

Precision Engineered Core-Shell Particles for Ultra-High Resolution BioSeparations

Aeris is a specialized line of reversed phase core-shell UHPLC columns, built exclusively for the ultra-high performance separation and analysis of proteins and peptides.

Core-shell particle technology provides striking increases in peak capacity and resolution at lower backpressures, giving chromatographers the ability to use longer (or coupled) columns for BioSeparations. Additionally, optimizing the pore size and shell thickness for intact proteins or smaller peptide fragments leads to maximum separation power.

If you are not completely satisfied with Aeris core-shell columns, send in your comparative data to a similar product within 45 days and KEEP THE COLUMN FOR FREE.



For more in-depth information about Aeris core-shell columns and to select the right column for your application, please visit p. 295

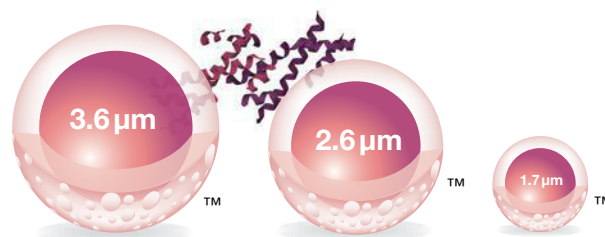
Aeris PEPTIDE Columns for Peptide and Peptide Mapping Separations

Aeris PEPTIDE particles are designed with small pores, inert XB-C18 surface chemistry, and three different particle sizes (3.6 μm , 2.6 μm , and 1.7 μm) to meet the resolution demands of chromatographers performing complex peptide and peptide map separations on HPLC and/or UHPLC systems.

Recommended for:

- Synthetic peptide impurity analysis
- Peptide mapping
- Identifying protein modifications
Glycosylation, Substitution, and Truncation
- Analyzing post-translational modifications
Deamidation, Oxidation, and Deletions

Aeris PEPTIDE



Small pore optimized for peptides and for peptide mapping

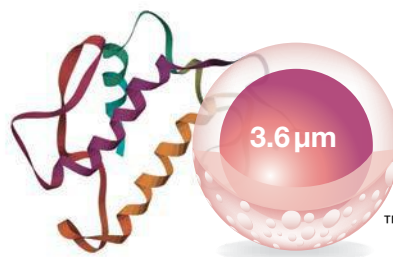
Aeris WIDEPORE Columns for Intact Protein and Polypeptide Separations

Aeris WIDEPORE columns are packed with 3.6 μm core-shell particles that are specially engineered with a thin porous shell, large pores, and sterically protected XB surface chemistry resulting in low backpressures, fast rates of diffusion, and excellent selectivity, generating exceptional chromatographic resolution on UHPLC systems.

Recommended for:

- Protein structural characterization
- Stability indicating assays
- Post-translational modification identification
- PEGylated proteins, antibodies, biogenics, etc.
- Impurity profiling
- Peptide mapping

Aeris WIDEPORE



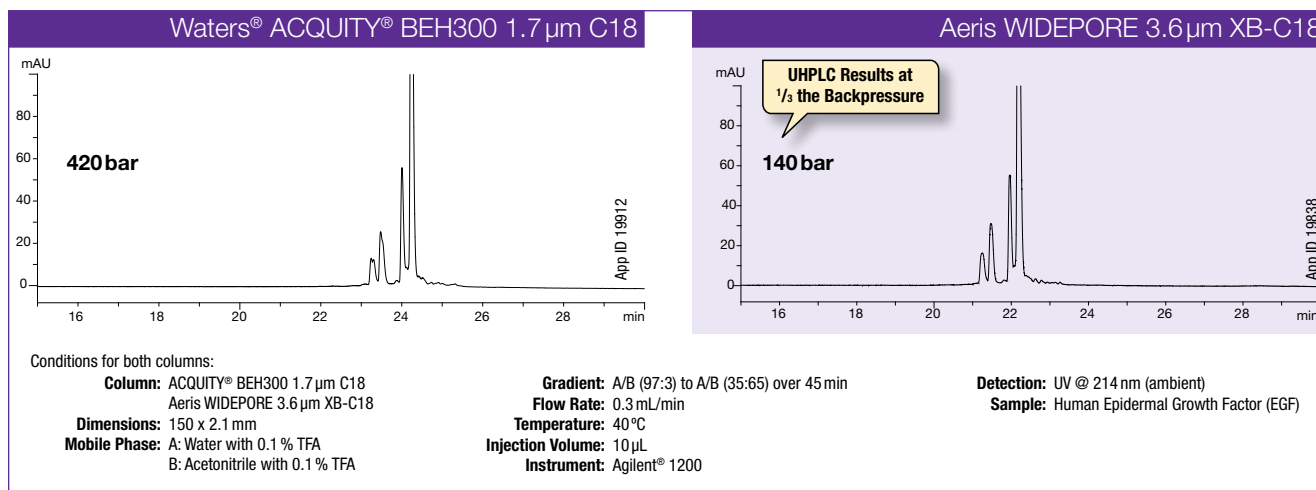
Large pore optimized for intact proteins and polypeptides

Maximize UHPLC Resolving Power with Unique 3.6 µm Core-Shell Particle

3.6 µm core-shell technology combined with inert surface chemistries and tight packing specifications results in Aeris WIDEPORE columns delivering exceptional resolving power at significantly lower backpressures. Chromatographers now have the ability to

generate higher quality data than typically produced by columns packed with fully porous particles for every protein analysis.

Performance Equivalent to Sub-2 µm Particle at Low Backpressure

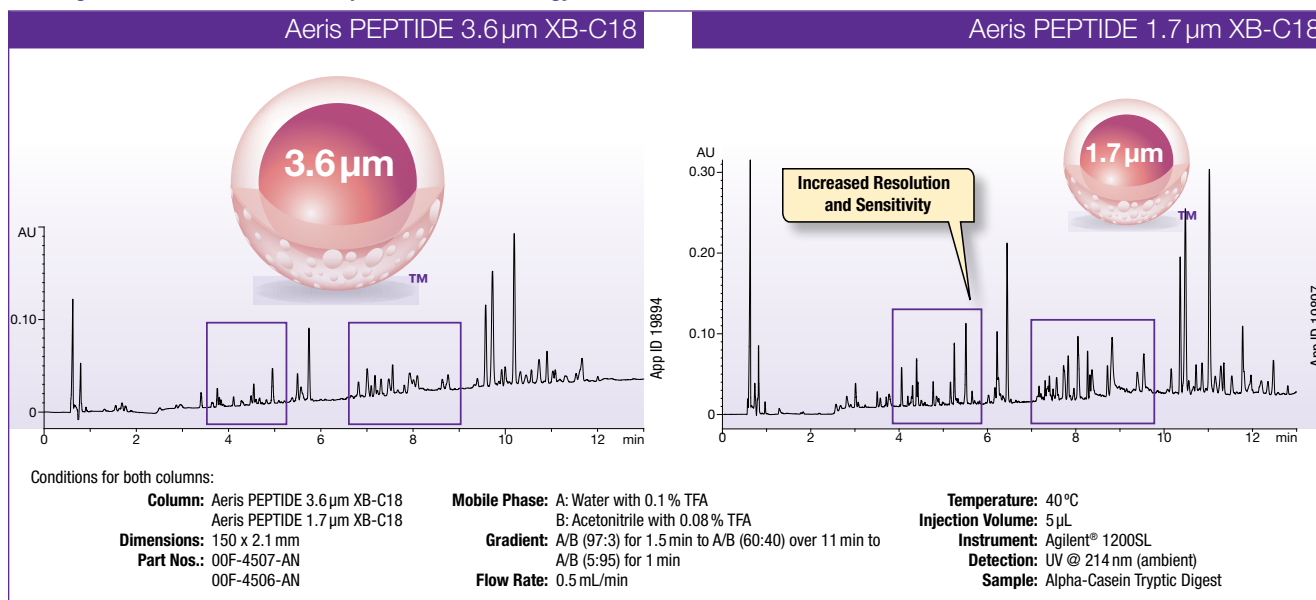


Increase Efficiency on UHPLC Systems with Sub-2 µm Core-Shell Particles

Aeris PEPTIDE 1.7 µm core-shell columns are an excellent solution for ultra-high resolution peptide and peptide mapping separations. Core-shell particle technology combined with a sub-2 µm particle

size results in extremely high efficiencies that scientists can use to pull apart critical peaks.

Ultra-High Resolution Achieved with 1.7 µm Core-Shell Technology



Greater Method Flexibility with Specialty Surface Chemistries

Aeris WIDEPORE columns are available in three surface chemistries (XB-C18, XB-C8, C4) to satisfy applications of all types, ranging from sticky, intact proteins to complex protein digests.

Aeris PEPTIDE columns utilize the XB-C18 chemistry, as it is excellent for peptides and peptide mapping applications.

The unique, sterically protected XB surface ligands are designed by bonding bulky isobutyl chains aside the alkyl chains, and then fully endcapping the surface to cover any remaining exposed silanols.

Material Characteristics

Packing Material	Total Particle Size (µm)	Porous Shell (µm)	Core Size (µm)	pH Stability	Temp Stability	Pressure Stability
Aeris WIDEPORE	3.6	0.2	3.2	1.5 - 9	90 °C	600 bar
Aeris PEPTIDE	1.7	0.22	1.25	1.5 - 9	90 °C	1000 bar
Aeris PEPTIDE	2.6	0.35	1.9	1.5 - 9	90 °C	1000 bar
Aeris PEPTIDE	3.6	0.5	2.6	1.5 - 9	90 °C	600 bar

Ordering Information

Aeris PEPTIDE 1.7 µm Minibore Columns (mm)				SecurityGuard™ ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
XB-C18	00B-4506-AN	00D-4506-AN	00F-4506-AN	AJ0-8948

for 2.1 mm ID

Aeris PEPTIDE 2.6 µm Minibore Columns (mm)			SecurityGuard™ ULTRA Cartridges*
Phases	150 x 2.1	250 x 2.1	3/pk
XB-C18	00F-4505-AN	00G-4505-AN	AJ0-8948

for 2.1 mm ID

Aeris PEPTIDE 2.6 µm Analytical Columns (mm)			SecurityGuard™ ULTRA Cartridges*
Phases	150 x 4.6	250 x 4.6	3/pk
XB-C18	00F-4505-E0	00G-4505-E0	AJ0-8946

for 4.6 mm ID

Aeris PEPTIDE 3.6 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	3/pk
XB-C18	00B-4507-AN	00D-4507-AN	00F-4507-AN	00G-4507-AN	AJ0-8948

for 2.1 mm ID

Aeris PEPTIDE 3.6 µm Analytical Columns (mm)					SecurityGuard™ ULTRA Cartridges*
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
XB-C18	00B-4507-E0	00D-4507-E0	00F-4507-E0	00G-4507-E0	AJ0-8946

for 4.6 mm ID

Aeris WIDEPORE 3.6 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	3/pk
XB-C18	00B-4482-AN	00D-4482-AN	00F-4482-AN	00G-4482-AN	AJ0-8783
XB-C8	00B-4481-AN	00D-4481-AN	00F-4481-AN	00G-4481-AN	AJ0-8785
C4	00B-4486-AN	00D-4486-AN	00F-4486-AN	00G-4486-AN	AJ0-8899

for 2.1 mm ID

Aeris WIDEPORE 3.6 µm Analytical Columns (mm)					SecurityGuard™ ULTRA Cartridges*
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
XB-C18	00B-4482-E0	00D-4482-E0	00F-4482-E0	00G-4482-E0	AJ0-8769
XB-C8	00B-4481-E0	00D-4481-E0	00F-4481-E0	00G-4481-E0	AJ0-8771
C4	00B-4486-E0	00D-4486-E0	00F-4486-E0	00G-4486-E0	AJ0-8901

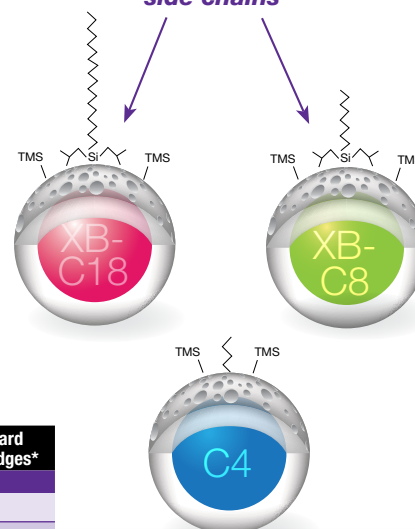
*SecurityGuard ULTRA cartridges require holder part number, AJ0-9000

for 4.6 mm ID

SecurityGuard™ ULTRA Cartridge Holder* (for 2.1 to 4.6 mm ID columns)

SecurityGuard ULTRA Guard Cartridge Holder	ea	Price
	AJ0-9000	

Protective isobutyl side chains



SecurityGuard ULTRA Holder with cartridge



Cartridge Holder



For more about SecurityGuard ULTRA, see p. 255.
For Core-Shell Performance Enhancement Kit, see p. 369

If you are not completely satisfied with Aeris core-shell columns, send in your comparative data to a similar product within 45 days and KEEP THE COLUMN FOR FREE.

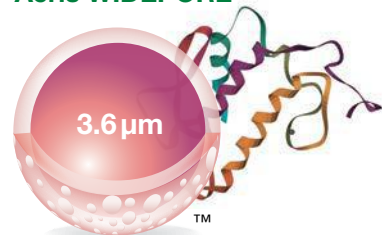
Core-Shell HPLC / UHPLC Columns for Proteins and Peptides

Ultra-High Resolution and Performance

Introducing Aeris, a specialized line of reversed phase core-shell HPLC / UHPLC columns, built exclusively for the ultra-high performance separation and analysis of proteins and peptides.

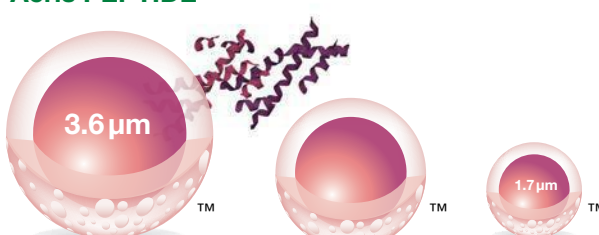
These columns can provide improved resolving power, selectivity, throughput, sensitivity, column lifetime, and method flexibility compared to other fully porous and core-shell columns typically used for bioseparations.

Aeris WIDEPORE



Large pore optimized for intact proteins and polypeptides

Aeris PEPTIDE



Small pore optimized for peptides and for peptide mapping

The precise architecture of Aeris core-shell particles provides dramatic leaps in performance in two important ways:

1 The thin, porous layer, or “shell”, decreases the diffusion path length, thus reducing the time it takes for biomolecules to adsorb/desorb into and out of the particle.

2 Expert manufacturing combined with tight packing specifications and high particle density reduces losses in efficiency and performance due to band broadening.

Aeris Core-Shell Particle

- High particle density helps create optimal bed structure which reduces band broadening effects of Eddy Diffusion
- Ultra-high performance on HPLC and UHPLC systems alike
- Reduced diffusion path improves efficiency



Fully Porous Particle

- Less homogenous bed structure leads to performance loss
- Ultra-high performance limited to sub-2µm particles on UHPLC systems
- Diffusion path limits efficiencies



The result is:

- **3.6µm core-shell particles** that can perform like sub-2µm columns on both HPLC and UHPLC systems at a fraction of the pressure
- **1.7µm and 2.6µm core-shell particles** that can provide higher peak capacities compared to fully porous sub-2µm columns on UHPLC systems

Selecting the Optimal Aeris Column for Your Applications

Aeris core-shell columns are designed for the separation of complex protein and peptide mixtures. Chromatographers can easily narrow down the column(s) that has a high probability of success for their separation by selecting from a variety of phase, pore size, and particle size options.

Aeris PEPTIDE

Recommended for the separation of low molecular weight peptides and for peptide mapping.

- **XB-C18 chemistry best suited for resolving peptides**
- **1.7 µm, 2.6 µm, and 3.6 µm particles for method development flexibility between HPLC and UHPLC systems**
- **Small pore optimized for peptide diffusion**

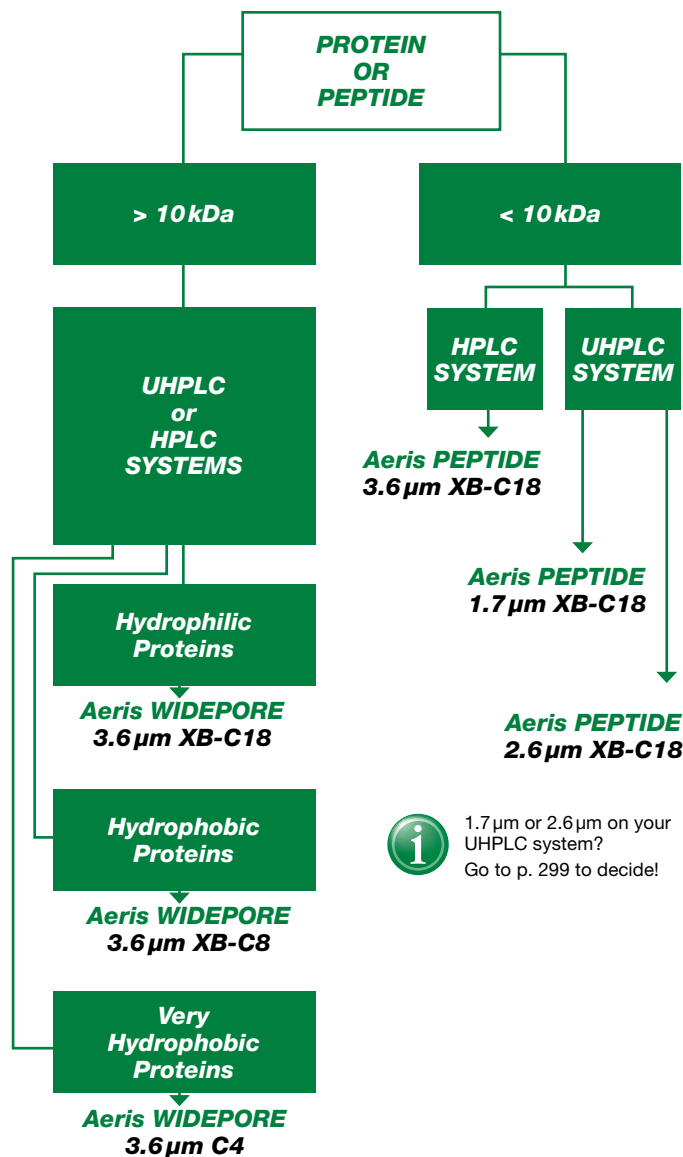
For increased resolving power, use a longer column, preferably a 250 mm (or 150 mm for the Aeris 1.7 µm XB-C18). Due to the lower backpressure of Aeris 3.6 µm, one can easily run 250 mm columns on both HPLC and UHPLC systems, AND one can couple multiple 250 mm columns together and run them inline for even better results. For maximum UHPLC resolution, the 150 mm length Aeris 1.7 µm or 250 mm length Aeris 2.6 µm columns, are excellent choices.

Aeris WIDEPORÉ

Recommended for the separation of intact proteins and polypeptides.

- **XB-C18, XB-C8, and C4 phases for alternate selectivities**
- **3.6 µm particle for system flexibility**
- **Large pore optimized for fast protein adsorption/desorption**

Because of the reduced hydrophobicity compared to fully porous 300 Å columns, one should start gradients with reduced organic concentrations compared to other columns to improve peak shape of polar proteins and peptides. Shallower gradients compared to other fully porous columns may be appropriate.



1.7 µm or 2.6 µm on your UHPLC system? Go to p. 299 to decide!

Material Characteristics

Packing Material	Total Particle Size (µm)	Porous Shell (µm)	Core Size (µm)	pH Stability	Temp Stability	Pressure Stability
Aeris WIDEPORÉ	3.6	0.2	3.2	1.5 - 9	90 °C	600 bar
Aeris PEPTIDE	1.7	0.22	1.25	1.5 - 9	90 °C	1000 bar
Aeris PEPTIDE	2.6	0.35	1.9	1.5 - 9	90 °C	1000 bar
Aeris PEPTIDE	3.6	0.5	2.6	1.5 - 9	90 °C	600 bar

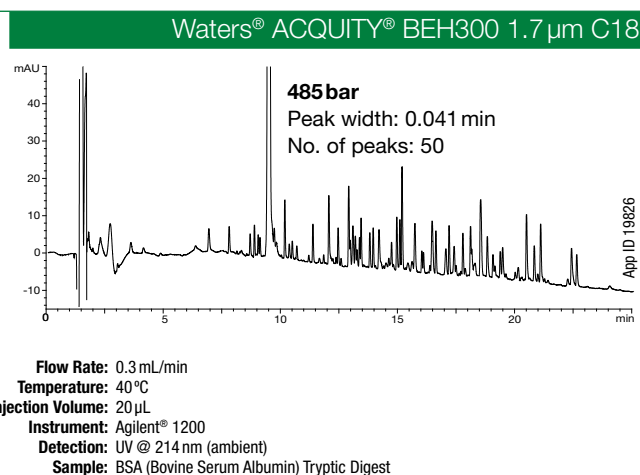
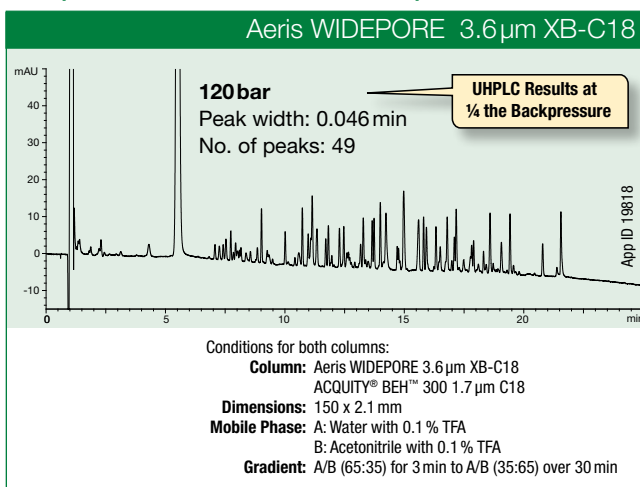


Aeris WIDEPORÉ XB-C18 and Aeris PEPTIDE XB-C18 make a perfect pair for peptide mapping. See p. 299 for more details.

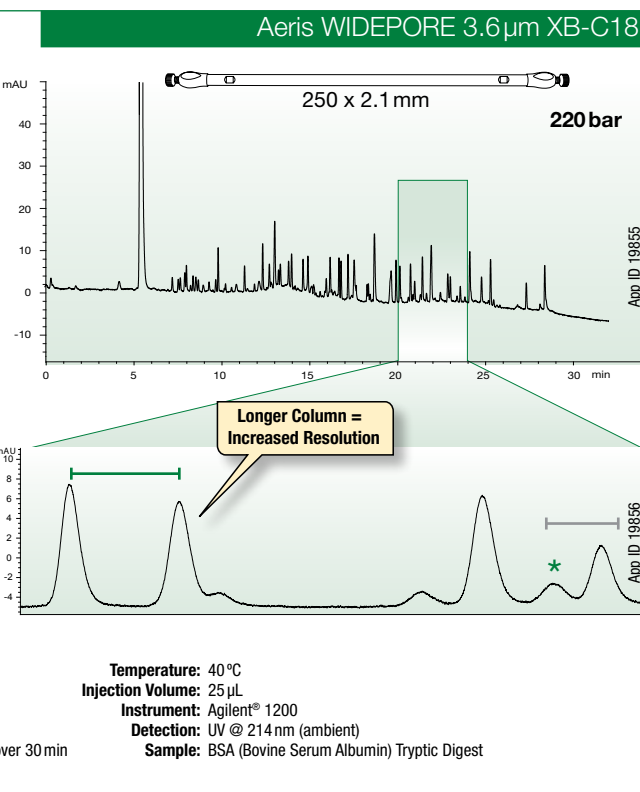
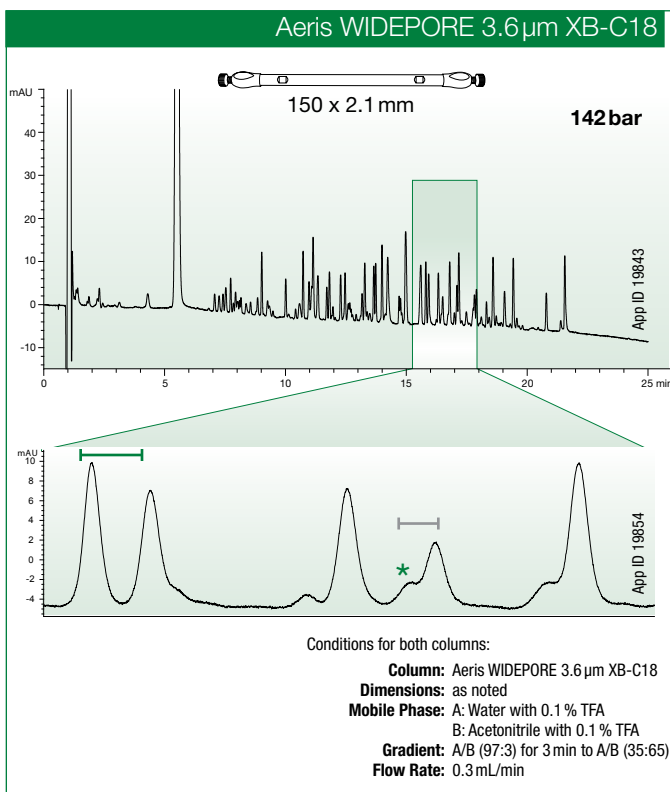
Improve Resolution on ANY System by Leveraging Low Backpressure

Aeris PEPTIDE and Aeris WIDEPORE 3.6µm columns can perform like sub-2µm columns at a fraction of the backpressure. This allows chromatographers to utilize the resolving power of longer length (or coupled) columns without exceeding the pressure limits of their HPLC system. Scientists analyzing proteins and peptides can now have ultra-high resolution on HPLC or UHPLC systems.

Sub-2µm Performance at a Fraction of the Backpressure



Increase Column Length to Improve Resolving Power

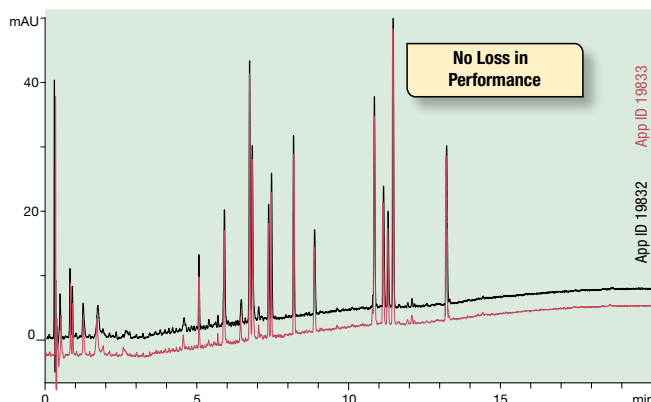


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Long Column Lifetimes Under Extreme Method Conditions

Aeris columns provide temperature stability up to 90 °C, and pH stability from 1.5 - 9, giving ample flexibility for method development and excellent column lifetime.

Over 1,000 Injections at 90 °C

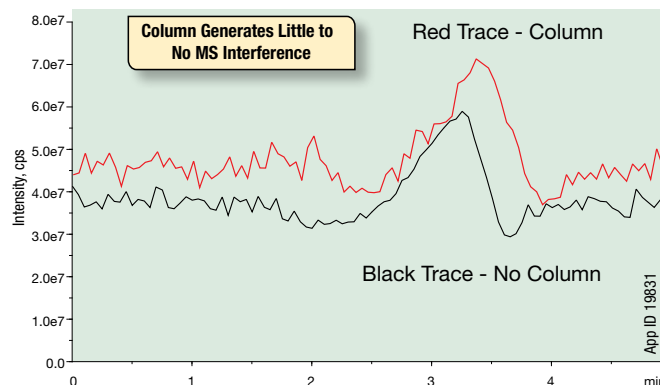


Column: Aeris WIDEPORE 3.6 µm XB-C18
Dimensions: 50 x 4.6 mm
Part No.: 00B-4282-E0
Mobile Phase: A: Water with 0.1 % TFA
 B: Acetonitrile with 0.1 % TFA
Gradient: A/B (97:3) for 3 min, then to A/B (35:65) over 20 min
Flow Rate: 1.5 mL/min
Temperature: 90 °C
Injection Volume: 10 µL
Detection: UV @ 214 nm (ambient)
Sample: Apomyoglobin Digest

Low Column Bleed for Amplified Mass Spec (MS) Sensitivity

Aeris columns show no significant phase bleed under LC/MS conditions, making them very suitable for protein and peptide analysis. Chemists can be assured accurate, dependable, and consistent results, time and time again.

Virtually no LC/MS Bleed

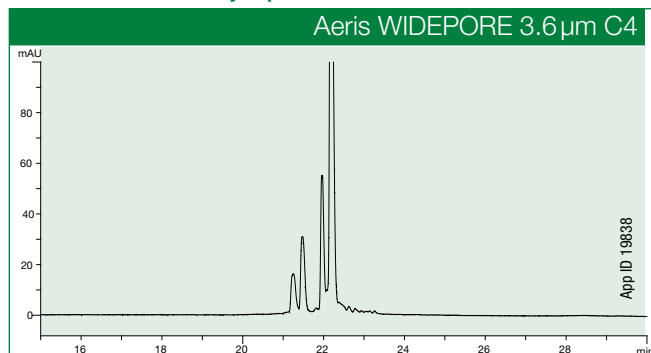


Column: Aeris WIDEPORE 3.6 µm XB-C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4282-AN
Mobile Phase: A: Water with 0.1 % Formic Acid
 B: Acetonitrile with 0.1 % Formic Acid
Gradient: A/B (95:5) for 2.5 min, to A/B (5:95) hold for 0.5 min, then re-equilibrate
Flow Rate: 0.5 mL/min
Temperature: 25 °C
Detection: MS (API 4000™)
 Positive Ion Mode
 Q1 scan from 75 to 800 amu
Sample: Blank

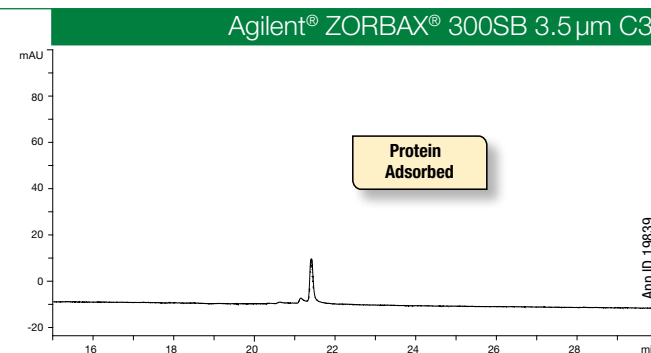
Minimize Adsorption and Maximize Recoveries for Accurate Results

Aeris phase chemistries and bonding technology create a highly inert surface, leading to greatly reduced irreversible adsorption, higher recoveries, and sharper, narrower peaks, providing high quality and accurate results for each consecutive analysis.

Maximize Recoveries of Hydrophobic Proteins



Conditions for both columns:
Column: Aeris WIDEPORE 3.6 µm C4
 ZORBAX® 300SB 3.5 µm C3
Dimensions: 150 x 2.1 mm
Mobile Phase: A: Water with 0.1 % TFA
 B: Acetonitrile with 0.1 % TFA
Gradient: A/B (97:3) to A/B (35:65) over 45 min



Flow Rate: 0.3 mL/min
Temperature: 40 °C
Injection Volume: 20 µL
Instrument: Agilent® 1200
Detection: UV @ 214 nm (ambient)
Sample: Human Epidermal Growth Factor

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Aeris PEPTIDE Columns for Peptide and Peptide Mapping Separations

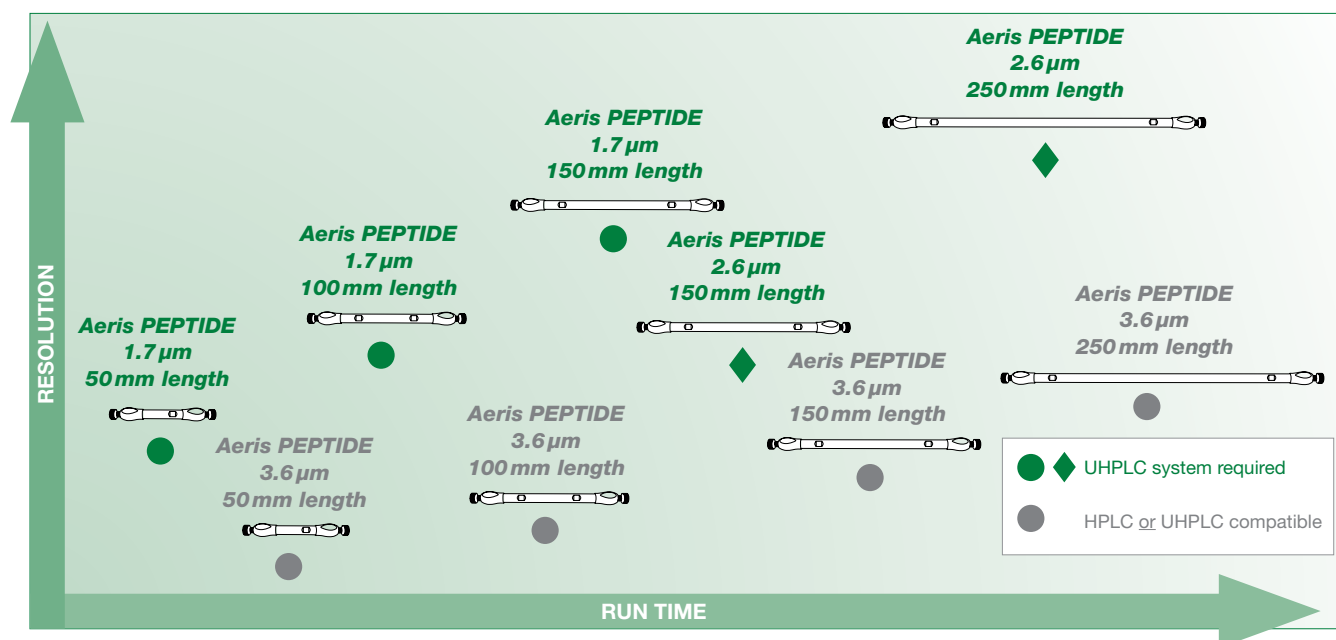
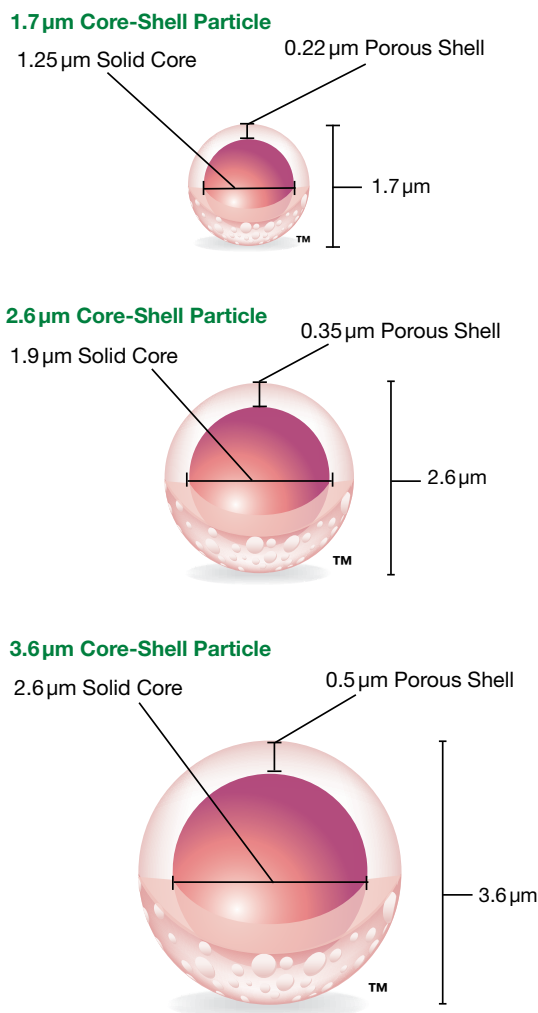
Based on core-shell particle technology, Aeris PEPTIDE particles are designed with small pores, inert XB-C18 surface chemistry, and three different particle sizes (3.6 μm , 2.6 μm , and 1.7 μm) to meet the resolution demands of chromatographers performing complex peptide and peptide map separations on HPLC and/or UHPLC systems.

Aeris PEPTIDE columns are built for the following:

- Synthetic peptide impurity analysis
- Peptide mapping
- Identifying protein modifications
Glycosylation, Substitution, and Truncation
- Analyzing post-translational modifications
Deamidation, Oxidation, and Deletions

Select the Most Suitable Aeris PEPTIDE Column to Achieve Your Separation Goals

The family of Aeris PEPTIDE XB-C18 columns is designed to provide versatility for the development of peptide separation methods. Depending on your resolution, throughput goals, and pressure capabilities of your system, you can choose from three particle sizes with unique performance attributes, as well as several column lengths to select the most suitable column for seamless method development and excellent results.

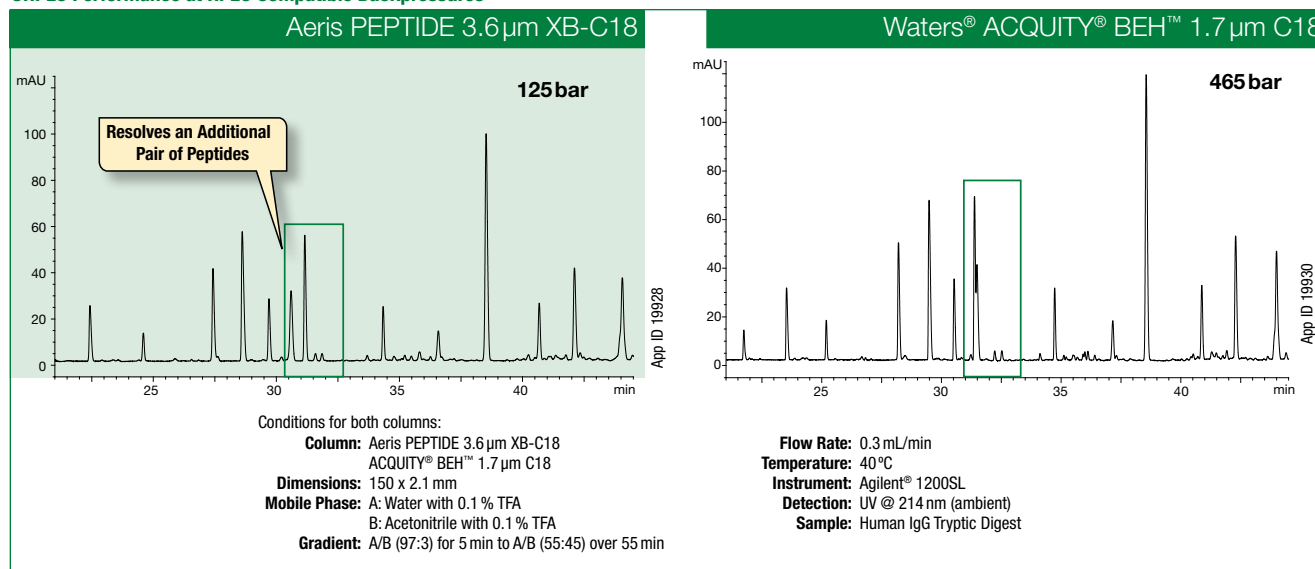


Ultra-High Resolving Power on HPLC and UHPLC Systems with Aeris PEPTIDE 3.6µm Columns

The Aeris PEPTIDE 3.6µm core-shell column was designed with one purpose in mind: to maximize the separation of large numbers of peptides on any HPLC or UHPLC system. Because core shell particles remove the backpressure constraints of HPLC or

UHPLC systems, chromatographers can achieve the ultra-high performance of similar length sub-2µm columns at a fraction of the backpressure.

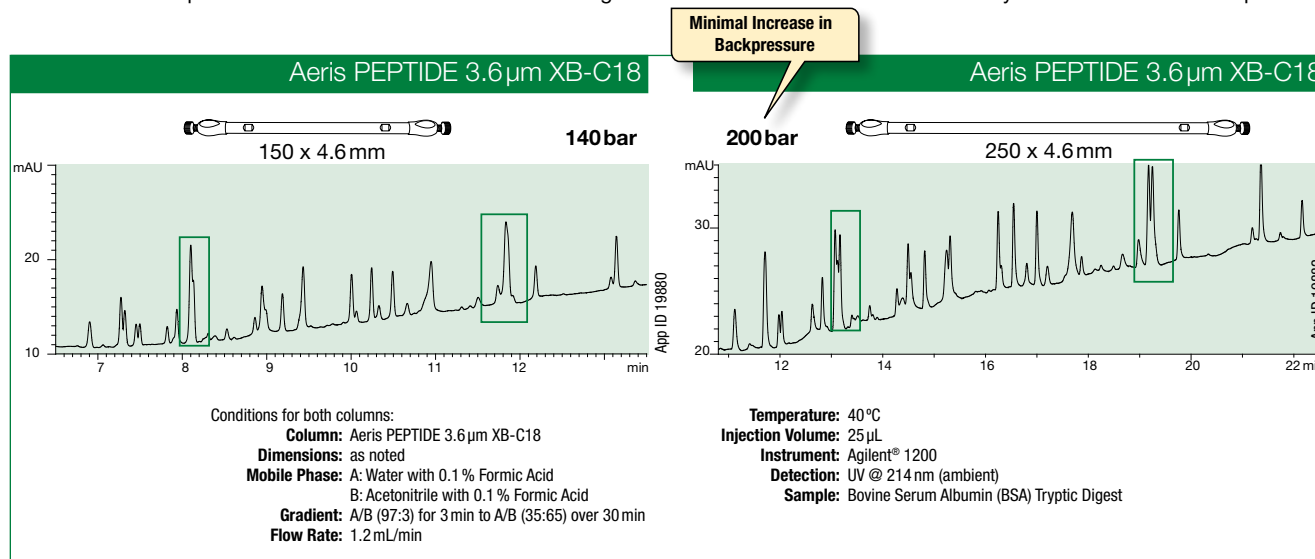
UHPLC Performance at HPLC Compatible Backpressures



Utilize Long Columns to Maximize Separation Power

For applications like peptide separations and peptide mapping where resolution is the primary goal, the lower backpressure of Aeris PEPTIDE 3.6µm core-shell columns allow one to use longer

columns for higher resolving power resulting in increased separation of closely eluting peptides. Use longer (or coupled) 3.6µm columns on UHPLC and HPLC systems to resolve critical peaks.



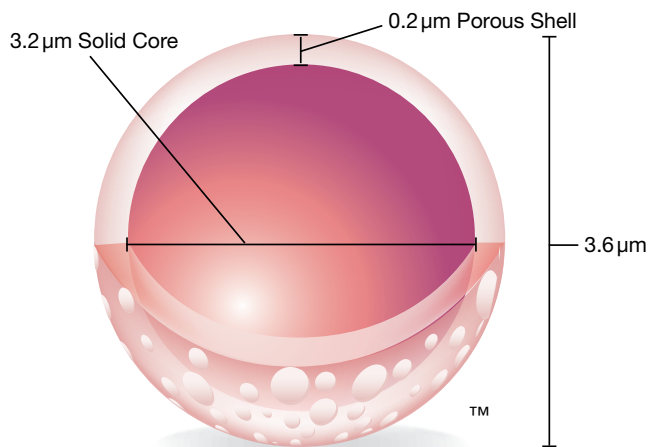
Aeris WIDEPORE Columns for Intact Protein and Polypeptide Separations

Aeris WIDEPORE columns are packed with 3.6µm core-shell particles that are specially engineered with a thin porous shell, large pores, and sterically protected XB surface chemistry to address the inherent separation challenges of proteins and peptides. This unique mix of features results in low backpressures, fast rates of diffusion, and excellent selectivity, generating exceptional chromatographic resolution on both HPLC and UHPLC systems.

Recommended for:

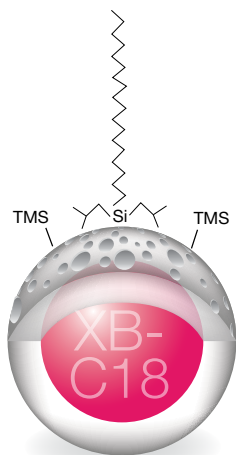
- Protein structural characterization
- Stability indicating assays
- Post-translational modification identification
- PEGylated proteins, antibodies, biogenerics, etc.
- Impurity profiling
- Peptide mapping

3.6µm Core-Shell Particle



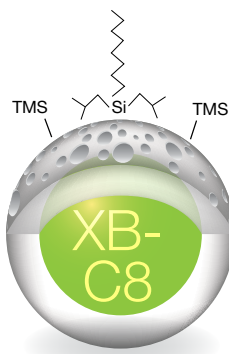
Easy Method Development with Three Selectivities

Aeris WIDEPORE 3.6µm Core-Shell Stationary Phases



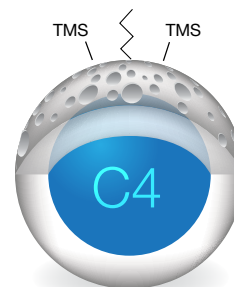
XB-C18
Maximum hydrophobicity
recommended for:

- Proteins
- Hydrophilic proteins
- PEGylated proteins
- High temperature separations
- Alternative selectivity for peptide mapping



XB-C8
Moderate hydrophobicity
recommended for:

- Large proteins
- Moderately hydrophobic proteins
- Monoclonal antibodies
- Glycosylated proteins
- High temperature separations



C4
Low hydrophobicity
recommended for:

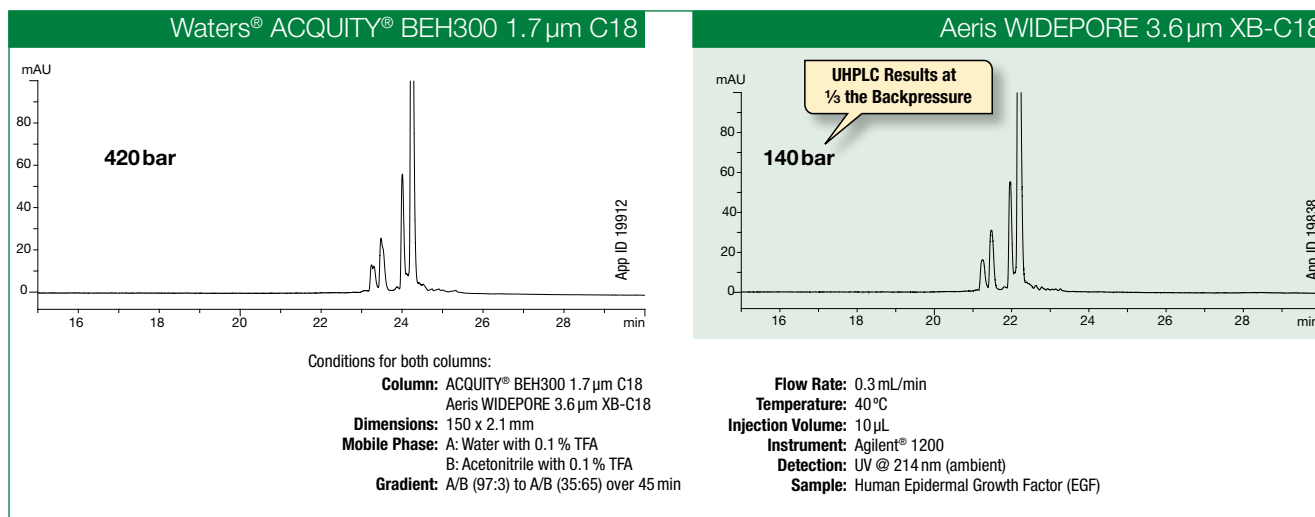
- Very large proteins
- Very hydrophobic proteins
- Membrane proteins
- Least retentive

Maximize HPLC and UHPLC Resolving Power with Unique 3.6µm Core-Shell Particle

3.6µm core-shell technology combined with inert surface chemistries and tight packing specifications results in Aeris WIDEPORE columns delivering exceptional resolving power at significantly lower backpressures. Chromatographers now have the ability to

generate higher quality data than typically produced by columns packed with fully porous particles for every protein analysis – on HPLC or UHPLC systems.

Performance Equivalent to Sub-2µm Particle at Low Backpressure



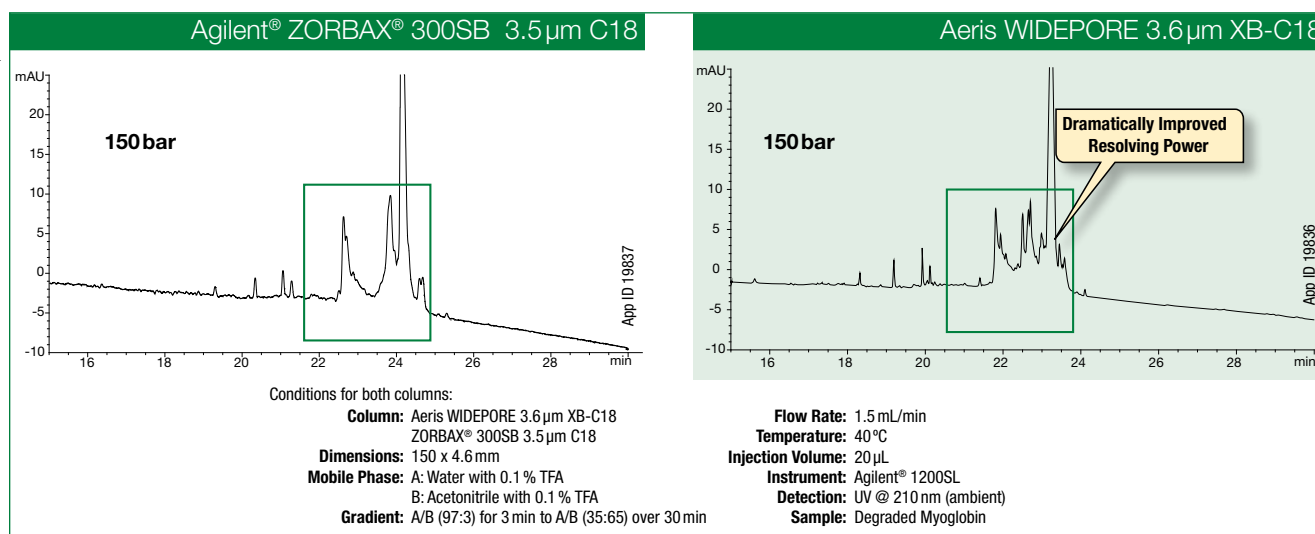
Achieve UHPLC Performance on HPLC Systems by Replacing 3µm and 5µm Columns

The innovative structure of 3.6µm Aeris core-shell particles was specially designed to provide sub-2µm performance at backpressures similar to fully porous 3µm and 5µm particles. Aeris columns can deliver increased resolution for existing protein and peptide separations performed on fully porous 3µm and 5µm columns,

using the same HPLC system!

Now you can have UHPLC performance on your HPLC system and experience better performance and method flexibility than ever before.

Upgrade Existing Methods on 3µm and 5µm Fully Porous Columns to Aeris Core-Shell Technology



Ordering Information

Aeris PEPTIDE 1.7 µm Minibore Columns (mm)				SecurityGuard ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
XB-C18	00B-4506-AN	00D-4506-AN	00F-4506-AN	AJ0-8948

Aeris PEPTIDE 2.6 µm Minibore Columns (mm)			SecurityGuard™ ULTRA Cartridges*
Phases	150 x 2.1	250 x 2.1	3/pk
XB-C18	00F-4505-AN	00G-4505-AN	AJ0-8948

Aeris PEPTIDE 2.6 µm Analytical Columns (mm)			SecurityGuard ULTRA Cartridges*
Phases	150 x 4.6	250 x 4.6	3/pk
XB-C18	00F-4505-E0	00G-4505-E0	AJ0-8946



Aeris PEPTIDE 3.6 µm Minibore Columns (mm)					SecurityGuard ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	3/pk
XB-C18	00B-4507-AN	00D-4507-AN	00F-4507-AN	00G-4507-AN	AJ0-8948

Aeris PEPTIDE 3.6 µm Analytical Columns (mm)					SecurityGuard ULTRA Cartridges*
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
XB-C18	00B-4507-E0	00D-4507-E0	00F-4507-E0	00G-4507-E0	AJ0-8946

Aeris WIDEPORE 3.6 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges*
Phases	50 x 2.1	100 x 2.1	150 x 2.1	250 x 2.1	3/pk
XB-C18	00B-4482-AN	00D-4482-AN	00F-4482-AN	00G-4482-AN	AJ0-8783
XB-C8	00B-4481-AN	00D-4481-AN	00F-4481-AN	00G-4481-AN	AJ0-8785
C4	00B-4486-AN	00D-4486-AN	00F-4486-AN	00G-4486-AN	AJ0-8899

Aeris WIDEPORE 3.6 µm Analytical Columns (mm)					SecurityGuard ULTRA Cartridges*
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
XB-C18	00B-4482-E0	00D-4482-E0	00F-4482-E0	00G-4482-E0	AJ0-8769
XB-C8	00B-4481-E0	00D-4481-E0	00F-4481-E0	00G-4481-E0	AJ0-8771
C4	00B-4486-E0	00D-4486-E0	00F-4486-E0	00G-4486-E0	AJ0-8901

*SecurityGuard ULTRA cartridges require holder part number. AJ0-9000

SecurityGuard ULTRA Cartridge Holder* (for 2.1 to 4.6 mm ID columns)		
SecurityGuard ULTRA Guard Cartridge Holder	ea	Price
		AJ0-9000



For more about SecurityGuard ULTRA, see p. 255
For Core-Shell Performance Enhancement Kit, see p. 370



For HPLC Column Performance Check Standards,
see pp. 372-373