



# **HICHROM**

**Chromatography Columns and Supplies**

**LC COLUMNS  
Thermo Scientific  
Hypersil GOLD**

**Catalogue 9**

## **Hichrom Limited**

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## 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.

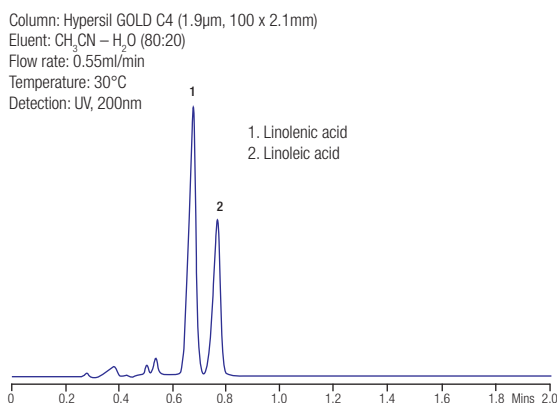


Figure 8. Separation of fatty acids on Hypersil GOLD C4

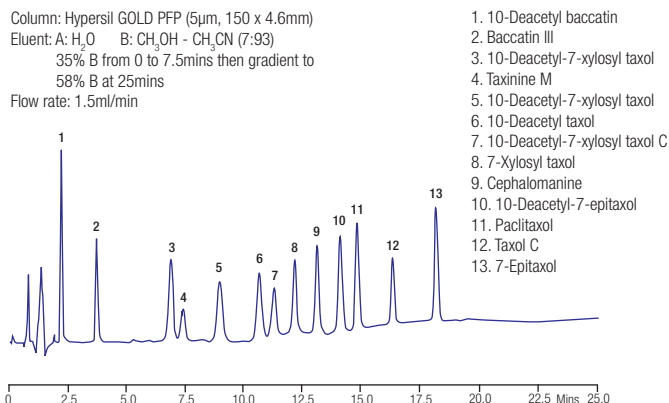


Figure 9. Separation of taxanes on Hypersil GOLD PFP

## Hypersil GOLD® (continued)

## Hypersil GOLD Selectivities (continued)

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

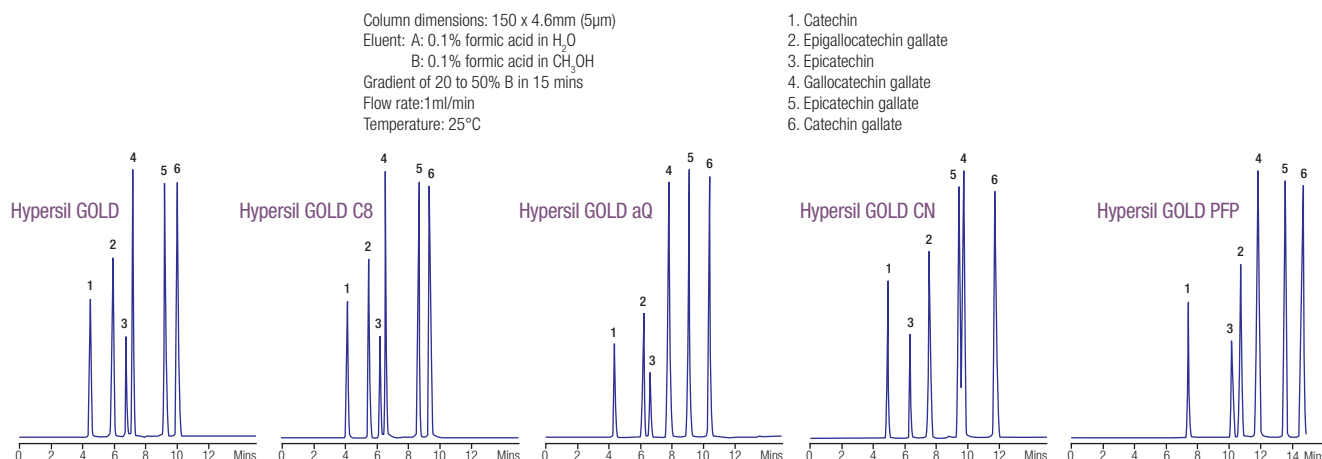


Figure 10. Selectivity changes with Hypersil GOLD phases

**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

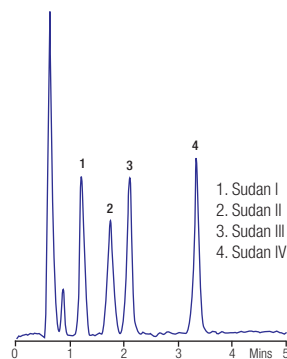


Figure 11. Analysis of Sudan dyes on 1.9µm Hypersil GOLD

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

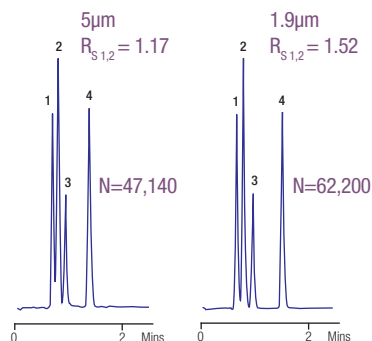


Figure 12. Anabolic steroids on Hypersil GOLD

## 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          |
| <b>1.9µm Hypersil GOLD</b>    |                    |              |              |              |              |
|                               | <b>£421</b>        | <b>£444</b>  | <b>£466</b>  | <b>£466</b>  | <b>£512</b>  |
| 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                         |  |
| <b>3µm Hypersil GOLD</b>      |                             |                             |                             |                             |                             |  |
| 2.1                           | 25003-032130<br><b>£379</b> | 25003-052130<br><b>£379</b> | 25003-102130<br><b>£413</b> | 25003-152130<br><b>£436</b> | -                           | 25003-012101 <sup>2</sup><br><b>£219</b> |
| 3.0                           | 25003-033030<br><b>£379</b> | 25003-053030<br><b>£379</b> | 25003-103030<br><b>£413</b> | 25003-153030<br><b>£436</b> | -                           | 25003-013001 <sup>2</sup><br><b>£219</b> |
| 4.0                           | 25003-034030<br><b>£361</b> | 25003-054030<br><b>£361</b> | 25003-104030<br><b>£395</b> | 25003-154030<br><b>£415</b> | -                           | 25003-014001 <sup>3</sup><br><b>£219</b> |
| 4.6                           | 25003-034630<br><b>£361</b> | 25003-054630<br><b>£361</b> | 25003-104630<br><b>£395</b> | 25003-154630<br><b>£415</b> | -                           | 25003-014001 <sup>3</sup><br><b>£219</b> |
| <b>5µm Hypersil GOLD</b>      |                             |                             |                             |                             |                             |  |
| 2.1                           | 25005-032130<br><b>£345</b> | 25005-052130<br><b>£345</b> | 25005-102130<br><b>£377</b> | 25005-152130<br><b>£397</b> | 25005-252130<br><b>£420</b> | 25005-012101 <sup>2</sup><br><b>£200</b> |
| 3.0                           | 25005-033030<br><b>£345</b> | 25005-053030<br><b>£345</b> | 25005-103030<br><b>£377</b> | 25005-153030<br><b>£397</b> | 25005-253030<br><b>£420</b> | 25005-013001 <sup>2</sup><br><b>£200</b> |
| 4.0                           | 25005-034030<br><b>£329</b> | 25005-054030<br><b>£329</b> | 25005-104030<br><b>£358</b> | 25005-154030<br><b>£378</b> | 25005-254030<br><b>£398</b> | 25005-014001 <sup>3</sup><br><b>£200</b> |
| 4.6                           | 25005-034630<br><b>£329</b> | 25005-054630<br><b>£329</b> | 25005-104630<br><b>£358</b> | 25005-154630<br><b>£378</b> | 25005-254630<br><b>£398</b> | 25005-014001 <sup>3</sup><br><b>£200</b> |

<sup>1</sup> Other dimensions available

<sup>2</sup> Use with Uniguard direct connect holder 852-00 (£75)

<sup>3</sup> Use with Uniguard direct connect holder 850-00 (£75)

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.

