



HPLC Column

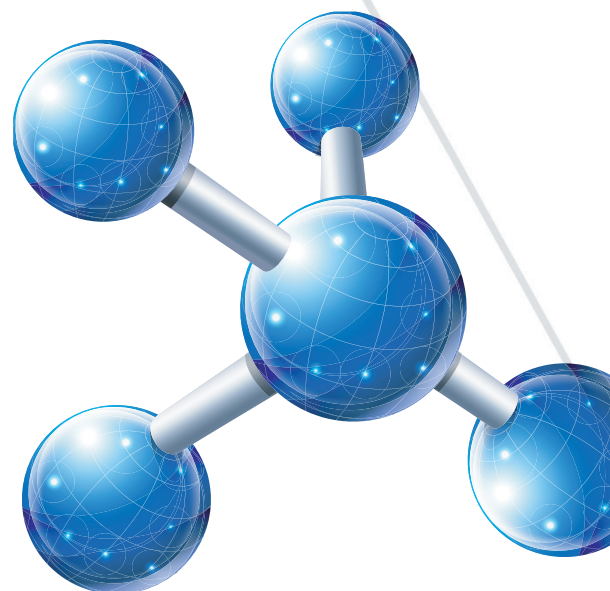


**RStech Corporation**  
[www.rstechcorp.com](http://www.rstechcorp.com)



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# I. Introduction

HECTOR column is designed for HPLC, LC-MS, SFC, and SMB. HECTOR columns are manufactured under the most stringently controlled conditions, guaranteeing constant particles and pore distribution as well as a constant size and pore volume and low metal impurity. HECTOR columns are well end-capped for reproducibility and durability. Therefore, HECTOR columns, which have a lower concentration of free silanols, affect the retention time and peak shapes of basic solutes. We offer a full line of phases, including HECTOR-M, A, T, W, and ACD, to provide our customers with a wide range of selectivity.

HECTOR columns are based on 3, 5, and 10  $\mu\text{m}$  particles with high-purity silica. We provide various lengths and inside diameters. These columns have a superb performance for a variety of applications in the pharmaceutical, chemical, environmental, and food separation areas.



## Advantages of HECTOR Columns

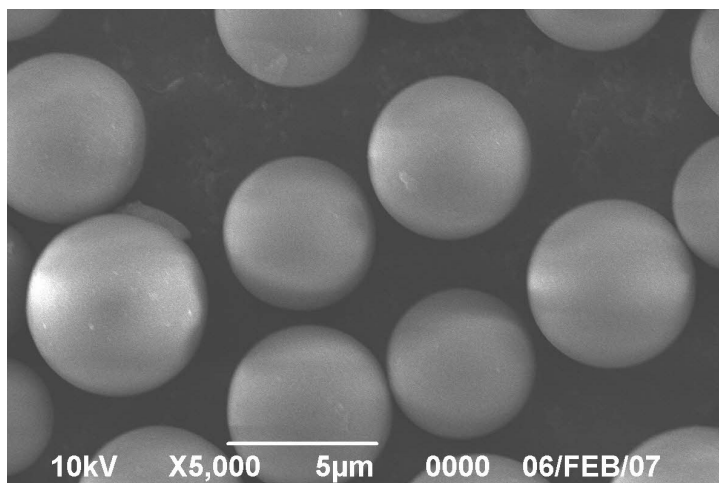
- High-purity silica
- Fully end-capped for reduced peak tailing
- Excellent peak shape for acids, bases, and neutrals
- High reproducibility
- Improved resolution
- Available in various pore and particle sizes
- Reproducible manufacturing practices for reproducible column-to-column performance
- Easy to scale up
- Eliminates the silanol effect for a good peak shape



## 1-1) Bare Silica Information

### Silica Distribution & Shape

SEM picture of bare silica



5 µm Bare Silica

HECTOR columns provide a silica material with  $\text{SiO}_2 > 99.99\%$  purity, which points to a total metal content of  $< 100$  ppm.

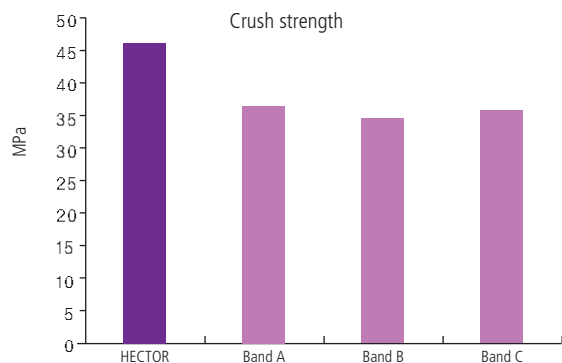
- Most lot data show less than 10 ppm
- Selection of particle sizes to optimize the efficiency
- Spherical particle shape to reduce the pressure
- Consistent and reproducible retention times to allow direct scale-up from the laboratory through the process applications
- Lot-to-lot consistency for reproducible performance
- Bulk quantities for larger-scale applications available, secured lots offered for process use

### Specifications of Silica

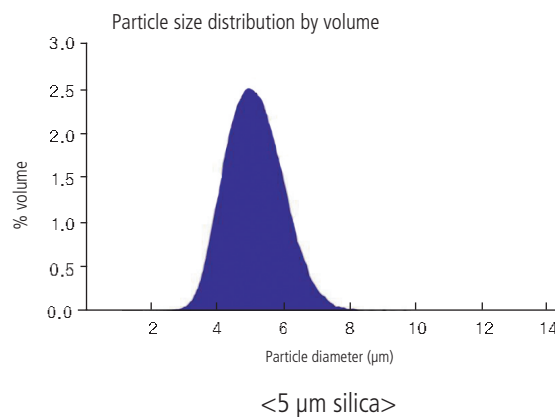
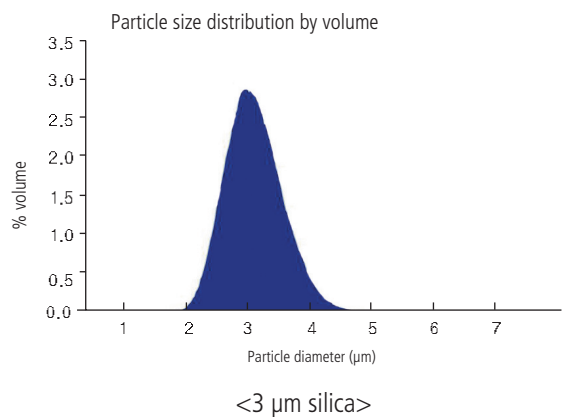
	Unit	Specification
Particle size	µm	3,5,10
Surface area	m <sup>2</sup> /g	320
Pore volume	ml/g	0.70-0.90
Particle size distribution d <sub>10</sub> /d <sub>90</sub>	µm	1.55 Max
Na	ppm	< 10 Max
Mg	ppm	< 10 Max
Al	ppm	< 10 Max
Ca	ppm	< 10 Max
Fe	ppm	< 10 Max
Zr	ppm	< 10 Max
Ti	ppm	< 10 Max



### Mechanical & Chemical Stability



### Particle size distribution



The narrow distribution of HECTOR columns permits their utilization for a broad range of applications, allowing optimization of selectivity and capacity. The tight particle size distributions for the 3 and 5 µm particles are ideal for choosing the best compromise between efficiency, operating pressure, and process time, thus offering the best balance between price and performance.



## 1-2) Column Line-up

### A) HECTOR-M: First choice, Wide range application

HECTOR-M columns are well end-capped for reproducibility and durability. Their wide range of stationary phases supports the customer demands, from the analytical to the semi-prep scales. For the reversed-phase mode, the C18, C8, C4, NH2, CN, and phenyl phases are available, depending on the polarity. On the other hand, Sil, NH2, and Diol are available for the normal-phase mode. These normal-phase columns separate acidic, neutral, and basic compounds through the right choice of stationary phase.

- Differentiated Phases: C18, C8, C4, NH2, Diol, CN, Phenyl, Sil
- Specifications: Spherical silica, monomerically bonded, endcapped, 100 Å pore size
- Format: Analytical, Semi-prep

#### HECTOR-M : Wide range application

Phase	Description	Base	Particle size (µm)	Pore Size (Å)	Surface Area(m <sup>2</sup> /g)	Carbon Load(%)	Phase Type	End-capping	USP
C18	ODS-bonded phase that used reversed phase.	Silica	3,5,10	100	320	17	monomeric	Yes	L01
C8	When C18 is too retentive. It has lower C% than C18.	Silica	3,5,10	100	320	10	monomeric	Yes	L07
C4		Silica	3,5,10	100	320	3-4	monomeric	Yes	L26
NH2	Polar phase that can be used normal and ion exchange mode	Silica	3,5,10	100	320	4	monomeric	Yes	L08
Diol	Alcoholic hydroxyl, mild adsorption, neutral charge.	Silica	3,5,10	100	320	4	monomeric	Yes	L20
CN	Stable, long-life, cyano phase	Silica	3,5,10	100	320	6-7	monomeric	Yes	L10
Phenyl	Nonpolar. hydrophobic retention of a phenyl phase is similar to that of a C8 bonded phase, but unique selectivity	Silica	3,5,10	100	320	10	monomeric	Yes	L11
Sil	For general purpose normal-phase application	Silica	3,5,10	100	320	-	-	-	L03



## B) HECTOR-A: Usable under 100% aqueous condition

By introducing a hydrophilic functional group to the C18 and C8 stationary phases, HECTOR-A is able to use below 100 % aqueous conditions without collapsing the carbon chains. The HECTOR-A stationary-phase provides alternative selectivity with a longer retention of polar compounds.

- Differentiated Phases: C18, C8
- Specifications: Spherical silica, monomerically bonded, endcapped, 100 Å pore size
- Format: Analytical, Semi-prep

HECTOR-A : Compatible with 100 % aqueous mobile phase

Phase	Description	Base	Particle size (µm)	Pore Size (Å)	Surface Area(m <sup>2</sup> /g)	Carbon Load(%)	Phase Type	End-capping	USP
C18	C18 bonded silica with hydrophilic functional group	Silica	3,5,10	100	320	12-13	monomeric	Yes	L01
C8	Similar but less retentive than C18	Silica	3,5,10	100	320	8	monomeric	Yes	L07

## C) HECTOR-T: Enhanced durability

HECTOR-T has a higher acid and base durability than monofunctional C18. The wide range of pH conditions supports the easy optimization of separation conditions. In addition, the tailing factor of the basic compounds has been improved. The polymeric-bonded phase from trifunctional silane may be more stable than the monomeric phases at a low pH.

- Differentiated Phases: C18
- Specifications: Spherical silica, Trifunctional bonded, endcapped, 100 Å pore size
- Format: Analytical, Semi-prep

HECTOR-T: Enhanced durability

Phase	Description	Base	Particle size (µm)	Pore Size (Å)	Surface Area(m <sup>2</sup> /g)	Carbon Load(%)	Phase Type	End-capping	USP
C18	C18 is based on trifunctional silane chemistry. More stability for wide pH range	Silica	3,5,10	100	320	19	Trifunctional	Yes	L01



### D) HECTOR-W: Wide pore for compounds with large molecule like protein & Peptide

HECTOR-W is a 300 Å wide-pore silica with C18, C8, C4 and NH2 derivarizations. This wide-pore silica is for the separation of peptides, proteins, and oligonucleotides. The derivarization type is selected by target compound property.

- Differentiated Phases: C18, C8, C4, NH2
- Specifications: Spherical silica, monomerically bonded, endcapped, 300 Å pore size
- Format: Analytical, Semi-prep

HECTOR-W: Wide pore for compounds with large molecule like protein & peptide

Phase	Description	Base	Particle size (µm)	Pore Size (Å)	Surface Area(m <sup>2</sup> /g)	Carbon Load(%)	Phase Type	End-capping	USP
C18	C18 bonded wide pore silica, it can be used for a wide range of molecular weights.	Silica	3,5,10	300	-	7	monomeric	Yes	L01
C8	When C18 is too retentive. It has lower C% than C18.	Silica	3,5,10	300	-	4	monomeric	Yes	L07
C4		Silica	3,5,10	300	-	3	monomeric	Yes	L26
NH2	Polar phase that can be used normal and ionexchange mode	Silica	3,5,10	300	-	-	monomeric	Yes	L08

### E) HECTOR-ACD: Dedicated for separation of acidic compounds

- Differentiated Phases: WCX (Weak Cation Exchange), SCX (Strong Cation Exchange)
- Specifications: Spherical silica, monomerically bonded, endcapped, 100 Å pore size
- Format: Analytical, Semi-prep

HECTOR-ACD: Dedicated for separation of acidic compounds

Phase	Description	Base	Particle size (µm)	Pore Size ( Å )	Surface Area(m <sup>2</sup> /g)	Carbon Load(%)	Phase Type	End-capping	USP
WCX	COOH boned silica surface	Silica	3,5,10	100	320	6-7	monomeric	Yes	
SCX	SO <sub>3</sub> H boned silica surface	Silica	3,5,10	100	320	5	monomeri	Yes	





## 1-3) Column Naming

Ex) part number: C18-M31000521

C18	M	3	100	05	21
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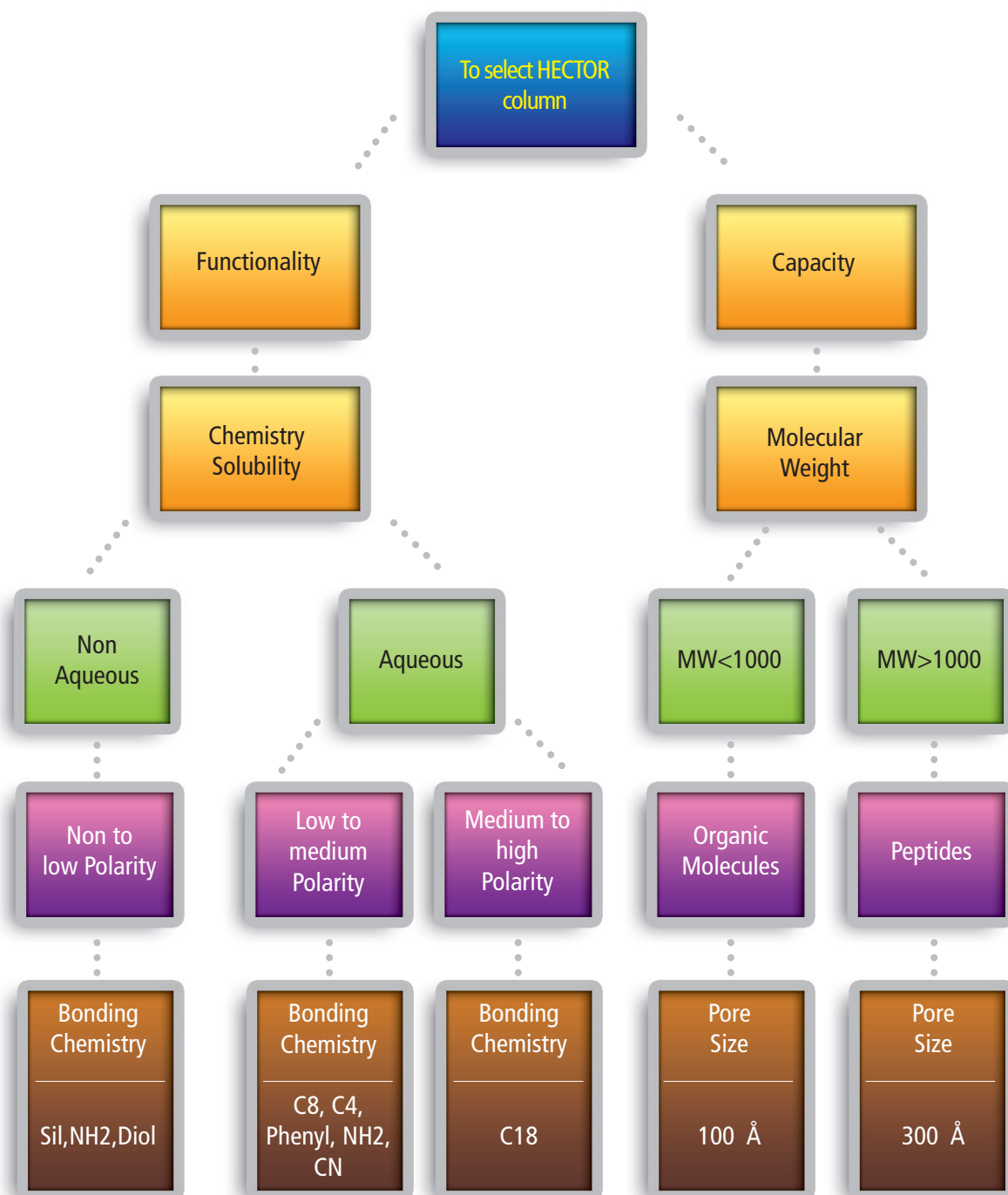
Bonding Chemistry	Column line-up		Particle size( $\mu\text{m}$ )	Pore size ( $\text{\AA}$ )	Length(mm)	ID (mm)
C18, C8, C4, NH <sub>2</sub> , Diol, CN, Phenyl, Sil, WCX, SCX	M	Wide range application	3, 5, 10	100, 300	50, 70, 100, 150, 250	2.1, 3.0, 3.9, 4.6, 10.0, 21.2
	A	Usable under 100% aqueous condition				
	T	Tri-functional bonded phase				
	W	Wide pore for compounds with large molecule like protein & Peptide				
	ACD	Dedicated for separation of acidic compounds				





## 1-4) Column Selection Guide

Column selection tree





### HPLC Column Selection by Application

Amino Acids	HECTOR-M C18
	HECTOR-A C18
	HECTOR-T C18
	HECTRO-ACD
Anions	HECTOR-M NH2
Antibiotics	HECTOR-W C18
	HECTOR-M NH2
Carbohydrates (Sugar)	HECTOR-M NH2
DNA	HECTOR-M C18
	HECTOR-T C18
Environmental (Carbamates, PAH's)	HECTOR-M C18
Fatty acids	HECTOR-M C18
Foods, Flavors and Fragrances	HECTOR-M C18
Insecticides	HECTOR-M C18
	HECTOR-A C18
Lipids	HECTOR-M C18
Nucleosides and Nucleotides	HECTOR-W C18
	HECTOR-M C18
	HECTOR-M NH2
	HECTOR-A C18
Organic acids	HECTOR-M C18
	HECTOR-A C18
	HECTOR-ACD
Proteins	HECTOR-A C18
	HECTOR W C18
Vitamins	HECTOR-M C18
	HECTOR-A C18
	HECTOR-T C18



Column Selection by USP Listing

USP No.	Kind	USP Description	HECTOR Phases
L01	C18	Octadecyl silane <ODS or C18> chemically bonded to porous silica or ceramic particles, 1.5 to 10 micron in diameter.	HECTOR-M C18 HECTOR-A C18 HECTOR-T C18 HECTOR-W C18
L03	Sil	Porous silica particles, 3 to 10 micron in diameter.	HECTOR-M Sil
L07	C8	Octyl silane <C8> chemically bonded to porous silica particles, 1.5 to 10 micron in diameter.	HECTOR-M C8 HECTOR-A C8 HECTOR-T C8 HECTOR-W C8
L08	NH2	An essentially monomolecular layer of aminopropylsilane <NH2> chemically bonded to totally porous silica gel support, 3 to 10 micron in diameter.	HECTOR-M NH2 HECTOR-W NH2
L9	Strongly acidic cation group	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10 micron in diameter.	HECTOR-ACD SCX
L10	CN	Nitrile groups <CN> chemically bonded to porous silica particles, 3 to 10 micron in diameter.	HECTOR-M CN
L11	Phenyl	Phenyl groups chemically bonded to porous silica particles, 1.5 to 10 micron in diameter.	HECTOR-M Phenyl
L20	Diol	Dihydroxypropane groups chemically bonded to porous silica particles, 5 to 10 micron in diameter.	HECTOR-M Diol
L26	C4	Butyl silane <C4> chemically bonded to porous silica particles, 3 to 10 micron in diameter.	HECTOR-M C4 HECTOR-A C4 HECTOR-W C4



## Column Selection by Manufacturer

Phase	Manufacturer	Pore Size(Å)	Area(m <sup>2</sup> /g)	%C	Recommended HECTOR Column
ACE AQ	ACT	100	300	14	HECTOR-A C18
ACE C18	ACT	100	300	15.5	HECTOR-M C18
ACE C18 300	ACT	300	300	9	HECTOR-W C18
ACE C4	ACT	100	300	5.5	HECTOR-M C4
ACE C8	ACT	100	300	9	HECTOR-M C8
ACE Phenyl	ACT	100	300	5.5	HECTOR-M Phenyl
ACE CN	ACT	100	300	5.5	HECTOR-M CN
Alltima HP C18	Grace	190	200	12	HECTOR-M C18
Alltima HP C18 AQ	Grace	100	450	20	HECTOR-A C18
Alltima HP C8	Grace	190	200	8	HECTOR-M C8
Alltima HP CN	Grace	190	200	4	HECTOR-A CN
Alltima HP Silica	Grace	190	200	-	HECTOR-M Sil
Ascentis C18	Supelco	100	450	25	HECTOR-M C18
Ascentis C8	Supelco	100	450	15	HECTOR-M C8
Ascentis Phenyl	Supelco	100	450	19	HECTOR-M Phenyl
Atlantis dC18	Waters	100	330	12	HECTOR-A C18
Columbus C18	Phenomenex	110	375	19	HECTOR-M C18
Columbus C8	Phenomenex	110	375	13	HECTOR-M C8
Discovery BIO Wide Pore C18	Supelco	300	-	-	HECTOR-W C18
Discovery BIO Wide Pore C8	Supelco	300	-	-	HECTOR-W C8
Discovery C18	Supelco	180	200	14	HECTOR-M C18
Discovery C8	Supelco	180	200	-	HECTOR-M C8
Discovery Cyano	Supelco	180	200	-	HECTOR-M CN
Gemini C18	Phenomenex	110	375	14	HECTOR-M C18
Genesis AQ	Grace	120	300	-	HECTOR-A C18
Genesis C4	Grace	120	300	-	HECTOR-M C4
Genesis C8	Grace	120	300	-	HECTOR-M C8
Genesis CN	Grace	120	300	7	HECTOR-M CN
Genesis MOS	Grace	120	300	11	HECTOR-M C8
Genesis ODS	Grace	120	300	18	HECTOR-M C18
Genesis Phenyl	Grace	120	300	-	HECTOR-M Phenyl
Genesis Silica	Grace	120	300	-	HECTOR-M Sil
Inertsil C4	GL Science	150	320	8	HECTOR-M C4
Inertsil C8	GL Science	150	320	11	HECTOR-M C8
Inertsil ODS3V	GL Science	100	450	15	HECTOR-M C18
Inertsil Phenyl	GL Science	150	320	10	HECTOR-M Phenyl
Inertsil Silica	GL Science	150	320	-	HECTOR-M Sil
Jupiter C18	Phenomenex	300	170	13	HECTOR-W C18
Jupiter C4	Phenomenex	300	170	5	HECTOR-W C4

Recommended HECTOR columns are not guaranteed to provide the same retention or selectivity.



Phase	Manufacturer	Pore Size(Å)	Area(m <sup>2</sup> /g)	%C	Recommended HECTOR Column
LiChrospher CN	Merck	100	350	7	HECTOR-M CN
LiChrospher Diol	Merck	100	350	-	HECTOR-M Diol
LiChrospher NH <sub>2</sub>	Merck	100	350	5	HECTOR-M NH <sub>2</sub>
LiChrospher RP18	Merck	100	350	21	HECTOR-A C18
LiChrospher RP-18e	Merck	100	350	22	HECTOR-A C18
LiChrospher RP-8	Merck	100	350	13	HECTOR-A C8
LiChrospher RP-8e	Merck	100	350	13	HECTOR-A C8
Luna C18	Phenomenex	100	400	18	HECTOR-M C18
Luna C8	Phenomenex	100	400	14	HECTOR-M C8
Luna CN	Phenomenex	100	400	-	HECTOR-M CN
Luna NH <sub>2</sub>	Phenomenex	100	400	10	HECTOR-M NH <sub>2</sub>
Luna SCX	Phenomenex	100	400	-	HECTOR-ACD SCX
μBondpak C18	Waters	125	330	10	HECTOR-M C18
μBondpak CN	Waters	125	330	-	HECTOR-M CN
μBondpak NH <sub>2</sub>	Waters	125	330	4	HECTOR-M NH <sub>2</sub>
μBondpak Phenyl	Waters	125	330	-	HECTOR-M Phenyl
Nova-Pak C8	Waters	60	120	-	HECTOR-M C8
Nova-Pak CN	Waters	60	120	-	HECTOR-M CN
Nova-Pak Silica	Waters	60	120	-	HECTOR-M Sil
Nova-Pak (HR) C18	Waters	60	120	7	HECTOR-M C18
NUCLEODUR C18 Gravity	Macherey-Nagel	110	340	18	HECTOR-M C18
NUCLEODUR C18 EC	Macherey-Nagel	110	340	18	HECTOR-M C18
NUCLEODUR CN	Macherey-Nagel	110	340	7	HECTOR-M CN
NUCLEODUR Pyramid	Macherey-Nagel	110	340	14	HECTOR-A C18
Nucleosil 100 C18	Macherey-Nagel	100	350	17	HECTOR-M C18
Nucleosil 100 C18 AB	Macherey-Nagel	100	350	24	HECTOR-M C18
Nucleosil 100 C <sub>6</sub> H <sub>5</sub>	Macherey-Nagel	100	350	-	HECTOR-M Phenyl
Nucleosil 100 C8	Macherey-Nagel	100	350	9	HECTOR-M C8
Nucleosil 100 CN	Macherey-Nagel	100	350	-	HECTOR-M CN
Nucleosil 100 NH <sub>2</sub>	Macherey-Nagel	100	350	4	HECTOR-M NH <sub>2</sub>
Nucleosil 100 OH	Macherey-Nagel	100	350	-	HECTOR-M Diol
Nucleosil 100 SA	Macherey-Nagel	100	350	7	HECTOR-SCX
Nucleosil 300 C18	Macherey-Nagel	300	100	7	HECTOR-W C18
Nucleosil 300 C4	Macherey-Nagel	300	100	-	HECTOR-W C4
Nucleosil 300 C8	Macherey-Nagel	300	100	-	HECTOR-W C8
Partisil C8	Whatman	85	350	9	HECTOR-M C8
Partisil ODS	Whatman	85	350	5	HECTOR-M C18
Partisil ODS2	Whatman	85	350	16	HECTOR-M C18
Partisil ODS-3	Whatman	85	350	11	HECTOR-M C18
Partisil SCX	Whatman	85	350	-	HECTOR-ACD SCX
Partisil Silica	Whatman	85	350	-	HECTOR-M Sil

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Phase	Manufacturer	Pore Size(Å)	Area(m <sup>2</sup> /g)	%C	Recommended HECTOR Column
Pinnacle C18	Restek	120	170	10	HECTOR-M C18
Pinnacle C4	Restek	120	170	4	HECTOR-M C4
Pinnacle CN	Restek	120	170	5	HECTOR-M CN
Pinnacle DB C18	Restek	140	-	11	HECTOR-M C18
Pinnacle DB Cyano	Restek	140	-	4	HECTOR-M CN
Pinnacle DB Phenyl	Restek	140	-	5	HECTOR-M Phenyl
Pinnacle IBD	Restek	120	170	-	HECTOR-M C18
Pinnacle NH <sub>2</sub>	Restek	120	170	2	HECTOR-M NH <sub>2</sub>
Pinnacle Phenyl	Restek	120	170	5	HECTOR-M Phenyl
Pinnacle Silica	Restek	120	170	-	HECTOR-M Sil
Pinnacle Ultra C18	Restek	100	-	20	HECTOR-M C18
Pinnacle Wide Pore C4	Restek	300	-	2	HECTOR-W C4
Polaris NH <sub>2</sub>	Varian	-	-	-	HECTOR-M NH <sub>2</sub>
Prodigy C8	Phenomenex	150	310	13	HECTOR-M C8
Prodigy ODS2	Phenomenex	150	310	18	HECTOR-M C18
Prodigy ODS-3	Phenomenex	100	450	16	HECTOR-M C18
Prodigy ODS-3V	Phenomenex	100	450	16	HECTOR-M C18
Prodigy Phenyl-3	Phenomenex	100	450	10	HECTOR-M Phenyl
Purospher RP-18	Merck	60	500	-	HECTOR-A C18
Purospher RP-18e	Merck	60	500	-	HECTOR-A C18
Purospher STAR RP-18e	Merck	120	300	-	HECTOR-A C18
Purospher STAR-8e	Merck	120	300	-	HECTOR-A C8
Pursuit C18	Varian	-	-	-	HECTOR-M C18
Pursuti C8	Varian	-	-	-	HECTOR-M C8
Sunfire C18	Waters	90	340	16	HECTOR-M C18
Sunfire C8	Waters	90	340	11.5	HECTOR-M C8
Supelcosil LC-18	Supelco	120	170	11	HECTOR-M C18
Supelcosil LC-18DB	Supelco	120	170	11	HECTOR-M C18
Supelcosil LC-8	Supelco	120	170	-	HECTOR-M C8
Supelcosil LC-CN	Supelco	120	170	-	HECTOR-M CN
Supelcosil LC-NH <sub>2</sub>	Supelco	120	170	-	HECTOR-M NH <sub>2</sub>
Supelcosil LC-Si	Supelco	120	170	-	HECTOR-M Sil
Symmetry C18	Waters	100	335	19	HECTOR-M C18
Symmetry C8	Waters	100	335	12	HECTOR-M C8
TSKgel Octyl-80TS	Tosoh	80	200	11	HECTOR-M C8
TSKgel ODS-120A	Tosoh	120	200	22	HECTOR-M C18
Waters Spherisorb C8	Waters	80	200	6	HECTOR-M C8
Waters Spherisorb CN	Waters	80	200	3	HECTOR-M CN
Waters Spherisorb NH <sub>2</sub>	Waters	80	200	2	HECTOR-M NH <sub>2</sub>
Waters Spherisorb ODS1	Waters	80	200	6	HECTOR-M C18
Waters Spherisorb ODS2	Waters	80	200	12	HECTOR-M C18

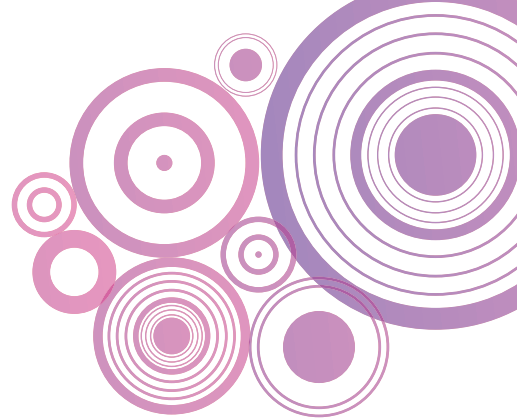
Recommended HECTOR columns are not guaranteed to provide the same retention or selectivity.



Phase	Manufacturer	Pore Size(Å)	Area(m <sup>2</sup> /g)	%C	Recommended HECTOR Column
Waters Spherisorb ODSB	Waters	80	200	12	HECTOR-M C18
Waters Spherisorb Phenyl	Waters	80	200	3	HECTOR-M Phenyl
Waters Spherisorb SCX	Waters	80	200	-	HECTOR-ACD SCX
Waters Spherisorb W (silica)	Waters	80	200	-	HECTOR-M Sil
Viva C18	Restek	300	-	9	HECTOR-W C18
Viva C4	Restek	300	-	4	HECTOR-W C4
Viva C8	Restek	300	-	5	HECTOR-W C8
X Bridge C18	Waters	135	185	17.5	HECTOR-T C18
X Bridge C8	Waters	135	185	17.5	HECTOR-T C8
Xterra MS C18	Waters	125	180	16	HECTOR-T C18
Xterra MS C8	Waters	125	180	12	HECTOR-T C8
YMCbasic	YMC	-	-	-	HECTOR-M C8
YMC-Pack C4	YMC	120	300	7	HECTOR-M C4
YMC-Pack C8	YMC	120	300	10	HECTOR-M C8
YMC-Pack CN	YMC	120	300	7	HECTOR-M CN
YMC-Pack NH <sub>2</sub>	YMC	120	-	-	HECTOR-M NH2
YMC-Pack ODS-AQ	YMC	120	300	16	HECTOR-A C18
YMC-Pack ODS-A	YMC	120	300	17	HECTOR-M C18
YMC-Pack ODS-A	YMC	300	150	7	HECTOR-W C18
YMC-Pack Phenyl	YMC	120	300	9	HECTOR-M Phenyl
YMC-Pack Pro C18	YMC	120	350	16	HECTOR-M C18
YMC-Pack Silica	YMC	120	-	-	HECTOR-M Sil
Zorbax Eclipse XDB C18	Agilent	80	180	10	HECTOR-T C18
Zorbax Eclipse Plus C18	Agilent	95	160	8	HECTOR-M C18
Zorbax Eclipse Plus C8	Agilent	95	160	6	HECTOR-M C8
Zorbax RRHT Eclipse Plus C18	Agilent	95	160	8	HECTOR-M C18
Zorbax RRHT Eclipse Plus C8	Agilent	95	160	6	HECTOR-M C8
Zorbax RRHT Eclipse XDB-C18	Agilent	80	180	10	HECTOR-M C18
Zorbax RRHT Eclipse XDB-C8	Agilent	80	180	7.5	HECTOR-M C8
Zorbax Eclipse SB-CN	Agilent	80	180	4	HECTOR-M CN
Zorbax SB Aq	Agilent	80	180	-	HECTOR-A C18
Zorbax SB C18	Agilent	80	18	10	HECTOR-M C18
Zorbax SB C18	Agilent	300	45	3	HECTOR-W C18
Zorbax SB C8	Agilent	80	180	6	HECTOR-M C8
Zorbax SB C8	Agilent	300	45	2	HECTOR-W C8
Zorbax SB CN	Agilent	80	180	4	HECTOR-M CN
Zorbax SB Phenyl	Agilent	80	180	6	HECTOR-M Phenyl

Recommended HECTOR columns are not guaranteed to provide the same retention or selectivity.





## II. HECTOR-M

### 2-1) Introduction

Wide range selection of stationary phase supports customer demands from analytical to Semi-prep scale. For reversed phase mode, C18, C8, C4, NH<sub>2</sub>, CN and phenyl phase are available depend on the polarity. On the other hands, Sil, NH<sub>2</sub>, Diol, and CN are available for normal phase mode. These normal phase columns cover to separate acidic, neutral, and basic compounds by right choice of stationary phase.

### 2-2) Advantages

- First choice for most regular samples
- High coverage and exhaustive end-capping
- Sharp peak shape
- Exceptional batch-to-batch reproducibility
- Enhanced mechanical stability
- Suitable for acidic, basic, neutral compounds separation
- High resolution
- High efficiency
- High peak capacity
- Low metal content in silica



### 2-3) Column Character

#### A) NIST test for HECOTR column Characterization

National Institute of Standards & Technology Standard Reference Material 870, NIST SRM 870 is a mixture of five organic compounds in methanol intended for use in characterizing general aspects of liquid chromatographic (LC) column performance, including efficiency, void volume, methylene selectivity, retentiveness, and activity toward chelators and organic bases. Other possible uses include (1) column classification to aid column selection during method development, (2) as a control material for monitoring LC column performance over time, and (3) in quality control for column manufacturing. SRM 870 consists of a mixture of the following five organic compounds in methanol: uracil, toluene, ethylbenzene, quinizarin, and amitriptyline (see Figure 1 for structures).

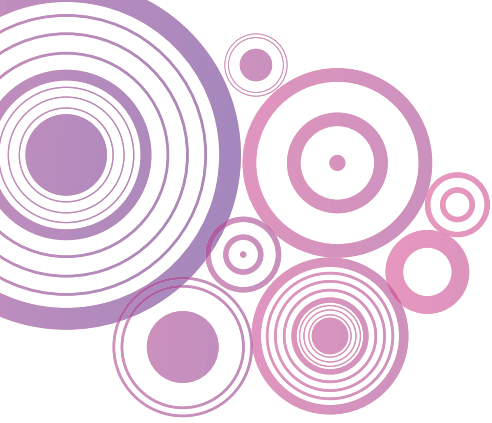
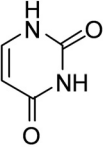
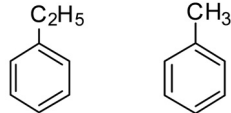
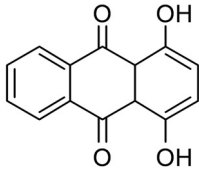
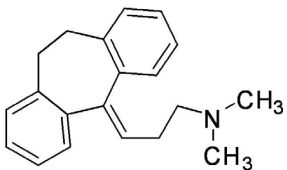


Fig.1 Structures and properties evaluated for components in SRM 870

Component	Property evaluated
Uracil 	Void volume marker
Toluene, Ethylbenzene 	Hydrophobic retention, Efficiency
Quinizarin 	Activity towards chelating reagents
Amitriptyline 	Activity towards bases

**Chromatographic condition**

Mobile phase: 20 % 20 mM phosphate buffer pH 7.0 in methanol  
 Flow rate: 1 mL/min  
 Temperature: 23 °C  
 Injection volumn: 1-2 µl  
 Detection: 210, 254, 480 nm  
 LC system: Agilent 1100

**Sample**

1. Uracil (28 µg/g)
2. Toluene (1400 µg/g)
3. Ethylbenzene (1700 µg/g)
4. Quinizarin (94 µg/g)
5. Amitriptyline (2800 µg/g) in Methanol

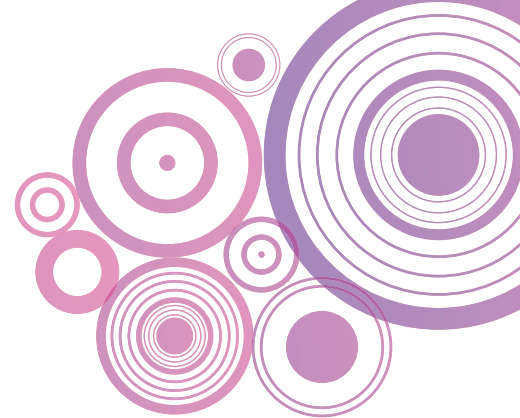
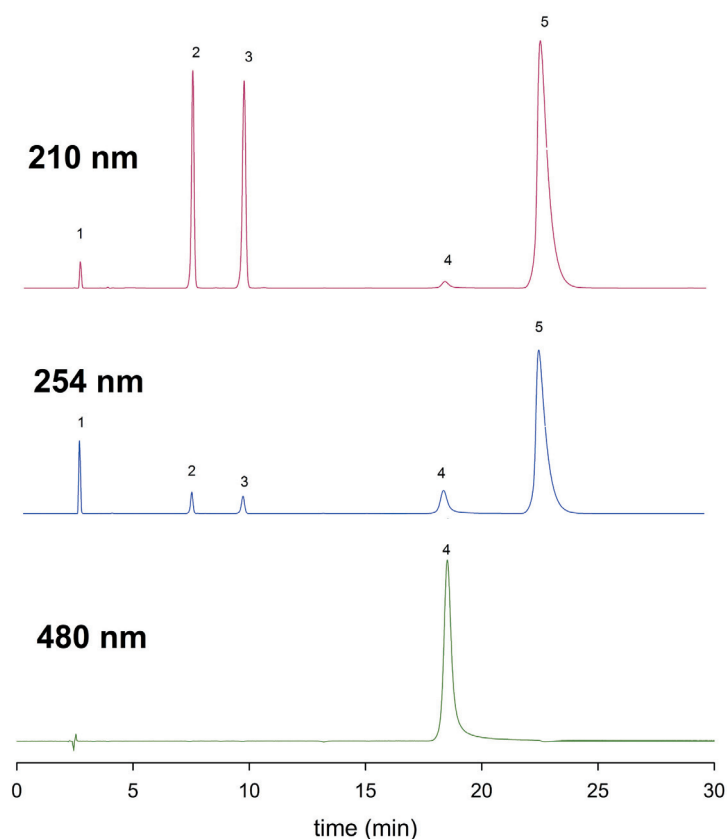


Fig. 2 Test result of SRM 870

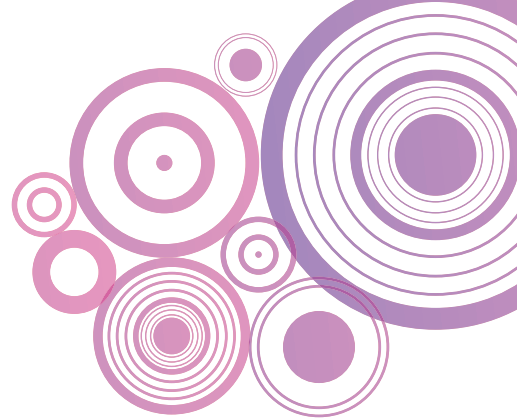


Toluene and/or ethylbenzene are useful markers for the calculation of column efficiency. The number of its theoretical plates is higher than 20,000. The HECTOR-M C18 column demonstrates excellent separation, capacity, and efficiency. Low activity towards chelating reagents is indicated by a symmetric peak shape, and high activity towards chelating reagents is indicated by a tailing, asymmetric peak shape. As shown in Fig. 2, HECTOR-M C18 surface has less metal purity.

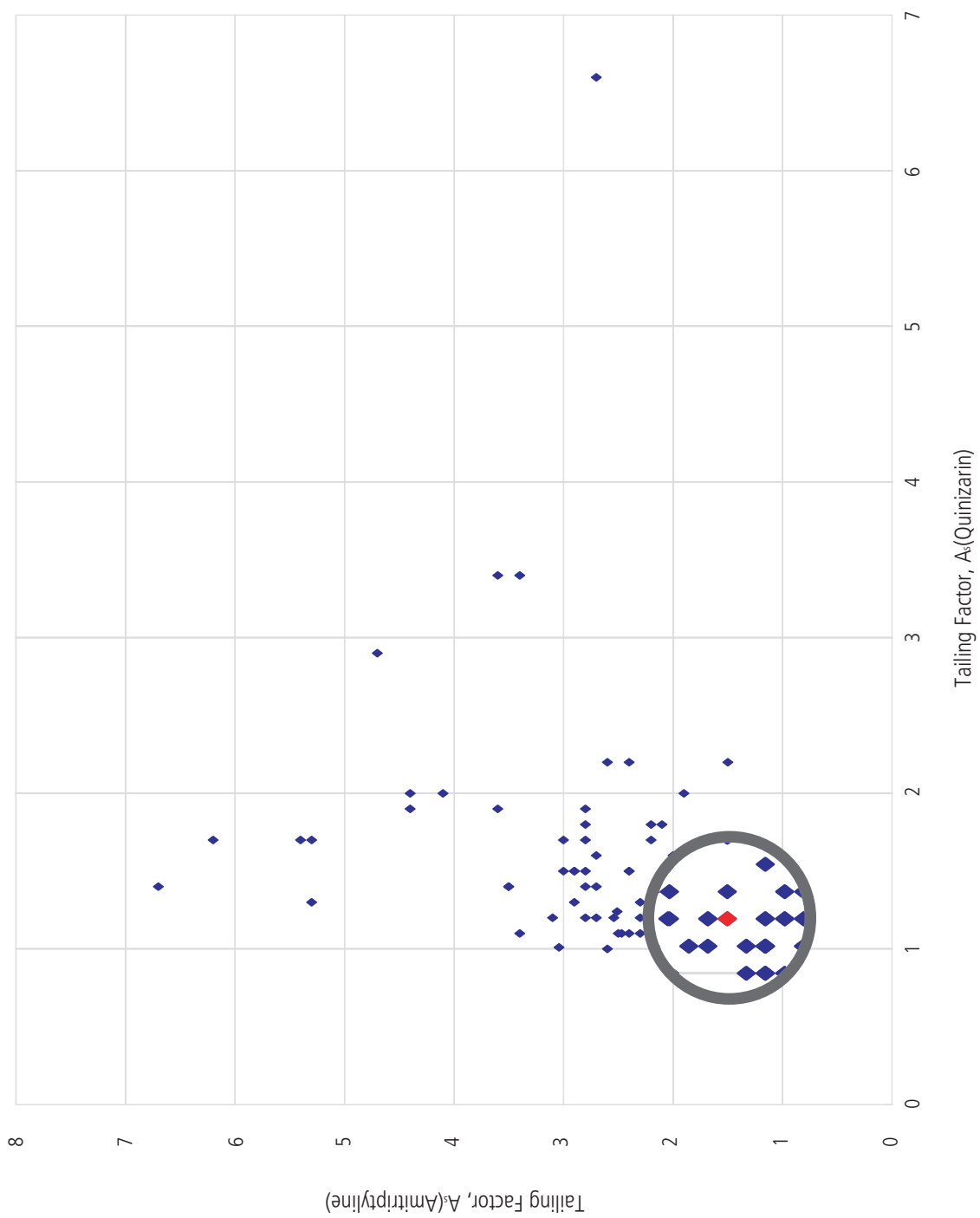
Amitriptyline is a basic ( $pK_a=9.4$ ) pharmaceutical drug (antidepressant) commonly used for column characterization indicating silica-surface silanol activity. Elution of organic bases with severe peak tailing is often associated with high silanol activity, but the elution of such compounds with symmetrical peak shapes is considered indicative of column deactivation. The result showed good symmetry, which points to low silanol activity.

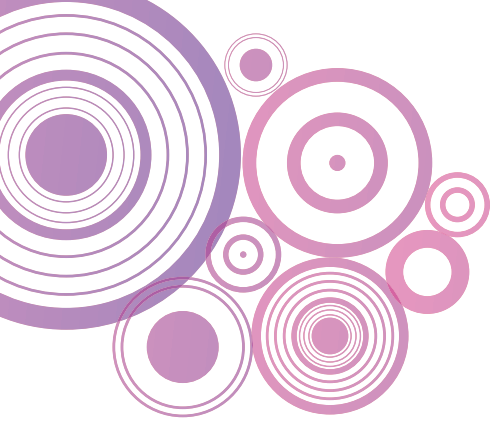
HECTOR columns are manufactured under well-controlled conditions and with fully end-capped surfaces. They can reduce secondary interaction with unreacted silanols. They thus have improved peak shapes for bases.





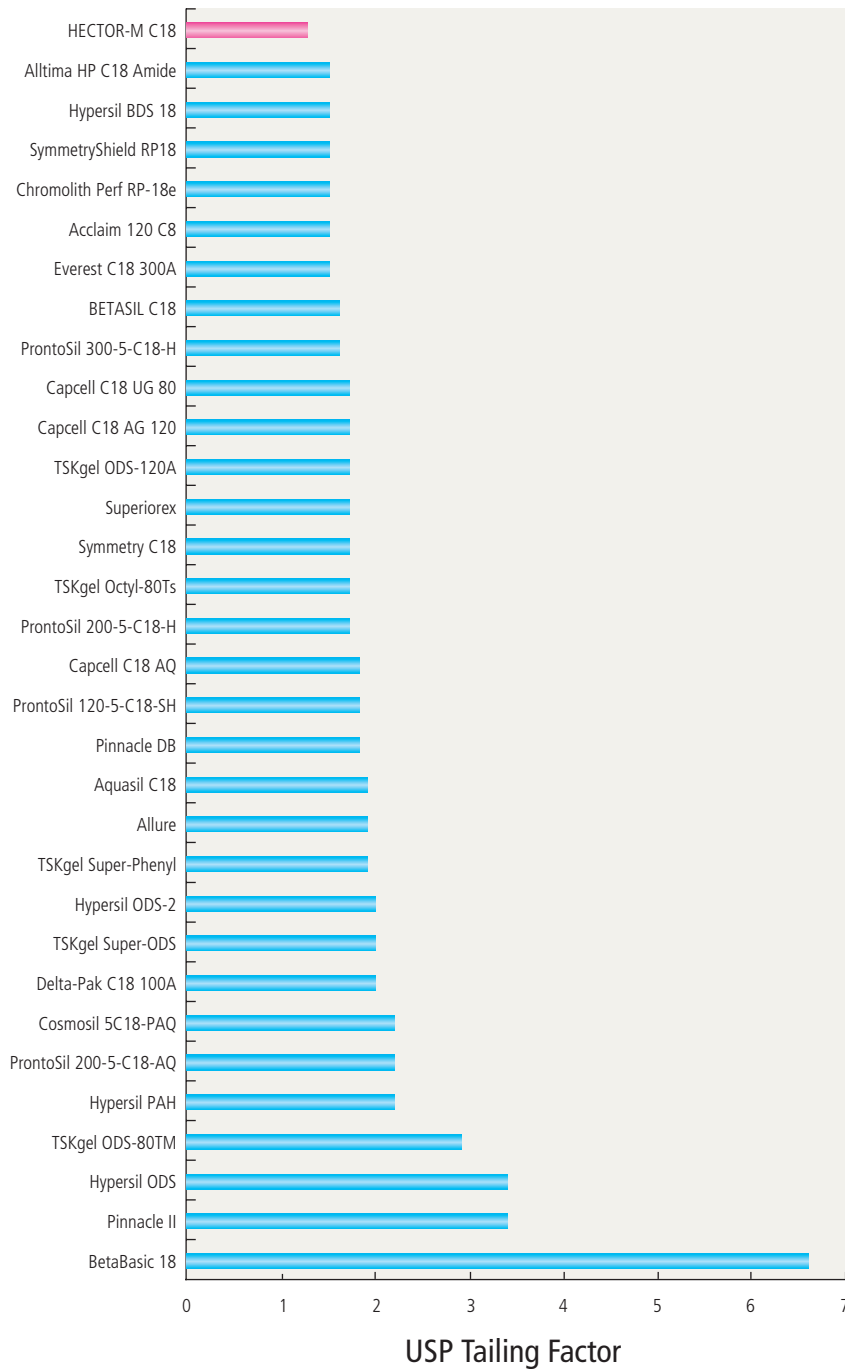
Plotting  $k'$  values of different compounds (polar vs. nonpolar) demonstrate the unique selectivity of HECTOR-M C18.

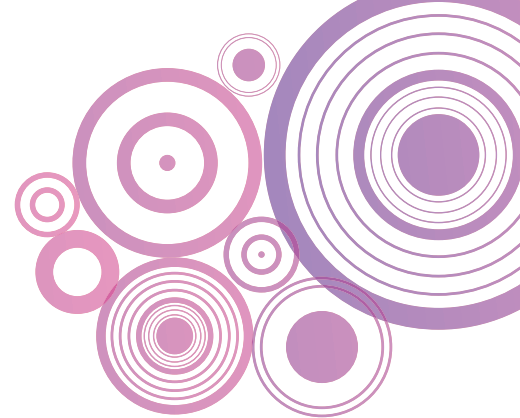




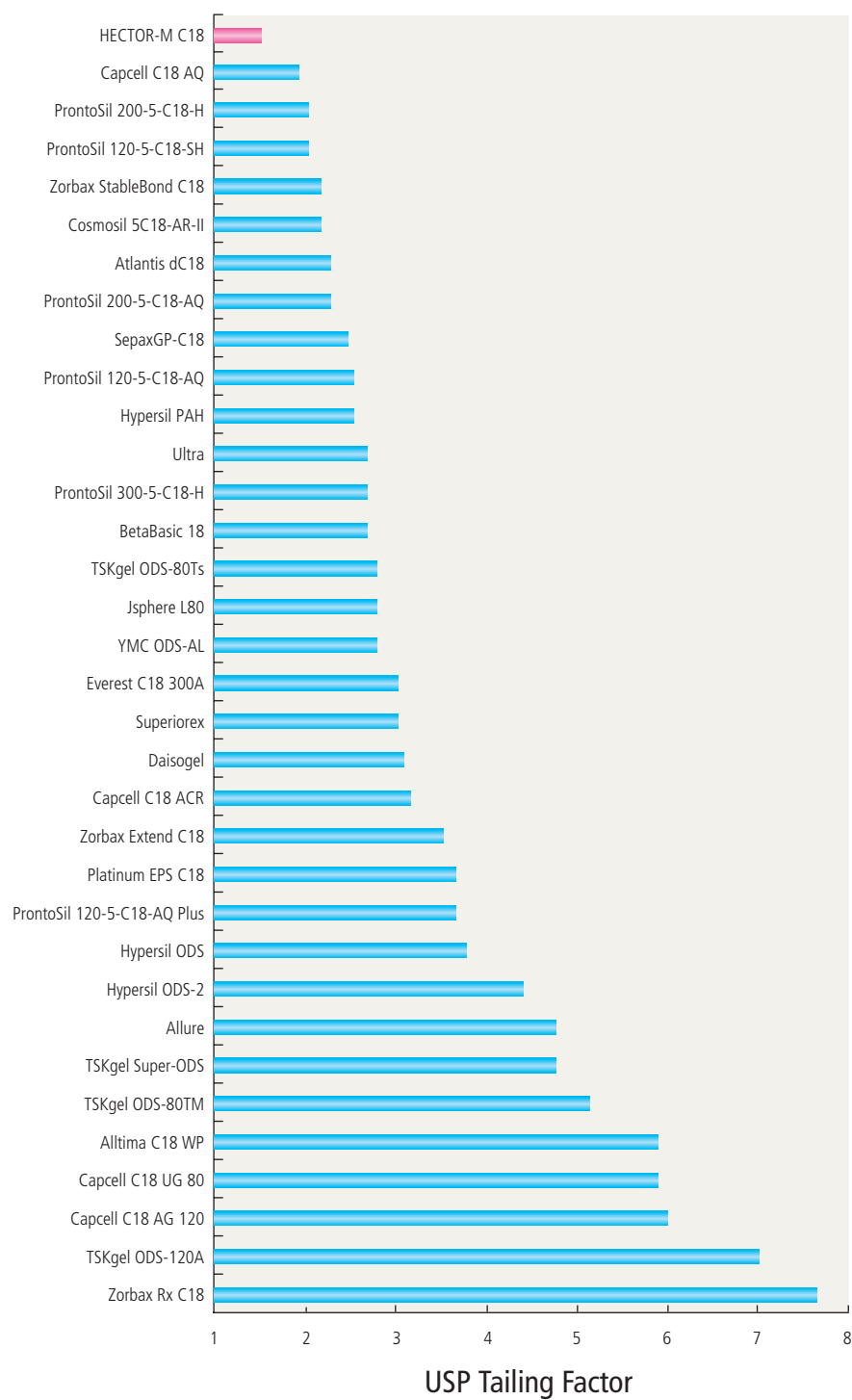
### C) Symmetry (USP Tailing factor)

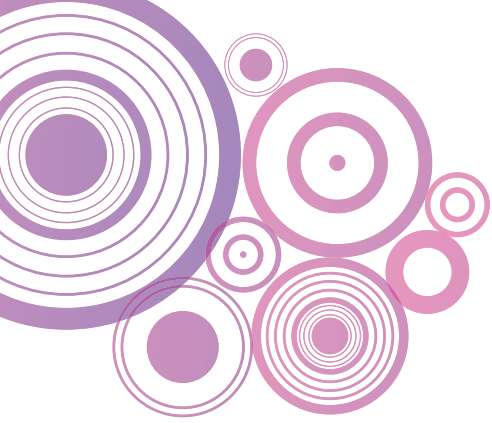
Comparison of metal activity using the NIST Test: Quinizarin asymmetry



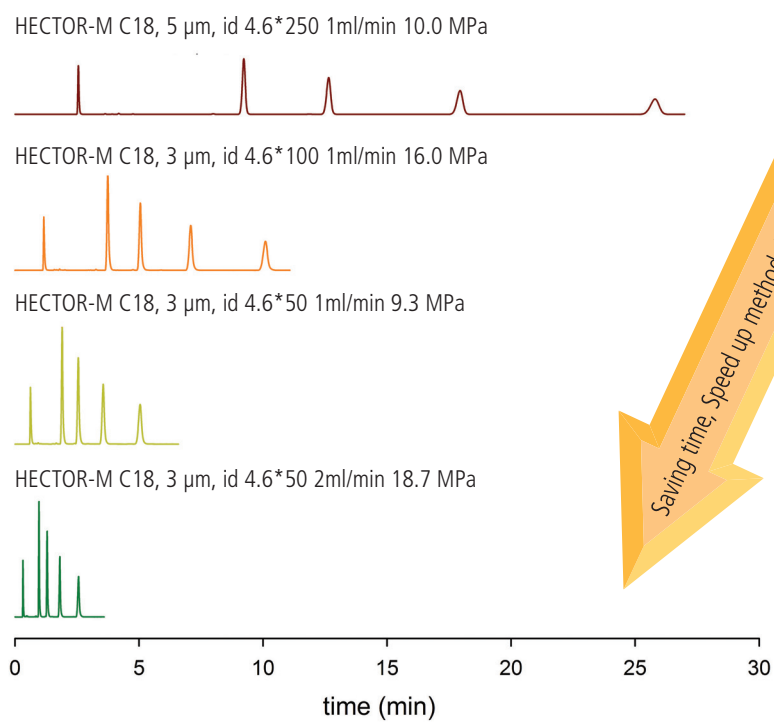


Comparison of silanol activity using the NIST Test : Amitriptyline asymmetry



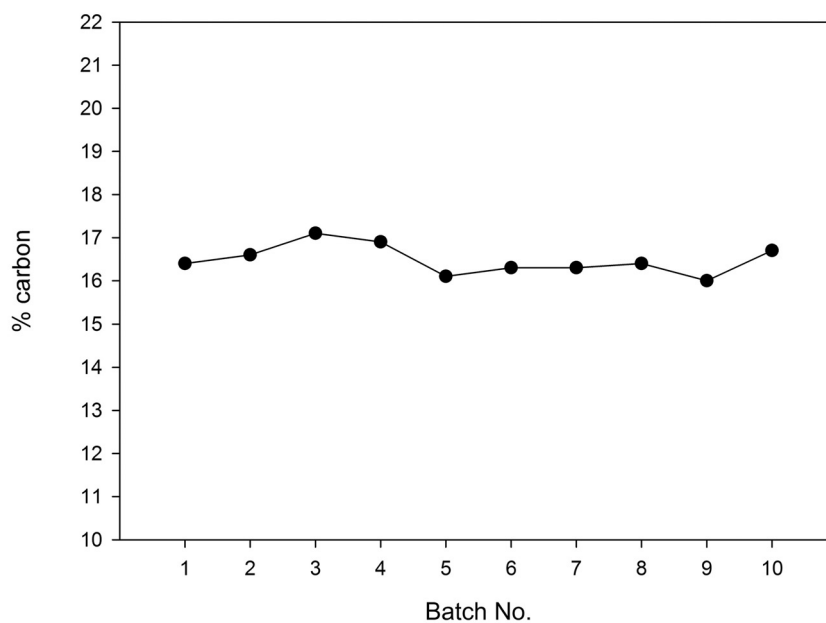


### D) Efficiency of Particle Size and Column Length

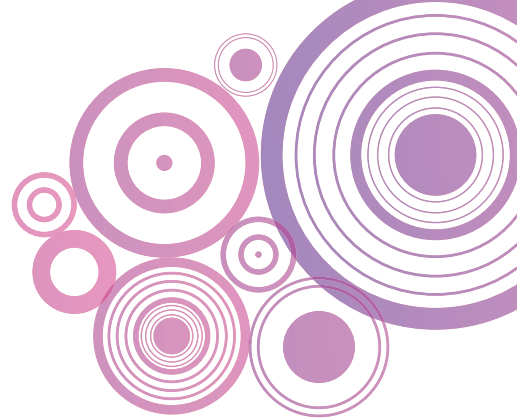


### E) Batch-to-Batch Reproducibility

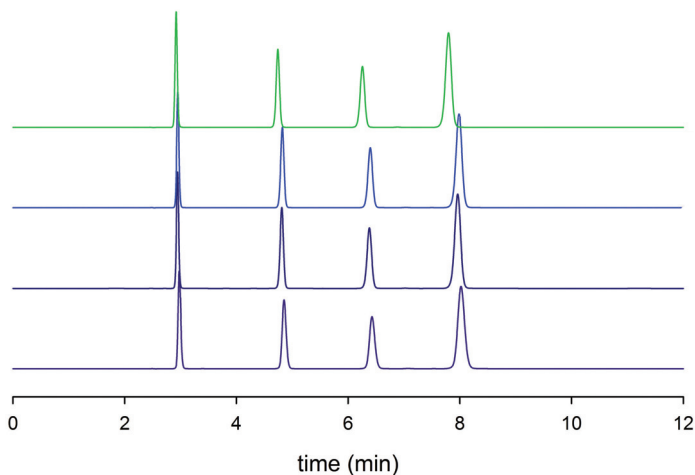
Silica Lot to Lot Data of HECTOR-M C18







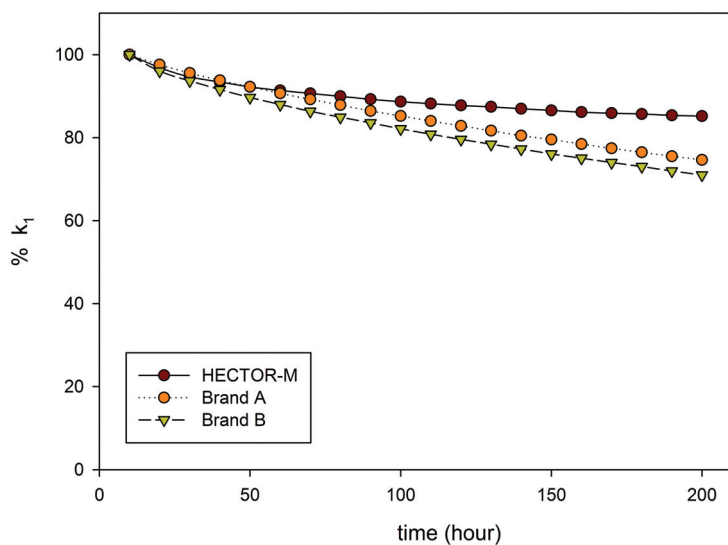
Column to Column Reproducibility Data of HECTOR-M C18



HECTOR-M C18  
 Column Size: 4.6 x 250 mm  
 Mobile phase: MeOH/H<sub>2</sub>O =90/10  
 Temperature: 25 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Phenol  
 2. Toluene  
 3. Biphenyl  
 4. Phenanthrene

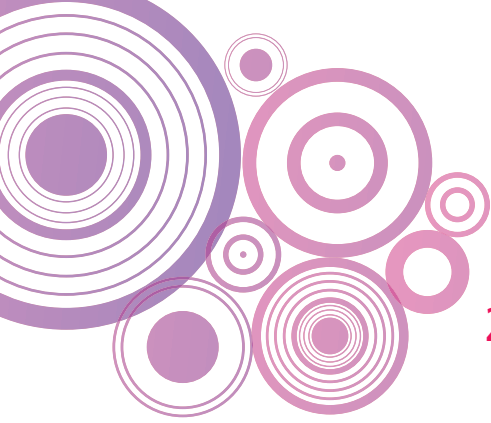
F) Low pH Stability

HECTOR-M C18 Acid resistance test



Column size : 150 X 4.6 mm  
 Mobile phase : 20 % MeOH / H<sub>2</sub>O in 1 vol % TFA  
 Temperature : 60 °C  
 Flow Rate : 1 mL/min  
 Detection : UV@254 nm  
 Sample : Benzyl alcohol, 1 mg/mL in 5  $\mu$ l  
 Sample injection at every one hour for 20 hours.





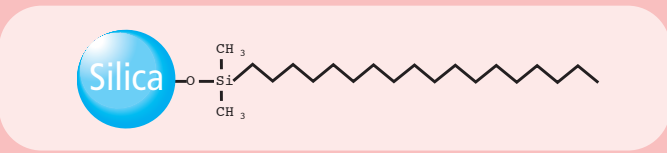
## 2-4) Product Details

### A) HECTOR-M C18

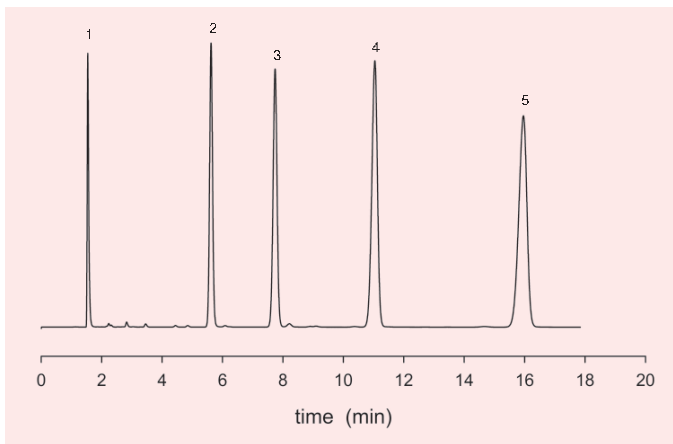
HECTOR-M C18 is the most versatile and popular reversed phase. It is extremely suitable for the validation of various analytes. It has an about 17 % carbon load and is fully end-capped. It provides high selectivity, efficiency, and a good peak shape.

#### Specification

- Particle size: 3,5,10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 17 %
- Usable pH range: 2-8



#### Standard chromatogram

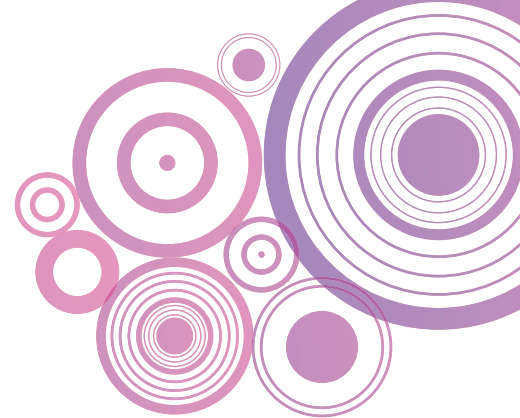


Column: HECTOR-M C18  
 Dimension: 150 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O =80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
           2. Ethylbenzene  
           3. N-Propylbenzene  
           4. N-Butylbenzene  
           5. N-Amylbenzene

### Product List

#### HECTOR-M C18

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-M31000521	C18-M31000530	C18-M31000539	C18-M31000546	C18-M310005100	-
	70	C18-M31000721	C18-M31000730	C18-M31000739	C18-M31000746	C18-M310007100	-
	100	C18-M31001021	C18-M31001030	C18-M31001039	C18-M31001046	C18-M310010100	-
	150	C18-M31001521	C18-M31001530	C18-M31001539	C18-M31001546	C18-M310015100	-
	250	C18-M31002521	C18-M31002530	C18-M31002539	C18-M31002546	C18-M310025100	-
5	50	C18-M51000521	C18-M51000530	C18-M51000539	C18-M51000546	C18-M510005100	C18-M510005200
	70	C18-M51000721	C18-M51000730	C18-M51000739	C18-M51000746	C18-M510007100	C18-M510007200
	100	C18-M51001521	C18-M51001530	C18-M51001539	C18-M51001546	C18-M510010100	C18-M510010200
	150	C18-M51001521	C18-M51001530	C18-M51001539	C18-M51001546	C18-M510015100	C18-M510015200
	250	C18-M51002521	C18-M51002530	C18-M51002539	C18-M51002546	C18-M510025100	C18-M510025200
10	100	-	-	-	C18-M101001046	C18-M1010010100	C18-M1010010200
	150	-	-	-	C18-M101001546	C18-M1010015100	C18-M1010015200
	250	-	-	-	C18-M101002546	C18-M1010025100	C18-M1010025200

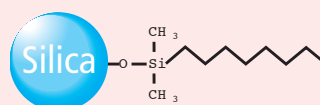


## B) HECTOR-M C8

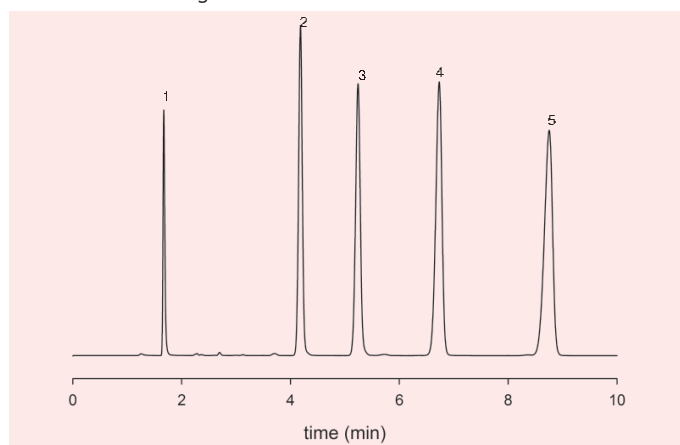
HECTOR-M C8 is packed with alkylchaine-group-bonded silica particles. It has a lower carbon load than HECTOR-M C18. We recommend HECTOR-M C8 when the sample has a high retention time. It can be used for pharmaceutical, environmental, food, and other industrial chromatographic separations. It provides less retention and greater speed.

### Specification

- Particle size: 3,5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents : about 10 %
- Usable pH range: 2-8



### Standard chromatogram

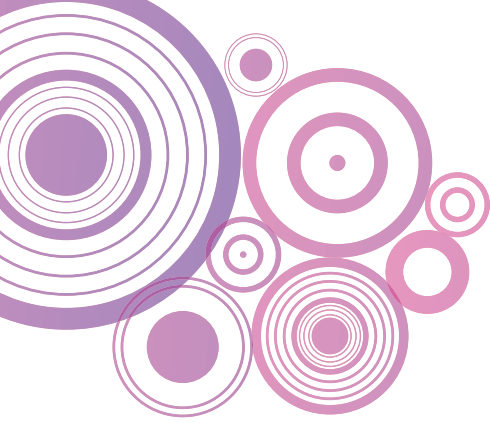


Column: HECTOR-M C8  
 Dimension: 150 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O =80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
           2. Ethylbenzene  
           3. N-Propylbenzene  
           4. N-Butylbenzene  
           5. N-Amylbenzene

## Product List

### HECTOR-M C8

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-M31000521	C8-M31000530	C8-M31000539	C8-M31000546	C8-M310005100	-
	70	C8-M31000721	C8-M31000730	C8-M31000739	C8-M31000746	C8-M310007100	-
	100	C8-M31001021	C8-M31001030	C8-M31001039	C8-M31001046	C8-M310010100	-
	150	C8-M31001521	C8-M31001530	C8-M31001539	C8-M31001546	C8-M310015100	-
	250	C8-M31002521	C8-M31002530	C8-M31002539	C8-M31002546	C8-M310025100	-
5	50	C8-M51000521	C8-M51000530	C8-M51000539	C8-M51000546	C8-M510005100	C8-M510005200
	70	C8-M51000721	C8-M51000730	C8-M51000739	C8-M51000746	C8-M510007100	C8-M510007200
	100	C8-M51001521	C8-M51001530	C8-M51001539	C8-M51001546	C8-M510015100	C8-M510015200
	150	C8-M51001521	C8-M51001530	C8-M51001539	C8-M51001546	C8-M510015100	C8-M510015200
	250	C8-M51002521	C8-M51002530	C8-M51002539	C8-M51002546	C8-M510025100	C8-M510025200
10	100	-	-	-	C8-M101001046	C8-M1010010100	C8-M1010010200
	150	-	-	-	C8-M101001546	C8-M1010015100	C8-M1010015200
	250	-	-	-	C8-M101002546	C8-M1010025100	C8-M1010025200

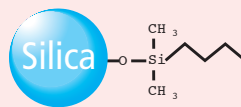


### C) HECTOR-M C4

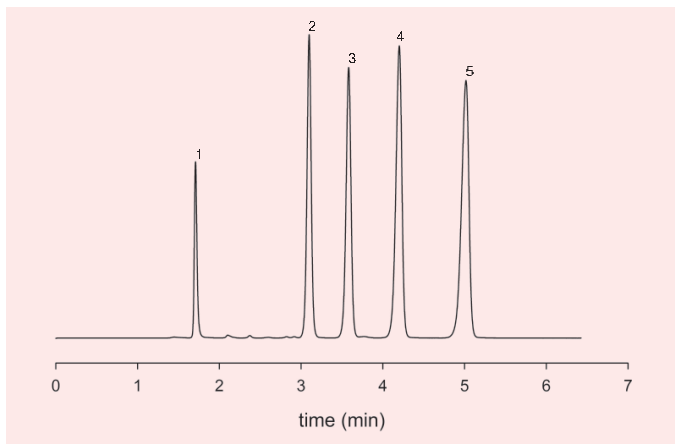
HECTOR-M C4 is packed with alkylchaine-group-bonded silica particles. It has a lower carbon load than HECTOR C18 and HECTOR C8. We recommend HECTOR-M C4 when the sample has a high retention time. It can be used for pharmaceutical, environmental, food, and other industrial chromatographic separations. It provides less retention and greater speed.

#### Specification

- Particle size: 3,5,10 µm
- Pore size: 100 Å
- Carbon contents : about 3 %
- Usable pH range: 2-8



#### Standard chromatogram

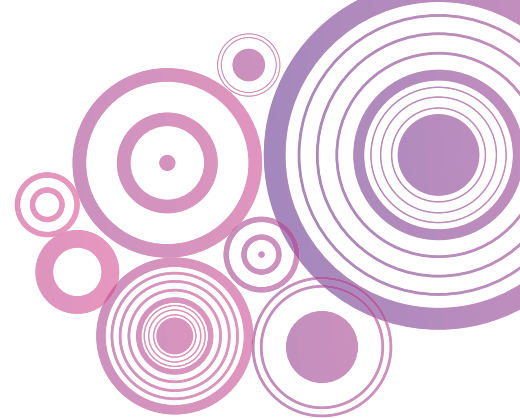


Column: HECTOR-M C4  
 Dimension: 150 x 4.6 mm  
 Mobile phase: MeOH/H:O =80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
           2. Ethylbenzene  
           3. N-Propylbenzene  
           4. N-Butylbenze  
           5. N-Amylbenzene

### Product List

#### HECTOR-M C4

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C4-M31000521	C4-M31000530	C4-M31000539	C4-M31000546	C4-M310005100	-
	70	C4-M31000721	C4-M31000730	C4-M31000739	C4-M31000746	C4-M310007100	-
	100	C4-M31001021	C4-M31001030	C4-M31001039	C4-M31001046	C4-M310010100	-
	150	C4-M31001521	C4-M31001530	C4-M31001539	C4-M31001546	C4-M310015100	-
	250	C4-M31002521	C4-M31002530	C4-M31002539	C4-M31002546	C4-M310025100	-
5	50	C4-M51000521	C4-M51000530	C4-M51000539	C4-M51000546	C4-M510005100	C4-M510005200
	70	C4-M51000721	C4-M51000730	C4-M51000739	C4-M51000746	C4-M510007100	C4-M510007200
	100	C4-M51001521	C4-M51001530	C4-M51001539	C4-M51001546	C4-M510015100	C4-M510015200
	150	C4-M51001521	C4-M51001530	C4-M51001539	C4-M51001546	C4-M510015100	C4-M510015200
	250	C4-M51002521	C4-M51002530	C4-M51002539	C4-M51002546	C4-M510025100	C4-M510025200
10	100	-	-	-	C4-M101001046	C4-M1010010100	C4-M1010010200
	150	-	-	-	C4-M101001546	C4-M1010015100	C4-M1010015200
	250	-	-	-	C4-M101002546	C4-M1010025100	C4-M1010025200

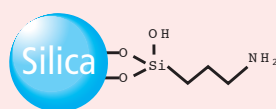


## D) HECTOR-M NH2

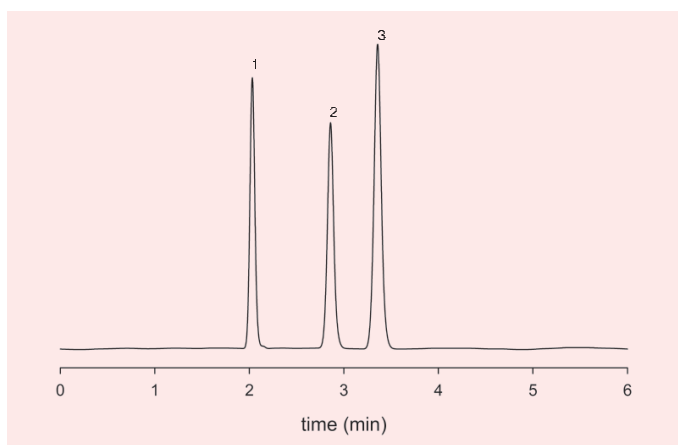
The NH<sub>2</sub>-modified stationary phase can be used in the HILIC, IEC, and NP modes. The HILIC mode is for the separation of polar compounds, such as carbohydrates. In the IEC mode, the NH<sub>2</sub> phase works as a weak anion exchanger in aqueous buffers at a low pH. In the NP mode, it is useful for separating basic compounds because the plus charge of the surface prevents ionic interaction with basic compounds.

### Specification

- Particle size: 3, 5, 10 µm
- Pore size: 100 Å
- Carbon contents: about 4 %
- Usable pH range: 2-8



### Standard chromatogram

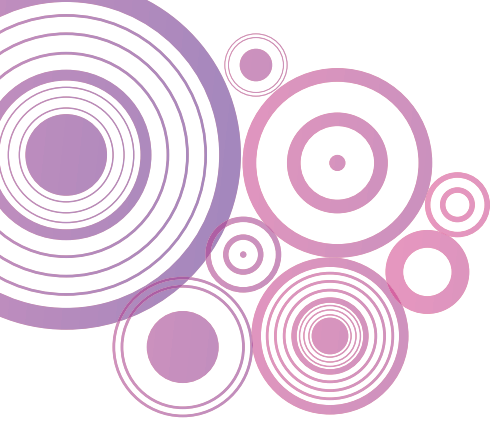


Column: HECTOR-M NH<sub>2</sub>  
 Dimension: 150 x 4.6 mm  
 Mobile phase: Heptane/Ethyl acetate =90/10  
 Temperature: 25 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Ethylbenzene  
           2. 2-Chloro-6-nitrotoluene  
           3. Nitrobenzene

## Product List

### HECTOR-M NH2

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	NH2-M31000521	NH2-M31000530	NH2-M31000539	NH2-M31000546	NH2-M310005100	-
	70	NH2-M31000721	NH2-M31000730	NH2-M31000739	NH2-M31000746	NH2-M310007100	-
	100	NH2-M31001021	NH2-M31001030	NH2-M31001039	NH2-M31001046	NH2-M310010100	-
	150	NH2-M31001521	NH2-M31001530	NH2-M31001539	NH2-M31001546	NH2-M310015100	-
	250	NH2-M31002521	NH2-M31002530	NH2-M31002539	NH2-M31002546	NH2-M310025100	-
5	50	NH2-M51000521	NH2-M51000530	NH2-M51000539	NH2-M51000546	NH2-M510005100	NH2-M510005200
	70	NH2-M51000721	NH2-M51000730	NH2-M51000739	NH2-M51000746	NH2-M510007100	NH2-M510007200
	100	NH2-M51001521	NH2-M51001530	NH2-M51001539	NH2-M51001546	NH2-M510015100	NH2-M510015200
	150	NH2-M51001521	NH2-M51001530	NH2-M51001539	NH2-M51001546	NH2-M510015100	NH2-M510015200
	250	NH2-M51002521	NH2-M51002530	NH2-M51002539	NH2-M51002546	NH2-M510025100	NH2-M510025200
10	100	-	-	-	NH2-M101001046	NH2-M1010010100	NH2-M1010010200
	150	-	-	-	NH2-M101001546	NH2-M1010015100	NH2-M1010015200
	250	-	-	-	NH2-M101002546	NH2-M1010025100	NH2-M1010025200

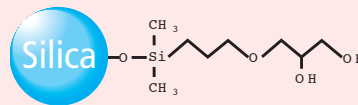


## F) HECTOR-M Diol

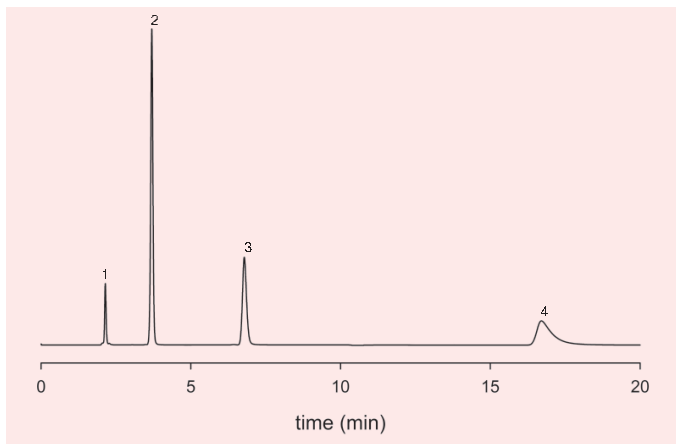
The diol-modified normal phase has a neutral hydroxyl group and is thus a more versatile alternative to silica. The hydrogen bonding on the diol layer is not as strong as with that on silanol on a bare silica surface, and shows improved reproducibility. The diol matrix is very easy wettable and is appropriate for the separation of neutral, acidic, and basic compounds.

### Specification

- Particle size: 3,5,10 µm
- Pore size: 100 Å
- Carbon contents: about 4 %
- Usable pH range: 2-8



### Standard chromatogram

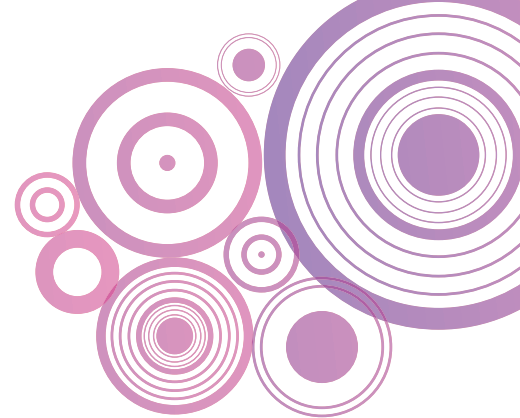


Column: HECTOR-M Diol  
 Dimension: 150 x 4.6 mm  
 Mobile phase: MeOH/Hexane = 1/99  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Benzene  
 2. Dibutyl phthalate  
 3. Phenol  
 4. Pyridine

## Product List

### HECTOR-M Diol

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	Diol-M31000521	Diol-M31000530	Diol-M31000539	Diol-M31000546	Diol-M310005100	-
	70	Diol-M31000721	Diol-M31000730	Diol-M31000739	Diol-M31000746	Diol-M310007100	-
	100	Diol-M31001021	Diol-M31001030	Diol-M31001039	Diol-M31001046	Diol-M310010100	-
	150	Diol-M31001521	Diol-M31001530	Diol-M31001539	Diol-M31001546	Diol-M310015100	-
	250	Diol-M31002521	Diol-M31002530	Diol-M31002539	Diol-M31002546	Diol-M310025100	-
5	50	Diol-M51000521	Diol-M51000530	Diol-M51000539	Diol-M51000546	Diol-M510005100	Diol-M510005200
	70	Diol-M51000721	Diol-M51000730	Diol-M51000739	Diol-M51000746	Diol-M510007100	Diol-M510007200
	100	Diol-M51001021	Diol-M51001030	Diol-M51001039	Diol-M51001046	Diol-M510010100	Diol-M510010200
	150	Diol-M51001521	Diol-M51001530	Diol-M51001539	Diol-M51001546	Diol-M510015100	Diol-M510015200
	250	Diol-M51002521	Diol-M51002530	Diol-M51002539	Diol-M51002546	Diol-M510025100	Diol-M510025200
10	100	-	-	-	Diol-M101001046	Diol-M1010010100	Diol-M1010010200
	150	-	-	-	Diol-M101001546	Diol-M1010015100	Diol-M1010015200
	250	-	-	-	Diol-M101002546	Diol-M1010025100	Diol-M1010025200

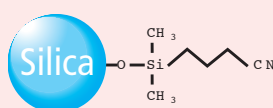


### G) HECTOR-M CN

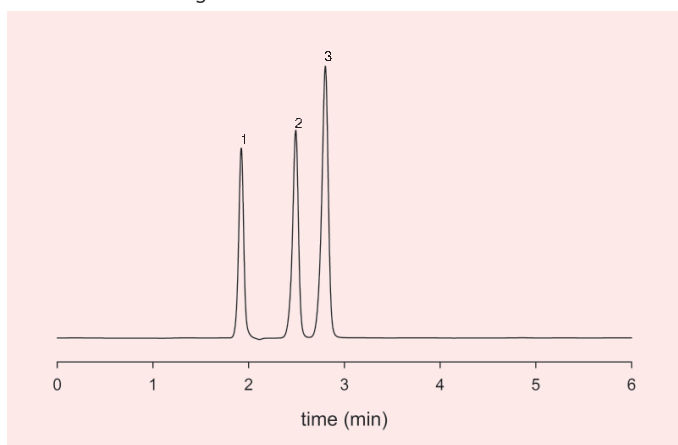
The Nitril-bonded phase is the most polar and the least retentive RP mode. In the case of the RP mode, the CN-modified phase is for the separation of extremely hydrophobic compounds. In the case of the NP mode, the CN-modified phase shows more uniform surface activity and often increased resistance to possible dissolution compared to bare silica.

#### Specification

- Particle size: 3,5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 6-7 %
- Usable pH range: 2-8



#### Standard chromatogram

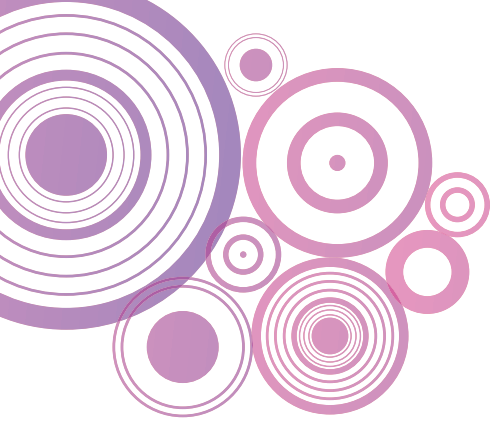


Column: HECTOR-M CN  
 Dimension: 150 x 4.6 mm  
 Mobile phase: Heptane/Ethyl acetate =90/10  
 Temperature: 25 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Ethylbenzene  
           2. 2-Chloro-6-nitrotoluene  
           3. Nitrobenzene

### Product List

#### HECTOR-M CN

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	CN-M31000521	CN-M31000530	CN-M31000539	CN-M31000546	CN-M310005100	-
	70	CN-M31000721	CN-M31000730	CN-M31000739	CN-M31000746	CN-M310007100	-
	100	CN-M31001021	CN-M31001030	CN-M31001039	CN-M31001046	CN-M310010100	-
	150	CN-M31001521	CN-M31001530	CN-M31001539	CN-M31001546	CN-M310015100	-
	250	CN-M31002521	CN-M31002530	CN-M31002539	CN-M31002546	CN-M310025100	-
5	50	CN-M51000521	CN-M51000530	CN-M51000539	CN-M51000546	CN-M510005100	CN-M510005200
	70	CN-M51000721	CN-M51000730	CN-M51000739	CN-M51000746	CN-M510007100	CN-M510007200
	100	CN-M51001521	CN-M51001530	CN-M51001539	CN-M51001546	CN-M510010100	CN-M510010200
	150	CN-M51001521	CN-M51001530	CN-M51001539	CN-M51001546	CN-M510015100	CN-M510015200
	250	CN-M51002521	CN-M51002530	CN-M51002539	CN-M51002546	CN-M510025100	CN-M510025200
10	100	-	-	-	CN-M101001046	CN-M1010010100	CN-M1010010200
	150	-	-	-	CN-M101001546	CN-M1010015100	CN-M1010015200
	250	-	-	-	CN-M101002546	CN-M1010025100	CN-M1010025200

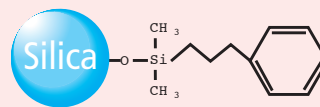


## H) HECTOR-M Phenyl

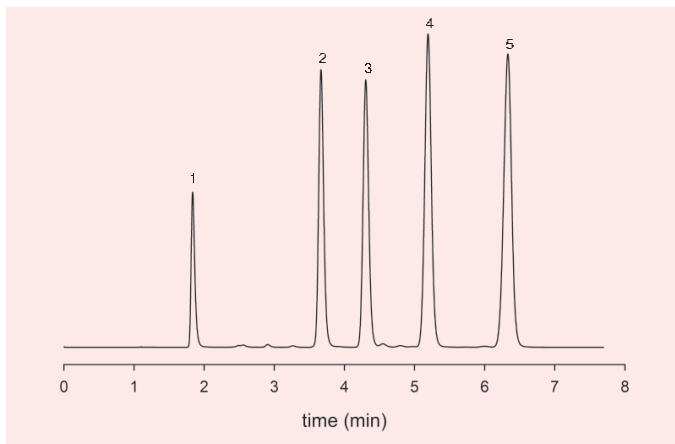
The phenyl-modified stationary phase has  $\pi$ -electrons. The hydrophobic and  $\pi$ - $\pi$  interactions between the stationary phase and the solute show unique separation characteristics compared with the alkyl-bonding stationary phases, such as C18, C8, and C4.

### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 10 %
- Usable pH range: 2-8



### Standard chromatogram



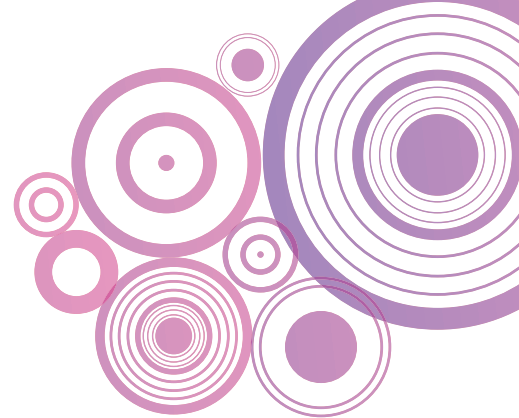
Column: HECTOR-M Phenyl  
 Dimension: 150 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O = 80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
 2. Ethylbenzene  
 3. N-Propylbenzene  
 4. N-Butylbenzene  
 5. N-Amylbenzene

## Product List

### HECTOR-M Phenyl

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	PN-M31000521	PN-M31000530	PN-M31000539	PN-M31000546	PN-M310005100	-
	70	PN-M31000721	PN-M31000730	PN-M31000739	PN-M31000746	PN-M310007100	-
	100	PN-M31001021	PN-M31001030	PN-M31001039	PN-M31001046	PN-M310010100	-
	150	PN-M31001521	PN-M31001530	PN-M31001539	PN-M31001546	PN-M310015100	-
	250	PN-M31002521	PN-M31002530	PN-M31002539	PN-M31002546	PN-M310025100	-
5	50	PN-M51000521	PN-M51000530	PN-M51000539	PN-M51000546	PN-M510005100	PN-M510005200
	70	PN-M51000721	PN-M51000730	PN-M51000739	PN-M51000746	PN-M510007100	PN-M510007200
	100	PN-M51001521	PN-M51001530	PN-M51001539	PN-M51001546	PN-M510010100	PN-M510010200
	150	PN-M51001521	PN-M51001530	PN-M51001539	PN-M51001546	PN-M510015100	PN-M510015200
	250	PN-M51002521	PN-M51002530	PN-M51002539	PN-M51002546	PN-M510025100	PN-M510025200
10	100	-	-	-	PN-M101001046	PN-M1010010100	PN-M1010010200
	150	-	-	-	PN-M101001546	PN-M1010015100	PN-M1010015200
	250	-	-	-	PN-M101002546	PN-M1010025100	PN-M1010025200





## I) HECTOR-M Sil

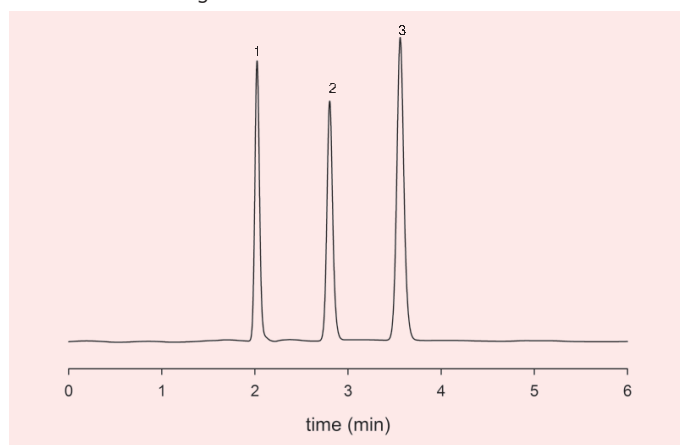
Sil stationary phase is widely used in normal phase separation. Especially, separation of position isomer and lipid-soluble compounds is effective. HECTOR-M Sil is produced by high purity silica (99.99 % purity) and enhanced mechanical strength.

### Specification

- Particle size: 3,5,10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Usable pH range: 2-8



### Standard chromatogram



Column: HECTOR-M Sil  
 Dimension: 150 x 4.6 mm  
 Mobile phase: Heptane/Ethyl acetate =90/10  
 Temperature: 25 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Ethylbenzene  
           2. 2-Chloro-6-nitrotoluene  
           3. Nitrobenzene

## Product List

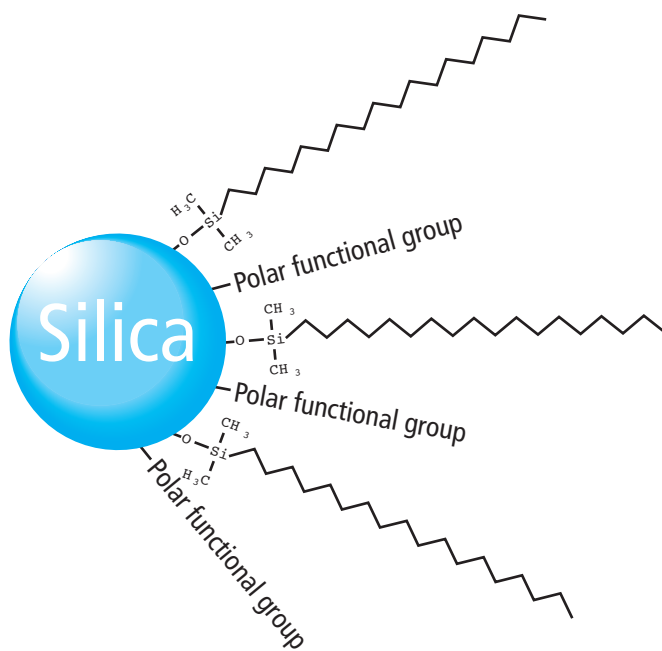
### HECTOR-M Sil

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	Sil-M31000521	Sil-M31000530	Sil-M31000539	Sil-M31000546	Sil-M310005100	-
	70	Sil-M31000721	Sil-M31000730	Sil-M31000739	Sil-M31000746	Sil-M310007100	-
	100	Sil-M31001021	Sil-M31001030	Sil-M31001039	Sil-M31001046	Sil-M310010100	-
	150	Sil-M31001521	Sil-M31001530	Sil-M31001539	Sil-M31001546	Sil-M310015100	-
	250	Sil-M31002521	Sil-M31002530	Sil-M31002539	Sil-M31002546	Sil-M310025100	-
5	50	Sil-M51000521	Sil-M51000530	Sil-M51000539	Sil-M51000546	Sil-M510005100	Sil-M510005200
	70	Sil-M51000721	Sil-M51000730	Sil-M51000739	Sil-M51000746	Sil-M510007100	Sil-M510007200
	100	Sil-M51001521	Sil-M51001530	Sil-M51001539	Sil-M51001546	Sil-M510010100	Sil-M510010200
	150	Sil-M51001521	Sil-M51001530	Sil-M51001539	Sil-M51001546	Sil-M510015100	Sil-M510015200
	250	Sil-M51002521	Sil-M51002530	Sil-M51002539	Sil-M51002546	Sil-M510025100	Sil-M510025200
10	100	-	-	-	Sil-M101001046	Sil-M1010010100	Sil-M1010010200
	150	-	-	-	Sil-M101001546	Sil-M1010015100	Sil-M1010015200
	250	-	-	-	Sil-M101002546	Sil-M1010025100	Sil-M1010025200

## III. HECTOR-A

### 3-1) Introduction

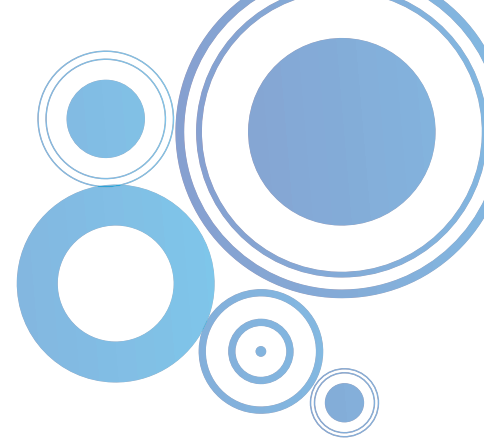
HECTOR-A's packing surface allows the use of 100 % water as an eluent, enabling good solvation between the mobile and hydrophilic surfaces. The HECTOR-A phases can be used for the separation of hydrophobic compounds without a phenomenon commonly known as "phase collapse". HECTOR-A packing introduces high-purity  $\text{SiO}_2 > 99.99\%$ , which points to a total metal content of  $< 100$  ppm. As such, it provides a good peak shape and reproducibility.



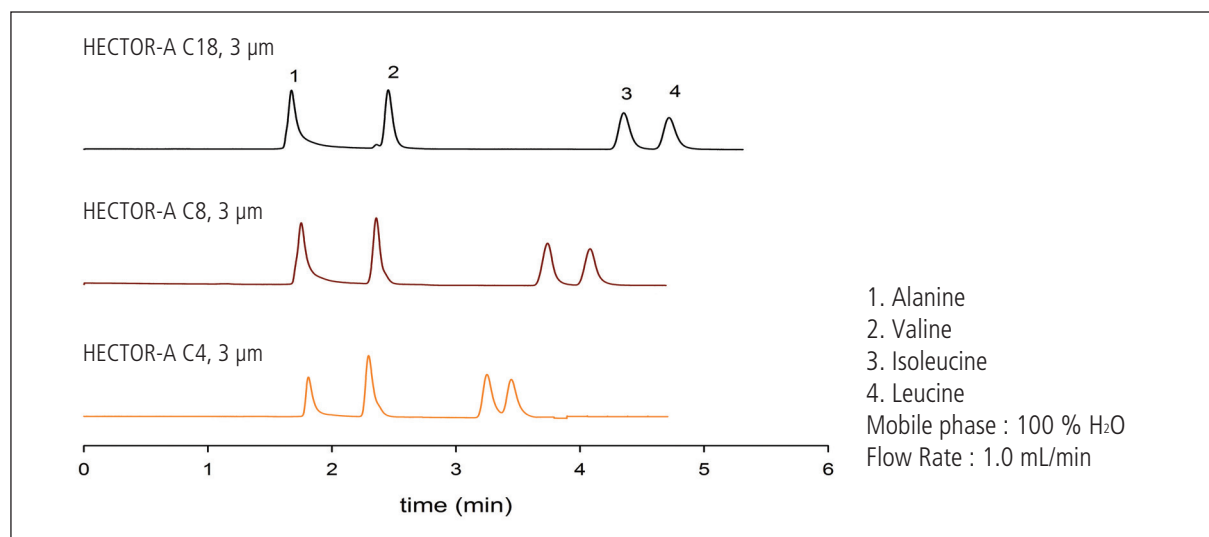
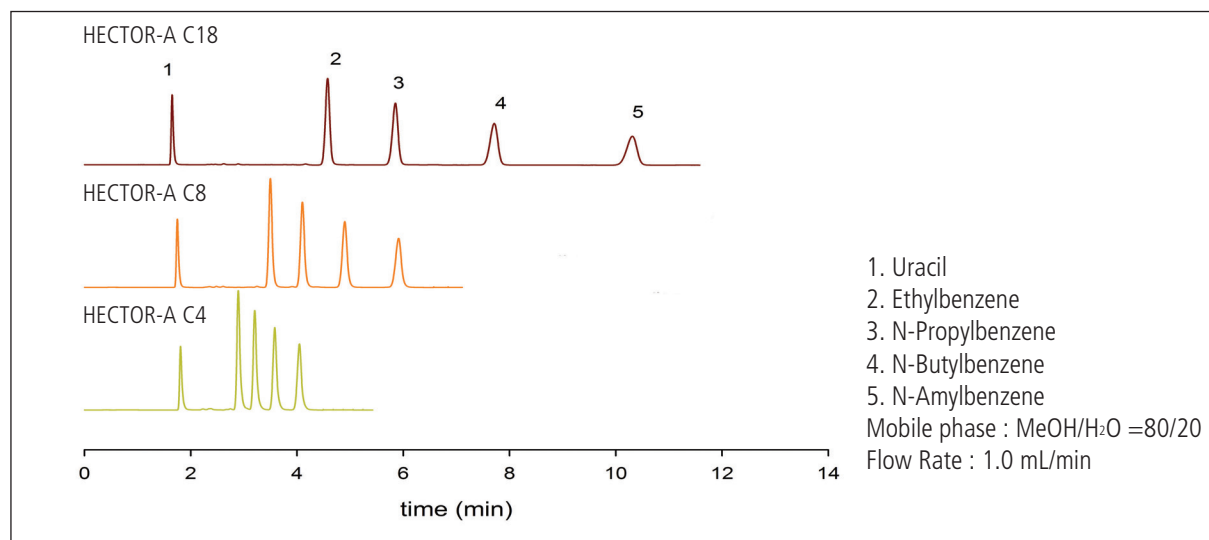
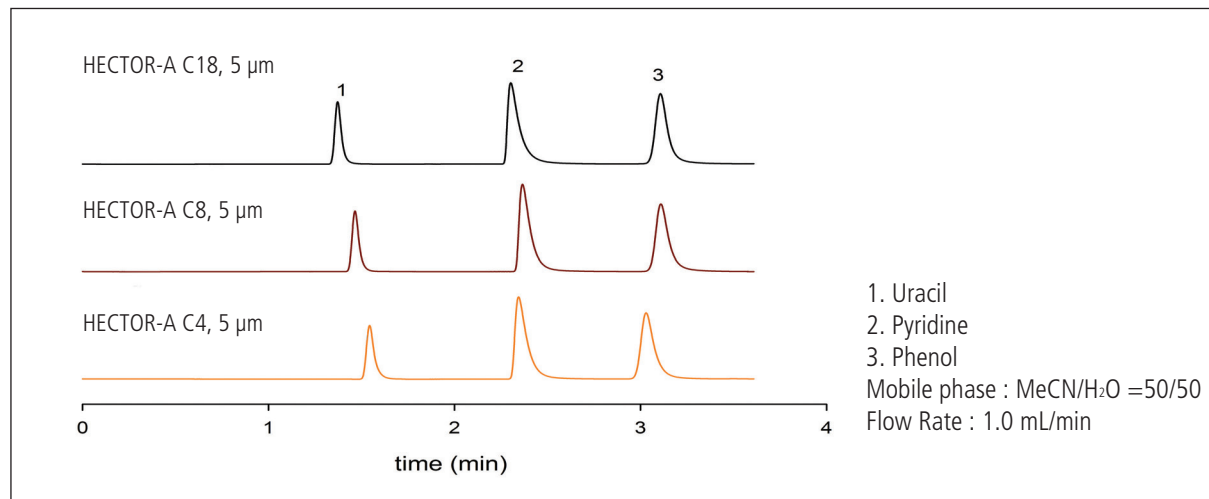
### 3-2) Advantages

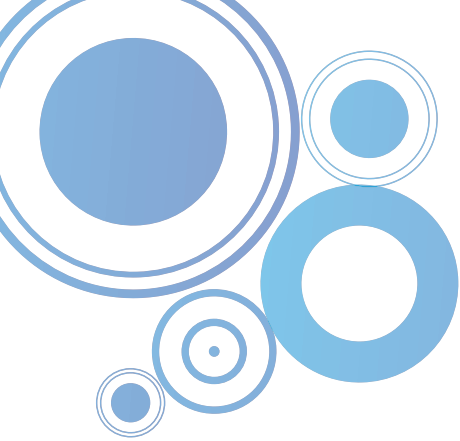
- Designed for separating hydrophilic and polar compounds
- Good stability in 100 % aqueous mobile phases
- Rapid equilibration
- Unique reversed-phase selectivity





### 3-3) Column Character





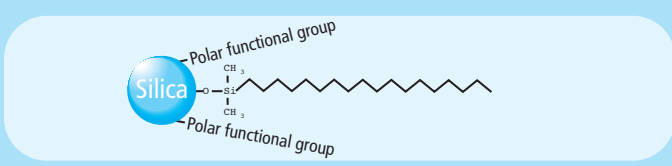
### 3-4) Product details

#### A) HECTOR-A C18

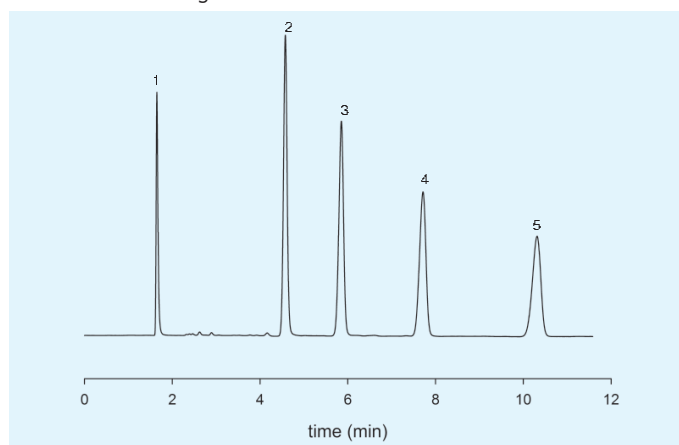
The HECTOR-A C18 phase shows similar selectivity as the conventional C18 phases when used for the separation of hydrophobic compounds with typical reversed-phase mobile phases. It is thus suitable for use as a unique universal C18 column.

##### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 12-13 %
- Usable pH range: 2-8



##### Standard chromatogram

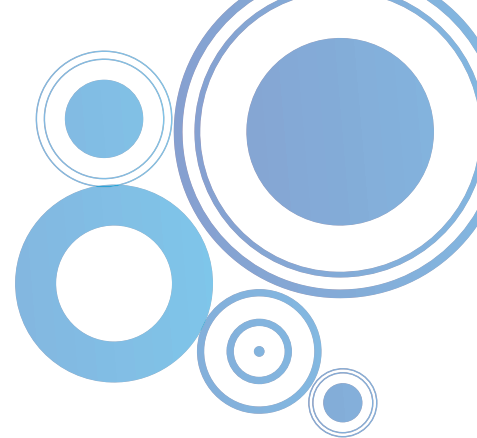


Dimension: 250 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O = 80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
 2. Ethylbenzene  
 3. N-Propylbenzene  
 4. N-Butylbenzene  
 5. N-Amylbenzene

#### Product List

##### HECTOR-A C18

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-A31000521	C18-A31000530	C18-A31000539	C18-A31000546	C18-A310005100	-
	70	C18-A31000721	C18-A31000730	C18-A31000739	C18-A31000746	C18-A310007100	-
	100	C18-A31001021	C18-A31001030	C18-A31001039	C18-A31001046	C18-A310010100	-
	150	C18-A31001521	C18-A31001530	C18-A31001539	C18-A31001546	C18-A310015100	-
	250	C18-A31002521	C18-A31002530	C18-A31002539	C18-A31002546	C18-A310025100	-
5	50	C18-A51000521	C18-A51000530	C18-A51000539	C18-A51000546	C18-A510005100	C18-A510005200
	70	C18-A51000721	C18-A51000730	C18-A51000739	C18-A51000746	C18-A510007100	C18-A510007200
	100	C18-A51001521	C18-A51001530	C18-A51001539	C18-A51001546	C18-A510010100	C18-A510010200
	150	C18-A51001521	C18-A51001530	C18-A51001539	C18-A51001546	C18-A510015100	C18-A510015200
	250	C18-A51002521	C18-A51002530	C18-A51002539	C18-A51002546	C18-A510025100	C18-A510025200
10	100	-	-	-	C18-A101001046	C18-A1010010100	C18-A1010010200
	150	-	-	-	C18-A101001546	C18-A1010015100	C18-A1010015200
	250	-	-	-	C18-A101002546	C18-A1010025100	C18-A1010025200

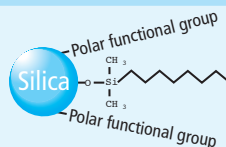


## B) HECTOR-A C8

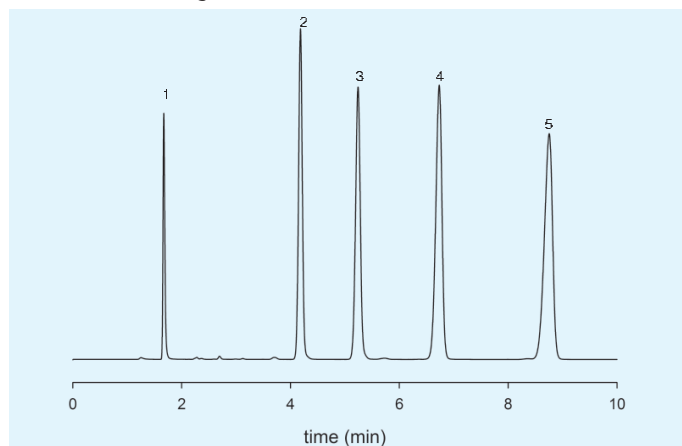
Besides C18, universal C8 is the material of choice for investigation. HECTOR-A C8 offers a “hydrophilic” alternative for the regular C8 material.

### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 8 %
- Usable pH range: 2-8



### Standard chromatogram



Dimension: 250 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O = 80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
           2. Ethylbenzene  
           3. N-Propylbenzene  
           4. N-Butylbenzene  
           5. N-Amylbenzene

## Product List

### HECTOR-A C8

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-A31000521	C8-A31000530	C8-A31000539	C8-A31000546	C8-A310005100	-
	70	C8-A31000721	C8-A31000730	C8-A31000739	C8-A31000746	C8-A310007100	-
	100	C8-A31001021	C8-A31001030	C8-A31001039	C8-A31001046	C8-A310010100	-
	150	C8-A31001521	C8-A31001530	C8-A31001539	C8-A31001546	C8-A310015100	-
	250	C8-A31002521	C8-A31002530	C8-A31002539	C8-A31002546	C8-A310025100	-
5	50	C8-A51000521	C8-A51000530	C8-A51000539	C8-A51000546	C8-A510005100	C8-A510005200
	70	C8-A51000721	C8-A51000730	C8-A51000739	C8-A51000746	C8-A510007100	C8-A510007200
	100	C8-A51001521	C8-A51001530	C8-A51001539	C8-A51001546	C8-A510010100	C8-A510010200
	150	C8-A51001521	C8-A51001530	C8-A51001539	C8-A51001546	C8-A510015100	C8-A510015200
	250	C8-A51002521	C8-A51002530	C8-A51002539	C8-A51002546	C8-A510025100	C8-A510025200
10	100	-	-	-	C8-A101001046	C8-A1010010100	C8-A1010010200
	150	-	-	-	C8-A101001546	C8-A1010015100	C8-A1010015200
	250	-	-	-	C8-A101002546	C8-A1010025100	C8-A1010025200

## IV. HECTOR-T

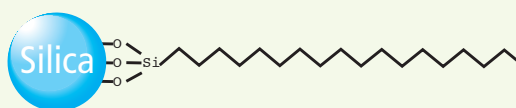
### HECTOR-T C18

The HECTOR-T C18 phase shows similar selectivity as the conventional C18 phases when used for the separation of hydrophobic compounds with typical reversed-phase mobile phases, but it has a fast analysis time. The HECTOR-T phase is available in trifunctional silica form. If the pH will be adjusted to acid values, it will be critical to use trifunctional silica to prevent the hydrolysis of the hydrocarbon group from the surface of HECTOR-T packings. This phase extends the stability, robustness, and reproducibility.

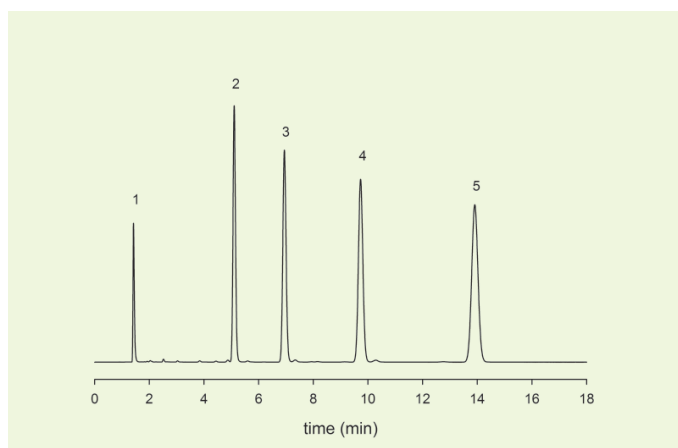
- Excellent robustness
- Extended column life time
- High reproducibility
- High efficiency
- Reduce analysis time

#### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 19 %
- Usable pH range: 2-9



#### Standard chromatogram

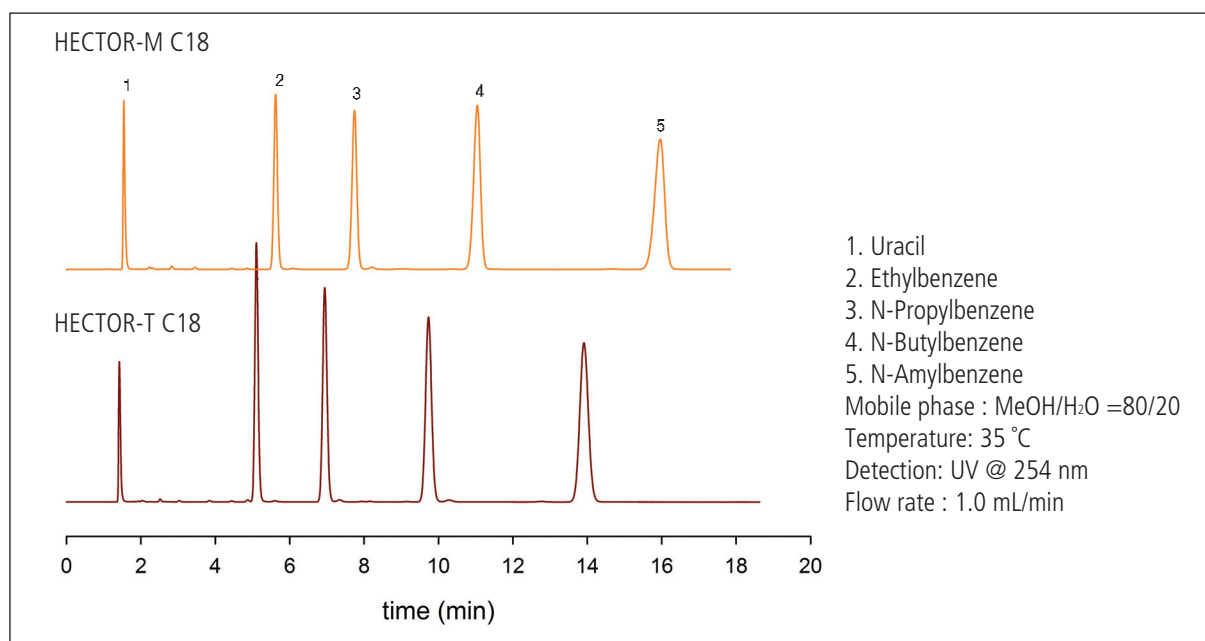


1. Uracil
  2. Ethylbenzene
  3. N-Propylbenzene
  4. N-Butylbenzene
  5. N-Amylbenzene
- Mobile phase : MeOH/H<sub>2</sub>O = 80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow Rate : 1.0 mL/min





Compared with HECTOR-M, it has a shorter retention factor and a brilliant stability even at a high pH. Its retention factor varies according to the length and chemistry of its alkyl chain. If the alkyl chain is identical, however, its retention factor will vary according to the bonding type.



### Product List

#### HECTOR-T C18

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-T31000521	C18-T31000530	C18-T31000539	C18-T31000546	C18-T310005100	-
	70	C18-T31000721	C18-T31000730	C18-T31000739	C18-T31000746	C18-T310007100	-
	100	C18-T31001021	C18-T31001030	C18-T31001039	C18-T31001046	C18-T310010100	-
	150	C18-T31001521	C18-T31001530	C18-T31001539	C18-T31001546	C18-T310015100	-
	250	C18-T31002521	C18-T31002530	C18-T31002539	C18-T31002546	C18-T310025100	-
5	50	C18-T51000521	C18-T51000530	C18-T51000539	C18-T51000546	C18-T510005100	C18-T510005200
	70	C18-T51000721	C18-T51000730	C18-T51000739	C18-T51000746	C18-T510007100	C18-T510007200
	100	C18-T51001521	C18-T51001530	C18-T51001539	C18-T51001546	C18-T510015100	C18-T510015200
	150	C18-T51001521	C18-T51001530	C18-T51001539	C18-T51001546	C18-T510015100	C18-T510015200
	250	C18-T51002521	C18-T51002530	C18-T51002539	C18-T51002546	C18-T510025100	C18-T510025200
10	100	-	-	-	C18-T101001046	C18-T1010010100	C18-T1010010200
	150	-	-	-	C18-T101001546	C18-T1010015100	C18-T1010015200
	250	-	-	-	C18-T101002546	C18-T1010025100	C18-T1010025200

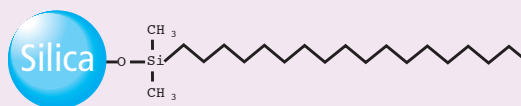
## V. HECTOR-W

### A) HECTOR-W C18

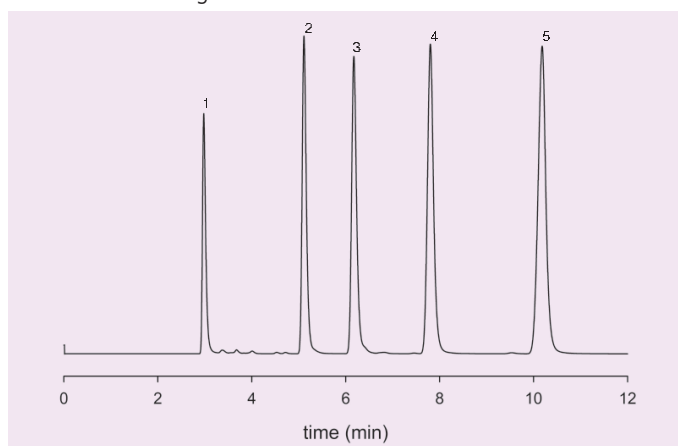
HECTOR-W is designed for the separation of biological compounds, such as proteins, peptides, nucleotides, and oligosaccharides. The HECTOR-W pore size affects analysis and provides high efficiency and a good peak shape. It is produced with the use of high-purity silica and is fully end-capped. It is available in 3, 5, and 10  $\mu\text{m}$  particle sizes and in various column sizes. The advanced total end-capping system that is used in its production makes this material excellent for analyzing basic substances and some metal complexes, where any trace of residual silanol sites will cause peak tailing.

#### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 300 Å
- Carbon contents: about 7 %
- Usable pH range: 2-8



#### Standard chromatogram



Dimension: 250 x 4.6 mm  
 Mobile phase: MeOH/H<sub>2</sub>O = 80/20  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. Uracil  
 2. Ethylbenzene  
 3. N-Propylbenzene  
 4. N-Butylbenzene  
 5. N-Amylbenzene

### Product List

#### HECTOR-W C18

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-W33000521	C18-W33000530	C18-W33000539	C18-W33000546	C18-W330005100	-
	70	C18-W33000721	C18-W33000730	C18-W33000739	C18-W33000746	C18-W330007100	-
	100	C18-W33001021	C18-W33001030	C18-W33001039	C18-W33001046	C18-W330010100	-
	150	C18-W33001521	C18-W33001530	C18-W33001539	C18-W33001546	C18-W330015100	-
	250	C18-W33002521	C18-W33002530	C18-W33002539	C18-W33002546	C18-W330025100	-
5	50	C18-W53000521	C18-W53000530	C18-W53000539	C18-W53000546	C18-W530005100	C18-W530005200
	70	C18-W53000721	C18-W53000730	C18-W53000739	C18-W53000746	C18-W530007100	C18-W530007200
	100	C18-W53001521	C18-W53001530	C18-W53001539	C18-W53001546	C18-W530010100	C18-W530010200
	150	C18-W53001521	C18-W53001530	C18-W53001539	C18-W53001546	C18-W530015100	C18-W530015200
	250	C18-W53002521	C18-W53002530	C18-W53002539	C18-W53002546	C18-W530025100	C18-W530025200
10	100	-	-	-	C18-W103001046	C18-W1030010100	C18-W1030010200
	150	-	-	-	C18-W103001546	C18-W1030015100	C18-W1030015200
	250	-	-	-	C18-W103002546	C18-W1030025100	C18-W1030025200



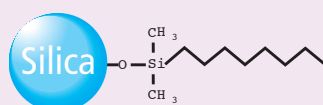


## B) HECTOR-W C8

As it contains highly hydrophobic compounds, HECTOR-W C8 is a good alternative to HECTOR-W C18 when less retention is desired.

### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 300  $\text{\AA}$
- Carbon contents: about 4 %
- Usable pH range: 2-8



### Product List

#### HECTOR-W C8

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-W 33000521	C8-W33000530	C8-W33000539	C8-W33000546	C8-W330005100	-
	70	C8-W 33000721	C8-W33000730	C8-W33000739	C8-W33000746	C8-W330007100	-
	100	C8-W 33001021	C8-W33001030	C8-W33001039	C8-W33001046	C8-W330010100	-
	150	C8-W 33001521	C8-W33001530	C8-W33001539	C8-W33001546	C8-W330015100	-
	250	C8-W 33002521	C8-W33002530	C8-W33002539	C8-W33002546	C8-W330025100	-
5	50	C8-W53000521	C8-W53000530	C8-W53000539	C8-W53000546	C8-W530005100	C8-W530005200
	70	C8-W53000721	C8-W53000730	C8-W53000739	C8-W53000746	C8-W530007100	C8-W530007200
	100	C8-W53001521	C8-W53001530	C8-W53001539	C8-W53001546	C8-W530010100	C8-W530010200
	150	C8-W53001521	C8-W53001530	C8-W53001539	C8-W53001546	C8-W530015100	C8-W530015200
	250	C8-W53002521	C8-W53002530	C8-W53002539	C8-W53002546	C8-W530025100	C8-W530025200
10	100	-	-	-	C8-W103001046	C8-W1030010100	C8-W1030010200
	150	-	-	-	C8-W103001546	C8-W1030015100	C8-W1030015200
	250	-	-	-	C8-W103002546	C8-W1030025100	C8-W1030025200

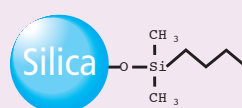


### C) HECTOR-W C4

As it contains highly hydrophobic compounds, HECTOR-W C4 is a good alternative to HECTOR-W C18 or C8 when less retention is desired.

#### Specification

- Particle size: 3, 5, 10  $\mu\text{m}$
- Pore size: 300  $\text{\AA}$
- Carbon contents: about 3 %
- Usable pH range: 2-8



#### Product List

##### HECTOR-W C4

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C4-W33000521	C4-W33000530	C4-W33000539	C4-W33000546	C4-W330005100	-
	70	C4-W33000721	C4-W33000730	C4-W33000739	C4-W33000746	C4-W330007100	-
	100	C4-W33001021	C4-W33001030	C4-W33001039	C4-W33001046	C4-W330010100	-
	150	C4-W33001521	C4-W33001530	C4-W33001539	C4-W33001546	C4-W330015100	-
	250	C4-W33002521	C4-W33002530	C4-W33002539	C4-W33002546	C4-W330025100	-
5	50	C4-W53000521	C4-W53000530	C4-W53000539	C4-W53000546	C4-W530005100	C4-W530005200
	70	C4-W53000721	C4-W53000730	C4-W53000739	C4-W53000746	C4-W530007100	C4-W530007200
	100	C4-W53001521	C4-W53001530	C4-W53001539	C4-W53001546	C4-W530010100	C4-W530010200
	150	C4-W53001521	C4-W53001530	C4-W53001539	C4-W53001546	C4-W530015100	C4-W530015200
	250	C4-W53002521	C4-W53002530	C4-W53002539	C4-W53002546	C4-W530025100	C4-W530025200
10	100	-	-	-	C4-W103001046	C4-W1030010100	C4-W1030010200
	150	-	-	-	C4-W103001546	C4-W1030015100	C4-W1030015200
	250	-	-	-	C4-W103002546	C4-W1030025100	C4-W1030025200

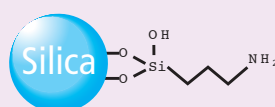


## D) HECTOR-W NH2

The NH<sub>2</sub> phase is for reversed- or normal-phase separation. It is excellent for the reversed-phase analysis of sugars, sugar alcohols, and anionic compounds, or for hydrogen-bonding compounds, under normal-phase conditions.

### Specification

- Particle size: 3, 5, 10 µm
- Pore size: 300 Å
- Carbon contents: about 3 %
- Usable pH range: 2-8



### Product List

#### HECTOR-W NH2

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	NH2-W33000521	NH2-W 33000530	NH2-W 33000539	NH2-W 33000546	NH2-W 330005100	-
	70	NH2-W33000721	NH2-W 33000730	NH2-W 33000739	NH2-W 33000746	NH2-W 330007100	-
	100	NH2-W33001021	NH2-W 33001030	NH2-W 33001039	NH2-W 33001046	NH2-W 330010100	-
	150	NH2-W33001521	NH2-W 33001530	NH2-W 33001539	NH2-W 33001546	NH2-W 330015100	-
	250	NH2-W33002521	NH2-W 33002530	NH2-W 33002539	NH2-W 33002546	NH2-W 330025100	-
5	50	NH2-W53000521	NH2-W53000530	NH2-W53000539	NH2-W53000546	NH2-W530005100	NH2-W530005200
	70	NH2-W53000721	NH2-W53000730	NH2-W53000739	NH2-W53000746	NH2-W530007100	NH2-W530007200
	100	NH2-W53001521	NH2-W53001530	NH2-W53001539	NH2-W53001546	NH2-W530015100	NH2-W530015200
	150	NH2-W53001521	NH2-W53001530	NH2-W53001539	NH2-W53001546	NH2-W530015100	NH2-W530015200
	250	NH2-W53002521	NH2-W53002530	NH2-W53002539	NH2-W53002546	NH2-W530025100	NH2-W530025200
10	100	-	-	-	NH2-W103001046	NH2-W1030010100	NH2-W1030010200
	150	-	-	-	NH2-W103001546	NH2-W1030015100	NH2-W1030015200
	250	-	-	-	NH2-W103002546	NH2-W1030025100	NH2-W1030025200

## VI. HECTOR-ACD

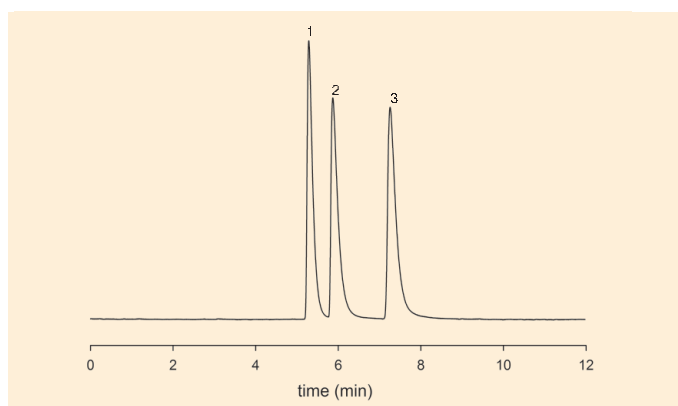
Liquid chromatography has been widely used for the purification of organic compounds. Especially, normal-phase chromatography using nonpolar solvents such as hexane and ethyl acetate has been applied due to the high solubility of its compounds and as it can be easily handled after treatment. There is separation difficulty with silica gel, however, depending on the characteristics of the compounds. Although adaptable media have been developed for compounds that have separation difficulty, there are no proper media for separating acid compounds with the carboxyl group, etc. HECTOR-ACD supplies a superior separation method for acidic compounds by introducing COOH and SO<sub>3</sub>H bonds on the silica surface (patent applied). This acid silica has been placed on the market for the separation of problematic compounds.

### Normal-phase silica grades

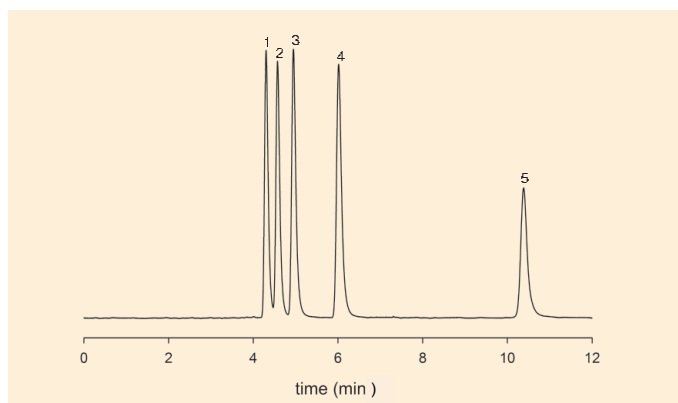
In the case of the normal-phase separation of organic compounds, it is necessary to select the proper media based on their characteristics. Neutral compounds are well separated by the contemporary silica gel. NH<sub>2</sub> and Diol silica are used for the separation of basic compounds. Additionally, "ACD silica" can be applied to acid compounds.

COOH silica: For the separation of ordinary acid compounds, but cannot be used for the separation of strong acid compounds

SO<sub>3</sub>H silica: For the separation of strong acid compounds. Please pay attention to the decomposition of the compounds due to the strong acid characteristics.



Column: HECTOR-ACD WCX  
 Dimension: 250 x 4.6 mm  
 Mobile phase: IPA/Hexane =5/95  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. o-Toluic acid  
 2. Benzoic acid  
 3. trans-Cinnamic acid



Column: HECTOR-ACD SCX  
 Dimension: 250 x 4.6 mm  
 Mobile phase: IPA/Hexane =5/95  
 Temperature: 35 °C  
 Detection: UV @ 254 nm  
 Flow rate: 1 mL/min  
 Sample: 1. o-Toluic acid  
 2. Benzoic acid  
 3. trans-Cinnamic acid  
 4. Salicylic acid  
 5. Phthalic acid

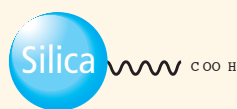


### A) HECTOR-ACD WCX (Weak Cation Exchange type)

To separate acidic compounds using normal-phase bare silica gel, the addition of acid to the solution is necessary. There is no problem with the use of a pH buffer as an agent in the case of analytical separation, but when performing preparative separation, the pH-buffering agent must be removed later in the process. As HECTOR-ACD WCX with an "immobilized-acid functional group" works just as well as a buffer, however, there is no need to add a TFA buffer.

#### Specification

- Particle size: 5  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 6-7 %
- Usable pH range: 2-8



### Product List

#### HECTOR-ACD WCX

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	WCX-31000521	WCX-31000530	WCX-31000539	WCX-31000546	WCX-310005100	-
	70	WCX-31000721	WCX-31000730	WCX-31000739	WCX-31000746	WCX-310007100	-
	100	WCX-31001021	WCX-31001030	WCX-31001039	WCX-31001046	WCX-310010100	-
	150	WCX-31001521	WCX-31001530	WCX-31001539	WCX-31001546	WCX-310015100	-
	250	WCX-31002521	WCX-31002530	WCX-31002539	WCX-31002546	WCX-310025100	-
5	50	WCX-51000521	WCX-51000530	WCX-51000539	WCX-51000546	WCX-510005100	WCX-510005200
	70	WCX-51000721	WCX-51000730	WCX-51000739	WCX-51000746	WCX-510007100	WCX-510007200
	100	WCX-51001521	WCX-51001530	WCX-51001539	WCX-51001546	WCX-510015100	WCX-510015200
	150	WCX-51001521	WCX-51001530	WCX-51001539	WCX-51001546	WCX-510015100	WCX-510015200
	250	WCX-51002521	WCX-51002530	WCX-51002539	WCX-51002546	WCX-510025100	WCX-510025200
10	100	-	-	-	WCX-101001046	WCX-1010010100	WCX-1010010200
	150	-	-	-	WCX-101001546	WCX-1010015100	WCX-1010015200
	250	-	-	-	WCX-101002546	WCX-1010025100	WCX-1010025200



## B) HECTOR-ACD SCX (Strong Cation Exchange type)

For the separation of strong acid compounds. Please pay attention to the decomposition of the compounds due to the strong acid characteristics.

### Specification

- Particle size: 5  $\mu\text{m}$
- Pore size: 100  $\text{\AA}$
- Carbon contents: about 5 %
- Usable pH range: 2-8



### Product List

#### HECTOR-ACD SCX

Particle size ( $\mu\text{m}$ )	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	SCX-31000521	SCX-31000530	SCX-31000539	SCX-31000546	SCX-310005100	-
	70	SCX-31000721	SCX-31000730	SCX-31000739	SCX-31000746	SCX-310007100	-
	100	SCX-31001021	SCX-31001030	SCX-31001039	SCX-31001046	SCX-310010100	-
	150	SCX-31001521	SCX-31001530	SCX-31001539	SCX-31001546	SCX-310015100	-
	250	SCX-31002521	SCX-31002530	SCX-31002539	SCX-31002546	SCX-310025100	-
5	50	SCX-51000521	SCX-51000530	SCX-51000539	SCX-51000546	SCX-510005100	SCX-510005200
	70	SCX-51000721	SCX-51000730	SCX-51000739	SCX-51000746	SCX-510007100	SCX-510007200
	100	SCX-51001521	SCX-51001530	SCX-51001539	SCX-51001546	SCX-510010100	SCX-510010200
	150	SCX-51001521	SCX-51001530	SCX-51001539	SCX-51001546	SCX-510015100	SCX-510015200
	250	SCX-51002521	SCX-51002530	SCX-51002539	SCX-51002546	SCX-510025100	SCX-510025200
10	100	-	-	-	SCX-101001046	SCX-1010010100	SCX-1010010200
	150	-	-	-	SCX-101001546	SCX-1010015100	SCX-1010015200
	250	-	-	-	SCX-101002546	SCX-1010025100	SCX-1010025200

# Total Product List

## HECTOR-M

### HECTOR-M C18

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-M31000521	C18-M31000530	C18-M31000539	C18-M31000546	C18-M310005100	-
	70	C18-M31000721	C18-M31000730	C18-M31000739	C18-M31000746	C18-M310007100	-
	100	C18-M31001021	C18-M31001030	C18-M31001039	C18-M31001046	C18-M310010100	-
	150	C18-M31001521	C18-M31001530	C18-M31001539	C18-M31001546	C18-M310015100	-
	250	C18-M31002521	C18-M31002530	C18-M31002539	C18-M31002546	C18-M310025100	-
5	50	C18-M51000521	C18-M51000530	C18-M51000539	C18-M51000546	C18-M510005100	C18-M510005200
	70	C18-M51000721	C18-M51000730	C18-M51000739	C18-M51000746	C18-M510007100	C18-M510007200
	100	C18-M51001521	C18-M51001530	C18-M51001539	C18-M51001546	C18-M510010100	C18-M510010200
	150	C18-M51001521	C18-M51001530	C18-M51001539	C18-M51001546	C18-M510015100	C18-M510015200
	250	C18-M51002521	C18-M51002530	C18-M51002539	C18-M51002546	C18-M510025100	C18-M510025200
10	100	-	-	-	C18-M101001046	C18-M1010010100	C18-M1010010200
	150	-	-	-	C18-M101001546	C18-M1010015100	C18-M1010015200
	250	-	-	-	C18-M101002546	C18-M1010025100	C18-M1010025200

### HECTOR-M C8

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-M31000521	C8-M31000530	C8-M31000539	C8-M31000546	C8-M310005100	-
	70	C8-M31000721	C8-M31000730	C8-M31000739	C8-M31000746	C8-M310007100	-
	100	C8-M31001021	C8-M31001030	C8-M31001039	C8-M31001046	C8-M310010100	-
	150	C8-M31001521	C8-M31001530	C8-M31001539	C8-M31001546	C8-M310015100	-
	250	C8-M31002521	C8-M31002530	C8-M31002539	C8-M31002546	C8-M310025100	-
5	50	C8-M51000521	C8-M51000530	C8-M51000539	C8-M51000546	C8-M510005100	C8-M510005200
	70	C8-M51000721	C8-M51000730	C8-M51000739	C8-M51000746	C8-M510007100	C8-M510007200
	100	C8-M51001521	C8-M51001530	C8-M51001539	C8-M51001546	C8-M510010100	C8-M510010200
	150	C8-M51001521	C8-M51001530	C8-M51001539	C8-M51001546	C8-M510015100	C8-M510015200
	250	C8-M51002521	C8-M51002530	C8-M51002539	C8-M51002546	C8-M510025100	C8-M510025200
10	100	-	-	-	C8-M101001046	C8-M1010010100	C8-M1010010200
	150	-	-	-	C8-M101001546	C8-M1010015100	C8-M1010015200
	250	-	-	-	C8-M101002546	C8-M1010025100	C8-M1010025200

## HECTOR-M C4

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C4-M31000521	C4-M31000530	C4-M31000539	C4-M31000546	C4-M310005100	-
	70	C4-M31000721	C4-M31000730	C4-M31000739	C4-M31000746	C4-M310007100	-
	100	C4-M31001021	C4-M31001030	C4-M31001039	C4-M31001046	C4-M310010100	-
	150	C4-M31001521	C4-M31001530	C4-M31001539	C4-M31001546	C4-M310015100	-
	250	C4-M31002521	C4-M31002530	C4-M31002539	C4-M31002546	C4-M310025100	-
5	50	C4-M51000521	C4-M51000530	C4-M51000539	C4-M51000546	C4-M510005100	C4-M510005200
	70	C4-M51000721	C4-M51000730	C4-M51000739	C4-M51000746	C4-M510007100	C4-M510007200
	100	C4-M51001521	C4-M51001530	C4-M51001539	C4-M51001546	C4-M510015100	C4-M510015200
	150	C4-M51001521	C4-M51001530	C4-M51001539	C4-M51001546	C4-M510015100	C4-M510015200
	250	C4-M51002521	C4-M51002530	C4-M51002539	C4-M51002546	C4-M510025100	C4-M510025200
10	100	-	-	-	C4-M101001046	C4-M1010010100	C4-M1010010200
	150	-	-	-	C4-M101001546	C4-M1010015100	C4-M1010015200
	250	-	-	-	C4-M101002546	C4-M1010025100	C4-M1010025200

## HECTOR-M NH2

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	NH2-M31000521	NH2-M31000530	NH2-M31000539	NH2-M31000546	NH2-M310005100	-
	70	NH2-M31000721	NH2-M31000730	NH2-M31000739	NH2-M31000746	NH2-M310007100	-
	100	NH2-M31001021	NH2-M31001030	NH2-M31001039	NH2-M31001046	NH2-M310010100	-
	150	NH2-M31001521	NH2-M31001530	NH2-M31001539	NH2-M31001546	NH2-M310015100	-
	250	NH2-M31002521	NH2-M31002530	NH2-M31002539	NH2-M31002546	NH2-M310025100	-
5	50	NH2-M51000521	NH2-M51000530	NH2-M51000539	NH2-M51000546	NH2-M510005100	NH2-M510005200
	70	NH2-M51000721	NH2-M51000730	NH2-M51000739	NH2-M51000746	NH2-M510007100	NH2-M510007200
	100	NH2-M51001521	NH2-M51001530	NH2-M51001539	NH2-M51001546	NH2-M510015100	NH2-M510015200
	150	NH2-M51001521	NH2-M51001530	NH2-M51001539	NH2-M51001546	NH2-M510015100	NH2-M510015200
	250	NH2-M51002521	NH2-M51002530	NH2-M51002539	NH2-M51002546	NH2-M510025100	NH2-M510025200
10	100	-	-	-	NH2-M101001046	NH2-M1010010100	NH2-M1010010200
	150	-	-	-	NH2-M101001546	NH2-M1010015100	NH2-M1010015200
	250	-	-	-	NH2-M101002546	NH2-M1010025100	NH2-M1010025200

## HECTOR-M Diol

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	Diol-M31000521	Diol-M31000530	Diol-M31000539	Diol-M31000546	Diol-M310005100	-
	70	Diol-M31000721	Diol-M31000730	Diol-M31000739	Diol-M31000746	Diol-M310007100	-
	100	Diol-M31001021	Diol-M31001030	Diol-M31001039	Diol-M31001046	Diol-M310010100	-
	150	Diol-M31001521	Diol-M31001530	Diol-M31001539	Diol-M31001546	Diol-M310015100	-
	250	Diol-M31002521	Diol-M31002530	Diol-M31002539	Diol-M31002546	Diol-M310025100	-
5	50	Diol-M51000521	Diol-M51000530	Diol-M51000539	Diol-M51000546	Diol-M510005100	Diol-M510005200
	70	Diol-M51000721	Diol-M51000730	Diol-M51000739	Diol-M51000746	Diol-M510007100	Diol-M510007200
	100	Diol-M51001521	Diol-M51001530	Diol-M51001539	Diol-M51001546	Diol-M510015100	Diol-M510015200
	150	Diol-M51001521	Diol-M51001530	Diol-M51001539	Diol-M51001546	Diol-M510015100	Diol-M510015200
	250	Diol-M51002521	Diol-M51002530	Diol-M51002539	Diol-M51002546	Diol-M510025100	Diol-M510025200
10	100	-	-	-	Diol-M101001046	Diol-M1010010100	Diol-M1010010200
	150	-	-	-	Diol-M101001546	Diol-M1010015100	Diol-M1010015200
	250	-	-	-	Diol-M101002546	Diol-M1010025100	Diol-M1010025200



## HECTOR-M CN

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	CN-M31000521	CN-M31000530	CN-M31000539	CN-M31000546	CN-M310005100	-
	70	CN-M31000721	CN-M31000730	CN-M31000739	CN-M31000746	CN-M310007100	-
	100	CN-M31001021	CN-M31001030	CN-M31001039	CN-M31001046	CN-M310010100	-
	150	CN-M31001521	CN-M31001530	CN-M31001539	CN-M31001546	CN-M310015100	-
	250	CN-M31002521	CN-M31002530	CN-M31002539	CN-M31002546	CN-M310025100	-
5	50	CN-M51000521	CN-M51000530	CN-M51000539	CN-M51000546	CN-M510005100	CN-M510005200
	70	CN-M51000721	CN-M51000730	CN-M51000739	CN-M51000746	CN-M510007100	CN-M510007200
	100	CN-M51001521	CN-M51001530	CN-M51001539	CN-M51001546	CN-M510010100	CN-M510010200
	150	CN-M51001521	CN-M51001530	CN-M51001539	CN-M51001546	CN-M510015100	CN-M510015200
	250	CN-M51002521	CN-M51002530	CN-M51002539	CN-M51002546	CN-M510025100	CN-M510025200
10	100	-	-	-	CN-M101001046	CN-M1010010100	CN-M1010010200
	150	-	-	-	CN-M101001546	CN-M1010015100	CN-M1010015200
	250	-	-	-	CN-M101002546	CN-M1010025100	CN-M1010025200

## HECTOR-M Phenyl

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	PN-M31000521	PN-M31000530	PN-M31000539	PN-M31000546	PN-M310005100	-
	70	PN-M31000721	PN-M31000730	PN-M31000739	PN-M31000746	PN-M310007100	-
	100	PN-M31001021	PN-M31001030	PN-M31001039	PN-M31001046	PN-M310010100	-
	150	PN-M31001521	PN-M31001530	PN-M31001539	PN-M31001546	PN-M310015100	-
	250	PN-M31002521	PN-M31002530	PN-M31002539	PN-M31002546	PN-M310025100	-
5	50	PN-M51000521	PN-M51000530	PN-M51000539	PN-M51000546	PN-M510005100	PN-M510005200
	70	PN-M51000721	PN-M51000730	PN-M51000739	PN-M51000746	PN-M510007100	PN-M510007200
	100	PN-M51001521	PN-M51001530	PN-M51001539	PN-M51001546	PN-M510010100	PN-M510010200
	150	PN-M51001521	PN-M51001530	PN-M51001539	PN-M51001546	PN-M510015100	PN-M510015200
	250	PN-M51002521	PN-M51002530	PN-M51002539	PN-M51002546	PN-M510025100	PN-M510025200
10	100	-	-	-	PN-M101001046	PN-M1010010100	PN-M1010010200
	150	-	-	-	PN-M101001546	PN-M1010015100	PN-M1010015200
	250	-	-	-	PN-M101002546	PN-M1010025100	PN-M1010025200

## HECTOR-M Sil

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	Sil-M31000521	Sil-M31000530	Sil-M31000539	Sil-M31000546	Sil-M310005100	-
	70	Sil-M31000721	Sil-M31000730	Sil-M31000739	Sil-M31000746	Sil-M310007100	-
	100	Sil-M31001021	Sil-M31001030	Sil-M31001039	Sil-M31001046	Sil-M310010100	-
	150	Sil-M31001521	Sil-M31001530	Sil-M31001539	Sil-M31001546	Sil-M310015100	-
	250	Sil-M31002521	Sil-M31002530	Sil-M31002539	Sil-M31002546	Sil-M310025100	-
5	50	Sil-M51000521	Sil-M51000530	Sil-M51000539	Sil-M51000546	Sil-M510005100	Sil-M510005200
	70	Sil-M51000721	Sil-M51000730	Sil-M51000739	Sil-M51000746	Sil-M510007100	Sil-M510007200
	100	Sil-M51001521	Sil-M51001530	Sil-M51001539	Sil-M51001546	Sil-M510010100	Sil-M510010200
	150	Sil-M51001521	Sil-M51001530	Sil-M51001539	Sil-M51001546	Sil-M510015100	Sil-M510015200
	250	Sil-M51002521	Sil-M51002530	Sil-M51002539	Sil-M51002546	Sil-M510025100	Sil-M510025200
10	100	-	-	-	Sil-M101001046	Sil-M1010010100	Sil-M1010010200
	150	-	-	-	Sil-M101001546	Sil-M1010015100	Sil-M1010015200
	250	-	-	-	Sil-M101002546	Sil-M1010025100	Sil-M1010025200

# HECTOR-A

## HECTOR-A C18

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-A31000521	C18-A31000530	C18-A31000539	C18-A31000546	C18-A310005100	-
	70	C18-A31000721	C18-A31000730	C18-A31000739	C18-A31000746	C18-A310007100	-
	100	C18-A31001021	C18-A31001030	C18-A31001039	C18-A31001046	C18-A310010100	-
	150	C18-A31001521	C18-A31001530	C18-A31001539	C18-A31001546	C18-A310015100	-
	250	C18-A31002521	C18-A31002530	C18-A31002539	C18-A31002546	C18-A310025100	-
5	50	C18-A51000521	C18-A51000530	C18-A51000539	C18-A51000546	C18-A510005100	C18-A510005200
	70	C18-A51000721	C18-A51000730	C18-A51000739	C18-A51000746	C18-A510007100	C18-A510007200
	100	C18-A51001521	C18-A51001530	C18-A51001539	C18-A51001546	C18-A510010100	C18-A510010200
	150	C18-A51001521	C18-A51001530	C18-A51001539	C18-A51001546	C18-A510015100	C18-A510015200
	250	C18-A51002521	C18-A51002530	C18-A51002539	C18-A51002546	C18-A510025100	C18-A510025200
10	100	-	-	-	C18-A101001046	C18-A1010010100	C18-A1010010200
	150	-	-	-	C18-A101001546	C18-A1010015100	C18-A1010015200
	250	-	-	-	C18-A101002546	C18-A1010025100	C18-A1010025200

## HECTOR-A C8

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-A31000521	C8-A31000530	C8-A31000539	C8-A31000546	C8-A310005100	-
	70	C8-A31000721	C8-A31000730	C8-A31000739	C8-A31000746	C8-A310007100	-
	100	C8-A31001021	C8-A31001030	C8-A31001039	C8-A31001046	C8-A310010100	-
	150	C8-A31001521	C8-A31001530	C8-A31001539	C8-A31001546	C8-A310015100	-
	250	C8-A31002521	C8-A31002530	C8-A31002539	C8-A31002546	C8-A310025100	-
5	50	C8-A51000521	C8-A51000530	C8-A51000539	C8-A51000546	C8-A510005100	C8-A510005200
	70	C8-A51000721	C8-A51000730	C8-A51000739	C8-A51000746	C8-A510007100	C8-A510007200
	100	C8-A51001521	C8-A51001530	C8-A51001539	C8-A51001546	C8-A510010100	C8-A510010200
	150	C8-A51001521	C8-A51001530	C8-A51001539	C8-A51001546	C8-A510015100	C8-A510015200
	250	C8-A51002521	C8-A51002530	C8-A51002539	C8-A51002546	C8-A510025100	C8-A510025200
10	100	-	-	-	C8-A101001046	C8-A1010010100	C8-A1010010200
	150	-	-	-	C8-A101001546	C8-A1010015100	C8-A1010015200
	250	-	-	-	C8-A101002546	C8-A1010025100	C8-A1010025200

# HECTOR-T

## HECTOR-T C18

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-T31000521	C18-T31000530	C18-T31000539	C18-T31000546	C18-T310005100	-
	70	C18-T31000721	C18-T31000730	C18-T31000739	C18-T31000746	C18-T310007100	-
	100	C18-T31001021	C18-T31001030	C18-T31001039	C18-T31001046	C18-T310010100	-
	150	C18-T31001521	C18-T31001530	C18-T31001539	C18-T31001546	C18-T310015100	-
	250	C18-T31002521	C18-T31002530	C18-T31002539	C18-T31002546	C18-T310025100	-
5	50	C18-T51000521	C18-T51000530	C18-T51000539	C18-T51000546	C18-T510005100	C18-T510005200
	70	C18-T51000721	C18-T51000730	C18-T51000739	C18-T51000746	C18-T510007100	C18-T510007200
	100	C18-T51001021	C18-T51001030	C18-T51001039	C18-T51001046	C18-T510010100	C18-T510010200
	150	C18-T51001521	C18-T51001530	C18-T51001539	C18-T51001546	C18-T510015100	C18-T510015200
	250	C18-T51002521	C18-T51002530	C18-T51002539	C18-T51002546	C18-T510025100	C18-T510025200
10	100	-	-	-	C18-T101001046	C18-T1010010100	C18-T1010010200
	150	-	-	-	C18-T101001546	C18-T1010015100	C18-T1010015200
	250	-	-	-	C18-T101002546	C18-T1010025100	C18-T1010025200

# HECTOR-W

## HECTOR-W C18

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C18-W33000521	C18-W33000530	C18-W33000539	C18-W33000546	C18-W330005100	-
	70	C18-W33000721	C18-W33000730	C18-W33000739	C18-W33000746	C18-W330007100	-
	100	C18-W33001021	C18-W33001030	C18-W33001039	C18-W33001046	C18-W330010100	-
	150	C18-W33001521	C18-W33001530	C18-W33001539	C18-W33001546	C18-W330015100	-
	250	C18-W33002521	C18-W33002530	C18-W33002539	C18-W33002546	C18-W330025100	-
5	50	C18-W53000521	C18-W53000530	C18-W53000539	C18-W53000546	C18-W530005100	C18-W530005200
	70	C18-W53000721	C18-W53000730	C18-W53000739	C18-W53000746	C18-W530007100	C18-W530007200
	100	C18-W53001021	C18-W53001030	C18-W53001039	C18-W53001046	C18-W530010100	C18-W530010200
	150	C18-W53001521	C18-W53001530	C18-W53001539	C18-W53001546	C18-W530015100	C18-W530015200
	250	C18-W53002521	C18-W53002530	C18-W53002539	C18-W53002546	C18-W530025100	C18-W530025200
10	100	-	-	-	C18-W103001046	C18-W1030010100	C18-W1030010200
	150	-	-	-	C18-W103001546	C18-W1030015100	C18-W1030015200
	250	-	-	-	C18-W103002546	C18-W1030025100	C18-W1030025200

## HECTOR-W C8

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C8-W 33000521	C8-W33000530	C8-W33000539	C8-W33000546	C8-W330005100	-
	70	C8-W 33000721	C8-W33000730	C8-W33000739	C8-W33000746	C8-W330007100	-
	100	C8-W 33001021	C8-W33001030	C8-W33001039	C8-W33001046	C8-W330010100	-
	150	C8-W 33001521	C8-W33001530	C8-W33001539	C8-W33001546	C8-W330015100	-
	250	C8-W 33002521	C8-W33002530	C8-W33002539	C8-W33002546	C8-W330025100	-
5	50	C8-W53000521	C8-W53000530	C8-W53000539	C8-W53000546	C8-W530005100	C8-W530005200
	70	C8-W53000721	C8-W53000730	C8-W53000739	C8-W53000746	C8-W530007100	C8-W530007200
	100	C8-W53001521	C8-W53001530	C8-W53001539	C8-W53001546	C8-W530010100	C8-W530010200
	150	C8-W53001521	C8-W53001530	C8-W53001539	C8-W53001546	C8-W530015100	C8-W530015200
	250	C8-W53002521	C8-W53002530	C8-W53002539	C8-W53002546	C8-W530025100	C8-W530025200
10	100	-	-	-	C8-W103001046	C8-W1030010100	C8-W1030010200
	150	-	-	-	C8-W103001546	C8-W1030015100	C8-W1030015200
	250	-	-	-	C8-W103002546	C8-W1030025100	C8-W1030025200

## HECTOR-W C4

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	C4-W33000521	C4-W33000530	C4-W33000539	C4-W33000546	C4-W330005100	-
	70	C4-W33000721	C4-W33000730	C4-W33000739	C4-W33000746	C4-W330007100	-
	100	C4-W33001021	C4-W33001030	C4-W33001039	C4-W33001046	C4-W330010100	-
	150	C4-W33001521	C4-W33001530	C4-W33001539	C4-W33001546	C4-W330015100	-
	250	C4-W33002521	C4-W33002530	C4-W33002539	C4-W33002546	C4-W330025100	-
5	50	C4-W53000521	C4-W53000530	C4-W53000539	C4-W53000546	C4-W530005100	C4-W530005200
	70	C4-W53000721	C4-W53000730	C4-W53000739	C4-W53000746	C4-W530007100	C4-W530007200
	100	C4-W53001521	C4-W53001530	C4-W53001539	C4-W53001546	C4-W530010100	C4-W530010200
	150	C4-W53001521	C4-W53001530	C4-W53001539	C4-W53001546	C4-W530015100	C4-W530015200
	250	C4-W53002521	C4-W53002530	C4-W53002539	C4-W53002546	C4-W530025100	C4-W530025200
10	100	-	-	-	C4-W103001046	C4-W1030010100	C4-W1030010200
	150	-	-	-	C4-W103001546	C4-W1030015100	C4-W1030015200
	250	-	-	-	C4-W103002546	C4-W1030025100	C4-W1030025200

## HECTOR-W NH2

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	NH2-W33000521	NH2-W 33000530	NH2-W 33000539	NH2-W 33000546	NH2-W 330005100	-
	70	NH2-W33000721	NH2-W 33000730	NH2-W 33000739	NH2-W 33000746	NH2-W 330007100	-
	100	NH2-W33001021	NH2-W 33001030	NH2-W 33001039	NH2-W 33001046	NH2-W 330010100	-
	150	NH2-W33001521	NH2-W 33001530	NH2-W 33001539	NH2-W 33001546	NH2-W 330015100	-
	250	NH2-W33002521	NH2-W 33002530	NH2-W 33002539	NH2-W 33002546	NH2-W 330025100	-
5	50	NH2-W53000521	NH2-W53000530	NH2-W53000539	NH2-W53000546	NH2-W530005100	NH2-W530005200
	70	NH2-W53000721	NH2-W53000730	NH2-W53000739	NH2-W53000746	NH2-W530007100	NH2-W530007200
	100	NH2-W53001521	NH2-W53001530	NH2-W53001539	NH2-W53001546	NH2-W530010100	NH2-W530010200
	150	NH2-W53001521	NH2-W53001530	NH2-W53001539	NH2-W53001546	NH2-W530015100	NH2-W530015200
	250	NH2-W53002521	NH2-W53002530	NH2-W53002539	NH2-W53002546	NH2-W530025100	NH2-W530025200
10	100	-	-	-	NH2-W103001046	NH2-W1030010100	NH2-W1030010200
	150	-	-	-	NH2-W103001546	NH2-W1030015100	NH2-W1030015200
	250	-	-	-	NH2-W103002546	NH2-W1030025100	NH2-W1030025200

# HECTOR-ACD

## HECTOR-ACD WCX(Weak acid Cation Exchange)

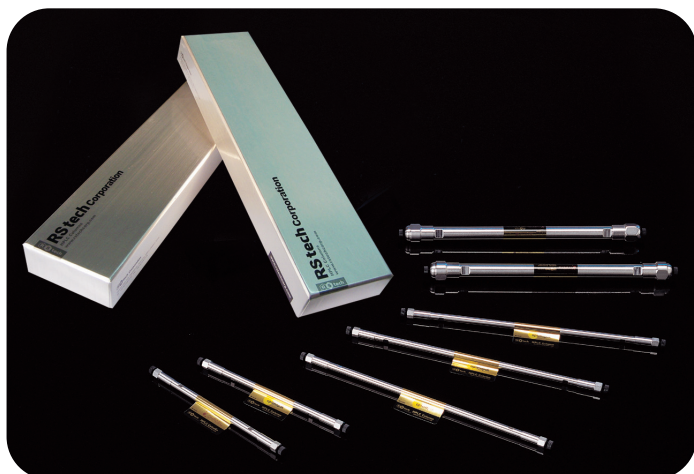
Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	WCX-31000521	WCX-31000530	WCX-31000539	WCX-31000546	WCX-310005100	-
	70	WCX-31000721	WCX-31000730	WCX-31000739	WCX-31000746	WCX-310007100	-
	100	WCX-31001021	WCX-31001030	WCX-31001039	WCX-31001046	WCX-310010100	-
	150	WCX-31001521	WCX-31001530	WCX-31001539	WCX-31001546	WCX-310015100	-
	250	WCX-31002521	WCX-31002530	WCX-31002539	WCX-31002546	WCX-310025100	-
5	50	WCX-51000521	WCX-51000530	WCX-51000539	WCX-51000546	WCX-510005100	WCX-510005200
	70	WCX-51000721	WCX-51000730	WCX-51000739	WCX-51000746	WCX-510007100	WCX-510007200
	100	WCX-51001521	WCX-51001530	WCX-51001539	WCX-51001546	WCX-510015100	WCX-510015200
	150	WCX-51001521	WCX-51001530	WCX-51001539	WCX-51001546	WCX-510015100	WCX-510015200
	250	WCX-51002521	WCX-51002530	WCX-51002539	WCX-51002546	WCX-510025100	WCX-510025200
10	100	-	-	-	WCX-101001046	WCX-1010010100	WCX-1010010200
	150	-	-	-	WCX-101001546	WCX-1010015100	WCX-1010015200
	250	-	-	-	WCX-101002546	WCX-1010025100	WCX-1010025200

## HECTOR-ACD SCX(Strong acid Cation Exchange)

Particle size (µm)	Length (mm)	2.1 mm ID	3.0 mm ID	3.9 mm ID	4.6 mm ID	10.0 mm ID	21.2 mm ID
3	50	SCX-31000521	SCX-31000530	SCX-31000539	SCX-31000546	SCX-310005100	-
	70	SCX-31000721	SCX-31000730	SCX-31000739	SCX-31000746	SCX-310007100	-
	100	SCX-31001021	SCX-31001030	SCX-31001039	SCX-31001046	SCX-310010100	-
	150	SCX-31001521	SCX-31001530	SCX-31001539	SCX-31001546	SCX-310015100	-
	250	SCX-31002521	SCX-31002530	SCX-31002539	SCX-31002546	SCX-310025100	-
5	50	SCX-51000521	SCX-51000530	SCX-51000539	SCX-51000546	SCX-510005100	SCX-510005200
	70	SCX-51000721	SCX-51000730	SCX-51000739	SCX-51000746	SCX-510007100	SCX-510007200
	100	SCX-51001521	SCX-51001530	SCX-51001539	SCX-51001546	SCX-510015100	SCX-510015200
	150	SCX-51001521	SCX-51001530	SCX-51001539	SCX-51001546	SCX-510015100	SCX-510015200
	250	SCX-51002521	SCX-51002530	SCX-51002539	SCX-51002546	SCX-510025100	SCX-510025200
10	100	-	-	-	SCX-101001046	SCX-1010010100	SCX-1010010200
	150	-	-	-	SCX-101001546	SCX-1010015100	SCX-1010015200
	250	-	-	-	SCX-101002546	SCX-1010025100	SCX-1010025200



RStech has been concentrated on obtaining the best HPLC column in the market. We have focused all its efforts and all its know-how, accumulated through more than 10 years of chromatographic research and development. OptimaPak has a superb performance for a variety of applications in the pharmaceutical, chemical, environmental, and food separation areas. It provides better peak shape and column efficiency, high reproducibility.



The uniqueness of OptimaPak high performance spherical silica is the combination of:

- high surface area
- mechanical strength

Other outstanding properties are:

- chemical purity
- chemical stability
- optimized surface properties
- well-defined pore structure

OptimaPak HPLC silica consists of perfectly spherical, totally porous particles, a narrow particle size distribution for high efficiency, low pressure drop and best total economy in chromatographic purifications.

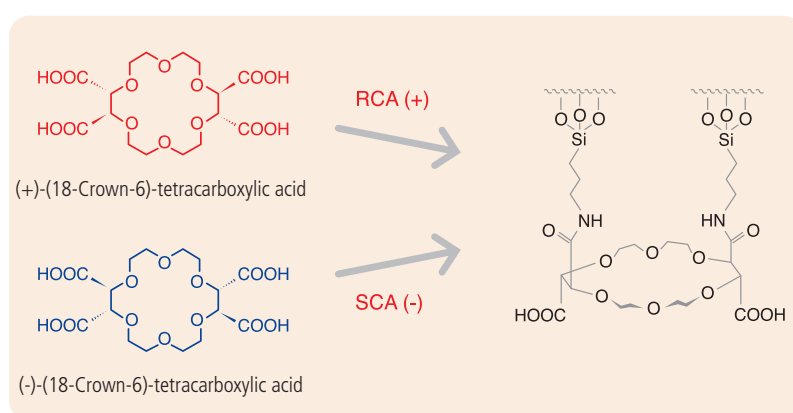
## ● Product List

Phase	Particle size	Pore size	Length × ID	Part No.
OptimaPak C18	5 µm	100 Å	150 x 4.6 mm	OP C18-51001546
	5 µm	100 Å	250 x 4.6 mm	OP C18-51002546
	3.5 µm	100 Å	100 x 2.1 mm	OP C18-31001021
	10 µm	100 Å	250 x 10 mm	OP C18-101002510
OptimaPak C8	5 µm	100 Å	150 x 4.6 mm	OP C8-51001546
	5 µm	100 Å	250 x 4.6 mm	OP C8-51002546
	3.5 µm	100 Å	100 x 2.1 mm	OP C8-31001021
	10 µm	100 Å	250 x 10 mm	OP C8-101002510
OptimaPak NH2	5 µm	100 Å	250 x 4.6 mm	OP NH2-51002546
OptimaPak Sil	5 µm	100 Å	250 x 4.6 mm	OP Sil-51002546
	10 µm	100 Å	250 x 10 mm	OP Sil-101002510



ChiroSil® columns are very effective for enantiomer separation of various natural and unnatural  $\alpha$ -amino acids,  $\alpha$ -amino acids, primary amines, amino alcohols ( $\beta$ -blockers) and secondary amines. Other racemic compounds, such as amino alcohols ( $\beta$ -blockers), secondary amines, drugs containing primary amines and secondary amines are also expected to be resolved on ChiroSil® columns.

## The structure of ChiroSil® Stationary phase



### High selectivity:

- $\alpha$ -Amino Acids
- $\alpha$ -Amino Amides and Esters
- Amines
- Amino Alcohols
- $\beta$ -Blockers
- $\beta$ -Amino Acids
- Aryl  $\alpha$ -Amino Ketones
- Tocainide's Analogues
- Gemifloxacin
- N-(3, 5-dinitrobenzoyl)- $\alpha$ -Amino Acids
- N-(3-dinitrobenzoyl)- $\alpha$ -Amino Acids
- N-benzyl- $\alpha$ -Amino Acids

## Product List

Phase	Particle size	Pore size	Length $\times$ ID	Part No.
ChiroSil RCA(+)	5 $\mu$ m	100 Å	100 x 2.1 mm	CH RCA(+)-51001021
			150 x 2.1 mm	CH RCA(+)-51001521
			150 x 4.6 mm	CH RCA(+)-51001546
			250 x 4.6 mm	CH RCA(+)-51002546
			250 x 10.0 mm	CH RCA(+)-51002510
			250 x 21.2 mm	CH RCA(+)-51002520
ChiroSil SCA(-)	5 $\mu$ m	100 Å	100 x 2.1 mm	CH SCA(-)-51001021
			150 x 2.1 mm	CH SCA(-)-51001521
			150 x 4.6 mm	CH SCA(-)-51001546
			250 x 4.6 mm	CH SCA(-)-51002546
			250 x 10.0 mm	CH SCA(-)-51002510
			250 x 21.2 mm	CH SCA(-)-51002520



Venture town #304, Sinil-dong 1688-5,  
Daedeok-gu, Daejeon 306-230, Republic of Korea  
Tel : +82-42-936-0133 Fax : +82-42-936-0134  
e-mail : [rstech@rstechcorp.com](mailto:rstech@rstechcorp.com)  
[www.rstechcorp.com](http://www.rstechcorp.com)



**Woongki Science Co., LTD**

277-38, Seongsu 2-ga 3-dong, Seongdong-gu, Seoul,  
Republic of Korea  
Tel : +82-2-461-3811 Fax : +82-2-461-3812  
[www.woongki.com](http://www.woongki.com)