



# HICHROM

Chromatography Columns and Supplies

LC COLUMNS  
Develosil

Catalogue 9

## Hichrom Limited

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- Spherical porous silica
- Range of C18 phases for different selectivity
- Range of C30 phases for high aqueous eluents and polar selectivity

Develosil® columns are manufactured by Nomura Chemical Co. Ltd, Japan. Six different C18 phases are offered: ODS-UG, ODS-HG, ODS-MG, ODS-SR, XG-C18 and the speciality PAHS. Each phase offers slightly different selectivity, enabling the chromatographer to fine-tune difficult separations. A series of C30 bonded columns provide added retention for polar compounds using 100% aqueous eluents. Develosil wide pore (300Å) C4-HG, C8-HG and ODS-HG can also be supplied.

### Develosil Phases<sup>3</sup>

Develosil Phase <sup>1</sup>	Functional Group	Endcapped	Particle Size (µm)	Pore Size (Å)	Surface Area (m <sup>2</sup> /g)	Carbon Load (%)	Bonding Type
TMS-UG	C1	Yes	3, 5	140	300	4.5	Monomeric, monofunctional
C8-UG	C8	Yes	3, 5	140	300	11	Monomeric, monofunctional
ODS-UG	C18	Yes	3, 5	140	300	18	Monomeric, monofunctional
Phenyl-UG	Phenyl	Yes	3, 5	140	300	8	Monomeric, monofunctional
CN-UG	CN	Yes	5	140	300	7	Monomeric, monofunctional
RPAQUEOUS (C30-UG) <sup>2</sup>	C30	Yes	3, 5	140	300	18	Monomeric, monofunctional
RPAQUEOUS-AR	C30	Yes	3, 5	140	300	18	Monomeric, trifunctional
ODS-MG	C18	Yes	3, 5	100	450	15	Monomeric, difunctional
ODS-HG	C18	Yes	3, 5	140	300	18	Monomeric, trifunctional
ODS-SR	C18	Yes	3, 5	80	-	18	Monomeric, difunctional
PAHS	C18	No	3, 5	120	350	23	Polymeric, trifunctional
XG-C18	C18	Yes	3, 5	140	300	19	Monomeric, monofunctional
XG-C30	C30	Yes	3, 5	140	300	19.5	Monomeric, monofunctional
XG-CN	CN	Yes	3, 5	140	300	7.5	Monomeric, monofunctional

<sup>1</sup> Develosil wide pore (300Å) phases C4-HG, C8-HG and ODS-HG also available

<sup>2</sup> The Combi-RP phase (see p. 96) is identical to the RPAQUEOUS (C30-UG) phase

<sup>3</sup> Please enquire for phases not listed

### Comparison of ODS (C18) Columns

**Develosil ODS-UG** is the most stable Develosil phase under alkaline conditions and can be used at pH 1 – 10.

**Develosil ODS-HG** is the most stable under acidic conditions (pH 1 – 9) and can be used with up to 0.5% TFA.

**Develosil ODS-MG** equilibrates quickly and shows higher retention of polar compounds.

**Develosil ODS-SR** (Super Retentive) is the most retentive of the C18 phases and is ideal for LC-MS, as the higher organic solvent content required leads to higher sensitivity. Figure 1 shows a comparison of retention times for oxine-copper and caffeine on ODS-SR-5 and ODS-UG-5.

**Develosil PAHS** is an ODS bonded non-endcapped phase with polymeric bonding and shows the greatest steric selectivity. Figure 2 shows the separation of the 16 priority pollutant polyaromatic hydrocarbons.

**Develosil XG-C18** is the newest addition to the C18 range and is based on high purity silica. The recommended pH range is 1.5 – 8.

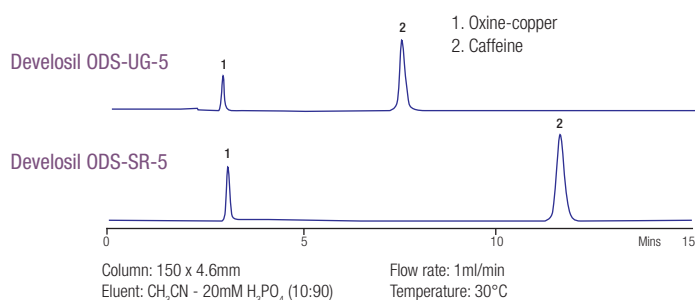


Figure 1. Comparison of retention times for ODS-SR-5 and ODS-UG-5

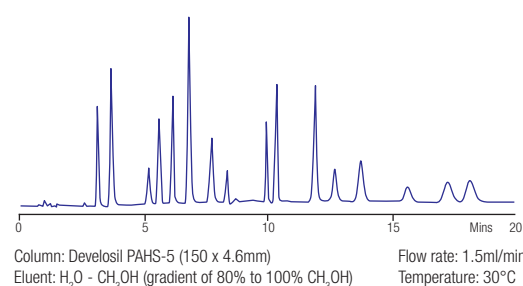


Figure 2. Analysis of 16 PAHs on Develosil PAHS-5

### Bulk Preparative Develosil

Bulk preparative scale Develosil material can be supplied. Please contact Hichrom for further details of Develosil bulk material.

### RPAQUEOUS\*

Develosil RPAQUEOUS is a C30 bonded phase that can be used under 100% aqueous conditions. In Figure 3 it is shown to be water stable for >150 hours, whereas the ODS-UG phase showed considerable loss of retention. It is believed that the C30 ligands remain in the solid state at a typical HPLC operating temperature of 30°C under these eluent conditions.

### Combi-RP\*

The Combi-RP phase is the same C30 material as the RPAQUEOUS phase. However, whereas RPAQUEOUS columns are intended for general purpose and LC-MS applications, Combi-RP is specially aimed at high throughput applications requiring 100% aqueous eluents (pH 2-8). Figure 4 shows the separation of five nucleic acid bases in under a minute.

### RPAQUEOUS-AR

RPAQUEOUS-AR is an alternative C30 phase which shows increased stability under acidic conditions due to the nature of the trifunctional bonding. It is suitable for polar compounds such as sugars and nucleotides and also fat soluble compounds such as tocopherols and carotenoids.

\* RPAQUEOUS, C30-UG and Combi-RP are the same material

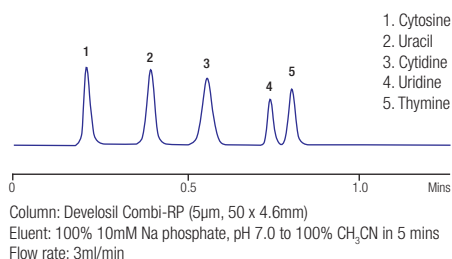


Figure 4. Separation of nucleic acid bases on Combi-RP

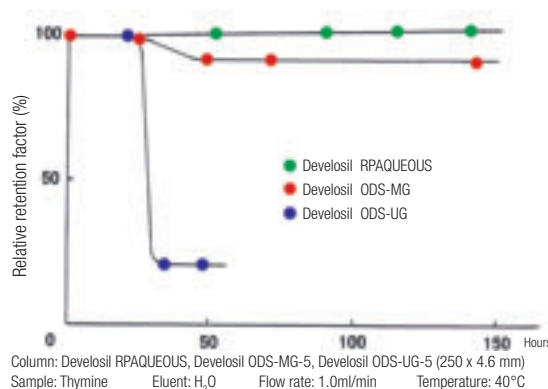


Figure 3. Effect of aqueous eluent on Develosil RPAQUEOUS, ODS-MG and ODS-UG phases

## Ordering Information

Develosil Phase	Column Dimensions <sup>1</sup> (mm)					
	50 x 4.6	100 x 4.6	150 x 4.6			
<b>3µm</b>						
ODS-UG-3	UG11346050W	UG11346100W	UG11346150W			
ODS-MG-3	MG11346050W	MG11346100W	MG11346150W			
ODS-HG-3	HG11346050W	HG11346100W	HG11346150W			
ODS-SR-3	SR11346050W	SR11346100W	SR11346150W			
PAHS-3	PAHS346050W	PAHS346100W	PAHS346150W			
RPAQUEOUS-3	RPAQ346050W	RPAQ346100W	RPAQ346150W			
RPAQUEOUS-AR-3	RPAR346050W	RPAR346100W	RPAR346150W			
Develosil Phase	Column Dimensions <sup>1</sup> (mm)			Guard Cartridges <sup>2</sup> (1/pk, 10 x 4.0mm)		
	100 x 4.6	150 x 4.6	250 x 4.6			
<b>5µm</b>						
ODS-UG-5	UG11546100W	UG11546150W	UG11546250W	UG11540010W		
ODS-MG-5	MG11546100W	MG11546150W	MG11546250W	MG11540010W		
ODS-HG-5	HG11546100W	HG11546150W	HG11546250W	HG11540010W		
ODS-SR-5	SR11546100W	SR11546150W	SR11546250W	SR11540010W		
PAHS-5	PAHS546100W	PAHS546150W	PAHS546250W	-		
TMS-UG-5	UG14546100W	UG14546150W	UG14546250W	UG14540010W		
C8-UG-5	UG12546100W	UG12546150W	UG12546250W	UG12540010W		
Phenyl-UG-5	UG15546100W	UG15546150W	UG15546250W	UG15540010W		
CN-UG-5	UG16546100W	UG16546150W	UG16546250W	UG16540010W		
RPAQUEOUS-5	RPAQ546100W	RPAQ546150W	RPAQ546250W	UG17540010W		
RPAQUEOUS-AR-5	RPAR546100W	RPAR546150W	RPAR546250W	RPAR540010W		
Develosil Phase	Particle Size (µm)	Column Dimensions <sup>1</sup> (mm)				
		35 x 2.0	50 x 2.0	35 x 4.6	50 x 4.6	50 x 20.0
Combi-RP-3	3	COMB320035W	COMB320050W	COMB346035W	COMB346050W	-
Combi-RP-5	5	COMB520035W	COMB520050W	COMB546035W	COMB546050W	COMB5P2050W

<sup>1</sup> Other dimensions available

<sup>2</sup> Holder included

Please contact Hichrom for phases and column dimensions not listed.