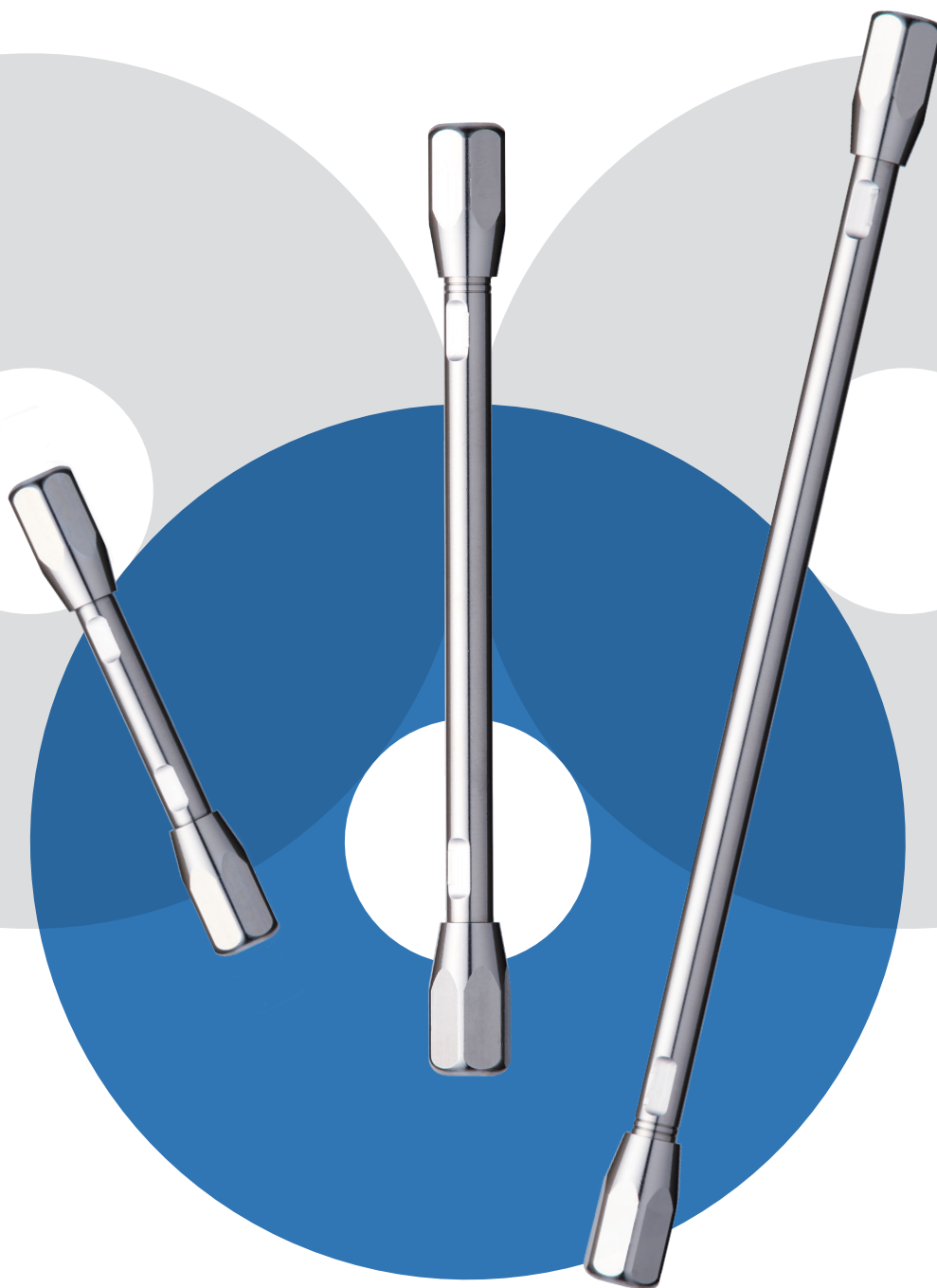


# InertCore Plus C18

The High Performance Core-shell Column For UHPLC/HPLC



- 
- Base Material : Core-shell type silica gel
  - Particle Size : 2.6  $\mu\text{m}$
  - Solid Core : 2.0  $\mu\text{m}$
  - Surface Area : 200  $\text{m}^2/\text{g}$
  - Pore Size : 90  $\text{\AA}$  (9 nm)
  - Functional Group : Octadecyl
  - End-capping : Yes
  - Carbon Loading : 15 %
  - USP Code : L1
  - pH Range : 1 - 10
  - Max Pressure : 100 MPa (2.1 mm I.D.)  
60 MPa (3.0 mm I.D., 4.6 mm I.D.)
-



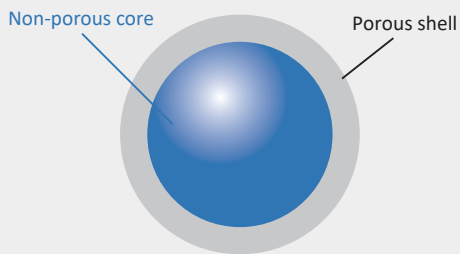
The manufacturing process is strictly controlled to minimize differences between and to ensure quality and supply stability.

## Core-Shell Technology for the highest theoretical plates.

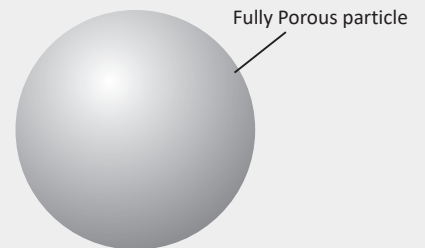
The molecules of the target analytes pass through the fine pores in the particles in the packing material. Core-shell particles are formed around a solid non-porous core, resulting in less diffusion inside the fine pore structure. This differs from the more traditional fully porous particle.

When using a core-shell column, the distribution of molecules in the peak is narrower when the target compound is eluted from the column, resulting in a greater number of theoretical plates.

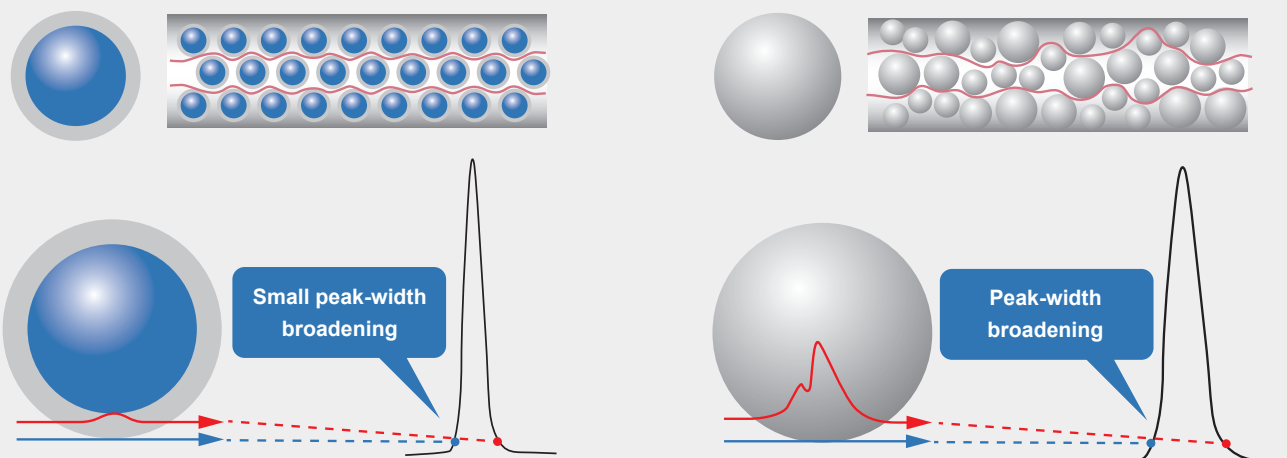
### Core-Shell type packing material



### Conventional fully porous packing material



- The effect of multiple-path diffusion is significantly reduced by improving the particle size distribution homogeneity to the highest achievable limits.
- A 2.6 $\mu\text{m}$  core-shell packing material achieves a comparable number of theoretical plates as a Sub 2 $\mu\text{m}$  fully porous packing material, but with the same back-pressure as a column using 3 $\mu\text{m}$  fully porous packing material.
- The theoretical plates are improved by reducing diffusion inside the particle.

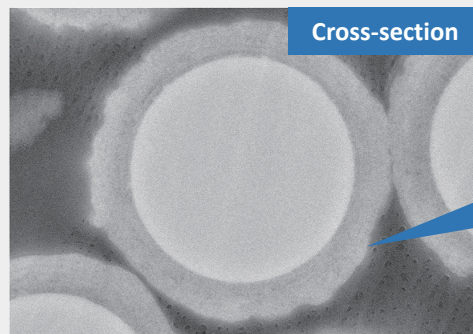
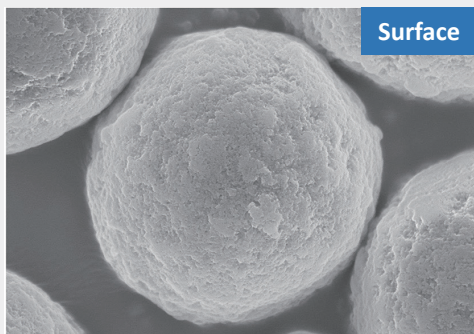


# Comparison with Products from Other Suppliers

The InertCore Plus C18 columns are subjected to rigorous internal quality control from bare silica manufacturing to inspection, resulting in superior reproducibility due to shell layer homogeneity.

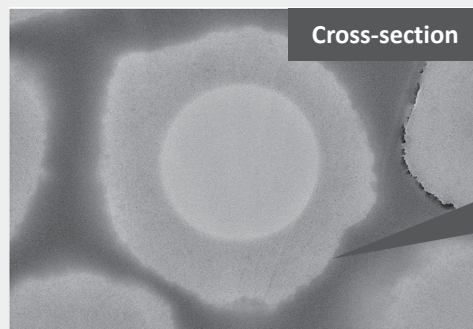
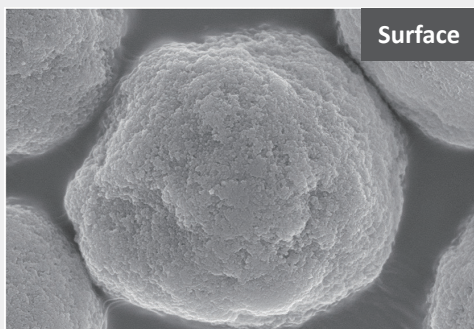
## SEM image

InertCore Plus C18



Shell layer is homogeneous.

Core-shell columns from other suppliers

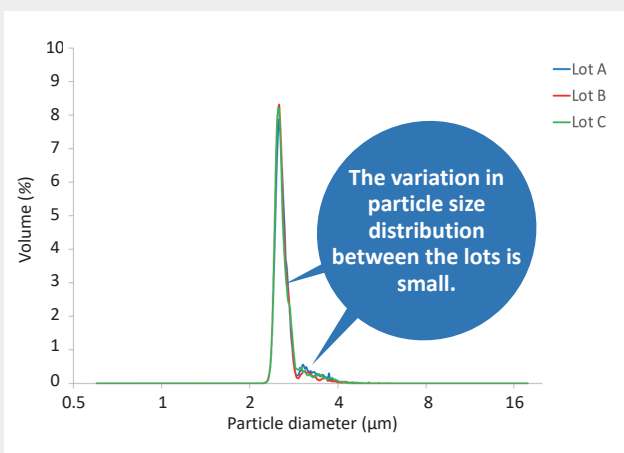


Shell layer is non-homogeneous

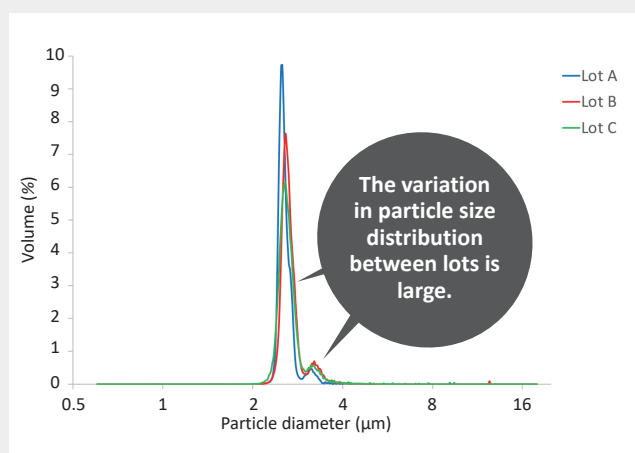
Compare with other core-shell brand columns, InertCore Plus C18 delivery extremely stable batch-to-batch performance.

## Particle size distribution

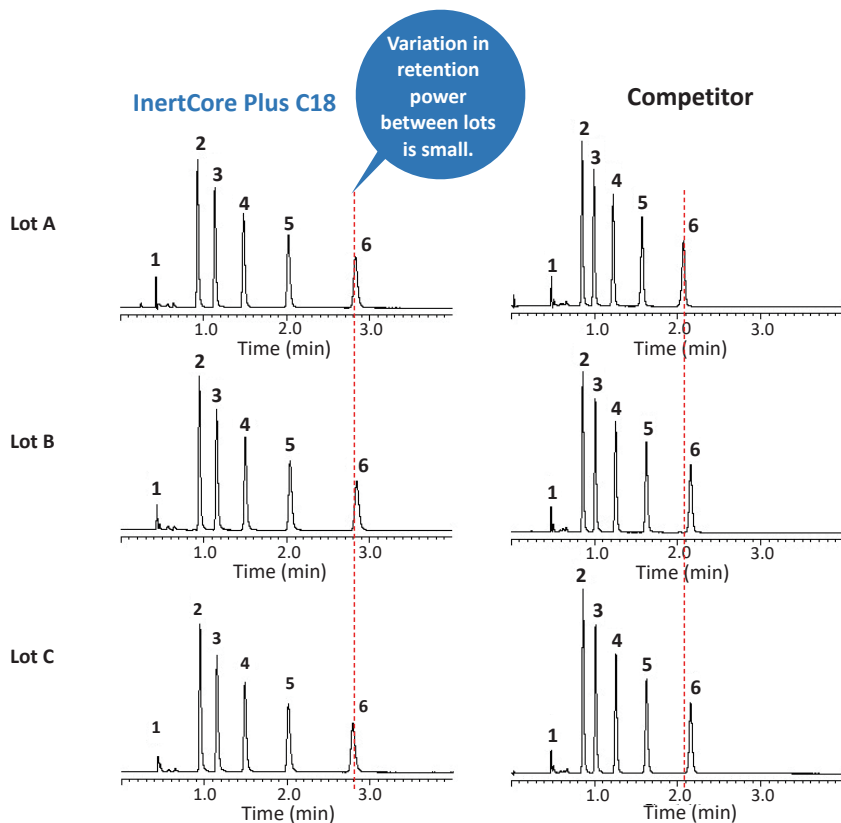
InertCore Plus C18



Competitor



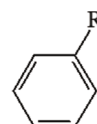
# Superior Reproducibility



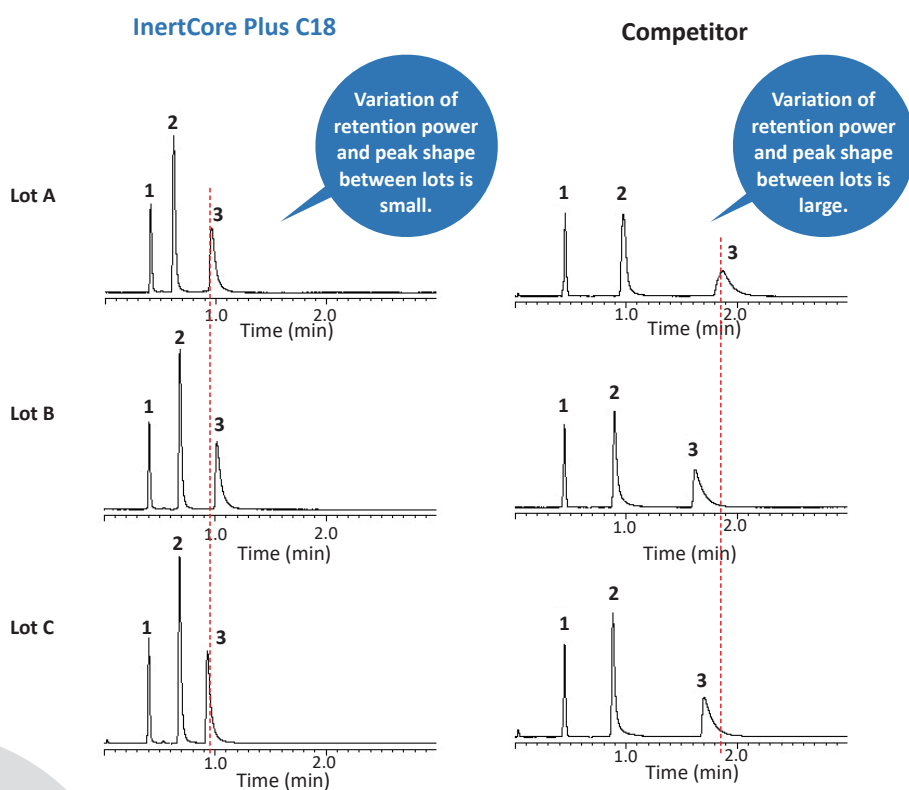
## 1 Hydrophobic retention test

### Conditions

Column Size : 2.6  $\mu$ m, 100  $\times$  2.1 mm I.D.  
 Eluent : CH<sub>3</sub>OH/H<sub>2</sub>O = 80/20, v/v  
 Flow Rate : 0.4 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 254 nm  
 Injection Vol. : 0.2  $\mu$ L  
 Sample : 1. Uracil 2. Toluene 3. Ethylbenzene  
 4. Propylbenzene 5. n-Butylbenzene  
 6. n-Amylbenzene



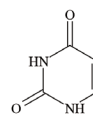
R: 2. Toluene — CH<sub>3</sub>  
 3. Ethylbenzene — CH<sub>2</sub>CH<sub>3</sub>  
 4. Propylbenzene — CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>  
 5. n-Butylbenzene — CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>  
 6. n-Amylbenzene — CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>



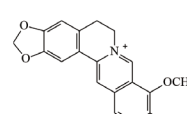
## 2 Strongly basic compounds adsorption test

### Conditions

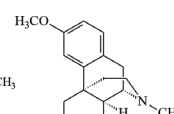
Column Size : 2.6  $\mu$ m, 100  $\times$  2.1 mm I.D.  
 Eluent : A) CH<sub>3</sub>CN  
 B) 25 mM K<sub>2</sub>HPO<sub>4</sub> (pH 7.0, KH<sub>2</sub>PO<sub>4</sub>)  
 A/B = 40/60, v/v  
 Flow Rate : 0.4 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 220 nm  
 Injection Vol. : 0.2  $\mu$ L  
 Sample : 1. Uracil 2. Berberine chloride  
 3. Dextromethorphan



1:Uracil  
(Neutrality)



2:Berberine chloride  
(Basicity)

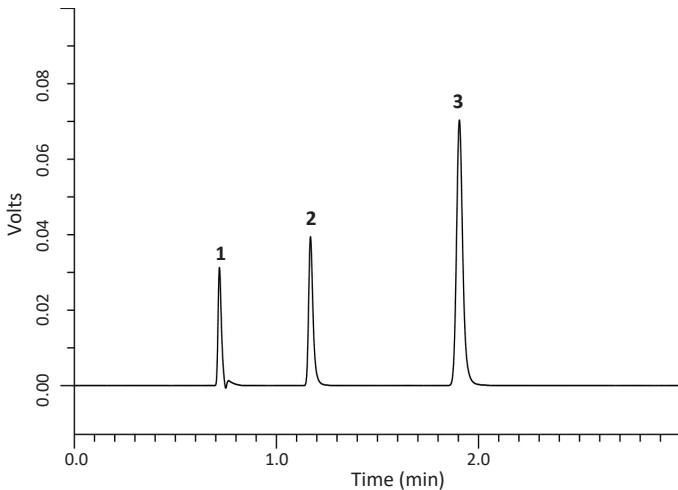


3:Dextromethorphan  
(Basicity)



# High Durability

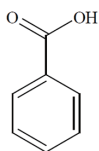
InertCore Plus C18 has high durability demonstrating that the performance for retention time, theoretical plate and symmetry factor is maintained even after 2000 continuous injections.



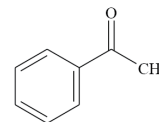
## Conditions

Column Size : 2.6  $\mu$ m, 100  $\times$  4.6 mm I.D.  
Eluent : CH<sub>3</sub>CN/0.1 % H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O = 40/60, v/v  
Flow Rate : 1.0 mL/min  
Col Temp. : 40 °C  
Detection : UV 254 nm  
Inj. Vol. : 10  $\mu$ L  
Sample : 1. Uracil 1 mg/L  
          2. Benzoic acid 20 mg/L  
          3. Acetophenone 5 mg/L

Performance is maintained even after 2000 injections.

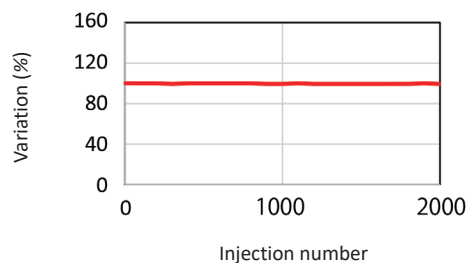
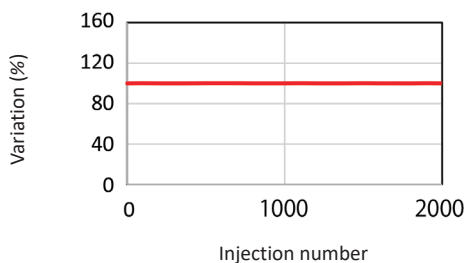


2. Benzoic acid

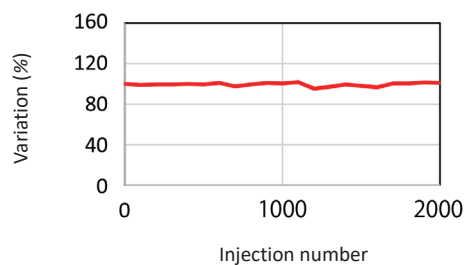
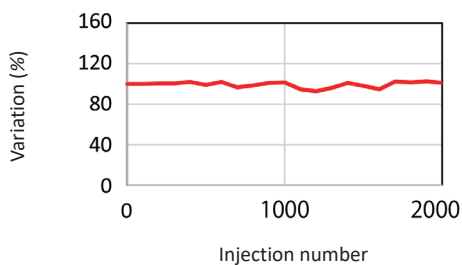


3. Acetophenone

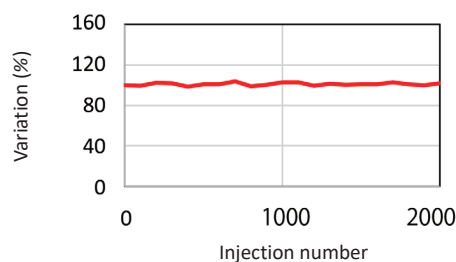
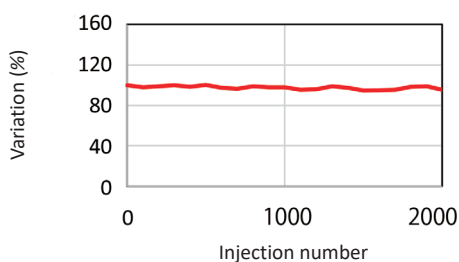
### Retention time



### Theoretical plates



### Symmetry factor

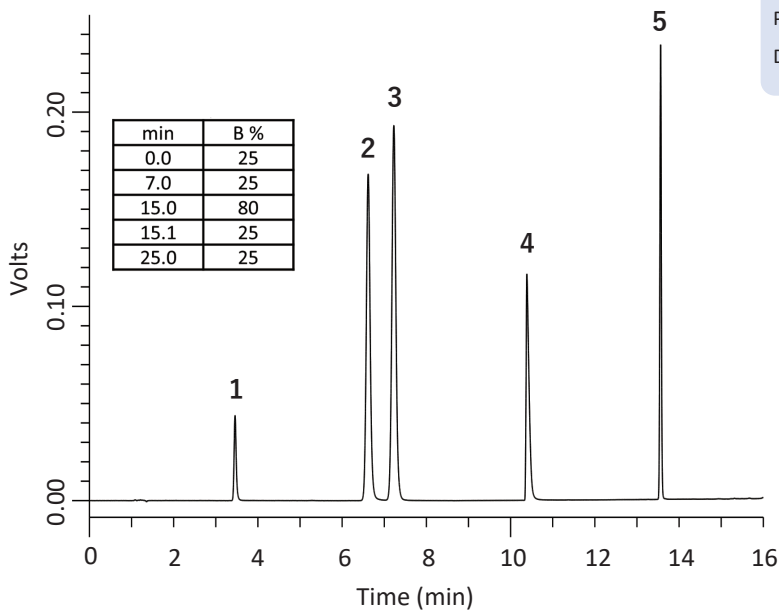




# Suitable for Both General Purpose HPLC and UHPLC

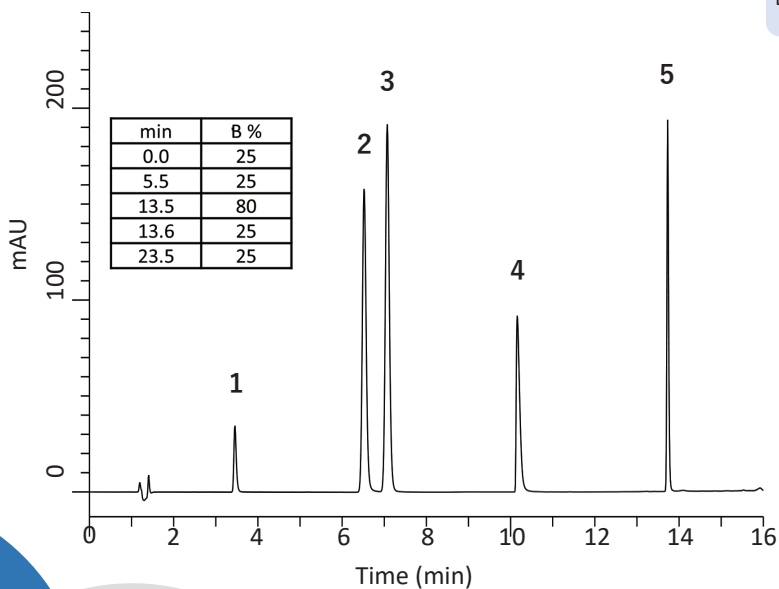
The results of analyses performed with the InertCore Plus C18 on two different HPLC systems, under the same conditions are shown. Peak shapes are excellent in both cases and equivalent chromatograms were obtained.

## When UHPLC is used



Pressure: 22.0 MPa (including all plumbing, etc.)  
Degree of separation between peak 2 and peak 3: 3.65

## When general purpose HPLC is used



Pressure: 19.0 MPa (including all plumbing, etc.)  
Degree of separation between peak 2 and peak 3: 3.29

### Conditions

Column Size : 2.6  $\mu$ m, 150  $\times$  4.6 mm I.D.  
Eluent : A) 10 mM  $\text{KH}_2\text{PO}_4$  in  $\text{H}_2\text{O}$  (pH 2.0,  $\text{H}_3\text{PO}_4$ )  
B)  $\text{CH}_3\text{CN}$   
Flow Rate : 1.0 mL/min  
Col.Temp. : 40  $^\circ\text{C}$   
Detection : PDA  
Injection Vol. : 2  $\mu$ L  
Sample : 1. Benzoic acid  
2. Ethyl p-Hydroxybenzoate  
3. Acetophenone  
4. Amitriptyline  
5. Indomethacin (100 mg/L in 50 % MeOH)

\* To eliminate the effect of system volume, plumbing size, etc. A general purpose HPLC system is optimized.

## Ordering Information

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### Analysis column

Description	Particle Size (µm)	Length / Inner Diameter (mm)	2.1	3.0	4.6
InertCore Plus C18	2.6	50	5020-17510	5020-17515	5020-17520
		75	5020-17513	5020-17518	5020-17523
		100	5020-17511	5020-17516	5020-17521
		150	5020-17512	5020-17517	5020-17522

Note) The type of fitting connections used is Parker type (UP type).

### Guard column

Description	Particle Size (µm)	Inner Diameter (mm)	Length (mm)	Cat. No
InertCore Plus C18	2.6	2.1	20	5020-17506
		3.0	20	5020-17507
		4.6	20	5020-17508

Note) The type of fitting connections used is Parker type (UP type).



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