

**COSMOSIL**

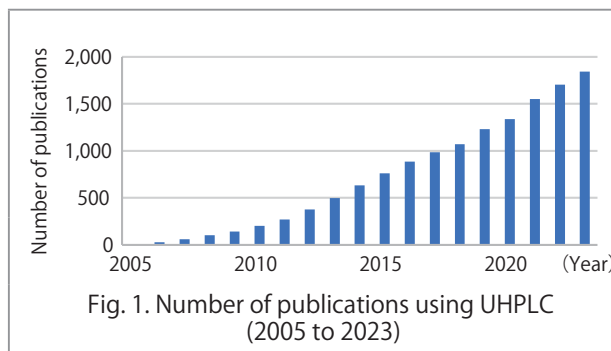
Silica gel columns for UHPLC

**COSMOSIL 1.8C<sub>18</sub>-MS-II / COSMOCORE 2.6C<sub>18</sub>**

- **Two C<sub>18</sub> columns for UHPLC separation**
- **Well-balanced selectivity for general-purpose separations**
- **Stable lot-to-lot quality and superior separation**

◆ **Fast analysis by UHPLC**

Ultra-high performance liquid chromatography (UHPLC) is a technology for speeding up analysis by using columns packed with smaller silica gel particles than standard HPLC and flowing mobile phase at a high rate. Analyses by UHPLC are increasing in number every year, and it is sure to continue to be an important technology in years to come.



Number of publications with "UHPLC" or "UPLC" in the title, abstract, or keywords, as searched on www.sciencedirect.com

Our UHPLC columns include COSMOSIL 1.8C<sub>18</sub>-MS-II, made with fully porous silica, and COSMOCORE 2.6C<sub>18</sub>, made with core-shell silica. Users should choose the appropriate column based on their instrument and analysis requirements. This pamphlet lists some characteristics of each column.

**Fully porous silica  
(COSMOSIL 1.8C<sub>18</sub>-MS-II)**

Pore size: about 12 nm  
Specific surface area: about 340 m<sup>2</sup>/g  
Max. pressure: 80 MPa  
Usable pH range: 2–10\*

1.8 μm

All porous

Because the fully porous silica has pores throughout its structure, it can interact with the sample over a very wide surface area. As the amount of octadecyl phase that can be bonded increases, hydrophobic samples can be retained longer, leading to improved separation.

**Core-shell silica  
(COSMOCORE 2.6C<sub>18</sub>)**

Pore size: about 9 nm  
Specific surface area: about 150 m<sup>2</sup>/g  
Max. pressure: 60 MPa  
Usable pH range: 2–10\*

2.6 μm

1.6 μm

Nonporous core  
Porous layer

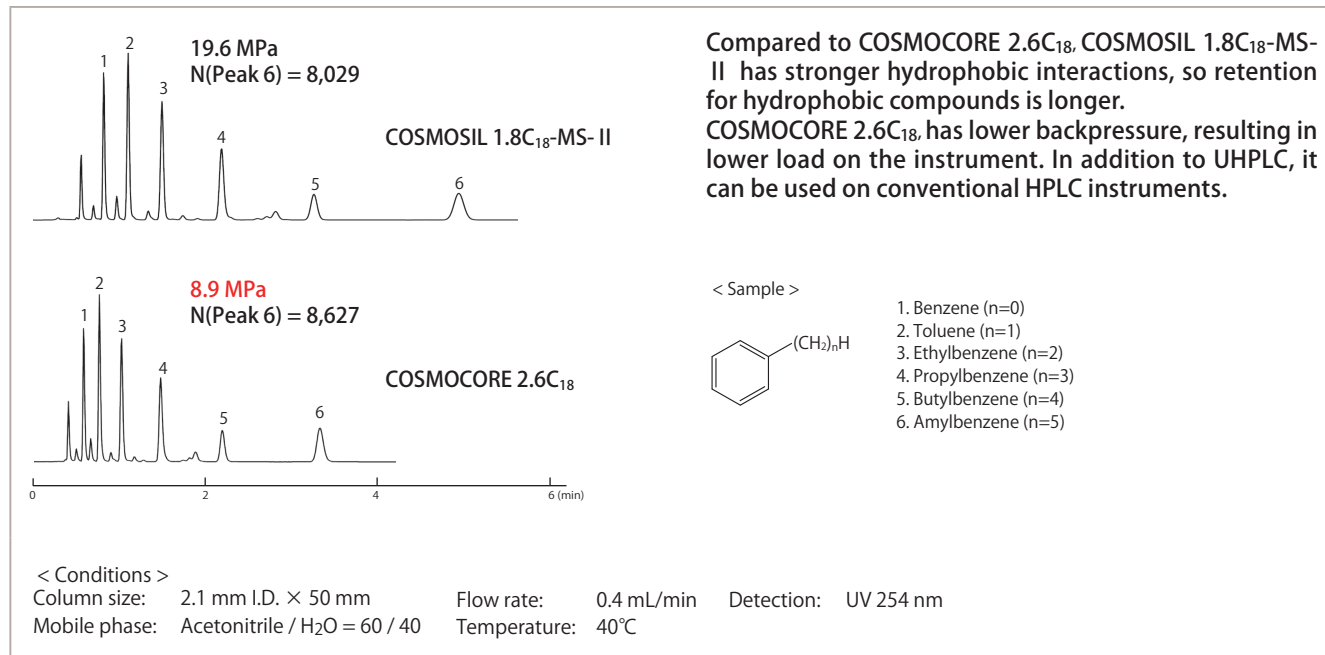
With core-shell silica's nonporous core, sample dispersion is reduced; compared to fully porous columns, high theoretical plate numbers can be achieved even with larger particles. These larger particles result in lower backpressure, enabling use on conventional HPLC instruments.

\*Silica gel columns are generally recommended to be used within pH 2–7.5. Outside this range, column degradation may happen more quickly.

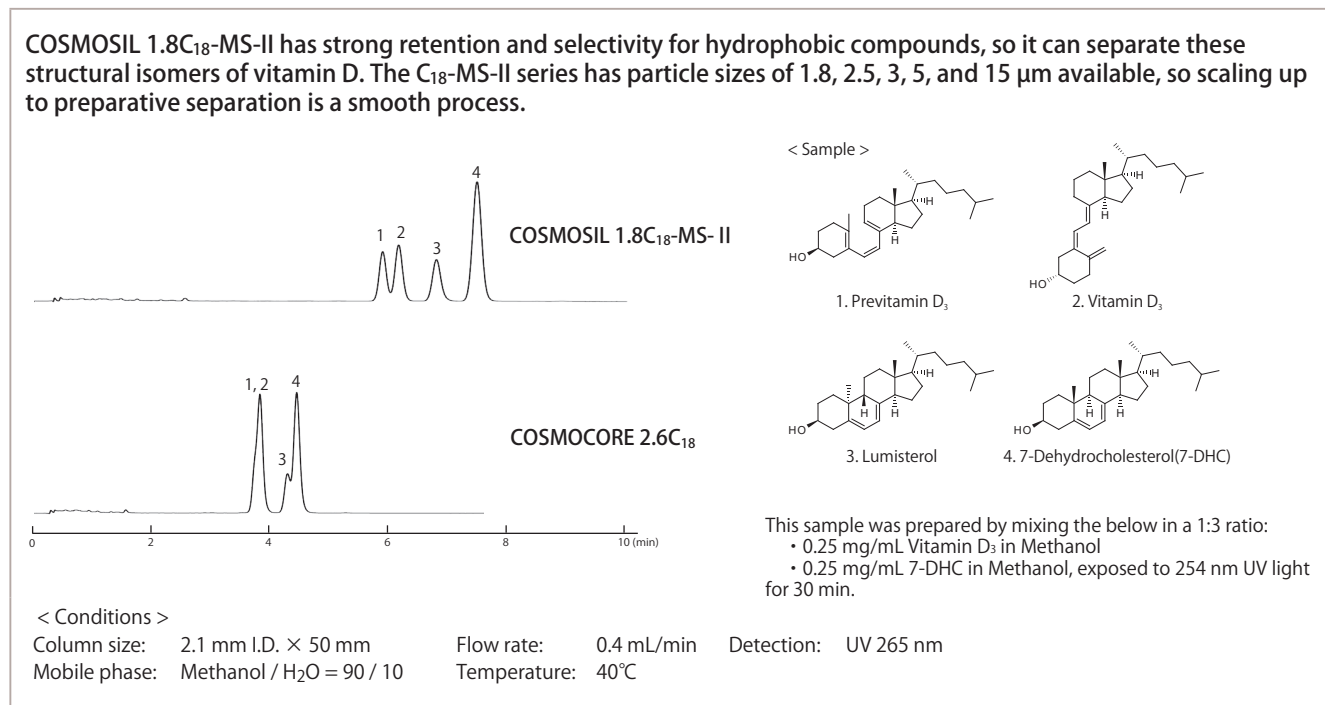
## Comparison of fully porous and core-shell columns

UHPLC columns exhibit very high numbers of theoretical plates, so good separation can be achieved even on short columns.

### Retention of alkylbenzenes



### Separation of structural isomers of vitamin D



- For analyses that require strong hydrophobic interactions
- For moving methods from HPLC to UHPLC, or scaling up to preparative separation



Fully porous column for UHPLC  
**COSMOSIL 1.8C<sub>18</sub>-MS-II**

- Keeps backpressure low
- For use with conventional HPLC instruments

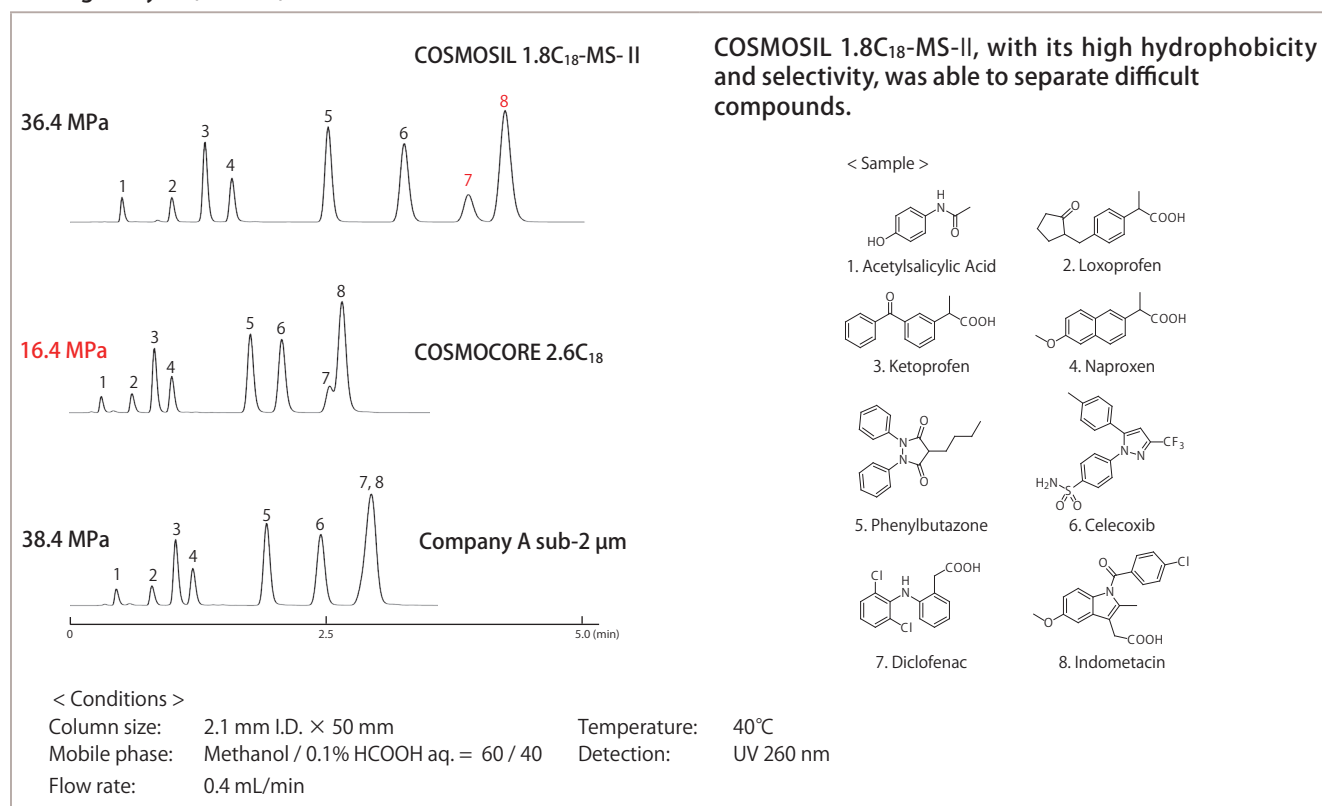


Core-shell column for UHPLC  
**COSMOCORE 2.6C<sub>18</sub>**

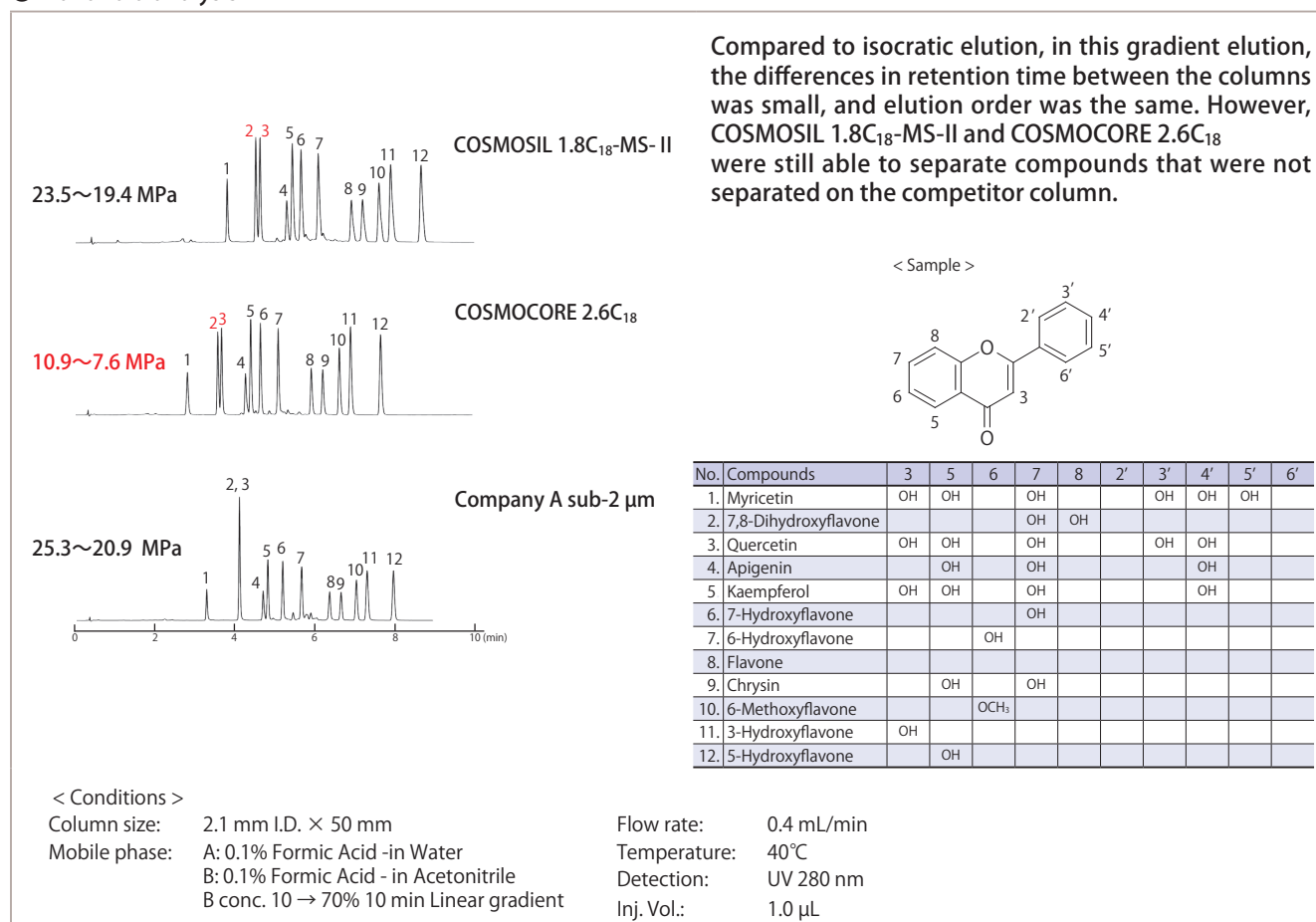
## Comparison to competitor columns

COSMOSIL 1.8C<sub>18</sub>-MS-II and COSMOCORE 2.6C<sub>18</sub> were compared to a competitor UHPLC column. COSMOSIL 1.8C<sub>18</sub>-MS-II, with its high retention for hydrophobic compounds, is able to separate compounds that the competitor column was not able to separate. COSMOCORE 2.6C<sub>18</sub> is similar in retention and selectivity to the competitor column, but ran with less than half the backpressure.

### ● Drug analysis (NSAIDs)

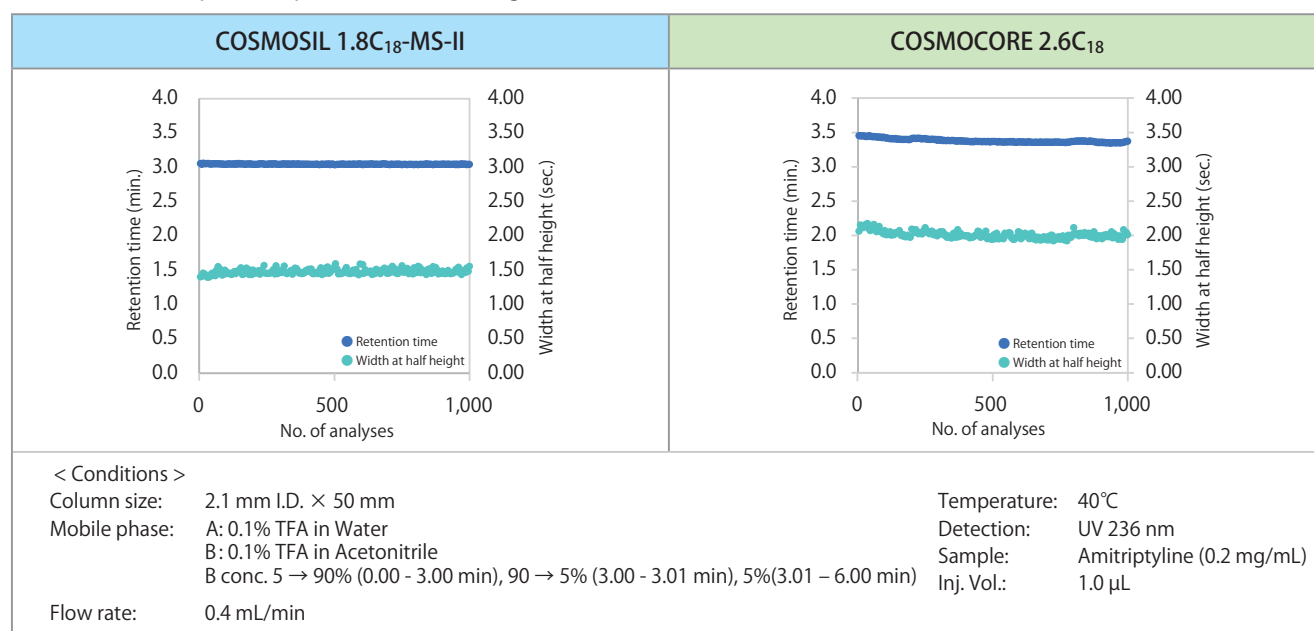


### ● Flavonoid analysis



## Durability of UHPLC columns

UHPLC columns are routinely exposed to high pressures. To evaluate the durability of these columns, amitriptyline was injected 1,000 times into each column. Neither COSMOSIL 1.8C<sub>18</sub>-MS-II nor COSMOCORE 2.6C<sub>18</sub> saw deterioration in retention time or peak shape (width at half height).

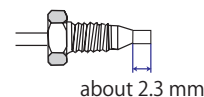


Please see the below resources for more information:

- COSMOSIL C<sub>18</sub>-MS-II  
(<https://www.nacalai.co.jp/cosmosil/column/C18-MS.html>)
- COSMOCORE 2.6C<sub>18</sub>  
(<https://www.nacalai.co.jp/cosmosil/column/COSMOCORE.html>)
- COSMOSIL Application  
(<https://www.nacalai.co.jp/cosmosil/data/csmosrctop.cfm>)

### 【Note on connector type:】

Our UHPLC columns use the same connectors as Waters UPLC® (UHPLC) columns. This is different from our conventional COSMOSIL columns, which use the conventional Waters HPLC-compatible connectors. Attempting to connect an unsuitable fitting may result in it becoming stuck in the column.



## Ordering information

### ● COSMOSIL 1.8C<sub>18</sub>-MS-II Analytical Columns (Particle Size: 1.8 µm)

#### Packed Column

I.D. x Length (mm)	Product Number	I.D. x Length (mm)	Product Number	I.D. x Length (mm)	Product Number
2.1 × 30	22132-71	2.1 × 75	22137-21	2.1 × 150	22139-01
2.1 × 50	22136-31	2.1 × 100	22138-11		

### ● COSMOCORE 2.6C<sub>18</sub> Analytical Columns (Particle Size: 2.6 µm)

#### Packed Column

I.D. x Length (mm)	Product Number	I.D. x Length (mm)	Product Number	I.D. x Length (mm)	Product Number
2.1 × 30	12632-31	3.0 × 30	12611-01	4.6 × 30	12601-31
2.1 × 50	12631-41	3.0 × 50	12609-51	4.6 × 50	12600-41
2.1 × 75	12630-51	3.0 × 75	12608-61	4.6 × 75	12599-91
2.1 × 100	12614-71	3.0 × 100	12607-71	4.6 × 100	12598-01
2.1 × 150	12612-91	3.0 × 150	12602-21	4.6 × 150	12597-11
				4.6 × 250	12596-21

COSMOSIL/COSMOCORE is registered under Nacalai Tesque, Inc.