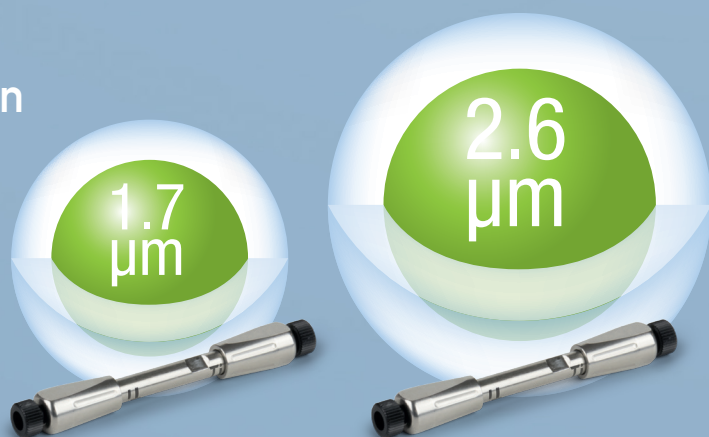




# Advanced Oligonucleotide Analysis

Increased Recovery and Reproducibility  
with **NEW bioZen Oligo**

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



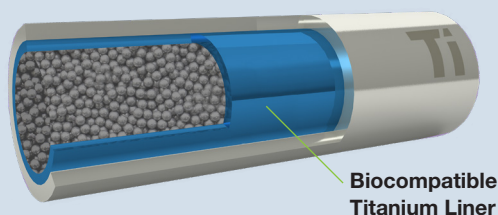
# Inside the bioZen Oligo Biocompatible Hardware Difference

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

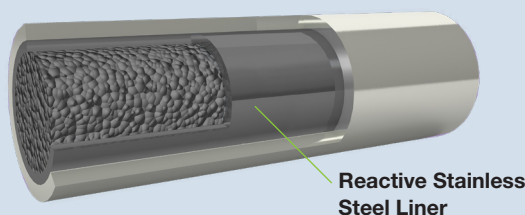


## BioTi LC Hardware Minimizes Adsorptive Interactions and Sample Loss

**Biocompatible Column Hardware**

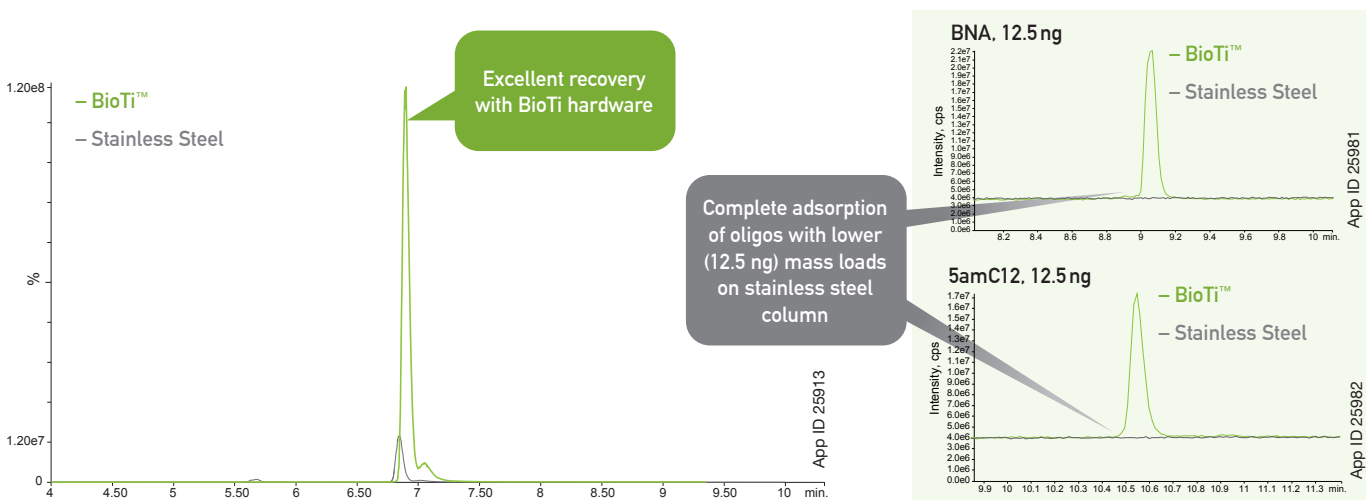


**Stainless Steel Column Hardware**



## 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 bio-inert hardware provides greater sensitivity as well as improved recovery, demonstrating this column's optimal utility for oligonucleotide characterization and quantitation.

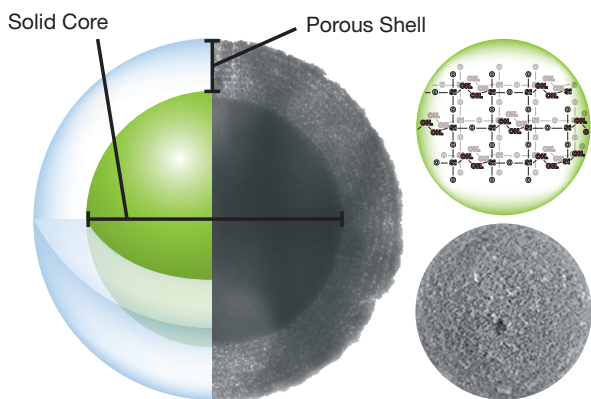


BioTi ensures method robustness and consistency from injection to injection!

# Patented Technology and Advanced Core-Shell Particle Chemistry

The bioZen™ Oligo Columns utilize organo-silica 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 is critical for the separation of closely eluting impurities associated to synthetic oligonucleotides.

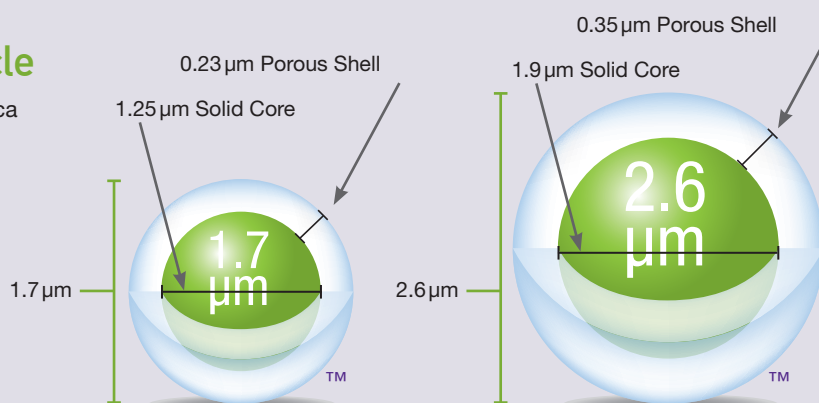
## Patented Core-Shell Particle Chemistry



bioZen Oligo uses a patented organo-silica grafting process that incorporates uniform stabilizing ethylene cross-linking to provide resistance to high pH and temperature which are fundamental to reversed phase analysis of oligonucleotides.

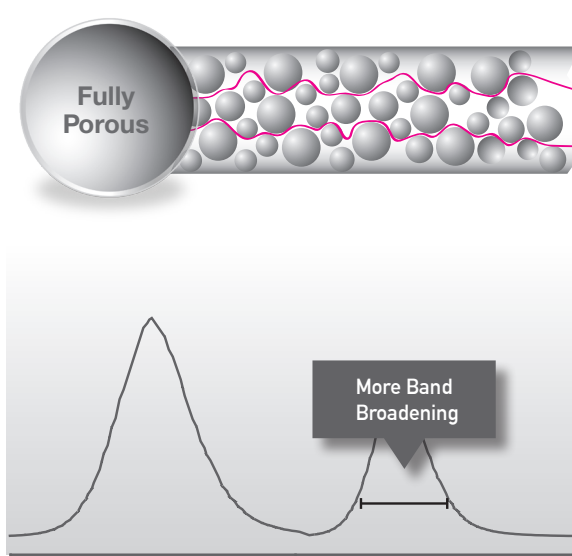
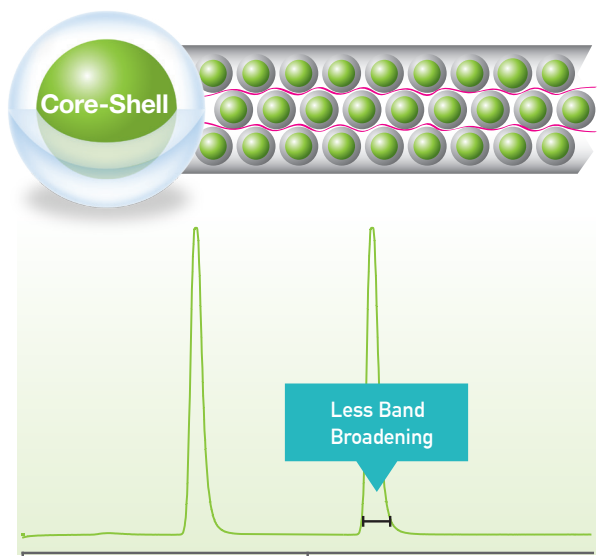
## High Efficiency Core-Shell Particle

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.



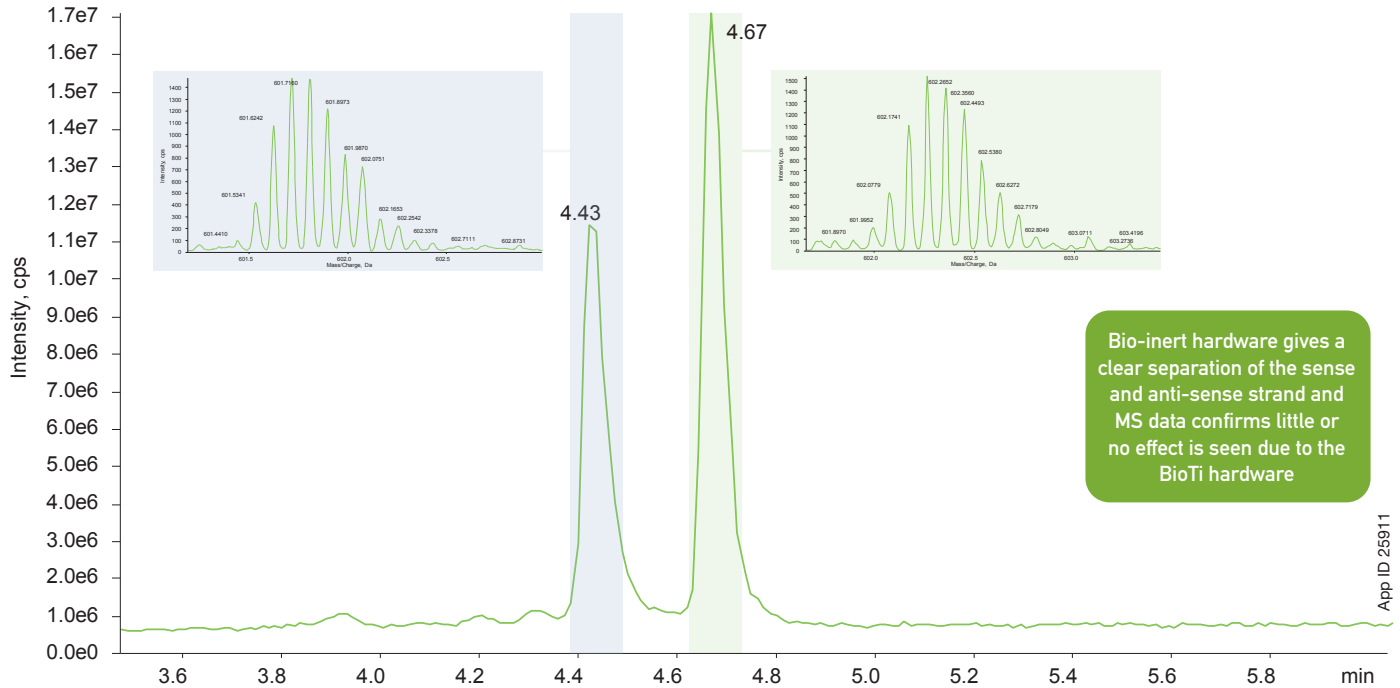
## Better Performance than Fully Porous Particles

Core-Shell Technology provides extremely high efficiencies for both low and high oligo concentrations. Industry leading column packing technology in combination with high particle consistency and density helps create optimal bed structure which reduces band broadening effects of Eddy Diffusion to produce 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.



# BioTi vs Stainless Steel Column Hardware

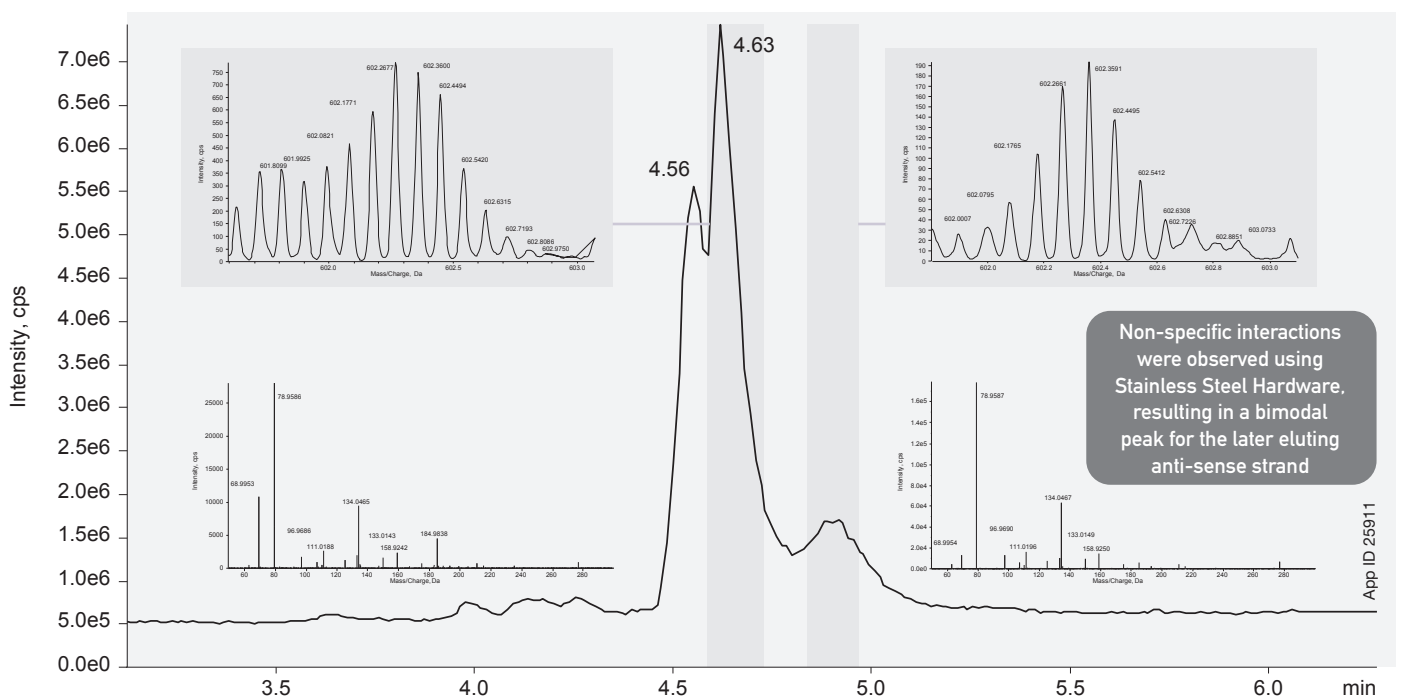
## LC-MS Analysis of siRNA using BioTi UHPLC Hardware



App ID 25911

Vs

## LC-MS Analysis of siRNA using Stainless Steel UHPLC Hardware

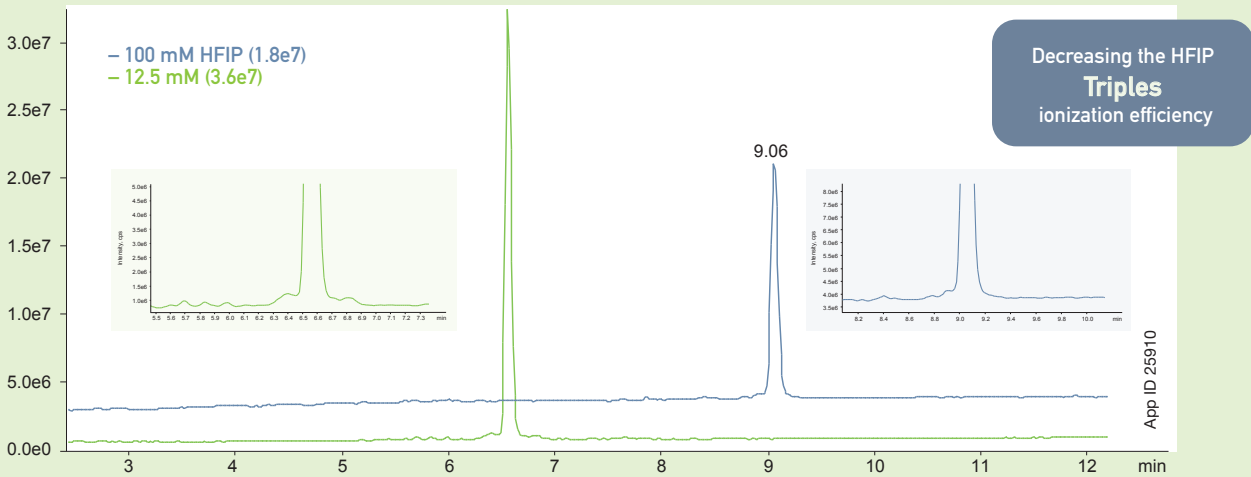


App ID 25911

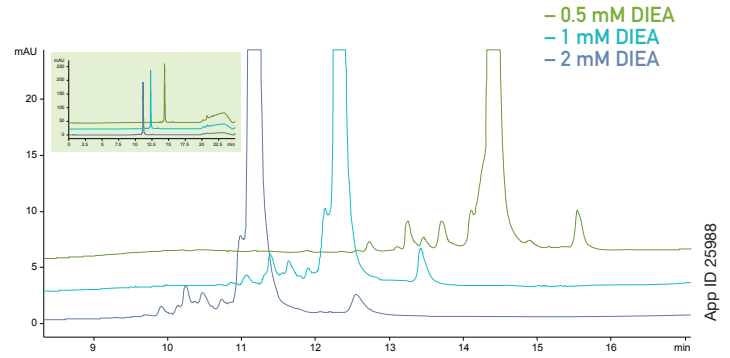
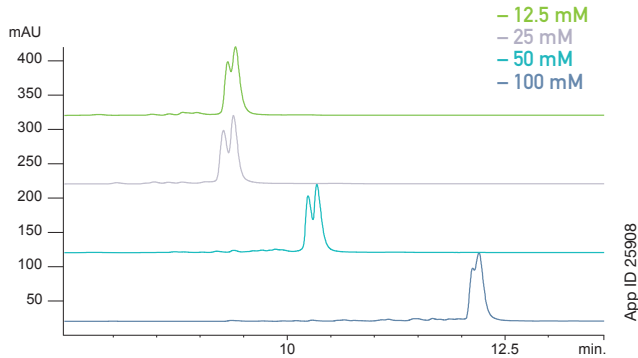
# Method Development Optimization

## Mobile Phase Optimization for Oligonucleotide with bioZen Oligo

### Effect of HFIP on Ionization Efficiency

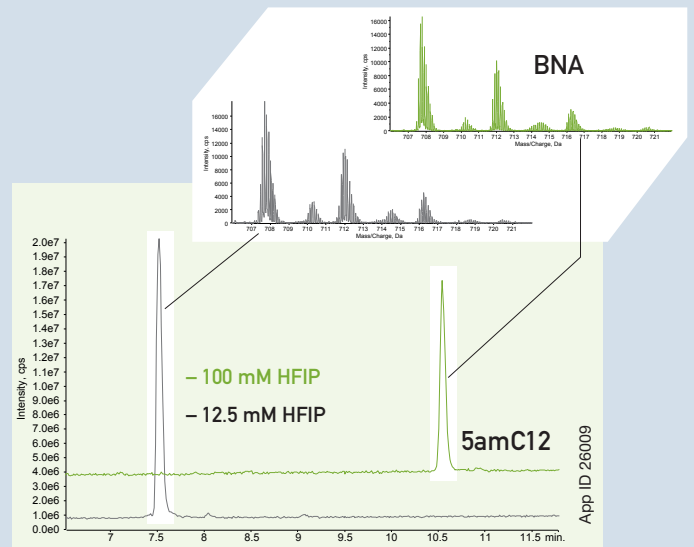
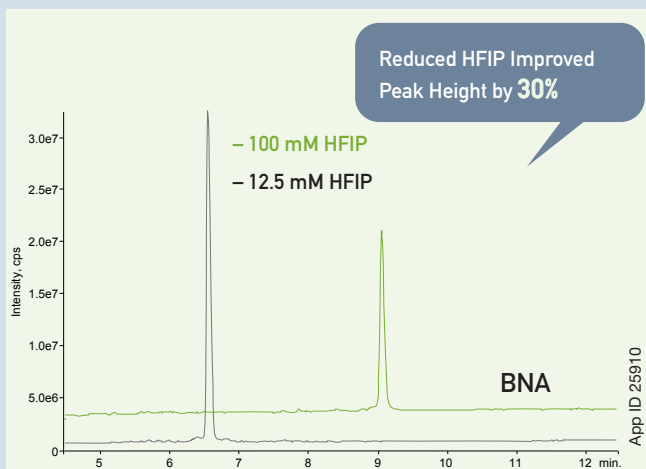


### Effect of HFIP Concentration on siRNA



Improved separation of sense/antisense of an siRNA when decreasing HFIP concentration

### Effect of HFIP on Oligo Peak Shape and Recovery



Interested in learning more about these applications?



[www.Phenomenex.com/OligoChat](http://www.Phenomenex.com/OligoChat)

Phenomenex | WEB: [www.phenomenex.com](http://www.phenomenex.com)

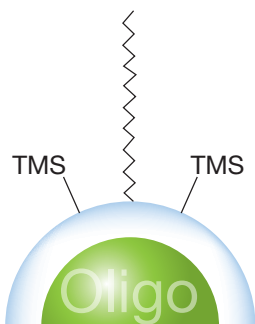
# Introducing bioZen™ Oligo

## A New Solution for Oligonucleotide Analysis and Characterization

With a single innovative product line, bioZen separation products provide enhanced characterization over an incredibly wide range of techniques.

### Oligonucleotide

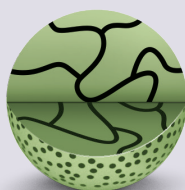
**NEW**



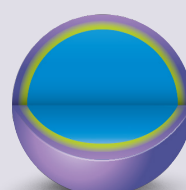
**bioZen Oligo**  
1.7µm and 2.6µm

Organo-silica core-shell bonded particle with a pH 1-12 stable C18 stationary phase that delivers speed, robust methods, and improved peak shape for Oligo analysis.

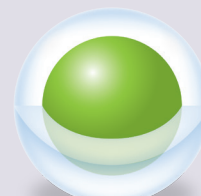
## 3 Particle Platforms



Thermally Modified Fully Porous



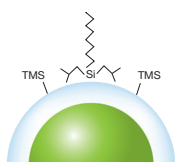
Monosized Polymeric Non-Porous



Core-Shell Technology

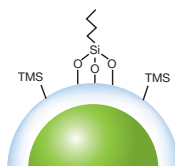
## 9 Particle Chemistries

### Intact/Subunit



**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.



**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.

### Size Exclusion (SEC)



**bioZen SEC-2**  
1.8µm

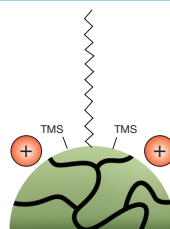
Extremely inert, high density fully porous particle with high efficiency and low molecular weight (LMW) separation range of 1k-450kDa.



**bioZen SEC-3**  
1.8µm

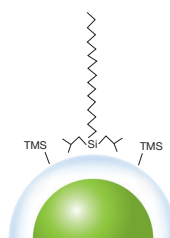
Extremely inert, high density fully porous particle with high efficiency and high molecular weight (HMW) separation range of 10k-700kDa.

### Peptide



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

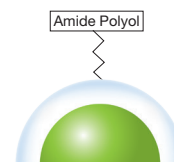
Excellent retention by combined positively charged surface ligand and C18 ligand.



**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.

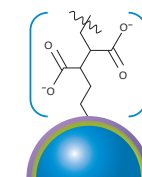
### Glycan



**bioZen Glycan**  
2.6µm

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

### 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                   | 300 x 4.6                   | for 2.1 mm                     | for 4.6 mm               | Holder                   |
| bioZen 2.6 µm Glycan         | <a href="#">00B-4773-AN</a> | <a href="#">00D-4773-AN</a> | <a href="#">00F-4773-AN</a> | —                           | —                           | —                           | —                           | —                           | 3/pk                           | —                        | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9800</a>       | —                        | <a href="#">AJ0-9000</a> |
| bioZen 1.6 µm Peptide PS-C18 | <a href="#">00B-4770-AN</a> | <a href="#">00D-4770-AN</a> | <a href="#">00F-4770-AN</a> | —                           | —                           | —                           | —                           | —                           | 3/pk                           | —                        | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9803</a>       | —                        | <a href="#">AJ0-9000</a> |
| bioZen 3 µm Peptide PS-C18   | <a href="#">00B-4771-AN</a> | —                           | <a href="#">00F-4771-AN</a> | <a href="#">00B-4771-E0</a> | —                           | <a href="#">00F-4771-E0</a> | —                           | —                           | 10/pk                          | 10/pk                    | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-7605</a>       | <a href="#">AJ0-7606</a> | <a href="#">KJ0-4282</a> |
| bioZen 1.7 µm Peptide XB-C18 | <a href="#">00B-4774-AN</a> | <a href="#">00D-4774-AN</a> | <a href="#">00F-4774-AN</a> | —                           | —                           | —                           | —                           | —                           | 3/pk                           | —                        | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9806</a>       | —                        | <a href="#">AJ0-9000</a> |
| bioZen 2.6 µm Peptide XB-C18 | <a href="#">00B-4768-AN</a> | <a href="#">00D-4768-AN</a> | <a href="#">00F-4768-AN</a> | <a href="#">00B-4768-E0</a> | —                           | <a href="#">00F-4768-E0</a> | —                           | —                           | 3/pk                           | 3/pk                     | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9806</a>       | <a href="#">AJ0-9808</a> | <a href="#">AJ0-9000</a> |
| bioZen 2.6 µm WidePore C4    | <a href="#">00B-4786-AN</a> | <a href="#">00D-4786-AN</a> | <a href="#">00F-4786-AN</a> | <a href="#">00B-4786-E0</a> | <a href="#">00D-4786-E0</a> | <a href="#">00F-4786-E0</a> | <a href="#">00G-4786-E0</a> | —                           | 3/pk                           | 3/pk                     | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9816</a>       | <a href="#">AJ0-9818</a> | <a href="#">AJ0-9000</a> |
| bioZen 3.6 µm Intact XB-C8   | <a href="#">00B-4766-AN</a> | <a href="#">00D-4766-AN</a> | <a href="#">00F-4766-AN</a> | <a href="#">00B-4766-E0</a> | —                           | <a href="#">00F-4766-E0</a> | —                           | —                           | 3/pk                           | 3/pk                     | ea                       |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | <a href="#">AJ0-9812</a>       | <a href="#">AJ0-9814</a> | <a href="#">AJ0-9000</a> |
|                              | 50 x 2.1                    | 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                   | 300 x 4.6                      | for 4.6 mm               | Holder                   |
|                              |                             |                             |                             |                             |                             |                             |                             |                             |                                | 3/pk                     | ea                       |
| bioZen 1.8 µm SEC-2          | <a href="#">00B-4769-AN</a> | —                           | <a href="#">00F-4769-AN</a> | —                           | —                           | <a href="#">00F-4769-E0</a> | —                           | —                           | <a href="#">00H-4769-E0</a>    | <a href="#">AJ0-9850</a> | <a href="#">AJ0-9000</a> |
| bioZen 1.8 µm SEC-3          | <a href="#">00B-4772-AN</a> | —                           | <a href="#">00F-4772-AN</a> | —                           | —                           | <a href="#">00F-4772-E0</a> | <a href="#">00F-4772-E0</a> | —                           | <a href="#">00H-4772-E0</a>    | <a href="#">AJ0-9851</a> | <a href="#">AJ0-9000</a> |
|                              | 50 x 2.1                    | 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                   | 300 x 4.6                      | for 4.6 mm               | Holder                   |
|                              |                             |                             |                             |                             |                             |                             |                             |                             |                                | 10/pk                    | ea                       |
| bioZen 6 µm WCX              | <a href="#">00B-4777-AN</a> | <a href="#">00D-4777-AN</a> | <a href="#">00F-4777-AN</a> | <a href="#">00G-4777-AN</a> | <a href="#">00B-4777-E0</a> | <a href="#">00D-4777-E0</a> | <a href="#">00F-4777-E0</a> | <a href="#">00G-4777-E0</a> | —                              | <a href="#">AJ0-9400</a> | <a href="#">KJ0-4282</a> |
|                              | 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                   | 300 x 4.6                   | for 2.1 mm                     | for 4.6 mm               | Holder                   |
|                              |                             |                             |                             |                             |                             |                             |                             |                             | 3/pk                           | 3/pk                     | ea                       |
| bioZen 2.6 µm Oligo          | <a href="#">00B-4790-AN</a> | <a href="#">00D-4790-AN</a> | <a href="#">00F-4790-AN</a> | <a href="#">00B-4790-E0</a> | <a href="#">00D-4790-E0</a> | <a href="#">00F-4790-E0</a> | —                           | —                           | <a href="#">AJ0-9820</a>       | <a href="#">AJ0-9822</a> | <a href="#">AJ0-9000</a> |
| bioZen 1.7 µm Oligo          | <a href="#">00B-4791-AN</a> | <a href="#">00D-4791-AN</a> | <a href="#">00F-4791-AN</a> | —                           | —                           | —                           | —                           | —                           | <a href="#">AJ0-9820</a>       | <a href="#">AJ0-9822</a> | <a href="#">AJ0-9000</a> |

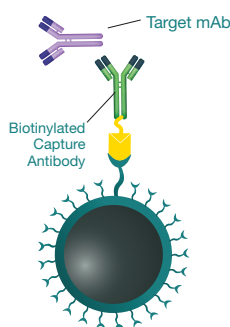
## Sample Preparation

| bioZen Solid Phase Extraction | Format                     | Sorbent Mass | Part Number                 | Unit  |
|-------------------------------|----------------------------|--------------|-----------------------------|-------|
| bioZen N-Glycan Clean-Up      | Microelution 96-Well Plate | 5 mg/well    | <a href="#">8M-S009-NGA</a> | 1/box |



## bioZen MagBeads Streptavidin Coated

| Formats                | Part No.                 | Concentration | Bead Size |
|------------------------|--------------------------|---------------|-----------|
| 25 mg (≈50 samples)    | <a href="#">KSO-9531</a> | 20 mg/mL      | 1.0 µm    |
| 50 mg (≈100 samples)   | <a href="#">KSO-9532</a> |               |           |
| 500 mg (≈1000 samples) | <a href="#">KSO-9533</a> |               |           |



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