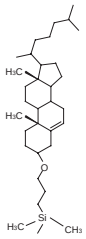
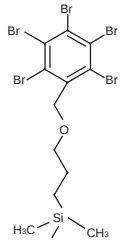
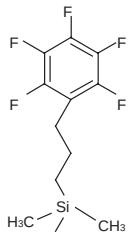
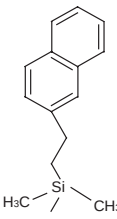
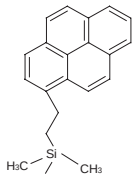
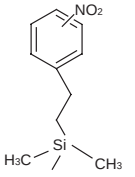
1. Reversed Phase Specialty Columns

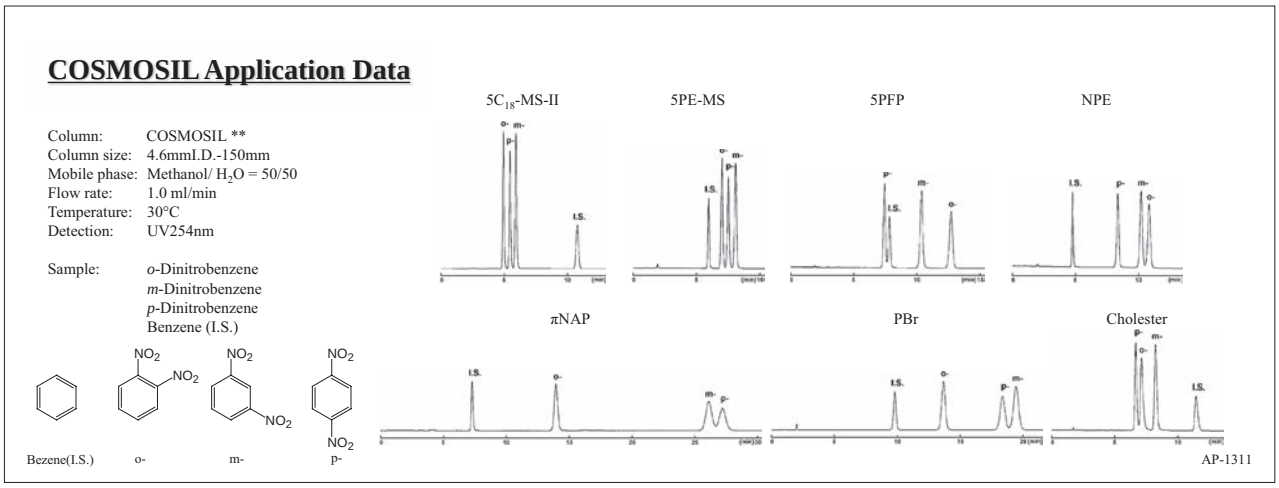
Specifications

Packing Material	Cholester				PBr			PFP	π NAP			PYE	NPE
Silica Gel*	Fully-Porous			Core-Shell	Fully-Porous		Core-Shell	Fully-Porous	Fully-Porous			Fully-Porous	Fully-Porous
Average Particle Size (μm)	2.5	3	5	2.6	3	5	2.6	5	2.5	3	5	5	5
Average Pore Size (Å)	130	120		90	120		90	120	130	120		120	120
Specific Surface Area (m^2/g)	330	300		150	300		150	300	330	300		300	300
Bonded Phase Structure													
Bonded Phase	Cholesteryl group				Pentabromobenzyl group			Pentafluorophenyl group	Naphthylethyl group			Pyrenylethyl group	Nitrophenylethyl group
Bonding Type	Monomeric												
Main Interaction	Hydrophobic interaction Molecular shape selectivity				Hydrophobic interaction Dispersion force			Hydrophobic interaction π-π interaction Dipole-dipole interaction	Hydrophobic interaction π-π interaction			Hydrophobic interaction π-π interaction Dispersion force Molecular shape selectivity	Hydrophobic interaction π-π interaction Dipole-dipole interaction
End-Capping	Near-perfect treatment												
Carbon Content	21%	20%		—	8%		—	10%	14%	11%		18%	9%
Usable pH Range	2 ～ 7.5												
Features	• Usable under the same conditions as C_{18} • High molecular shape selectivity				• Separate hydrophilic compounds under reversed-phase conditions • Separate using dispersion force			• Weak dipole-dipole interaction	• Stronger π-π interaction than phenyl column			• Very strong π-π interaction	• Strong dipole-dipole interaction

* Silica Gel：Fully-Porous…High purity porous spherical silica　　Core-Shell…Core-Shell silica gel

Selectivity for positional isomers of dinitrobenzene

Different stationary phases exhibit different selectivity due to the use of forces that C_{18} (hydrophobic interaction) does not have. By using these columns, you can achieve separation that cannot be done using only C_{18}.



COSMOSIL Cholester / COSMOCORE Cholester

- Cholesterol-bonded stationary phase
- Increased stereoselectivity and improved resolution for geometric isomers
- Usable under the same conditions as C_{18}

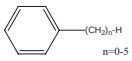
Suitable Samples
- Natural compounds
- Structurally similar compounds
- Polyphenols, catechins, fat-soluble vitamins and flavones

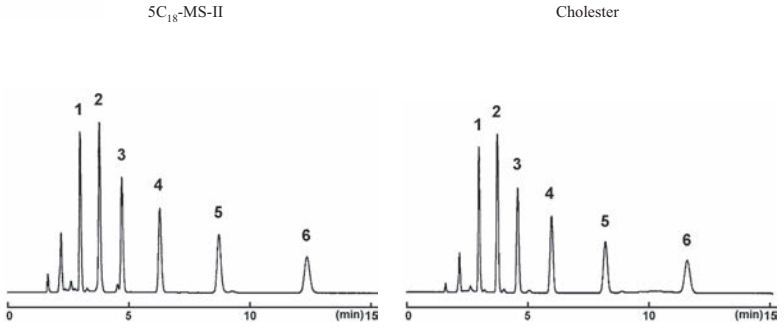
Hydrophobic Interaction

The below figure shows the comparison of hydrophobic interactions with competitor C_{18} columns. Cholester provides about the same hydrophobicity as alkyl group-bonded types (C_{18}, C_{30}). It is not necessary to change the analytical conditions when replacing C_{18} or C_{30} columns with Cholester.

Comparison of Hydrophobic Interaction

Column:
Column size: 4.6mmI.D.-150mm
Mobile phase: Methanol/H_2O = 80/20
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV254nm
Sample:
1; Benzene (1.67µg)
2; Toluene (1.67µg)
3; Ethylbenzene (1.67µg)
4; *n*-Propylbenzene (1.67µg)
5; *n*-Butylbenzene (1.67µg)
6; Amylbenzene (1.67µg)





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Molecular Shape Selectivity

The stationary phase of Cholester has a very rigid structure and can distinguish different molecular shapes. Cholester retains planar triphenylene longer than non-planar *o*-Terphenyl.

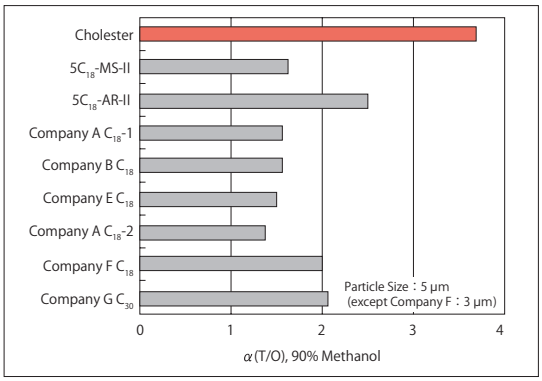
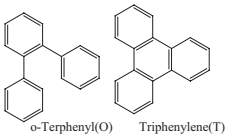
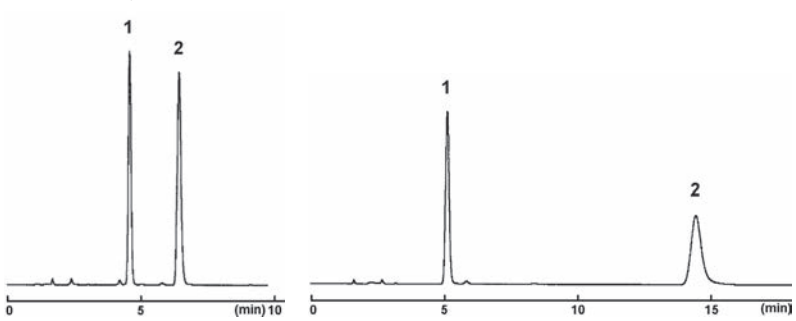


Figure. Comparison of molecular shape selectivty

Comparison of Molecular Shape Selectivity

Column:
Column size: 4.6mmI.D.-150mm
Mobile phase: Methanol/H_2O = 90/10
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV254nm
Sample:
1; *o*-Terphenyl (0.1µg)
2; Triphenylene (0.01µg)





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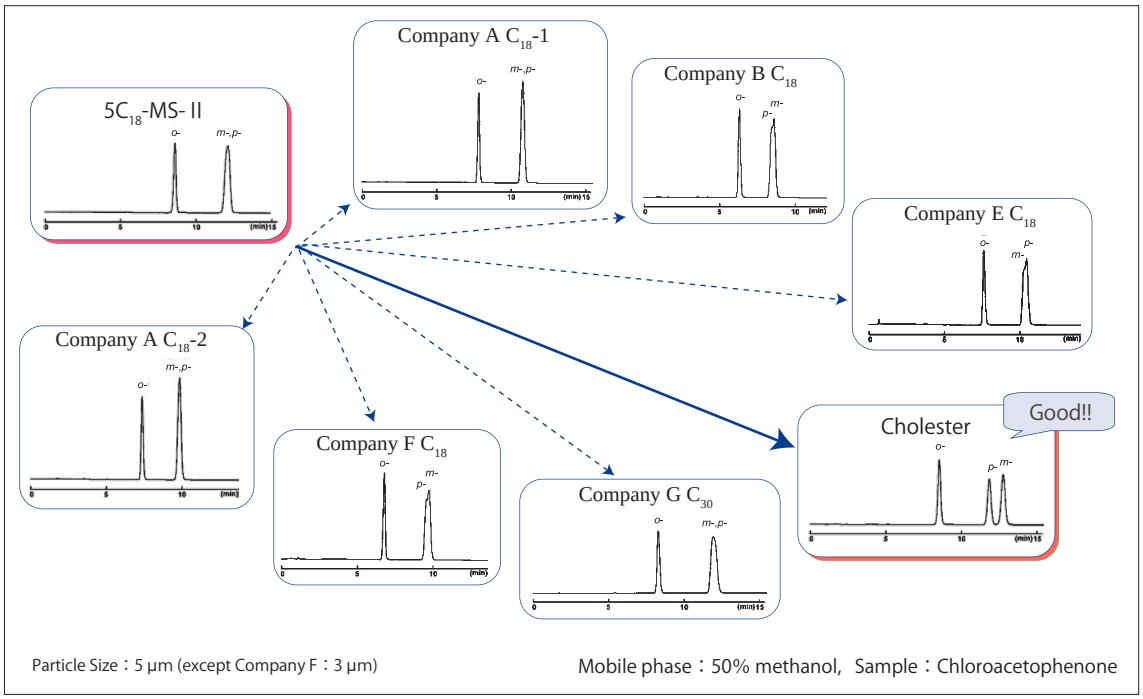
Improvement in Separation

COSMOSIL Cholester provides enhanced selectivity over traditional C_{18} columns and offers greater performance in separating isomers or other closely related compounds. COSMOSIL Cholester is ideal for method development and serves as an excellent alternative to traditional C_{18} columns. The figure below shows analytical data of chloroacetophenone isomers. These isomers are difficult to separate with C_{18} and C_{30}, but they are well resolved by COSMOSIL Cholester.

● Comparison with competitor's C_{18} and C_{30} columns

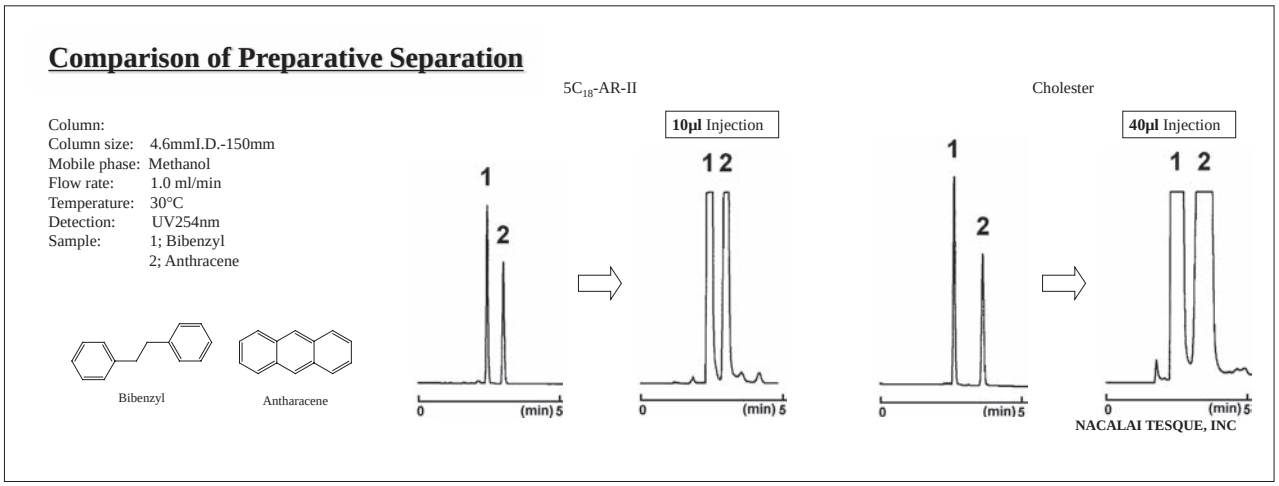


Particle Size：5 µm (except Company F：3 µm)

Mobile phase：50% methanol, Sample：Chloroacetophenone

Efficiency of Preparative Separation

The figure below shows the comparison of efficiency of preparative separation with a C_{18} column. Both columns show good separation. However, sample loading capacity for preparative separations can be affected by a slight difference in separation ability. COSMOSIL Cholester can load 4 times the sample volume compared with C_{18} columns.



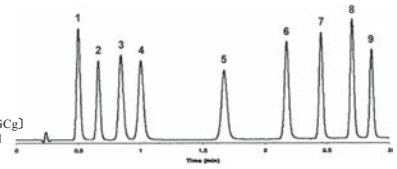
About Core-Shell 2.6Cholester Particles

COSMOCORE 2.6Cholester is packed with cholesterol-bonded 2.6 µm core-shell particles. It delivers performance equivalent to sub-2 µm particles at faster flow rate and analysis time while maintaining a lower back pressure. COSMOCORE can also be used in longer column size to gain additional resolution.

● Catechins (Standard)

COSMOCORE Application Data

Column: COSMOCORE 2.6Cholester
Column size: 2.1mmI.D.-50mm
Mobile phase: A; Acetonitrile/ 0.1% H_3PO_4 = 10/90
B; Acetonitrile/ 0.1% H_3PO_4 = 40/60
B conc. 0→100% 3min Linear gradient
Flow rate: 0.6 ml/min
Temperature: 30°C
Detection: UV280nm
Sample:
1; (-)-Gallocatechin[(-)-GC]
2; Caffeine
3; (-)-Epigallocatechin[(-)-EGC]
4; (-)-Catechin[(-)-C]
5; (-)-Epicatechin[(-)-EC]
6; (-)-Epigallocatechin Gallate[(-)-EGCg]
7; (-)-Gallocatechin Gallate[(-)-GCg]
8; (-)-Epicatechin Gallate[(-)-ECg]
9; (-)-Catechin Gallate[(-)-Cg]



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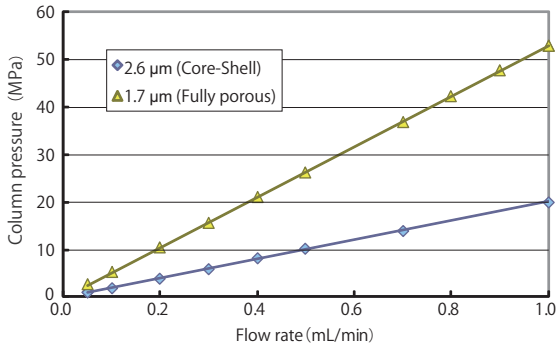
Data courtesy of a customer

● Comparison of Column Pressure



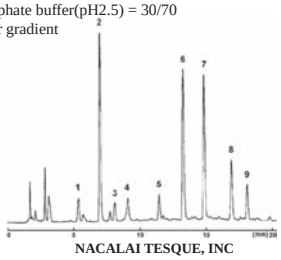
Column Size : 2.1 mmI.D. x 100 mm
Mobile Phase : Acetonitrile/Water = 70/30
Temperature : 40℃

Applications

● Catechins (Commercial Green Tea)

COSMOSIL Application Data

Column: COSMOSIL Cholester
Column size: 4.6mmI.D.-150mm
Mobile phase: A; Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 10/90
B; Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 30/70
B conc. 0→100% 20min Linear gradient
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV280nm
Sample: Green Tea
1; (-)-Gallocatechin[(-)-GC]
2; Caffeine
3; (-)-Epigallocatechin[(-)-EGC]
4; (-)-Catechin[(-)-C]
5; (-)-Epicatechin[(-)-EC]
6; (-)-Epigallocatechin Gallate[(-)-EGCg]
7; (-)-Gallocatechin Gallate[(-)-GCg]
8; (-)-Epicatechin Gallate[(-)-ECg]
9; (-)-Catechin Gallate[(-)-Cg]
Injection Vol. 1.0µl



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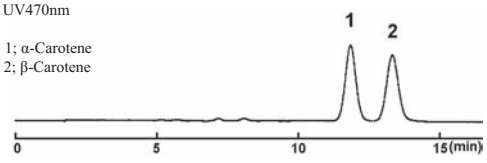
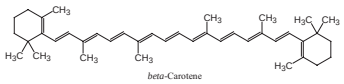
● Carotene

COSMOSIL Application Data

Column: COSMOSIL Cholester
Column size: 4.6mmI.D.-150mm
Mobile phase: Tetrahydrofuran/Methanol = 20/80
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV470nm
Sample: 1; α-Carotene
2; β-Carotene





beta-Carotene

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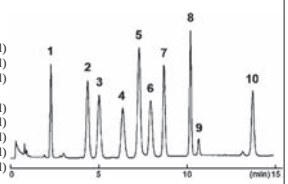
● Fat-Soluble Vitamins

COSMOSIL Application Data

Column: COSMOSIL 2.5Cholester
Mobile phase: A; 0.1% TFA-Methanol/ H_2O = 90/10
B; 0.1% TFA-Methanol
B conc. 0%(0-5min)-100%(10min)-100%(15min)
Flow rate: 0.4 ml/min
Temperature: 40°C
Detection: UV280nm
Sample:

1; Vitamin A Acetate, *all trans*	(0.06mg/ml)
2; Vitamin D_2 [Calciferol]	(0.30mg/ml)
3; Vitamin D_3	(0.06mg/ml)
4; Vitamin E Succinate [*D*-α-Tocopherol Succinate]	(0.60mg/ml)
5; Vitamin K_2	(0.18mg/ml)
6; Vitamin E [*DL*-α-Tocopherol]	(0.60mg/ml)
7; Vitamin E Acetate [*DL*-α-Tocopherol Acetate]	(0.60mg/ml)
8; *trans*-Vitamin K_1	(0.18mg/ml)
9; *cis*-Vitamin K_1	
10; Vitamin A Palmitate	(0.18mg/ml)

Inj. Vol: 2.5µl



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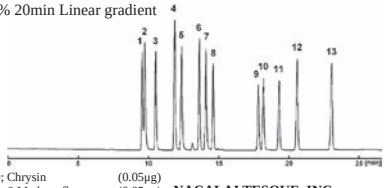
● Flavone

COSMOSIL Application Data

Column: COSMOSIL Cholester
Column size: 4.6mmI.D.-150mm
Mobile phase: A: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 20/80
B: Acetonitrile/ 20mmol/l Phosphate buffer(pH2.5) = 70/30
B conc. 0→100% 20min Linear gradient
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV280nm
Sample:

1; Fisetin	(0.25µg)		
2; Myricetin	(0.20µg)		
3; 7,8-Dihydroxyflavone	(0.05µg)		
4; Luteolin	(0.20µg)		
5; Quercetin	(0.20µg)		
6; 7-Hydroxyflavone	(0.10µg)	10; Chrysin	(0.05µg)
7; Baicalein	(0.05µg)	11; 6-Methoxyflavone	(0.05µg)
8; 6-Hydroxyflavone	(0.05µg)	12; 3-Hydroxyflavone	(0.25µg)
9; Flavone	(0.05µg)	13; 5-Hydroxyflavone	(0.05µg)



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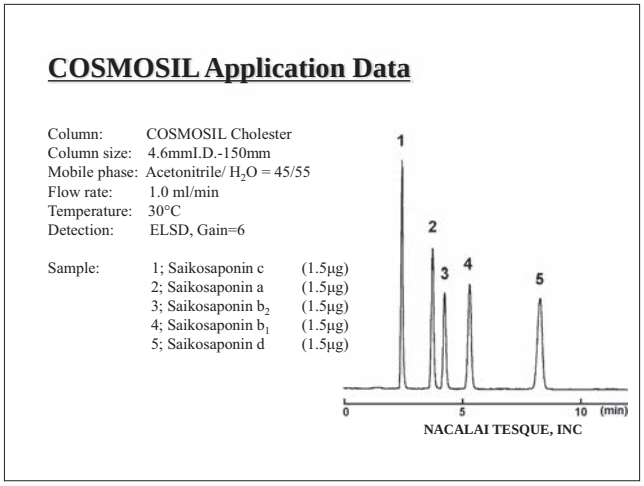
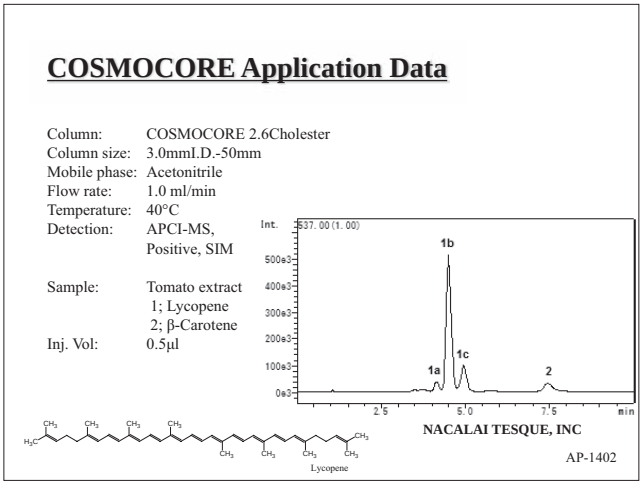
Applications

● Saikosaponins



● Tomato Extracts



Ordering Information

● COSMOSIL Cholester Analytical / Preparative Columns (Particle Size: 5 µm)

Packed Column

I.D. x Length (mm)	Product Number
1.0×150	05968-71
1.0×250	05969-61
2.0× 30	08565-51
2.0× 50	06352-91
2.0×100	06948-01
2.0×150	05971-11
2.0×250	05972-01
3.0×150	05973-91
3.0×250	05974-81
4.6× 50	06359-21
4.6×100	06591-61

I.D. x Length (mm)	Product Number
4.6×150*	05976-61
4.6×150 3 lots set*	07970-03
4.6×250*	05977-51
10× 50	16590-61
10×100	16591-51
10×150	08011-91
10×250	05979-31
20× 50	05981-81
20×100	15995-01
20×150	06088-71
20×250	05982-71

I.D. x Length (mm)	Product Number
28×100	16592-41
28×150	16593-31
28×250	05985-41

Guard Column / Guard Cartridge

I.D. x Length (mm)	Product Number
4.6×10	05975-71
4.6×10 Cartridge †	19183-24
10×20	05978-41
20×20	05980-91
28×50	05983-61

* Columns for validation
† 2 cartridges included. Guard cartridge holder required; refer to page 78

● COSMOSIL 3Cholester Fast LC Columns (Particle Size: 3 µm)

Packed Column

I.D. x Length (mm)	Product Number
2.0× 50	19188-61
2.0× 75	19189-51
2.0×100	19190-11
2.0×150	19191-01
2.0×250	19192-91
3.0× 50	19194-71
3.0× 75	19195-61

I.D. x Length (mm)	Product Number
3.0×100	19196-51
3.0×150	19197-41
3.0×250	19198-31
4.6× 50	19199-21
4.6× 75	19200-71
4.6×100	19300-61
4.6×150	19151-21
4.6×250	19316-71

Guard Cartridge

I.D. x Length (mm)	Product Number
2.0× 10 Cartridge*	19325-64
4.6×10 Cartridge*	19344-14

* 2 cartridges included. Guard cartridge holder required; refer to page 78.

● COSMOSIL 2.5Cholester Fast LC columns (Particle Size: 2.5 µm)

Packed Column

I.D. x Length (mm)	Product Number
2.0×50	09000-01
2.0×75	09047-11

I.D. x Length (mm)	Product Number
2.0×100	09048-01
3.0× 50	09049-91

I.D. x Length (mm)	Product Number
3.0× 75	09050-51
3.0×100	09051-41

● COSMOCORE 2.6Cholester UHPLC Columns (Particle Size: 2.6 µm)

Packed Column

I.D. x Length (mm)	Product Number
2.1× 30	12858-91
2.1× 50	12859-81
2.1× 75	12860-41
2.1×100	12861-31
2.1×150	12862-21

I.D. x Length (mm)	Product Number
3.0× 30	12863-11
3.0× 50	12864-01
3.0× 75	12866-81
3.0×100	12867-71
3.0×150	12868-61

I.D. x Length (mm)	Product Number
4.6× 30	12869-51
4.6× 50	12870-11
4.6× 75	12871-01
4.6×100	12872-91
4.6×150	12873-81
4.6×250	12875-61

COSMOCORE's connector is the same type as Waters UPLC® columns.