

Shim-pack Scepter LC Columns

CoreFocus



Hybrid Technology for Versatility and Superior Performance

Broad pH tolerance (pH 1 to 12*) for use with a wide range of method conditions
Eight stationary phases and Three column hardware types for extensive sample coverage

Scalability from analytical UHPLC to preparative purification applications

Achieve excellent stability and performance over a wide range of LC conditions with Shim-pack Scepter™- the next generation organic silica hybrid-based LC columns.

Featuring different ligand functional groups, Shim-pack Scepter columns are effective for method development/scouting, and are suitable for a wide variety of applications and sample types.

The three particle sizes (1.9 µm, 3 µm, 5 µm) and wide range of column dimensions make Shim-pack Scepter LC columns fully scalable between UHPLC, HPLC, and preparative LC for seamless method transfer between different laboratory instrumentation.

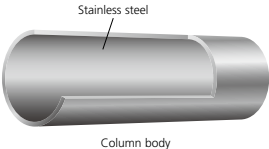
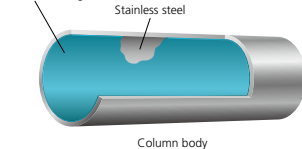
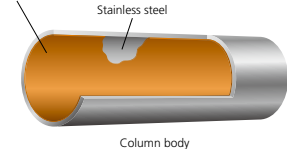
* C18 columns. Operating pH range varies by functional group. Refer to the stationary phase properties below for details.

Shim-pack Scepter Chemistries

Shim-pack Scepter	Reversed Phase				
	C18-120	C18-300	HD-C18-80	C8-120	C4-300
Ligand Type	Trifunctional C18	Trifunctional C18	Trifunctional C18	Trifunctional C8	Trifunctional C4
	General Purpose	General Purpose for Large Molecules	High Density Type for Increased Retention		
Particle	Organic Silica Hybrid				
Particle Size	1.9 µm, 3 µm, 5 µm				
Pore Size	12 nm (120Å)	30 nm (300Å)	8 nm (80Å)	12 nm	30 nm
End Capping	Proprietary				
pH Range	1 - 12				1 - 10
100% Aqueous Condition	YES	YES	x	x	YES
USP Classification	L1	L1	L1	L7	L26

Shim-pack Scepter	Reversed Phase		HILIC
	Phenyl	PFPP	Diol-HILIC
Ligand Type	Trifunctional Phenylbutyl	Trifunctional Pentafluorophenylpropyl	Trifunctional Dihydroxypropyl
Particle	Organic Silica Hybrid		
Particle Size	1.9 µm, 3 µm, 5 µm		
Pore Size	12 nm (120Å)		
End Capping	Proprietary	None	
pH Range	1 - 10	1 - 8	2 - 10
100% Aqueous Condition	YES	YES	—
USP Classification	L11	L43	L20

Shim-pack Scepter Column Hardware

	Scepter	Scepter Claris	Scepter [metal-free]
			
Wetted materials for body	Stainless steel	Bioinert coating	PEEK
Wetted materials for frit	Stainless steel	Bioinert coating	PEEK

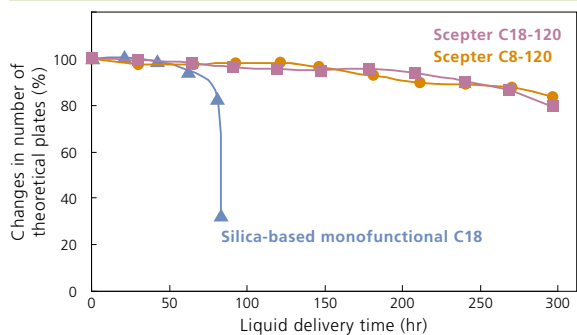
Broad pH Tolerance (pH 1 to 12 for C18) for Use in a Wide Range of Method Conditions

Outstanding pH and Temperature Tolerance

The organic silica hybrid base material used in Shim-pack Scepter columns is highly stable and allows the use of acidic and basic mobile phases across a wide pH range. The stability of a Shim-pack Scepter reversed-phase column under neutral and basic conditions is demonstrated below. The Shim-pack Scepter column provides stable long-term performance superior to other commercial C18 columns.

Stable at High pH Values

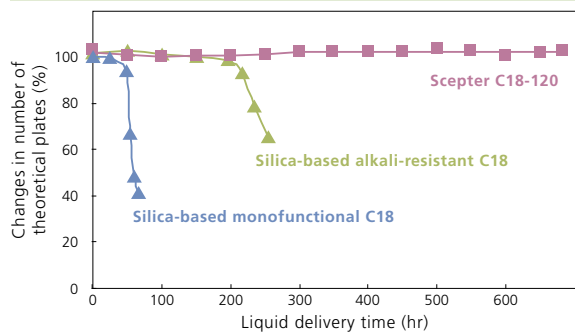
Triethylamine (pH 11.5), 40 °C



Mobile phase : 50 mmol/L triethylamine (pH 11.5)/methanol = 90/10 (v/v)
 Flow Rate : 1.0 mL/min
 Column Temp. : 40 °C
 Sample : Benzyl alcohol

Stable at High Temperatures

pH 6.9, 70 °C

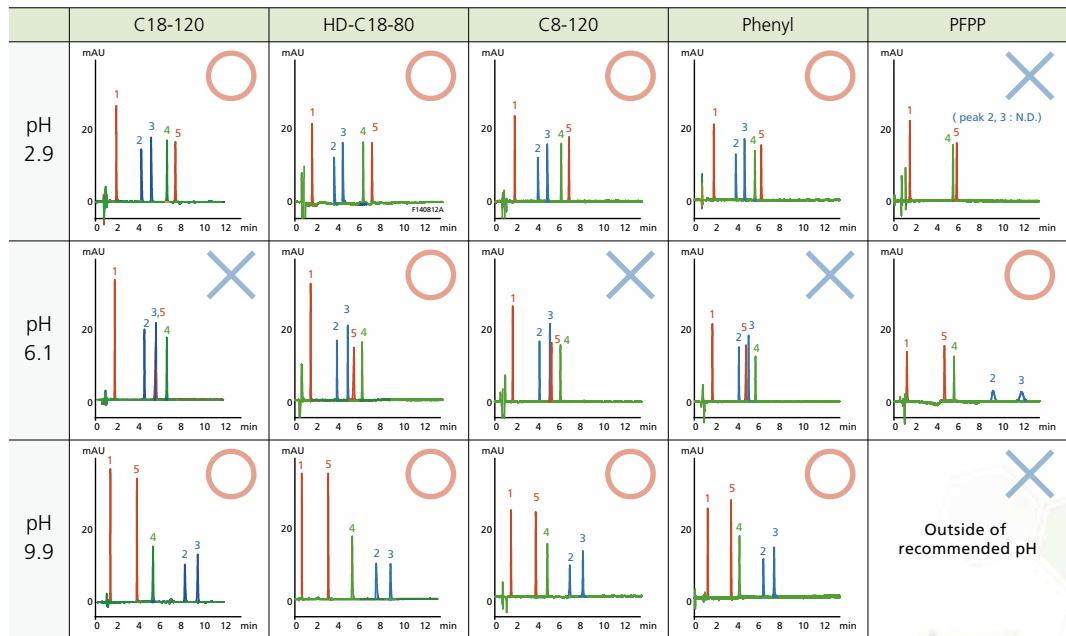


Mobile phase : 20 mmol/L phosphate (potassium) (pH 6.9)/acetonitrile = 90/10 (v/v)
 Flow Rate : 0.2 mL/min
 Column Temp. : 70 °C
 Sample : Phenol

Method Scouting Performance Over a Wide pH Range

Shim-pack Scepter LC columns provide excellent stability over a wide range of LC conditions for effective method scouting that combines mobile phase pH and organic modifiers.

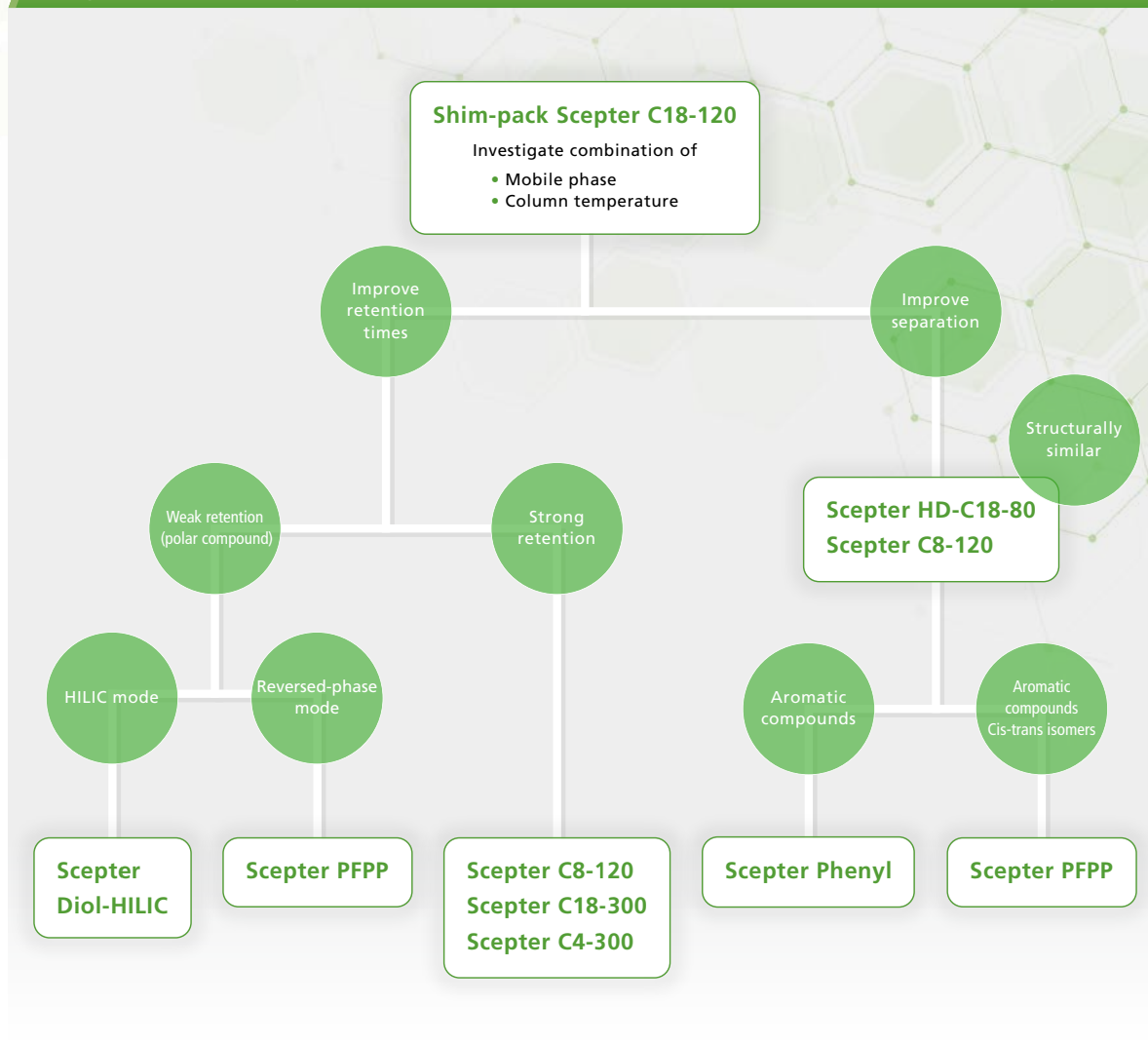
Comparison of Chromatograms using Gradient Conditions with Acetonitrile



- Analytes
- 1. Saccharin (pKa = 2.2)
- 2. Dextromethorphan (pKa = 8.3)
- 3. Amitriptyline (pKa = 9.4)
- 4. N-Butyl paraben (pKa = 8.3)
- 5. Ibuprofen (pKa = 4.4)
- Acidic, basic, neutral

Eight Stationary Phases and Three Column Hardware Types for Extensive Sample Coverage

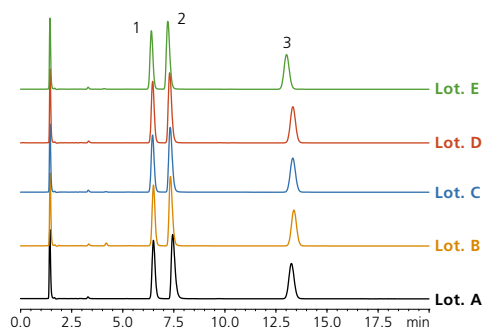
Eight Stationary Phases Facilitate Solutions to Diverse Challenges



Excellent Lot-to-Lot Reproducibility

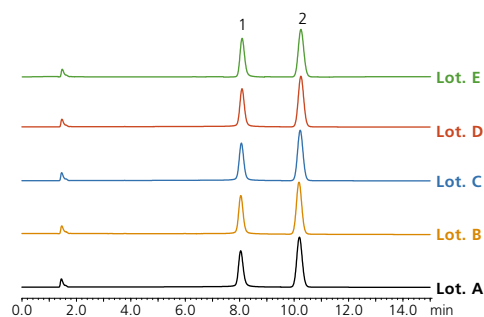
Consistent lot-to-lot column performance is key for fully maximizing your laboratory's performance. Shim-pack Scepter LC columns provide consistent performance across all lots.

Basic Compound



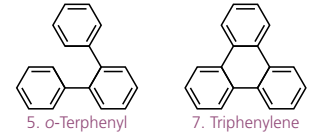
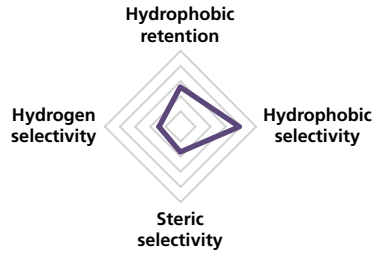
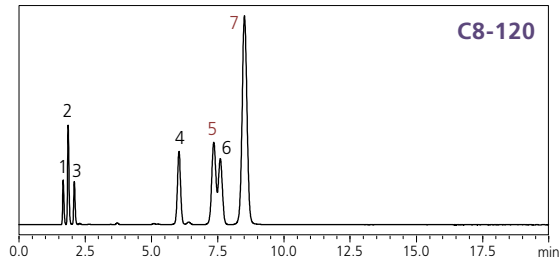
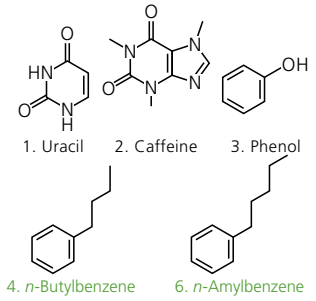
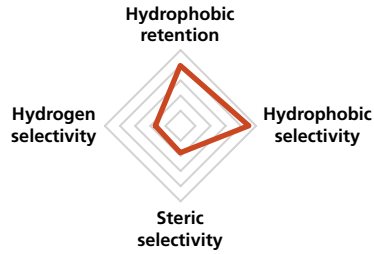
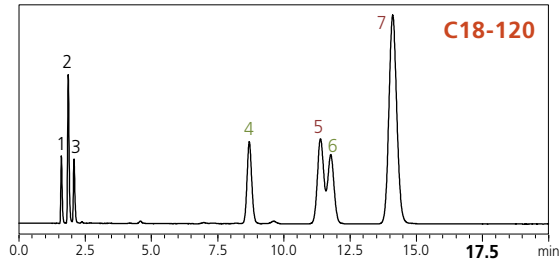
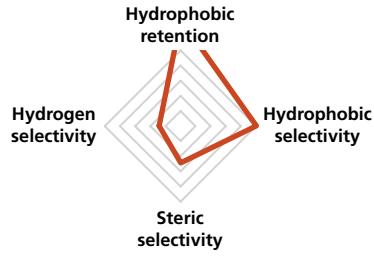
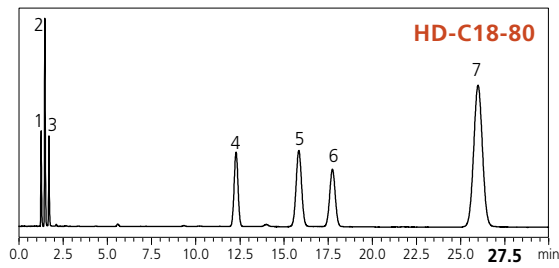
Mobile phase : 20 mmol/L phosphate (potassium)
(pH6.9)/acetonitrile =65/35 (v/v)
Flow Rate : 0.4 mL/min
Column Temp. : 40 °C
Detection : UV 235 nm

Coordination Compound

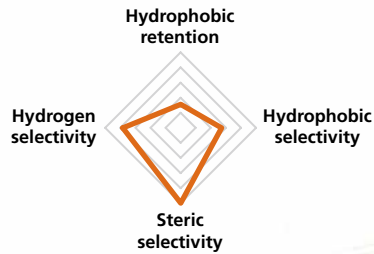
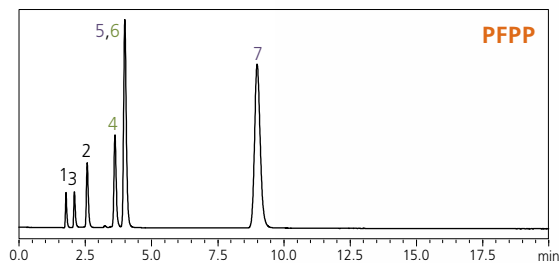
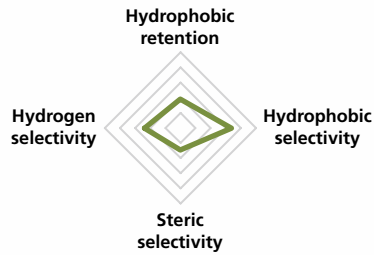
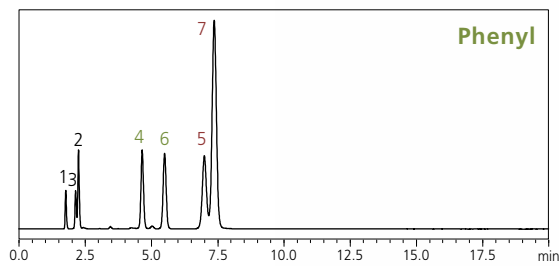
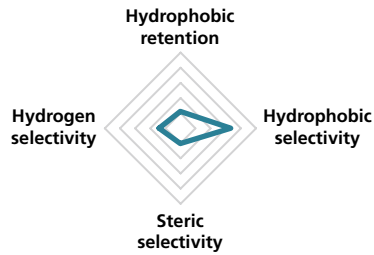
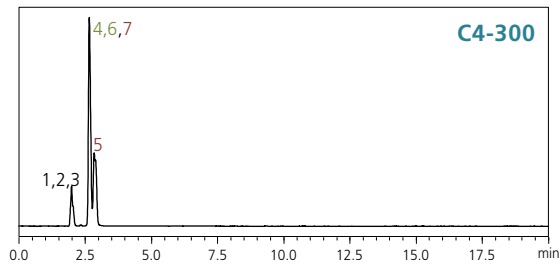


Mobile phase : Acetonitrile / 0.1% Phosphoric acid in water
= 40/60 (v/v)
Flow Rate : 0.4 mL/min
Column Temp. : 40 °C
Detection : UV 254 nm

Comparing Separation Performance of Shim-pack Scepter Reversed Phases



System : Nexera™ X2
Mobile phase : A Water / methanol = 20 : 80
 : B Water / methanol = 70 : 30
Flow Rate : 1.0 mL/min
Column Temp. : 40 °C
Injection Vol. : 1 µL
Detection : UV 254 nm



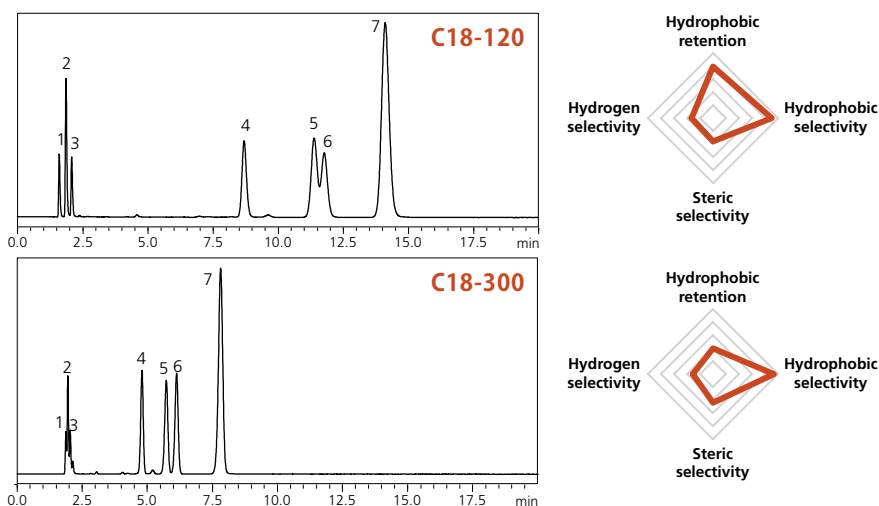
Shim-pack Scepter C18-300, C4-300

Shim-pack Scepter C18-300 and C4-300 are wide-pore organic silica hybrid reversed phase columns recommended for the separation of proteins such as monoclonal antibodies and mid-sized molecules such as oligonucleic acids and peptides that may not be retained on 100-120Å pore size columns due to size-exclusion effects. The organic silica hybrid base material is highly stable even at high temperatures under acidic and basic mobile phase conditions. Pore sizes are optimized for large molecular weight compounds and dispersed uniformly in the column, resulting in symmetrical peak shapes and increased resolution of antibodies and nucleic acids compared to a smaller pore size column. Shim-pack Scepter C18-300 and C4-300 are also effective for high-sensitivity LC/MS analysis, producing good peak shapes even under weak ion-pairing conditions using a formic acid mobile phase.

	C18-300	C4-300
Ligand Type	Trifunctional C18	Trifunctional C 4
	Generic Purpose Type	Generic Purpose Type
Particle Size	1.9, 3, 5 µm	
Pore Size	30 nm (300Å)	
End Capping	Proprietary	
pH Range	1-12	1-10
100% aqueous condition	YES	
USP Classification	L1	L26

Pore Size-Dependent Selectivity

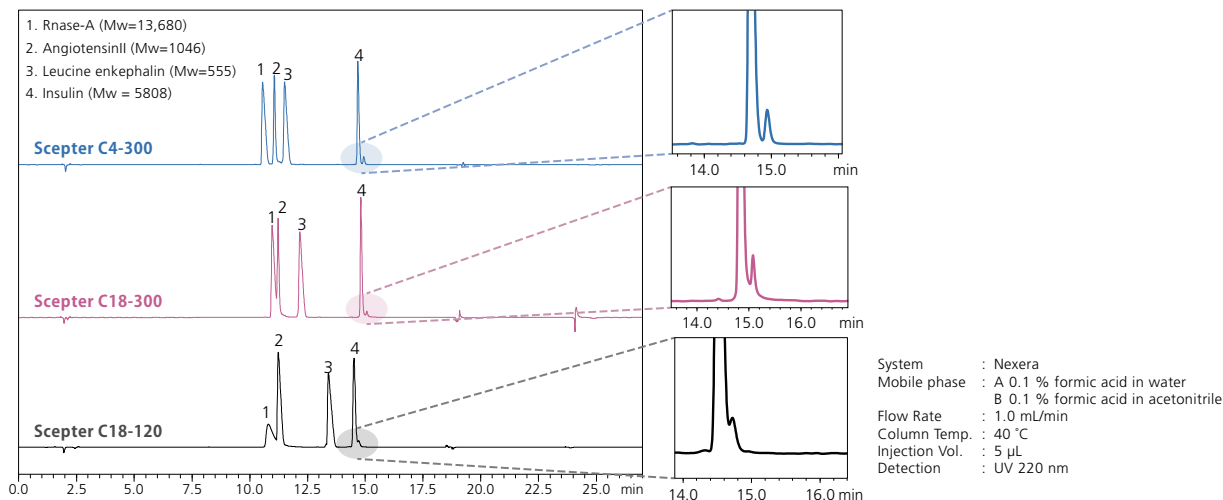
Shim-pack Scepter C18-300 has larger pore sizes than Scepter C18-120, a smaller carbon content, and a lower specific surface area. As a result, Scepter C18-300 exhibits weaker retention compared to Scepter C18-120, making it suitable for applications aimed at reducing analysis time, and for the analysis of compounds that are strongly retained and may have inconsistent retention times on typical C18 columns.



Peptide Analysis Example

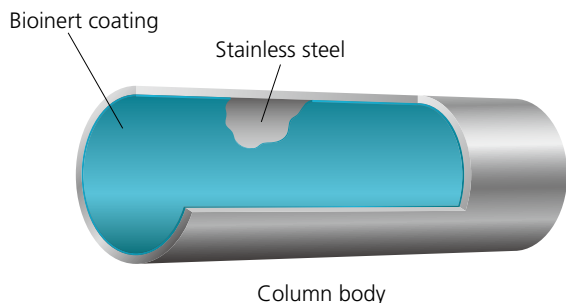
Shim-pack Scepter C18-300 and C4-300 made with 300 Å (30 nm) pore size packing material.

The larger pore size is recommended for the analysis of mid-sized and large-sized molecules with molecular weights above 5000 to enable retention and avoid size-exclusion effects. This analysis of a mixed sample of four different peptides and proteins demonstrated good peak shapes and favorable separation of insulin and ribonuclease A due to the pore size that was large enough to allow proper diffusion of these large molecular weight compounds.



Three Column Hardware Types to Support a Wide Range of Applications

Shim-pack Scepter Claris

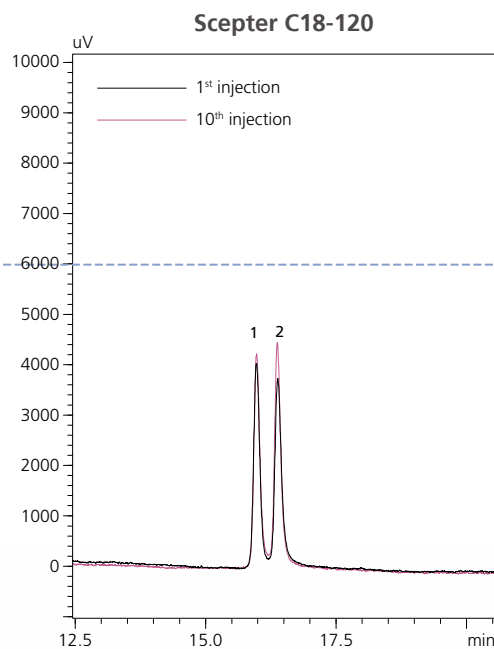
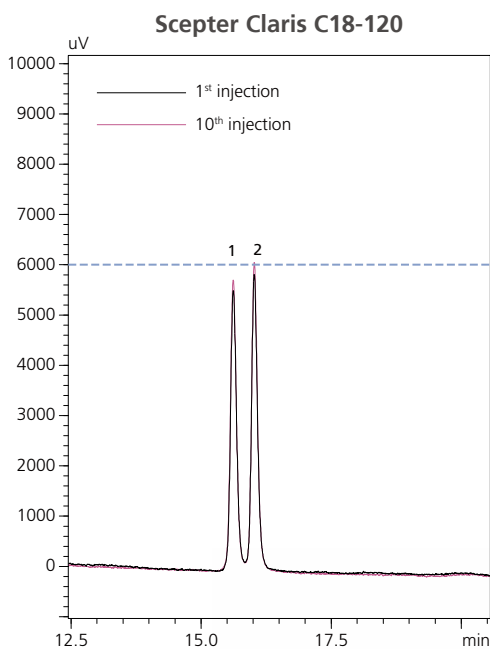


Shim-pack Scepter Claris features a column body with a newly-developed bioinert coating packed with Scepter series stationary phases.

- Bioinert coating is applied to the column body and stainless steel frit
- Ideal for analysis of metal-coordinating and hydrophobically adsorbing compounds such as nucleic acids, proteins, and lipids
- Outstanding pH and lifetime stability due to Scepter organic silica hybrid packing

Superior Sensitivity and Separation Performance in Nucleic Acid Analysis

Shim-pack Scepter Claris C18-120 with the bioinert coating and Scepter C18-120 with traditional stainless steel hardware were compared in this example of an analysis of a synthetic oligonucleotide. Results from Claris were highly sensitive and reproducible from the first injection, with no loss of sample signal. Scepter C18-120 in a stainless steel column body produced low-sensitivity results and showed adsorption from the first sample injection.

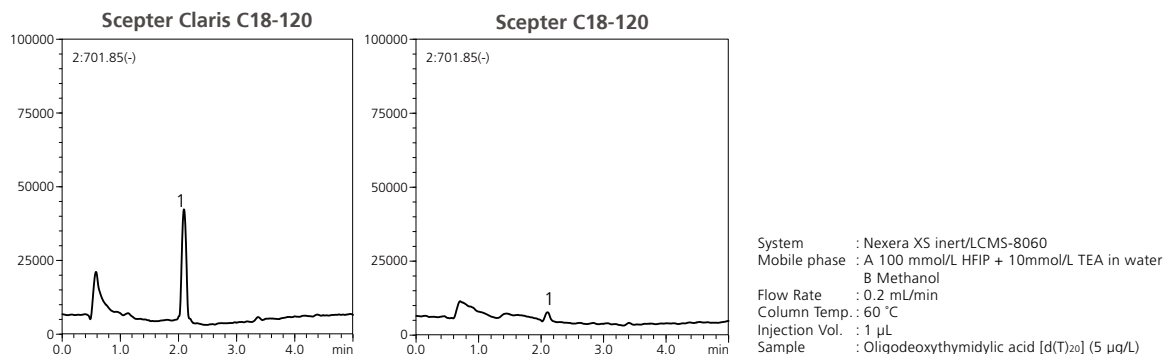


System : Nexera XS inert
 Mobile phase : A 100 mmol/L HFIP + 10 mmol/L TEA in water
 B Methanol
 Flow Rate : 0.3 mL/min
 Column Temp. : 60 °C
 Injection Vol. : 1 µL
 Sample : 1. Synthetic oligonucleotide 20 mer (10 mg/L)
 2. Synthetic oligonucleotide 21 mer (10 mg/L)
 Detection : UV 260 nm

Outstanding Performance in Oligonucleic Acid Analysis

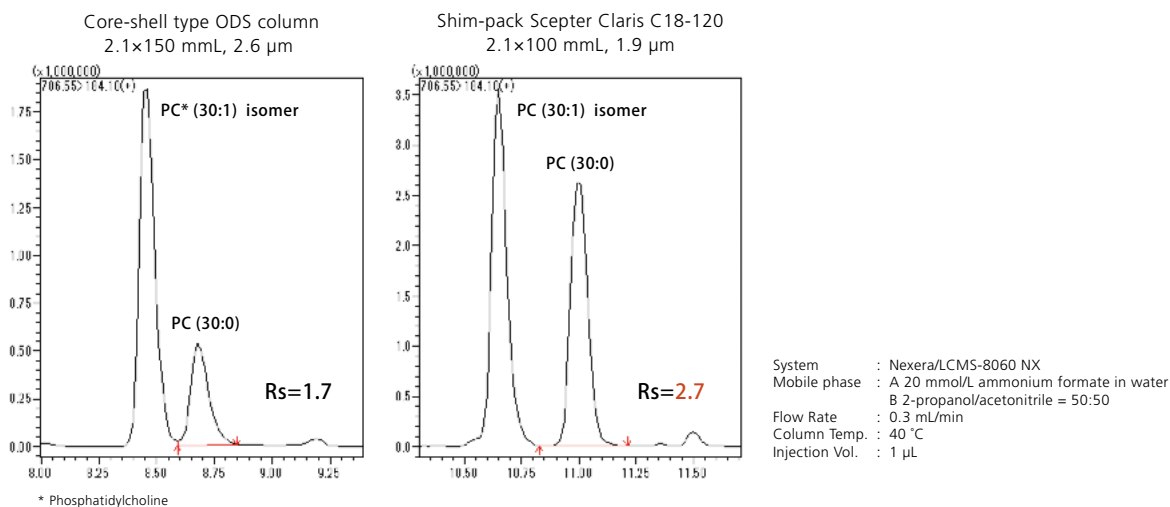
Shim-pack Scepter Claris C18-120 (bioinert coating) and Scepter C18-20 (stainless steel body) were compared in this analysis of Oligodeoxythymidylic acid [d(T)₂₀].

Results from Scepter C18-120 show low peak intensity, suggesting adsorption on metal surfaces. In contrast, Scepter Claris C18-120 produced a sharper and high-intensity peak.



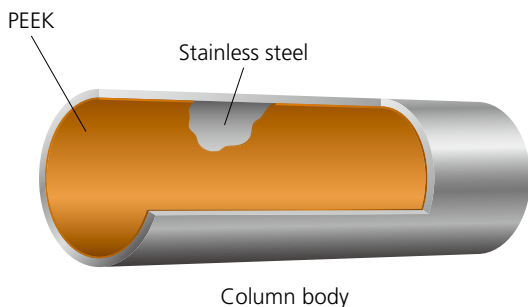
Improved Sensitivity and Separation of Phospholipids

Shim-pack Scepter Claris C18-120 minimizes metal-mediated adsorption and hydrophobic absorption on the column surfaces, resulting in high-resolution separations. In this example of structurally complex phosphatidylcholine isomers, Scepter Claris C18-120 achieved increased baseline resolution between isomers with higher sensitivity.



Shim-pack Scepter [metal-free]

Shim-pack Scepter (metal-free) is an inert column with a PEEK-lined stainless steel body designed for ultra-high-performance analysis. All wetted surfaces including the column body and frit are metal-free.



- Ideal for analysis of metal-coordinating and ion-adsorbing compounds such as phosphate-containing and basic analytes
- Outstanding pH and lifetime stability due to Scepter organic silica hybrid packing

Note: PEEK-lined stainless steel body and piping should be connected according to recommendations. Scan the QR code or visit https://www.an.shimadzu.co.jp/hplc/consumables/shimpack_scepter.pdf for more information.

Cautions when connecting
 Metal-free Column to the piping



[Shim-pack Scepter Claris]

Chemistry			C18-120			HD-C18-80			C18-300		
Particle Size (µm)	Length (mm)	ID (mm)	2.1	3	4.6	2.1	3	4.6	2.1	3	4.6
1.9	50	227-31210-01				227-31211-01			227-31209-01		
	75										
	100	227-31210-02				227-31211-02			227-31209-02		
	150	227-31210-03				227-31211-03			227-31209-03		
3	50	227-31210-04			227-31210-07	227-31211-04		227-31211-07	227-31209-04		227-31209-07
	75										
	100	227-31210-05			227-31210-08	227-31211-05		227-31211-08	227-31209-05		227-31209-08
	150	227-31210-06			227-31210-09	227-31211-06		227-31211-09	227-31209-06		227-31209-09
	250										
5	50	227-31210-10			227-31210-13	227-31211-10		227-31211-13	227-31209-10		227-31209-13
	75										
	100	227-31210-11			227-31210-14	227-31211-11		227-31211-14	227-31209-11		227-31209-14
	150	227-31210-12			227-31210-15	227-31211-12		227-31211-15	227-31209-12		227-31209-15
	250										

Chemistry			C8-120			C4-300			Phenyl		
Particle Size (µm)	Length (mm)	ID (mm)	2.1	3	4.6	2.1	3	4.6	2.1	3	4.6
1.9	50	227-31212-01				227-31208-01			227-31215-01		
	75										
	100	227-31212-02				227-31208-02			227-31215-02		
	150	227-31212-03				227-31208-03			227-31215-03		
3	50	227-31212-04			227-31212-07	227-31208-04		227-31208-07	227-31215-04		227-31215-07
	75										
	100	227-31212-05			227-31212-08	227-31208-05		227-31208-08	227-31215-05		227-31215-08
	150	227-31212-06			227-31212-09	227-31208-06		227-31208-09	227-31215-06		227-31215-09
	250										
5	50	227-31212-10			227-31212-13	227-31208-10		227-31208-13	227-31215-10		227-31215-13
	75										
	100	227-31212-11			227-31212-14	227-31208-11		227-31208-14	227-31215-11		227-31215-14
	150	227-31212-12			227-31212-15	227-31208-12		227-31208-15	227-31215-12		227-31215-15
	250										

Chemistry			PFPP			Diol-HILIC		
Particle Size (µm)	Length (mm)	ID (mm)	2.1	3	4.6	2.1	3	4.6
1.9	50	227-31214-01				227-31213-01		
	75							
	100	227-31214-02				227-31213-02		
	150	227-31214-03				227-31213-03		
3	50	227-31214-04			227-31214-07	227-31213-04		227-31213-07
	75							
	100	227-31214-05			227-31214-08	227-31213-05		227-31213-08
	150	227-31214-06			227-31214-09	227-31213-06		227-31213-09
	250							
5	50	227-31214-10			227-31214-13	227-31213-10		227-31213-13
	75							
	100	227-31214-11			227-31214-14	227-31213-11		227-31213-14
	150	227-31214-12			227-31214-15	227-31213-12		227-31213-15
	250							

[Shim-pack Scepter [metal-free]]

Chemistry		C18-120			HD-C18-80			C18-300		
Particle Size (µm)	ID (mm)	2.1	3	4.6	2.1	3	4.6	2.1	3	4.6
	Length (mm)									
1.9	50	227-31072-01			227-31173-01			227-31204-01		
	75									
	100	227-31072-02			227-31173-02			227-31204-02		
	150							227-31204-03		
3	50	227-31073-01		227-31074-01	227-31077-01		227-31078-01	227-31204-04		227-31204-07
	75									
	100	227-31073-02		227-31074-02	227-31077-02		227-31078-02	227-31204-05		227-31204-08
	150	227-31073-03		227-31074-03			227-31078-03	227-31204-06		227-31204-09
5	50	227-31075-01		227-31076-01	227-31079-01		227-31080-01	227-31204-10		227-31204-13
	75									
	100	227-31075-02		227-31076-02	227-31079-02		227-31080-02	227-31204-11		227-31204-14
	150			227-31076-03			227-31080-03	227-31204-12		227-31204-15
250										

Chemistry		C8-120			C4-300			Phenyl		
Particle Size (µm)	ID (mm)	2.1	3	4.6	2.1	3	4.6	2.1	3	4.6
	Length (mm)									
1.9	50	227-31166-01			227-31197-01			227-31169-01		
	75									
	100	227-31166-02			227-31197-02			227-31169-02		
	150	227-31166-03			227-31197-03					
3	50	227-31081-01		227-31082-01	227-31198-01		227-31199-01	227-31093-01		227-31094-03
	75									
	100	227-31081-02		227-31082-02	227-31198-02		227-31199-02	227-31093-02		227-31094-01
	150	227-31081-03		227-31082-03	227-31198-03		227-31199-03			227-31094-02
5	50	227-31083-01		227-31084-01	227-31200-01		227-31201-01	227-31095-01		227-31096-01
	75									
	100	227-31083-02		227-31084-02	227-31200-02		227-31201-02	227-31095-02		227-31096-02
	150	227-31083-03		227-31084-03	227-31200-03		227-31201-03			227-31096-03
250										

Chemistry		PFPP			Diol-HILIC		
Particle Size (µm)	ID (mm)	2.1	3	4.6	2.1	3	4.6
	Length (mm)						
1.9	50	227-31168-01			227-31167-01		
	75						
	100	227-31168-02			227-31167-02		
	150						
3	50	227-31089-01		227-31090-03	227-31085-01		227-31086-01
	75						
	100	227-31089-02		227-31090-01	227-31085-02		227-31086-02
	150			227-31090-02			227-31086-03
5	50	227-31091-01		227-31092-01	227-31087-01		227-31088-03
	75						
	100	227-31091-02		227-31092-02	227-31087-02		227-31088-01
	150			227-31092-03			227-31088-02
250							

[Shim-pack Scepter EXP Guard Cartridge (Particle size : 1.9 μm , 3 pk)]

Dimension \ Chemistry	C18-120	HD-C18-80	C18-300	C8-120	C4-300	Phenyl	PFPP
2.1x5 mm	227-31120-01	227-31128-01	227-31206-01	227-31136-01	227-31187-01	227-31158-01	227-31150-01
3.0x5 mm	227-31120-02	227-31128-02	227-31206-02	227-31136-02	227-31187-02	227-31158-02	227-31150-02

* EXP Cartridge holder for Shim-pack Scepter: 227-32041-01

[Shim-pack Scepter Analytical Guard Cartridge (5 pk)]

Particle Size (μm)	3								
Dimension \ Chemistry	C18-120	HD-C18-80	C18-300	C8-120	C4-300	Phenyl	PFPP	Diol-HILIC	
2.1x10 mm	227-31121-01	227-31129-01	227-31207-01	227-31137-01	227-31188-01	227-31159-01	227-31151-01	227-31144-01	
3.0x10 mm	227-31122-01	227-31130-01	227-31207-03	227-31138-01	227-31189-01	227-31160-01	227-31152-01	227-31145-01	
4.0x10 mm	227-31123-01	227-31131-01	227-31207-05	227-31139-01	227-31190-01	227-31161-01	227-31153-01	227-31146-01	

Particle Size (μm)	5								
Dimension \ Chemistry	C18-120	HD-C18-80	C18-300	C8-120	C4-300	Phenyl	PFPP	Diol-HILIC	
2.1x10 mm	227-31124-01	227-31132-01	227-31207-07	227-31140-01	227-31191-01	227-31162-01	227-31154-01	227-31147-01	
3.0x10 mm	227-31125-01	227-31133-01	227-31207-09	227-31141-01	227-31192-01	227-31163-01	227-31155-01	227-31148-01	
4.0x10 mm	227-31126-01	227-31134-01	227-31207-11	227-31142-01	227-31193-01	227-31164-01	227-31156-01	227-31149-01	

* Cartridge holder for Analytical Shim-pack Scepter guard cartridges (10 mm length): 227-31172-03

[Shim-pack Scepter Preparative Guard Cartridge (Particle size : 5 μm , 2 pk)]

Dimension \ Chemistry	C18-120	HD-C18-80	C18-300	C8-120	C4-300	Phenyl	PFPP	Cartridge Holder
10x10 mm	227-31127-01	227-31135-01	227-31207-13	227-31143-01	227-31194-01	227-31165-01	227-31157-01	227-31171-01
20x10 mm	227-31127-02	227-31135-02	227-31207-14	227-31143-02	227-31195-01	227-31165-02	227-31157-02	227-31171-02
30x10 mm	227-31127-03	227-31135-03	227-31207-15	227-31143-03	227-31196-01	227-31165-03	227-31157-03	227-31171-03

Shim-pack, Shim-pack Scepter, CoreFocus logo, and Nexera are trademarks of Shimadzu Corporation or its affiliated companies in Japan and/or other countries.



Shimadzu Corporation

www.shimadzu.com/an/**For Research Use Only. Not for use in diagnostic procedures.**

This publication may contain references to products that are not available in your country. Please contact us to check the availability of these products in your country.

Company names, products/service names and logos used in this publication are trademarks and trade names of Shimadzu Corporation, its subsidiaries or its affiliates, whether or not they are used with trademark symbol "TM" or "®".

Third-party trademarks and trade names may be used in this publication to refer to either the entities or their products/services, whether or not they are used with trademark symbol "TM" or "®".

Shimadzu disclaims any proprietary interest in trademarks and trade names other than its own.

The contents of this publication are provided to you "as is" without warranty of any kind, and are subject to change without notice. Shimadzu does not assume any responsibility or liability for any damage, whether direct or indirect, relating to the use of this publication.