

Technical Guide Version 4

Thermo Scientific Hypersil GOLD HPLC Columns

Unleash the productivity of your HPLC



 **Scantec Nordic**
Analys & Mätteknik
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Thermo Scientific Hypersil GOLD Columns

Designed for improved chromatography, Hypersil GOLD® columns are the culmination of over 30 years of experience in the product development and manufacturing of HPLC media and columns. We continue to extend the range and capabilities of this state-of-the-art family of columns, with additional chemistries and a range of particle sizes and hardware formats to meet the challenges of modern chromatography.

The highly pure Hypersil GOLD silica is manufactured, bonded and packed in ISO 9001:2000 accredited facilities, operating under strict protocols using robust procedures and extensive quality control testing. This ensures consistent performance, column after column.

Hypersil GOLD HPLC columns are available in 12 different chemistries to optimize separations and maximize productivity. The expanded 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, the expanded range of Hypersil GOLD columns offers chromatographers even more flexibility in choosing the correct column, whether they are using conventional or ultra-high pressure LC systems.

Q. How can I be guaranteed the quality of Hypersil GOLD columns?

A. We control all aspects of the Hypersil GOLD manufacturing process using extensive quality control testing in an ISO9001:2000 environment.



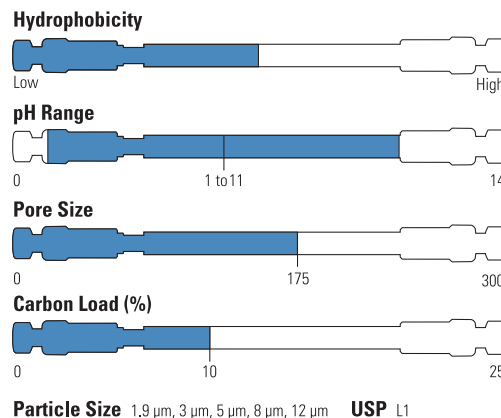


Improved Selectivity, Resolution and Productivity

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Thermo Scientific Hypersil GOLD Columns

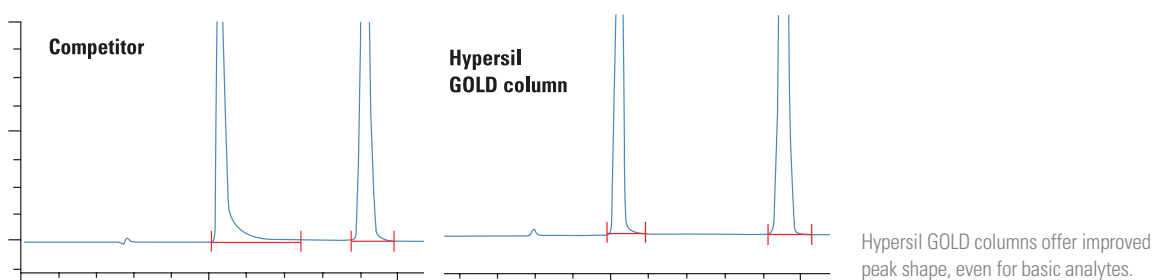
Outstanding peak shape using generic gradients with C18 selectivity



Application Areas Pharmaceutical | Food Safety | Environmental | Clinical | Forensics

Hypersil GOLD columns are based on improved, 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

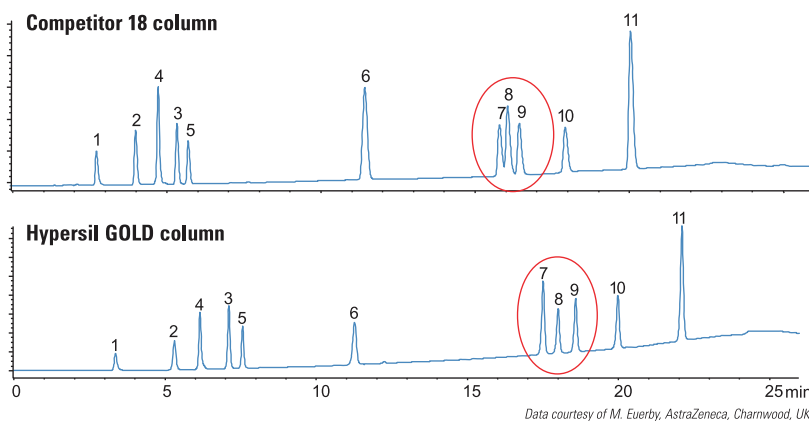


Enhanced Resolution

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.

Q. Why do Hypersil GOLD columns deliver outstanding peak shape?

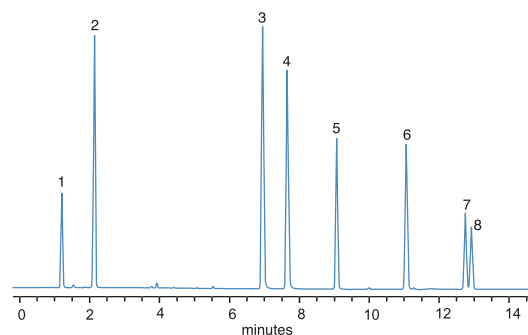
A. The manufacturing and bonding process creates an even surface with fewer silanols leading to reduced secondary interactions.



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

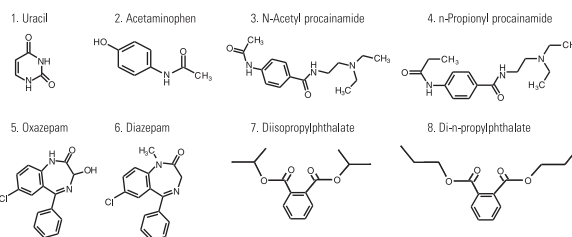
Improved Sensitivity

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.



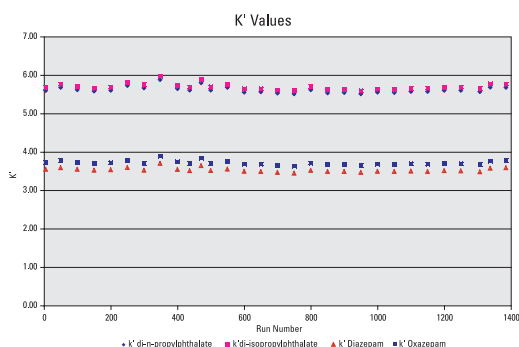
Reproducibility

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 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.1% ammonia pH 10.6

B: MeOH + 0.1% ammonia

Gradient: 5 – 100% B in 15 min

Flow: 1.0 mL/min

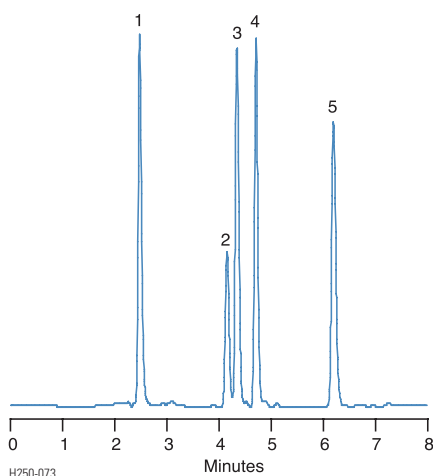
Injection: 10 μ L

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 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.1% Acetic acid
B: ACN

Gradient: 20 – 70% B in 10 mins

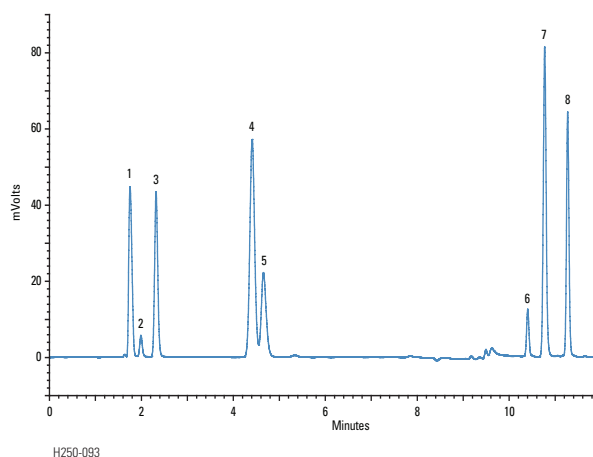
Flow Rate: 1 mL/min

Detection: UV @ 254 nm

Temperature: 25°C

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

Pharmaceutical: Cough / cold formulation



Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 20 mM NH_4COOH at pH 3.0
B: MeOH

Gradient: Time (min)	% B
0	10
5	10
10	70

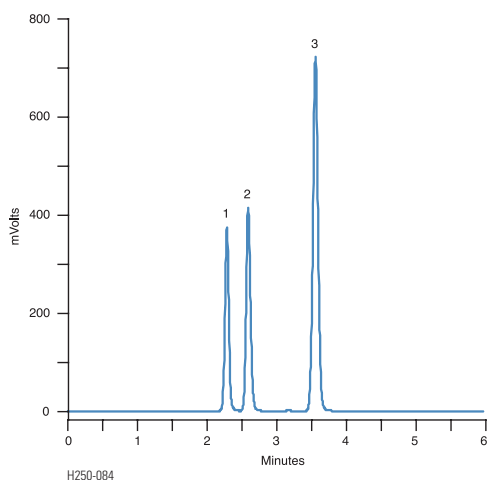
Flow Rate: 1.5 mL/min

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

Pharmaceutical: Anaesthetics



Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.05 M KH_2PO_4 , pH 3
B: ACN

Isocratic: 50:50

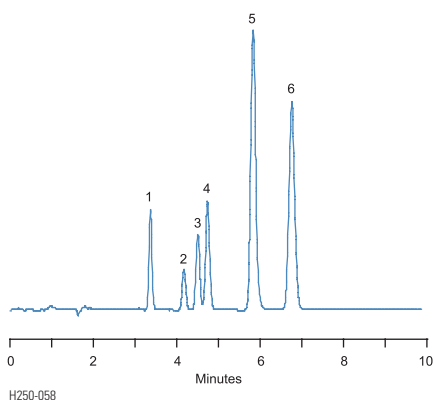
Flow Rate: 1.25 mL/min

Detection: UV @ 220 nm

Temperature: 25°C

1. Lidocaine
2. Tetracaine
3. Benzocaine

Environmental: Polycyclic aromatic hydrocarbons

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: MeOH

B: H₂O

Isocratic: 75:25

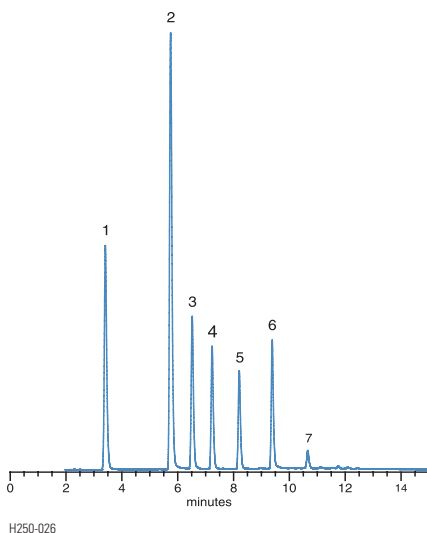
Flow Rate: 1 mL/min

Detection: UV @ 269 nm

Temperature: 25°C

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

Environmental: Banned aromatic amines

Column: Hypersil GOLD, 3 μ m, 150 x 2.1 mm

Part Number: 25003-152130

Mobile Phase: A: 25 mM NH₄OAc at pH 5

B: ACN

Gradient: 20 – 100% B in 10 min

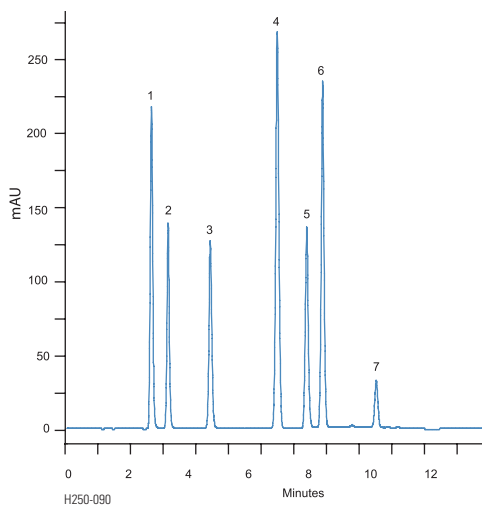
Flow Rate: 0.2 mL/min

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

Environmental: Endocrine disruptors

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: H₂O

B: ACN

Gradient: 25 – 70% B in 20 min

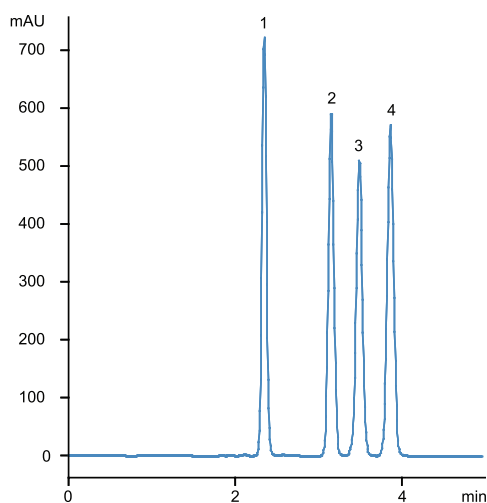
Flow Rate: 1.5 mL/min

Detection: UV @ 220 nm

Temperature: 25°C

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

Clinical: Testosterones



H250-052

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: H₂O
B: ACN

Isocratic: 43:57

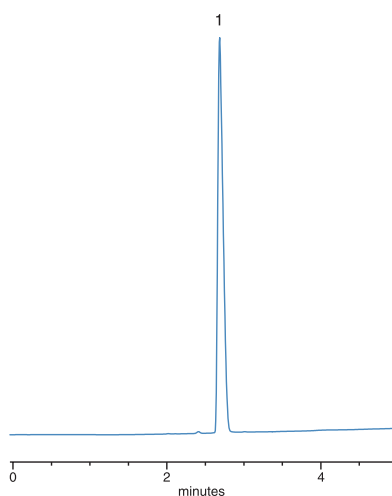
Flow Rate: 1 mL/min

Detection: UV @ 254 nm

Temperature: 25°C

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

Clinical: Chlorpromazine



H250-031

Column: Hypersil GOLD, 5 μ m, 50 x 2.1 mm

Part Number: 25005-052130

Mobile Phase: A: 0.1% Formic acid
B: ACN + 0.1% Formic acid

Gradient: 15 – 80% B in 5 min

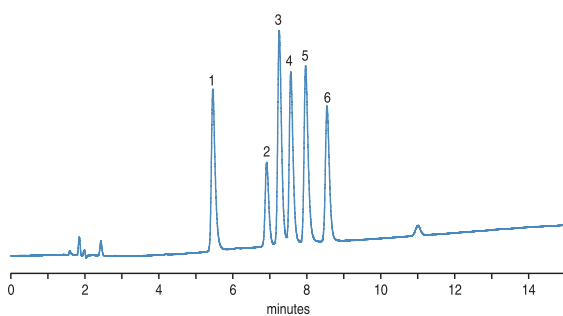
Flow Rate: 1 mL/min

Detection: UV @ 254 nm

Temperature: 30°C

1. Chlorpromazine

Clinical: Tricyclic antidepressants



H250-050

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.1% Formic acid
B: ACN + 0.1% Formic acid

Gradient: 30 – 50% B in 15 min

Flow Rate: 1 mL/min

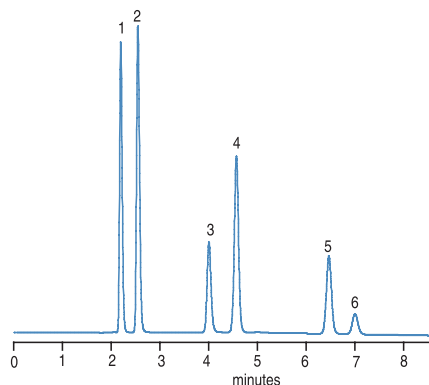
Detection: UV @ 254 nm

Temperature: 30°C

Concentration: 2.5 ng/ μ L

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

Food safety: Energy drink additives



H250-009

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 10 mM NH₄OAc at pH 5.0
B: MeOH

Gradient: 30 – 45% B in 10 min

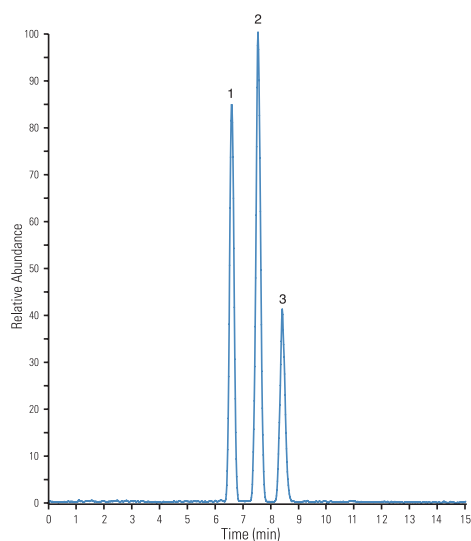
Flow Rate: 1 mL/min

Detection: UV @ 230 nm

Temperature: 25°C

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

Food safety: Tocopherols



H250-092

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: H₂O
B: MeOH

Isocratic: 5:95

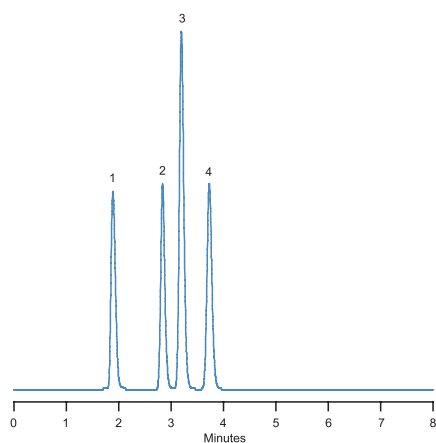
Flow Rate: 1 mL/min

Detection: - ESI

Temperature: 30°C

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

Food safety: Coumaric acids



H250-070

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.1% Formic acid
B: ACN

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

Ordering Information

Hypersil GOLD Columns

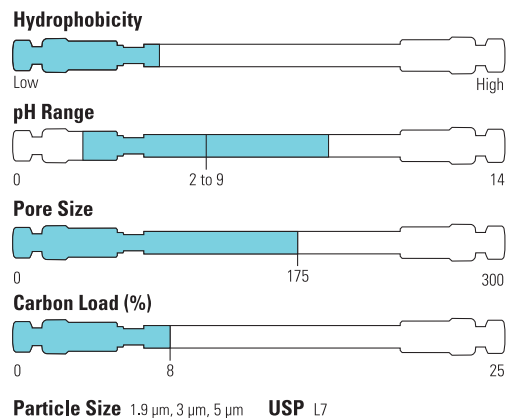


Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μm	20	—	—	25002-023030	25002-022130	25002-021030
	30	—	—	25002-033030	25002-032130	25002-031030
	50	25002-054630	—	25002-053030	25002-052130	25002-051030
	100	—	—	25002-103030	25002-102130	25002-101030
	150	—	—	—	25002-152130	—
	200	—	—	—	25002-202130	—
3 μm	30	25003-034630	25003-034030	25003-033030	25003-032130	25003-031030
	50	25003-054630	25003-054030	25003-053030	25003-052130	25003-051030
	100	25003-104630	25003-104030	25003-103030	25003-102130	25003-101030
	150	25003-154630	25003-154030	25003-153030	25003-152130	25003-151030
5 μm	30	25005-034630	25005-034030	25005-033030	25005-032130	25005-031030
	50	25005-054630	25005-054030	25005-053030	25005-052130	25005-051030
	100	25005-104630	25005-104030	25005-103030	25005-102130	25005-101030
	150	25005-154630	25005-154030	25005-153030	25005-152130	25005-151030
	250	25005-254630	25005-254030	25005-253030	25005-252130	25005-251030
8 μm	150	25008-154630	—	—	—	—
	250	25008-254630	—	—	—	—



Thermo Scientific Hypersil GOLD C8 Columns

Enhanced resolution, efficiency,
sensitivity and speed



Application Areas **Pharmaceutical** | **Environmental** | **Food Safety** | **Clinical** | **Forensics**

- 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 particularly useful where smaller amounts of hydrophobicity are needed in order to successfully retain compounds 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.

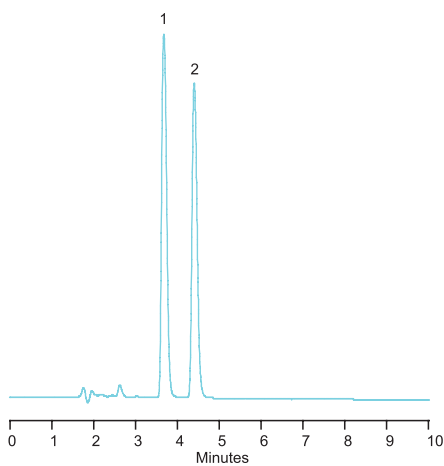
Faster Separations

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: Fatty acids



H252-004

Column: Hypersil GOLD C8, 5 μ m, 150 x 4.6 mm

Part Number: 25205-154630

Mobile Phase: A: 0.1% Formic acid
B: ACN

Isocratic: 15:85

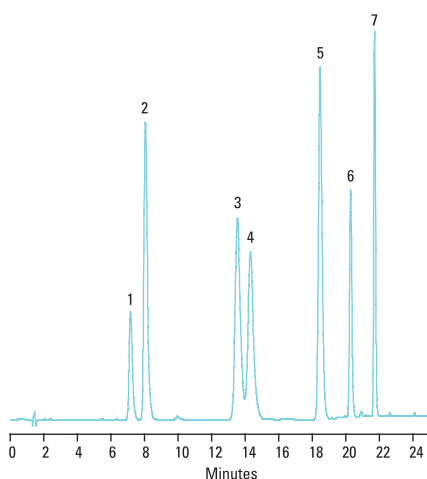
Flow Rate: 1 mL/min

Detection: UV @ 200 nm

Temperature: 25°C

1. Linolenic Acid
2. Linoleic Acid

Environmental: Triazines and uron herbicides



H252-010

Column: Hypersil GOLD C8, 5 μ m, 150 x 4.6 mm

Part Number: 25205-154630

Mobile Phase: A: H₂O
B: ACN

Gradient: Time (min)	% B
0	20
15	23
25	75

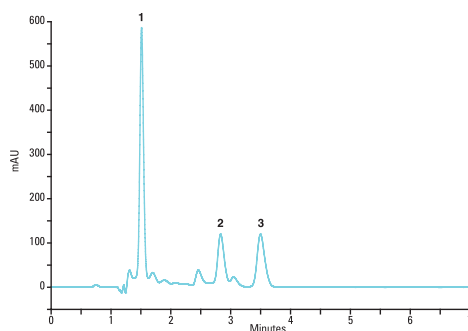
Flow Rate: 1.5 mL/min

Detection: UV @ 240 nm

Temperature: 25°C

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

Food safety: β -Carotene



H252-009

Column: Hypersil GOLD C8, 5 μ m, 150 x 4.6 mm

Part Number: 25205-154630

Mobile Phase: MeOH

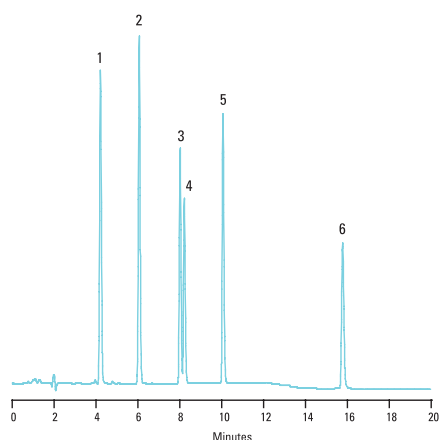
Flow Rate: 1.5 mL/min

Detection: UV @ 450 nm

Temperature: 25°C

1. Lutein
2. Lycopene
3. β -Carotene

Environmental: Phthalates



H252-006

Column: Hypersil GOLD C8, 5 μ m,

150 x 4.6 mm

Part Number: 25205-154630

Mobile Phase: A: H₂O

B: ACN

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

Ordering Information

Hypersil GOLD C8 Columns

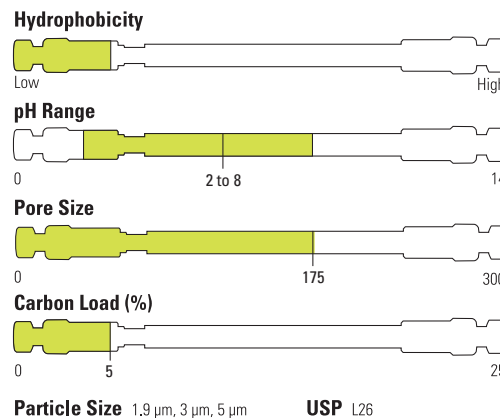


Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	25202-023030	25202-022130	25202-021030
	30	—	—	25202-033030	25202-032130	25202-031030
	50	25202-054630	—	25202-053030	25202-052130	25202-051030
	100	—	—	25202-103030	25202-102130	25202-101030
	150	—	—	—	25202-152130	—
	200	—	—	—	25202-202130	—
3 μ m	30	25203-034630	25203-034030	25203-033030	25203-032130	25203-031030
	50	25203-054630	25203-054030	25203-053030	25203-052130	25203-051030
	100	25203-104630	25203-104030	25203-103030	25203-102130	25203-101030
	150	25203-154630	25203-154030	25203-153030	25203-152130	25203-151030
5 μ m	30	25205-034630	25205-034030	25205-033030	25205-032130	25205-031030
	50	25205-054630	25205-054030	25205-053030	25205-052130	25205-051030
	100	25205-104630	25205-104030	25205-103030	25205-102130	25205-101030
	150	25205-154630	25205-154030	25205-153030	25205-152130	25205-151030
	250	25205-254630	25205-254030	25205-253030	25205-252130	25205-251030



Thermo Scientific Hypersil GOLD C4 Columns

Low hydrophobicity columns
for less retention



Application Areas Pharmaceutical | Biotech | Food safety | Forensics

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

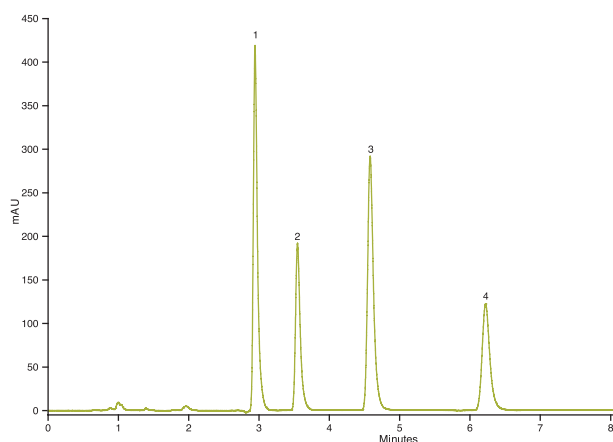
Lower Hydrophobicity for Faster Separations

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 x 4.6 mm

Part Number: 25505-154630

Mobile Phase: H₂O/MeCN (50:50)

Flow Rate: 1.0 mL/min

Temperature: 25°C

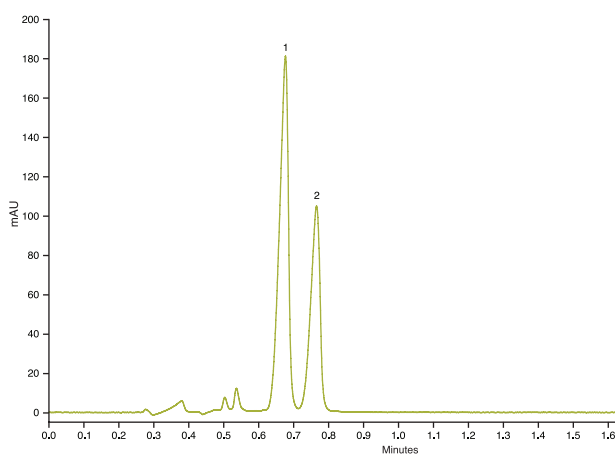
Detection: 214 nm

Injection volume: 10 μL

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

H255-001

Food safety: Fatty Acids

Column: Hypersil GOLD C4, 1.9 μ m, 100 x 2.1 mm

Part Number: 25502-102130

Mobile Phase: H₂O/MeCN (20:80)

Flow Rate: 0.55 mL/min

Temperature: 30°C

Detection: 200 nm

Injection volume: 1 μ L1. Linolenic acid
2. Linoleic acid

H255-002

Ordering Information

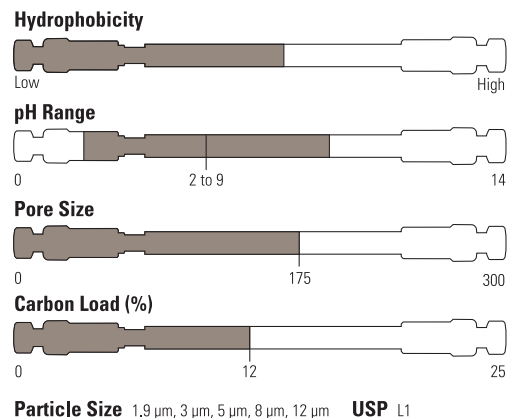
Hypersil GOLD C4 Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	25502-023030	25502-022130	25502-021030
	30	—	—	25502-033030	25502-032130	25502-031030
	50	25502-054630	—	25502-053030	25502-052130	25502-051030
	100	—	—	25502-103030	25502-102130	25502-101030
	150	—	—	—	25502-152130	—
	200	—	—	—	25502-202130	—
3 μ m	30	25503-034630	25503-034030	25503-033030	25503-032130	25503-031030
	50	25503-054630	25503-054030	25503-053030	25503-052130	25503-051030
	100	25503-104630	25503-104030	25503-103030	25503-102130	25503-101030
	150	25503-154630	25503-154030	25503-153030	25503-152130	25503-151030
5 μ m	30	25505-034630	25505-034030	25505-033030	25505-032130	25505-031030
	50	25505-054630	25505-054030	25505-053030	25505-052130	25505-051030
	100	25505-104630	25505-104030	25505-103030	25505-102130	25505-101030
	150	25505-154630	25505-154030	25505-153030	25505-152130	25505-151030
	250	25505-254630	25505-254030	25505-253030	25505-252130	25505-251030

Thermo Scientific Hypersil GOLD aQ Columns

Enhanced retention and resolution
of polar analytes



Application Areas **Pharmaceutical** | **Food Safety** | **Environmental** | **Clinical** | **Forensics**

- Analysis of water soluble vitamins and organic acids

Retention and Resolution of Polar Analytes

Because Hypersil GOLD 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.

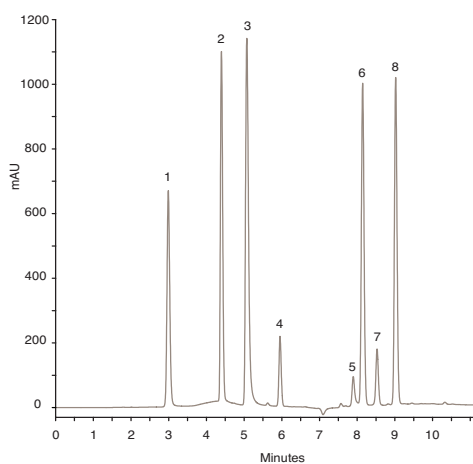
Excellent Peak Shapes

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.

Measure polar compounds chromatographically



Food safety: Water soluble vitamins



H253-003

Column: Hypersil GOLD aQ, 5 μ m, 150 x 4.6 mm

Part Number: 25305-154630

Mobile Phase: A: 50 mM KH_2PO_4 , pH 3.5
B: MeOH

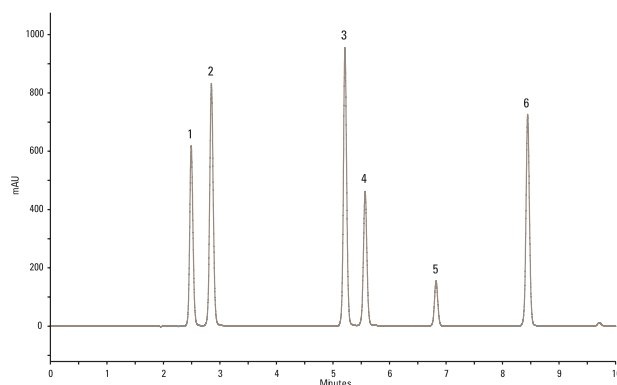
Gradient: 0 – 100% B in 15 min

Flow Rate: 1 mL/min

Detection: UV @ 205 nm

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

Pharmaceutical: Sulfonamides



H253-009

Column: Hypersil GOLD aQ, 5 μ m, 150 x 4.6 mm

Part Number: 25305-154630

Mobile Phase: A: 0.1% Formic acid
B: ACN + 0.1% Formic acid

Gradient: 10 – 100% B in 15 min

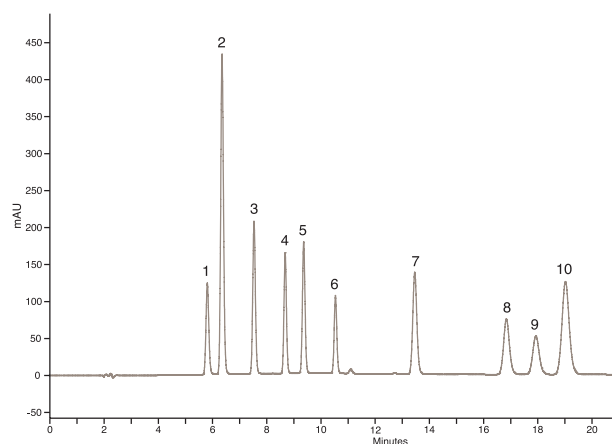
Flow: 1.0 mL/min

Detection: UV @ 270 nm

Temperature: 30°C

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

Biochemical: PTH amino acids



H250-096

Column: Hypersil GOLD, 5 μ m, 150 x 4.6 mm

Part Number: 25005-154630

Mobile Phase: A: 0.1% TFA + 0.015%
Triethylamine in H_2O
B: 0.1% TFA + 0.015%
Triethylamine in ACN

Gradient:	Time (min)	% B
	0	17
	2	20
	7	35
	20	35

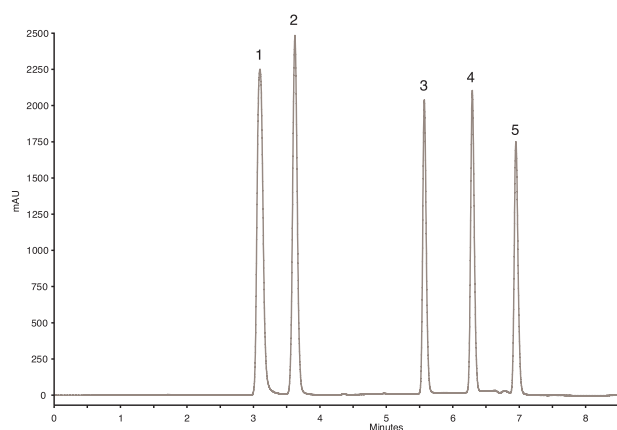
Flow Rate: 1 mL/min

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. Phenylalanine
10. Leucine

Pharmaceutical: Xanthines



Column: Hypersil GOLD aQ, 5 µm, 150 x 4.6 mm

Part Number: 25305-154630

Mobile Phase: A: 50 mM NaH₂PO₄ pH 2.5
B: MeOH

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

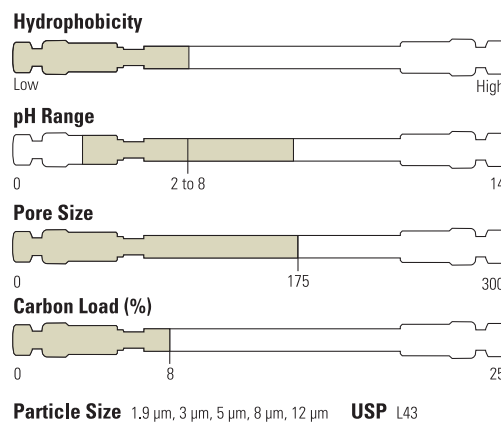
H253-008

Ordering Information

Hypersil GOLD aQ Analytical Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 µm	20	—	—	25302-023030	25302-022130	25302-021030
	30	—	—	25302-033030	25302-032130	25302-031030
	50	25302-054630	—	25302-053030	25302-052130	25302-051030
	100	—	—	25302-103030	25302-102130	25302-101030
	150	—	—	—	25302-152130	—
	200	—	—	—	25302-202130	—
3 µm	30	25303-034630	25303-034030	25303-033030	25303-032130	25303-031030
	50	25303-054630	25303-054030	25303-053030	25303-052130	25303-051030
	100	25303-104630	25303-104030	25303-103030	25303-102130	25303-101030
	150	25303-154630	25303-154030	25303-153030	25303-152130	25303-151030
5 µm	30	25305-034630	25305-034030	25305-033030	25305-032130	25305-031030
	50	25305-054630	25305-054030	25305-053030	25305-052130	25305-051030
	100	25305-104630	25305-104030	25305-103030	25305-102130	25305-101030
	150	25305-154630	25305-154030	25305-153030	25305-152130	25305-151030
	250	25305-254630	25305-254030	25305-253030	25305-252130	25305-251030



Application Areas Forensics | Pharmaceutical | Clinical | Environmental | Food Safety

- 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 the 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.

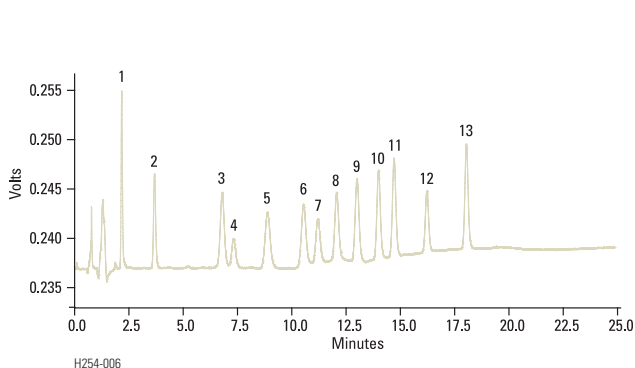
Unique Selectivity for Non-halogenated Polar Compounds

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.

Q. Why are Hypersil GOLD PFP columns particularly suited to the analysis of compounds containing substituted aromatic rings?

A. The fluorine atoms around the phenyl ring enhance pi-pi interactions increasing retention and selectivity.

Pharmaceutical: Taxanes



Column: Hypersil GOLD PFP, 5 μ m, 150 x 4.6 mm

Part Number: 25405-154630

Mobile Phase: A: H₂O

B: MeOH + ACN, 7:93

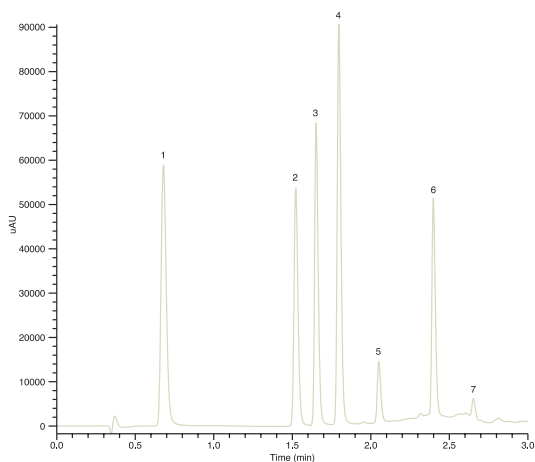
Gradient: Time (min)	% B
0	35
7	35
25	58

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. Cephalomantine
10. 10-Deacetyl-7-epitaxol
11. Paclitaxol
12. Taxol C
13. 7-Epitaxol

Environmental: Banned aromatic amines



Column: Hypersil GOLD PFP, 1.9 μ m, 50 x 2.1 mm

Part Number: 25002-052130

Mobile Phase: A: 25 mM NH₄OAc, pH 5.0

B: ACN

Gradient: 10 – 100% B in 3 mins

Flow Rate: 0.5 mL/min

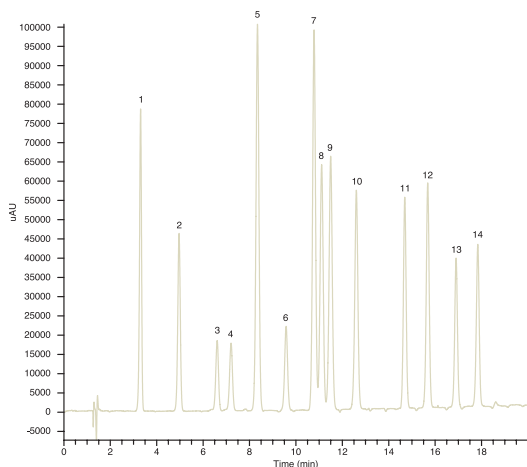
Temperature: 40°C

Detection: UV @ 254 nm (2 μ L flow cell)

Injection Volume: 0.5 μ L

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

Environmental: Phenolic positional isomers



Column: Hypersil GOLD PFP, 5 μ m, 150 x 4.6 mm

Part Number: 25405-154630

Mobile Phase: A: H₂O + 0.1% formic acid

B: ACN + 1.0% formic acid

Gradient: 15 – 45% B in 20 mins

Flow Rate: 1.5 mL/min

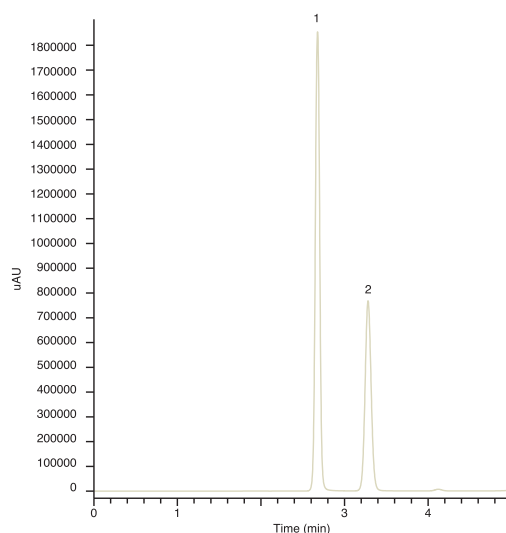
Temperature: 25°C

Detection: UV @ 270 nm

Injection Volume: 5 μ L

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

Pharmaceutical: Fluorinated nucleic bases



H254-005

Column: Hypersil GOLD PFP, 5 μ m, 150 x 4.6 mm

Part Number: 25405-154630

Mobile Phase: H₂O + 0.1% TFA

Flow Rate: 1.0 mL/min

Temperature: 30°C

Detection: UV @ 220 nm

1. Fluorocytosine
2. Fluorouracil

Ordering Information

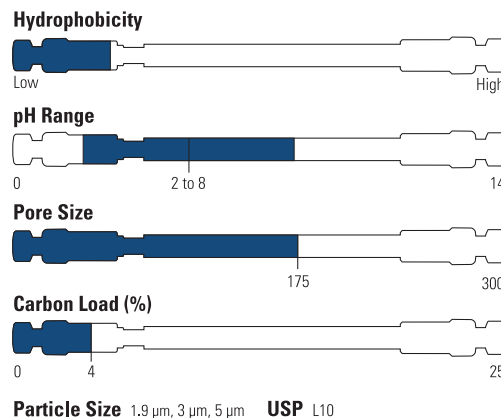
Hypersil GOLD PFP Analytical Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	25402-023030	25402-022130	25402-021030
	30	—	—	25402-033030	25402-032130	25402-031030
	50	25402-054630	—	25402-053030	25402-052130	25402-051030
	100	—	—	25402-103030	25402-102130	25402-101030
	150	—	—	—	25402-152130	—
	200	—	—	—	25402-202130	—
3 μ m	30	25403-034630	25403-034030	25403-033030	25403-032130	25403-031030
	50	25403-054630	25403-054030	25403-053030	25403-052130	25403-051030
	100	25403-104630	25403-104030	25403-103030	25403-102130	25403-101030
	150	25403-154630	25403-154030	25403-153030	25403-152130	25403-151030
5 μ m	30	25405-034630	25405-034030	25405-033030	25405-032130	25405-031030
	50	25405-054630	25405-054030	25405-053030	25405-052130	25405-051030
	100	25405-104630	25405-104030	25405-103030	25405-102130	25405-101030
	150	25405-154630	25405-154030	25405-153030	25405-152130	25405-151030

Thermo Scientific Hypersil GOLD CN Columns

Cyano columns for reversed and normal phase separations



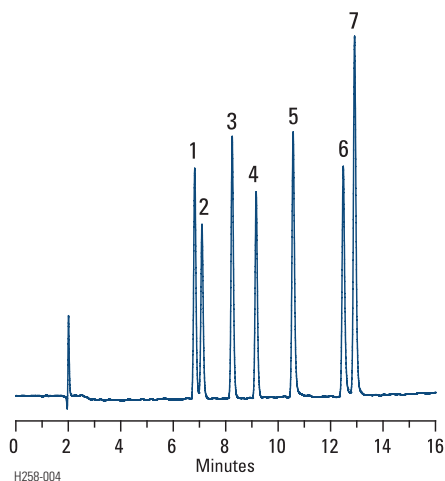
Application Areas Pharmaceutical | Clinical

- 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.

Clinical: Steroids



Column: Hypersil GOLD CN, 5 μm, 150 x 4.6 mm

Part Number: 25805-154630

Mobile Phase: A: H₂O
B: ACN

Gradient: Time (mins)	% B
0	10
15	50

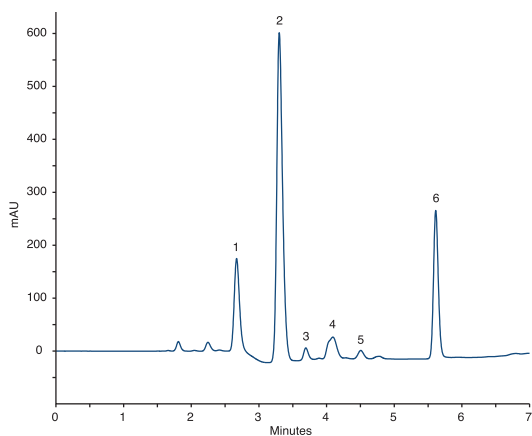
Flow Rate: 1.5 mL/min

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

Pharmaceutical: Penicillins



H258-006

Column: Hypersil GOLD CN, 5 μ m, 150 x 4.6 mm

Part Number: 25805-154630

Mobile Phase: A: 10 mM KH_2PO_4 pH3

B: MeCN

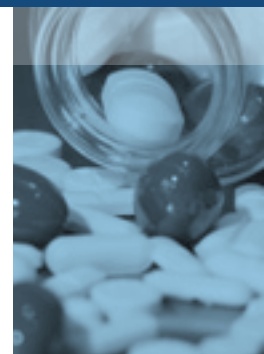
Gradient: Time (mins)	% B
0	0
1	10
8	70

Flow Rate: 1.25 mL/min

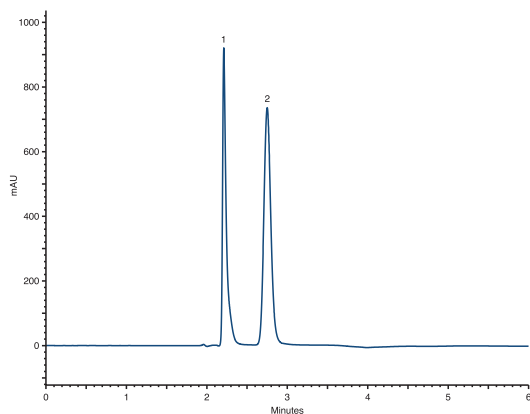
Temperature: 25°C

Detection: UV @ 220 nm

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



Pharmaceutical: TB Drugs



H258-005

Column: Hypersil GOLD CN, 5 μ m, 150 x 4.6 mm

Part Number: 25805-154630

Mobile Phase: A: 20 mM NH_4 Formate pH3

B: MeCN

Gradient: Time (mins)	% B
0	0
15	20

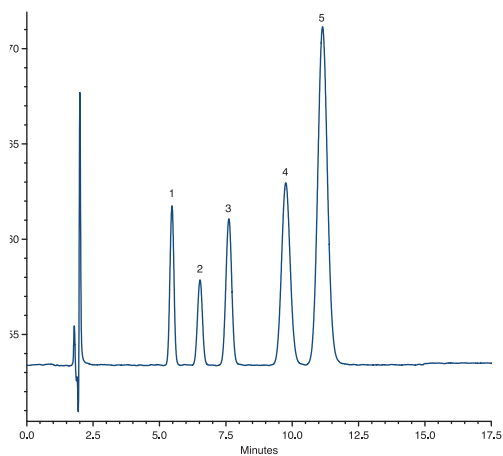
Flow Rate: 1.0 mL/min

Temperature: 25°C

Detection: UV @ 254 nm

1. Isoniazid
2. Pyrazinamide

General: Organic acids



H258-002

Column: Hypersil GOLD CN, 5 μ m, 150 x 4.6 mm

Part Number: 25805-154630

Mobile Phase: A: 25 mM KH_2PO_4 pH2

B: MeOH

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

Ordering Information

Hypersil GOLD CN Columns

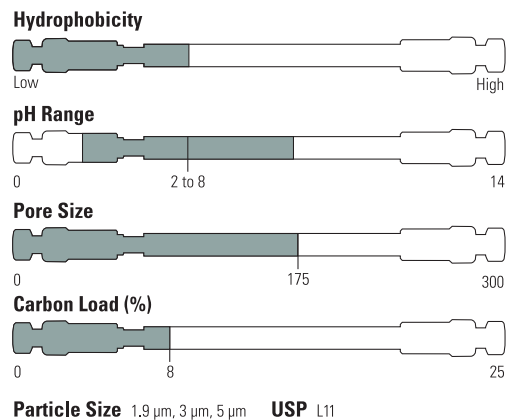


Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μm	20	—	—	25802-023030	25802-022130	25802-021030
	30	—	—	25802-033030	25802-032130	25802-031030
	50	25802-054630	—	25802-053030	25802-052130	25802-051030
	100	—	—	25802-103030	25802-102130	25802-101030
	150	—	—	—	25802-152130	—
	200	—	—	—	25802-202130	—
3 μm	30	25803-034630	25803-034030	25803-033030	25803-032130	25803-031030
	50	25803-054630	25803-054030	25803-053030	25803-052130	25803-051030
	100	25803-104630	25803-104030	25803-103030	25803-102130	25803-101030
	150	25803-154630	25803-154030	25803-153030	25803-152130	25803-151030
5 μm	30	25805-034630	25805-034030	25805-033030	25805-032130	25805-031030
	50	25805-054630	25805-054030	25805-053030	25805-052130	25805-051030
	100	25805-104630	25805-104030	25805-103030	25805-102130	25805-101030
	150	25805-154630	25805-154030	25805-153030	25805-152130	25805-151030
	250	25805-254630	25805-254030	25805-253030	25805-252130	25805-251030



Thermo Scientific Hypersil GOLD Phenyl Columns

Excellent retention and unique selectivity
for aromatic analytes



Application Areas **Pharmaceutical** | **Environmental** | **Food Safety** | **Clinical** | **Forensics**

- Analyte mixtures with varying polarity and aromaticity

Alternative Selectivity for Aromatic and Moderately Polar Analytes

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

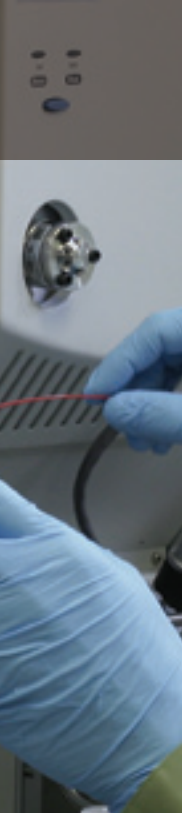
Enhanced Pi-pi Interactions with Aromatics

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.

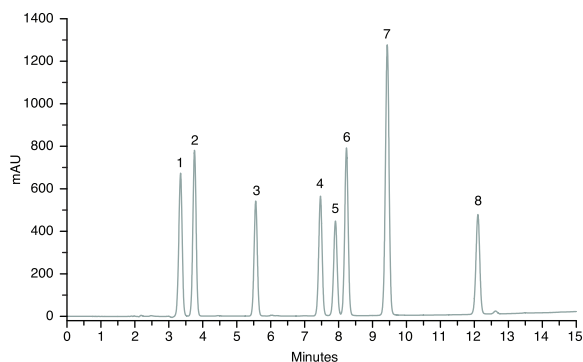
Moderate Hydrophobicity

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 μ m,
150 x 4.6 mm

Part Number: 25905-154630

Mobile Phase: A: 20 mM KH_2PO_4 , pH 2.5
B: MeCN

Gradient: 20 – 50% B in 15 mins

Flow Rate: 1 mL/min

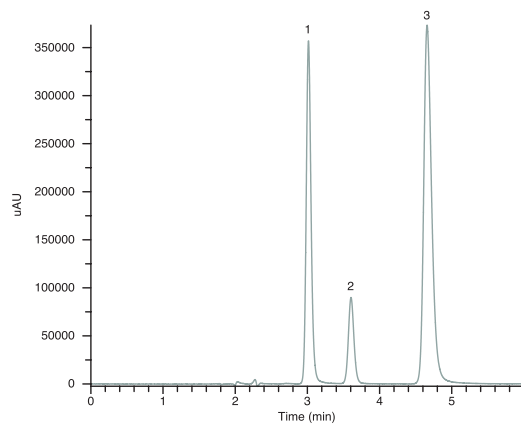
Temperature: 30°C

Injection Volume: 5 μ L

Detection: UV @ 225 nm

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

Pharmaceutical: Antacids



Column: Hypersil GOLD Phenyl, 5 μ m,
150 x 4.6 mm

Part Number: 25405-154630

Mobile Phase: 20 mM K_2HPO_4 ,
pH 7.0/MeCN, 80/20

Flow Rate: 1 mL/min

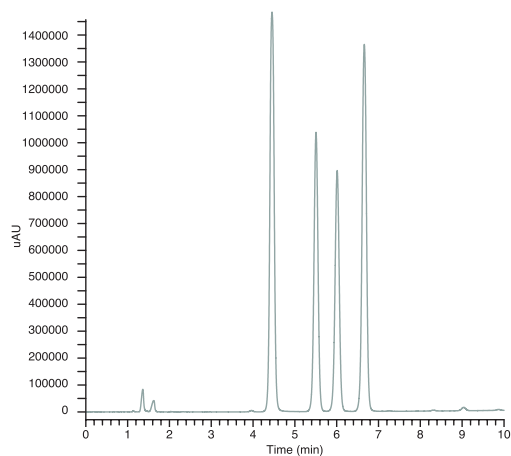
Temperature: 25°C

Injection Volume: 5 μ L

Detection: UV @ 254 nm

1. Famotidine
2. Cimetidine
3. Ranitidine

Pharmaceutical: Veterinary drug coccidiostats



Column: Hypersil GOLD Phenyl, 5 μ m,
150 x 4.6 mm

Part Number: 25405-154630

Mobile Phase: A: H_2O
B: MeOH

Gradient: 40 – 70% B in 10 mins

Flow Rate: 1 mL/min

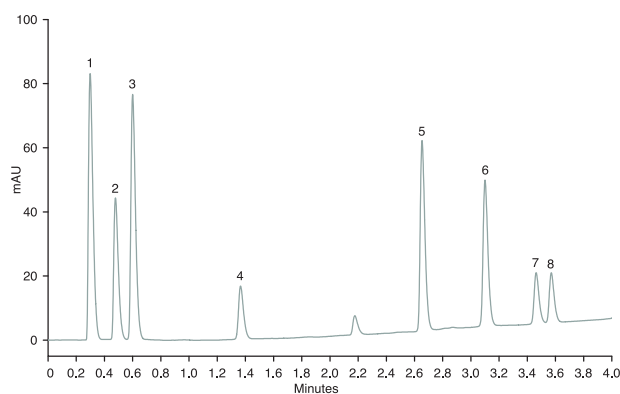
Temperature: 25°C

Injection Volume: 5 μ L

Detection: UV @ 260 nm

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

Pharmaceutical: Antidepressants



H259-006

Column: Hypersil GOLD Phenyl, 1.9 μ m,
50 x 2.1 mm

Part Number: 25902-052130

Mobile Phase: A: 0.1% Formic acid
B: 0.1% Formic acid in MeCN

Gradient: 10 – 60% B in 3.4 mins,
60 – 90% B in 0.24 min

Flow Rate: 0.5 mL/min

Temperature: 60°C

Injection Volume: 0.7 μ L

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

Ordering Information

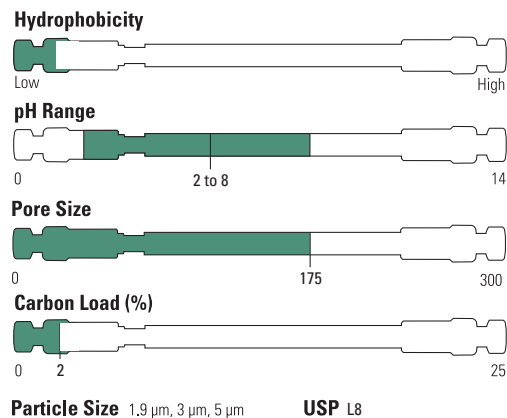
Hypersil GOLD Phenyl Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	25902-023030	25902-022130	25902-021030
	30	—	—	25902-033030	25902-032130	25902-031030
	50	25902-054630	—	25902-053030	25902-052130	25902-051030
	100	—	—	25902-103030	25902-102130	25902-101030
	150	—	—	—	25902-152130	—
	200	—	—	—	25902-202130	—
3 μ m	30	25903-034630	25903-034030	25903-033030	25903-032130	25903-031030
	50	25903-054630	25903-054030	25903-053030	25903-052130	25903-051030
	100	25903-104630	25903-104030	25903-103030	25903-102130	25903-101030
	150	25903-154630	25903-154030	25903-153030	25903-152130	25903-151030
5 μ m	30	25905-034630	25905-034030	25905-033030	25905-032130	25905-031030
	50	25905-054630	25905-054030	25905-053030	25905-052130	25905-051030
	100	25905-104630	25905-104030	25905-103030	25905-102130	25905-101030
	150	25905-154630	25905-154030	25905-153030	25905-152130	25905-151030
	250	25905-254630	25905-254030	25905-253030	25905-252130	25905-251030

Thermo Scientific Hypersil GOLD Amino Columns

Highly versatile aminopropyl
stationary phase



Application Areas Food Safety | Pharmaceutical | Chemical/Industrial

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

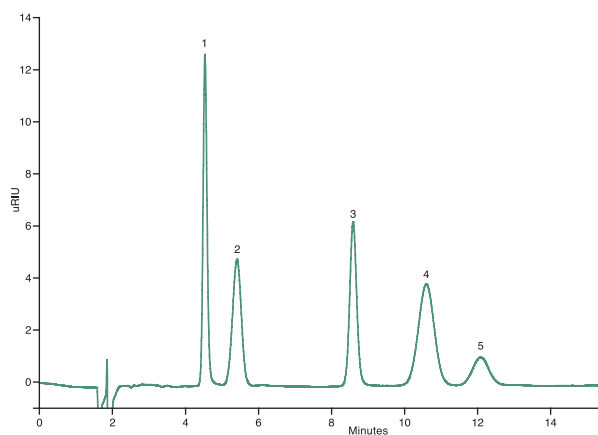
Excellent Chromatographic Properties in Four Modes: Weak Anion Exchange, Reversed Phase, HILIC and Normal Phase

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 reversed phase or HILIC mode.

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.

Food Safety: Sugars



Column: Hypersil GOLD Amino,
5 μm , 150 x 4.6 mm

Part Number: 25705-154630

Mobile Phase: MeCN/Water (80:20)

Flow Rate: 1.2 mL/min

Temperature: 35°C

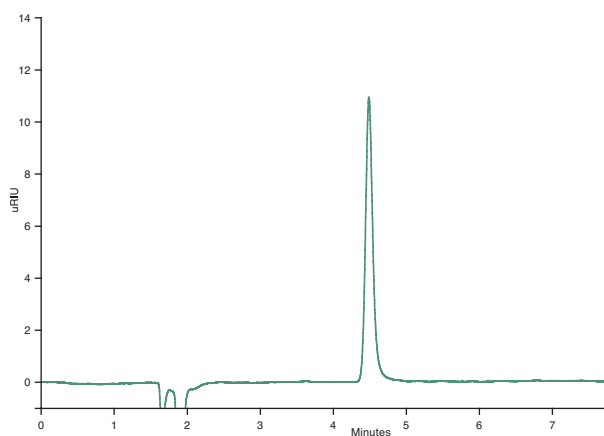
Detection: RI

Injection volume: 20 μL

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

H257-001

Food Safety: Sorbitol



Column: Hypersil GOLD Amino,
5 μ m, 150 x 4.6 mm

Part Number: 25705-154630

Mobile Phase: MeCN/Water (80:20)

Flow Rate: 1.2 mL/min

Temperature: 35°C

Detection: RI

Injection volume: 20 μ L

1. Sorbitol

H257-002

Ordering Information

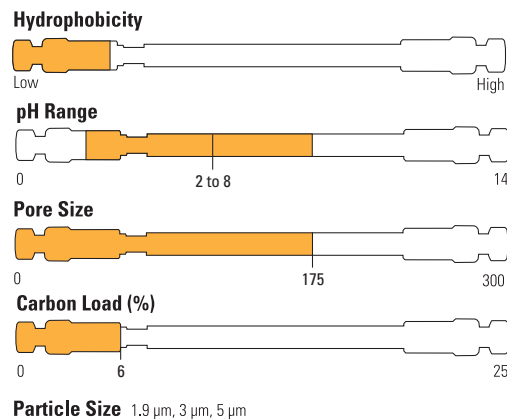
Hypersil GOLD Amino Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	25702-023030	25702-022130	25702-021030
	30	—	—	25702-033030	25702-032130	25702-031030
	50	25702-054630	—	25702-053030	25702-052130	25702-051030
	100	—	—	25702-103030	25702-102130	25702-101030
	150	—	—	—	25702-152130	—
	200	—	—	—	25702-202130	—
3 μ m	30	25703-034630	25703-034030	25703-033030	25703-032130	25703-031030
	50	25703-054630	25703-054030	25703-053030	25703-052130	25703-051030
	100	25703-104630	25703-104030	25703-103030	25703-102130	25703-101030
	150	25703-154630	25703-154030	25703-153030	25703-152130	25703-151030
5 μ m	30	25705-034630	25705-034030	25705-033030	25705-032130	25705-031030
	50	25705-054630	25705-054030	25705-053030	25705-052130	25705-051030
	100	25705-104630	25705-104030	25705-103030	25705-102130	25705-101030
	150	25705-154630	25705-154030	25705-153030	25705-152130	25705-151030
	250	25705-254630	25705-254030	25705-253030	25705-252130	25705-251030

Thermo Scientific Hypersil GOLD AX Columns

Separation of anionic species
and polar molecules



Application Areas Pharmaceutical | Biotech | Food Safety | Environmental

- Smaller proteins and peptides
- Anionic species
- Polar molecules

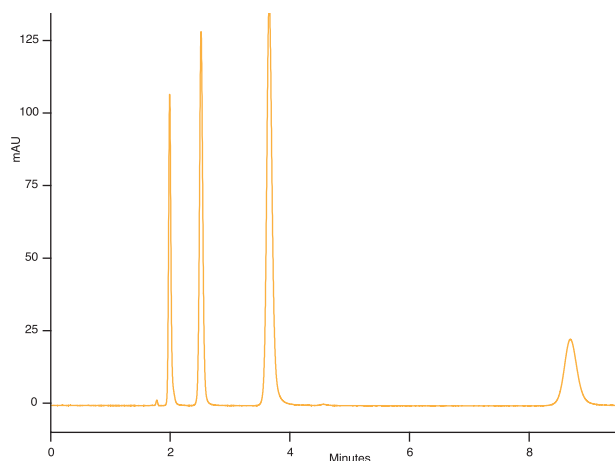
Weak Anion Exchange Phase

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.

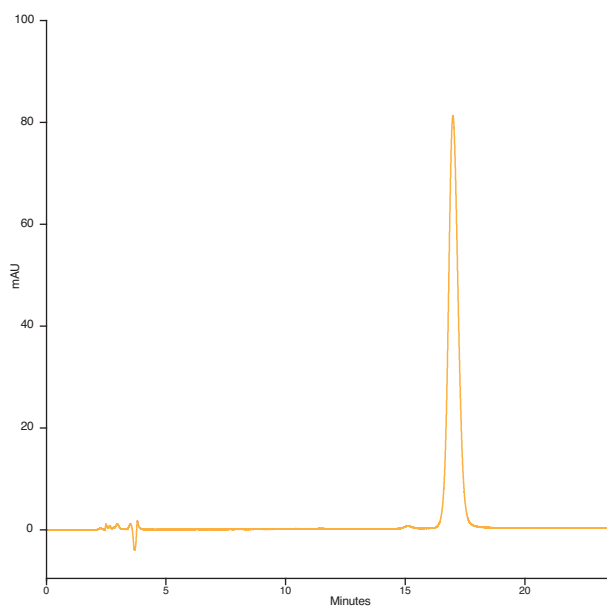
Biotech: Monophosphates



Column: Hypersil GOLD AX, 5 µm, 150 x 4.6 mm
Part Number: 26105-154630
Mobile Phase: Aqueous KH_2PO_4 (50 mM, pH 3)
Flow Rate: 1.0 mL min⁻¹
Temperature: 40°C
Detection: UV @ 254 nm
Injection volume: 10 µL

H261-001

Food safety: Vitamin C



Column: Hypersil GOLD AX, 5 μ m, 100 x 4.6 mm

Part Number: 26105-104630

Mobile Phase: 100 mM Ammonium Acetate
pH 6.8/MeCN (30:70)

Flow Rate: 0.5 mL/min

Temperature: 30°C

Detection: UV @ 240 nm

Injection volume: 50 μ L

H261-002

Ordering Information

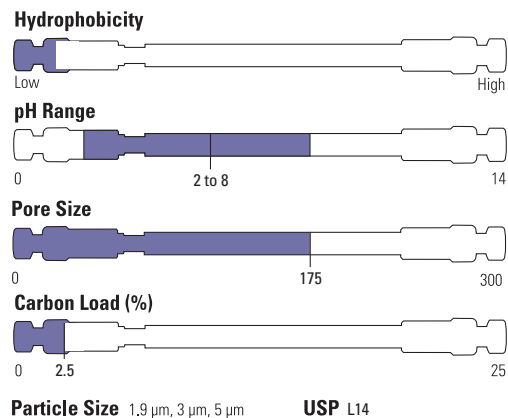
Hypersil GOLD AX Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	26102-023030	26102-022130	26102-021030
	30	—	—	26102-033030	26102-032130	26102-031030
	50	26102-054630	—	26102-053030	26102-052130	26102-051030
	100	—	—	26102-103030	26102-102130	26102-101030
	150	—	—	—	26102-152130	—
	200	—	—	—	26102-202130	—
3 μ m	30	26103-034630	26103-034030	26103-033030	26103-032130	26103-031030
	50	26103-054630	26103-054030	26103-053030	26103-052130	26103-051030
	100	26103-104630	26103-104030	26103-103030	26103-102130	26103-101030
	150	26103-154630	26103-154030	26103-153030	26103-152130	26103-151030
5 μ m	30	26105-034630	26105-034030	26105-033030	26105-032130	26105-031030
	50	26105-054630	26105-054030	26105-053030	26105-052130	26105-051030
	100	26105-104630	26105-104030	26105-103030	26105-102130	26105-101030
	150	26105-154630	26105-154030	26105-153030	26105-152130	26105-151030
	250	26105-254630	26105-254030	26105-253030	26105-252130	26105-251030

Thermo Scientific Hypersil GOLD SAX Columns

Quaternary amine strong anion exchange column



Application Areas Pharmaceutical | Biotech

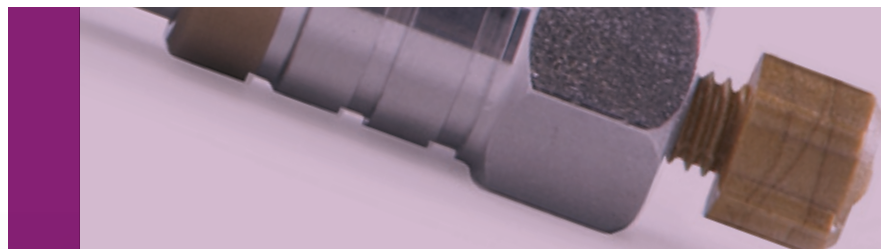
- Smaller organic molecules

High Stability to Aqueous Mobile Phase

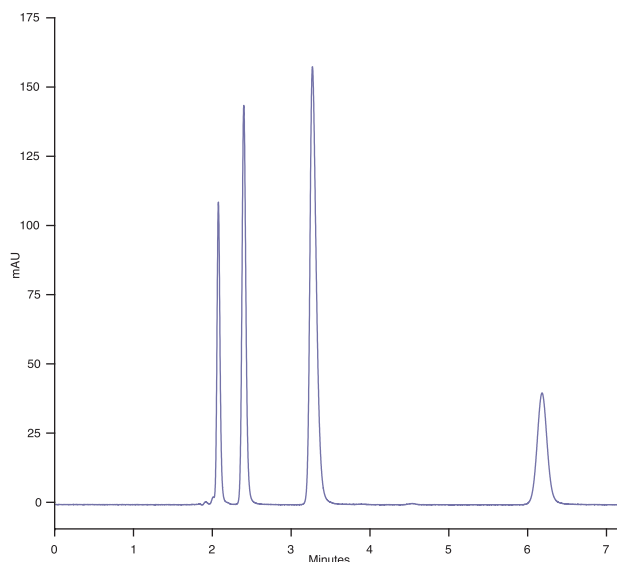
The Hypersil GOLD SAX stationary phase utilises a highly stable quaternary amine strong anion exchange ligand bonded to highly pure silica. Hypersil GOLD SAX columns are suited to the analysis of smaller organic molecules such as nucleotides and organic acids using aqueous and low pH mobile phases.

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.



Monophosphates



H263-001

Column: Hypersil GOLD SAX 5 μ m, 150 x 4.6 mm
 Part number: 26305-154630
 Mobile phase: 50 mM KH_2PO_4 pH 3.0
 Flow rate: 1.0 mL/min
 Detection: UV @ 254 nm
 Column temperature: 40°C
 Injection volume: 10 μ L

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

Ordering Information

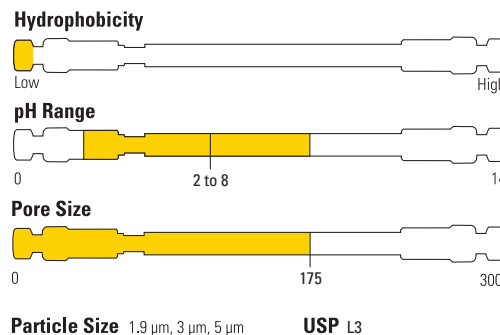
Hypersil GOLD SAX Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	26302-023030	26302-022130	26302-021030
	30	—	—	26302-033030	26302-032130	26302-031030
	50	26302-054630	—	26302-053030	26302-052130	26302-051030
	100	—	—	26302-103030	26302-102130	26302-101030
	150	—	—	—	26302-152130	—
	200	—	—	—	26302-202130	—
3 μ m	30	26303-034630	26303-034030	26303-033030	26303-032130	26303-031030
	50	26303-054630	26303-054030	26303-053030	26303-052130	26303-051030
	100	26303-104630	26303-104030	26303-103030	26303-102130	26303-101030
	150	26303-154630	26303-154030	26303-153030	26303-152130	26303-151030
5 μ m	30	26305-034630	26305-034030	26305-033030	26305-032130	26305-031030
	50	26305-054630	26305-054030	26305-053030	26305-052130	26305-051030
	100	26305-104630	26305-104030	26305-103030	26305-102130	26305-101030
	150	26305-154630	26305-154030	26305-153030	26305-152130	26305-151030
	250	26305-254630	26305-254030	26305-253030	26305-252130	26305-251030

Thermo Scientific Hypersil GOLD Silica Columns

Excellent peak shape in normal
phase chromatography

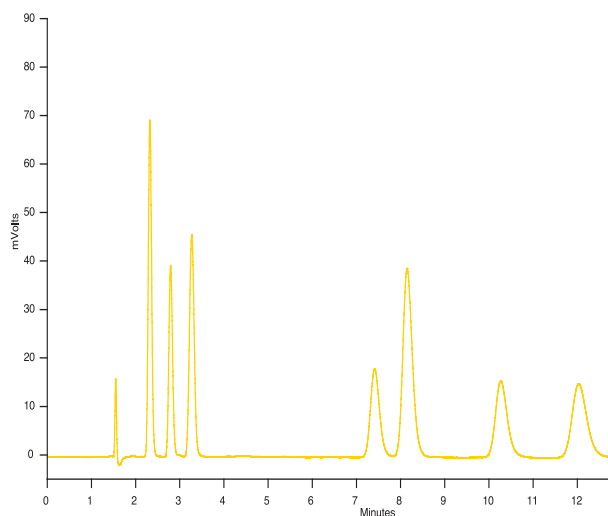


Application Areas Pharmaceutical | Forensics | Industrial

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 x 4.6 mm

Part Number: 25105-154630

Mobile Phase: 19:1 (v/v) n-C₆H₁₄/EtOH

Flow Rate: 1.5 mL min⁻¹

Temperature: 30°C

Detection: UV @ 254 nm

Injection volume: 5 μL

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

H251-002

Ordering Information

Hypersil GOLD Silica Columns



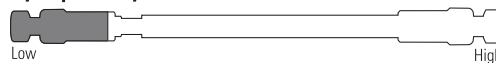
Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μm	20	—	—	25102-023030	25102-022130	25102-021030
	30	—	—	25102-033030	25102-032130	25102-031030
	50	25102-054630	—	25102-053030	25102-052130	25102-051030
	100	—	—	25102-103030	25102-102130	25102-101030
	150	—	—	—	25102-152130	—
	200	—	—	—	25102-202130	—
3 μm	30	25103-034630	25103-034030	25103-033030	25103-032130	25103-031030
	50	25103-054630	25103-054030	25103-053030	25103-052130	25103-051030
	100	25103-104630	25103-104030	25103-103030	25103-102130	25103-101030
	150	25103-154630	25103-154030	25103-153030	25103-152130	25103-151030
5 μm	30	25105-034630	25105-034030	25105-033030	25105-032130	25105-031030
	50	25105-054630	25105-054030	25105-053030	25105-052130	25105-051030
	100	25105-104630	25105-104030	25105-103030	25105-102130	25105-101030
	150	25105-154630	25105-154030	25105-153030	25105-152130	25105-151030
	250	25105-254630	25105-254030	25105-253030	25105-252130	25105-251030



Thermo Scientific Hypersil GOLD HILIC Columns

Enhanced retention of polar
and hydrophilic analytes

Hydrophobicity



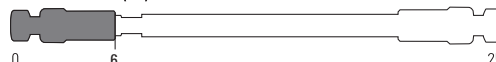
pH Range



Pore Size



Carbon Load (%)



Particle Size 1.9 μm , 3 μm , 5 μm

Application Areas Pharmaceutical | Food Safety | Environmental

- Polar and hydrophilic compounds

Enhanced Retention of Polar and Hydrophilic Analytes

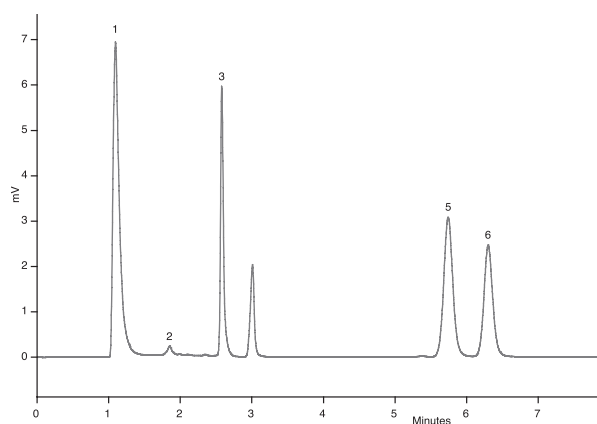
Hydrophilic interaction liquid chromatography (HILIC) is an increasingly popular technique offering complementary selectivity to reversed-phase. With the ability to retain highly polar and hydrophilic compounds, Hypersil GOLD HILIC columns have been developed to aid the analysis of compounds that are 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.

Improved Sensitivity with MS Detection

Furthermore, the highly organic mobile phase contains low salt levels, making Hypersil GOLD HILIC columns ideal for use with electrospray mass spectroscopy.

Food Safety: Water soluble vitamins



Column: Hypersil GOLD HILIC, 5 μm , 150 x 4.6 mm

Part Number: 26505-154630

Mobile Phase: Water/MeCN (10:90)
+ 0.1% formic acid

Flow Rate: 1.0 mL/min

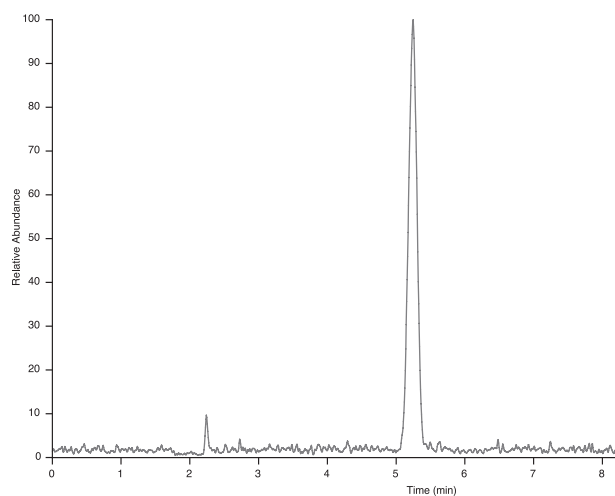
Temperature: ambient

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



H265-005

Column: Hypersil GOLD HILIC, 5 μ m, 150 x 4.6 mm

Part Number: 26505-154630

Mobile Phase: H₂O/MeCN (10:90)
+ 0.1% formic acid

Flow Rate: 0.6 mL/min

Temperature: 30°C

Detection: +ESI

Injection volume: 1 μ L (made up in mobile phase)

1. Urea

Ordering Information

Hypersil GOLD HILIC Columns



Particle Size	Length (mm)	4.6 mm ID	4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
1.9 μ m	20	—	—	26502-023030	26502-022130	26502-021030
	30	—	—	26502-033030	26502-032130	26502-031030
	50	26502-054630	—	26502-053030	26502-052130	26502-051030
	100	—	—	26502-103030	26502-102130	26502-101030
	150	—	—	—	26502-152130	—
	200	—	—	—	26502-202130	—
3 μ m	30	26503-034630	26503-034030	26503-033030	26503-032130	26503-031030
	50	26503-054630	26503-054030	26503-053030	26503-052130	26503-051030
	100	26503-104630	26503-104030	26503-103030	26503-102130	26503-101030
	150	26503-154630	26503-154030	26503-153030	26503-152130	26503-151030
5 μ m	30	26505-034630	26505-034030	26505-033030	26505-032130	26505-031030
	50	26505-054630	26505-054030	26505-053030	26505-052130	26505-051030
	100	26505-104630	26505-104030	26505-103030	26505-102130	26505-101030
	150	26505-154630	26505-154030	26505-153030	26505-152130	26505-151030
	250	26505-254630	26505-254030	26505-253030	26505-252130	26505-251030

Thermo Scientific Hypersil GOLD 1.9 μm

Small particles to improve speed and efficiency

Application Areas Pharmaceutical | Environmental | Food Safety | Clinical | Forensics

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.

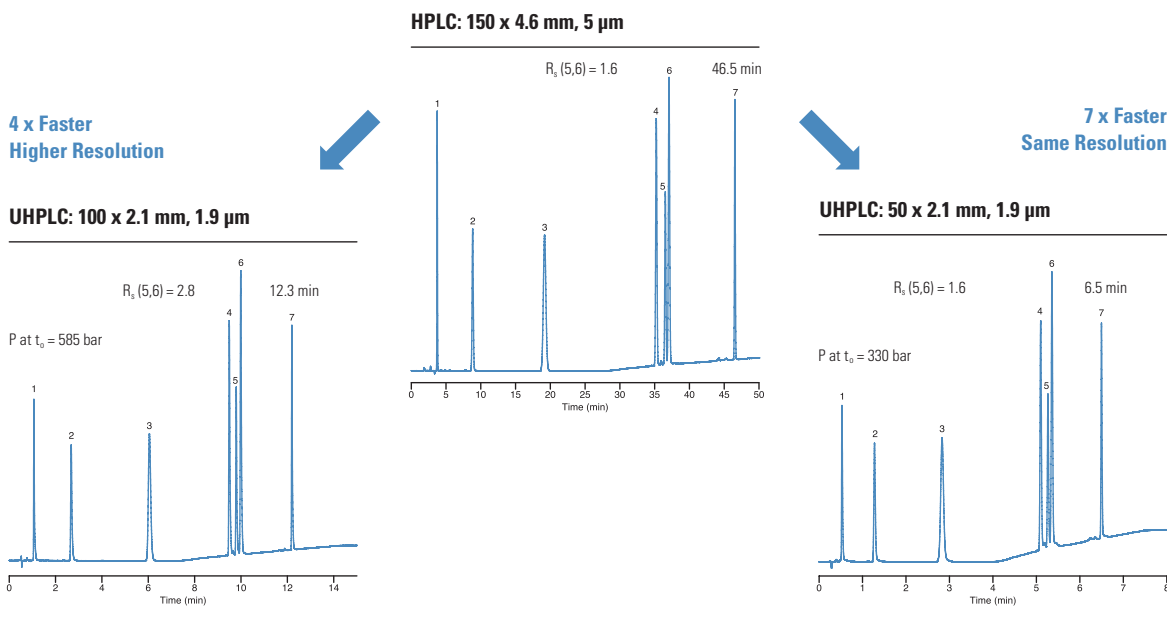
Three Tips for Method Transfer

- 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.

Q. What is the pressure rating of Hypersil GOLD 1.9 μm columns?

A. All analytical columns are packed to withstand pressures of 1250 bar (8000 psi). Capillary, nanobore and javelin columns are rated at 400 bar (6000 psi).

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

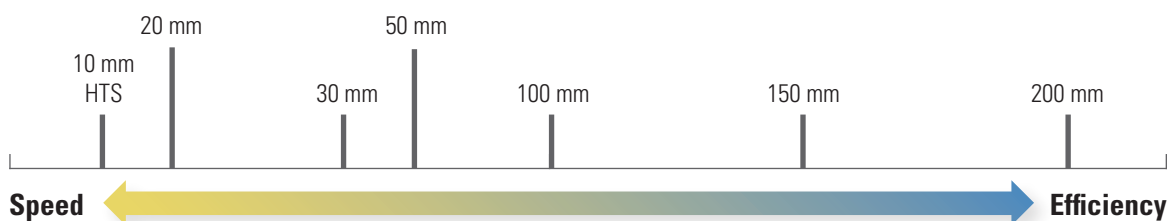


Q. I want to transfer my existing method, but I am not sure what parameters to use for the new method?
A. A method transfer calculator is available on our Chromatography Resource Centre, which can be accessed through www.thermo.com/columns

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.

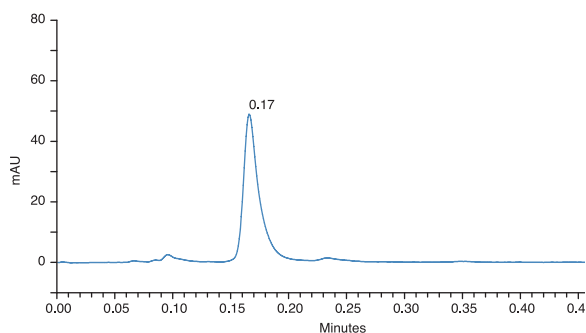
- Speed – Choose from 10 mm Javelin HTS, 20, 30 or 50 mm long analytical columns
- Efficiency – Choose a longer column (for example 150 or 200 mm)
- Low backpressure – Hypersil GOLD 1.9 μm media is packed into a high pressure column 50 mm long and 4.6 mm internal diameter. Traditionally, a 1.9 μm column 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

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.

Nandrolone analysis



Column: Hypersil GOLD 1.9 μm , 10 x 2.1 mm

Column Serial Number: KS1207042J

Mobile phase: $\text{H}_2\text{O}/\text{MeCN}$, 40/60+ 0.1% TFA, isocratic

Flow rate: 0.4 mL/min

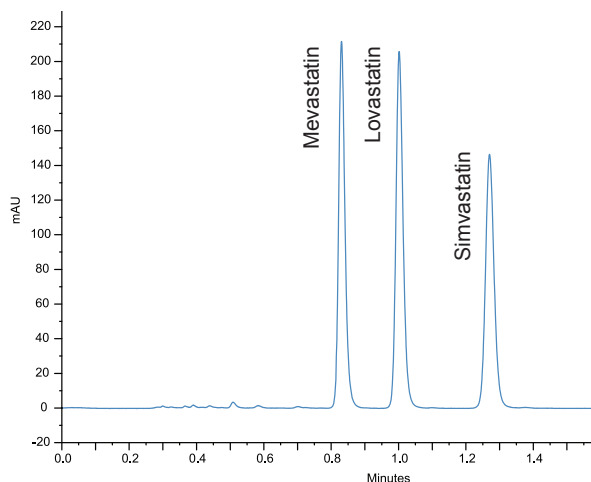
Temperature: 5°C

Detection: 254 nm

Injection volume: 0.5 μL

1. Nandrolone (19-Nortestosterone)

Fast statin separation



Column: Hypersil GOLD 1.9 μm , 100 x 2.1 mm

Mobile phase: A: H_2O 35%
B: ACN 65%

Gradient: Isocratic

Flow rate: 823 $\mu\text{L}/\text{min}$

Column temperature: 45°C

Injection: 0.8 μL

Detection: UV 238 nm

Q. How is it possible to pack 1.9 μm particles columns 200 mm in length?

A. 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.

System Considerations

With 1.9 μ m 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 Accela High Speed LC, will take account of these factors.

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

Further details on method transfer and optimization using Hypersil GOLD 1.9 μ m columns can be found in Technical Guide TG20338. We also offer a convenient method transfer calculator at the Chromatography Resource Center (www.thermoscientific.com/chromatography)

Thermo Scientific Accela LC Systems

Unsurpassed LC capabilities, from HPLC to combined HPLC/UHPLC in one quaternary system with operating pressures up to 1250 bar.

Thermo Scientific Accela Systems provide a robust modular system with a large suite of integrated features to increase application flexibility and efficiency, permitting full customization for any laboratory. From routine industrial QA/QC to advanced drug discovery, from traditional HPLC to unsurpassed combined HPLC/UHPLC capabilities in one system, the Accela™ systems are designed for maximum performance, reliability and productivity. Both the Accela 600 and 1250 pump have the Unique and innovative Force Feedback Control (FFC) technology, enabling the delivery of accurate and precise flow and gradients under all operating conditions by continuously adjusting valve timing and pumping efficiency based on the measured compressibility of the actual solvents providing the flexibility of a quaternary pump with unparalleled performance. Our Accela can be controlled by either the Thermo Scientific Xcalibur MS data system or the Thermo Scientific ChromQuest Chromatography Data System (CDS).

- Quaternary mixing enables rapid method development
- Unparalleled compositional and flow rate accuracy and precision over the entire operating range provide maximum reproducibility
- Stable baselines without a pulse dampener
- Accela system can operate at both conventional and high pressure up to 1,250 bar
- Extremely low quaternary pump delay volume of 70 μ L (Accela 1,250 pump)
- System can provide temperature control for columns up to 250 mm
- Accela 600 Pump: Max flow rate 5 mL/min; maximum pressure 600 bar
- Accela 1250 Pump: Max flow rate 2 mL/min; maximum pressure 1,250 bar



For more information on our Accela High Speed LC Solution, please visit www.thermoscientific.com/accela

Thermo Scientific 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
- KAPPA™ capillary columns
- PicoFrit™ and IntegraFrit™ nanobore columns
- Javelin™ HTS direct-connection columns and DASH™ HTS columns, designed for high throughput screening
- 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.

Capillary and Nanoflow Analysis

The KAPPA line of capillary columns meets all the sensitivity needs of demanding LC/MS separations. These high efficiency capillaries are available in internal diameters ranging from 500 μm all the way down to 75 μm ID, and lengths of 50 mm to 250 mm.

Hypersil GOLD, Hypersil GOLD aQ and Hypersil GOLD PFP packing materials are also available in nanobore formats for nanospray LC/MS applications, particularly proteomics. At flow rates of nL/min versus mL/min, nanobore columns offer higher sensitivity with greater signal-to-noise ratio than traditional electrospray.

- IntegraFrit columns have an integral high-porosity frit which is polished flat to ensure a clean connection to the emitter of choice
- PicoFrit columns spray directly from the column, boosting MS performance

Columns for High Throughput Screening

Javelin HTS and Dash 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. Both Javelin HTS and Dash HTS columns are available in multipacks to provide a cost effective solution.



Q. If I cannot find a column with suitable dimensions in this brochure, what can I do?

A. The Hypersil GOLD family of columns is also available in other column dimensions and hardware formats. Please call Customer Service for more information.



Thermo Scientific Column Protection

Extend column lifetime
and improve performance

Guard Columns for Column Protection

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.

- Available for all Hypersil GOLD stationary phases with 3 μm and 5 μm particle size



Ordering Information

Phase	Quantity	Particle Size	Length (mm)	4.6 mm / 4.0 mm ID	3.0 mm ID	2.1 mm ID	1.0 mm ID
Hypersil GOLD	4	3 µm	10	25003-014001	25003-013001	25003-012101	25003-011001
	4	5 µm	10	25005-014001	25005-013001	25005-012101	25005-011001
Hypersil GOLD C8	4	3 µm	10	25203-014001	25203-013001	25203-012101	25203-011001
	4	5 µm	10	25205-014001	25205-013001	25205-012101	25205-011001
Hypersil GOLD C4	4	3 µm	10	25503-014001	25503-013001	25503-012101	25503-011001
	4	5 µm	10	25505-014001	25505-013001	25505-012101	25505-011001
Hypersil GOLD aQ	4	3 µm	10	25303-014001	25303-013001	25303-012101	25303-011001
	4	5 µm	10	25305-014001	25305-013001	25305-012101	25305-011001
Hypersil GOLD PFP	4	3 µm	10	25403-014001	25403-013001	25403-012101	25403-011001
	4	5 µm	10	25405-014001	25405-013001	25405-012101	25405-011001
Hypersil GOLD CN	4	3 µm	10	25803-014001	25803-013001	25803-012101	25803-011001
	4	5 µm	10	25805-014001	25805-013001	25805-012101	25805-011001
Hypersil GOLD Phenyl	4	3 µm	10	25903-014001	25903-013001	25903-012101	25903-011001
	4	5 µm	10	25905-014001	25905-013001	25905-012101	25905-011001
Hypersil GOLD Amino	4	3 µm	10	25703-014001	25703-013001	25703-012101	25703-011001
	4	5 µm	10	25705-014001	25705-013001	25705-012101	25705-011001
Hypersil GOLD AX	4	3 µm	10	26103-014001	26103-013001	26103-012101	26103-011001
	4	5 µm	10	26105-014001	26105-013001	26105-012101	26105-011001
Hypersil GOLD SAX	4	3 µm	10	26303-014001	26303-013001	26303-012101	26303-011001
	4	5 µm	10	26305-014001	26305-013001	26305-012101	26305-011001
Hypersil GOLD Silica	4	3 µm	10	25103-014001	25103-013001	25103-012101	25103-011001
	4	5 µm	10	25105-014001	25105-013001	25105-012101	25105-011001
Hypersil GOLD HILIC	4	3 µm	10	26503-014001	26503-013001	26503-012101	26503-011001
	4	5 µm	10	26505-014001	26505-013001	26505-012101	26505-011001
UNIGUARD Drop-in Cartridge Holder	1	—	—	850-00	852-00	852-00	851-00

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.

Ordering Information

Item	Part Number
UHPLC direct connect filter holder	27006
2.1 mm ID filter cartridge, 0.2 µm (5/pk)	22180
1.0 mm ID filter cartridge, 0.2 µm (5/pk)	22185

National Scientific Mass Spec Certified Vials

Industry's first and only pre-cleaned, low particle, low background chromatography vial

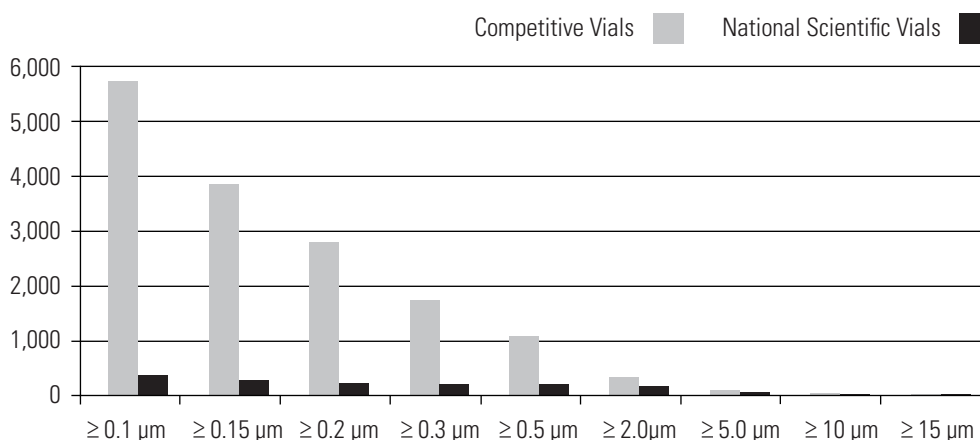


When your instrumentation, sample handling and methodology is pushing the limits, a chromatography vial that can keep up is essential.

- The only chromatography vials pre-cleaned to provide unmatched consistency
- The first low particle, low background chromatography vials
- Pre-cleaned vial packaging protects the product integrity
- High purity closures packed in air-tight re-closeable container
- Tested and certified for 13 critical physical characteristics affecting vial performance
- Tested and certified for low background by positive ESI LC/MS
- Tested and certified for low background by GC/MS

The table below shows the results obtained from particulate analysis of a typical unprocessed vial compared to the National Scientific Certified Mass Spec vials. The processed vial shows a significant reduction in total particle counts.

Typical Cumulative Particle Counts



For further information visit www.nationalscientific.com

Thermo Scientific eVol Sample Dispensing System

Improve accuracy in dispensing
of samples in the laboratory

- A digitally controlled positive displacement dispensing system
- Reproducible and accurate liquid handling procedures
- Easily calibrated to ensure validity of results

Precision in Sample Dispensing

The eVol™ sample dispensing system is programmable to reproducibly and accurately perform a wide variety of liquid handling procedures.

Analytical syringes can be used in place of pipettors when dispensing solvents and other non-aqueous liquids. Coupling an analytical syringe to an electronic device leads to greater accuracy and reproducibility when handling such substances.

For laboratories that need to repeatedly dispense non-aqueous liquids, eVol is unlike other laboratory dispensing devices. By coupling an analytical syringe to an electronic device, the result is a unique hand-held digital dispenser that can be easily calibrated to accurately and precisely dispense liquids independent of the user's skills.

Key Benefits

The programmable digital hand-held device means liquid handling procedures are user-independent, allowing more efficient workflow scheduling and a reduction in the re-analysis of incorrectly processed or false positive samples.

XCHANGE analytical syringes are easily and quickly changed using the coupling device, allowing them to be dedicated to individual liquids to prevent possible cross-contamination of reagents.

www.thermoscientific.com/evol





Thermo Scientific Columns and Consumables

As the world's sole manufacturer of Thermo Scientific Hypersil silica, we have set a very high standard in HPLC and continue to maintain it with innovative new products spanning across SPE, HPLC and GC. We offer one of the broadest selections of premier chromatographic phases and innovative hardware designs available, combined with superb technical support and customer service. Whether you use HyperSep products for rapid sample preparation, Hypersil BDS columns for routine separations or are looking for something new for your most challenging methods like Hypersil GOLD columns or Thermo Scientific TRACE GC columns, we have the choices to meet your needs.

Chromatography Resources

Our bi-monthly Separated by Experience newsletter keeps you up-to-date on the latest technical and product information of interest to chromatographers. Subscribe today! www.thermoscientific.com/chromatography

Our 2010/2011 Chromatography Columns and Consumables catalogs helps you find all your chromatography needs in a single resource. To order your copy visit www.thermoscientific.com/chromatography



www.thermoscientific.com/columns

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