

- 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.

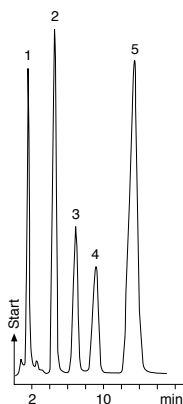
Material Characteristics

| 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. 3, 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

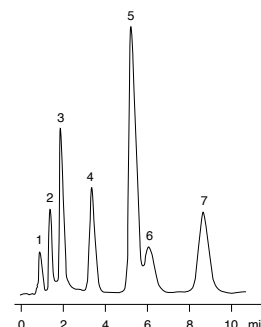
Column: Nucleosil 5 µm C18 100 Å
Dimensions: 250 x 3.2 mm
Part No: 00G-0323-RO
Mobile Phase: 0.05 M Phosphate buffer pH 7/Acetonitrile (7:2.5, v/v)
Flow Rate: 1.8 mL/min
Detection: UV @ 220 nm
Injection Volume: 10 µL
Sample:
 1. Ampicillin
 2. Oxacillin
 3. Cloxacillin
 4. Flucloxacillin
 5. Dicloxacillin



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. Thiogental



*Nucleosil® is a registered trademark of Macherey-Nagel

App ID 5409

Neurotransmitters

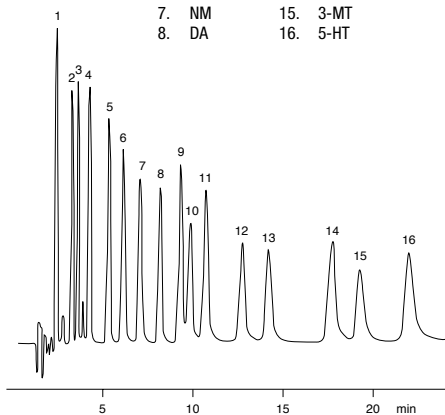
Column: Nucleosil 5 µm C18 100 Å
Dimensions: 150 x 4.6 mm
Part No: 00F-0323-E0
Mobile Phase: 0.1 mol/L citrate buffer, 0.3 mmol/L Na₂EDTA, 0.293 mmol/L octyl sulphate in Acetonitrile/Water (6.3:93.7) pH 2.35

Flow Rate: 1.2 mL/min

Detection: EC +1.2 V

Sample:

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



App ID 5418

Inorganic Anions

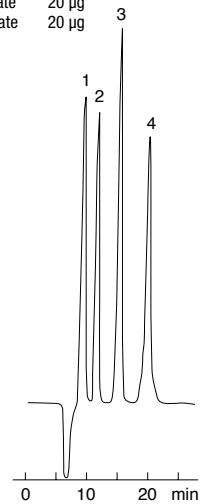
Column: Nucleosil 10 µm SB 100 Å
Dimensions: 250 x 4.6 mm
Part No: 00G-0333-E0
Mobile Phase: 0.03 M Sodium salicylate, pH 4.0

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)

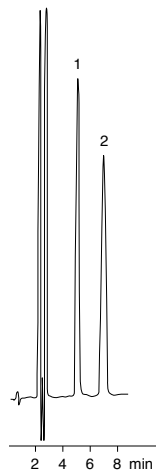
Flow Rate: 1.0 mL/min

Detection: UV

Temperature: 25 °C

Sample: 20 µL

1. Acetanilide
2. Prednisone



*Chromatogram courtesy of Pradip Patel, Lannett Company.

App ID 5419

Hop Resins

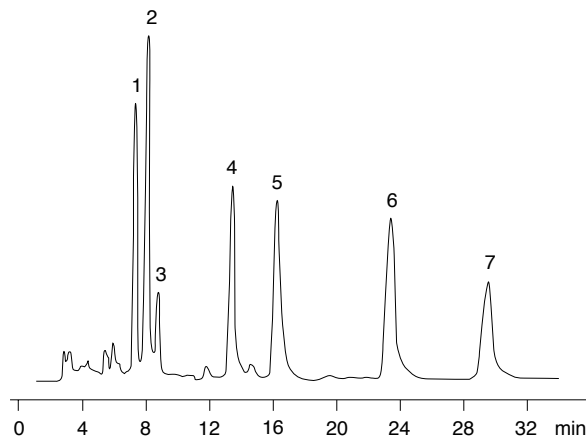
Column: Nucleosil 5 µm C18
Dimensions: 250 x 4.6 mm
Part No: 00G-0323-E0
Mobile Phase: 1660 mL Methanol/380 mL Water/1 mL 0.1M EDTA

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



ORDERING INFORMATION

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

| 3 µm 100 Å Columns (mm) | | | | | | | | | | SecurityGuard™ Cartridges | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|---------------------------|--|
| 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 | 4 x 2.0 mm* /10pk | 4 x 3.0 mm* /10pk | |
| Silica | — | — | 00D-0367-R0 | — | 00E-0367-D0 | — | — | 00F-0367-E0 | AJO-4347 | AJO-4348 | |
| C18 | 00B-0319-B0 | 00F-0319-B0 | — | 00F-0319-R0 | 00E-0319-D0 | 00B-0319-E0 | 00D-0319-E0 | 00F-0319-E0 | AJO-4286 | AJO-4287 | |

for ID: 2.0-3.0 mm 3.2-8.0 mm

| 5, 7, and 10 µm 100 Å Columns (mm) | | | | | | | | | | SecurityGuard™ Cartridges | | |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------|----------------------|---------------------|
| 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 | 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 | — | AJO-4347 | AJO-4348 | AJO-7223 |
| 5µm C8 | 00F-0322-B0 | — | — | — | 00E-0322-D0 | 00G-0322-D0 | 00F-0322-E0 | 00G-0322-E0 | — | AJO-4289 | AJO-4290 | AJO-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 | AJO-4286 | AJO-4287 | AJO-7221 |
| 5µm CN | — | 00G-0324-B0 | — | — | 00E-0324-D0 | — | 00F-0324-E0 | 00G-0324-E0 | — | AJO-4304 | AJO-4305 | AJO-7213 |
| 5µm SA | 00F-0325-B0 | — | — | — | 00E-0325-D0 | 00G-0325-D0 | 00F-0325-E0 | 00G-0325-E0 | — | AJO-4307 | AJO-4308 | AJO-7369 |
| 5µm SB | — | — | — | — | — | 00G-0326-D0 | 00F-0326-E0 | 00G-0326-E0 | — | AJO-4310 | AJO-4311 | AJO-7370 |
| 5µm NH ₂ | — | — | — | — | — | 00G-0327-D0 | 00F-0327-E0 | 00G-0327-E0 | — | AJO-4301 | AJO-4302 | AJO-7364 |
| 5µm NO ₂ | — | — | — | — | — | — | — | 00G-0307-E0 | — | — | — | — |
| 7µm Phenyl | — | — | — | — | — | — | 00F-0305-E0 | 00G-0305-E0 | — | AJO-4350 | AJO-4351 | AJO-7314 |
| 10µm Silica | — | — | — | — | — | — | — | 00G-0328-E0 | — | AJO-4347 | AJO-4348 | AJO-7223 |
| 10µm C18 | — | — | — | — | 00E-0330-D0 | 00G-0330-D0 | 00F-0330-E0 | 00G-0330-E0 | 00G-0330-N0 | AJO-4286 | AJO-4287 | AJO-7221 |
| 10µm CN | — | — | — | — | — | 00G-0331-D0 | — | 00G-0331-E0 | — | AJO-4304 | AJO-4305 | AJO-7213 |
| 10µm SA | — | — | — | — | — | — | 00F-0332-E0 | 00G-0332-E0 | — | AJO-4307 | AJO-4308 | AJO-7369 |
| 10µm SB | — | — | — | — | — | — | — | 00G-0333-E0 | — | AJO-4310 | AJO-4311 | AJO-7370 |
| 10µm NH ₂ | — | — | — | — | — | — | — | 00G-0334-E0 | — | AJO-4301 | AJO-4302 | AJO-7364 |

for ID: 2.0-3.0 mm 3.2-8.0 mm 9-16 mm

| 3 µm 120 Å Columns (mm) | | | | | | | | SecurityGuard™ Cartridges | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|---------------------|----------------------|---------------------------|--|
| Phases | 150 x 2.0 | 150 x 3.2 | 125 x 4.0 | 100 x 4.6 | 150 x 4.6 | 4 x 2.0 mm* /10k | 4 x 3.0 mm* /10pk | | |
| C8 | — | — | — | — | 00D-0335-E0 | 00F-0335-E0 | AJO-4289 | AJO-4290 | |
| C18 | 00F-0339-B0 | 00F-0339-R0 | 00E-0339-D0 | 00D-0339-E0 | 00F-0339-E0 | — | AJO-4286 | AJO-4287 | |

for ID: 2.0-3.0 mm 3.2-8.0 mm

| 5 µm 120 Å Columns (mm) | | | | | | | | SecurityGuard™ Cartridges | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|----------------------|----------------------|---------------------------|--|--|
| Phases | 250 x 3.2 | 250 x 4.0 | 150 x 4.6 | 250 x 4.6 | 250 x 10 | 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 | AJO-4286 | AJO-4287 | AJO-7221 | | |

for ID: 2.0-3.0 mm 3.2-8.0 mm 9-16 mm

| 5 µm 300 Å Columns (mm) | | | | | | | | SecurityGuard™ Cartridges | | |
|-------------------------|-------------|-------------|-------------|-------------|-------------|----------------------|----------------------|---------------------------|----------|--|
| Phases | 250 x 2.0 | 250 x 4.0 | 150 x 4.6 | 250 x 4.6 | 250 x 10 | 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 | — | — | AJO-4329 | AJO-4330 | AJO-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 | — | AJO-4320 | AJO-4321 | AJO-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 |

| 100 Å HD, AB, Protect I | | | | |
|-------------------------|-----------|----------------|-----------|-------|
| Part No. | Mfr. No. | Description | Size (mm) | Price |
| CHO-4752 | 720193.46 | 3 µm C18 HD | 150 x 4.6 | |
| CHO-4753 | 720192.46 | 3 µm C18 HD | 250 x 4.6 | |
| CHO-4754 | 720194.46 | 5 µm C8 HD | 150 x 4.6 | |
| CHO-4755 | 720196.46 | 5 µm C8 HD | 250 x 4.6 | |
| CHO-4756 | 720294.46 | 5 µm C18 HD | 150 x 4.6 | |
| CHO-4757 | 720280.46 | 5 µm C18 HD | 250 x 4.6 | |
| CHO-4542 | 720174.46 | 5 µm Protect I | 150 x 4.6 | |
| CHO-4543 | 720170.46 | 5 µm Protect I | 250 x 4.6 | |
| CHO-4758 | 720935.46 | 5 µm C18 AB | 125 x 4.6 | |
| CHO-4759 | 720936.46 | 5 µm C18 AB | 250 x 4.6 | |

*SecurityGuard™ Analytical Cartridges require holder, Part No.: KJO-4282

†Semi-prep SecurityGuard™ Cartridges require holder, Part No.: AJO-7220



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

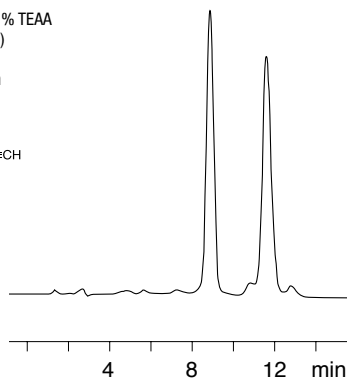
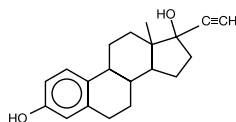
for resolving a wide range of enantiomeric pairs, including many important pharmaceutical, pesticide and biochemical compounds. Phenomenex offers the complete line of Macherey-Nagel chiral columns.

| 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 |

Ethynylestradiol

App ID 5424

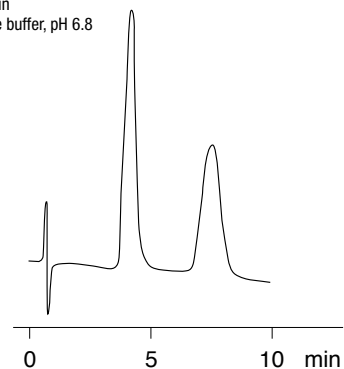
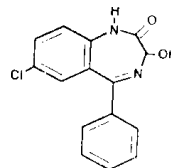
Column: Nucleodex β -PM
Dimensions: 200 x 4.0 mm
Part No.: CH0-3027
Mobile Phase: Methanol/0.1% TEAA
 pH 4.0 (70:30)
Flow Rate: 0.7 mL/min
Detector: UV @ 278 nm



Oxazepam

App ID 5425

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 β -OH Cyclodextrin | 200 x 4.0 | |
| CH0-7048 | 721460.40 | Nucleodex β -OH guard column (requires adapter) | 8 x 4.0 | |
| CH0-3027 | 720125.40 | Nucleodex β -PM Cyclodextrin | 200 x 4.0 | |
| CH0-7049 | 721462.40 | Nucleodex β -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.