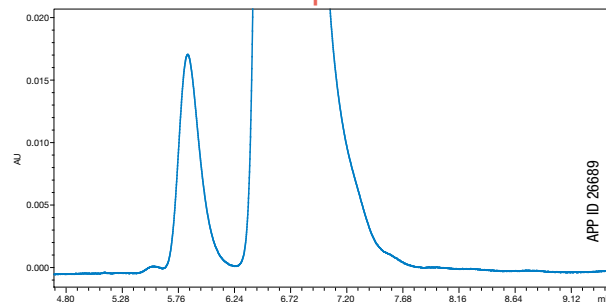
IgG4 Nivolumab



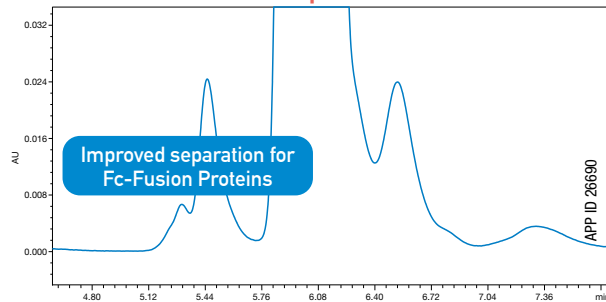
IgG2 Denosumab



Fc-Fusion Aflibercept



Fc-Fusion Etanercept



Conditions for both columns:

Column: Biozen 1.8µm dSEC-2, 200 Å

Dimension: 300 x 4.6 mm

Part No.: 00H-4787-E0

Mobile Phase: 200 Potassium Phosphate + 250 mM KCl, pH 6.2

Flow Rate: 0.35 mL/min

Injection Volume: 10 µL

Detector: UV @ 280 nm

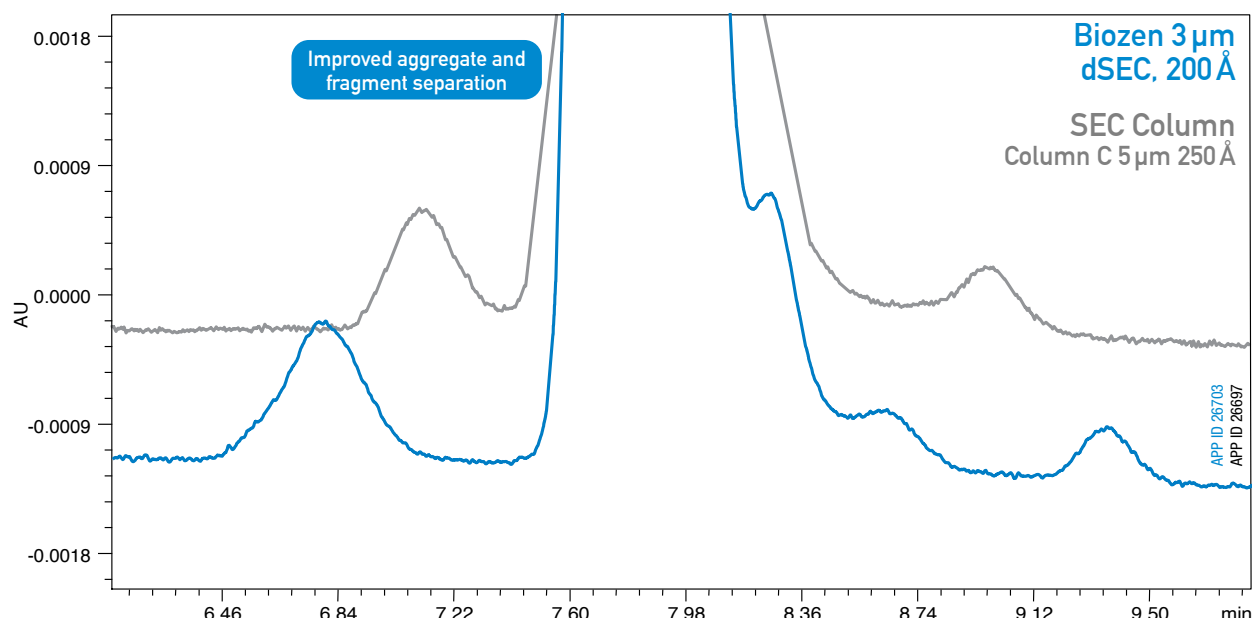
Temperature: 25 °C

Sample: Various, 10 mg/mL

Improved Aggregate Recovery and Separation

Although many silica-based SEC columns use similar stationary phases and nominal pore diameters, pore structure and surface chemistry vary significantly. Biozen dSEC-2 columns provide the optimum pore volume and surface chemistry that has been finely tuned for monoclonal antibodies and related formats.

Trastuzumab

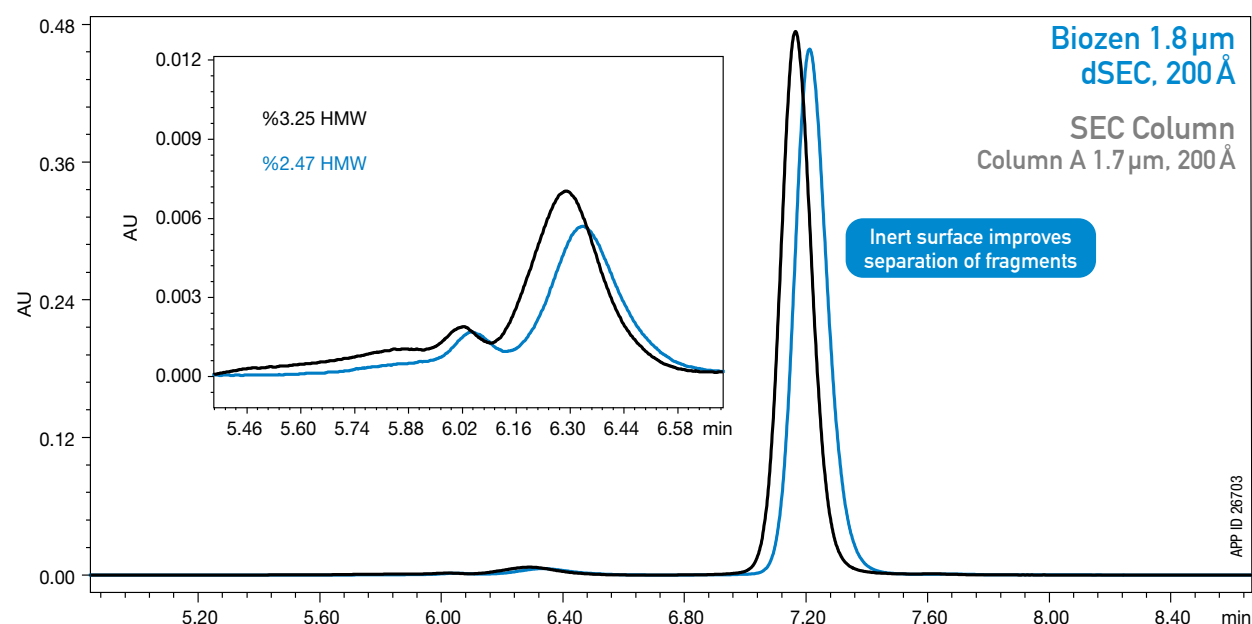


Conditions for both columns:

Columns: Biozen 3 µm dSEC-2, 200 Å
 Column C 5 µm 250 Å
Dimension: 300 x 7.8 mm
Part No.: 00H-4788-K0 (Biozen)
Mobile Phase: 50 mM Sodium Phosphate +
 300 mM NaCl, pH 6.8

Flow Rate: 1.0 mL/min
Injection Volume: 10 µL
Detector: UV @ 280 nm
Temperature: 25 °C
Sample: Trastuzumab, 10 mg/mL

NIST mAb



Conditions for both columns:

Columns: Biozen 1.8 µm dSEC-2, 200 Å
 Column A 1.7 µm, 200 Å
Dimension: 300 x 4.6 mm
Part No.: 00H-4787-E0 (Biozen)
Mobile Phase: 200 Potassium Phosphate +
 250 mM Potassium Chloride pH 6.2

Flow Rate: 0.35 mL/min
Injection Volume: 3 µL
Detector: UV @ 280 nm
Temperature: 25 °C
Sample: NIST mAb, 10 mg/mL

Biozen SEC Applications

The newest addition to the Biozen portfolio brings a unique combination of **improved silica particle mechanical strength** and column stability resulting in exceptional reproducibility and performance to withstand the rigors of modern aggregate analysis.

Method Development

- [Effect of Mobile Phase pH in Aggregate Analysis of Monoclonal Antibodies by Size Exclusion Chromatography](#)
- [Improving Resolution for Size Exclusion Chromatography Methods by Optimization of Linear Velocity](#)
- [Optimizing Phosphate Concentration for Size Exclusion Chromatography Aggregate Analysis](#)
- [Organic Solvent in Size Exclusion Chromatography of an Antibody Drug Conjugate Surrogate](#)
- [The Effect of Column Inner Diameter for Robust Size Exclusion Chromatography Methods](#)
- [Arginine as a Mobile Phase Co-solvent to Improve High Molecular Weight Aggregate Recovery for Size Exclusion Chromatography](#)

Antibodies and Recombinant Proteins

- [Aggregate Analysis of Fc-Fusion Proteins](#)
- [Aggregate Analysis of an IgG2 Monoclonal Antibody](#)
- [Aggregate Analysis of a Bispecific Antibody](#)
- [Aggregate Analysis of Recombinant Human Growth Hormone](#)

Materials Science and Technology

- [Assessing Column Lifetime of a UHPLC Size Exclusion Column](#)
- [High-Throughput Methods for Size Exclusion Chromatography](#)
- [Column Bed Stability During Routine Size Exclusion Chromatography](#)
- [Assessment of Column Priming for sub-2µm Size Exclusion Columns](#)
- [Assessing Batch-to-Batch Performance for Size Exclusion Chromatography Method](#)
- [Generating a Calibration Curve with UHPLC Size Exclusion Column](#)

SEC-MS

- [Hyphenating Size Exclusion Chromatography to High Resolution Mass Spectrometry - Bispecific Antibody](#)
- [Hyphenating Size Exclusion Chromatography to High Resolution Mass Spectrometry - IdeZ Digested Monoclonal Antibody](#)
- [Hyphenating Size Exclusion Chromatography to High Resolution Mass Spectrometry - NIST mAb](#)

To view more technical notes, go to www.Phenomenex.com/dsec

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Biozen Column Material Characteristics

Phases	Description	Pore Size (Å)	Surface Area (m ² /g)	Carbon Load (%)	pH stability	Shipping Solvent	Max Pressure (psi/bar)	Temp (°C)	Mode of Analysis
Biozen 1.8 µm dSEC-2	Inert, high-strength porous particle for the separation and quantitation of monoclonal antibody aggregate and fragments	200	–	–	2.5-7.5	0.1 M Sodium Phosphate, pH 6.8 w/ 0.025 % NaN ₃	8000/570	50	SEC/GFC
Biozen 3 µm dSEC-2	Inert, high-strength porous particle for the separation and quantitation of monoclonal antibody aggregate and fragments	200	–	–	2.5-7.5	0.1 M Sodium Phosphate, pH 6.8 w/ 0.025 % NaN ₃	4000/285	50	SEC/GFC
Biozen 1.7 µm Oligo	The particle is an organo-silica core-shell bonded with a C18 stationary phase	100	200	11	1-12	Acetonitrile/Water (60:40)	15000/1050	60	RP
Biozen 2.6 µm Oligo							8700/600	60	RP
Biozen 2.6 µm Glycan	Provides optimal combination of high efficiency and selectivity for released glycans, suitable for HPLC and UHPLC.	100	200	–	2-7.5	Acetonitrile /0.1 M Ammonium Formate, pH 3.2 (90:10)	8700/600	60	HILIC
Biozen 1.6 µm Peptide PS-C18	Excellent retention by combined positively charged surface ligand and C18 ligand, contains a positively charged weak base that repels basic ions, suitable for use with UHPLC.	100	260	9	1.5-8.5 ***	Acetonitrile/Water (65:35 v/v)	15000/1030	90*	RP
Biozen 3 µm Peptide PS-C18	Excellent retention by combined positively charged surface ligand and C18 ligand, contains a positively charged weak base that repels basic ions, suitable for use with HPLC.						5000/340	90*	RP
Biozen 1.7 µm Peptide XB-C18	Overall retention of both acidic and basic peptides through C18 stationary phase with di-isobutyl side chains, suitable for use with UHPLC.	100	200	10	1.5-9 **	Acetonitrile/Water (65:35 v/v)	15000/1050	90*	RP
Biozen 2.6 µm Peptide XB-C18	Overall retention of both acidic and basic peptides through C18 stationary phase with di-isobutyl side chains, suitable for use with HPLC and UHPLC.						8700/600		RP
Biozen 3.6 µm Intact XB-C8	Large pore core-shell particle for fast intact and subunit biological entry. C8 provides highly useful moderate hydrophobic selectivity.	200	20	–			8700/600		RP
Biozen 2.6 µm WidePore C4	Core-shell particle with butyl stationary phase and optimal wide pore size distribution for better resolution of large biologics, including monoclonal antibodies and subunit analysis.	400	25	–			12500		RP
Biozen 6 µm WCX	Monodispersed, non-porous PS-DVB particle with a hydrophilic graft and linear carboxylate polymer chain for the separation of acidic/basic variants for proteins.	–	–	–	2-12	20 mM Sodium Phosphate + 150 mM NaCl 4 mM NaN ₃ , pH 6.5	6000	60	IEX

* Temperature limits are dependent on method running parameters. Suggested max temperature for these Biozen LC columns is 90°C, however temperature limits are dependent on your running parameters. Running at a pH greater than 8 and elevated temperature will compromise column lifetime. Continuous use of Biozen columns at the maximum temperature limit may compromise column longevity.

** pH range is 1.5 - 9 under gradient conditions. pH range is 1.5 -10 under isocratic conditions.

*** pH range is 1.5 - 8.5 under gradient conditions. pH range is 1.5 -10 under isocratic conditions

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- Innovation is our ultimate competitive differentiator. We pursue out-of-the box ideas, both large and small, to add value and advance innovation.
- We improve people's lives by delivering technologies that matter. By helping our customers achieve amazing things, we enhance quality of life around the world.

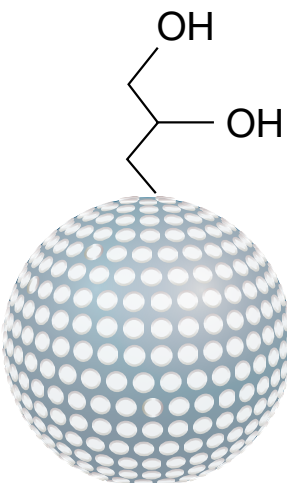


The Potential To Make a Difference

Danaher's innovative companies are developing leading edge diagnostic tools, and advancing life-saving scientific research

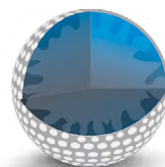
Introducing A New Solution for Your mAbs and Aggregate Analysis with Biozen dSEC Column

NEW dSEC



**Biozen dSEC
1.8µm and 3µm**

4 Particle Platforms



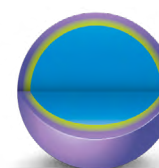
**Pore Controlled
Technology**



**Thermally Modified
Fully Porous**

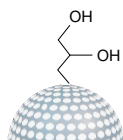


**Core-Shell
Technology**



**Monosized Polymeric
Non-Porous**

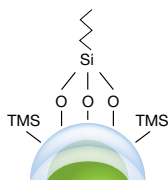
dSEC



**Biozen dSEC
1.8µm and 3µm**

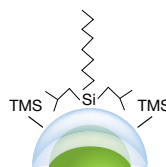
Inert, high-strength porous particle for the separation and quantitation of monoclonal antibody aggregate and fragments

Intact



**Biozen WidePore C4
2.6µm**

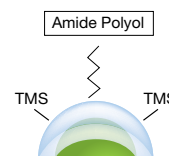
Core-shell particle with butyl stationary phase and optimal wide pore size distribution for better resolution of large biologics, including monoclonal antibodies and subunit analysis.



**Biozen Intact XB-C8
3.6µm**

Large pore core-shell particle for fast intact and subunit biologic entry. C8 provides highly useful moderate hydrophobic selectivity.

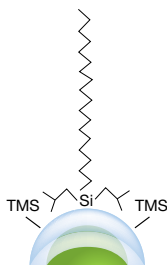
Glycan



**Biozen Glycan
2.6µm**

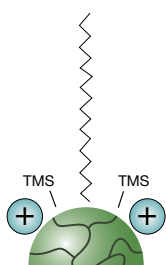
Provides optimal combination of high efficiency and selectivity for released glycans.

Peptide



**Biozen Peptide XB-C18
1.7µm and 2.6µm**

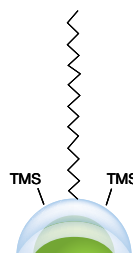
Overall retention of both acidic and basic peptides through C18 stationary phase with di-isobutyl side chains.



**Biozen Peptide PS-C18
1.6µm and 3µm**

Excellent retention by combined positively charged surface ligand and C18 ligand.

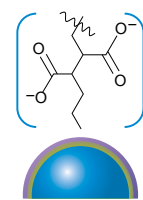
Oligonucleotides



**Biozen Oligo
1.7µm and 2.6µm**

Organo-silica core-shell particle bonded with a C18 stationary phase offers high selectivity for even minute oligo differences alongside high and low pH robustness.

Ion-Exchange



**Biozen WCX
6µm**

Monosized particles grafted with linear polycarboxylate chains to envelop and separate proteins from acidic/basic variants

Ordering Information

Biozen™ Products - Powered by Biocompatible Hardware

Biozen Columns (mm)								Biocompatible Guard Cartridges		
	50 x 2.1	100 x 2.1	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	for 2.1 mm	for 4.6 mm	Holder
								/3pk		ea
Biozen 2.6 µm Glycan	00B-4773-AN	00D-4773-AN	00F-4773-AN	—	—	—	—	AJ0-9800	—	AJ0-9000
								/3pk		ea
Biozen 1.6 µm Peptide PS-C18	00B-4770-AN	00D-4770-AN	00F-4770-AN	—	—	—	—	AJ0-9803	—	AJ0-9000
								/10pk	/10pk	ea
Biozen 3 µm Peptide PS-C18	00B-4771-AN	—	00F-4771-AN	00B-4771-E0	—	00F-4771-E0	—	AJ0-7605	AJ0-7606	KJ0-4282
								/3pk		ea
Biozen 1.7 µm Peptide XB-C18	00B-4774-AN	00D-4774-AN	00F-4774-AN	—	—	—	—	AJ0-9806	—	AJ0-9000
								/3pk	/3pk	ea
Biozen 2.6 µm Peptide XB-C18	00B-4768-AN	00D-4768-AN	00F-4768-AN	00B-4768-E0	—	00F-4768-E0	—	AJ0-9806	AJ0-9808	AJ0-9000
								/3pk	/3pk	ea
Biozen 2.6 µm WidePore C4	00B-4786-AN	00D-4786-AN	00F-4786-AN	00B-4786-E0	00D-4786-E0	00F-4786-E0	00G-4786-E0	AJ0-9809	AJ0-9811	AJ0-9000
								/3pk	/3pk	ea
Biozen 3.6 µm Intact XB-C8	00B-4766-AN	00D-4766-AN	00F-4766-AN	00B-4766-E0	—	00F-4766-E0	—	AJ0-9812	AJ0-9814	AJ0-9000

	50 x 2.1	150 x 2.1	150 x 4.6	300 x 4.6	150 x 7.8	300 x 7.8	for 4.6 mm	Holder
							/3pk	ea
Biozen 3 µm dSEC	—	—	00F-4788-E0	00H-4788-E0	00F-4788-K0	00H-4788-K0	AJ0-9850	AJ0-9000
Biozen 1.8 µm dSEC	00B-4787-AN	00F-4787-AN	00F-4787-E0	00H-4787-AN	—	—	AJ0-9851	AJ0-9000

	50 x2.1	100 x 2.1	150 x 2.1	250 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	for 4.6mm	Holder
									/10pk	ea
Biozen 6 µm WCX	00B-4777-AN	00D-4777-AN	00F-4777-AN	00G-4777-AN	00B-4777-E0	00D-4777-E0	00F-4777-E0	00G-4777-E0	AJ0-9400	KJ0-4282

	50 x2.1	100 x 2.1	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	for 2.1 mm	for 4.6 mm	Holder
							/3pk	/3pk	ea
Biozen 1.7 µm Oligo	00B-4791-AN	00D-4791-AN	00F-4791-AN	—	—	—	AJ0-9820	AJ0-9822	KJ0-9000
Biozen 2.6 µm Oligo	00B-4790-AN	00D-4790-AN	00F-4790-AN	00B-4790-E0	00D-4790-E0	00F-4790-E0	AJ0-9820	AJ0-9822	KJ0-9000

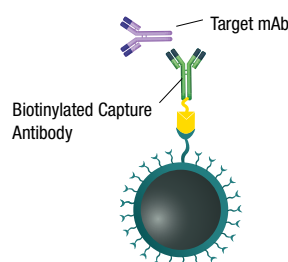
Sample Preparation

Biozen Solid Phase Extraction	Format	Sorbent Mass	Part Number	Unit
Biozen N-Glycan Clean-Up	Microelution 96-Well Plate	5 mg/well	8M-S009-NGA	1/box



Biozen MagBeads Streptavidin Coated

Formats	Part No.	Concentration	Bead Size
25 mg (≈50 samples)	KS0-9531	20 mg/mL	1.0 µm
50 mg (≈100 samples)	KS0-9532		
500 mg (≈1000 samples)	KS0-9533		

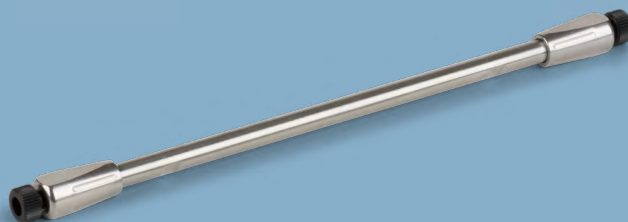
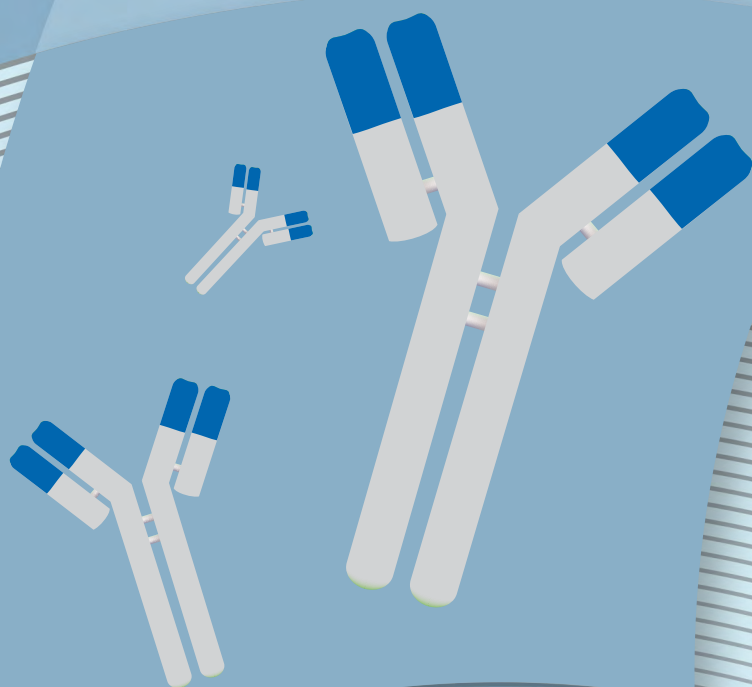


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info@phenomenex.com

**☎ All other countries/regions
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