thermo scientific

Hypersil GOLD HPLC Columns

Outstanding peak shape for your separations

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Hypersil GOLD Columns

Designed for improved chromatography, Thermo Scientific™ Hypersil GOLD™ columns are the culmination of 40 years of experience in the product development and manufacturing of HPLC media and columns. The range and capabilities of this state-of-the-art family of columns, with numerous chemistries and a range of particle sizes and hardware formats meet the challenges of modern chromatography.

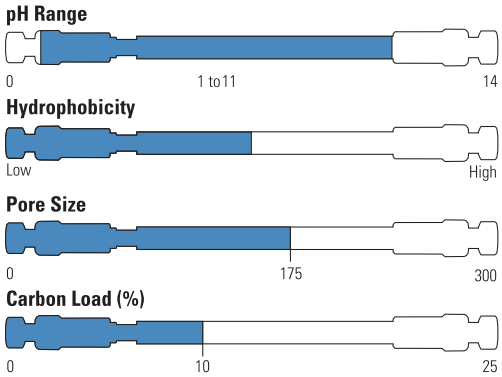
The highly pure Hypersil GOLD silica is manufactured, bonded and packed in ISO 9001:2008 accredited facilities, operating under strict protocols using robust procedures and extensive quality control testing. The manufacturing and bonding process creates an even surface with fewer silanols leading to reduced secondary interactions. This ensures consistent performance, column after column.

Hypersil GOLD HPLC columns are available in 12 different chemistries to optimize separations and maximize productivity. The extensive range of Hypersil GOLD columns offers chromatographers outstanding peak shape for reversed phase, ion exchange, HILIC or normal phase chromatography. With all 12 phases being available with 1.9 µm particle size, Hypersil GOLD columns offers chromatographers flexibility in choosing the correct column, whether they are using conventional or ultra-high pressure LC systems.

Improved Selectivity, Resolution and Productivity

Hypersil GOLD

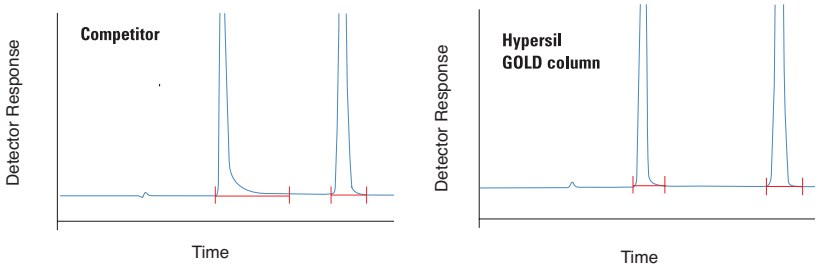
Outstanding peak shape using generic gradients with C18 selectivity



Particle Size 1.9 µm, 3 µm, 5 µm, 12 µm **USP** L1

Hypersil GOLD columns are based on highly pure silica and a novel proprietary derivatization and endcapping procedure using alkyl chain chemistry. This gives:

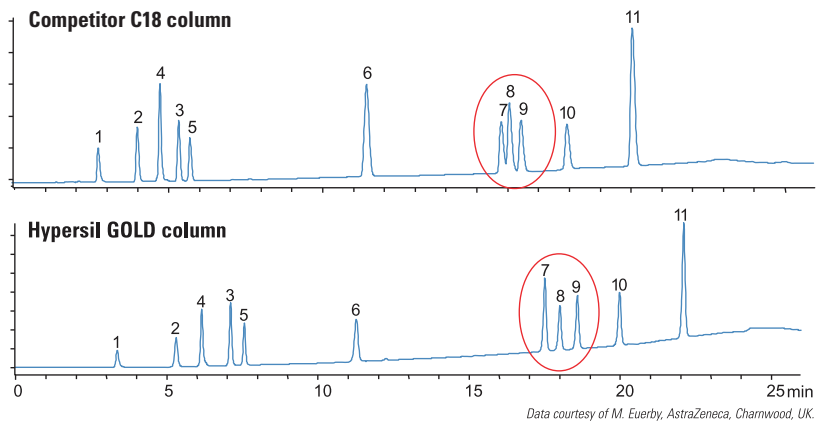
- Significant reduction in peak tailing while retaining C18 (USP L1) selectivity
- Excellent resolution, efficiency and sensitivity
- Confidence in the accuracy and quality of analytical data



Hypersil GOLD columns offer improved peak shape, even for basic analytes.

Enhanced Resolution

Robust assay development requires a clear definition of resolution expectations. Narrow symmetrical chromatographic peaks ensure that optimum resolution is achieved. Obtaining narrow peak widths is especially challenging for basic pharmaceutical compounds. The reduced silanol activity on Hypersil GOLD columns reduces tailing for basic analytes, thus improving resolution.



Data courtesy of M. Euerby, AstraZeneca, Charnwood, UK.

Hypersil GOLD columns provide excellent resolution between critical pairs, aiding separation of closely related species.

Improved Sensitivity

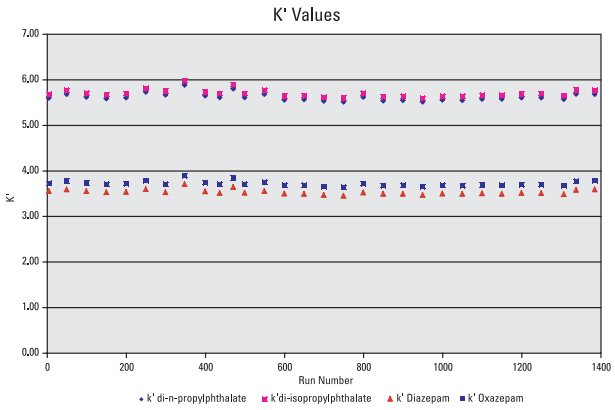
Outstanding peak shape results in greater sensitivity. When peaks exhibit tailing, peak height is reduced, therefore compromising the sensitivity of the analysis. The highly symmetrical peaks provided by Hypersil GOLD columns enhance peak height and allow for optimised peak integration calculations. This can be particularly critical when low concentrations of an analyte are present, for example in an impurity assay.

Reproducibility

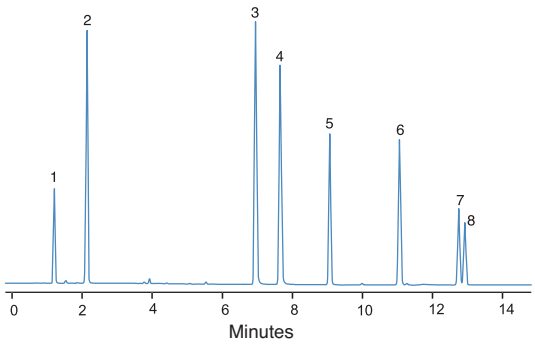
Our Hypersil GOLD columns are exceptionally reproducible for reliable chromatography, column after column. This allows the user to be confident that assays developed with Hypersil GOLD columns will be robust and stable for the life of the assay, making them an ideal choice for new method development.

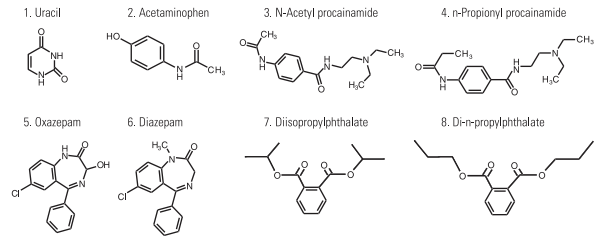
pH Stability

Our Hypersil GOLD columns are well suited to extended pH applications and have been shown to produce robust assays at high pH. At low pH, excellent column stability and reproducibility are illustrated over 1500 injections at pH 1.8.



Stability of Hypersil GOLD columns at low pH. No loss of retention after 28 L of mobile phase in 19.5 days of analysis.



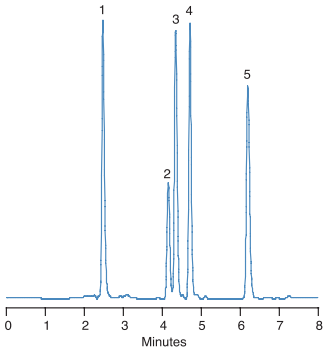


Column:	Hypersil GOLD , 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% ammonia pH 10.6
	B: Methanol + 0.1% ammonia
Gradient:	5–100% B in 15 min
Flow Rate:	1.0 mL/min
Injection Volume:	10 µL
Detection:	UV @ 254 nm
Temperature:	30 °C

High pH stability assay (pH 10.6) of Hypersil GOLD columns.

Pharmaceutical

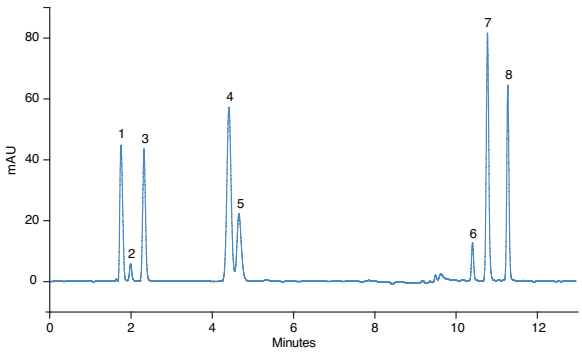
Cepha antibiotics



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% acetic acid B: Acetonitrile
Gradient:	20–70% B in 10 mins
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	25 °C

1. Cefadroxil
2. Cefaclor
3. Cephalexin
4. Cephradine
5. Cefazolin

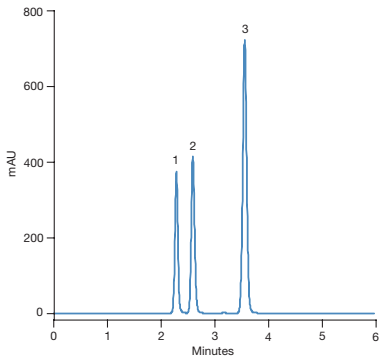
Cough/cold formulation



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: 20 mM ammonium formate at pH 3.0 B: Methanol	
Gradient:	Time (min)	% B
	0	10
	5	10
	10	70
Flow Rate:	1.5 mL/min	
Detection:	UV @ 270 nm	
Temperature:	25 °C	

1. 4-Amino phenol
2. (chlorpheniramine) maleate
3. Phenylephrine
4. Acetaminophen
5. Saccharin
6. Impurity from 4-Amino phenol
7. 4-Nitro phenol
8. Chlorpheniramine

Anaesthetics

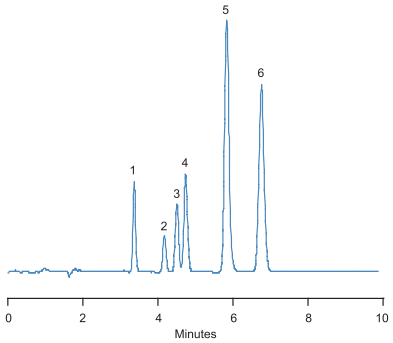


Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.05 M monopotassium phosphate pH 3 B: Acetonitrile
Isocratic:	50:50
Flow Rate:	1.25 mL/min
Detection:	UV @ 220 nm
Temperature:	25 °C

1. Lidocaine
2. Tetracaine
3. Benzocaine

Environmental

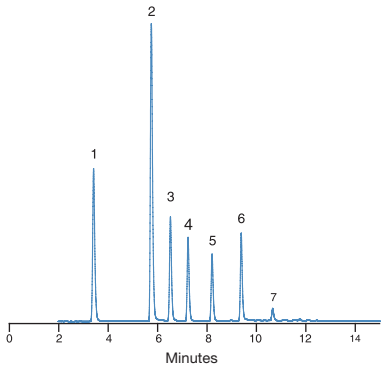
Polycyclic aromatic hydrocarbons



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Methanol
	B: Water
Isocratic:	75:25
Flow Rate:	1 mL/min
Detection:	UV @ 269 nm
Temperature:	25 °C

1. Naphthalene
2. Fluorene
3. Phenanthrene
4. Anthracene
5. Pyrene
6. Chrysene

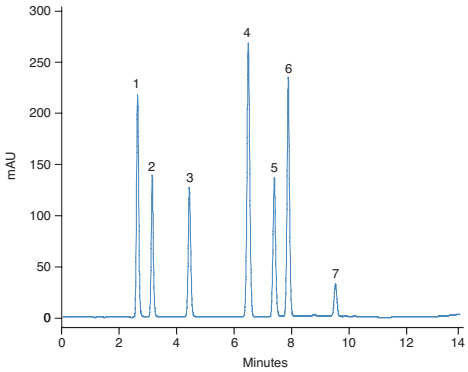
Banned aromatic amines



Column:	Hypersil GOLD, 3 µm, 150 × 2.1 mm
Mobile Phase:	A: 25 mM ammonium acetate at pH 5
	B: Acetonitrile
Gradient:	20–100% B in 10 min
Flow Rate:	0.2 mL/min
Detection:	UV @ 254 nm
Temperature:	40 °C

1. 2,4-Diaminotoluene
2. 4,4-Oxydianiline
3. o-Toluidine
4. 2-Methoxy-5-methylaniline
5. 2,4,5-Trimethylaniline
6. 4,4'-Methylene-bis (2-chloroaniline)
7. Unknown

Endocrine disruptors

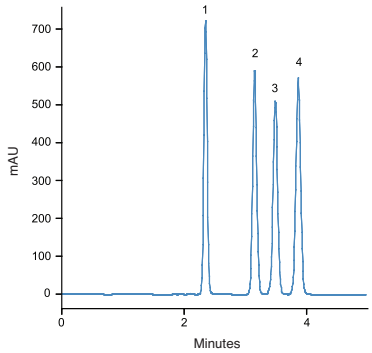


Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water
	B: Acetonitrile
Gradient:	25–70% B in 20 min
Flow Rate:	1.5 mL/min
Detection:	UV @ 220 nm
Temperature:	25 °C

1. Desethyl atrazine
2. Estriol
3. Simazine
4. Atrazine
5. Diuron
6. Bisphenol A
7. Estrone

Toxicology

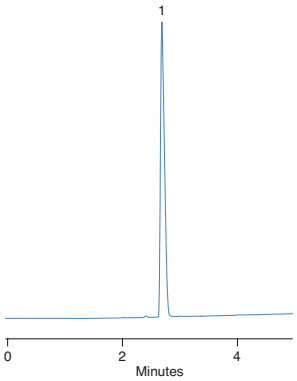
Testosterones



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water
	B: Acetonitrile
Isocratic:	43:57
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	25 °C

1. 11-Ketotestosterone
2. 19-Nortestosterone (nandrolone)
3. Testosterone
4. Epitestosterone

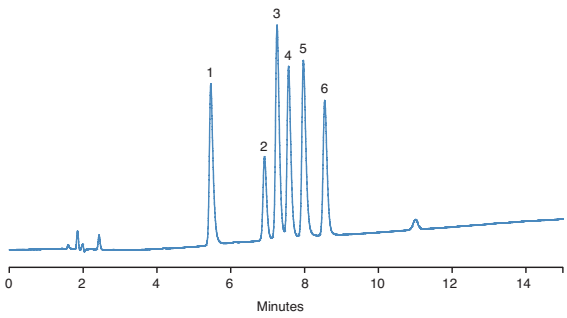
Chlorpromazine



Column:	Hypersil GOLD, 5 µm, 50 × 2.1 mm
Mobile Phase:	A: 0.1% formic acid
	B: Acetonitrile + 0.1% formic acid
Gradient:	15–80% B in 5 min
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	30 °C

1. Chlorpromazine

Tricyclic antidepressants

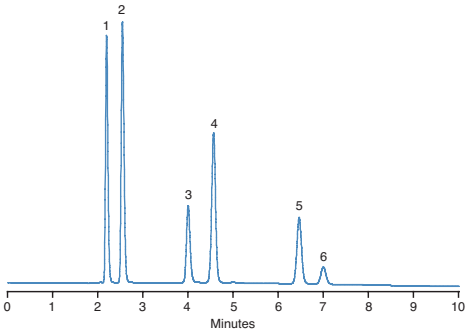


Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% formic acid
	B: Acetonitrile + 0.1% formic acid
Gradient:	30–50% B in 15 min
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	30 °C
Concentration:	2.5 ng/µL

1. Doxepin
2. Protriptyline
3. Imipramine
4. Nortriptyline
5. Amitriptyline
6. Trimipramine

Food Safety

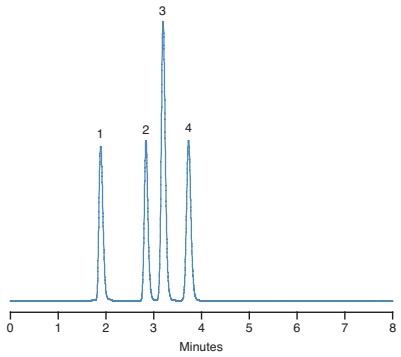
Energy drink additives



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 10 mM ammonium acetate at pH 5.0
	B: Methanol
Gradient:	30–45% B in 10 min
Flow Rate:	1 mL/min
Detection:	UV @ 230 nm
Temperature:	25 °C

1. Acesulfame
2. Saccharin
3. Caffeine
4. Benzoic acid
5. Sorbic acid
6. Aspartame

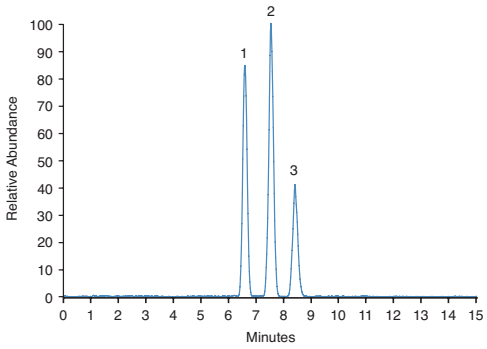
Coumaric acids



Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% formic acid
	B: Acetonitrile
Isocratic:	70:30
Flow Rate:	1 mL/min
Detection:	UV @ 270 nm
Temperature:	40 °C

1. Uracil
2. p-Coumaric Acid
3. m-Coumaric Acid
4. o-Coumaric Acid

Tocopherols

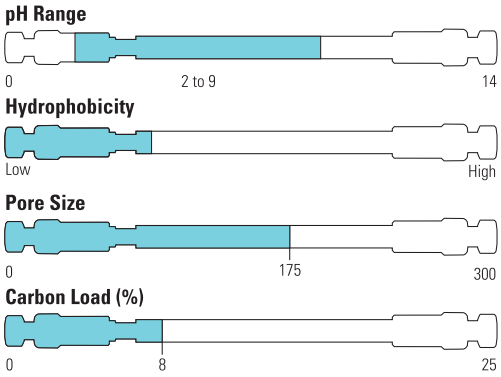


Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water
	B: Methanol
Isocratic:	5:95
Flow Rate:	1 mL/min
Detection:	-ESI
Temperature:	30 °C

1. δ-Tocopherol
2. γ-Tocopherol
3. α-Tocopherol

Hypersil GOLD C8

Enhanced resolution, efficiency, sensitivity and speed



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L7

- Analytes of medium hydrophobicity
- When a less hydrophobic phase is required to obtain adequate retention

Similar Selectivity but Less Retention than C18

Hypersil GOLD C8 media provides similar selectivity to C18 with a predictable elution order, but less retention. This feature is is particularly useful where lower hydrophobicity is needed in order to successfully retain compounds of of interest. Hypersil GOLD C8 columns are recommended for analytes of medium hydrophobicity or when a less hydrophobic phase is required to obtain adequate retention.

Faster Separations

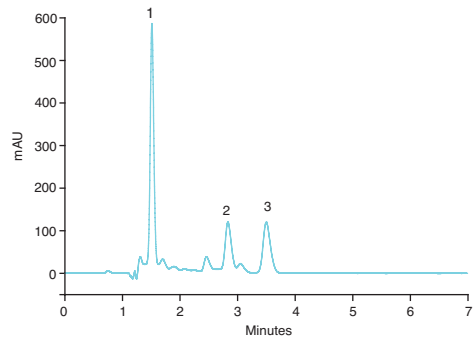
Hypersil GOLD C8 columns can provide improved throughput of analysis over that of a C18 alkyl chain chemistry. Hydrophobic interactions are reduced, allowing compounds to elute quicker from the column.

Excellent Peak Shapes with High Efficiency and Outstanding Sensitivity

Hypersil GOLD C8 columns provide very symmetrical peak shapes while also improving capabilities such as speed of analysis, efficiency and sensitivity.

Food Safety

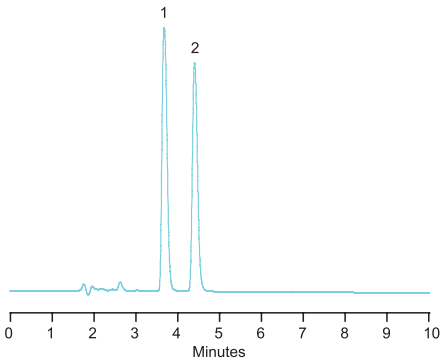
β-Carotene



Column:	Hypersil GOLD C8, 5 µm, 150 × 4.6 mm
Mobile Phase:	Methanol
Flow Rate:	1.5 mL/min
Detection:	UV @ 450 nm
Temperature:	25 °C

1. Lutein
2. Lycopene
3. β-Carotene

Fatty acids

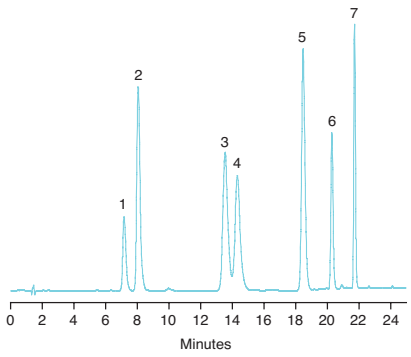


Column:	Hypersil GOLD C8, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% formic acid
	B: Acetonitrile
Isocratic:	15:85
Flow Rate:	1 mL/min
Detection:	UV @ 200 nm
Temperature:	25 °C

1. Linolenic Acid
2. Linoleic Acid

Environmental

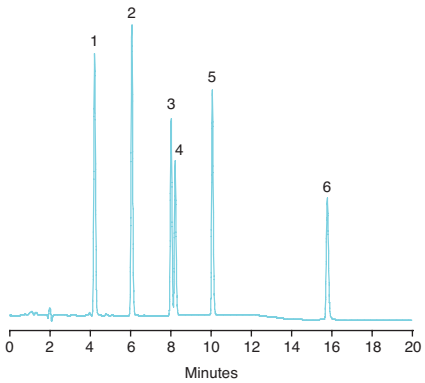
Triazines and uron herbicides



Column:	Hypersil GOLD C8, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: Water	
	B: Acetonitrile	
Gradient:	Time (min)	% B
	0	20
	15	23
	25	75
Flow Rate:	1.5 mL/min	
Detection:	UV @ 240 nm	
Temperature:	25 °C	

1. Simazine
2. Monuron
3. Chlorotoluron
4. Atrazine
5. Diuron
6. Propazine
7. Linuron

Phthalates

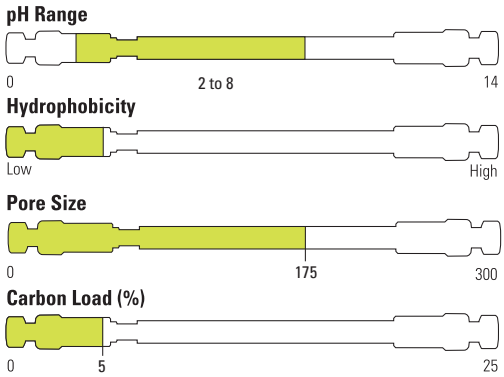


Column:	Hypersil GOLD C8, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water
	B: Acetonitrile
Gradient:	60–90% B in 10 min; hold 10 min
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	25 °C

1. Dimethyl phthalate
2. Diethyl phthalate
3. Dipropyl phthalate
4. Diisopropyl phthalate
5. Di-n-butyl phthalate
6. Di-n-octyl phthalate

Hypersil GOLD C4

Low hydrophobicity columns for less retention



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L26

- Analytes with high hydrophobicity
- When a less hydrophobic phase is required to obtain adequate retention

Lower Hydrophobicity for Faster Separations

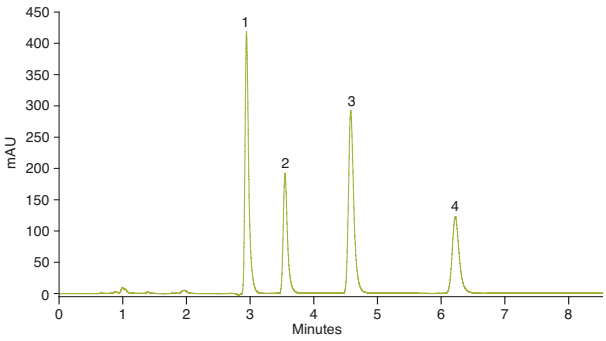
Hypersil GOLD C4 columns provide similar selectivity to C18 and C8 columns but with less retention. The shorter chain length and lower hydrophobic character make C4 a particularly useful stationary phase for the retention and separation of hydrophobic polypeptides and proteins.

Excellent Peak Shape, Showing High Efficiency and Outstanding Sensitivity

Based on the same highly pure silica, Hypersil GOLD C4 columns deliver excellent peak shape. For high speed, high efficiency separations, Hypersil GOLD C4 columns are available with 1.9 µm particle size.

Pharmaceutical

Parabens

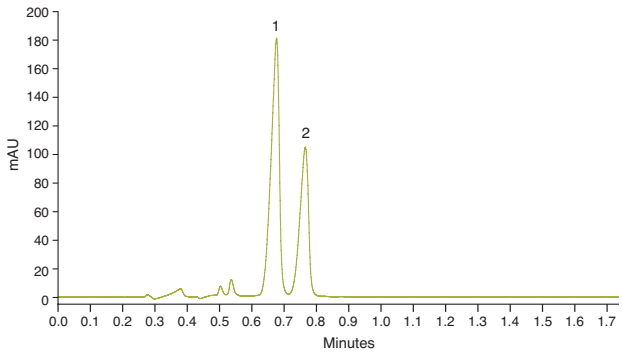


Column:	Hypersil GOLD C4, 5 µm, 150 × 4.6 mm
Mobile Phase:	Water/acetonitrile (50:50)
Flow Rate:	1.0 mL/min
Temperature:	25 °C
Detection:	214 nm
Injection volume:	10 µL

1. Methylparaben
2. Ethylparaben
3. Propylparaben
4. Butylparaben

Food safety

Fatty Acids

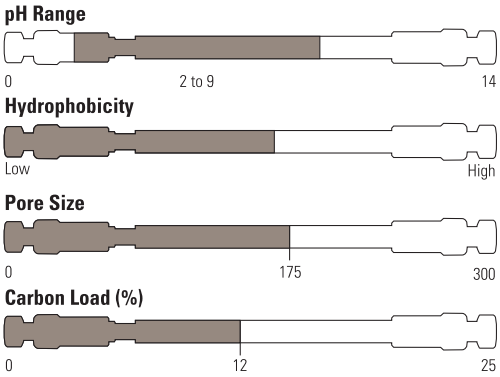


Column:	Hypersil GOLD C4, 1.9 µm, 100 × 2.1 mm
Mobile Phase:	Water/acetonitrile (20:80)
Flow Rate:	0.55 mL/min
Temperature:	30 °C
Detection:	200 nm
Injection volume:	1 µL

1. Linolenic acid
2. Linoleic acid

Hypersil GOLD aQ

Enhanced retention and resolution of polar analytes



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L1

- Analysis of water soluble vitamins and organic acids
- Use with highly aqueous mobile phase

Retention and Resolution of Polar Analytes

Because Hypersil GOLD aQ columns are packed with a polar endcapped C18 phase, they offer superior retention of polar compounds. Dispersive interactions are the primary mechanism of retention with alkyl chain bonded phases. The polar functional group used to endcap Hypersil GOLD aQ media provides an additional controlled interaction mechanism by which polar compounds can be retained and resolved. The resulting optimized peak shape provides excellent resolution sensitivity and efficiency, making Hypersil GOLD aQ columns ideal for the quantitative analysis of trace levels of polar analytes.

Polar Endcapped C18 Stationary Phase for Alternative Selectivity

The additional interaction mechanism often provides selectivity differences over the traditional alkyl chain chemistries, and offers a solution for the separation of polar compounds which exhibit insufficient retention on pure alkyl chain phases under typical reversed phase mobile phase conditions.

Ideal for Highly Aqueous Mobile Phases

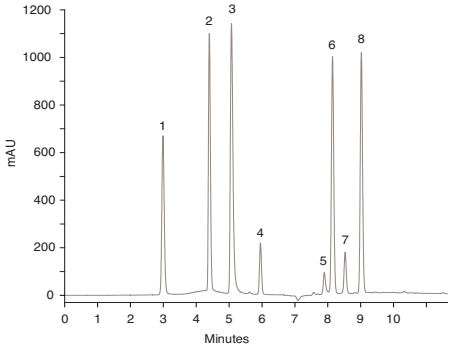
The wettability of reversed phase media can be increased by the introduction of polar functional groups. The polar endcapping of Hypersil GOLD aQ media also makes it usable in 100% aqueous mobile phases without the risk of loss of performance or poor stability.

Excellent Peak Shapes

Hypersil GOLD aQ silica ensures optimized peak shape, resolution, sensitivity and efficiency. Hypersil GOLD aQ columns provide only controlled secondary interactions to ensure excellent peak shape for all analyte types, making them ideal for the quantitative analysis of trace levels of polar analytes.

Food Safety

Water soluble vitamins

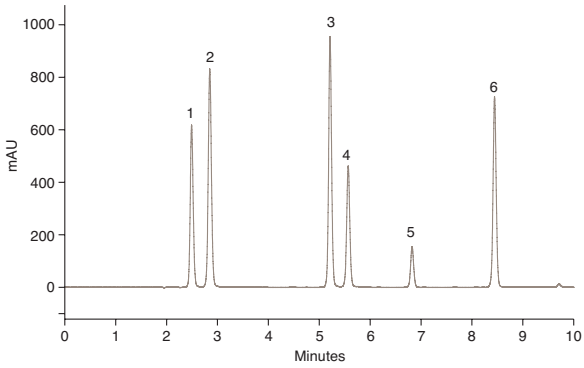


Column:	Hypersil GOLD aQ, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 50 mM monopotassium phosphate pH 3.5 B: Methanol
Gradient:	0–100% B in 15 min
Flow Rate:	1 mL/min
Detection:	UV @ 205 nm

1. Vitamin B1 (thiamine)
2. Vitamin B6 (pyridoxine)
3. Vitamin B3 (nicotinamde)
4. Vitamin B5 (pantothenic acid)
5. Folic Acid
6. Vitamin B12 (cyanocobalamin)
7. Vitamin H (biotin)
8. Vitamin B2 (riboflavin)

Pharmaceutical

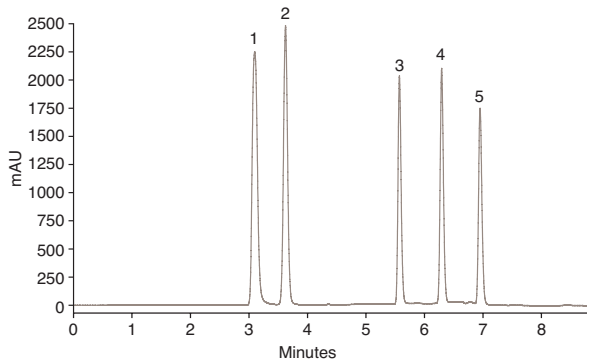
Sulfonamides



Column:	Hypersil GOLD aQ, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 0.1% formic acid B: Acetonitrile + 0.1% formic acid
Gradient: 1	0–100% B in 15 min
Flow Rate:	1.0 mL/min
Detection:	UV @ 270 nm
Temperature:	30 °C

1. Sulfaguanidine
2. Sulfanilamide
3. Sulfathiazole
4. Sulfamerazine
5. Sulfamonomethoxine
6. Sulfaquinoxaline

Xanthines

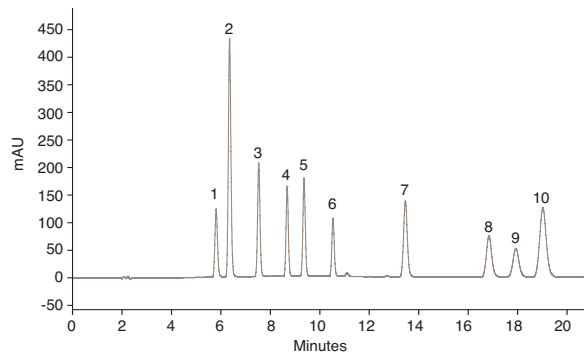


Column:	Hypersil GOLD aQ, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 50 mM monosodium phosphate pH 2.5 B: Methanol
Gradient:	1–100% B in 10 min
Flow Rate:	1 mL/min
Detection:	UV @ 254 nm
Temperature:	30 °C

1. Hypoxanthine
2. Xanthine
3. Theobromine
4. Theophylline
5. Caffeine

Biochemical

PTH amino acids

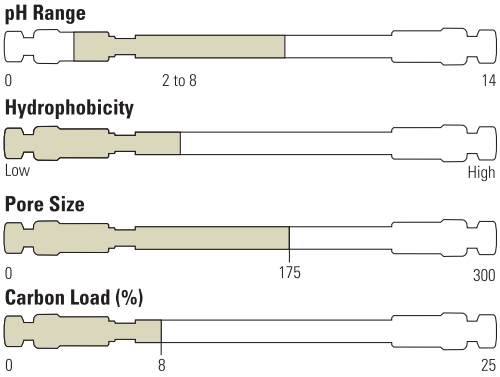


Column:	Hypersil GOLD, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: 0.1% tetrahydrofuran + 0.015% triethylamine in water B: 0.1% tetrahydrofuran + 0.015% triethylamine in acetonitrile	
Gradient:	Time (min)	% B
	0	17
	2	20
	7	35
	20	35
Flow Rate:	1 mL/min	
Detection:	UV @ 269 nm	
Temperature:	25 °C	

1. Serine
2. Asparagine
3. Aspartic acid
4. Glutamic acid
5. Alanine
6. Tyrosine
7. Methionine
8. Tryptophan
9. Phenylanaline
10. Leucine

Hypersil GOLD PFP

Unique selectivity with perfluorinated columns



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L43

- Analyzing difficult to resolve mixtures of halogenated compounds
- Non-halogenated polar aromatic compounds
- Analysis of complex taxane samples

Alternative Selectivity to C18 with Excellent Peak Shape and Sensitivity

Hypersil GOLD PFP (pentafluorophenyl) columns build on the performance of Hypersil GOLD silica by providing excellent peak shapes while also offering alternative selectivity in reversed phase chromatography compared to alkyl chain phases. The Hypersil GOLD PFP manufacturing process provides improvements in speed of analysis, peak shape and sensitivity over other fluorinated phases.

Extra Retention for Halogenated Species

Introduction of fluorine groups into the stationary phase causes significant changes in solute-stationary phase interactions. This can lead to extra retention and selectivity for positional isomers of halogenated compounds.

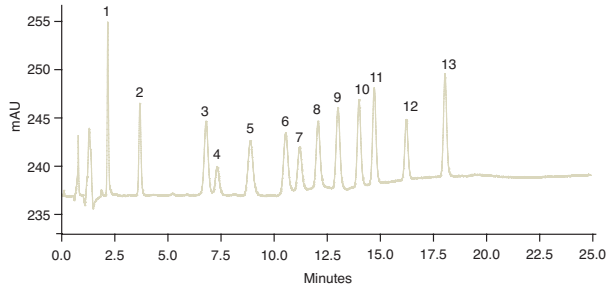
Unique Selectivity for Non-Halogenated Polar Compounds

Hypersil GOLD PFP Columns are also well suited to the selective analysis of non-halogenated compounds, in particular polar compounds containing hydroxyl, carboxyl, nitro, or other polar groups. High selectivity is often most apparent when the functional groups are located on an aromatic or other rigid ring system.

Hypersil GOLD PFP columns are particularly suited to the analysis of compounds containing substituted aromatic rings. This is because the fluorine atoms around the phenyl ring enhance pi-pi interactions increasing retention and selectivity.

Pharmaceutical

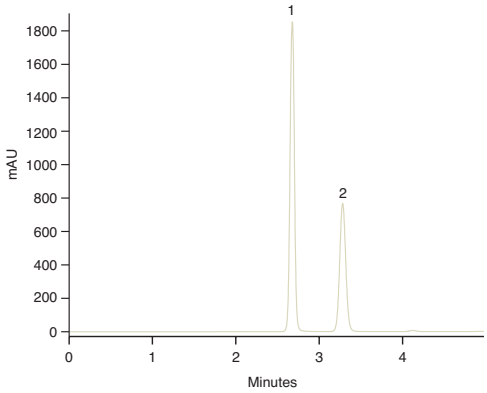
Taxanes



Column:	Hypersil GOLD PFP, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water
	B: Methanol/acetonitrile (7:93)
Gradient:	Time (min) % B
	0 35
	7 35
	25 58
Flow Rate:	1.5 mL/min
Detection:	UV @ 220 nm

1. 10 -Deacetyl baccatin
2. Baccatin III
3. 10-Deacetyl-7-xylosyl taxol B
4. Taxinine M
5. 10-Deacetyl-7-xylosyl taxol
6. 10-Deacetyl taxol
7. 10-Deacetyl-7-xylosyl taxol C
8. 7-Xylosyl taxol
9. Cephalomanine
10. 10-Deacetyl-7epitaxol
11. Paclitaxol
12. Taxol C
13. 7-Epitaxol

Fluorinated nucleic bases

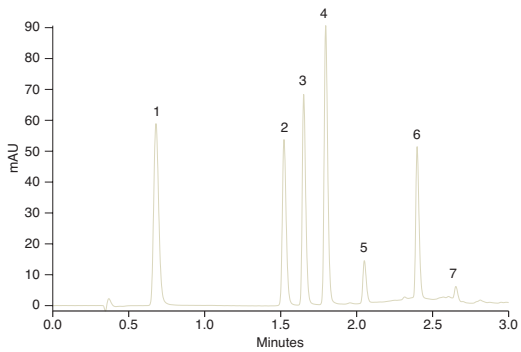


Column:	Hypersil GOLD PFP, 5 µm, 150 × 4.6 mm
Mobile Phase:	Water + 0.1% tetrahydrofuran
Flow Rate:	1.0 mL/min
Temperature:	30 °C
Detection:	UV @ 220 nm

1. Fluorocytosine
2. Fluorouracil

Environmental

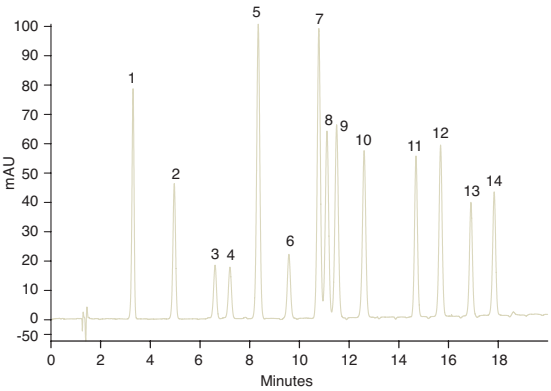
Banned aromatic amines



Column:	Hypersil GOLD PFP, 1.9 µm, 50 × 2.1 mm
Mobile Phase:	A: 25 mM ammonium acetate pH 5.0
	B: Acetonitrile
Gradient:	10–100% B in 3 mins
Flow Rate:	0.5 mL/min
Temperature:	40 °C
Detection:	UV @ 254 nm (2 µL flow cell)
Injection Volume:	0.5 µL

1. 2,4-Diaminotoluene
2. o-Toluidine
3. 4,4-Oxydianiline
4. 2-Methoxy-5-Methylaniline
5. 2,4,5-Trimethylaniline
6. 4,4-Methylene-bis (2-chloroaniline)
7. Impurity from Analyte No. 6

Phenolic positional isomers

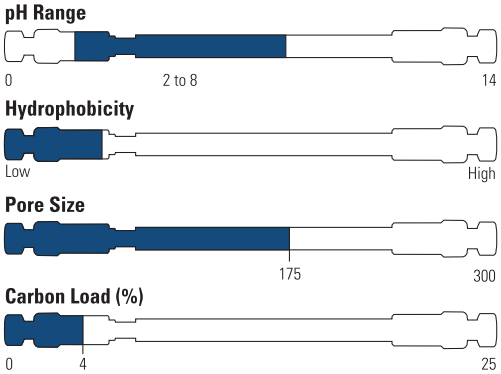


Column:	Hypersil GOLD PFP, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water + 0.1% formic acid
	B: Acetonitrile + 1.0% formic acid
Gradient:	15–45% B in 20 mins
Flow Rate:	1.5 mL/min
Temperature:	25 °C
Detection:	UV @ 270 nm
Injection Volume:	5 µm

1. 3,4-Dimethoxyphenol
2. 2,6-Dimethoxyphenol
3. 2,6-Difluorophenol
4. 3,5-Dimethoxyphenol
5. 2,4-Difluorophenol
6. 2,3-Difluorophenol
7. 3,4-Difluorophenol
8. 3,5-Dimethoxyphenol
9. 2,6-Dimethoxyphenol
10. 2,6-Dichlorophenol
11. 4-Chloro-3-Methylphenol
12. 3,4-Dichlorophenol
13. 4-Chloro-2-Methylphenol
14. 3,5-Dichlorophenol

Hypersil GOLD CN

Cyano columns for reversed and normal phase separations



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L10

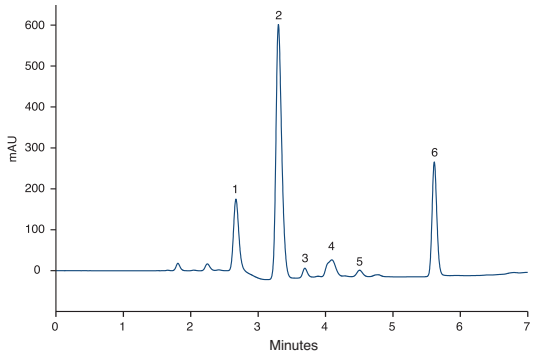
- Steroids and polyphenols in reversed phase
- Surfactants and other polar species in normal phase

Alternative Selectivity with Lower Hydrophobicity than C18

Hypersil GOLD CN columns offer alternative selectivity in reversed phase chromatography with lower hydrophobicity compared to C18 alkyl chain phases. Hypersil GOLD CN columns can also be used in normal phase chromatography, where they offer less retention and different selectivity compared to silica columns.

Pharmaceutical

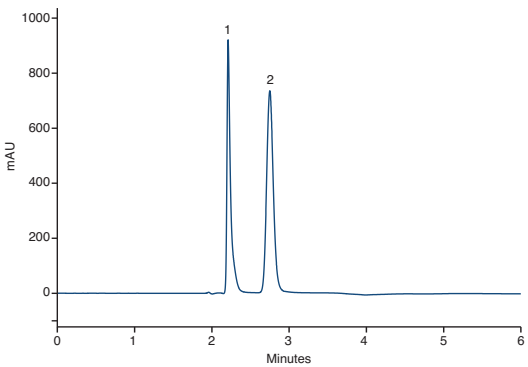
Penicillins



Column:	Hypersil GOLD CN, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: 10 mM potassium phosphate pH3	
	B: Acetonitrile	
Gradient:	Time (mins)	% B
	0	0
	1	10
	8	70
Flow Rate:	1.25 mL/min	
Temperature:	25 °C	
Detection:	UV @ 220 nm	

1. N-acetyl Penicillamine
2. Ampicillin
3,4,5. Impurities from Penicillin G
6, Penicillin G

TB Drugs

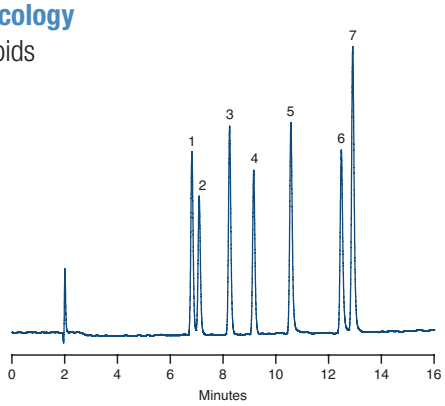


Column:	Hypersil GOLD CN, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: 20 mM ammonium formate pH3	
	B: Acetonitrile	
Gradient:	Time (mins)	% B
	0	0
	15	20
Flow Rate:	1.0 mL/min	
Temperature:	25 °C	
Detection:	UV @ 254 nm	

1. Isoniazid
2. Pyrazinamide

Toxicology

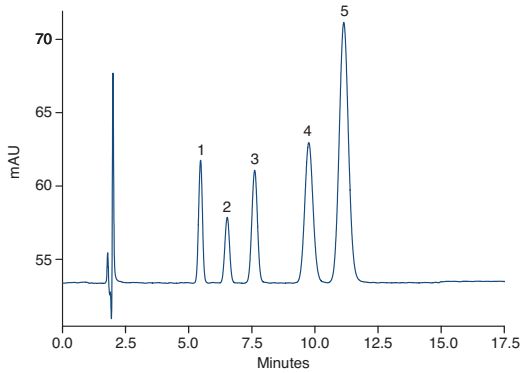
Steroids



Column:	Hypersil GOLD CN, 5 µm, 150 × 4.6 mm	
Mobile Phase:	A: Water	
	B: Acetonitrile	
Gradient:	Time (mins)	% B
	0	10
	15	50
Flow Rate:	1.5 mL/min	
Temperature:	25 °C	
Detection:	UV @ 254 nm	

1. Hydrocortisone
2. Cortisone
3. Corticosterone
4. 11-α Hydroxprogesterone
5. 17-α Hydroxprogesterone
6. Progesterone
7. Deoxycorticosterone

Organic acids

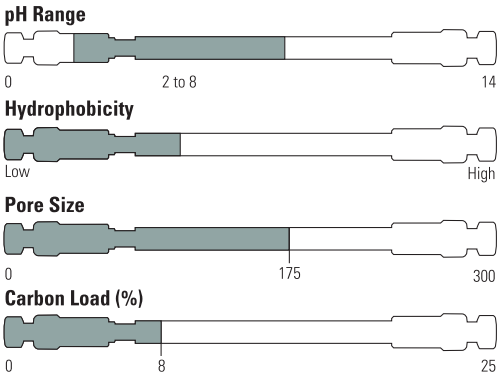


Column:	Hypersil GOLD CN, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 25 mM potassium phosphate pH2
	B: Methanol
Isocratic:	95% A: 5% B
Flow Rate:	1.5 mL/min
Temperature:	25 °C
Detection:	UV @ 230 nm

1. 4-Fluorobenzoic
2. o-Toluic Acid
3. p-Toluic Acid
4. 2,4,6-Trimethylbenzoic Acid
5. 2,5-Dimethylbenzoic Acid

Hypersil GOLD Phenyl

Excellent retention and unique selectivity for aromatic analytes



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L11

- Analyte mixtures with varying polarity and aromaticity
- Where alternative selectivity to C18 is required

Alternative Selectivity for Aromatic and Moderately Polar Analytes

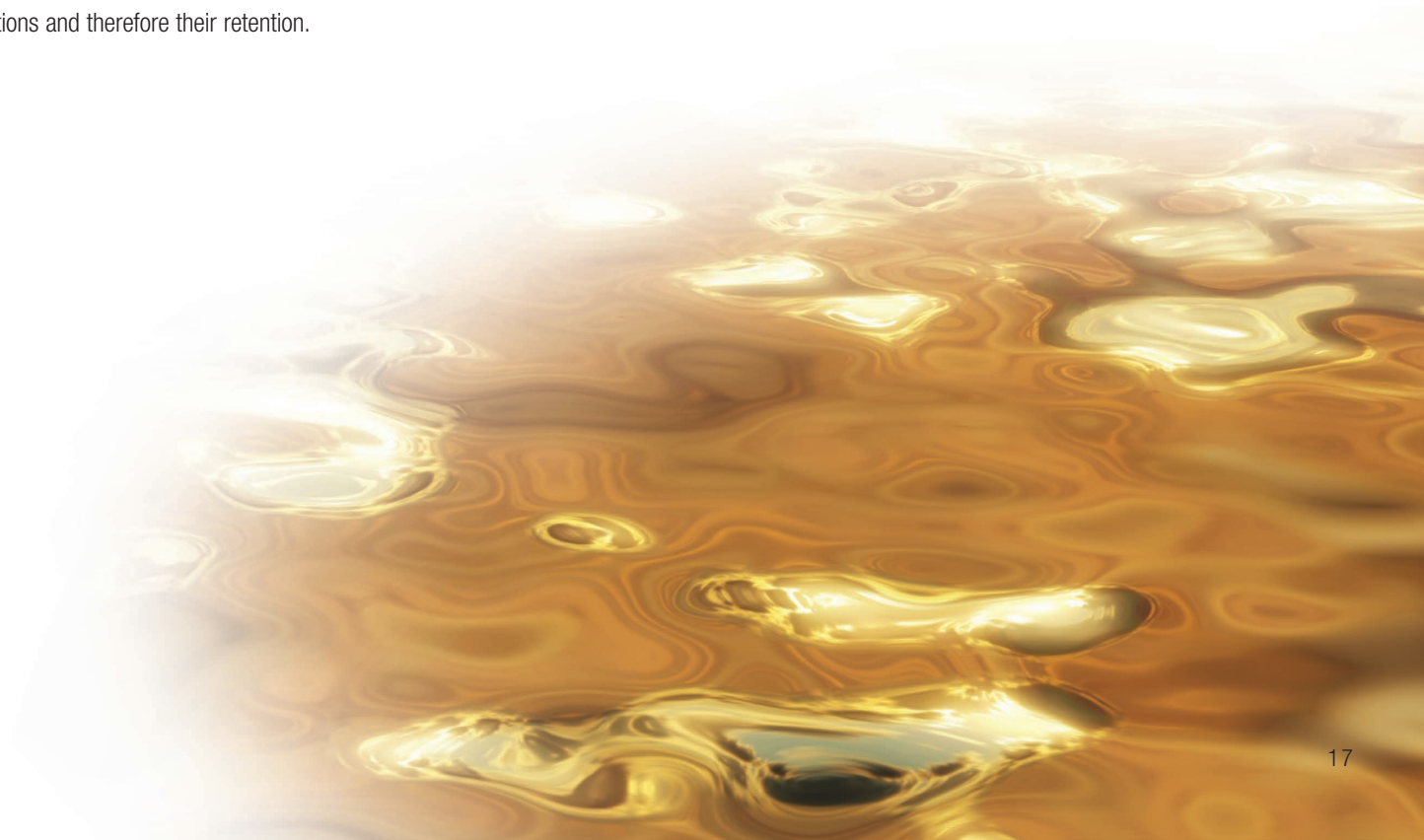
Hypersil GOLD Phenyl reversed phase HPLC columns exhibit alternative selectivity to alkyl chain columns, particularly for aromatic and moderately polar analytes.

Enhanced Pi-Pi Interactions with Aromatics

Many phenyl phases use a propyl (C3) linker between the silica and the phenyl ring. The Hypersil GOLD Phenyl bonded phase contains a butyl (C4) linker which allows for superior alignment of the phenyl ring with aromatic molecules, enhancing pi-pi interactions and therefore their retention.

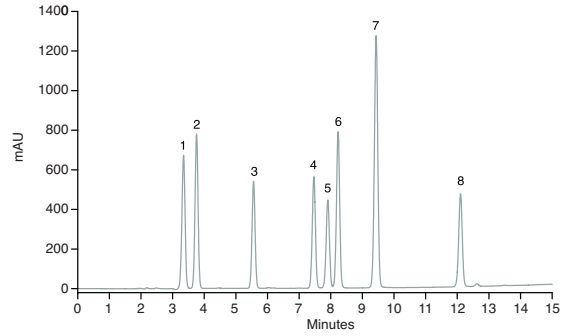
Moderate Hydrophobicity

The C4 linker also provides the stationary phase with moderate hydrophobicity, making it ideal for the separation of analyte mixtures with varying polarity and aromaticity.



Pharmaceutical

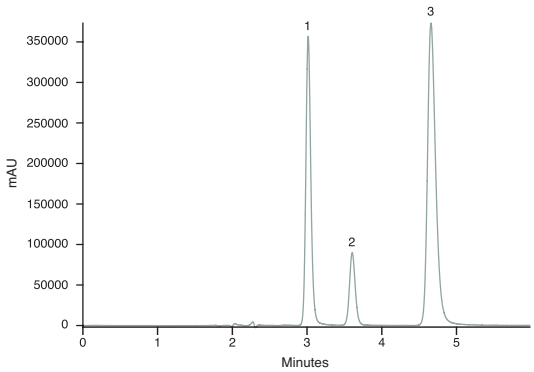
Antibacterials



Column:	Hypersil GOLD Phenyl, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: 20 mM potassiumn phosphate pH 2.5 B: Acetonitrile
Gradient:	20–50% B in 15 mins
Flow Rate:	1 mL/min
Temperature:	30 °C
Injection Volume:	5 µL
Detection:	UV @ 225 nm

1. Carbadox
2. Thiamphenicol
3. Furazolidone
4. Oxolinic Acid
5. Sulfadimethoxine
6. Sulfaquinoxaline
7. Nalidixic Acid
8. Piromidic Acid

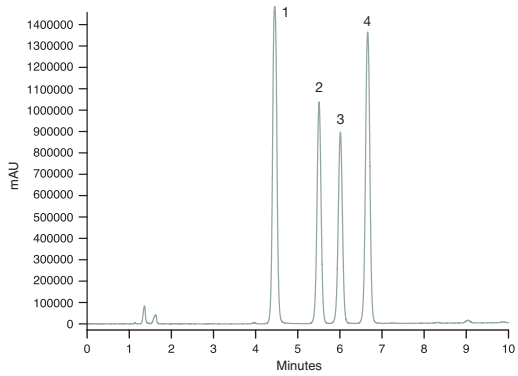
Antacids



Column:	Hypersil GOLD Phenyl, 5 µm, 150 × 4.6 mm
Mobile Phase:	20 mM potassium phosphate pH 7.0/ acetonitrile (80/20)
Flow Rate:	1 mL/min
Temperature:	25 °C
Injection Volume:	5 µL
Detection:	UV @ 254 nm

1. Famotidine
2. Cimetidine
3. Ranitidine

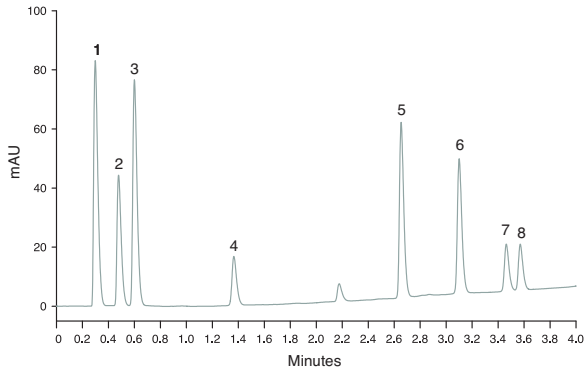
Veterinary drug coccidiostats



Column:	Hypersil GOLD Phenyl, 5 µm, 150 × 4.6 mm
Mobile Phase:	A: Water B: Methanol
Gradient:	40–70% B in 10 mins
Flow Rate:	1 mL/min
Temperature:	25 °C
Injection Volume:	5 µL
Detection:	UV @ 260 nm

1. 4-amino-3,5-dinitrobenzamide
2. Zoalene (3,5-nitro-o-toluamide
3. Nitromid (3,5-dinitrobenzamide)
4. Ethopabate

Antidepressants

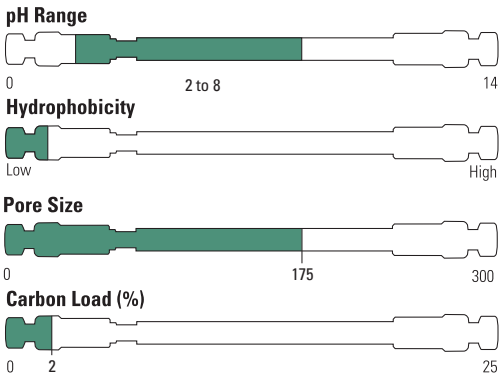


Column:	Hypersil GOLD Phenyl, 1.9 µm, 50 × 2.1 mm
Mobile Phase:	A: 0.1% formic acid B: 0.1% formic acid in acetonitrile
Gradient:	10–60% B in 3.4 min 60–90% B in 0.24 min
Flow Rate:	0.5 mL/min
Temperature:	60 °C
Injection Volume:	0.7 µL
Detection:	UV @ 225 nm and 254 nm

1. Uracil
2. Acetaminophen
3. p-Hydroxybenzoic acid
4. o-Hydroxybenzoic acid
5. Oxazepam
6. Diazepam
7. Di-isopropyl phthalate
8. Di-n-propyl phthalate

Hypersil GOLD Amino

Highly versatile aminopropyl stationary phase



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L8

- Retains anions and organic acids in weak anion exchange
- Excellent for carbohydrate analysis in HILIC

Outstanding Peak Shape and Sensitivity

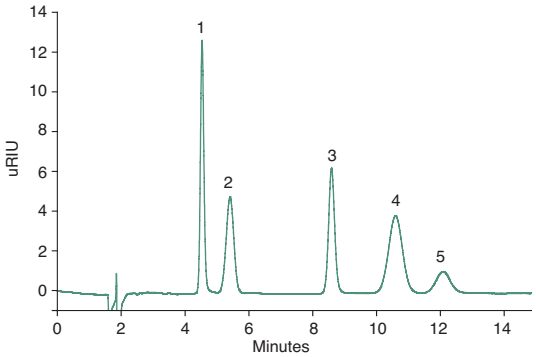
Based on the same highly pure silica backbone, Hypersil GOLD Amino columns offer improved peak shape over type A silica columns. For high speed, high efficiency separations, Hypersil GOLD Amino columns are available with 1.9 µm particle size.

Excellent Chromatographic Properties in Four Modes: Weak Anion Exchange, Reversed Phase, HILIC and Normal Phase

Hypersil GOLD Amino columns can be used with common buffers and an organic modifier as a weak ion exchange material for the analysis of anions and organic acids. When used under normal phase conditions, Hypersil GOLD Amino columns offer an alternative selectivity to silica. Hypersil GOLD Amino columns excel for carbohydrate analysis when used in HILIC mode.

Food Safety

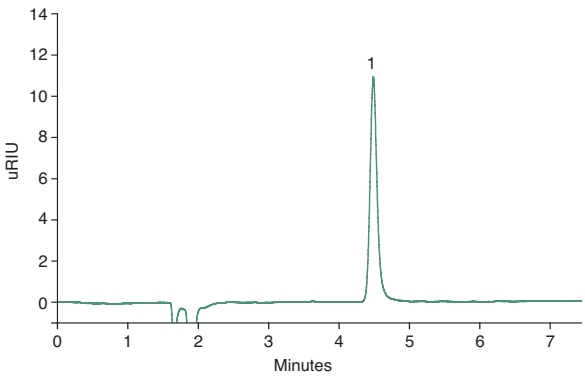
Sugars



Column:	Hypersil GOLD Amino, 5 µm, 150 × 4.6 mm
Mobile Phase:	Acetonitrile/water (80:20)
Flow Rate:	1.2 mL/min
Temperature:	35 °C
Detection:	RI
Injection Volume:	20 µL

1. Fructose
2. Glucose
3. Sucrose
4. Maltose
5. Lactose

Sorbitol

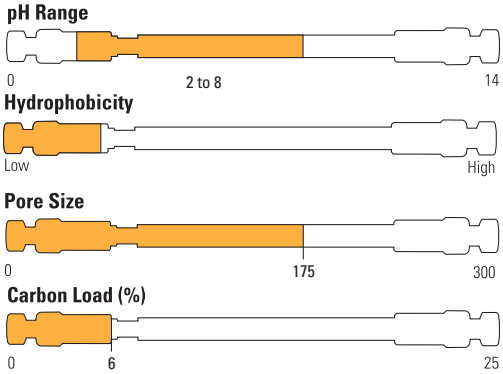


Column:	Hypersil GOLD Amino, 5 µm, 150 × 4.6 mm
Mobile Phase:	Acetonitrile/water (80:20)
Flow Rate:	1.2 mL/min
Temperature:	35 °C
Detection:	RI
Injection Volume:	20 µL

1. Sorbitol

Hypersil GOLD AX

Separation of anionic species and polar molecules



Particle Size 1.9 µm, 3 µm, 5 µm

- Smaller proteins and peptides
- Anionic species
- Polar molecules

Weak Anion Exchange Phase

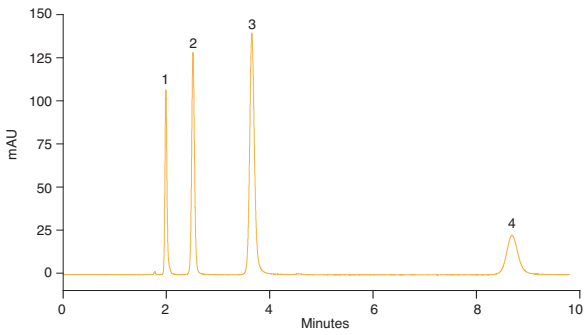
Hypersil GOLD AX columns utilise a novel polymeric amine ligand bonded to highly pure base deactivated silica. The silica substrate brings higher efficiency than polymer based ion exchange columns.

Suitable for HILIC

Hypersil GOLD AX columns are particularly suited to the analysis of polar compounds in HILIC applications. For high speed, high efficiency separations, Hypersil GOLD AX columns are available with 1.9 µm particle size.

Biopharma

Monophosphates

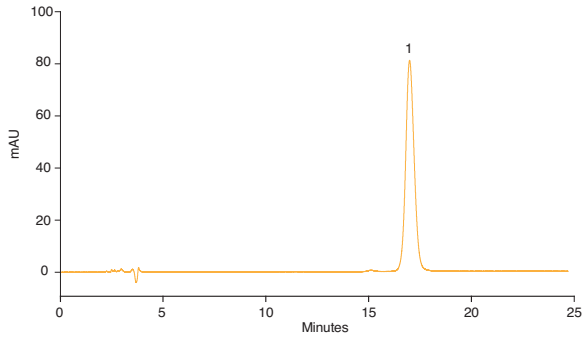


Column:	Hypersil GOLD AX, 5 µm, 150 × 4.6 mm
Mobile Phase:	Aqueous phosphate buffer (50 mM, pH 3)
Flow Rate:	1.0 mL/min
Temperature:	40 °C
Detection:	UV @ 254 nm
Injection Volume:	10 µL

1. Uracil
2. Cytidine-5'-monophosphate
3. Adenosine-5'-monophosphate
4. Guanosine-5'-monophosphate

Food Safety

Vitamin C

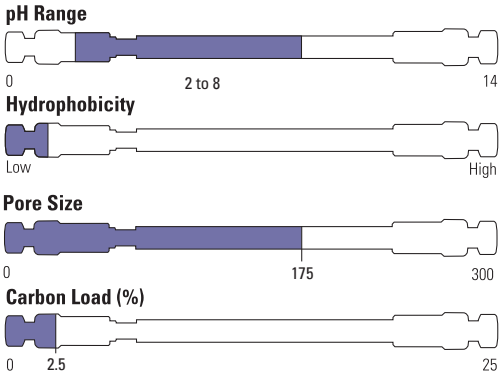


Column:	Hypersil GOLD AX, 5 µm, 100 × 4.6 mm
Mobile Phase:	100 mM ammonium acetate pH 6.8/ acetonitrile (30:70)
Flow Rate:	0.5 mL/min
Temperature:	30 °C
Detection:	UV @ 240 nm
Injection Volume:	50 µL

1. Vitamin C

Hypersil GOLD SAX

Quaternary amine strong anion exchange column



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L14

- Smaller organic molecules
- Ionic species

High Stability to Aqueous Mobile Phase

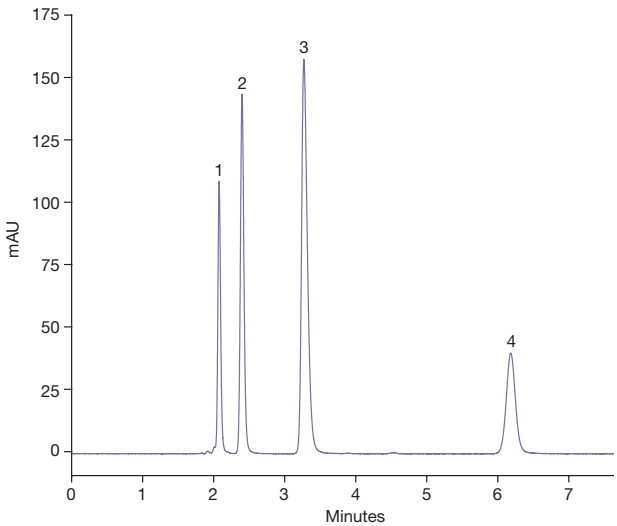
The Hypersil GOLD SAX stationary phase utilises a highly stable quaternary amine strong anion exchange ligand bonded to highly pure silica. Hypersil GOLD SAX columns are suited to the analysis of smaller organic molecules such as nucleotides and organic acids using aqueous and low pH mobile phases.

Outstanding Peak Shape and Sensitivity

Based on the same highly pure silica backbone, Hypersil GOLD SAX columns offer improved peak shape over type A silica columns. For high speed, high efficiency separations, Hypersil GOLD SAX columns are available with 1.9 µm particle size.

Biopharma

Monophosphates

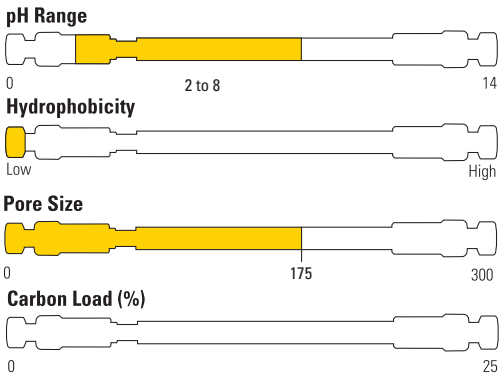


Column:	Hypersil GOLD SAX, 5 µm, 150 × 4.6 mm
Mobile Phase:	50 mM phosphate buffer pH 3.0
Flow Rate:	1.0 mL/min
Detection:	UV @ 254 nm
Column Temperature:	40 °C
Injection Volume:	10 µL

1. Uracil
2. Cytidine-5'-monophosphate
3. Adenosine-5'-monophosphate
4. Guanosine-5'-monophosphate

Hypersil GOLD Silica

Excellent peak shape in normal phase chromatography



Particle Size 1.9 µm, 3 µm, 5 µm **USP** L3

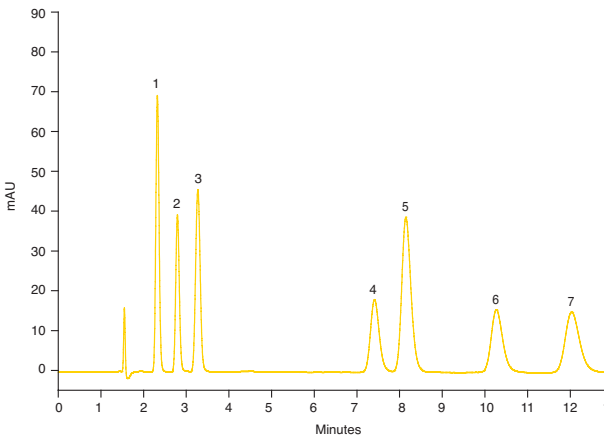
- Steroids in normal phase
- Polar analytes in HILIC

Outstanding Peak Shape and Sensitivity

Unbonded, highly pure base deactivated silica media that is the backbone of the Hypersil GOLD range of columns. Hypersil GOLD Silica columns are a powerful and efficient tool for the chromatography of non-polar and moderately polar organic compounds by normal phase chromatography. For high speed, high efficiency separations, Hypersil GOLD Silica columns are available with 1.9 µm particle size.

Forensics

Steroids

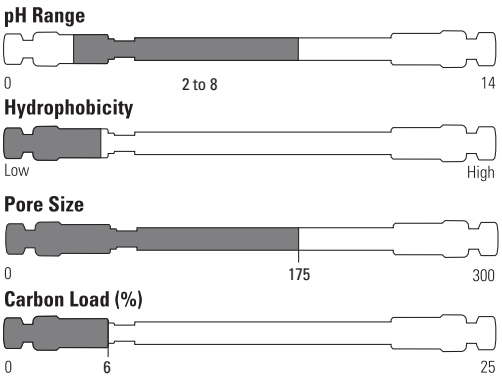


Column:	Hypersil GOLD Silica, 5 µm, 150 × 4.6 mm
Mobile Phase:	Hexane/ethanol (19:1)
Flow Rate:	1.5 mL/min
Temperature:	30 °C
Detection:	UV @ 254 nm
Injection Volume:	5 µL

1. Progesterone
2. 21-Hydroxyprogesterone -21-acetate
3. 17-a-Hydroxyprogesterone
4. Cortisone
5. 11-a-Hydroxyprogesterone
6. Corticosterone
7. Hydrocortisone

Hypersil GOLD HILIC

Enhanced retention of polar and hydrophilic analytes



Particle Size 1.9 µm, 3 µm, 5 µm

- Polar and hydrophilic compounds
- Carbohydrates
- Enhanced sensitivity in MS

Improved Sensitivity with MS Detection

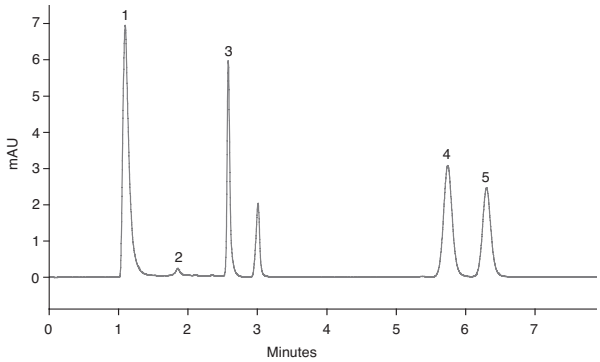
The highly organic mobile phases containing low salt levels used for HILIC, make Hypersil GOLD HILIC columns ideal for use with electrospray mass spectroscopy.

Enhanced Retention of Polar and Hydrophilic Analytes

Hydrophilic interaction liquid chromatography (HILIC) is an increasingly popular technique offering complementary selectivity to reversed-phase. With the ability to retain highly polar and hydrophilic compounds, Hypersil GOLD HILIC columns have been developed to aid the analysis of compounds that are traditionally difficult to retain using conventional C18 columns. In HILIC, by incorporating water in the highly organic mobile phase, an adsorbed water-rich layer is formed on the polar stationary phase surface into which analyte molecules partition. Retention is governed by dipole-dipole interactions and hydrogen bonding mechanisms.

Food Safety

Water soluble vitamins

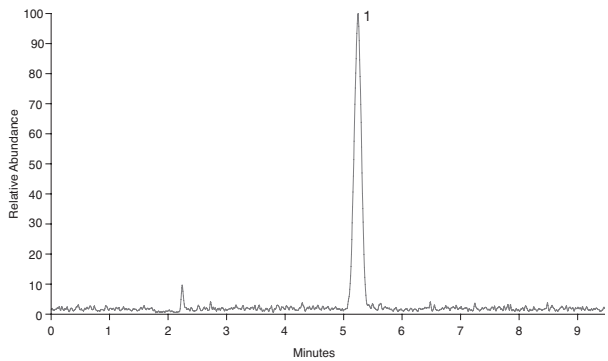


Column:	Hypersil GOLD HILIC, 5 µm, 150 × 4.6 mm
Mobile Phase:	Water/acetonitrile (10:90) + 0.1% formic acid
Flow Rate:	1.0 mL/min
Temperature:	ambient
Detection:	UV @ 205, 230 & 260 nm
Injection Volume:	10 µL

1. Thiamine
2. Nicotinic acid
3. Nicotinamide
4. Pyridoxine
5. Riboflavin
6. PABA.

Chemical

Urea



Column:	Hypersil GOLD HILIC, 5 µm, 150 × 4.6 mm
Mobile Phase:	Water/acetonitrile (10:90) + 0.1% formic acid
Flow Rate:	0.6 mL/min
Temperature:	30 °C
Detection:	+ESI
Injection Volume:	1 µL (made up in mobile phase)

1. Urea

Hypersil GOLD 1.9 µm

Small particles to improve speed and efficiency

The Power of 1.9 µm Particles

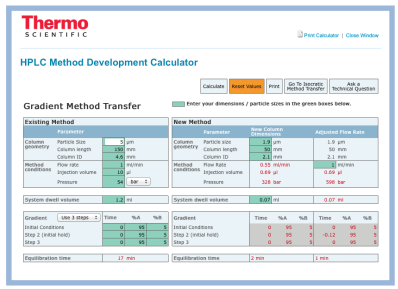
1.9 µm particles give higher efficiency than 3 µm or 5 µm particles and this efficiency is delivered over a greater range of optimum linear velocity. This makes it possible to operate at higher flow rates without losing performance. Because shorter columns packed with 1.9 µm particles give equivalent efficiency to longer columns packed with 5 µm particles, faster analysis and solvent savings for the chromatographer become a reality.

Three Tips for Method Transfer

1. To maintain an equivalent separation when transferring a method it is important to keep the reduced linear velocity constant between the original and new method.

2. Sub-2 µm based methods are most often transferred to smaller volume columns, so the same injection volume will take up a larger proportion of the new column, possibly leading to band broadening. It is therefore important to scale down the injection volume to match the change in column volume.

3. Geometrical transfer of the gradient requires calculation of the number of column volumes of mobile phase in each segment (time interval) of the gradient in the original method to ensure that the new calculated gradient takes place over the same number of column volumes, for the new column.

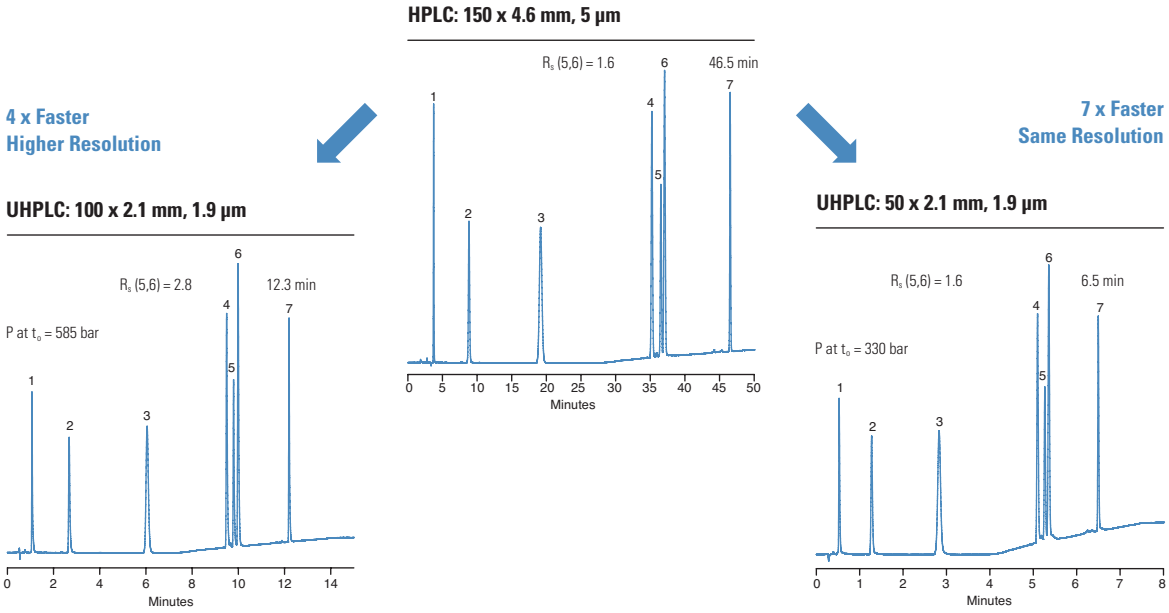


HPLC Method Development Calculator
www.thermoscientific.com/crc

Pressure Rating of Hypersil GOLD 1.9 µm Columns

Column Hardware	Pressure Rating
Analytical columns	1250 bar/18,000 psi
Capillary/nano columns	400 bar/6,000 psi
Javelin HTS columns	400 bar/6,000 psi

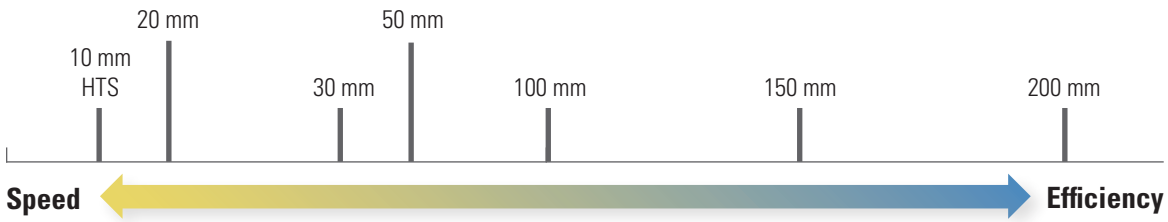
Transferring a method using these tips can give results as shown below for the separation of Ibuprofen and impurities.



Which 1.9 µm Column?

We offer an extensive range of columns packed with 1.9 µm particles to suit the full variety of application needs.
The choice of column will depend upon the requirement of the analysis.

- Speed: choose from 10 mm Javelin HTS, 20, 30 or 50 mm long analytical columns
- Efficiency: choose a longer column (for example 150 or 200 mm)
- Low backpressure: Hypersil GOLD 1.9 µm media is packed into a high pressure column 50 mm long and 4.6 mm internal diameter. Traditionally, a 1.9 µm column is used on UHPLC instruments. However, by producing less backpressure, this new wider column is suitable for users of conventional systems where pressure limits are often in the 6000 psi/400 bar region, ensuring fast chromatography without the need for extensive instrument optimization.

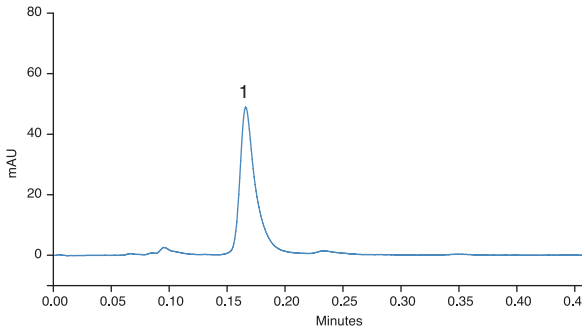


Hypersil GOLD 1.9 µm Javelin HTS Columns for Speed

Hypersil GOLD 1.9 µm Javelin HTS columns take fast LC to the extreme. These short 10 mm columns enable analysis times as fast as 8 seconds to be achieved. The use of ultra-low dead volume, direct connect Javelin hardware also minimizes dispersion.

Toxicology

Nandrolone



Column:	Hypersil GOLD 1.9 µm, 10 × 2.1 mm
Mobile Phase:	Warer/acetonitrile 40/60 + 0.1% tetrahydrofuran isocratic
Flow Rate:	0.4 mL/min
Temperature:	5 °C
Detection:	254 nm
Injection Volume:	0.5 µL

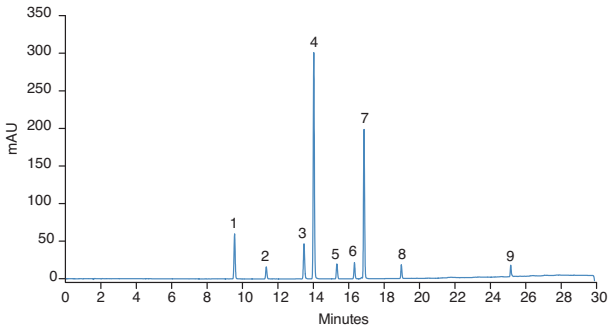
1. Nandrolone (19-Nortestosterone)

200 mm Column for Efficiency

The 1.9 µm particles used in Hypersil GOLD columns give less backpressure than 1.8 or 1.7 µm, permitting the use of longer columns for greater efficiency.

Environmental

Phenolic pollutants



Column:	Hypersil GOLD 1.9 µm, 200 × 2.1 mm
Mobile Phase:	A: Water + 0.1% formic acid B: Acetonitrile + 0.1% formic acid
Gradient:	5 to 95% B in 24 min
Flow Rate:	0.6 ml/min
Temperature:	60 °C
Injection Volume:	1 µL
Detection:	UV at 270 nm
Pressure:	606 bar

1. Phenol
2. 4-nitrophenol
3. 2-nitrophenol
4. 4-chlorophenol
5. 2-chlorophenol
6. 2,6-dimethylphenol
7. 2,4-dimethylphenol
8. 2,4-dichlorophenol
9. Pentachlorophenol

System Considerations

With 1.9 µm particles, analyses can be performed with a high linear velocity through the column without loss in performance, provided the LC system is optimized to operate under these conditions. In order to produce fast, efficient chromatography, all system components for the assay should also be considered. Modern ultra high pressure liquid chromatography (UHPLC) instruments, including the Thermo Scientific™ Vanquish™ UHPLC system, will take account of these factors.

There are three major system considerations to remember when using short columns packed with 1.9 µm particles.

1. The system volume (connecting tubing ID and length, injection volume, UV detector flow cell volume) must be minimized
2. The detector time constant and sampling rate need to be carefully selected
3. When running fast gradients pump delay volume needs to be minimal.

Hardware Solutions

Hardware solutions for high throughput screening, capillary and preparative chromatography

Hypersil GOLD columns are available in particle sizes and column designs to meet all separation needs, including improved resolution, enhanced sensitivity, and faster analyses. With particle sizes from 1.9 µm to 12 µm, Hypersil GOLD columns offer chromatographic solutions with consistent separations and performance. Specialized hardware includes:

- Preparative columns
- Thermo Scientific™ Javelin™ HTS direct-connection columns
- Guard columns for column protection

Preparative Columns

Analytical methods may require scale up to preparative sizes to isolate and purify compounds from mixtures. In choosing the best column and packing material for your preparative application, consider:

- Selectivity
- Loadability of the media
- Column dimensions

We have established a strong reputation for the manufacture and supply of high quality preparative columns, designed to give the same levels of performance and reproducibility as our popular analytical columns. Scale up is easiest when starting from an analytical column packed with smaller particle size media offering the same selectivity as the larger particle size preparative media. Hypersil GOLD phases are offered in various sizes to complement lab scale operations and facilitate the scale up to preparative chromatography. Contact us for ordering details on Hypersil GOLD preparative columns.

Columns for High Throughput Screening

Javelin HTS columns are specifically designed for high throughput applications. Using finger tight fittings and low dead volume hardware to minimise band broadening, these columns are ideal for ballistic gradients, providing enough retention and sensitivity for very fast assays. Javelin HTS columns are available in multipacks to provide a cost effective solution.

Javelin HTS Column

Description	Particle Size	Length (mm)	ID (mm)	Part Number
Hypersil GOLD Javelin HTS Column (3/pk)	1.9	10	2.1	**11808901**
	5	20	4.0	**10157354**

Column Protection

Extend column lifetime and improve performance

Guard Columns

Drop-in guard cartridges and holders offer convenience, economy, and effective protection for extending analytical column lifetimes. The 10 mm design offers maximum protection with minimal increase in retention. Hypersil GOLD drop-in guard cartridges are provided in packs of 4 each.

UHPLC Filter

Replaceable 0.2 µm Thermo Scientific UHPLC filter cartridges can be used to protect Hypersil GOLD 1.9 µm columns against particulate contamination, extending column lifetime. It's low dead volume design maintains chromatographic performance without degrading peak shape and causes minimal efficiency loss through dispersion. The UHPLC filter adds minimal increase in backpressure and so can be fitted to any length column.

UNIGUARD Guard Cartridge Holder

Description	Length (mm)	ID (mm)	Part Number
UNIGUARD Guard Cartridge Holder	10	1.0	**10762567**
		2.1	**10776714**
		3.0	**10776714**
		4.0/4.6	**10602864**

Description	ID (mm)	Part Number
UHPLC Filter Holder		**10775706**
UHPLC Filter Cartridge, 0.2 µm (5/pk)	2.1	**10127594**
	1.0	**11550944**

Ordering Information

Hypersil GOLD HPLC Columns

Particle Size (µm)	Description	Length (mm)	ID (mm)	Hypersil GOLD	Hypersil GOLD C8	Hypersil GOLD C4
1.9	UHPLC Column	20	2.1	**10464613**	**10658895**	–
		30	1.0	**10305063**	–	–
			2.1	**10049142**	**10044264**	–
		50	1.0	**10020213**	–	–
			2.1	**10474783**	**10664945**	**10127614**
			3.0	**10345203**	**10556845**	–
			4.6	**10169344**	**10096024**	–
		100	1.0	**10715004**	**10329884**	–
			2.1	**10734604**	**10074694**	**10691396**
			3.0	**10582465**	**10442195**	–
		150	2.1	**10630204**	**10234864**	**10391585**
		200	2.1	**10446503**	–	–
3	Drop-in Guard (4/pk)	10	1.0	**10608705**	**10714817**	**10147884**
			2.1	**11518270**	**11598270**	**10447534**
			3.0	**10481365**	**10075814**	**10157884**
			4.0/4.6	**11528270**	**10487694**	**10610626**
	HPLC Column	30	2.1	**10394463**	–	–
			3.0	–	–	–
			4.6	**10764984**	–	–
		50	2.1	**10424413**	**10553035**	**10159534**
			3.0	**10293183**	**10558585**	–
			4.0	**10658825**	**10715126**	–
			4.6	**10089282**	**10543995**	–
		100	1.0	**10281225**	**10027464**	–
			2.1	**10632864**	**10018912**	**10037254**
			3.0	**10304923**	**10619395**	**10027504**
			4.0	**10794546**	**10202105**	–
			4.6	**10384323**	**10774414**	**10732826**
		150	1.0	**10704556**	–	**10199474**
			2.1	**10121223**	**10078952**	**10599735**
			3.0	**10131383**	**10312745**	**10312355**
			4.0	**10456844**	**10734766**	–
			4.6	**10610564**	**10736144**	**10261325**
5	Drop-in Guard (4/pk)	10	2.1	**11538270**	**10535445**	**10076694**
			3.0	**10544085**	**10259644**	**10514475**
			4.0/4.6	**11548270**	**11508280**	**10670046**
	HPLC Column	30	2.1	**10475163**	–	–
			3.0	**10668825**	–	–
			4.6	**10008862**	–	–
		50	2.1	**10611334**	**10293413**	**10609585**
			3.0	**10191523**	**10764356**	–
			4.6	**10611524**	**10690564**	**10699385**
		100	2.1	**10140743**	**10503235**	**10382865**
			3.0	**10384723**	**10261915**	**10322355**
			4.6	**10121033**	**10690754**	**10699755**
		150	2.1	**10131033**	**10203663**	**10609765**
			3.0	**10795316**	**10108874**	–
			4.0	**10313065**	**10149494**	–
			4.6	**10501695**	**10755783**	**10486854**
		250	2.1	**10009102**	**10765783**	**10067684**
			3.0	**10352775**	**10619405**	**10548415**
			4.0	**10506365**	**10343465**	–
			4.6	**10543035**	**10243453**	**10312635**

Hypersil GOLD HPLC Columns

Particle Size (µm)	Description	Length (mm)	ID (mm)	Hypersil GOLD aQ	Hypersil GOLD PFP	Hypersil GOLD CN
1.9	UHPLC Column	20	2.1	**10375203**	**10670774**	–
		30	1.0	–	–	–
			2.1	**10324223**	**10243553**	–
		50	1.0	**10101723**	**10465753**	–
			2.1	**10572635**	**10661134**	**10319984**
			3.0	**10111723**	**10435943**	–
			4.6	**10119574**	**10269504**	–
		100	1.0	**10621344**	**10523435**	–
			2.1	**10582635**	**10583025**	**10565885**
			3.0	**10631344**	**10531135**	–
		150	2.1	**10736734**	**10706354**	–
		200	2.1	**10486693**	**10253193**	**10675325**
3	Drop-in Guard (4/pk)	10	1.0	**10360905**	**10486764**	**10269954**
			2.1	**11548280**	**11528290**	**11588290**
			3.0	**11558280**	**10734657**	**10035844**
			4.0/4.6	**11568280**	**10270055**	**11598290**
	HPLC Column	30	2.1	**10715793**	**10485533**	**10343993**
			3.0	**10466664**	**10260995**	–
			4.6	–	**10444973**	–
		50	2.1	**10513795**	**10641904**	**10069142**
			3.0	**10251235**	**11952458**	–
			4.0	**10629955**	**10537255**	–
			4.6	**10541105**	**10521305**	–
		100	1.0	**10129514**	**10250665**	–
			2.1	**10190873**	**10304473**	**10553225**
			3.0	**10074313**	**10473415**	**10417264**
			4.0	**10139514**	**10608425**	–
			4.6	**10364603**	**10642864**	**10746524**
		150	1.0	**10210655**	**10559365**	**10785716**
			2.1	**10572255**	**10233223**	**10672864**
			3.0	**10268944**	**10229944**	**10795716**
			4.0	**10509355**	–	–
			4.6	**10008902**	**10774984**	**10553995**
5	Drop-in Guard (4/pk)	10	2.1	**10783497**	**10619285**	**10361105**
			3.0	**10370905**	**10535825**	**10341215**
			4.0/4.6	**11578280**	**11538290**	**11508300**
	HPLC Column	30	2.1	–	–	–
			3.0	–	–	–
			4.6	–	–	–
		50	2.1	**10776153**	**10131223**	**10600954**
			3.0	**10508405**	**10640536**	–
			4.6	**10662474**	–	**10652484**
		100	2.1	**10140593**	**10620564**	**10662484**
			3.0	**10557435**	**10704756**	**10231965**
			4.6	**10150593**	**10621524**	–
		150	2.1	**10718063**	**10724414**	**10746144**
			3.0	**10497414**	**10220815**	–
			4.0	–	**10418574**	–
			4.6	**10019382**	**10068902**	**10213663**
		250	2.1	**10161023**	**10078902**	**10474983**
			3.0	–	–	**10027154**
			4.0	**10056134**	**10159194**	**10538585**
			4.6	**10582065**	**10141033**	**10273703**

Hypersil GOLD HPLC Columns

Particle Size (µm)	Description	Length (mm)	ID (mm)	Hypersil GOLD Phenyl	Hypersil GOLD Amino	Hypersil GOLD AX
1.9	UHPLC Column	20	2.1	–	–	–
		30	1.0	–	–	–
			2.1	–	–	–
		50	1.0	–	–	–
			2.1	**10422015**	**10793097**	**10449644**
			3.0	–	–	–
			4.6	–	–	–
		100	1.0	–	–	–
			2.1	**10207834**	**10177994**	**10601406**
			3.0	–	–	–
		150	2.1	**10431825**	**10670246**	**10229564**
		200	2.1	**10595125**	**10732347**	**10611406**
3	Drop-in Guard (4/pk)	10	1.0	**10459054**	**10036304**	**10177644**
			2.1	**10380915**	**10698515**	**10016414**
			3.0	**10279654**	**10478664**	**10742137**
			4.0/4.6	**10026124**	**10056114**	**10167734**
	HPLC Column	30	2.1	–	**10681196**	**10077194**
			3.0	–	–	–
			4.6	–	–	–
		50	2.1	**10208264**	**10187654**	**10037824**
			3.0	–	–	–
			4.0	–	–	–
			4.6	–	–	–
		100	1.0	–	–	–
			2.1	**10056364**	**10742527**	**10097834**
			3.0	**10437324**	**10689755**	–
			4.0	–	–	–
			4.6	**10690256**	**10289364**	**10467254**
		150	1.0	**10794627**	**10211095**	**10087344**
			2.1	–	**10600826**	**10763606**
			3.0	**10446984**	**10169564**	**10139184**
			4.0	–	–	–
			4.6	**10287924**	**10381295**	**10027654**
5	Drop-in Guard (4/pk)	10	2.1	**10025644**	**10659465**	**10469644**
			3.0	**10525435**	**10525615**	**10536185**
			4.0/4.6	**10351445**	**10259174**	**10734817**
	HPLC Column	30	2.1	–	–	–
			3.0	–	–	–
			4.6	–	–	–
		50	2.1	**10675335**	**10427324**	–
			3.0	–	–	–
			4.6	**10762907**	**10157554**	**10547245**
		100	2.1	**10753477**	**10391295**	**10302455**
			3.0	**10127604**	**10169524**	–
			4.6	–	–	**10231385**
		150	2.1	–	–	**10567455**
			3.0	–	–	–
			4.0	–	–	–
			4.6	**10014574**	**10006074**	**10077364**
		250	2.1	–	**10554105**	**10332885**
			3.0	**10594095**	**10517455**	**10734366**
			4.0	**10005784**	**10322975**	**10648995**
			4.6	**10442595**	**10752717**	–

Hypersil GOLD HPLC Columns

Particle Size (µm)	Description	Length (mm)	ID (mm)	Hypersil GOLD SAX	Hypersil GOLD Silica	Hypersil GOLD HILIC
1.9	UHPLC Column	20	2.1	–	–	–
		30	1.0	–	–	–
			2.1	–	–	–
		50	1.0	–	–	–
			2.1	–	**10722157**	**11527931**
			3.0	–	–	–
			4.6	–	–	–
		100	1.0	–	–	–
			2.1	**10259514**	**10065884**	**11567931**
			3.0	–	–	–
		150	2.1	**10754257**	**10341165**	**10029259**
		200	2.1	–	**10498674**	–
3	Drop-in Guard (4/pk)	10	1.0	–	**10468664**	**11738056**
			2.1	**10620056**	**10371105**	**11748056**
			3.0	**10056224**	**10629865**	**11758056**
			4.0/4.6	**10609685**	**10289124**	**11768056**
	HPLC Column	30	2.1	–	**10524125**	**11547941**
			3.0	–	–	–
			4.6	–	**10076744**	–
		50	2.1	**10362645**	**10187524**	**11597941**
			3.0	–	–	–
			4.0	–	–	–
			4.6	–	–	–
		100	1.0	–	–	–
			2.1	**10609025**	**10066264**	**11547951**
			3.0	**10487414**	**10177954**	**11557951**
			4.0	–	–	–
			4.6	**10569155**	–	**11577951**
		150	1.0	–	**10763887**	**11587951**
			2.1	–	**10764447**	**11597951**
			3.0	**10540126**	**10127624**	**11507961**
			4.0	–	–	–
			4.6	**10392475**	**10157894**	**11527961**
5	Drop-in Guard (4/pk)	10	2.1	**10702337**	**10555425**	**11708056**
			3.0	**10703697**	**10702147**	**11718056**
			4.0/4.6	**10006844**	**10648905**	**11728056**
	HPLC Column	30	2.1	–	–	–
			3.0	–	–	–
			4.6	–	–	–
		50	2.1	**10417454**	**10311535**	**11537971**
			3.0	–	–	–
			4.6	–	–	**11567971**
		100	2.1	**10352525**	**10311125**	**11587971**
			3.0	**10251185**	**10418284**	**11597971**
			4.6	**10477414**	**10290385**	–
		150	2.1	**10598195**	**10167474**	–
			3.0	–	–	–
			4.0	–	–	–
			4.6	**10629755**	**10437534**	**11567981**
		250	2.1	**10149084**	**10556955**	**11587981**
			3.0	**10417624**	–	**11597981**
			4.0	**10333065**	**10774077**	**11507991**
			4.6	**10703786**	**10360835**	**11517991**

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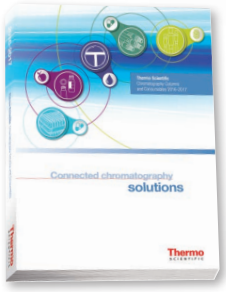

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