NUCLEOSIL®*

- **Base deactivated AB, HD and PROTECT I packings**
- **Pore size selection from 50 Å to 500 Å**

Nucleosil is a high surface area spherical silica manufactured by Macherey-Nagel. This high quality silica has a narrow particle size distribution making it an efficient packing material for HPLC.

When choosing a Nucleosil column, the compound's molecular weight (MW) must first be taken into account. Most researchers choose the 100 Å silicas for compounds with MW below 2000 daltons; in general, the 50 and 120 Å material are suitable for small molecule analysis. For proteins and other compounds with MW greater than 2000 daltons, the 300 Å and larger pore size silicas are the better choice.

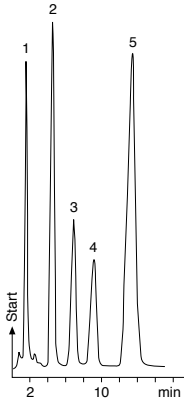
Material Characteristics

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m^2/g)	Carbon Load %		Calculated Bonded Phase Coverage (µmole/m^2)	End Capping
Nucleosil 50 Silica	Spher. 3, 5, 7, 10	50	0.8	450	0		0	No
Nucleosil 100 Silica	Spher. 3, 5, 7, 10	100	1.0	350	0		0	No
Nucleosil 100 C18	Spher. 3, 5, 7, 10	100	1.0	350	14,	Monomeric	2.06	Yes
Nucleosil 100 C18 AB	Spher. 5	100	1.0	350	25,	Polymeric	4.51	Yes
Nucleosil 100 C18 HD	Spher. 3, 5	100	1.0	350	20,	Monomeric	—	Yes
Nucleosil 100 Protect I	Spher. 5	100	1.0	350	11,	Monomeric	—	Yes
Nucleosil 100 C8	Spher. 5, 7, 10	100	1.0	350	9,	Monomeric	2.49	No
Nucleosil 100 C8 HD	Spher. 5,	100	1.0	350	13,	Monomeric	—	Yes
Nucleosil 100 C2	Spher. 7	100	1.0	350	3.5,	Monomeric	N/A	No
Nucleosil 100 CN	Spher. 5, 10	100	1.0	350	5,	Monomeric	—	No
Nucleosil 100 NH_2	Spher. 5, 10	100	1.0	350	3.5,	Monomeric	N/A	No
Nucleosil 100 Diol	Spher. 7	100	1.0	350	5,	Monomeric	—	No
Nucleosil 100 Phenyl	Spher. 5, 7	100	1.0	350	8,	Monomeric	1.96	No
Nucleosil 100 SA	Spher. 5, 10	100	1.0	350	1 mval/g,	Monomeric	—	No
Nucleosil 100 SB	Spher. 5, 10	100	1.0	350	1 mval/g,	Monomeric	—	No
Nucleosil 120 Silica	Spher. 3, 5, 7, 10	120	0.65	200	0		0	No
Nucleosil 120 C4	Spher. 5	120	0.65	200	5,	Monomeric	N/A	No
Nucleosil 120 C8	Spher. 3, 5, 7, 10	120	0.65	200	7,	Monomeric	3.27	No
Nucleosil 120 C18	Spher. 3, 5, 7, 10	120	0.65	200	11,	Monomeric	2.69	Yes
Nucleosil 120 Phenyl	Spher. 7	120	0.65	200	6,	Monomeric	2.49	No
Nucleosil 300-C18	Spher. 5, 7, 10	300	0.8	100	6,	Monomeric	2.72	Yes
Nucleosil 300-C4	Spher. 5, 7	300	0.8	100	1,	Monomeric	1.41	Yes
Nucleosil 300-C8	Spher. 5, 7	300	0.8	100	2,	Monomeric	1.72	Yes
Nucleosil 500-C18	Spher. 7	500	0.8	35	2,	Monomeric	2.45	Yes

App ID 5407

Penicillins

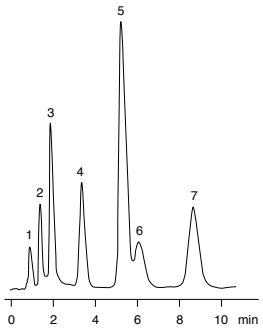
Column: Nucleosil 5 µm C18 100 Å
Dimensions: 250 x 3.2 mm
Part No: 00G-0323-R0
Mobile Phase: 0.05 M Phosphate buffer pH 7/Acetonitrile (7:2.5, v/v)
Flow Rate: 1.8 mL/min
Detection: UV @ 220 nm
Injection Volume: 10 µL
Sample:
1. Ampicillin
2. Oxacillin
3. Cloxacillin
4. Flucloxacillin
5. Dicloxacillin



App ID 5408

Narcotics

Column: Nucleosil 10 µm C18 100 Å
Dimensions: 250 x 4.0 mm
Part No: 00G-0330-D0
Mobile Phase: Methanol/Water (45:55)
Flow Rate: 0.42 cm/sec
Detection: UV @ 254 nm
Injection Volume: 5 µL
Sample:
1. Unknown
2. Veronal
3. Luminal
4. Prominal
5. Revonal
6. Unknown
7. Thiogenal



**Nucleosil® is a registered trademark of Macherey-Nagel*

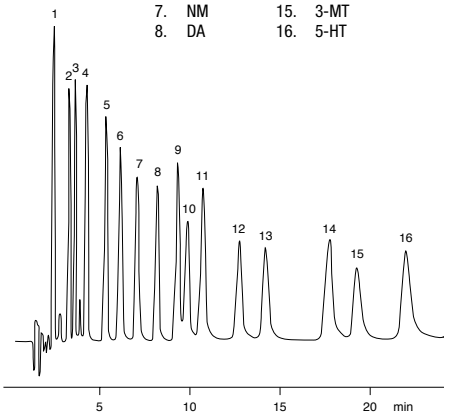
NUCLEOSIL®

App ID 5409

Neurotransmitters

Column: Nucleosil 5 µm C18 100 Å
Dimensions: 150 x 4.6 mm
Part No: 00F-0323-E0
Mobile Phase: 0.1 mol/L citrate buffer, 0.3 mmol/L Na_2EDTA, 0.293 mmol/L octyl sulphate in Acetonitrile/Water (6.3:93.7) pH 2.35
Flow Rate: 1.2 mL/min
Detection: EC +1.2 V
Sample:

1. DHPG
2. VMA
3. MHPG
4. NE
5. E
6. DOPA
7. NM
8. DA
9. 5-HTOL
10. MET
11. 5-HIAA
12. ISOP
13. HVA
14. 5-HTP
15. 3-MT
16. 5-HT

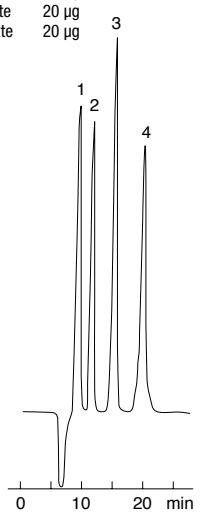


App ID 5418

Inorganic Anions

Column: Nucleosil 10 µm SB 100 Å
Dimensions: 250 x 4.6 mm
Part No: 00G-0333-E0
Mobile Phase: 0.03 M Sodium salicylate, pH 4.0
Flow Rate: 0.5 mL/min
Detection: RI
Sample: 20 µL injection

1. Phosphate 20 µg
2. Chloride 10 µg
3. Nitrate 20 µg
4. Sulfate 20 µg



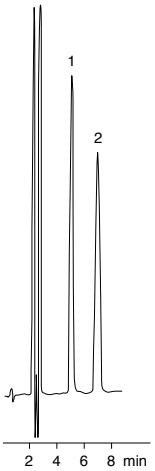
App ID 5420

Acetanilide and Prednisone USP XXII p. 1137

Column: Nucleosil 10 µm C18
Dimensions: 250 x 4.6 mm
Part No: 00G-0330-E0
Mobile Phase: Water/THF/Methanol (688:250:62)
Flow Rate: 1.0 mL/min
Detection: UV
Temperature: 25 °C
Sample: 20 µL

1. Acetanilide
2. Prednisone

**Chromatogram courtesy of Pradip Patel, Lannett Company.*

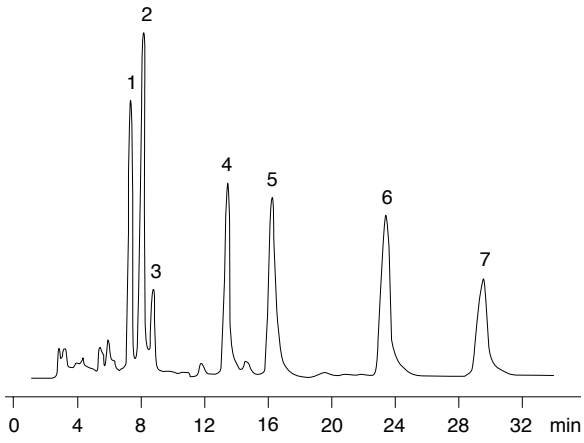


App ID 5419

Hop Resins

Column: Nucleosil 5 µm C18
Dimensions: 250 x 4.6 mm
Part No: 00G-0323-E0
Mobile Phase: 1660 mL Methanol/380 mL Water/1 mL 0.1M EDTA
Flow Rate: 0.5 mL/min
Detection: UV @ 270 nm
Sample: 100 µL

1. Iso-Cohumulone
2. Iso-Humulone
3. Iso-Adhumulone
4. Cohumulone
5. Humulone/Adhumulone
6. Colupulone
7. Lupulone/Adlupulone



NUCLEOSIL®

ORDERING INFORMATION

SecurityGuard™ Analytical Cartridges require universal holder Part No.: KJ0-4282

3 µm 100 Å Columns (mm)

Phases	50 x 2.0	150 x 2.0	100 x 3.2	150 x 3.2	125 x 4.0	50 x 4.6	100 x 4.6	150 x 4.6	SecurityGuard™ Cartridges 4 x 2.0 mm* /10pk	4 x 3.0 mm* /10pk
Silica	—	—	00D-0367-R0	—	00E-0367-D0	—	—	00F-0367-E0	AJ0-4347	AJ0-4348
C18	00B-0319-B0	00F-0319-B0	—	00F-0319-R0	00E-0319-D0	00B-0319-E0	00D-0319-E0	00F-0319-E0	AJ0-4286	AJ0-4287
									for ID: 2.0-3.0 mm	3.2-8.0 mm

5, 7, and 10 µm 100 Å Columns (mm)

Phases	150 x 2.0	250 x 2.0	150 x 3.2	250 x 3.2	125 x 4.0	250 x 4.0	150 x 4.6	250 x 4.6	250 x 10	SecurityGuard™ Cartridges 4 x 2.0 mm* /10pk	4 x 3.0 mm* /10pk	10 x 10 mm‡ /3pk
5µm Silica	—	—	—	—	—	00G-0321-D0	00F-0321-E0	00G-0321-E0	—	AJ0-4347	AJ0-4348	AJ0-7223
5µm C8	00F-0322-B0	—	—	—	00E-0322-D0	00G-0322-D0	00F-0322-E0	00G-0322-E0	—	AJ0-4289	AJ0-4290	AJ0-7222
5µm C18	00F-0323-B0	00G-0323-B0	00F-0323-R0	00G-0323-R0	00E-0323-D0	00G-0323-D0	00F-0323-E0	00G-0323-E0	00G-0323-N0	AJ0-4286	AJ0-4287	AJ0-7221
5µm CN	—	00G-0324-B0	—	—	00E-0324-D0	—	00F-0324-E0	00G-0324-E0	—	AJ0-4304	AJ0-4305	AJ0-7213
5µm SA	00F-0325-B0	—	—	—	00E-0325-D0	00G-0325-D0	00F-0325-E0	00G-0325-E0	—	AJ0-4307	AJ0-4308	AJ0-7369
5µm SB	—	—	—	—	—	00G-0326-D0	00F-0326-E0	00G-0326-E0	—	AJ0-4310	AJ0-4311	AJ0-7370
5µm NH_2	—	—	—	—	—	00G-0327-D0	00F-0327-E0	00G-0327-E0	—	AJ0-4301	AJ0-4302	AJ0-7364
5µm NO_2	—	—	—	—	—	—	—	00G-0307-E0	—	—	—	—
7µm Phenyl	—	—	—	—	—	—	00F-0305-E0	00G-0305-E0	—	AJ0-4350	AJ0-4351	AJ0-7314
10µm Silica	—	—	—	—	—	—	—	00G-0328-E0	—	AJ0-4347	AJ0-4348	AJ0-7223
10µm C18	—	—	—	—	00E-0330-D0	00G-0330-D0	00F-0330-E0	00G-0330-E0	00G-0330-N0	AJ0-4286	AJ0-4287	AJ0-7221
10µm CN	—	—	—	—	—	00G-0331-D0	—	00G-0331-E0	—	AJ0-4304	AJ0-4305	AJ0-7213
10µm SA	—	—	—	—	—	—	00F-0332-E0	00G-0332-E0	—	AJ0-4307	AJ0-4308	AJ0-7369
10µm SB	—	—	—	—	—	—	—	00G-0333-E0	—	AJ0-4310	AJ0-4311	AJ0-7370
10µm NH_2	—	—	—	—	—	—	—	00G-0334-E0	—	AJ0-4301	AJ0-4302	AJ0-7364
										for ID: 2.0-3.0 mm	3.2-8.0 mm	9-16 mm

3 µm 120 Å Columns (mm)

Phases	150 x 2.0	150 x 3.2	125 x 4.0	100 x 4.6	150 x 4.6	SecurityGuard™ Cartridges 4 x 2.0 mm* /10k	4 x 3.0 mm* /10pk
C8	—	—	—	00D-0335-E0	00F-0335-E0	AJ0-4289	AJ0-4290
C18	00F-0339-B0	00F-0339-R0	00E-0339-D0	00D-0339-E0	00F-0339-E0	AJ0-4286	AJ0-4287
						for ID: 2.0-3.0 mm	3.2-8.0 mm

5 µm 120 Å Columns (mm)

Phases	250 x 3.2	250 x 4.0	150 x 4.6	250 x 4.6	250 x 10	SecurityGuard™ Cartridges 4 x 2.0 mm* /10pk	4 x 3.0 mm* /10pk	10 x 10 mm‡ /3pk
C18	00G-0341-R0	00G-0341-D0	00F-0341-E0	00G-0341-E0	00G-0341-N0	AJ0-4286	AJ0-4287	AJ0-7221
						for ID: 2.0-3.0 mm	3.2-8.0 mm	9-16 mm

5 µm 300 Å Columns (mm)

Phases	250 x 2.0	250 x 4.0	150 x 4.6	250 x 4.6	250 x 10	SecurityGuard™ Cartridges 4 x 2.0 mm* /10pk	4 x 3.0 mm* /10pk	10 x 10 mm‡ /3pk
C4	—	00G-0275-D0	00F-0275-E0	00G-0275-E0	—	AJ0-4329	AJ0-4330	AJ0-7225
C8	—	00G-0276-D0	00F-0276-E0	00G-0276-E0	—	—	—	—
C18	00G-0277-B0	00G-0277-D0	00F-0277-E0	00G-0277-E0	00G-0277-N0	AJ0-4320	AJ0-4321	AJ0-7224
						for ID: 2.0-3.0 mm	3.2-8.0 mm	9-16 mm

7 µm 500 Å Columns (mm)

Phases	250 x 4.6
C18	00G-0386-E0

**SecurityGuard™ Analytical Cartridges require holder, Part No.: KJ0-4282*
‡Semi-prep SecurityGuard™ Cartridges require holder, Part No.: AJ0-7220

100 Å HD, AB, Protect I

Part No.	Mfr. No.	Description	Size (mm)	Price
CH0-4752	720193.46	3 µm C18 HD	150 x 4.6	
CH0-4753	720192.46	3 µm C18 HD	250 x 4.6	
CH0-4754	720194.46	5 µm C8 HD	150 x 4.6	
CH0-4755	720196.46	5 µm C8 HD	250 x 4.6	
CH0-4756	720294.46	5 µm C18 HD	150 x 4.6	
CH0-4757	720280.46	5 µm C18 HD	250 x 4.6	
CH0-4542	720174.46	5 µm Protect I	150 x 4.6	
CH0-4543	720170.46	5 µm Protect I	250 x 4.6	
CH0-4758	720935.46	5 µm C18 AB	125 x 4.6	
CH0-4759	720936.46	5 µm C18 AB	250 x 4.6	

Other column dimensions available upon request.

See p. 219 for SecurityGuard Cartridge Holders and Cartridges.

NUCLEOSIL® CHIRAL COLUMNS

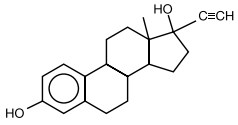
The purity and narrow particle and pore size distributions of Nucleosil silicas provide the base materials for some of the highest quality HPLC chiral stationary phases. The variety of chemistries are designed to promote chiral separations through diverse mechanisms directly, quickly and without derivatization (see table below). Macherey-Nagel's chiral stationary phases are highly suited for resolving a wide range of enantiomeric pairs, including many important pharmaceutical, pesticide and biochemical compounds. Phenomenex offers the complete line of Macherey-Nagel chiral columns.

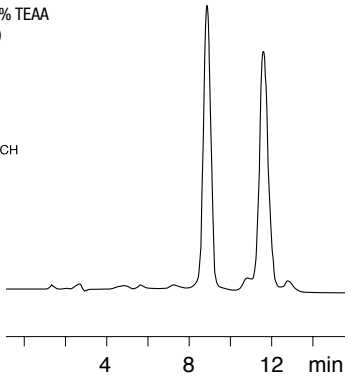
Column	Stationary Phase Type	Chemistry	Mechanism	Applications
Chiral 1	ligand exchange	L-hydroxyproline-Cu++	diastereomeric metal complex	α-amino acids, α-hydroxy acids, N-methyl-α-amino acids, α-alkyl-α-amino acids, α-amino alcohols
Chiral 2	brush (Pirkle)	D-dinitro-benzoyl phenylglycine	attractive interactions hydrogen bonding charge transfer (π-π interaction)	organic-soluble pharmaceuticals and agrochemicals
Chiral 3		L-dinitro-benzoyl phenylglycine	dipole stacking	
Nucleodex β-OH Nucleodex β-PM	cavity	native β-cyclodextrin permethylated-β-cyclodextrin	inclusion complexes	carboxylic acids, and esters, amides, imides, geometric and positional isomers
Resolvosil BSA-7	protein	bovine serum albumin	hydrophobic interactions polar interactions steric effects	wide variety of low MW pharmacologically active compounds

App ID 5424

Ethynylestradiol

Column: Nucleodex β-PM
Dimensions: 200 x 4.0 mm
Part No.: CH0-3027
Mobile Phase: Methanol/0.1 % TEAA pH 4.0 (70:30)
Flow Rate: 0.7 mL/min
Detector: UV @ 278 nm

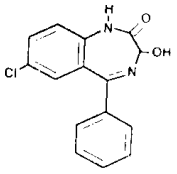


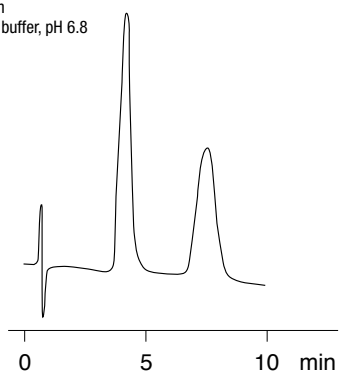


App ID 5425

Oxazepam

Column: Resolvosil BSA-7
Dimensions: 150 x 4.0 mm
Part No.: CH0-1998
Mobile Phase: 1 % 1-Propanol in 0.1 M Phosphate buffer, pH 6.8
Flow Rate: 2.0 mL/min
Detector: UV @ 230 nm





ORDERING INFORMATION

Nucleosil Chiral Columns

Part No.	Mfr. No.	Column Description	Size (mm)	Price
CH0-1994	720081.40	Nucleosil Chiral-1 L-hydroxyproline-Cu++ complex	250 x 4.0	
CH0-7047	721455.40	Nucleosil Chiral-1 guard column (requires adapter)	8 x 4.0	
CH0-1996	720088.40	Nucleosil Chiral-2 D-dinitrobenzoyl phenylglycine, Pirkle-type	250 x 4.0	
CH0-1997	720350.40	Nucleosil Chiral-3 L-dinitrobenzoyl phenylglycine, Pirkle-type	250 x 4.0	
CH0-3025	720124.40	Nucleodex ß-OH Cyclodextrin	200 x 4.0	
CH0-7048	721460.40	Nucleodex ß-OH guard column (requires adapter)	8 x 4.0	
CH0-3027	720125.40	Nucleodex ß-PM Cyclodextrin	200 x 4.0	
CH0-7049	721462.40	Nucleodex ß-PM guard column (requires adapter)	8 x 4.0	
CH0-1998	720046.40	Resolvosil BSA-7 300 Å pore, Protein-based	150 x 4.0	
CH0-5812	721359	Guard column adapter, 8 mm		

See p. 108 for additional Chiral stationary phases.