

All dimensions and lengths available for microbore 1.0 mm, semi-preparative, preparative, specialty sizes, and threaded modular column, please refer to page 5.

Chiral Columns

- Bonded phenylglycine and leucine
- Bonded tartar amide
- Protein bond BSA columns
- Bonded cyclodextrins
- Competitive prices
- Analytical, guard, and preparative

The application of HPLC to the analysis of chiral substances is increasing rapidly. This is particularly important in the pharmaceutical industry where information on enantiomeric composition is being required. In many biological processes the activity of one isomer can be contrasted with the inactivity or even harmful effect of the other. ES Industries offer several different types of chiral stationary phases to handle the wide variety of chiral separation problems.

Phenylglycine and Leucine Phases

ES Industries offers either optically active phenylglycine or leucine derivative bonded to the silica surface (Pirkle types). Since these optically active compounds are chemically bound to the silica surface there is no restriction on the polarity of the mobile phase.

Tartramide Phase

ES Industries offers a unique stationary phase that incorporates a chiral dinitrophenyltartramide moiety linked through a propyl spacer group bonded to the silica surface. This is particularly useful in separating agrochemical and like molecules.

Phenylglycine and Leucine

Description	Particle Size (μ)	Pore Size (Å)	Length (mm)	Standard-bore P/N (4.6 mm)	Standard-bore P/N (4.0 mm)	Small-bore P/N (3.2 mm)	Small-bore P/N (2.0 mm)	Price
D-phenylglycine	5	100	50	115221-CHR-D-PG	114221-CHR-D-PG	11d221-CHR-D-PG	112221-CHR-D-PG	Call
D-phenylglycine	5	100	100	125221-CHR-D-PG	124221-CHR-D-PG	12d221-CHR-D-PG	122221-CHR-D-PG	Call
D-phenylglycine	5	100	150	135221-CHR-D-PG	134221-CHR-D-PG	13d221-CHR-D-PG	132221-CHR-D-PG	Call
D-phenylglycine	5	100	250	155221-CHR-D-PG	154221-CHR-D-PG	15d221-CHR-D-PG	152221-CHR-D-PG	Call
L-phenylglycine	5	100	50	115221-CHR-L-PG	114221-CHR-L-PG	11d221-CHR-L-PG	112221-CHR-L-PG	Call
L-phenylglycine	5	100	100	125221-CHR-L-PG	124221-CHR-L-PG	12d221-CHR-L-PG	122221-CHR-L-PG	Call
L-phenylglycine	5	100	150	135221-CHR-L-PG	134221-CHR-L-PG	13d221-CHR-L-PG	132221-CHR-L-PG	Call
L-phenylglycine	5	100	250	155221-CHR-L-PG	154221-CHR-L-PG	15d221-CHR-L-PG	152221-CHR-L-PG	Call
DL-phenylglycine	5	100	50	115221-CHR-DL-PG	114221-CHR-DL-PG	11d221-CHR-DL-PG	112221-CHR-DL-PG	Call
DL-phenylglycine	5	100	100	125221-CHR-DL-PG	124221-CHR-DL-PG	12d221-CHR-DL-PG	122221-CHR-DL-PG	Call
DL-phenylglycine	5	100	150	135221-CHR-DL-PG	134221-CHR-DL-PG	13d221-CHR-DL-PG	132221-CHR-DL-PG	Call
DL-phenylglycine	5	100	250	155221-CHR-DL-PG	154221-CHR-DL-PG	15d221-CHR-DL-PG	152221-CHR-DL-PG	Call
L-Leucine	5	100	50	115221-CHR-L-LEU	114221-CHR-L-LEU	11d221-CHR-L-LEU	112221-CHR-L-LEU	Call
L-Leucine	5	100	100	125221-CHR-L-LEU	124221-CHR-L-LEU	12d221-CHR-L-LEU	122221-CHR-L-LEU	Call
L-Leucine	5	100	150	135221-CHR-L-LEU	134221-CHR-L-LEU	13d221-CHR-L-LEU	132221-CHR-L-LEU	Call
L-Leucine	5	100	250	155221-CHR-L-LEU	154221-CHR-L-LEU	15d221-CHR-L-LEU	152221-CHR-L-LEU	Call

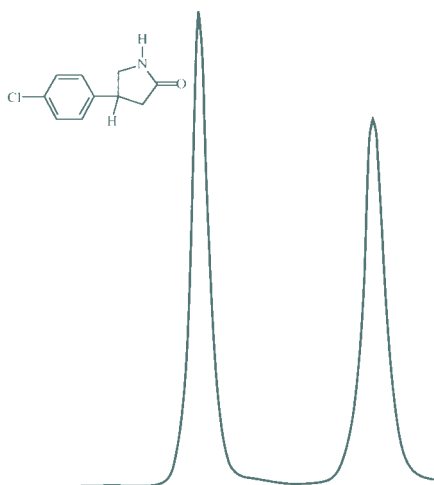
Tartramide

Description	Particle Size (μ)	Pore Size (Å)	Length (mm)	Standard-bore P/N (4.6 mm)	Standard-bore P/N (4.0 mm)	Small-bore P/N (3.2 mm)	Small-bore P/N (2.0 mm)	Price
Tartramide	5	100	50	115221-CHR-TA	114221-CHR-TA	11d221-CHR-TA	112221-CHR-TA	Call
Tartramide	5	100	100	125221-CHR-TA	124221-CHR-TA	12d221-CHR-TA	122221-CHR-TA	Call
Tartramide	5	100	150	135221-CHR-TA	134221-CHR-TA	13d221-CHR-TA	132221-CHR-TA	Call
Tartramide	5	100	250	155221-CHR-TA	154221-CHR-TA	15d221-CHR-TA	152221-CHR-TA	Call

Chiral Columns

Kromasil Tartar Amide Phases

ES Industries is able to offer chiral network polymers covalently bonded to Kromasil. Kromasil CHI-DMB contains the chiral monomer O,O'-bis [3,5-dimethylbenzoyl]-N,N'-diallyl-L-tartar diamide and Kromasil CHI-TBB contains the chiral monomer O,O'-bis [4-tert-butylbenzoyl]-N,N' diallyl-L-tartar diamide. Both monomers are reacted with a multifunctional hydrosilane yielding a network polymer incorporating the bifunctional C₂-symmetric chiral selector.

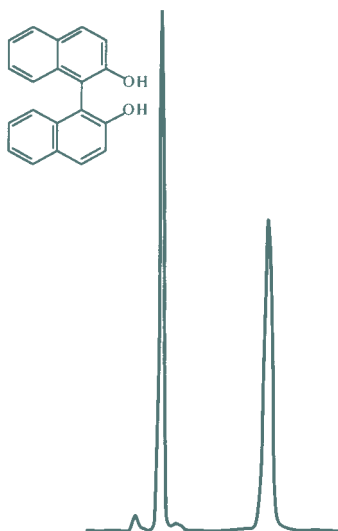


Baclophenlactam

Column: Kromasil CHI-TBB, 4.6 x 250 mm, 5 μ
 Mobile phase: Hexane/2-propanol 95/5
 Flow rate: 2 mL/min.

Resolvosil™ BSA

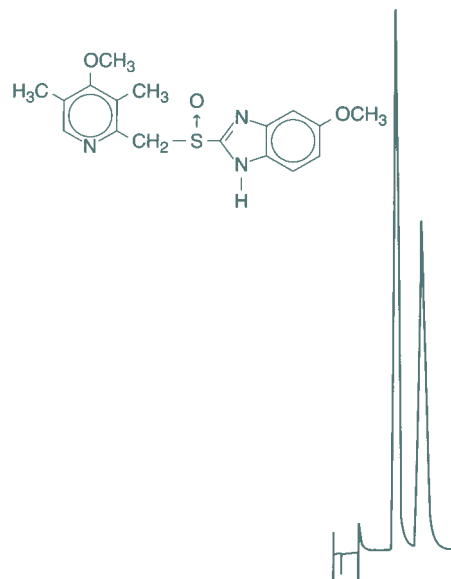
ES Industries is able to offer a chiral stationary phase of Resolvosil BSA (Bovine serum albumin) covalently bonded to silica. The main advantages of the Resolvosil are its high selectivity in combination with the ease by which retention can be regulated by small changes in the mobile phase



Elnaphtol

Column: Kromasil CHI-DMB, 4.6 x 250 mm, 5 μ
 Mobile phase: Hexane/2-propanol 95/5
 Flow rate: 2 mL/min.

composition. Resolvosil has been used to separate chiral mixtures of amino acids, aromatic sulphoxides, barbiturates and beta blockers. Resolvosil BSA is available in two pore sizes 100° A (BSA-7; low capacity) and 300° A (BSA-7PX; high capacity).



Optical Isomers of Omeprazole

Column: ET 150/4 Resolvosil BSA-7, 150 x 4 mm ID
 Mobile phase: 0.05 M phosphate buffer, pH 7.9 + 2% propanol-1
 Flow rate: 1 mL/min.

Kromasil Tartar Amide

Description	Particle Size (μ)	Pore Size (Å)	Length (mm)	Standard-bore P/N (4.6 mm)	Price
DMB	5	100	250	155221-KR-DMB	Call
TBB	5	100	250	155221-KR-TBB	Call

Resolvosil™ BSA

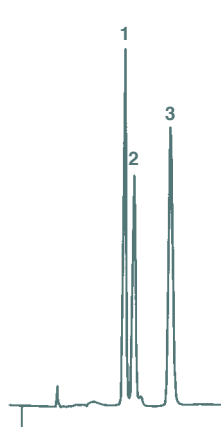
Description	Particle Size (μ)	Pore Size (Å)	Length (mm)	Standard-bore P/N (4.0 mm)	Price
BSA-7	7	100	150	134421-MN-BSA-7	Call
BSA-7PX	7	300	150	134431-MN-BSA-7PX	Call

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Nucleodex™

ES Industries is able to offer a chiral columns based on a cyclodextrin chiral selectors. These cyclodextrins are covalently bonded to the silica matrix via a spacer, resulting in hydrolytically stable adsorbent. Cyclodextrins are cyclic oligosaccharides consisting of glucose units. They are formed by degradation of starch by bacillus macerans or bacillus circulans under action of cyclodextrin-glycosyltransferase. Nucleodex is available in different types, Beta-OH, Alpha-PM, Beta-PM and Gamma-PM. Beta-cyclodextrin contains seven glucose units

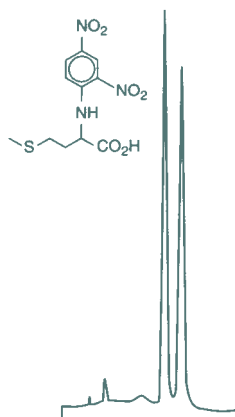
and cavity opening of 7.5 Å. Beta-OH contains Beta-cyclodextrin with free hydroxy groups and Beta-PM contains permethylated hydroxy groups. Alpha-cyclodextrin contains six glucose units and a smaller opening than the Beta type. The Gamma-cyclodextrin contains eight glucose units and the larger opening than the Beta type. Nucleodex columns have been used for the chiral separation of phenols, barbiturates and steroids.



o-, m-, and p-Cresol

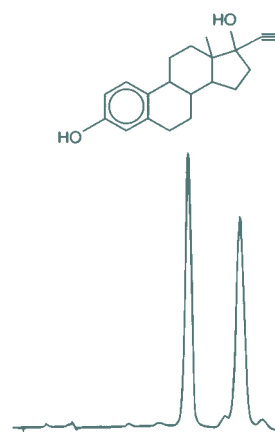
Column: Nucleodex β-OH
Mobile phase: 50:50 Water:MeOH
Flow rate: 0.7 mL/min.

1. o-cresol
2. m-cresol
3. p-cresol



DNP-D, L-Methionine

Column: Nucleodex β-OH
Mobile phase: 40:60 MeOH:50 mM NaH₂PO₄, pH = 7
Flow rate: 0.7 mL/min.



Ethinylestradiol

Column: Nucleodex β-PM
Mobile phase: 70:30 MeOH:0.1% TEAA, pH = 4
Flow rate: 0.7 mL/min.

Nucleodex™

Description	Particle Size (μ)	Length (mm)	Standard-bore P/N (4.0 mm)	Price
Beta-OH	5	200	144221-MN-B-OH	Call
Beta-PM	5	200	144221-MN-B-PM	Call
Alpha-PM	5	200	144221-MN-A-PM	Call
Gamma-OPM	5	200	144221-MN-G-PM	Call