

## Hypersil GOLD®

- Excellent peak symmetry and efficiency
- Increased sensitivity and resolution
- Variety of chemistries
- 1.9 to 12µm particles
- Capillary to preparative dimensions

Hypersil GOLD® columns are based on high purity silica and a novel proprietary derivatization and endcapping procedure, which reduces unwanted secondary and tertiary interactions of an analyte with the silica.

### Hypersil GOLD Phases

Phase	Functional Group	Endcapped	Particle Size (µm)	Pore Size (Å)	Surface Area (m <sup>2</sup> /g)	Carbon Load (%)	pH Range
GOLD	Proprietary	Yes	1.9, 3, 5, 8, 12	175	220	10	1 - 11
GOLD C8	Octyl	Yes	1.9, 3, 5	175	220	8	2 - 9
GOLD C4	Butyl	Yes	1.9, 3, 5	175	220	5	2 - 8
GOLD aQ	Octadecyl	Yes	1.9, 3, 5, 8, 12	175	220	12	2 - 9
GOLD PFP	Perfluorophenyl	Yes	1.9, 3, 5, 8, 12	175	220	8	2 - 8
GOLD CN	Cyano	Yes	1.9, 3, 5	175	220	4	2 - 8
GOLD Phenyl	Phenyl	Yes	1.9, 3, 5	175	220	8	2 - 8
GOLD Amino	Amino	Yes	1.9, 3, 5	175	220	2	2 - 8
GOLD AX	Polymeric amine	No	1.9, 3, 5	175	220	6	2 - 8
GOLD SAX	Quaternary amine	Yes	1.9, 3, 5	175	220	2.5	2 - 8
GOLD Silica	-	-	1.9, 3, 5	175	220	-	2 - 8
GOLD HILIC	Polyethyleneimine	n/a	1.9, 3, 5	175	220	6	2 - 8

### Hypersil GOLD Selectivities

In addition to the original **Hypersil GOLD** phase, eleven other phases are now available, offering a range of selectivity options to optimise separations and maximise productivity. The original Hypersil GOLD shows C18-like USP L1 retention and selectivity. The phase is claimed to be stable over the pH range 1 to 11.

**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 phase for separation of hydrophobic polypeptides and small proteins. Figure 8 shows the separation of linolenic acid and linoleic acid on Hypersil GOLD C4.

**Hypersil GOLD aQ** is a polar endcapped C18 phase, which is compatible with highly aqueous eluents. It offers superior retention of polar compounds, due to the polar functional group providing additional interaction mechanisms with polar compounds.

**Hypersil GOLD PFP** columns offer alternative selectivity in reversed-phase HPLC by offering extra retention and selectivity for positional isomers of halogenated compounds. They are also well suited for the selective analysis of non-halogenated compounds, particularly polar compounds containing hydroxyl, carboxyl, nitro or other polar groups, especially when these groups are located on an aromatic or other rigid ring system. Figure 9 shows the separation of taxanes on Hypersil GOLD PFP.

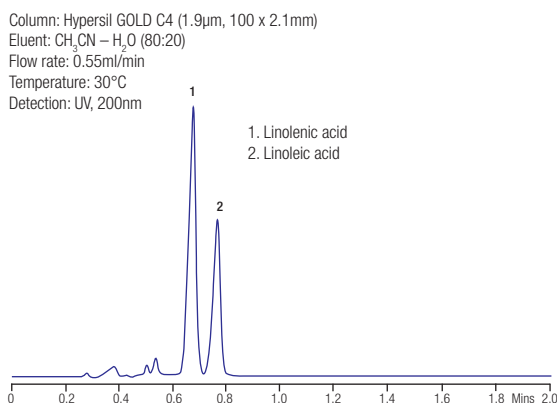


Figure 8. Separation of fatty acids on Hypersil GOLD C4

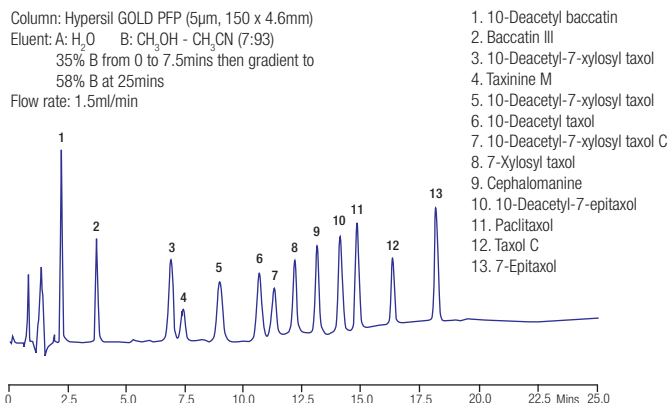


Figure 9. Separation of taxanes on Hypersil GOLD PFP

## Hypersil GOLD® (continued)

## Hypersil GOLD Selectivities (continued)

Figure 10 illustrates the selectivity variations obtained with different Hypersil GOLD phases for a mixture of catechins.

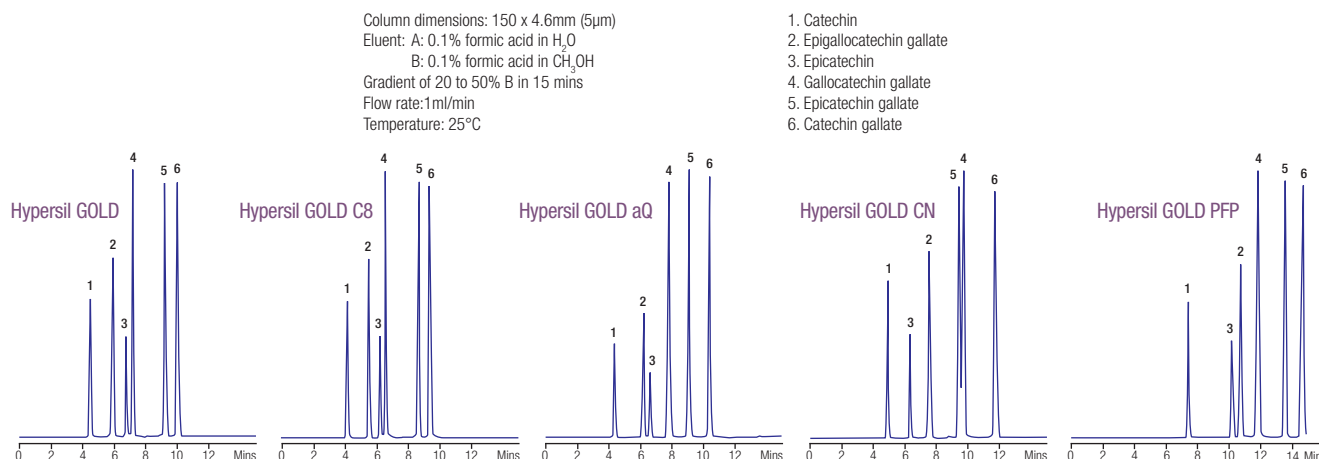


Figure 10. Selectivity changes with Hypersil GOLD phases

**Hypersil GOLD Amino** can be used as a weak anion-exchange material for the analysis of anions and organic acids. It is also useful for carbohydrate analysis when used in reversed-phase or HILIC mode.

**Hypersil GOLD AX** columns utilise a novel polymeric amine ligand bonded to silica. It is a weak anion-exchange material, suitable for the analysis of smaller proteins and peptides and anionic species. They are particularly suited to the analysis of polar compounds in HILIC applications.

**Hypersil GOLD SAX** utilises a highly stable quaternary amine strong cation-exchange ligand bonded to silica. Columns are suited to the analysis of smaller organic molecules such as nucleotides and organic acids.

## 1.9µm Hypersil GOLD

The Hypersil GOLD 1.9µm particle size columns enable fast, high throughput analyses to be achieved, whilst maintaining the peak shape and resolution obtained with Hypersil GOLD columns in larger particle formats. Short 1.9µm Hypersil GOLD columns can be used with high flow rates to obtain exceptional peak capacities with short run times. The higher linear velocities through the column enable operation within the pressure limits of conventional HPLC systems, without loss of performance.

In order to perform these high speed separations, all system components must be optimised, including connecting tubing, injection volume, UV flow cell detector volume and detector time constant and sampling rate (see pages 21-23 for further information on converting HPLC methods to UHPLC).

Figure 11 shows the separation of Sudan dyes on a 1.9µm Hypersil GOLD (20 x 4.6mm) column. Figure 12 shows the increase in resolution obtained for a mixture of anabolic steroids as particle size is reduced from 5µm to 1.9µm.

Column: Hypersil GOLD (1.9µm, 20 x 4.6mm)  
 Eluent: 0.1% formic acid in H<sub>2</sub>O - 0.1% formic acid in CH<sub>3</sub>CN (12:88)  
 Flow rate: 0.5ml/min  
 Detection: +ve ESI

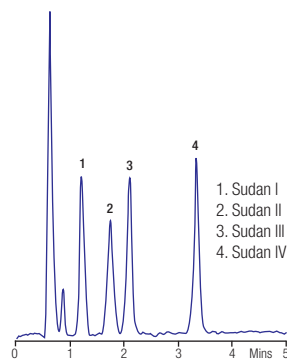


Figure 11. Analysis of Sudan dyes on 1.9µm Hypersil GOLD

Column: Hypersil GOLD (5µm and 1.9µm, 50 x 2.1mm)  
 Eluent: 0.1% formic acid in H<sub>2</sub>O - 0.1% formic acid in CH<sub>3</sub>CN  
 Flow rate: 0.2ml/min

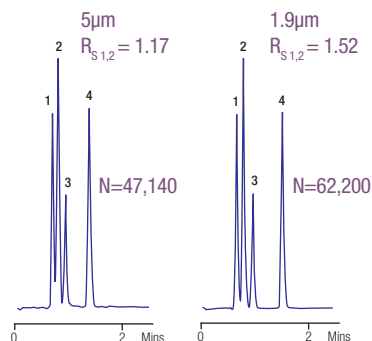


Figure 12. Anabolic steroids on Hypersil GOLD

## Hypersil GOLD® (continued)

### Capillary to Preparative Analyses

Hypersil GOLD columns are available in a wide range of particle sizes (1.9 to 12µm) and in column dimensions from capillary to preparative. KAPPA format capillary columns are available in 500, 320, 180, 100 and 75µm i.d. and lengths of 50 to 250mm. Hypersil GOLD, Hypersil GOLD aQ and Hypersil GOLD PFP are also available in nanobore formats for nanospray LC-MS applications, particularly proteomics. Please enquire for further details.

### Ordering Information – Hypersil GOLD

Column i.d. <sup>1</sup> (mm)	Column Length (mm)				
	20	30	50	100	150

#### 1.9µm Hypersil GOLD

1.0	25002-021030	25002-031030	25002-051030	25002-101030	-
2.1	25002-022130	25002-032130	25002-052130	25002-102130	25002-152130
3.0	25002-023030	25002-033030	25002-053030	25002-103030	-

Column i.d. <sup>1</sup> (mm)	Column Length (mm)					Drop-In Guard Cartridges (4/pk)
	30	50	100	150	250	

#### 3µm Hypersil GOLD

2.1	25003-032130	25003-052130	25003-102130	25003-152130	-	25003-012101 <sup>2</sup>
3.0	25003-033030	25003-053030	25003-103030	25003-153030	-	25003-013001 <sup>2</sup>
4.0	25003-034030	25003-054030	25003-104030	25003-154030	-	25003-014001 <sup>3</sup>
4.6	25003-034630	25003-054630	25003-104630	25003-154630	-	25003-014001 <sup>3</sup>

#### 5µm Hypersil GOLD

2.1	25005-032130	25005-052130	25005-102130	25005-152130	25005-252130	25005-012101 <sup>2</sup>
3.0	25005-033030	25005-053030	25005-103030	25005-153030	25005-253030	25005-013001 <sup>2</sup>
4.0	25005-034030	25005-054030	25005-104030	25005-154030	25005-254030	25005-014001 <sup>3</sup>
4.6	25005-034630	25005-054630	25005-104630	25005-154630	25005-254630	25005-014001 <sup>3</sup>

<sup>1</sup> Other dimensions available

<sup>2</sup> Use with Uniguard direct connect holder 852-00

<sup>3</sup> Use with Uniguard direct connect holder 850-00

Other Hypersil GOLD phases are available as follows:

	1.9µm	3µm	5µm		1.9µm	3µm	5µm
Hypersil GOLD C8	25202	25203	25205	Hypersil GOLD Amino	25702	25703	25705
Hypersil GOLD C4	25502	25503	25505	Hypersil GOLD AX	26102	26103	26105
Hypersil GOLD aQ	25302	25303	25305	Hypersil GOLD SAX	26302	26303	26305
Hypersil GOLD PFP	25402	25403	25405	Hypersil GOLD Silica	25102	25103	25105
Hypersil GOLD CN	25802	25803	25805	Hypersil GOLD HILIC	26502	26503	26505
Hypersil GOLD Phenyl	25902	25903	25905				

Please contact Hichrom for pricing on these Hypersil GOLD phases and information about 12µm Hypersil GOLD columns.

