



COSMOSIL

COSMOSIL

High Performance Liquid Chromatography

Catalog **12th Edition**

PCI[®]
Analytics

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COSMOSIL Packing Material List

Separation Mode	Packing Material	Bonded Phase	Bonding Type	Average Particle Size (μm)	Average Pore Size (Å)	Carbon Content (%)	Special Features and Applications	USP Category	Page			
Reversed phase	C ₁₈ -MS-II	Octadecyl group	Mono-meric	2.5	130	18	Multi-purpose C ₁₈ column	L1	24			
	3, 5, 15			120	16	32						
	COSMOCORE C ₁₈		Polymeric	2.6 (Core-Shell)	90		7	Features strong acid resistance, good for acidic compounds and peptides	L1	26		
	C ₁₈ -AR-II			3, 5, 15	120	17	Good for hydrophilic compounds and stable performance under 100% aqueous conditions				L1	28
	C ₁₈ -PAQ			3, 5, 15		11						
	C ₁₈ -EB	Mono-meric	3	14.5	Usable under the same conditions as C ₁₈ . Unique rigid cholesterol structure improves separation.	L101	10					
	Cholester	Cholesteryl group	2.5	130				21	Separate hydrophilic compounds under reversed-phase conditions.	—	14	
			2.6 (Core-Shell)	90				—				
			3, 5	120		20						
	PBr	Pentabromobenzyl group	2.6 (Core-Shell)	90		—	Separation utilizing weak dipole-dipole interaction	L43	17			
			3, 5	120		8						
	PFP	Pentafluorophenyl group	Mono-meric	5		120	10	Stronger π - π interaction than phenyl column	—	18		
	π NAP	Naphthylethyl group		2.5		130	14	The most powerful π - π interaction	—	20		
	PYE	Pyrenylethyl group		5		120	11	Separation utilizing dipole-dipole interaction	—	22		
	NPE	Nitrophenylethyl group					18	Enables separation of different hydrophobic samples without using gradients	L10	35		
	CN-MS	Cyanopropyl group			9		Alkyl chain columns, excluding C ₁₈	—	36			
	C ₂₂ -AR-II	Docosyl group			Polymeric			19		Wide pore column with the advantages of both C ₁₈ and C ₄	L1	57
	C ₈ -MS	Octyl group			Mono-meric			10			L7	
	C ₄ -MS	Butyl group						7			L26	
	PE-MS	Phenylethyl group					10	π - π interaction	L11			
	Protein-R	Octadecyl group			Polymeric		300	—	Wide pore type	L1	50	
	C ₁₈ -AR-300	Octadecyl group	12					L1				
	C ₈ -AR-300	Octyl group	7					L7				
	C ₄ -AR-300	Butyl group	6					L26				
	Ph-AR-300	Phenyl group	7					L11				
	RNA-RP1	Octadecyl group	—		5		—	—	For analysis of nucleic acids longer than 100 nt	—	52	
	Normal phase	SL-II	—	—	3, 5, 15	120	—	Suitable for preparative separation	L3	42		
Hydrophilic interaction	HILIC	Triazole	—	2.5	130	—	Retains highly polar compounds that would not be retained in a C ₁₈ column.	L104	44			
					120							
	Sugar-D	Polyamine	—	5	—	—	A novel stationary phase for mono- and oligosaccharides	—	48			
	NH ₂ -MS	Aminopropyl group	Polymeric			120	4	Primary amino-bonded column	L8	50		

Separation Mode	Packing Material	Bonded Phase	Bonding Type	Average Particle Size (μm)	Average Pore Size (Å)	Carbon Content (%)	Special Features and Applications	USP Category	Page
Gel filtration	Diol-120-II	Diol group	—	5	120	—	Sample MW Protein: 5,000-100,000 Water-Soluble Polymer: 1,000-20,000	L20	59
	Diol-300-II				300		Sample MW Protein: 10,000-700,000 Water-Soluble Polymer: 5,000-100,000		
	Diol-1000-II				1,000		Sample MW Water-Soluble Polymer: 50,000-500,000		
	RNA-SEC-1000	Hydrophilic group			1,000		For analysis of nucleic acids longer than 100 nt	—	51
	RNA-SEC-2000				2,000				
Hydrophobic interaction	HIC	—	—	5	300	—	Little loss in enzyme activity and the tertiary structure of proteins	—	61
—	Buckyprep	Pyrenylpropyl group	Mono-meric	5	120	17	Standard column for fullerene separation	—	63
	Buckyprep-D	Nitro-carbazoyl group				—	Good for derivatized fullerenes		64
	Buckyprep-M	Phenothiazinyl group				13	Good for metallofullerenes		65
	PBB	Pentabromobenzyl group				8	Good for preparative separation of C ₆₀ or C ₇₀		66
Gel filtration	CNT-300	Hydrophilic group (neutral)	—	5	300	—	Separation of soluble carbon nanotubes	—	67
	CNT-1000				1,000				
	CNT-2000				2,000				
Chiral Separation	CHiRAL A	Amylose tris (3,5-dimethyl-phenyl carbamate)	—	3, 5	—	—	Immobilized selectors can withstand many different solvents.	L 99	37
	CHiRAL B	Cellulose tris (3,5-dimethyl-phenyl carbamate)						—	
	CHiRAL C	Cellulose tris (3,5-dichloro-phenyl carbamate)						—	

SFC Columns

Separation Mode	Packing Material	Bonded Phase	Bonding Type	Average Particle Size (μm)	Average Pore Size (Å)	Carbon Content (%)	Special Features and Applications	USP Category	Page
SFC	PY	Pyridinyl group	—	3, 5	120	—	Similar separation properties as 2-Ethylpyridine, with stronger retention	—	68
	HP	3-Hydroxyphenyl group					Good for hydrophilic compounds. Stronger retention for basic compounds than PY		
	Diol	Diol group					Less effect from ionic interaction		
	Cholester	Cholesteryl group					Longer retention and better separation than C ₁₈		
	π MAX	Pyrenylethyl group					Stronger π - π interaction than phenyl column		
	PBr	Pentabromobenzyl group					Unique separations using dispersion force		

Column Selection Guide

Sample	Category	Separation Mode	Recommended Column	Page	Remark
Low-MW drugs	—	Reversed phase	C ₁₈ -EB	30	Near-perfect end capping treatment
			COSMOCORE C ₁₈	32	
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
		Normal phase	SL-II	42	Standard for normal phase
Vitamins	Water-soluble vitamins	Reversed phase	C ₁₈ -PAQ	28	Compatible with 100% water based mobile phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
	Fat-soluble vitamins	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
			Cholester	10	Different selectivity from C ₁₈
		Normal phase	SL-II	42	Standard for normal phase
Natural products	—	Reversed phase	C ₁₈ -MS-II	24	Utilize various interactions for versatile separations. See each product page for details.
			Cholester	10	
			PBr	14	
			π NAP	18	
		Normal phase	SL-II	42	Suitable for preparative separation
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Organic acids	—	Reversed phase	C ₁₈ -PAQ	28	Compatible with 100% water based mobile phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Fatty acids	—	Reversed phase	C ₁₈ -AR-II	26	Features strong acid resistance
			Cholester	10	Different selectivity from C ₁₈
Phospholipids	Molecular species	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
	Class species	Normal phase	SL-II	42	Standard for normal phase
Agricultural chemicals	—	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
			Cholester	10	Different selectivity from C ₁₈
		Normal phase	SL-II	42	Standard for normal phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Metabolites	—	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
			Cholester	10	Different selectivity from C ₁₈
		Normal phase	SL-II	42	Standard for normal phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Food additives	—	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
			Cholester	10	Different selectivity from C ₁₈
		Normal phase	SL-II	42	Standard for normal phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Other low-MW compounds	—	Reversed phase	C ₁₈ -MS-II	24	Standard for reversed phase
			Cholester	10	Different selectivity from C ₁₈
		Normal phase	SL-II	42	Standard for normal phase
		Hydrophilic interaction	HILIC	44	Retains highly polar compounds that would not be retained in C ₁₈ column
Structural isomers Structural analogs	—	Reversed phase	C ₁₈ -MS-II	24	Utilize various interactions for versatile separations. See each product page for details.
			C ₁₈ -AR-II	26	
			Cholester	10	
			π NAP	18	
			PYE	20	
			NPE	22	
			PBr	14	
			PFP	17	
		Normal phase	SL-II	42	Standard for normal phase

Sample	Category	Separation Mode	Recommended Column	Page	Remark
Optical isomers	—	Normal phase Reversed phase	CHiRAL A Type, B Type, C Type	37	3 chiral selectors with high overall hit rate
Amino acids	Free amino acids	Reversed phase	PBr	14	Retains aromatic amino acids
		Hydrophilic interaction	HILIC	44	For amino acids not retained in reversed-phase mode
	Labeled amino acids	Reversed phase	C ₁₈ -AR-II	26	Features strong acid resistance
Peptides Proteins	M. W. 3,000 or less	Reversed phase	C ₁₈ -AR-II	26	Features strong acid resistance
			PBr	14	Separation for oligopeptides
		Hydrophilic interaction	HILIC	44	For hydrophilic peptides not retained in reversed-phase mode
	M. W. 3,000 or more	Reversed phase	Protein-R	55	Wide pore columns
			C ₁₈ -AR-300	57	
		C ₄ -AR-300			
Size exclusion	Diol-II	59	Separation utilizing molecular size		
Nucleic acids	Nucleic acid bases	Reversed phase	PBr	14	Separate under reversed-phase condition
		Hydrophilic interaction	HILIC	44	Different selectivity from reversed phase
	Nucleosides Nucleotides	Reversed phase	C ₁₈ -PAQ	28	Compatible with 100% water based mobile phase
			PBr	14	Strong retain than C ₁₈
	Oligonucleotides	Hydrophilic interaction	HILIC	44	Different separatin from reversed phase
		Reversed phase	RNA-RP1	52	High resolution with standard C ₁₈ phase
		Size exclusion	RNA-SEC-1000	51	Analyze a wide range of molecular weights
		Size exclusion	RNA-SEC-2000	51	Analyze a wide range of molecular weights
	Sugars	Monosaccharides	Hydrophilic interaction	Sugar-D	48
NH ₂ -MS				50	
Labeled saccharides		Reversed phase	C ₁₈ -PAQ	28	For pyridylaminated sugars
		Hydrophilic interaction	Sugar-D	48	For two-dimensional separations with reversed-phase
NH ₂ -MS			50		
Oligosaccharides		Reversed phase	PBr	14	Retained in reversed-phase mode
		Hydrophilic interaction	Sugar-D	48	Separation in non-derivatized form
NH ₂ -MS			50		
Polysaccharides	Size exclusion	Diol-II	59	Separation utilizing molecular size	
Fullerenes	Fullerenes	—	Buckyprep	63	Standard for fullerene separation
	Metallofullerenes	—	Buckyprep	63	Different selectivity for metallofullerenes
			Buckyprep-M	65	
	Derivatized fullerenes	—	Buckyprep	63	Separation in toluene mobile phase
			Buckyprep-D	64	
Carbon nanotubes	—	Size exclusion	CNT	67	Separation of soluble carbon nanotubes
Water-soluble polymer	—	Size exclusion	Diol-II	59	Separation utilizing molecular size

● COSMOSIL Cholester / COSMOCORE Cholester

- Cholesterol-bonded stationary phase
- Increased stereoselectivity and improved resolution for geometric isomers
- Usable under the same conditions as C

Suitable Samples

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

● COSMOSIL PBr / COSMOCORE PBr

- Pentabromobenzyl-bonded stationary phase
- Separate hydrophilic and hydrophobic compounds in reversed-phase conditions

Suitable Samples

- Hydrophilic compounds
- Nucleotides, peptides, catecholamines and oligosaccharides

Comparison with C₁₈

COSMOSIL PBr retains hydrophilic compounds stronger than C₁₈ columns under the same reversed-phase conditions.

● COSMOCORE 2.6PBr core-shell column

- High-performance separation of water-soluble compounds in reversed-phase mode

Water-soluble compounds can be difficult to separate under reversed-phase conditions, even using C₁₈ columns designed for aqueous conditions, due to very low retention. PBr can retain many of these compounds enough to achieve separation, as in the below separation of ten water-soluble vitamins.

● COSMOSIL PFP

- Pentafluorophenyl-bonded stationary phase
- Alternative selectivity to C₁₈ columns

Suitable Samples

- Vitamin E
- Structural isomers and fluorides

Alternative Selectivity to C₁₈ Columns

COSMOSIL PFP provides different selectivity from C₁₈ columns. Furthermore, it offers improved separation compared to other PFP columns.

● COSMOSIL π NAP

- Naphthalene-bonded stationary phase
- Enhanced π - π interactions

Suitable Samples

- Aromatic compounds and positional isomers

● COSMOSIL PYE

- Pyrenylethyl-bonded stationary phase
- Stronger π - π interactions

Suitable Samples

- Aromatic compounds, positional isomers, dioxins and PCBs

● COSMOSIL NPE

- Nitrophenylethyl-bonded stationary phase
- Separation with dipole-dipole and π - π interactions

Suitable Samples

- Isomers and nitro compounds

Selectivity for dipole-dipole interactions

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.

● COSMOSIL C₁₈-MS-II

- First-choice column of our ODS series
- Multi-purpose C₁₈ column
- High reproducibility
- A wide range of applications

● Fast LC Columns (COSMOSIL 2.5C₁₈-MS-II)

* This application was taken using a semi-micro HPLC instrument, setting the detector response time to 0.02 sec.

● COSMOSIL C₁₈-AR-II

- Features strong acid resistance

Suitable Samples

- Peptides, acidic compounds, etc.

Acid Resistance

COSMOSIL 5C₁₈-AR-II packed column features a polymeric type of C₁₈ reversed phase material. The acidic resistance of COSMOSIL 5C₁₈-AR-II is much improved compared with commercially available monomeric type octadecyl stationary phases. It retains high performance even with acidic mobile phases commonly used to separate acidic compounds and peptides.

● COSMOSIL C₁₈-PAQ

- Compatible with 100% water based mobile phase

Suitable Samples

- Hydrophilic compounds
- Organic acids, nucleic acid bases, etc.

● COSMOSIL 3C₁₈-EB

- Excellent for basic compounds
- 3 μ m C₁₈ column with reduced tailing and high resolution

Suitable Samples

- For quality control of drugs
- Compounds that induce peak tailing, such as basic compounds

Analysis of Basic Compounds

COSMOSIL 3C₁₈-EB uses a new end-capping method to reduce the number of residual silanol groups, which can cause peak tailing with basic compounds.

● COSMOCORE 2.6C₁₈

- Core-shell particles
- Ultra-high performance LC results with conventional HPLC equipment
- Same number of theoretical plates as sub-2 µm columns with half the back pressure

Suitable Samples

- For quality control of drugs
- Compounds that induce peak tailing, such as basic compounds

Excellent pH Stability

Under accelerated pH 10.4, 40°C stability test, COSMOCORE C₁₈ column shows superior stability compared with other core shell C₁₈ phases.

● COSMOSIL CN-MS

- Cyanopropyl-bonded stationary phase
- Enables separation of different hydrophobic samples without using gradient

Suitable Samples

- Mixtures of natural compounds

Rapid Analysis

Gradient elution is commonly used for the samples containing both polar and non-polar compounds. However, gradient elution may cause reproducibility problem depending on the gradient mixer and pump, and need an equilibration time for each analysis. COSMOSIL 5CN-MS offers rapid analysis and great reproducibility using isocratic elution mode.

● COSMOSIL CHiRAL Series

Packing Material	COSMOSIL CHiRAL 3A, 5A	COSMOSIL CHiRAL 3B, 5B	COSMOSIL CHiRAL 3C, 5C
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- Immobilized selectors can withstand many different solvents
- Sharpen peaks with CHiRAL 3 Series (Particle Size: 3 µm)
- Preparative separations with CHiRAL 5 Series (Particle Size: 5 µm)
- Equivalent performance to columns currently on the market
- Competitive price

● COSMOSIL SL-II

- High purity silica gel (>99.99%) with special treatment
- Suitable for preparative separation

Suitable Samples

- Fat-soluble vitamins, natural products, phospholipids, structural analogs, low-MW drugs, etc.

● COSMOSIL HILIC

- Triazole-bonded stationary phase
- Unique anion-exchange mechanism (Hydrophilic interaction + Anion-exchange)

Suitable Samples

- Hydrophilic compounds that would not be retained in reversed phase chromatography
- Melamine, water-soluble vitamins, organic acids, free amino acids, peptides, nucleotides and natural compounds

● Mono and Oligosaccharide Analysis Columns

Packing Material	Sugar-D	NH ₂ -MS
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Saccharides are not retained on standard C₁₈ columns because of their low hydrophobicity. COSMOSIL Sugar-D and NH₂-MS are specifically designed for separation of saccharides. COSMOSIL C₁₈-PAQ is recommended for hydrophobic glycosides and saccharide derivatives.

● COSMOSIL Sugar-D

- Different selectivity from aminopropyl columns
- Superior durability compared to conventional amino columns
- Minimized undesirable adsorption

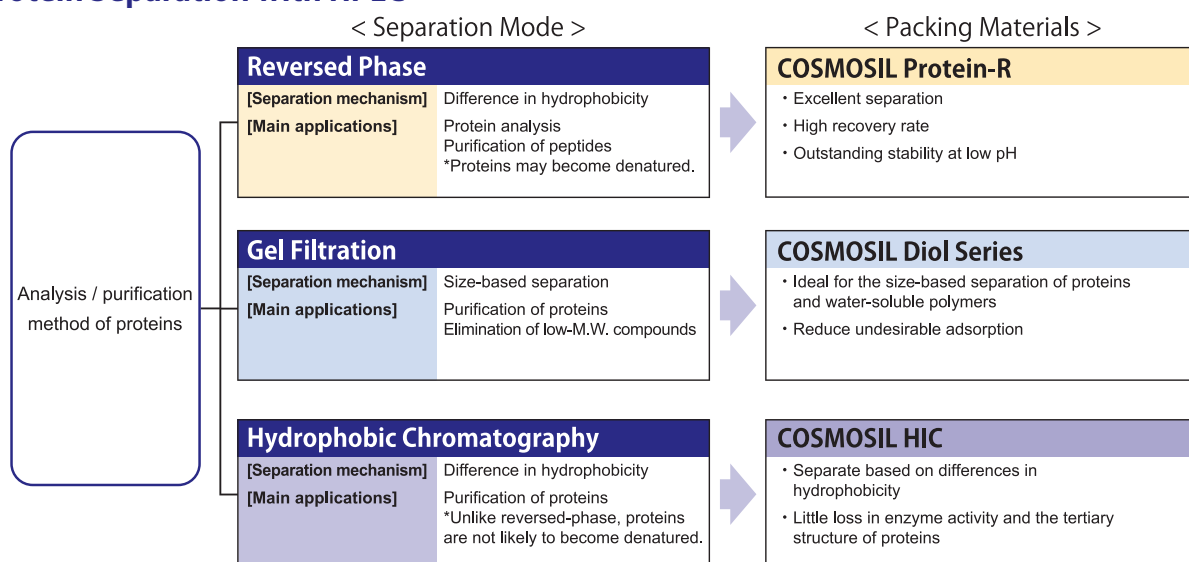
● COSMOSIL NH₂-MS

- Aminopropyl-bonded stationary phase
- Different selectivity from Sugar-D

COSMOSIL NH₂-MS offers better separation than COSMOSIL Sugar-D for some samples.

● PROTEIN SEPARATION COLUMNS

Protein Separation with HPLC



● COSMOSIL Protein-R

- Excellent separation
- High recovery rate
- Outstanding stability at low pH

● COSMOSIL C₁₈-AR-300, C₈-AR-300, C₄-AR-300, Ph-AR-300

- Wide-pore reversed-phase columns
- 4 types of phases (octadecyl, octyl, butyl and phenyl)

● COSMOSIL Diol-120-II, Diol-300-II, Diol-1000-II

- Ideal for the size-based separation of proteins and water-soluble polymers
- Reduce undesirable adsorption

● COSMOSIL HIC

- Separate based on differences in hydrophobicity
- Little loss in enzyme activity and the tertiary structure of proteins

● Fullerene Separation Columns

Separation of fullerenes, especially preparative scale separation, on conventional HPLC columns are always problematic due to the low solubility and low recovery rate of fullerenes. COSMOSIL offers a variety of columns designed for preparative scale separation of fullerenes including higher fullerenes, metallofullerenes and fullerene derivatives.

● COSMOSIL Buckyprep

- Standard column for fullerene separation
- Excellent separation for higher and derivatized fullerenes

Difference in Preparative Separation

COSMOSIL Buckyprep can be used with toluene, the most commonly-used solvent in fullerene separation. Because tailing does not occur, you can inject about 35 times more sample, 2,500 μ L (6.25 mg), than with a C₁₈ column.

● COSMOSIL Buckyprep-D

- For preparative separation of derivatized fullerenes
- For separation of derivatized fullerenes such as C₆₀ indene used for organic thin-film solar cell

Buckyprep-D offers improved separation for C₆₀ indene, a derivatized fullerene, that has received much attention as an n-type semiconductor material for organic thin-film solar cells.

● COSMOSIL Buckyprep-M

- Different selectivity from Buckyprep
- Excellent separation for metallofullerenes

● Metallofullerenes

COSMOSIL Buckyprep-M is a phenothiazinyl-bonded silica-based column specifically designed for metallofullerene separation. Metallofullerenes are retained more strongly than other fullerenes on this column. COSMOSIL Buckyprep-M is also effective for the separation of higher fullerenes and fullerene derivatives.

● COSMOSIL PBB

- Can be used with o-dichlorobenzene or carbon disulfide
- Suitable for preparative scale separation

● Preparative Separation of Fullerene

The loading capacity of COSMOSIL PBB for C₆₀ and C₇₀ can be three times greater than COSMOSIL Buckyprep.

● COSMOSIL CNT-300, CNT-1000, CNT-2000

- Size-based separation of soluble carbon nanotubes
- 3 pore sizes (300 Å, 1,000 Å, 2,000 Å)
- High durability

● COSMOSIL SFC Column Series

- Three categories of stationary phase for different types of compounds
- Different selectivity from HPLC

Columns for mid- to high-polarity compounds

For these compounds, a high-polarity stationary phase is suitable. More polar compounds are retained longer.

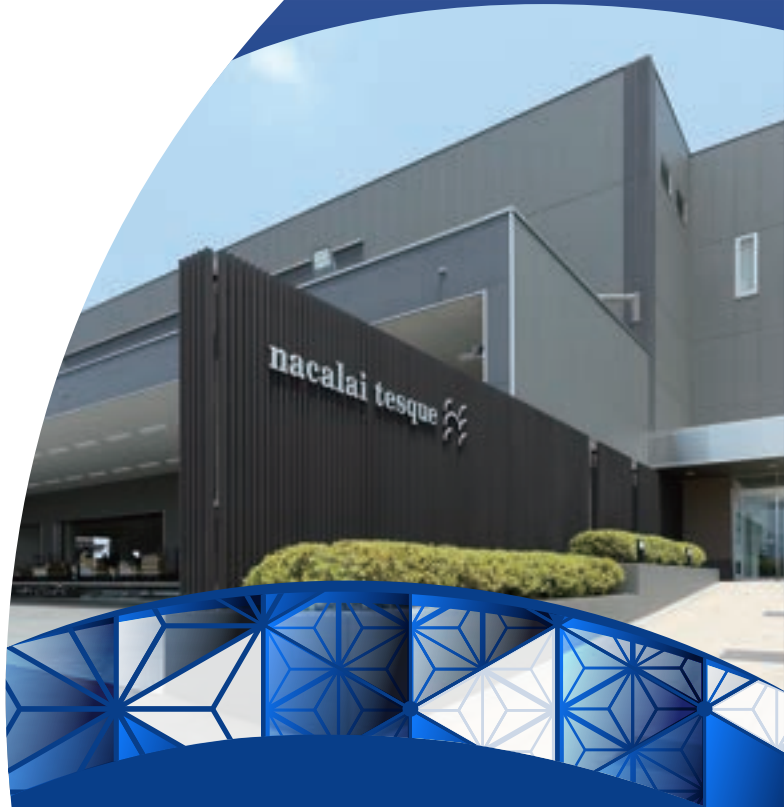
Columns for low-polarity compounds

For these compounds, a low-polarity stationary phase is suitable.

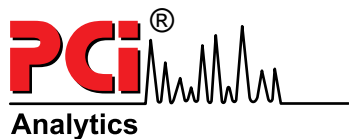
Columns for SFC-specific separations

In supercritical fluid chromatography (SFC), secondary interactions such as π - π and dispersion force* are stronger compared to high-performance liquid chromatography (HPLC). As a result, these columns are capable of unique separations in SFC.

Note : For details, description, part numbers, dimension and price, Kindly contact us : sales@pcianalytics.in / gm@pcianalytics.in



Authorized Distributor



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