AXIA™ | KINETEX®

Preparative Chromatography Meets UHPLC

The Power of Kinetex Core-Shell Technology with the Performance of Piston Packed Prep Columns

- Ultra-High Efficiencies
- Ultra-Long Lifetimes
- NO Added Pressure

phenomenex®
. . . breaking with tradition℠

Two Award Winning Technologies

Award Recipient AXIA

Award Recipient Kinetex

NOW COMBINED to give you unmatched purification performance for both HPLC and SFC applications.

KINETEX® Core-Shell Technology

Kinetex Core-Shell Technology produces increased efficiencies over traditional, fully porous columns, yielding remarkable chromatographic resolution, higher peak capacities, and greater sensitivity, so labs can get even more out of their HPLC analyses!

The benefits of Kinetex Core-Shell Technology include:

- Increased efficiencies over traditional fully porous columns
- Seamless scalability from HPLC/UHPLC to Preparative LC
- Kinetex 5 µm provides better performance than traditional fully porous 5 and 3 µm materials

AXIA™ Preparative Column Packing Technology

An advanced preparative column packing and hardware design, Axia incorporates patented Hydraulic Piston Compression technology that offers increased sorbent bed density and eliminates media bed collapse as a source of premature column failure in preparative HPLC columns.

Unlike traditional column packing methods, the Axia packing method is completely automated and monitored by multiple sensors to allow for measurement and recording of all process parameters for every column. The result is a vastly improved packing process that offers the following benefits:

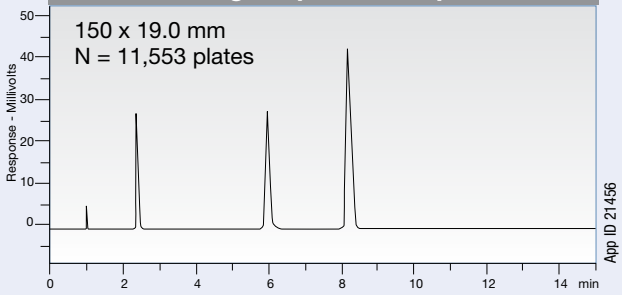
- Extended column lifetimes
- Improved reproducibility: Column-to-Column and Batch-to-Batch
- Efficiencies and peak symmetries on par with analytical separations
- Increased column stability under high flow rates

Combining These Two Award Winning Technologies Gives You...

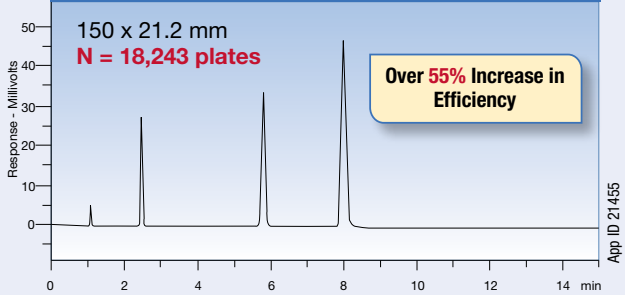
Higher Efficiency!

Start with sharper peaks by taking advantage of the high efficiencies of Kinetex® 5 µm Axia™ preparative columns.

Waters® XBridge™ 5µm C18 Prep OBD™



Kinetex 5 µm XB-C18 Axia Packed



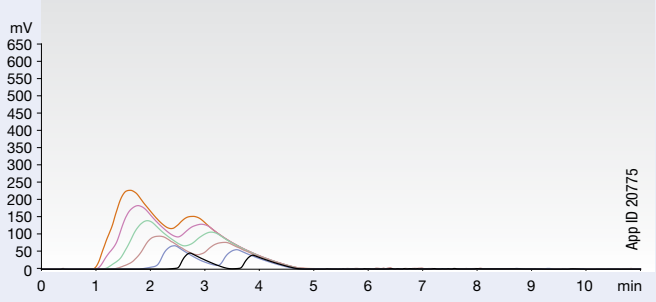
Conditions for both columns:
Columns: Kinetex 5 µm XB-C18 Axia Packed
XBridge 5 µm C18 Prep OBD
Dimensions: 150 x 21.2 mm (Kinetex)
150 x 19 mm (XBridge)
Mobile Phase: Water/ Acetonitrile (50:50)
Injection Volume: 10 µL

Flow Rate: 25 mL/ min
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 1. Uracil
2. Acetophenone
3. Toluene
4. Naphthalene

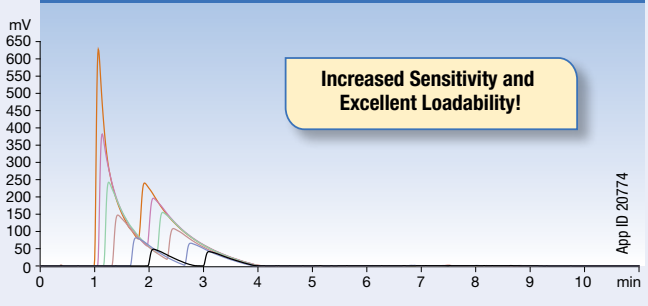
Excellent Loadability!

With narrower peak widths than fully porous columns across every sample load, Axia packed Kinetex 5 µm columns give you the capability of increased sample load and higher throughput for vastly improved purification performance and economics.

Waters XBridge 5µm C18 Prep OBD



Kinetex 5µm C18 Axia Packed



Conditions for both columns:
Columns: Kinetex 5 µm C18 Axia Packed
XBridge 5 µm C18 Prep OBD
Dimensions: 50 x 21.2 mm (Kinetex)
50 x 19 mm (XBridge)
Mobile Phase: A: Water with 0.5 % Formic acid
B: Acetonitrile with 0.5 % Formic acid
Gradient:

Time (min)	% B
0	20
8	50
11	50

Flow Rate: 30 mL/min
Temperature: Ambient
Detection: UV @ 254 nm
Sample: 200 mg/mL in DMSO
1. Doxepin (From 1 - 500 mg on-column)
2. Amitriptyline (From 1 - 500 mg on-column)

Axia™ Technology Vs. Traditional Prep Column Packing

TRADITIONAL PREP PACKING

Waters® "OBD" Patented Prep Column Packing Process:

In traditional slurry packing processes, like the Waters® OBD™ (Optional Bed Density) Prep column packing approach, pressure on the packed bed is released when the column is removed from the column packing station to allow attachment of the endfitting.

This conventional packing process involves:
Compression ➔ Decompression ➔ Recompression

Several problems with this packing method are:

- Variability in column performance due to increased number of manual operations required for assembly
- Potential silica media damage during recompression
- Limited level of process control is based on traditional slurry packing technology

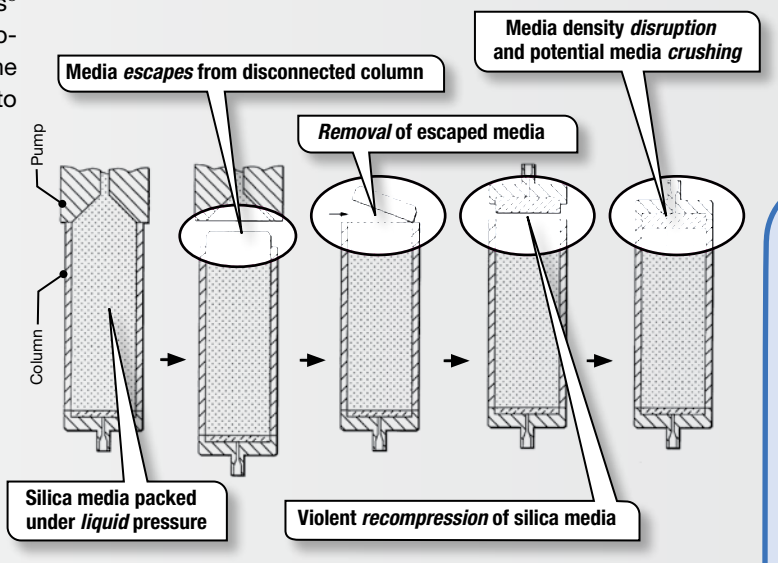


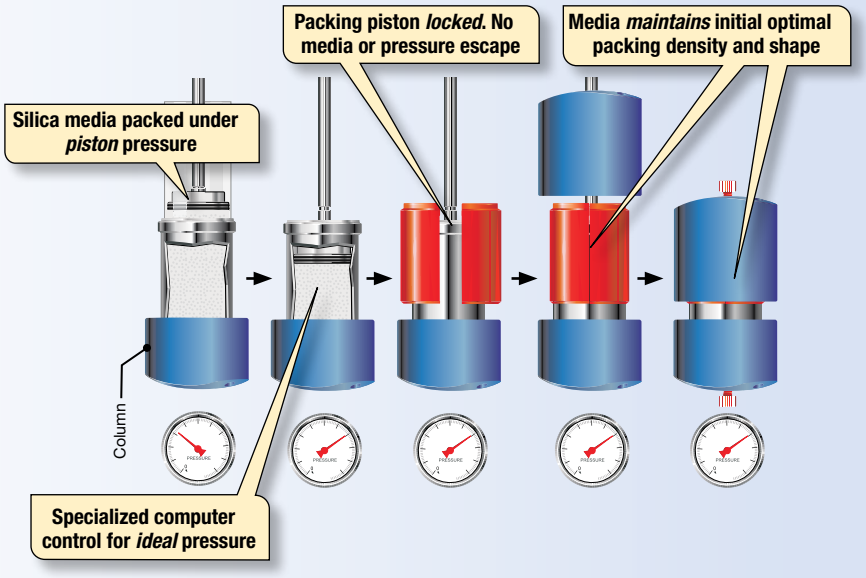
Diagram from Waters Corporation U.S. Patent No. 7,399,410

AXIA TECHNOLOGY

Our Vastly Improved Patented Packing Process:

In contrast to the multi-step process required in conventional slurry packing, Axia packed preparative columns are packed using a single axial compression step. The ideal column bed density is custom calculated and automated for each specific media and column size. Computer control of the entire process ensures both proper bed density and column uniformity every time.

During the Axia packing process, the packing piston is locked in place, eliminating any decompression and recompression of the packed bed. This improves media integrity and column bed stability, and solves the primary lifetime and performance problems associated with conventional slurry packed preparative columns.

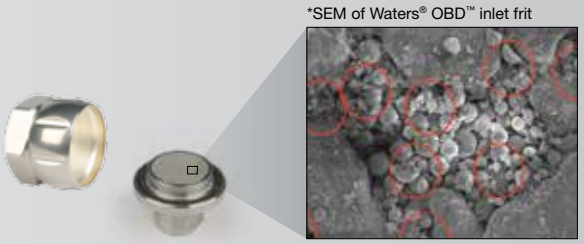


Axia patent: U.S. Patent No. 7,674,383

The Packing Difference You Can See!

Traditional Prep Packing

Decompression and then recompression during packing can damage the media and lead to increased column-to-column variability, flow disturbances, and decreased column lifetimes.

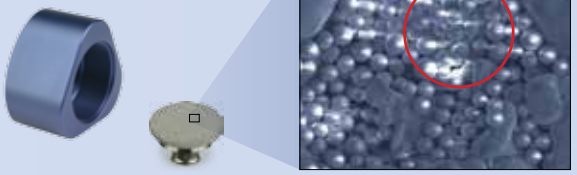


*SEM of Waters® OBD™ inlet frit

Crushed media or silica fines at frit surface after packing

Axia Packing Technology

Highly tuned patented process and hardware eliminates potential decompression and ensures media stability and optimal bed density.



*SEM of Axia inlet frit

Intact media at frit surface after packing

*The images are believed to be representative, but individual columns may vary.

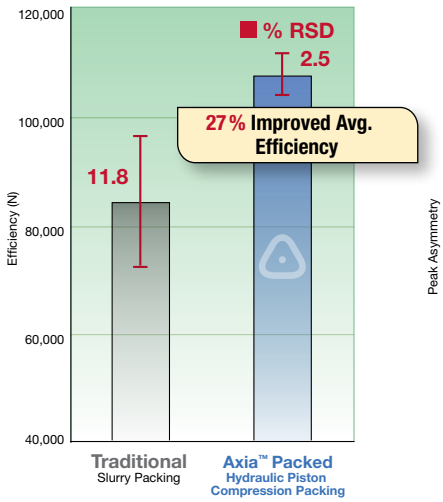
View an animated packing process comparison **www.AxiaPrep.com**

Unmatched Column Reproducibility

The completely automated Axia packing system provides feedback control and infinite tuning of packing density for specific media characteristics such as mechanical strength and porosity. An optimum bed density can be consistently reproduced column-to-column. This directly translates into consistent efficiency and peak asymmetry measurements and decreases the column variability seen in traditionally packed preparative columns.

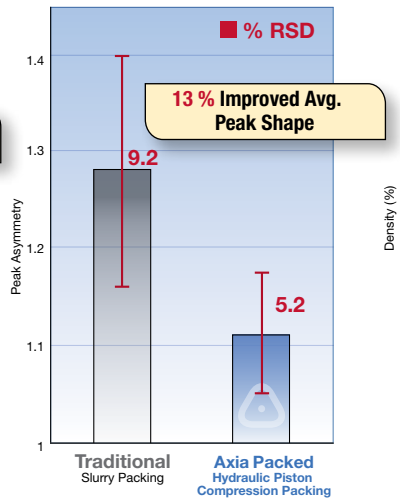
Reproducible

Column-to-Column Efficiency
Average Efficiency (N) with Synergi™
4 µm Hydro-RP 100 x 21.2 mm

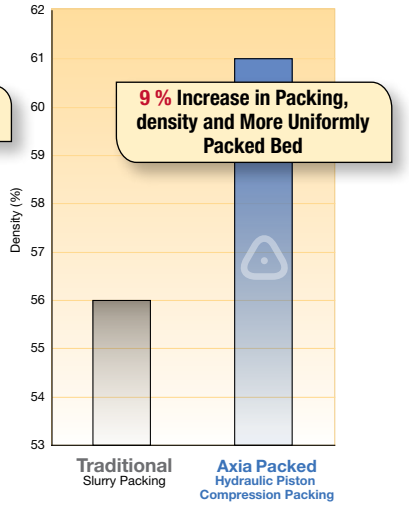


Reproducible

Column-to-Column Peak Asymmetry
Average Peak Asymmetry with Gemini®
5 µm C18 50 x 21.2 mm



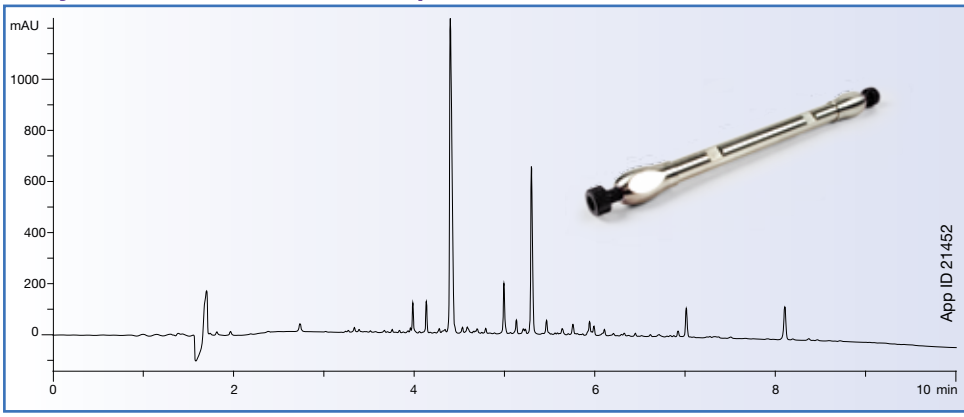
Density Comparison of Packed Beds



Seamless Scalability from HPLC/UHPLC to PREP

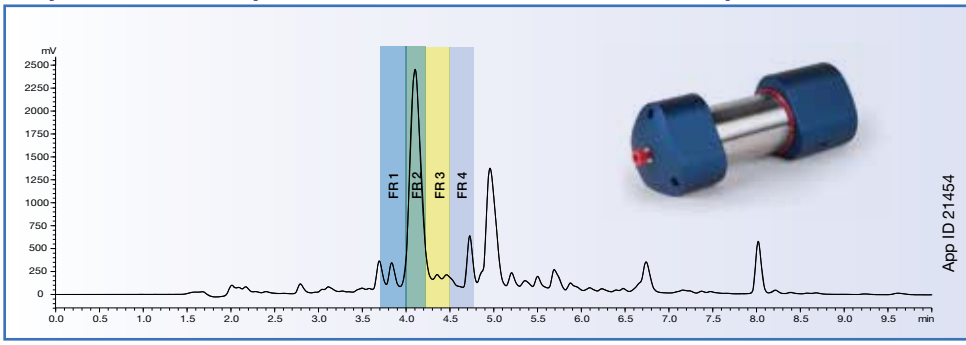
The recent addition of the Kinetex® 5 µm in the Axia packed format (21.2 mm ID) makes it the first core-shell sorbent commercially available for small-scale preparative applications. Combine this with the added flexibility that the entire Kinetex core-shell line (1.3 µm, 1.7 µm, 2.6 µm and 5 µm) is fully scalable in retention and selectivity, makes transferring high performance HPLC/UHPLC methods to preparative and SFC applications, simple.

Analytical method — Kinetex 2.6 µm XB-C18



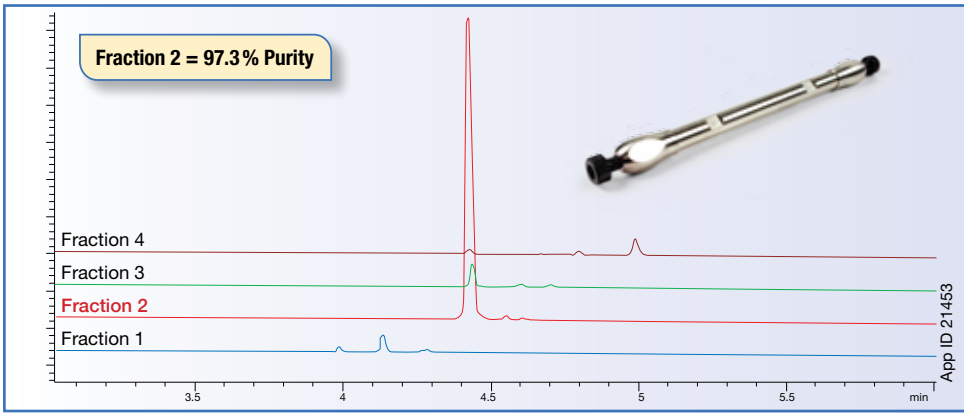
Column: Kinetex 2.6 µm XB-C18
Dimensions: 150 x 4.6 mm
Part No.: 00F-4496-E0
Mobile Phase: A: 0.1% TFA in Water
B: 0.1% TFA in Acetonitrile
Gradient: Linear 85:15 (A/B) to 5:95 (A/B) over 10 minutes
Injection Volume: 10 µL
Flow Rate: 1 mL/ min
Temperature: Ambient
Detection: UV @ 210 nm
Sample: Crude peptide mix

Preparative scale-up and fraction collection — Kinetex 5 µm XB-C18



Column: Kinetex 5 µm XB-C18 Axia Packed
Dimensions: 150 x 21.2 mm
Part No.: 00F-4605-P0-AX
Mobile Phase: A: 0.1% TFA in Water
B: 0.1% TFA in Acetonitrile
Gradient: Linear 85:15 (A/B) to 5:95 (A/B) over 10 minutes
Injection Volume: 1 mL
Flow Rate: 20 mL/ min
Temperature: Ambient
Detection: UV @ 210 nm
Sample: Crude peptide mix

Analytical fraction analysis — Kinetex 2.6 µm XB-C18

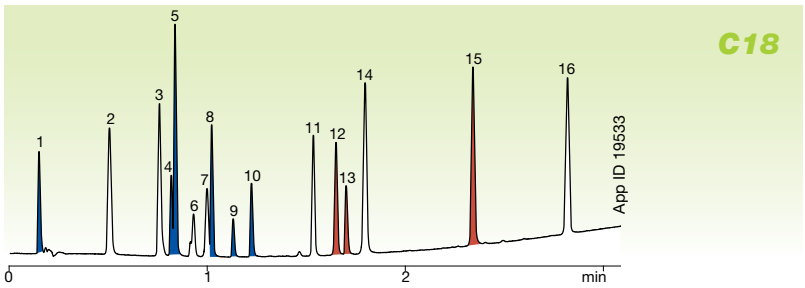


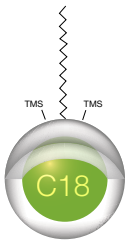
Column: Kinetex 2.6 µm XB-C18
Dimensions: 150 x 4.6 mm
Part No.: 00F-4496-E0
Mobile Phase: A: 0.1% TFA in Water
B: 0.1% TFA in Acetonitrile
Gradient: Linear 85:15 (A/B) to 5:95 (A/B) over 10 minutes
Injection Volume: 10 µL
Flow Rate: 1 mL/ min
Temperature: Ambient
Detection: UV @ 210 nm
Sample: Crude peptide mix

Tip: For more information on the power of Kinetex core-shell scalability, request technical note TN-1135 at:
www.phenomenex.com/Kinetex/AxiaRequest

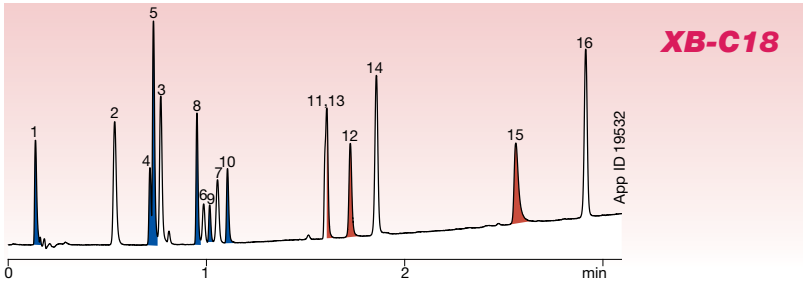
A Broad Spectrum of Column Selectives

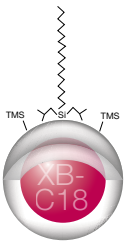
Kinetex® core-shell columns are available in a wide range of stationary phases, allowing you to optimize your separation for maximum resolution and loadability across HPLC, UHPLC, and Preparative HPLC and SFC applications.



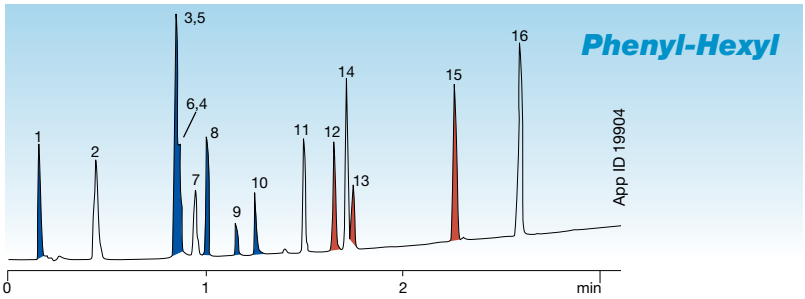


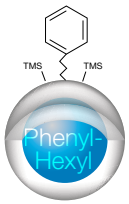
Endcapped C18 phase
Increased retention for polar basic compounds



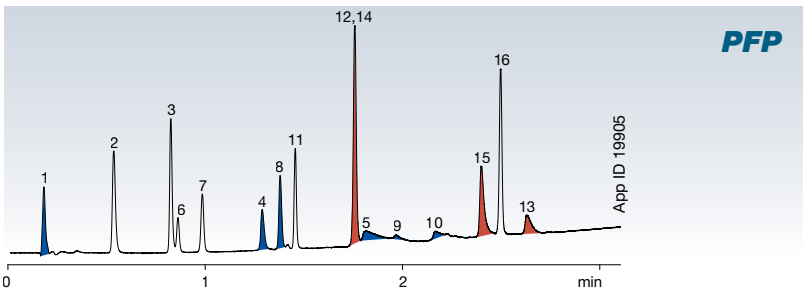


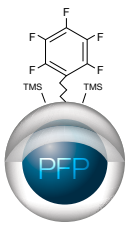
Protective isobutyl side chains
Increased retention of polar acidic compounds





Phenyl-Hexyl
Greater retention and separation of aromatic hydrocarbons





Pentafluorophenyl phase
Unique aromatic and polar selectivity

Conditions for all columns:

Column: Kinetex 2.6 µm C18
Kinetex 2.6 µm XB-C18
Kinetex 2.6 µm Phenyl-Hexyl
Kinetex 2.6 µm PFP

Dimensions: 50 x 2.1 mm

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

Gradient:

Time (min)	% B
0.0	5
0.2	5
4.2	95
4.21	5
5.5	5

Flow Rate: 0.8 mL/min
Temperature: 30 °C
Detection: UV @ 254 nm (ambient)
Sample:

1. Pyridine
2. Acetaminophen
3. Pindolol
4. Quinidine
5. Sulfathiazole
6. Acebutolol
7. Benzyl alcohol
8. Chlorpheniramine
9. Phenol
10. Triprolidine
11. Nortriptyline
12. Prednisolone
13. 3-Methyl-4-nitrobenzoic acid
14. 2-Hydroxy-5-methylbenzaldehyde
15. Diflunisal
16. Hexanophenone

red-acids
blue-bases
white-neutrals

Comparative separations may not be representative of all applications. Columns are pH stable from 1.5-10 under isocratic conditions. Columns are pH stable 1.5-8.5 under gradient conditions.

A New Era of Technical Support Services, Let Us Do the Work for You

PhenoLogix, our in-house application support lab, saves you time and money by screening multiple scout columns and solvent strategies for new purification methods or revalidating your current methods. We work together to make you successful by minimizing your process purification development time and optimizing your purification method.

phenoLogix℠
Your Method. Our Scientists.

1 Column Screening

- **Normal Phase**
- **Reversed Phase**
- **Polar Organic**
- **SFC**
- **Chiral**

2 Method Optimization Services

- **Fast Turnaround**
- **Easy Method Transfer**
- **Continued Support**

3 Preparative and Process Scale-Up

- **Media Screening**
- **Small Scale Purification**
- **DAC Packing Assistance**

Get started today

and let us exceed your expectations.

www.phenomenex.com/phenologix

Extend the Lifetime of Your Axia™ Preparative Column

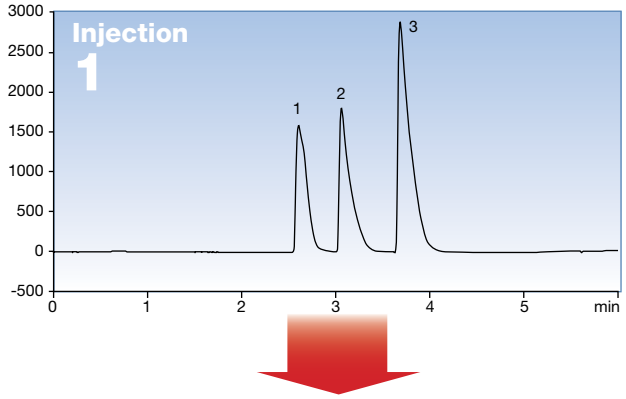
Use the SecurityGuard™ PREP column protection system!

- Extend preparative column lifetime by as much as 5x
- Protect column from samples that precipitate out of solution
- Protect column from contaminants
- Stable and leak-free up to 60 mL/min

The SecurityGuard PREP system was designed to effectively (and inexpensively) protect your valuable Prep columns from the damaging effects of mobile phase and sample chemical contaminants and particulates, without altering your chromatographic results.

Forced Degradation Lifetime Study

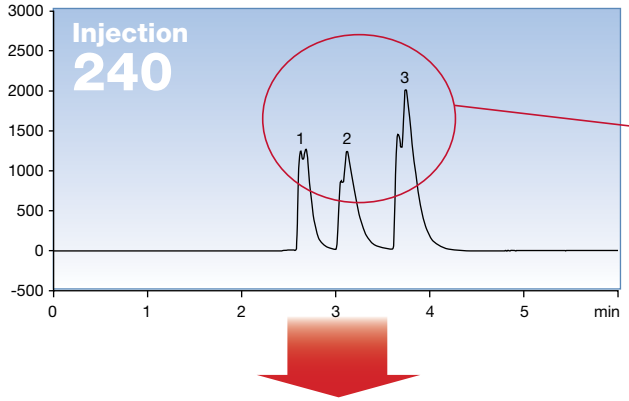
Axia packed column with SecurityGuard PREP cartridge after initial injection



Conditions

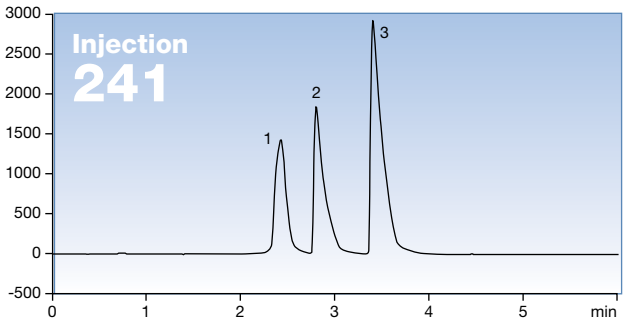
Column:	Luna® 10 µm C18(2) Axia Packed
Dimension:	50 x 21.2 mm
Part No.:	00B-4253-P0-AX
Mobile Phase:	A: 0.1% TFA in Water
	B: 0.1% TFA in Water/Acetonitrile (25:75)
Gradient:	Linear 93:7 (A/B) to 100 % B over 5 minutes
Injection Volume:	420 µL
Flow Rate:	60 mL/min
Temperature:	Ambient
Detection:	UV @ 270 nm
Sample:	1. Nadolol
	2. Metoprolol
	3. Propranolol

Axia packed column with SecurityGuard PREP cartridge after multiple injections



Time to change the PREP cartridge

Axia packed column after removing SecurityGuard column protection system



Original column performance maintained by using SecurityGuard PREP

If Axia™ packed columns do not provide at least an equivalent separation as compared to a competing preparative column of the same particle size, same phase and dimensions, return the column with comparative data within 45 days for a **FULL REFUND**. Only applies to 21.2 mm ID columns.

Kinetex® Analytical Columns

5 µm Columns (mm)	50 x 2.1	SecurityGuard ULTRA Cartridges* 3/pk	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	SecurityGuard ULTRA Cartridges* 3/pk
XB-C18	00B-4605-AN	AJ0-8782	00B-4605-E0	00D-4605-E0	00F-4605-E0	00G-4605-E0	AJ0-8768
C18	00B-4601-AN	AJ0-8782	00B-4601-E0	00D-4601-E0	00F-4601-E0	00G-4601-E0	AJ0-8768
PFP	00B-4602-AN	AJ0-8787	00B-4602-E0	00D-4602-E0	00F-4602-E0	00G-4602-E0	AJ0-8773
Phenyl-Hexyl	00B-4603-AN	AJ0-8788	00B-4603-E0	00D-4603-E0	00F-4603-E0	00G-4603-E0	AJ0-8774
		for 2.1 mm ID					for 4.6 mm ID

2.6 µm Analytical Columns (mm)	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	SecurityGuard ULTRA Cartridges* 3/pk
XB-C18	—	00B-4496-E0	00C-4496-E0	00D-4496-E0	00F-4496-E0	AJ0-8768
C18	00A-4462-E0	00B-4462-E0	00C-4462-E0	00D-4462-E0	00F-4462-E0	AJ0-8768
PFP	00A-4477-E0	00B-4477-E0	00C-4477-E0	00D-4477-E0	00F-4477-E0	AJ0-8773
Phenyl-Hexyl	—	00B-4495-E0	00C-4495-E0	00D-4495-E0	00F-4495-E0	AJ0-8774
						for 4.6 mm ID

2.6 µm MidBore™ Columns (mm)	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	SecurityGuard ULTRA Cartridges* 3/pk
XB-C18	00A-4496-Y0	00B-4496-Y0	00C-4496-Y0	00D-4496-Y0	00F-4496-Y0	AJ0-8775
C18	00A-4462-Y0	00B-4462-Y0	00C-4462-Y0	00D-4462-Y0	00F-4462-Y0	AJ0-8775
PFP	00A-4477-Y0	00B-4477-Y0	00C-4477-Y0	00D-4477-Y0	00F-4477-Y0	AJ0-8780
Phenyl-Hexyl	—	—	—	00D-4495-Y0	00F-4495-Y0	AJ0-8781
						for 3.0 mm ID

2.6 µm Minibore Columns (mm)	30 x 2.1	50 x 2.1	75 x 2.1	100 x 2.1	150 x 2.1	SecurityGuard ULTRA Cartridges* 3/pk
XB-C18	00A-4496-AN	00B-4496-AN	00C-4496-AN	00D-4496-AN	00F-4496-AN	AJ0-8782
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782
PFP	00A-4477-AN	00B-4477-AN	00C-4477-AN	00D-4477-AN	00F-4477-AN	AJ0-8787
Phenyl-Hexyl	00A-4495-AN	00B-4495-AN	00C-4495-AN	00D-4495-AN	00F-4495-AN	AJ0-8788
						for 2.1 mm ID

1.7 µm MidBore Columns (mm)	30 x 3.0	50 x 3.0	100 x 3.0	SecurityGuard™ ULTRA Cartridges* 3/pk
XB-C18	00A-4498-Y0	00B-4498-Y0	00D-4498-Y0	AJ0-8775
C18	—	00B-4475-Y0	00D-4475-Y0	AJ0-8775
PFP	—	00B-4476-Y0	00D-4476-Y0	AJ0-8780
				for 3.0 mm ID

1.7 µm Minibore Columns (mm)	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	SecurityGuard™ ULTRA Cartridges* 3/pk
XB-C18	00A-4498-AN	00B-4498-AN	00D-4498-AN	00F-4498-AN	AJ0-8782
C18	00A-4475-AN	00B-4475-AN	00D-4475-AN	00F-4475-AN	AJ0-8782
PFP	00A-4476-AN	00B-4476-AN	00D-4476-AN	00F-4476-AN	AJ0-8787
Phenyl-Hexyl	—	00B-4500-AN	00D-4500-AN	00F-4500-AN	AJ0-8788
					for 2.1 mm ID

1.3 µm Columns (mm)	50 x 2.1
C18	00B-4515-AN

Axia Packed Kinetex Preparative Columns

5 µm Axia™ Packed Preparative Columns (mm)	50 x 21.2	100 x 21.2	150 x 21.2	250 x 21.2	SecurityGuard PREP Cartridges** 15 x 21.2 /ea
XB-C18	00B-4605-P0-AX	00D-4605-P0-AX	00F-4605-P0-AX	00G-4605-P0-AX	AJ0-9145
C18	00B-4601-P0-AX	00D-4601-P0-AX	00F-4601-P0-AX	00G-4601-P0-AX	AJ0-9145
PFP	00B-4602-P0-AX	00D-4602-P0-AX	00F-4602-P0-AX	00G-4602-P0-AX	AJ0-9146
Phenyl-Hexyl	00B-4603-P0-AX	00D-4603-P0-AX	00F-4603-P0-AX	00G-4603-P0-AX	AJ0-9147
					for 21.2 mm ID

SecurityGuard™ Column Protection

Protect your Kinetex and Axia Packed preparative columns from the damaging effects of mobile phase and sample chemical contaminants with SecurityGuard ULTRA and SecurityGuard PREP

- Dramatically extends column lifetime and performance
- Virtually no change in chromatography
- Simple to use

*SecurityGuard ULTRA cartridges require holder, Part No. AJ0-9000
**SecurityGuard PREP cartridges require holder, Part No. AJ0-8223

SecurityGuard ULTRA			
Part No.	Description	Unit	Price
AJ0-9000	SecurityGuard ULTRA Holder for UHPLC/ HPLC Columns 2.1 to 4.6mm ID	ea	

SecurityGuard PREP			
Part No.	Description	Unit	Price
AJ0-8223	SecurityGuard PREP HPLC Guard Cartridge Holder Kit, 21.mm ID, includes column coupler	ea	

AXIA™ | KINETEX®

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