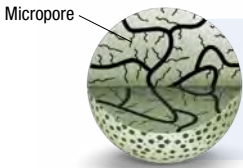


4 Advanced Particle Platforms

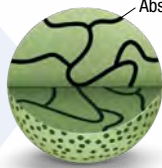
All four of the Biozen particle platforms were individually designed and built by Phenomenex to take advantage of integral levels of performance, ruggedness, and reproducibility for protein characterization applications.

Individually, each platform differs in the proprietary processing techniques used to control particle size and morphology.

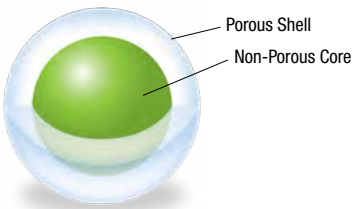
Thermally Modified Fully Porous



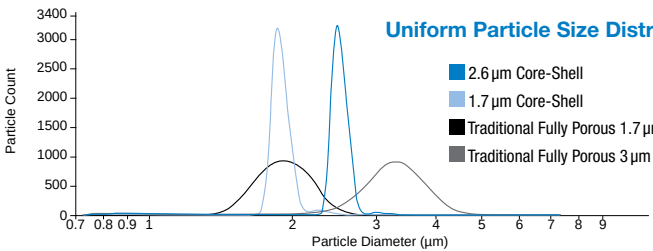
Through a proprietary thermal processing series of steps, we eliminate micropores and further improve consistency, column efficiency, inertness, ruggedness, and reproducibility.



Core-Shell Technology



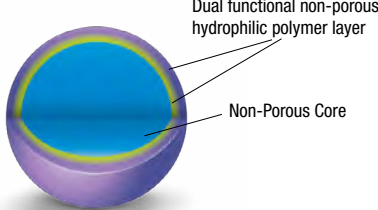
Uniform Particle Size Distribution



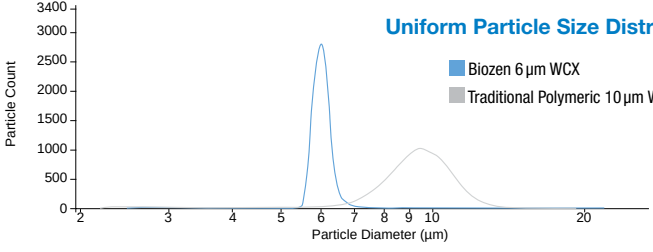
■ 2.6 μm Core-Shell
■ 1.7 μm Core-Shell
■ Traditional Fully Porous 1.7 μm
■ Traditional Fully Porous 3 μm

Using sol-gel processing techniques that incorporate nano structuring technology, a durable, homogeneous porous shell is grown on a solid silica core. This highly optimized process combined with industry leading column packing technology produces highly reproducible columns that generate extremely high efficiencies and sensitivity.

Monosized Polymeric Non-Porous



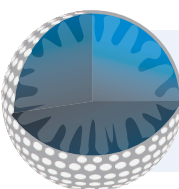
Uniform Particle Size Distribution



■ Biozen 6 μm WCX
■ Traditional Polymeric 10 μm WCX

Meticulously controlled monosized particle technology secures incredible particle consistency that leads to improved and reliable efficiency. This innovative non-porous particle serves as the perfect backbone for complex ion-exchange chemistries.

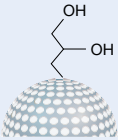
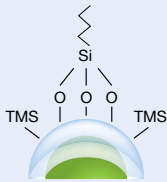
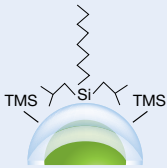
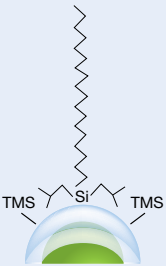
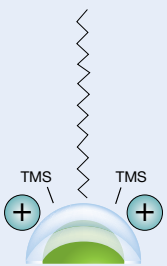
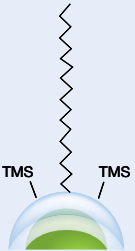
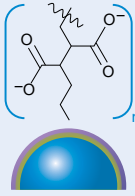
Pore Controlled Technology



dSEC-2 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.

8 Particle Chemistries

With a single innovative product line, you can now find a variety of quality particle chemistries designed and tested for biologics.

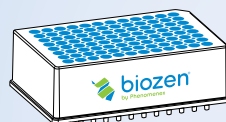
dSEC	Intact		Glycan
 Biozen dSEC-2 1.8 µm and 3 µm Inert, high-strength porous particle for the separation and quantitation of monoclonal antibody aggregate and fragments	 Biozen WidePore C4 2.6 µm Core-shell particle with butyl stationary phase and optimal wide pore size distribution for better resolution of large biologics, including monoclonal antibodies and subunit analysis.	 Biozen Intact XB-C8 3.6 µm Large pore core-shell particle for fast intact and subunit biologic entry. C8 provides highly useful moderate hydrophobic selectivity.	 Biozen Glycan 2.6 µm Provides optimal combination of high efficiency and selectivity for released glycans.
Peptide		Oligonucleotides	Ion-Exchange
 Biozen Peptide XB-C18 1.7 µm and 2.6 µm Overall retention of both acidic and basic peptides through C18 stationary phase with di-isobutyl side chains.	 Biozen Peptide PS-C18 1.6 µm and 3 µm Excellent retention by combined positively charged surface ligand and C18 ligand.	 Biozen Oligo 1.7 µm and 2.6 µm 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.	 Biozen WCX 6 µm Monosized particles grafted with linear polycarboxylate chains to envelop and separate proteins from acidic/basic variants



Learn More:
www.phenomenex.com/Biozen

Sample Preparation Solutions

N-Glycan Clean-Up

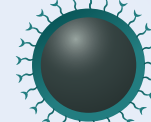


HILIC Solid Phase Extraction (SPE)
High recovery of labeled, released N-glycans in a microelution format allowing for streamlined processing and clean-up of small sample volumes.



To learn more, see p. 78

MagBeads



Streptavidin Coated
Higher binding capacity magnetic particles result in faster and reliable purification, clean-up, and isolation of proteins and peptide molecules.

U.S. Patent Nos. 7,563,367 and 8,658,038 and foreign counterparts.

Oligo Characterization and Quantitation

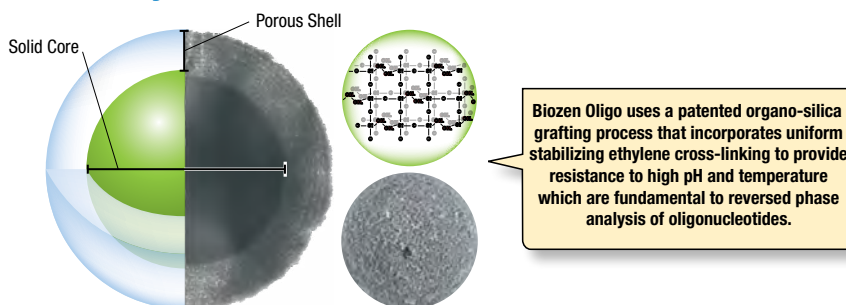
Advanced Oligonucleotide Analysis for Increased Recovery and Reproducibility

The Biozen Oligo LC Column brings a unique combination of core-shell versatility and high pH ruggedness necessary for oligonucleotide separations. Additionally, Biozen Oligo is packed in a unique bio-inert titanium hardware designed to minimize the sample loss and adsorption issues typically seen with stainless steel hardware, demonstrating this column's optimal utility for oligonucleotide characterization and quantitation.

- **BioTi™ Hardware Reduces Sample Loss and Adsorption**
- **Robustness at High pH and Temperature**
- **Core-Shell Advantage for High Efficiency**

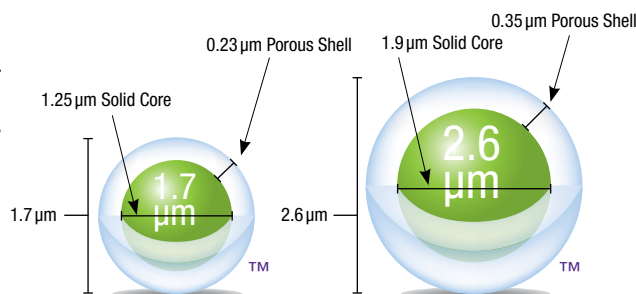
Patented Technology and Advanced Core-Shell Particle Chemistry

Patented Core-Shell Particle Chemistry



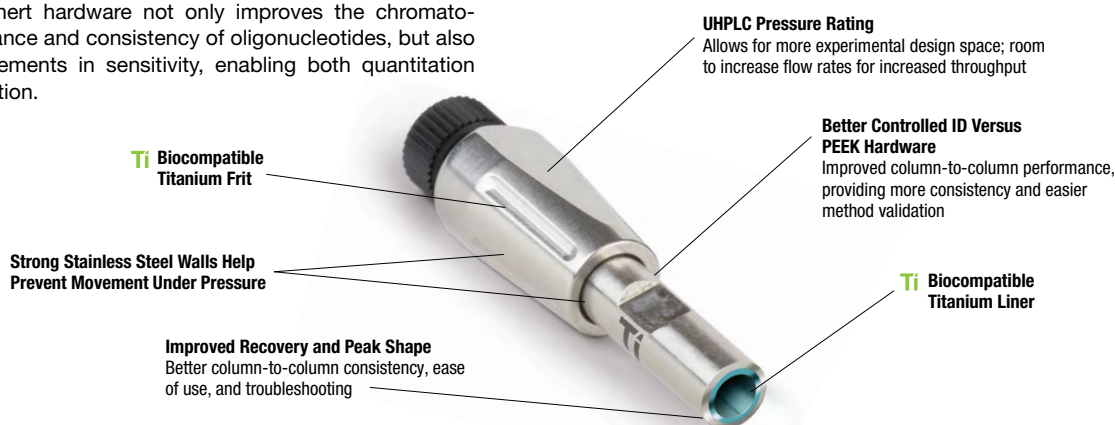
High Efficiency Core-Shell Particle

After meticulous core construction, a uniform porous silica layer is grown around the spherical solid silica core. This unique combination of precise particle architecture and particle size provides dramatic leaps in performance.



Inside the Biozen Oligo Biocompatible Hardware Difference

The use of bioinert hardware not only improves the chromatographic performance and consistency of oligonucleotides, but also provides improvements in sensitivity, enabling both quantitation and characterization.



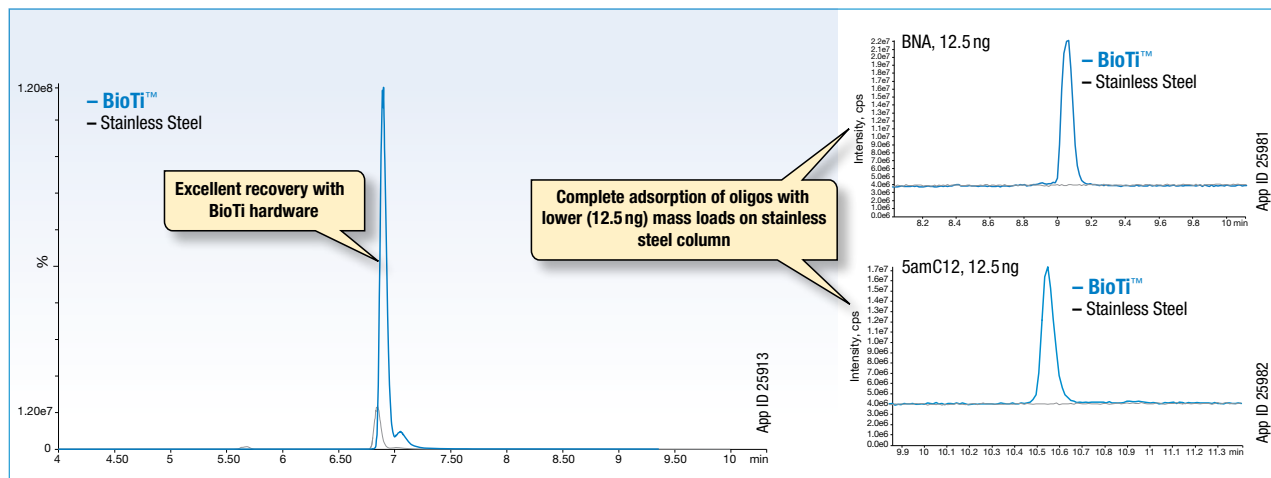
Oligo Characterization and Quantitation (cont'd)

BioTi versus Traditional Stainless Steel Hardware

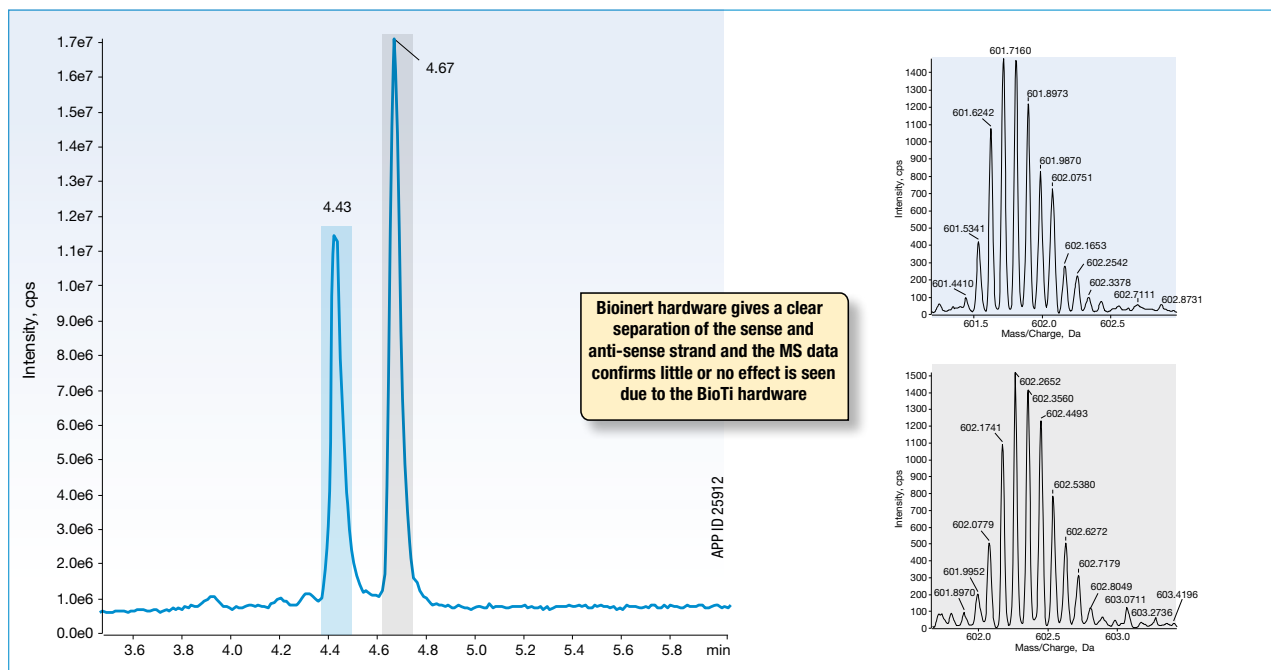
Oligos can chelate to trace heavy metals in stainless steel column hardware, leading to poor recovery, inconsistent chromatography and problematic carryover. The Biozen Oligo bioinert hardware provides

greater sensitivity as well as improved recovery, demonstrating this column's optimal utility for oligonucleotide characterization and quantitation.

BioTi Ensures Method Robustness and Consistency from Injection-to-Injection!



LC-MS Analysis of siRNA using Bioinert Hardware



Ordering Information

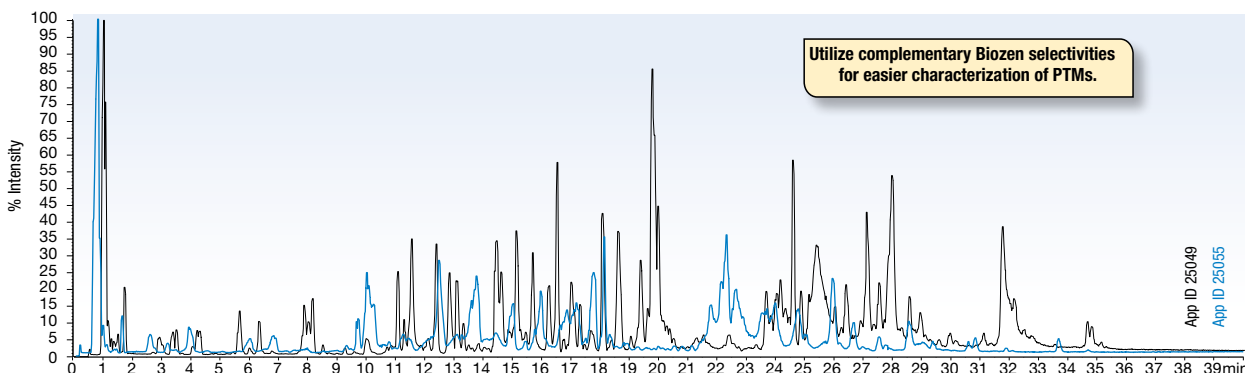
Biozen Columns (mm)	Biocompatible Guard Cartridges					
	50 x 2.1	100 x 2.1	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6
Biozen 1.7 µm Oligo	00B-4791-AN	00D-4791-AN	00F-4791-AN	—	—	—
Biozen 2.6 µm Oligo	00B-4790-AN	00D-4790-AN	00F-4790-AN	00B-4790-E0	00D-4790-E0	00F-4790-E0

Peptide Mapping

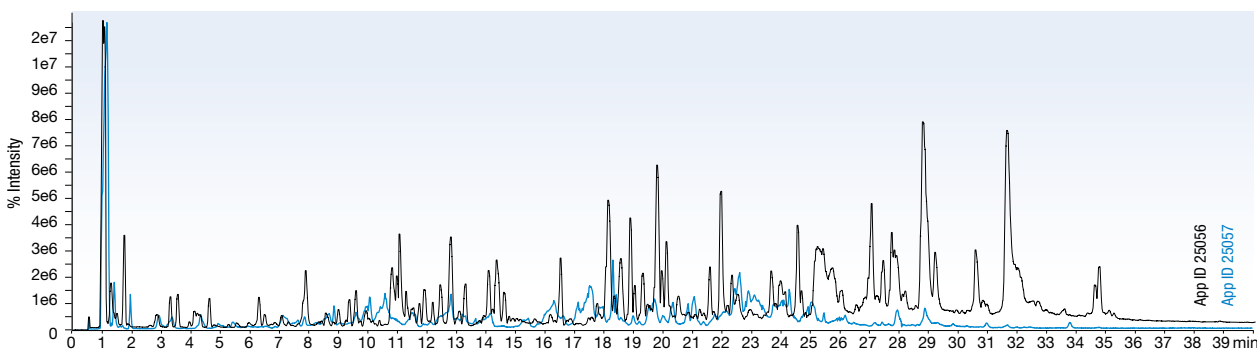
Digested mAbs or ADCs typically include a large body of compounds which are crucial to understanding post translation modifications. So we designed two Biozen Peptide columns to offer highly useful and unique retention profiles. Each allows for fast and

effective elution windows by utilizing either high efficiency core-shell or thermally modified fully porous particles to gain sharper peaks, better peak capacities, and overall higher sensitivity.

Trastuzumab Biosimilar Peptide Map



Infliximab Biosimilar Peptide Map



Conditions for all columns:

Columns: ■ Biozen 1.6 µm Peptide PS-C18
■ Biozen 2.6 µm Peptide XB-C18

Dimension: 150 x 2.1 mm

Part No.: 00F-4770-AN

00F-4768-AN

Mobile Phase: A: 0.1 % Formic Acid in Water
 B: 0.1 % Formic Acid in Acetonitrile

Gradient: Time (min) % B
 0 1
 0.5 1
 50 50
 55 50
 56 95

Flow Rate: 0.3 mL/min
Temperature: 40 °C
Detection: QTOF (SCIEX® X500B)

Ordering Information

Biozen Columns (mm)	Biocompatible Guard Cartridges						Holder
	50 x 2.1	100 x 2.1	150 x 2.1	50 x 4.6	150 x 4.6	for 2.1 mm /3pk	for 4.6 mm /10pk
Biozen 1.6 µm Peptide PS-C18	00B-4770-AN	00D-4770-AN	00F-4770-AN	—	—	AJ0-9803	AJ0-9000
Biozen 3 µm Peptide PS-C18	00B-4771-AN	—	00F-4771-AN	00B-4771-E0	00F-4771-E0	AJ0-7605	KJ0-4282
Biozen 1.7 µm Peptide XB-C18	00B-4774-AN	00D-4774-AN	00F-4774-AN	—	—	AJ0-9806	AJ0-9000
Biozen 2.6 µm Peptide XB-C18	00B-4768-AN	00D-4768-AN	00F-4768-AN	00B-4768-E0	00F-4768-E0	AJ0-9806	AJ0-9000

Aggregate Analysis

With mAb aggregate often at very low levels (<0.1 % by peak area compared to monomer) and fragment separation a requirement, adequate resolution and peak shape have become even more crucial method outcomes. To address this need, the robust set

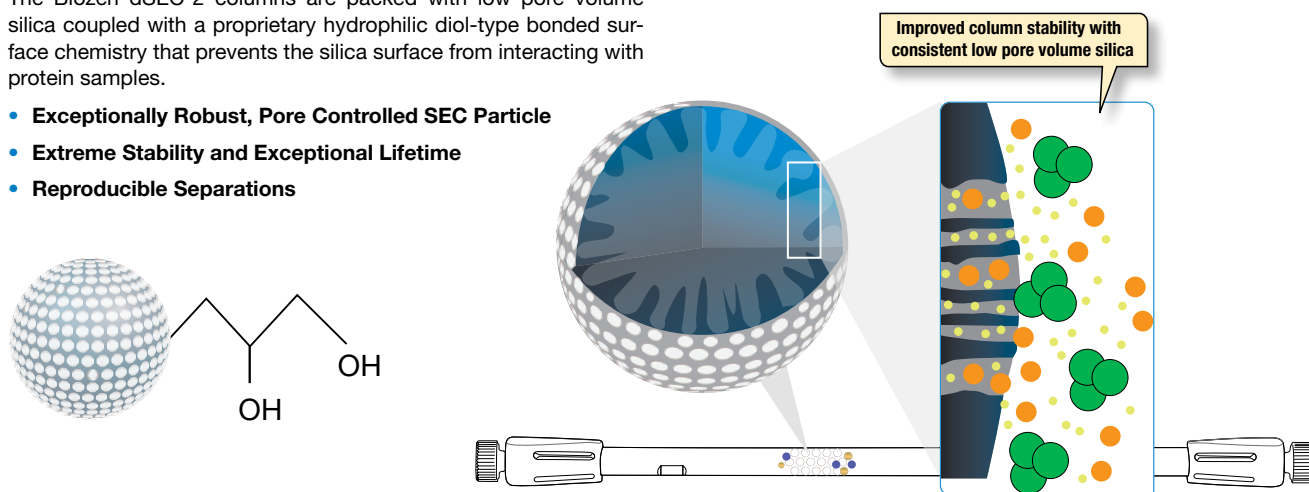
of Biozen SEC columns were developed with a combination of UHPLC efficiency and higher sensitivity, to drive resolution and identification of even lower level targets.

Biozen dSEC-2 Size Exclusion Columns

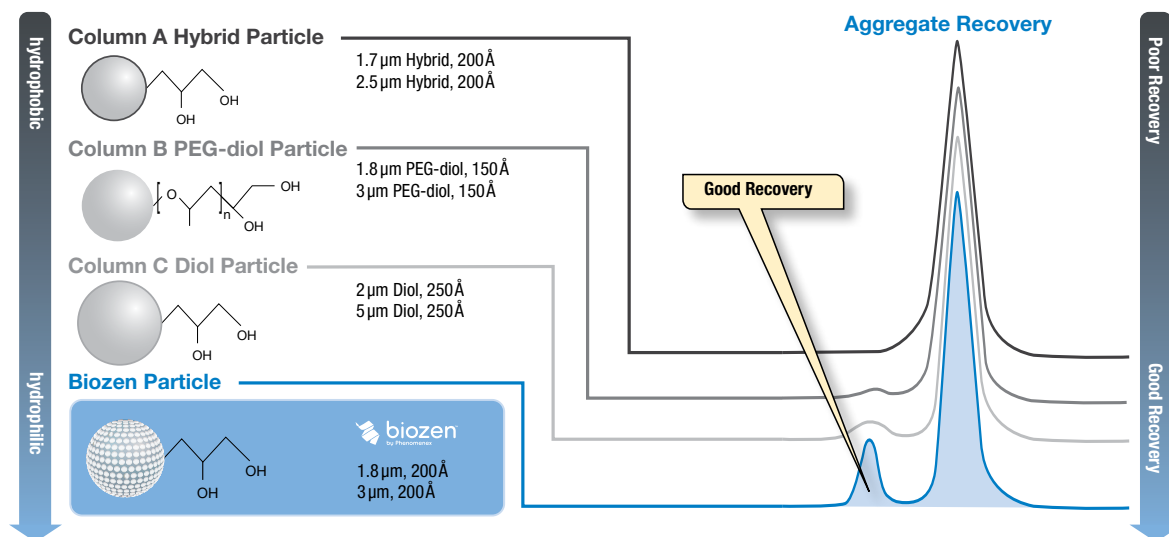
Advanced SEC Silica Particle Technology and Surface Chemistry for Characterization Biomolecules

The Biozen dSEC-2 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.

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



Biozen dSEC-2 Hydrophilic Surface Chemistry Improves Aggregate Analysis



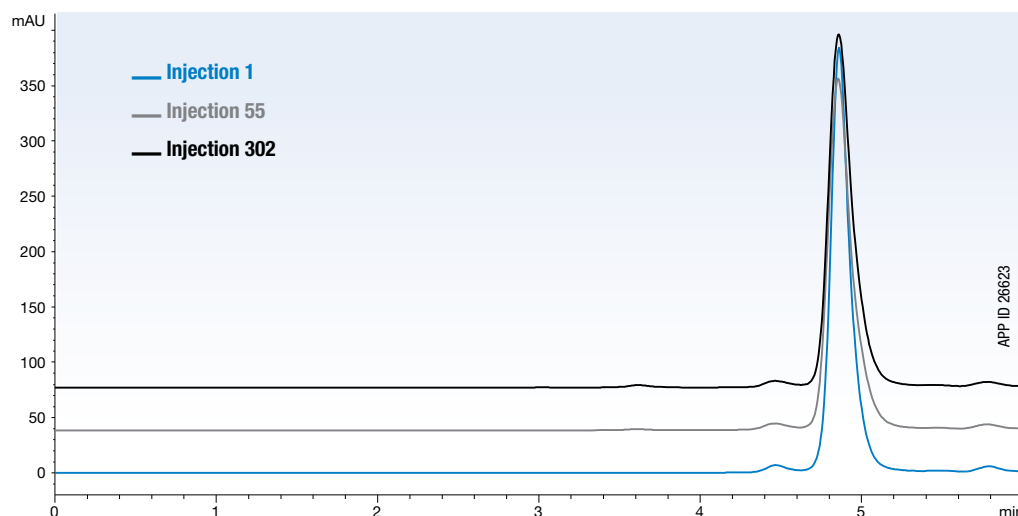
Comparative separations may not be representative of all applications.

Aggregate Analysis (cont'd)

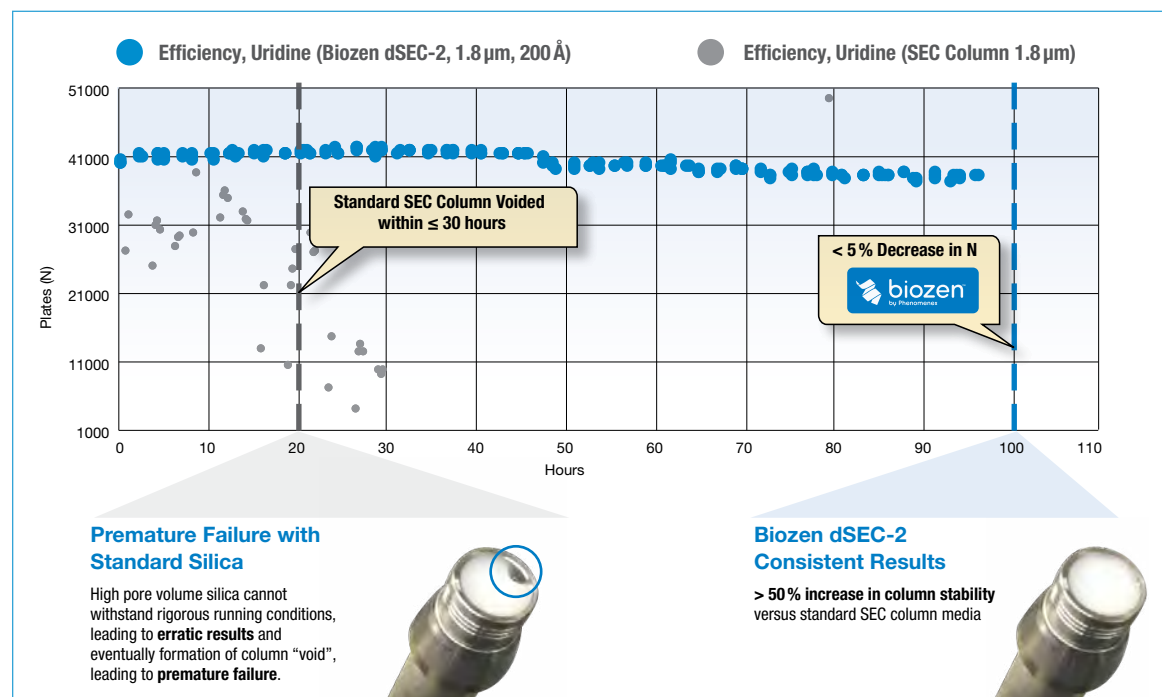
Improved Column Lifetime and Performance Stability

Phenomenex's optimized dSEC-2 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

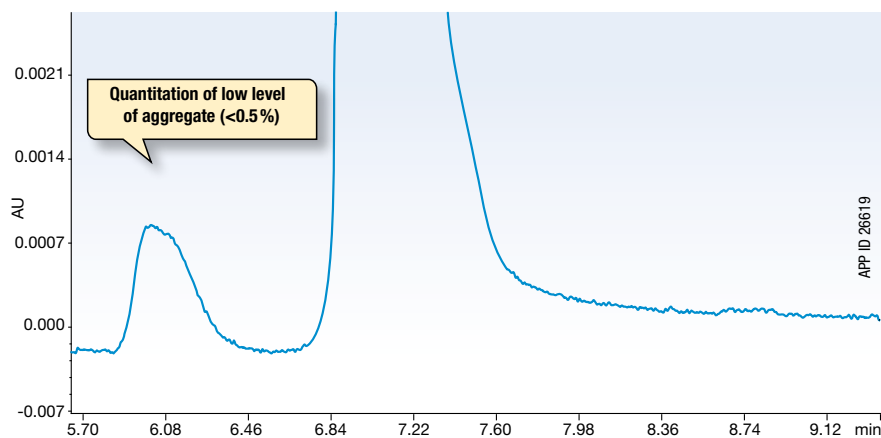


Aggregate Analysis (cont'd)

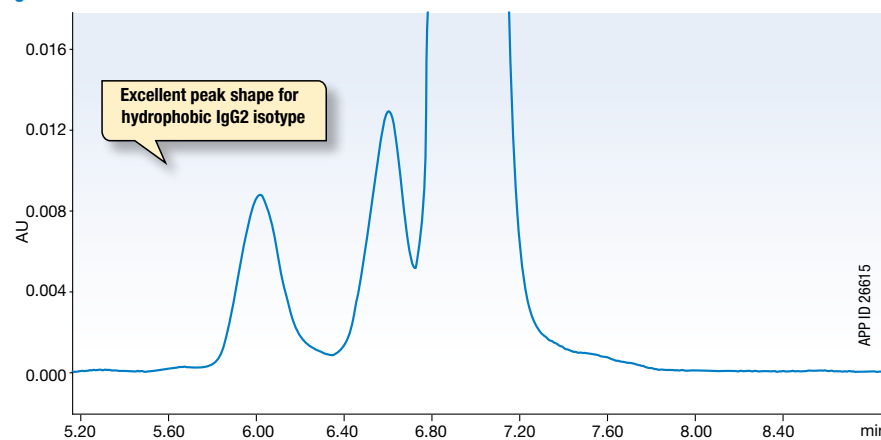
New Standard for Platform SEC Methods

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.

Bispecific Emicizumab



IgG2 Panitumumab



Conditions for both columns:

Column: Biozen dSEC-2, 200 Å

Dimension: 300 x 4.6 mm

Part No.: [00H-4787-EQ](#)

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

Ordering Information

Biozen Columns (mm)	50 x 2.1	150 x 2.1	150 x 4.6	300 x 4.6	150 x 7.8	300 x 7.8	Biocompatible Guard Cartridges:	
Biozen 1.8 µm dSEC-2	00B-4787-AN	00F-4787-AN	00F-4787-EQ	00H-4787-EQ	—	—	AJQ-9852	AJQ-9853
Biozen 3 µm dSEC-2	—	—	00F-4788-EQ	00H-4788-EQ	00F-4788-KQ	00H-4788-KQ	AJQ-9852	AJQ-9853
							for 2.1 mm	for 4.6 mm

*SecurityGuard ULTRA Cartridges require holder, Part No.: [AJQ-9000](#)

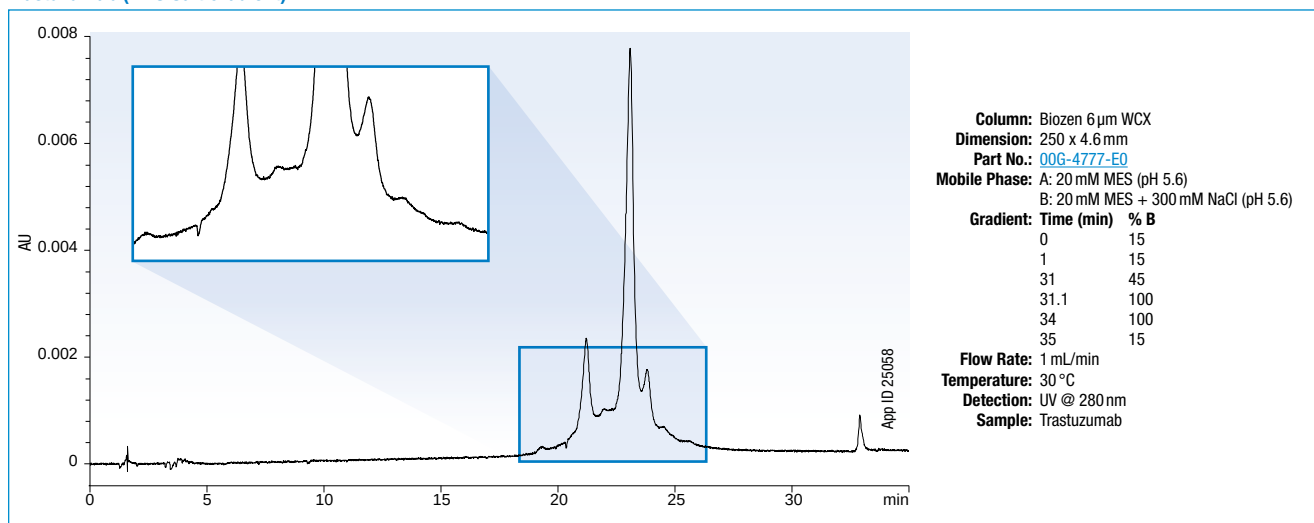
Guard Columns	
30 x 4.6	40 x 7.8
Biozen 3 µm dSEC-2 Guard	03A-4788-EQ 03Q-4788-KQ

Charge Variant Analysis

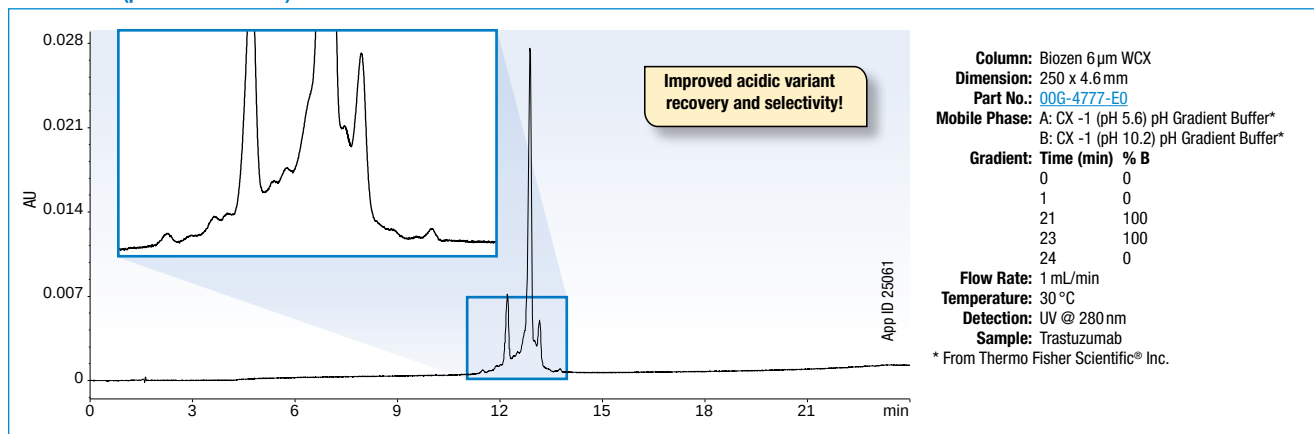
Biozen WCX was crafted to consistently decipher between native protein variants that arise from PTMs within a therapeutics creation and development. The linear polycarboxylate chains grafted to monosized non-porous polymeric particles, envelop and separate proteins from acidic and basic protein variants. With such a highly

tuned and controlled manufacturing process, Biozen WCX media affords scientists a way to reproducibly characterize heterogeneity while taking advantage of excellent recovery through high particle inertness and bioinert titanium BioTi™ column hardware.

Trastuzumab (MES Salt Gradient)



Trastuzumab (pH Gradient Buffer)



Ordering Information

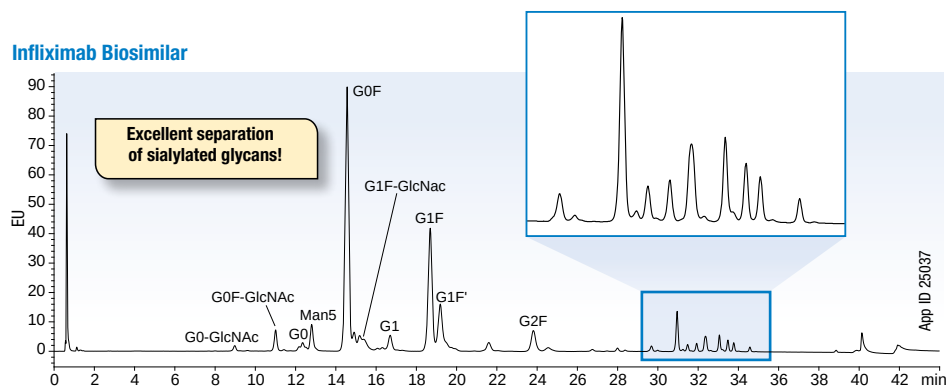
Biozen Columns (mm)					Biocompatible Guard Cartridges	
	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	for 2.1 mm	Holder
Biozen 6 μ m WCX	00B-4777-AN	00D-4777-AN	00F-4777-AN	00G-4777-AN	AJO-9401	KJO-4282
	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	for 4.6 mm	Holder
Biozen 6 μ m WCX	00B-4777-E0	00D-4777-E0	00F-4777-E0	00G-4777-E0	AJO-9400	KJO-4282
					for 4.6 mm	Holder

Glycan Analysis

The unique selectivity of the Biozen Glycan was designed to provide higher order separations of released and labeled glycans. With a 2.6µm core-shell particle size, customers using either HPLC or UHPLC systems can draw upon a high efficiency Biozen Glycan

particle run at higher linear velocities, to easily provide sharper peak shapes and faster elution windows, without high UHPLC pressures. Under HILIC-FLR or HILIC-MS conditions, the Biozen Glycan excels with increased polar retention and selectivity.

Infliximab Biosimilar



Conditions for both separations:

Column: Biozen 2.6µm Glycan

Dimensions: 150 x 2.1 mm

Part No.: 00F-4773-AN

Mobile Phase: A: 100 mM Ammonium Formate, pH 4.5

B: Acetonitrile

Gradient: Time (min)	% B
0	78
10	74.5
24	72
38.5	55.9
38.6	40
40.6	40
40.7	78
48	78

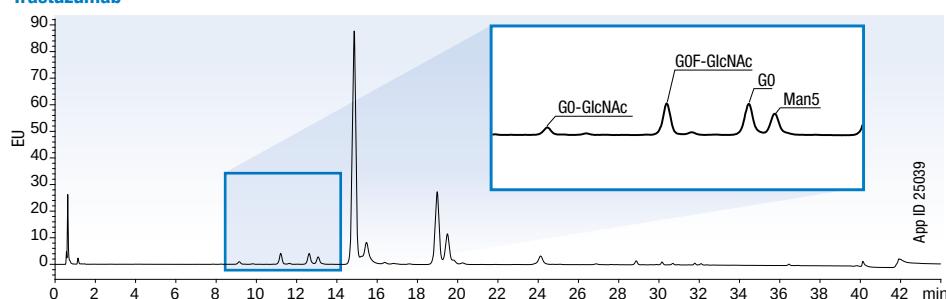
Flow Rate: 0.5 mL/min

Temperature: 50 °C

Detection: FLD ex/em 285/345 nm

Sample: As noted

Trastuzumab



Ordering Information

Biozen Columns (mm)	Biocompatible Guard Cartridges				
	50 x 2.1	100 x 2.1	150 x 2.1	for 2.1 mm	Holder
Biozen 2.6µm Glycan	00B-4773-AN	00D-4773-AN	00F-4773-AN	AJ0-9800	AJ0-9000

Sample Preparation

Ordering Information

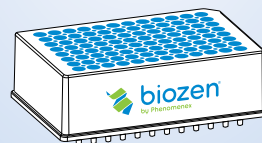
Format	Biozen Solid Phase Extraction	Sorbent Mass	Part Number	Unit
Microelution 96-Well Plate	Biozen N-Glycan Clean-Up	5 mg/well	8M-S009-NGA	1/box



Biozen N-Glycan Clean-Up

Novel solid phase extraction (SPE) HILIC stationary phase that excels at retention and recovery of labeled, released N-glycans! Available in microelution 96-well plate format that works extremely well for processing and clean-up of small sample volumes.

www.phenomenex.com/GlycanSPE



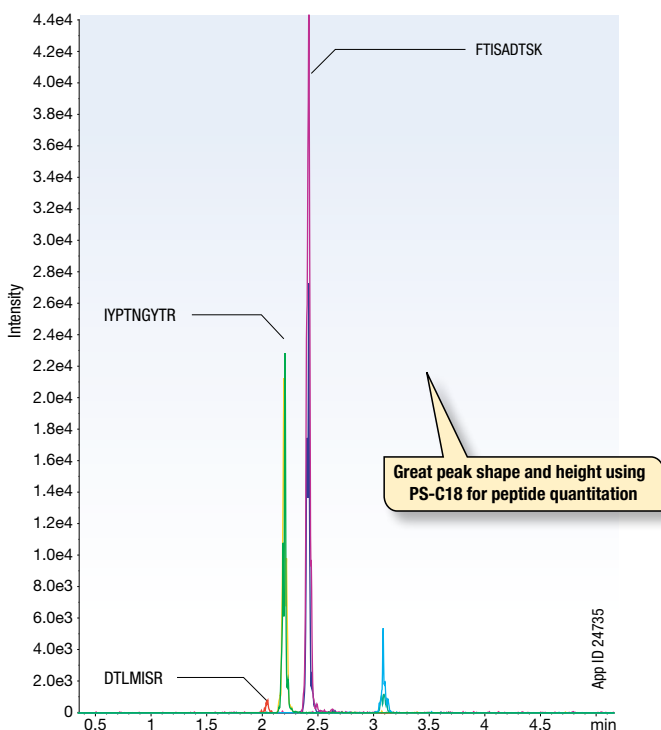
Peptide Quantitation

When quantitating signature peptides from biological matrices, you need sharp peak shape and sufficient retention of hydrophilic peptides to prevent any signal loss from matrix suppression regions. Both Biozen Peptide columns were developed to deliver excellent selectivity for even closely related peptides. Additionally, they build

on this body of valuable characteristics with unique ways of delivering sharper peak shape for basic peptides; Biozen Peptide XB-C18 blocks secondary surface interactions via isobutyl side chains, while the Biozen Peptide PS-C18 contains a positively charged weak base that repels other basic species.

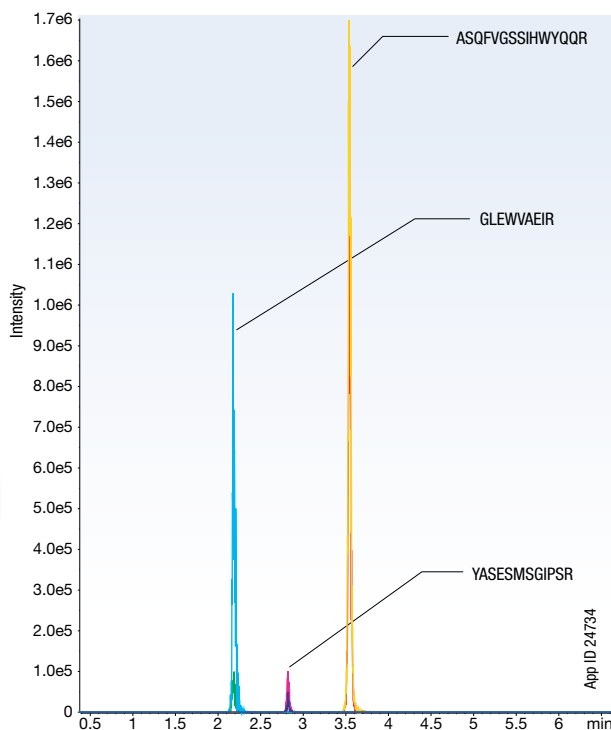
Kadcyla

(4 Signature Peptides)



Infliximab

(3 Signature Peptides)



Conditions same for both samples:

Column: Biozen 3µm Peptide PS-C18

Dimensions: 50 x 2.1 mm

Part No.: 00B-4771-AN

Mobile Phase: A: 0.1 % Formic Acid in Water

B: 0.1 % Formic Acid in Acetonitrile

Gradient	Time (min)	% B
	0	3
	1	3
	4.5	25

Flow Rate: 0.5 mL/min

Temperature: 22 °C

LC System: ExionLC™ AD HPLC

Detection: MS/MS

Detector: SCIEX® QTRAP® 5500

Sample: As noted

Ordering Information

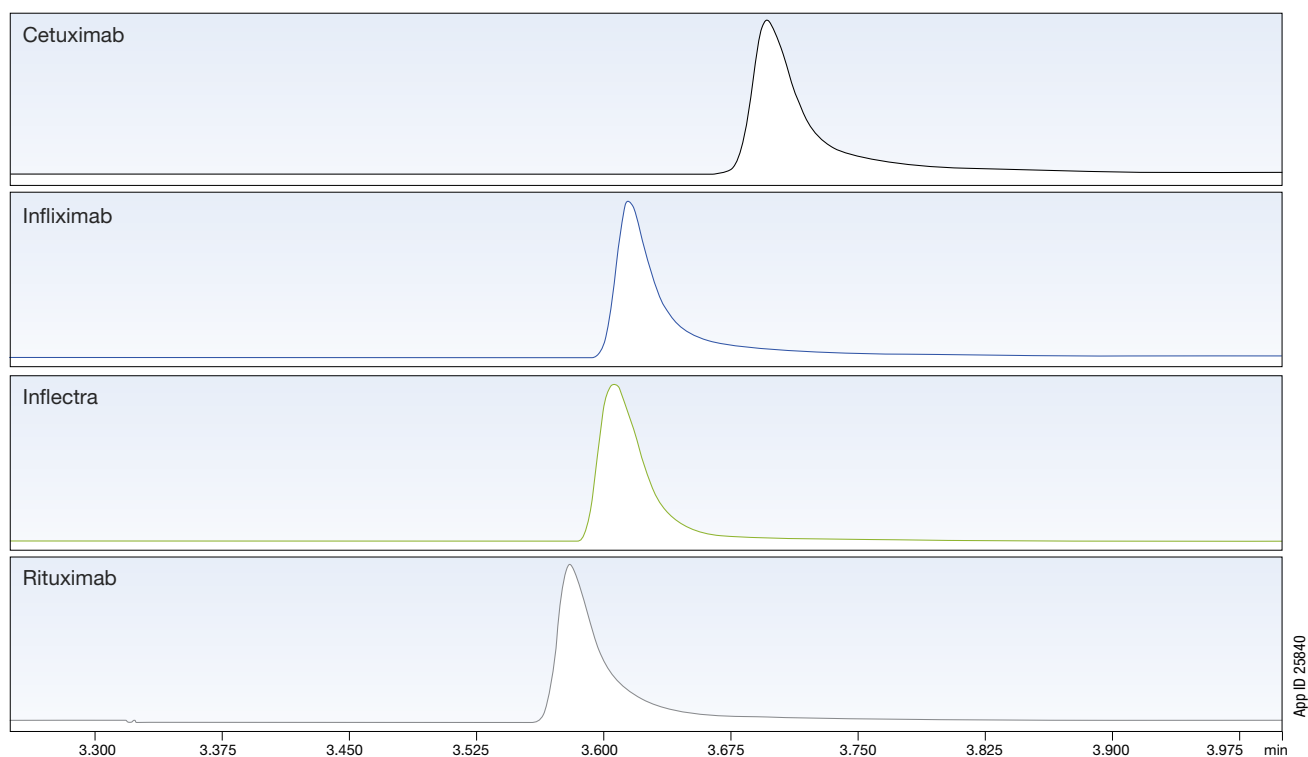
Biozen Columns (mm)						Biocompatible Guard Cartridges		
	50 x 2.1	100 x 2.1	150 x 2.1	50 x 4.6	150 x 4.6	for 2.1 mm	for 4.6 mm	Holder
Biozen 1.6µm Peptide PS-C18	00B-4770-AN	00D-4770-AN	00F-4770-AN	—	—	/3pk AJ0-9803	—	AJ0-9000
Biozen 3µm Peptide PS-C18	00B-4771-AN	—	00F-4771-AN	00B-4771-EQ	00F-4771-EQ	/10pk AJ0-7605	/10pk AJ0-7606	KJ0-4282
Biozen 1.7µm Peptide XB-C18	00B-4774-AN	00D-4774-AN	00F-4774-AN	—	—	/3pk AJ0-9806	—	AJ0-9000
Biozen 2.6µm Peptide XB-C18	00B-4768-AN	00D-4768-AN	00F-4768-AN	00B-4768-EQ	00F-4768-EQ	/3pk AJ0-9806	/3pk AJ0-9808	AJ0-9000

Intact mAbs and Subunit Analysis

Impurity profiling and characterization of intact biologic fragments is a challenging undertaking because of the need to identify very small differences between variants. Biozen WidePore C4 columns contain skillfully manufactured large pore core-shell particles that

provide narrower, taller peaks in conjunction with higher resolution between the target HC/LC, Fc/Fab, or isoforms and are ideal for large biologics to optimize analysis.

Diverse mAb Comparison with Chromatographic Performance Suitable for Intact MS Analysis



Conditions same for all samples:

Column: Biozen 2.6 µm WidePore C4
Dimension: 100 x 2.1 mm
Part No.: [00D-4786-AN](#)
Mobile Phase: A: 0.1 % Formic Acid in Water
 B: 0.1 % Formic Acid in Acetonitrile
Gradient: Time (min) % B
 0 10
 4 90
Flow Rate: 0.3 mL/min
Temperature: 80 °C
Detection: UV @ 280 nm
Sample: mAbs, Various (1 mg/mL)

Improved peak shape for intact mass applications by high resolution MS.

Sample	Retention Time (min)	Width @ (50 %)
Rituximab	3.580	0.0233
Infliximab Biosimilar	3.606	0.0272
Cetuximab	3.696	0.0270
Infliximab	3.615	0.0222

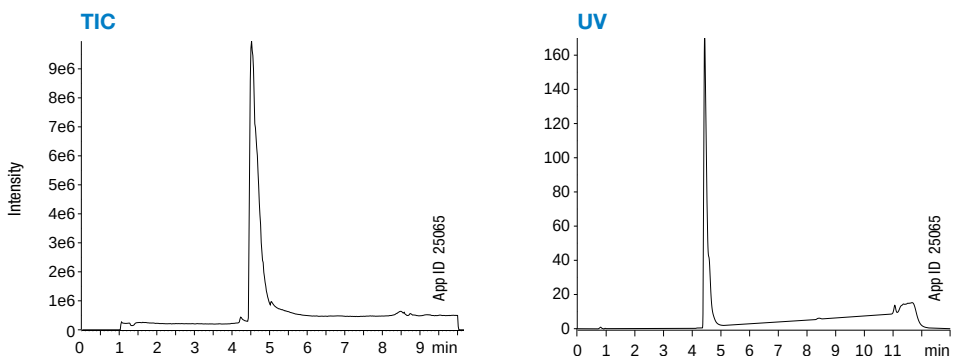
Ordering Information

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
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	AJ0-9816	AJ0-9818	AJ0-9000
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

Intact Mass

Intact Mass can give indications not only of relative abundance of glycoforms, but also stability as degraded mAbs will not give good charge envelope by ESI-MS. Intact Mass with a high resolution MS to identify PTMs, especially relative abundance of glycoforms, combines extremely well with the fast run times and tight peak shapes provided by the Biozen Intact XB-C8 and Biozen WidePore C4.

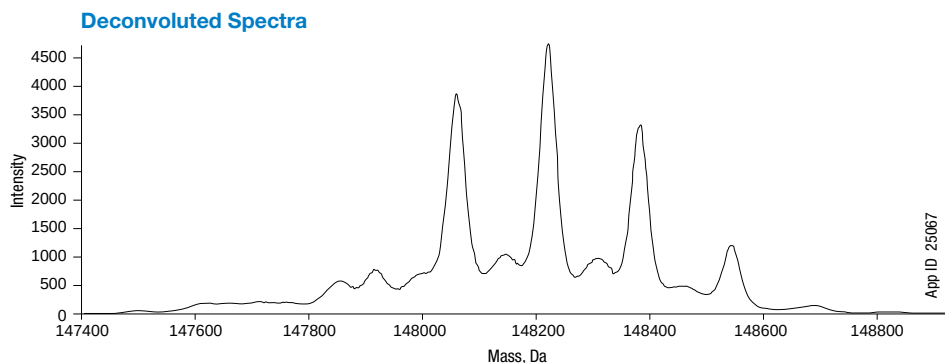
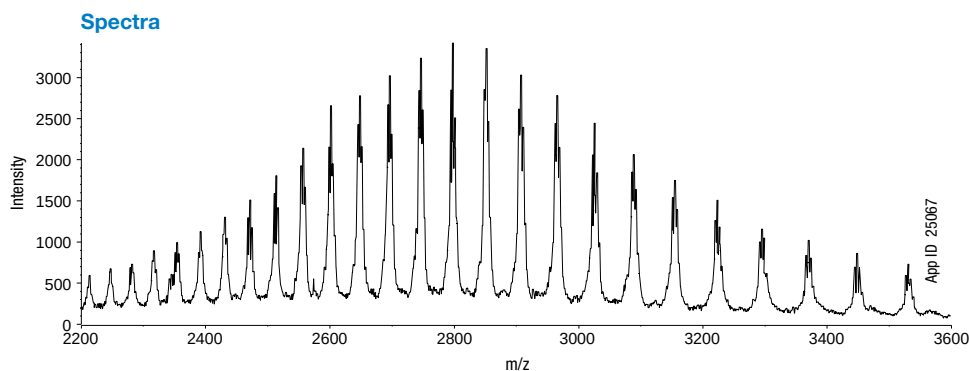
Intact Mass of Trastuzumab Biosimilar using a Biozen Intact XB-C8 and SCIEX® X500B



Columns: Biozen 3.6 µm Intact XB-C8
Dimension: 150 x 2.1 mm
Part No.: [00F-4766-AN](#)
Mobile Phase: A: 0.1 % Formic Acid in Water
 B: 0.1 % Formic Acid in Acetonitrile / Isopropyl alcohol (50:50)
Gradient:

Time (min)	% B
2.5	20
10	65
10.1	95

Flow Rate: 0.3 mL/min
Temperature: 90 °C
Detection: QTOF (SCIEX X500B)
Sample: Trastuzumab



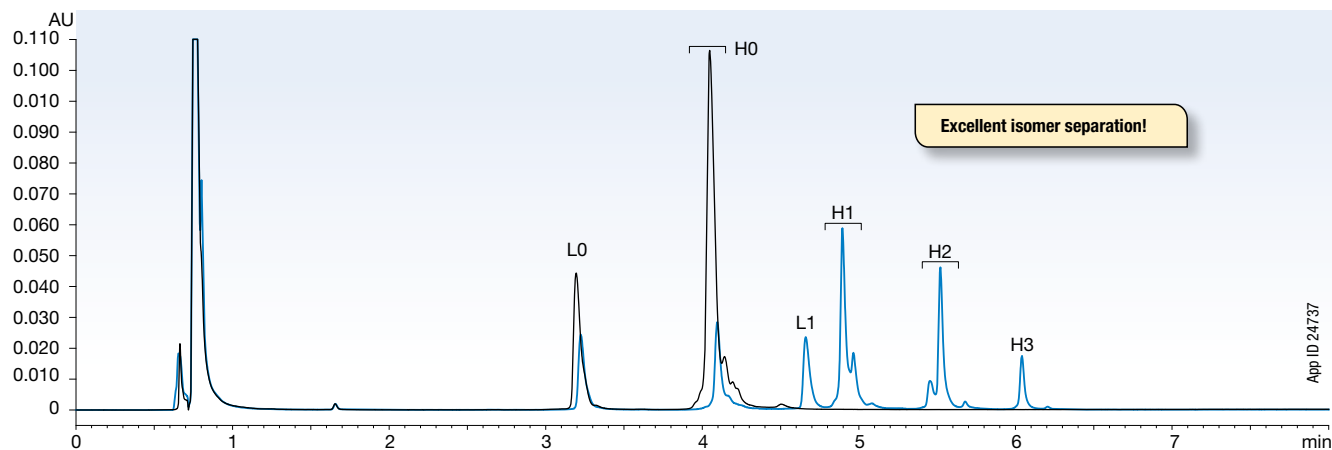
Ordering Information

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
Biozen 2.6 µm WidePore C4	00B-4786-AN	00D-4786-AN	00F-4786-AN	00B-4786-EQ	00D-4786-EQ	00F-4786-EQ	00G-4786-EQ	AJ0-9816	AJ0-9818	AJ0-9000
Biozen 3.6 µm Intact XB-C8	00B-4766-AN	00D-4766-AN	00F-4766-AN	00B-4766-EQ	—	00F-4766-EQ	—	AJ0-9812	AJ0-9814	AJ0-9000

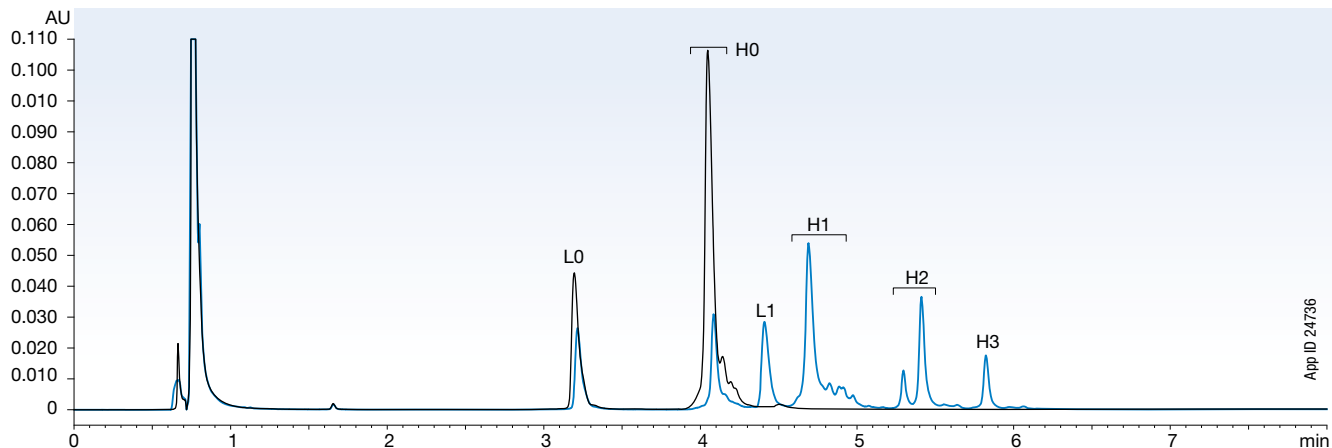
Drug Antibody Ratio (DAR)

With a direct effect on efficacy and safety, conjugation for each ADC must be well understood. The Biozen Intact XB-C8 provides an excellent vehicle for determining drug load distribution and DAR for ADCs. Its large pore size allows intact ADCs to interact with a moderately retentive stationary phase while the core-shell particle supplies increased efficiency to deliver the required resolution between ADC species with differing drug loads.

Herceptin—vcMMAE using Biozen 3.6 µm Intact XB-C8



Herceptin—mcMMAF using Biozen 3.6 µm Intact XB-C8



Acknowledgment

We would especially like to thank Colin McKee and ADC Biotechnology LTD for their support and ADC samples for this application.



Find the conditions online at:
www.phenomenex.com/Biozen

Ordering Information

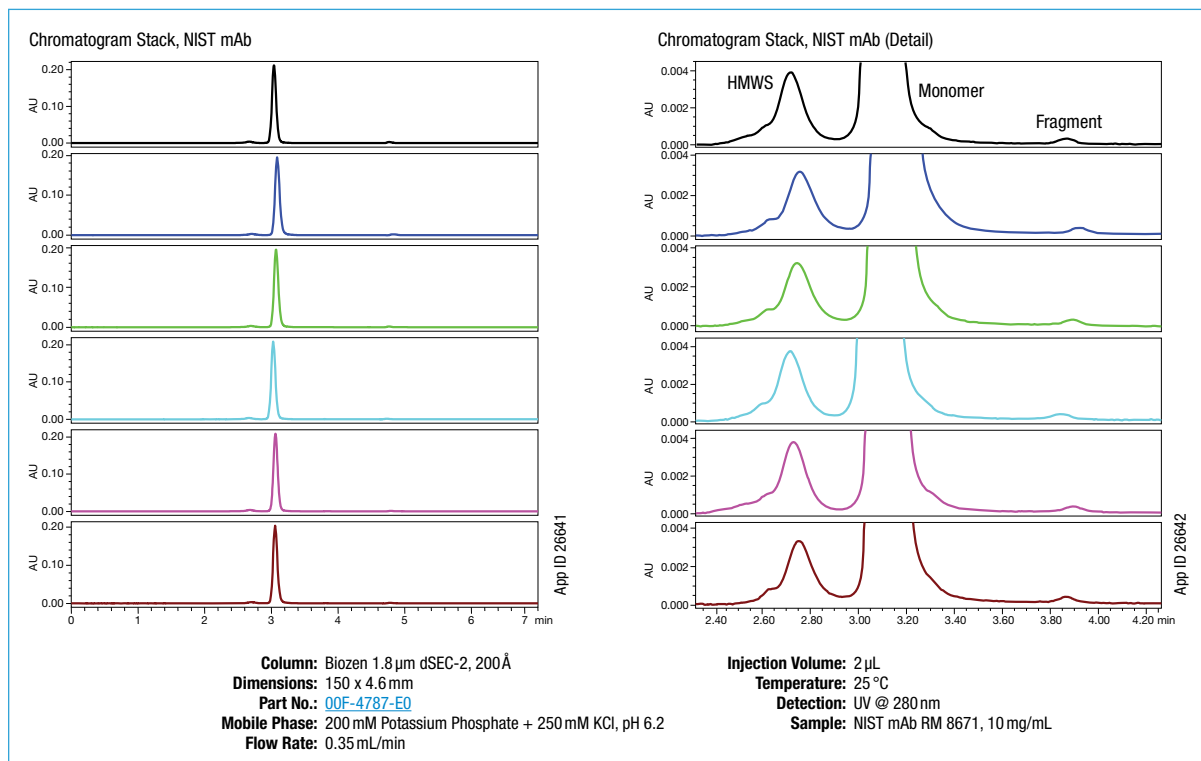
Biozen Columns (mm)								Biocompatible Guard Cartridges		
	50 x 2.1	100 x 2.1	150 x 2.1	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	for 2.1 mm	for 4.6mm	Holder
								/3pk	/3pk	ea
Biozen 2.6 µm WidePore C4	00B-4786-AN	00D-4786-AN	00F-4786-AN	00B-4786-EQ	00D-4786-EQ	00F-4786-EQ	00G-4786-EQ	AJ0-9816	AJ0-9818	AJ0-9000
Biozen 3.6 µm Intact XB-C8	00B-4766-AN	00D-4766-AN	00F-4766-AN	00B-4766-EQ	—	00F-4766-EQ	—	AJ0-9812	AJ0-9814	AJ0-9000

Bio QC Testing

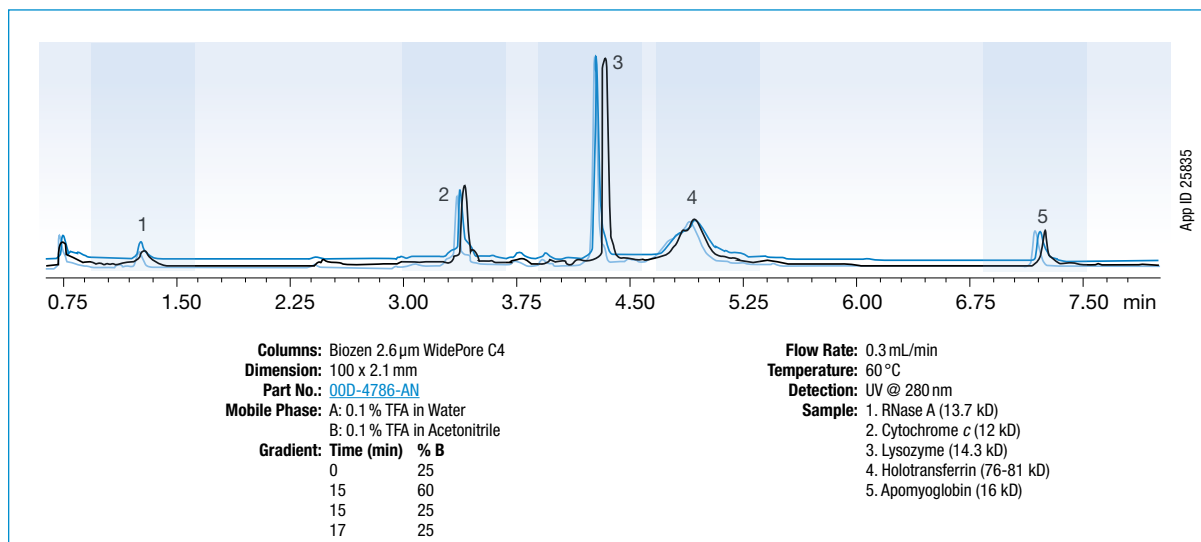
At every stage of our manufacturing and quality testing we keep you and your biologics analysis in mind. We initially focus on innovative products that will enhance workflows, then we work tirelessly to ensure that those products are reliably made time and time again. To further enrich the quality of these products, we assign very specific application-oriented testing protocols that properly mimic the conditions that you and other customers ultimately require.

Each batch of media and each column goes through a gambit of testing to ensure that you're getting our highest level of science, so that you can kick down the door of progress.

Chromatographic Results for NIST mAb, 6 Batch Robustness Assessment using Biozen 1.8 µm dSEC-2



Batch-to-Batch Results—Biozen 2.6 µm WidePore C4



Biozen Nano LC Columns

Biozen Nano Columns offer a powerful combination of an advanced particle platform, three unique column chemistries, and fully integrated SecurityLINK Fitting Technology for a zero dead-volume connection.

- **Integrated SecurityLINK™ fittings for easy installation and leak-free connections (Now with double-ended SecurityLINK)**
- **Maximized resolution for improved protein/peptide identification**
- **Increased robustness and sensitivity**

Advanced Particle Platform

This Biozen particle platform was individually designed and built by Phenomenex to take advantage of integral levels of performance, ruggedness, and reproducibility for omics applications. Individually, each platform differs in the proprietary processing techniques used to control particle size and morphology.

- **High Efficiency**
- **Excellent Inertness**
- **Increased Sensitivity**
- **Exceptional Quality and Robustness**



Core-Shell Technology

3 Unique Nano Chemistries

Peptide		Polar
Biozen Peptide PS-C18 Excellent retention by combined positively charged surface ligand and C18 ligand.	Biozen Peptide XB-C18 Overall retention of both acidic and basic peptides through C18 stationary phase with di-isobutyl side chains.	Biozen Polar C18 Enhanced selectivity / retention for polar analytes without diminishing useful non-polar retention

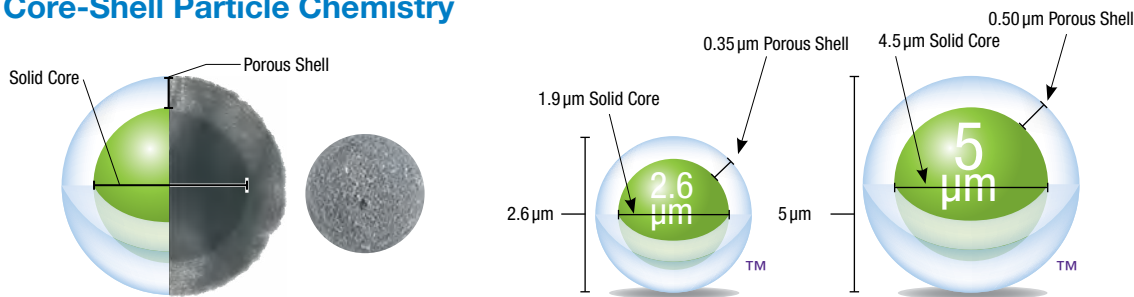


Chat with a live technical expert to learn about our Biozen Nano Connections that are available
www.phenomenex.com/chat

Advanced Core-Shell Particle in Nano Format

The Biozen Nano columns utilize core-shell particles with a highly consistent morphology that minimizes band broadening associated with diffusion and mass transfer, leading to higher efficiency and minimal peak widths, which enhances the separation for omics analysis.

Core-Shell Particle Chemistry



High Efficiency Core-Shell Particle

Using a rigorous core construction process, a uniform porous silica layer is grown around the spherical solid silica core. This unique combination of precise particle architecture and particle size provides dramatic leaps in performance.

Fully Porous		Biozen Nano Core-Shell	Average Efficiency Gain with Biozen Nano Core-Shell
5 µm	VS	5 µm	90 % Higher
3 µm	VS	2.6 µm	85 % Higher
1.7 µm	VS	2.6 µm	Equivalent Efficiency

Better Performance than Fully Porous Particles

Core-Shell Technology provides extremely high efficiencies for omics analysis. Industry leading column packing technology in combination with high particle consistency produces highly reproducible columns that generate greater performance compared to

fully porous particles. This ultra-high efficiency can be leveraged to achieve increased resolution, improved sensitivity, and higher productivity.

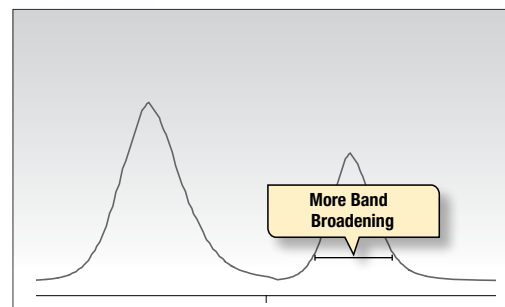
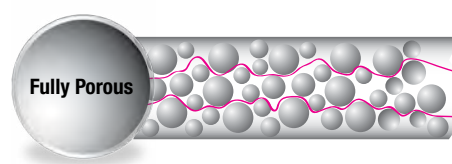
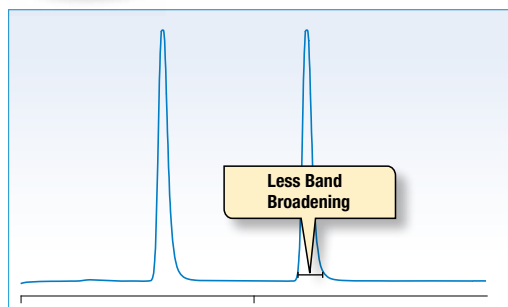
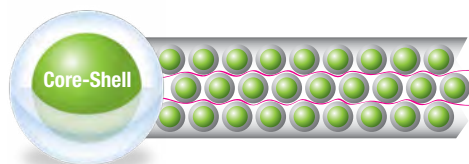
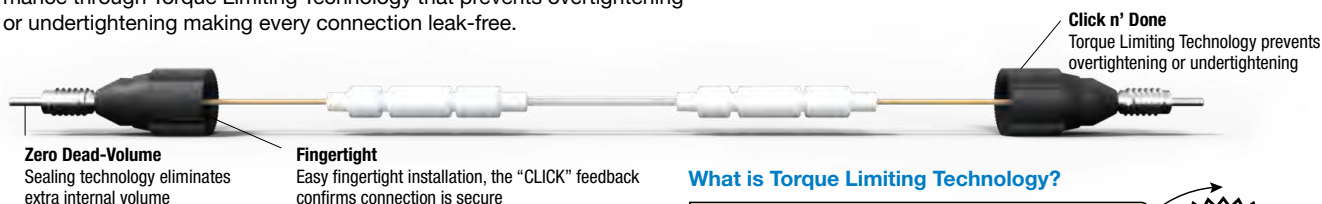


Illustration - not actual test data

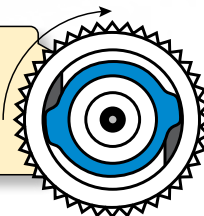
Zero Dead-Volume Nano LC Connections in a CLICK

Biozen Nano's fully integrated SecurityLINK™ fingertight fitting system simplifies your system connections while providing consistent performance through Torque Limiting Technology that prevents overtightening or undertightening making every connection leak-free.

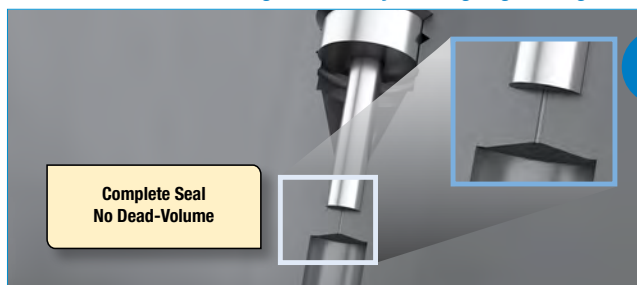


What is Torque Limiting Technology?

Once the perfect connection has been made through fingertightening, the SecurityLINK fitting offers a haptic "CLICK" to confirm that optimum torque has been reached. This ensures a consistent connection each and every time and prevents over or undertightening that may cause column performance issues.

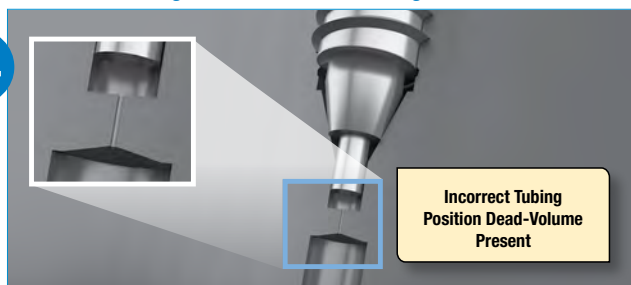


Biozen Nano Column with Integrated SecurityLINK Fingertight Fittings



VS.

Nano Columns using Standard Nut Ferrule Fittings



Biozen Nano LC Columns with Integrated SecurityLINK™ Fitting

Ordering Information

Biozen Nano LC Columns (mm)				
Phases	150 x 0.075 mm	250 x 0.075 mm	500 x 0.075 mm	
Biozen 2.6 µm Peptide PS-C18	00F-4797-AW-21	00G-4797-AW-21	—	
Biozen 2.6 µm Peptide XB-C18	00F-4768-AW-21	00G-4768-AW-21	00J-4768-AW-21	
Biozen 2.6 µm Polar-C18	00F-4796-AW-21	00G-4796-AW-21	—	
Biozen 5 µm Peptide XB-C18	—	—	00J-4792-AW-21	

Biozen Nano LC Columns with Double SecurityLINK™ Fitting

Ordering Information

Biozen Nano LC Columns (mm)				
Phases	150 x 0.075 mm	250 x 0.075 mm	500 x 0.075 mm	
Biozen 2.6 µm Peptide PS-C18	00F-4797-AW-22	00G-4797-AW-22	—	
Biozen 2.6 µm Peptide XB-C18	00F-4768-AW-22	00G-4768-AW-22	00J-4768-AW-22	
Biozen 2.6 µm Polar-C18	00F-4796-AW-22	00G-4796-AW-22	—	
Biozen 5 µm Peptide XB-C18	—	—	00J-4792-AW-22	

Biozen Nano LC Columns with Open Fused-Silica Inlet Fitting

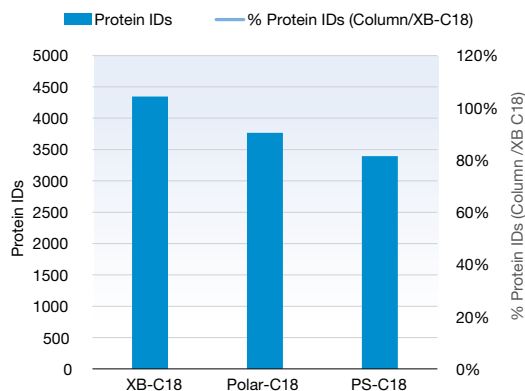
Ordering Information

Biozen Nano LC Columns (mm)				
Phases	150 x 0.075 mm	250 x 0.075 mm	500 x 0.075 mm	
Biozen 2.6 µm Peptide PS-C18	00F-4797-AW-11	00G-4797-AW-11	—	
Biozen 2.6 µm Peptide XB-C18	00F-4768-AW-11	00G-4768-AW-11	—	
Biozen 2.6 µm Polar-C18	00F-4796-AW-11	00G-4796-AW-11	—	
Biozen 5 µm Peptide XB-C18	—	—	00J-4792-AW-11	

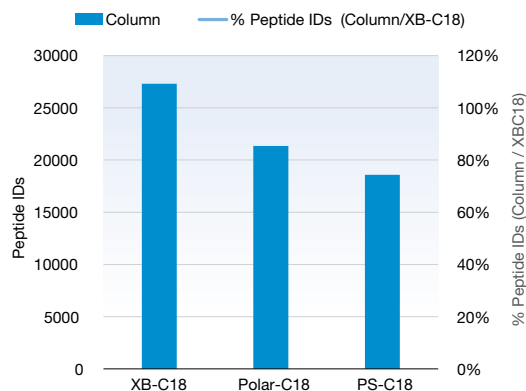
Complementary Column and Trap Selectivity Portfolio for Improved IDs of Complex Omics Samples

Number of proteins and peptides that were identified on a nano LC-MS analysis of a digested HeLa sample using a Biozen 2.6µm Peptide XB-C18 column formatted in direct inject, trap and elute.

Peptide XB-C18 + Trap Selectivity Protein Identifications



Peptide XB-C18 + Trap Selectivity Peptide Identifications



High pH Fractionation Column

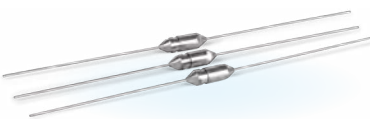
Fractionation Column		
Part No.	Description	Dimension
00F-4793-AN	Biozen 3 µm High pH Fractionation Column	150 x 2.1 mm



More information about traps and fractionation columns on page 230 and 231

Nano Trap Columns

Trap Columns		
Phases	10 x 0.075 mm	Unit
RP-1 (General RP)	05N-4252-AW	3/pk
RP-2 (Aqueous Stable RP)	05N-4754-AW	3/pk



Complementary Nano LC Column and Trap Selectivity

Similar to analytical scale LC, the performance and optimization of your separation is directly affected by the chosen stationary phase. By utilizing different combinations of column and trap selectivities you can positively alter relative recovery and separation performance

Nano Trap Columns

Ordering Information

Trap Columns (mm)		
Phases	10 x 0.075	Unit
RP-1 (General RP)	05N-4252-AW	3/pk
RP-2 (Aqueous Stable RP)	05N-4754-AW	3/pk



Trap Fitting Guide

Threads per Inch	Pitch (inches)	Pitch (mm)
32	0.0313	0.794
40	0.025	0.635

Caution

The installation of an improper nut could potentially cause cross-threading or damage to the port and fitting. Verify fit: Traps are available for 1/16" connections (10-32 thread) or with 1/32" connections (6-40 or 6-32 thread).

Fittings

Ordering Information

Trap Fittings		
Part No.	Description	Unit
AQO-7602	PEEKlok™ fittings with 6-40 thread for 1/32" OD tubing (2 x fittings, 6 x ferrules and 1 x tightening tool)	ea
AQO-7603	PEEKlok fittings with 6-32 thread for 1/32" OD tubing (2 x fittings, 6 x ferrules and 1 x tightening tool)	ea
AQO-7600	PEEKlok fittings with 10-32 thread for 1/16" OD tubing with low profile hex head (2 x fittings, 6 x ferrules and 1 x wrench)	ea



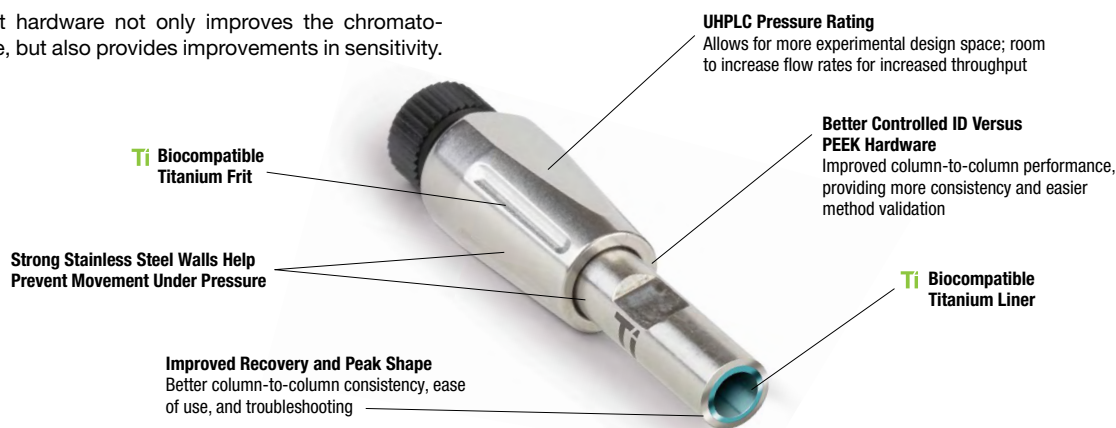
Biozen High pH Fractionation Column

Bio-Inert Hardware

The Biozen High pH Fractionation HPLC Column provides superior performance with its titanium hardware which minimizes nonspecific adsorption resulting in increased confidence in your peptide identifications.

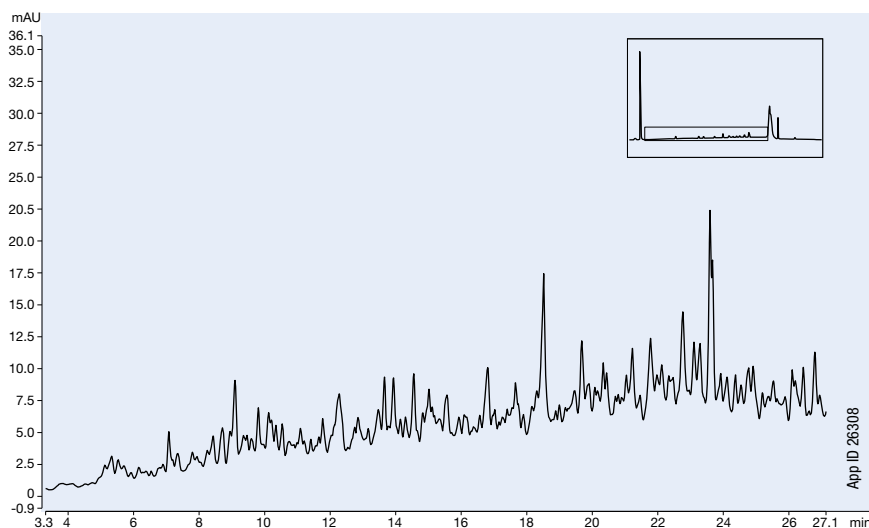
Inside the Biozen Biocompatible Hardware Difference

The use of bio-inert hardware not only improves the chromatographic performance, but also provides improvements in sensitivity.



Deep Proteome Coverage on HeLa Lysate using a Biozen Fractionation Column for High pH

UV trace of a 30 minute basic pH reversed phase separation using 100 µg of HeLa tryptic digest.



Fractionation LC Conditions

Column: Biozen 3 µm High pH Fractionation Column
Dimension: 150 x 2.1 mm
Part No.: [00F-4793-AN](#)
Pressure (bar): 150 bar
Mobile Phase: A: 10 mM Ammonium formate in Water
 B: 10 mM Ammonium formate in 90 % Acetonitrile and 10 % Water
Gradient:

Time (min)	% B
0	1
1	1
25	25
27	60
28	70
33	70
34	1

Flow Rate: 300 µL/min
Temperature: 50 °C
LC System: Vanquish™ Flex UHPLC
Detection: UV @ 280 nm
Injection Volume: 100 µL
µg on Column: 100 µg

High pH Fractionation Column

Ordering Information

Fractionation Column		
Part Number	Description	Dimension
00F-4793-AN	Biozen 3 µm High pH Fractionation Column	150 x 2.1 mm

