

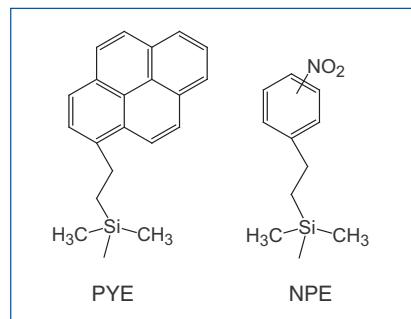


COSMOSIL

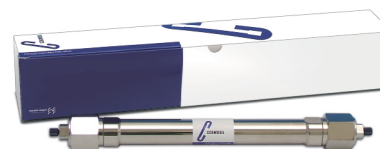
HPLC Column for Structural Isomers

# COSMOSIL PYE COSMOSIL NPE

	COSMOSIL PYE	COSMOSIL NPE
Silica Gel	High Purity Porous Spherical Silica	
Average Particle Size	5 $\mu\text{m}$	
Average Pore Size	approx. 120 $\text{\AA}$	
Stationary Phase	2-(1-Pyrenyl)ethyl Group	Nitrophenylethyl Group
Main Interaction	Hydrophobic Interaction $\pi$ - $\pi$ Interaction Charge Transfer Interaction Stereoselectivity	Hydrophobic Interaction $\pi$ - $\pi$ Interaction Dipole-Dipole Interaction
Carbon Content	approx. 18%	approx. 9%



COSMOSIL PYE (Pyrenylethyl group bonded) and COSMOSIL NPE (Nitrophenylethyl group bonded) column show unique retention characteristics based on multiple separation modes such as hydrophobic, charge transfer and  $\pi$ - $\pi$  interactions. These columns are recommended for the separation of structural isomers.



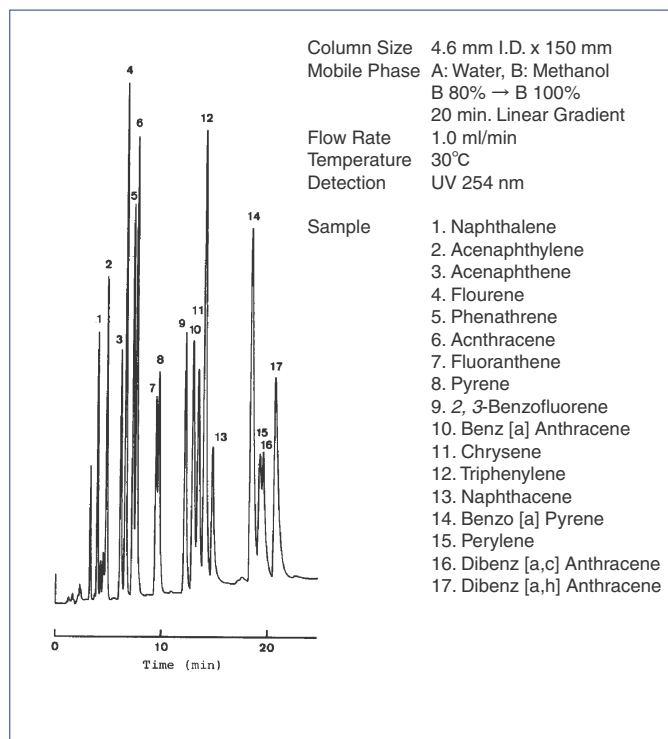
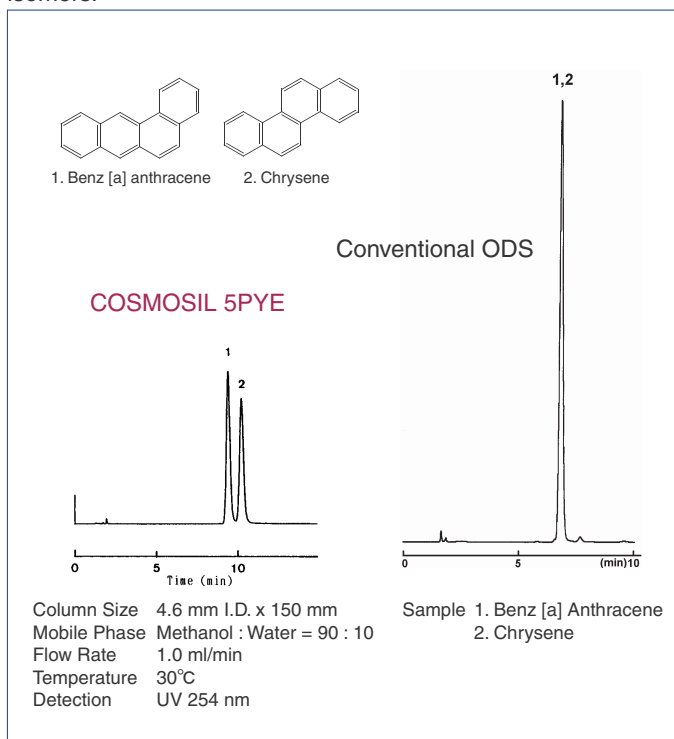
## COSMOSIL PYE

- *Pyrenylethyl group bonded stationary phase*
- *Separation with high molecular shape selectivity or  $\pi$ - $\pi$  interactions*
- *Excellent separation for structural isomers*

COSMOSIL PYE column is a reversed phase column with 2-(1-Pyrenyl) ethyl groups bonded silica packing material. This column utilizes  $\pi$ - $\pi$  interactions originating from the planar pyrene ring structure to separate structural isomers.

### Separation of PAHs

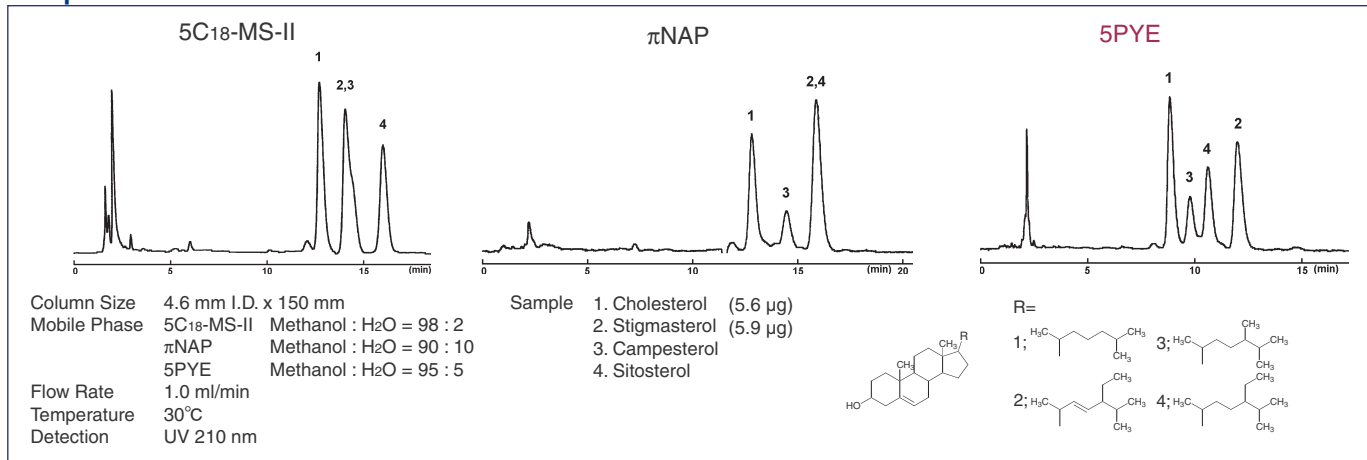
Due to the planar pyrene ring structure and strong  $\pi$ - $\pi$  interactions, COSMOSIL PYE achieves excellent separation of aromatic isomers.



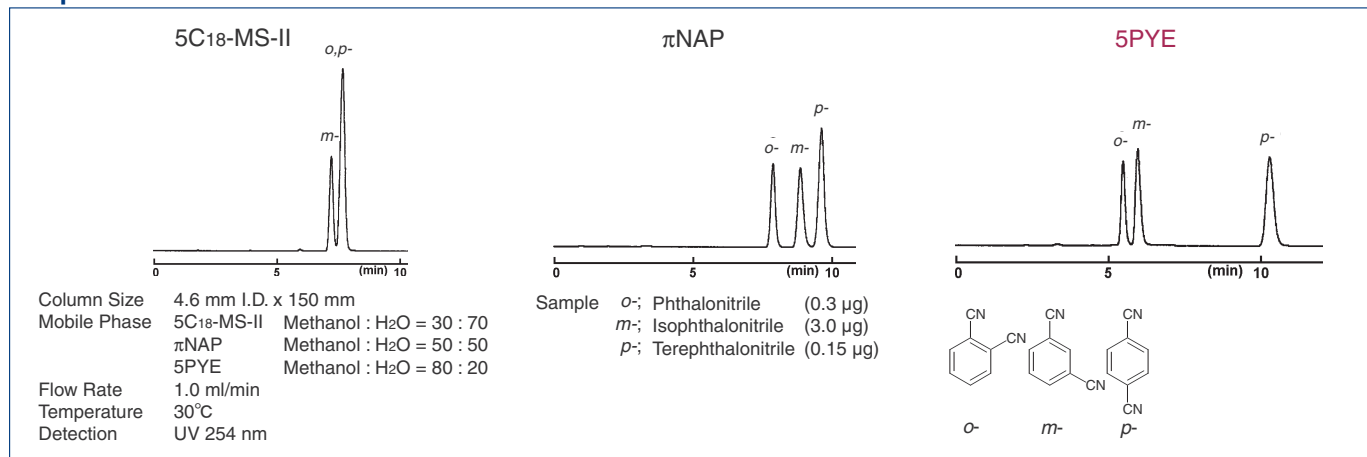
## COSMOSIL PYE (continued)

### Application Data

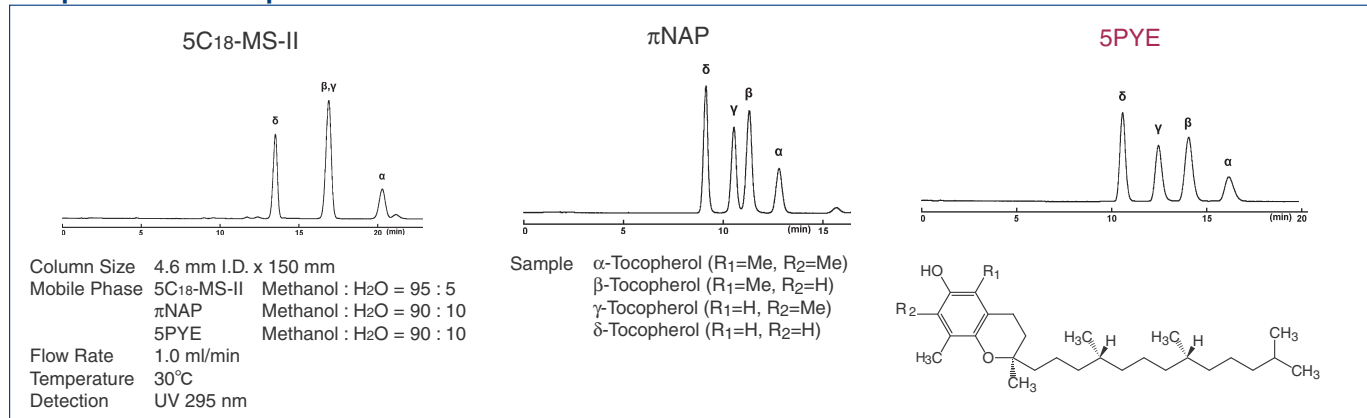
#### Separation of Sterols



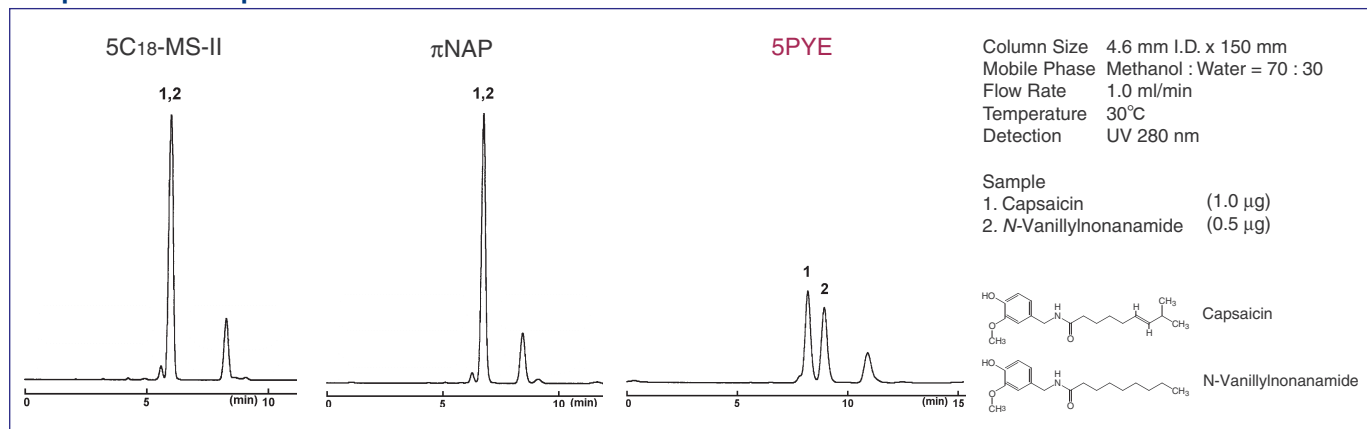
#### Separation of Phthalonitriles



#### Separation of Tocopherols



#### Separation of Capsaicin



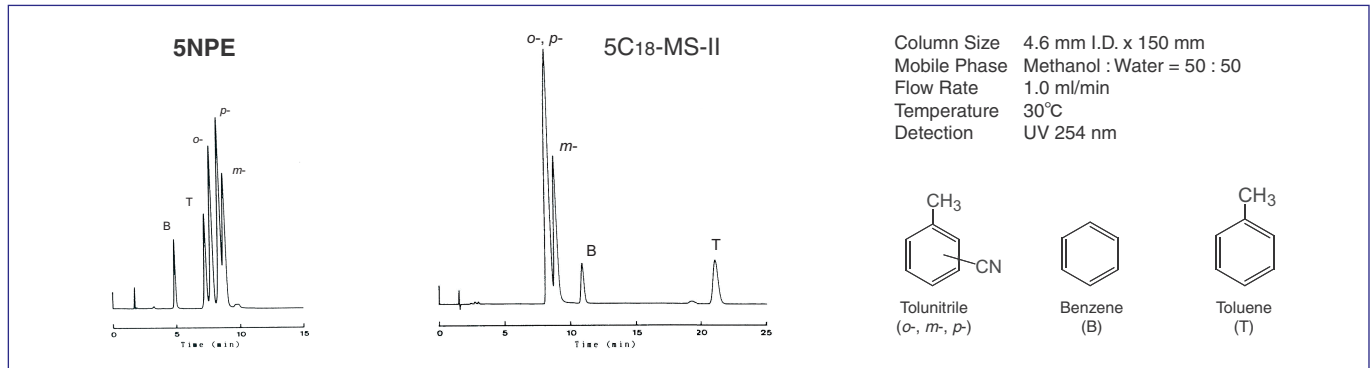
## COSMOSIL NPE

COSMOSIL NPE column is a reversed phase column with Nitrophenylethyl groups bonded silica packing material. This column provides unique retention characteristics, slightly different from the COSMOSIL PYE column, utilizing both dipole-dipole and  $\pi$ - $\pi$  interactions.

- **Nitrophenylethyl group bonded stationary phase**
- **Separation with dipole-dipole and  $\pi$ - $\pi$  interactions**
- **Excellent separation for structural isomers**

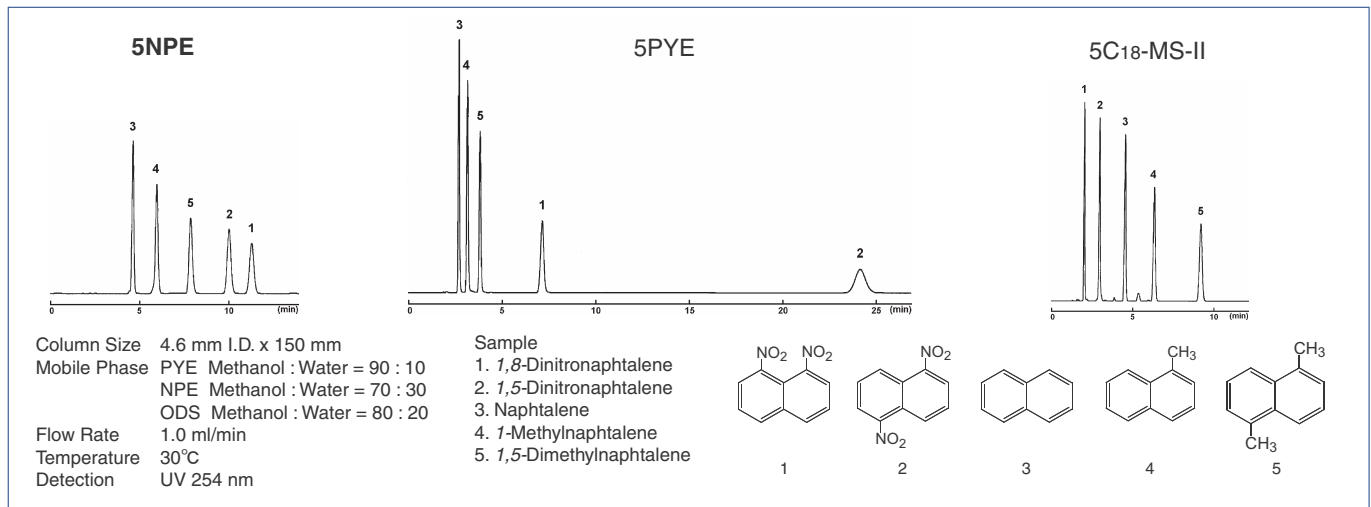
### Advantage of Dipole-Dipole Interactions

The chromatogram below illustrates the separation of *o*-, *m*-, *p*-tolunitrile. Since hydrophobic interaction is dominant in the separation by a ODS column, tolunitrile elutes first. In COSMOSIL NPE, tolunitrile elutes later. This suggests that COSMOSIL NPE utilizes the interaction between  $\pi$ -electron of the nitrophenyl group and CN- for retention in addition to hydrophobic interaction.



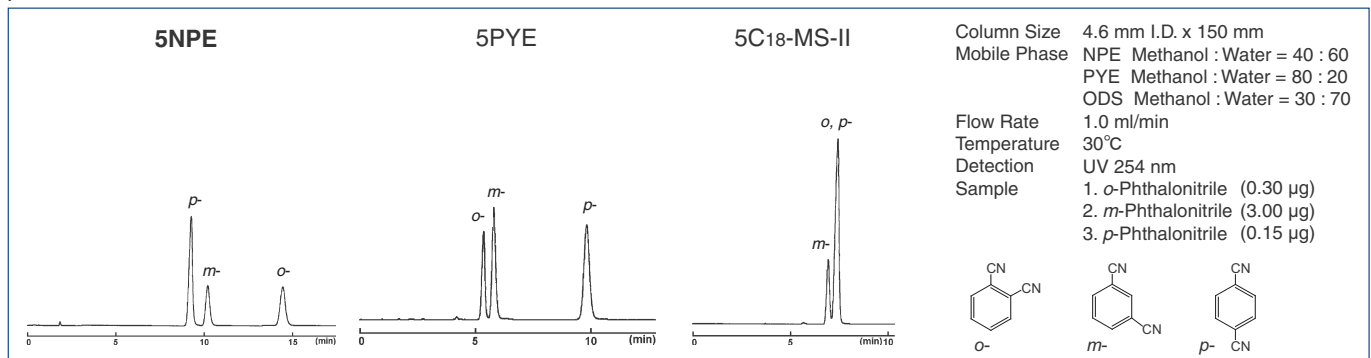
### Application of Disubstituted Napthalenes

COSMOSIL NPE strongly retains 1,8-dinitronaphthalene because of the strong dipole formed by the two nitro groups positioned on the same side of naphthalene.



### Effect of Dipole-Dipole Interaction

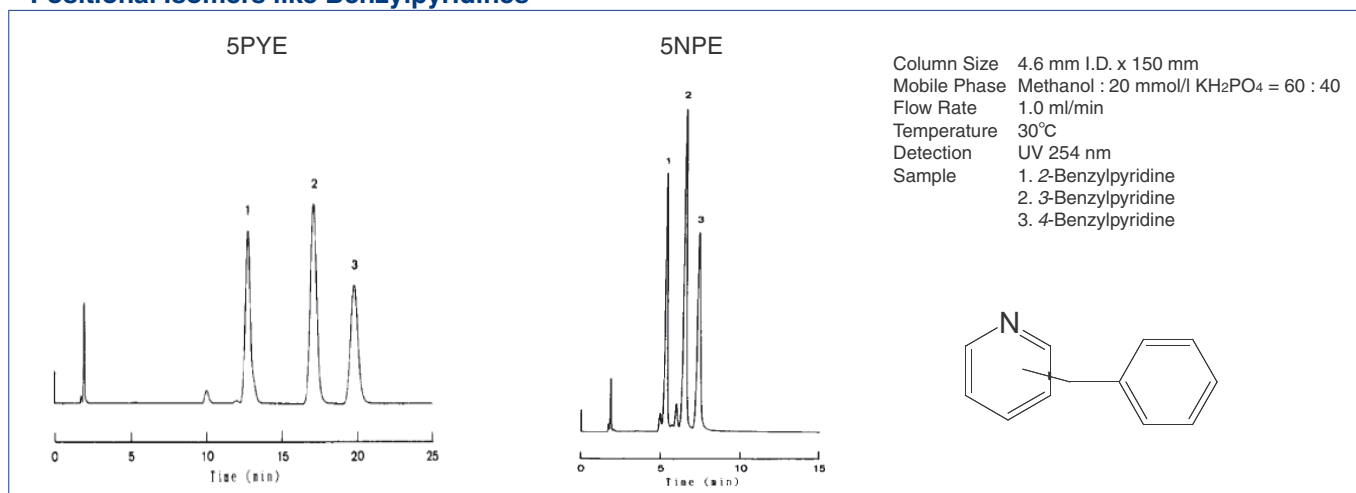
The ODS column cannot sharply separate the positional isomers like phthalonitrile. In contrast, COSMOSIL PYE and NPE can separate them very well by  $\pi$ - $\pi$  interaction. Furthermore, COSMOSIL NPE strongly retains ortho compound which has a big dipole moment.



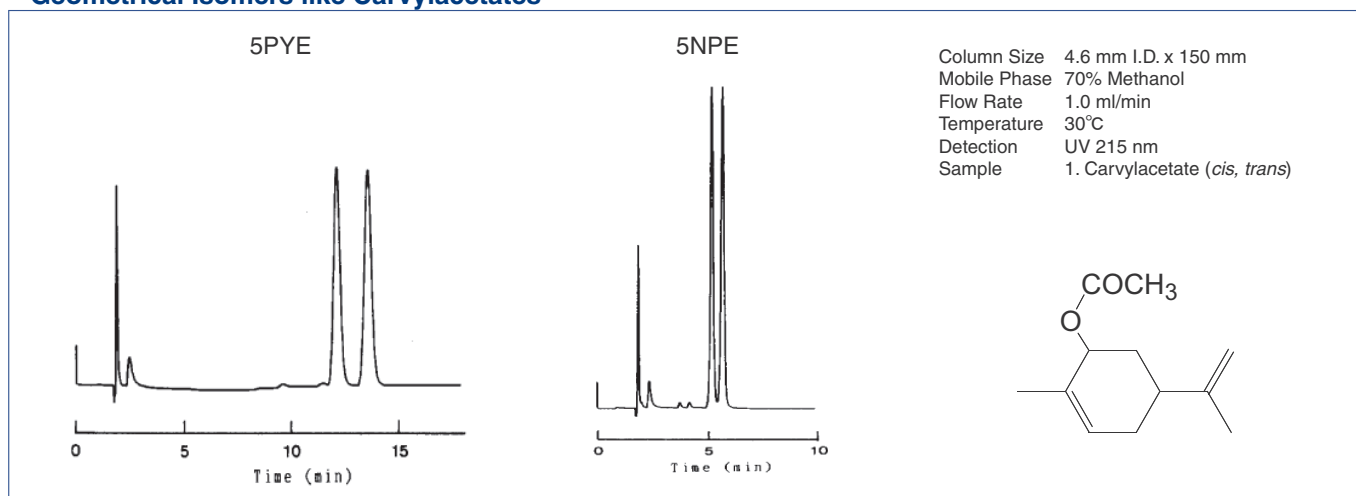
## COSMOSIL NPE (continued)

### Application Data

#### Positional Isomers like Benzylpyridines



#### Geometrical Isomers like Carvylacetates



### Ordering Information

Product Name	Column Size	Product Number	Product Name	Column Size	Product Number
COSMOSIL 5PYE Packed Column	1.0 mm I.D. x 150 mm	02851-71	COSMOSIL 5PYE	4.6 mm I.D. x 10 mm	37903-11
	2.0 mm I.D. x 150 mm	38042-61	Guard Column	10.0 mm I.D. x 20 mm	38041-71
	2.0 mm I.D. x 250 mm	34450-31		20.0 mm I.D. x 20 mm	05867-91
	4.6 mm I.D. x 150 mm	37837-91		20.0 mm I.D. x 50 mm	34475-21
	4.6 mm I.D. x 250 mm	37989-11		COSMOSIL 5NPE	4.6 mm I.D. x 10 mm
	10.0 mm I.D. x 250 mm	37996-11	Guard Column	10.0 mm I.D. x 20 mm	38045-31
20.0 mm I.D. x 250 mm	38044-41	20.0 mm I.D. x 20 mm		05868-81	
COSMOSIL 5NPE	1.0 mm I.D. x 150 mm	05897-01		20.0 mm I.D. x 50 mm	05869-71
Packed Column	2.0 mm I.D. x 150 mm	34328-51			
	2.0 mm I.D. x 250 mm	34379-91			
	4.6 mm I.D. x 150 mm	37902-21			
	4.6 mm I.D. x 250 mm	37990-71			
	10.0 mm I.D. x 250 mm	05469-11			
	20.0 mm I.D. x 250 mm	38046-21			

Other size may be available. Please enquire.

For research use only, not intended for diagnostic or drug use.