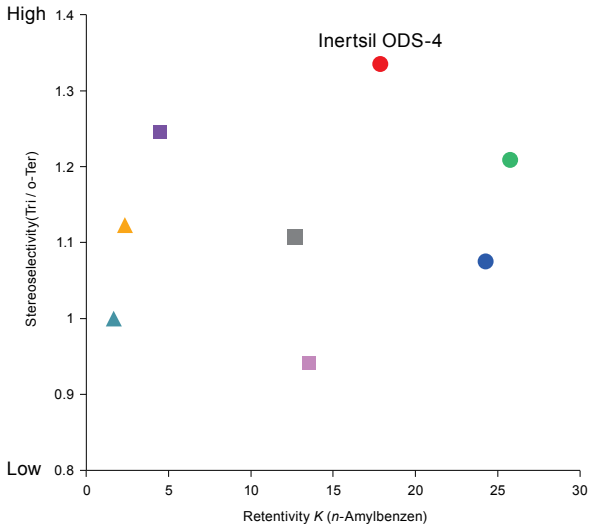
Inertsil® ODS-4

Physical Properties

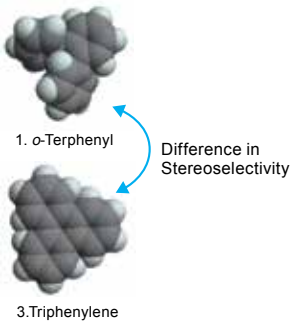
- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 2 µm, 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 11 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

Inertsil ODS-4 delivers the same extreme inertness to any type of compounds just like InertSustain C18 along with unprecedented stability under 100 % aqueous mobile phases for qualitative and quantitative analysis.
However, as the base silica gel and carbon loading are different on Inertsil ODS-4, differences in selectivity can be observed for certain analytes.

Figure 1 : Comparison of Selectivity between various GL Sciences' Columns



- InertSustain C18
- Inertsil ODS-4
- Inertsil ODS-3
- InertSustain C8
- Inertsil C8-3
- Inertsil C8-4
- InertSustain Phenyl
- Inertsil Ph-3

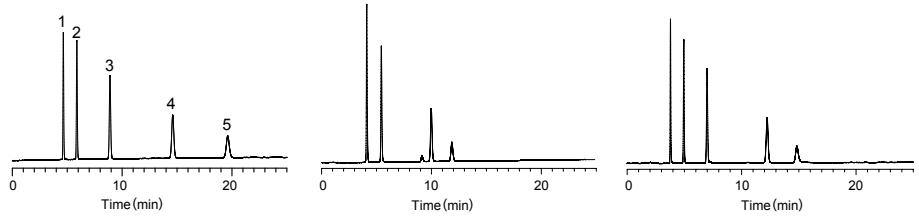


Conditions

Column Size	: 5 µm, 150 × 4.6 mm I.D.
Eluent	: A) CH_3OH
	B) H_2O
	A/B = 70/30, v/v
Flow Rate	: 0.8 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm

Sample :
1. *o*-Terphenyl
2. *n*-Amylbenzene
3. Triphenylene

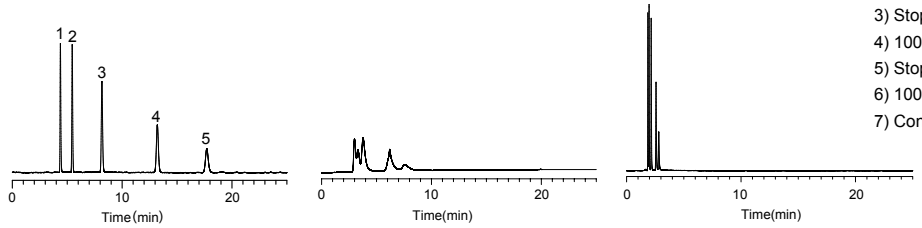
Figure 2 : Dewetting Test



Reduction rate of retention time
9.8 %

Reduction rate of retention time
64.0 %

Reduction rate of retention time
81.0 %



Inertsil ODS-4 | XBridge C18 | Luna C18(2)

Conditions

Column Size	: ODS Column (5 µm, 250 × 4.6 mm I.D.)
Eluent	: H_2O
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Sample	: 1. Cytosine
	2. Uracil
	3. Guanine
	4. Thymine
	5. Adenine

Testing Procedure:

1) 100 % water is introduced into column over 20 minutes.
2) Conduct Analysis (Upper chromatogram)
3) Stop flow for 15 minutes.
4) 100 % water is introduced again into column over 30 minutes.
5) Stop flow for 15 minutes again.
6) 100 % water is introduced again into column over 15 minutes.
7) Conduct Analysis (Lower chromatogram)

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0		
Particle Size: 2 µm	30	5020-81200	5020-81210		
	50	5020-81202	5020-81212		
	75	5020-81203	5020-81213		
	100	5020-81204	5020-81214		
	150	5020-81205	5020-81215		
	Length \ I.D. (mm)	2.1	3.0	4.6	
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	30	5020-14061	5020-14064	5020-14067	
	50	5020-14062	5020-14065	5020-14068	
	75	5020-14063	5020-14066	5020-14069	
	100	5020-14001	5020-14004	5020-14007	
	150	5020-14002	5020-14005	5020-14008	
	250	5020-14003	5020-14006	5020-14009	

* End-fittings are 1/16" Waters-compatible.
* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.
* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)
* For maximum operating pressure information, please refer to page 46.

	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81111	5020-81121		
	50	5020-81112	5020-81122		
	75	5020-81113	5020-81123		
	100	5020-81114	5020-81124		
	150	5020-81115	5020-81125		
	250	5020-81116	5020-81126		
Particle Size: 3 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-04011	5020-04021	5020-04031	5020-04041
	50	5020-04012	5020-04022	5020-04032	5020-04042
	75	5020-04013	5020-04023	5020-04033	5020-04043
	100	5020-04014	5020-04024	5020-04034	5020-04044
	125	5020-04017	5020-04027	5020-04037	5020-04047
	150	5020-04015	5020-04025	5020-04035	5020-04045
	250	5020-04016	5020-04026	5020-04036	5020-04046
	Length \ I.D. (mm)	1.0	1.5		
	30	5020-81011	5020-81021		
	50	5020-81012	5020-81022		
	75	5020-81013	5020-81023		
	100	5020-81014	5020-81024		
	150	5020-81015	5020-81025		
	250	5020-81016	5020-81026		
Particle Size: 5 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	30	5020-03911	5020-03921	5020-03931	5020-03941
	50	5020-03912	5020-03922	5020-03932	5020-03942
	75	5020-03913	5020-03923	5020-03933	5020-03943
	100	5020-03914	5020-03924	5020-03934	5020-03944
	125	5020-03917	5020-03927	5020-03937	5020-03947
	150	5020-03915	5020-03925	5020-03935	5020-03945
	250	5020-03916	5020-03926	5020-03936	5020-03946

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19202	5020-19201	5020-19252	5020-19251
1.5, 2.1		1.5	5020-19302	5020-19301	5020-19352	5020-19351
2.1, 3.0		3.0	5020-19102	5020-19101	5020-19152	5020-19151
4.0, 4.6		4.0	5020-19002	5020-19001	5020-19052	5020-19051
2.1, 3.0	20	3.0	5020-19502	5020-19501	5020-19552	5020-19551
4.0, 4.6		4.0	5020-19402	5020-19401	5020-19452	5020-19451
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

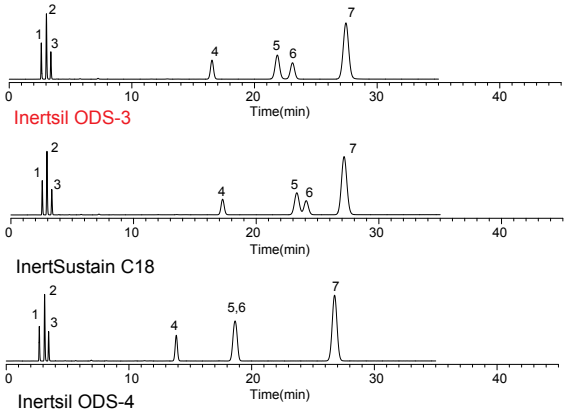
Inertsil® ODS-3

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 2 µm, 3 µm, 4 µm , 5 µm, 7 µm, 10 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

Inertsil ODS-3 is still GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical, and contract research labs. As shown in figure 1, Inertsil ODS-3 has a relatively strong retentivity compared to commercially available ODS columns. In addition, the introduction of higher surface area silica provide high preparative loading capacity without sacrificing peak shape which is illustrated in figure 2.

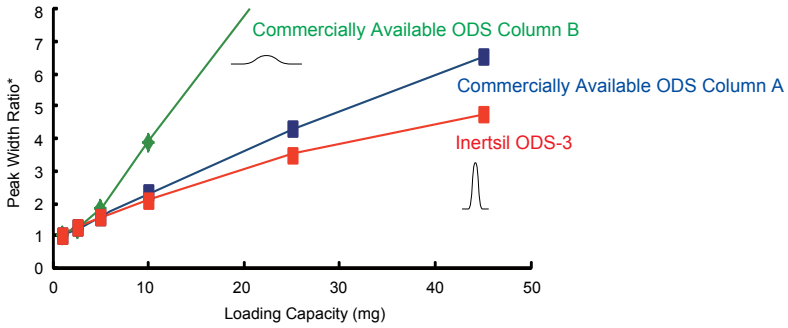
Figure 1 : Comparison of Retentivity



Conditions

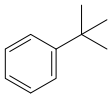
Column Size	: 5 µm, 250 × 4.6 mm I.D.	Sample :
Eluent	: A) CH_3OH	1. Uracil
	B) H_2O	2. Caffeine
	A/B= 80/20, v/v	3. Phenol
Flow Rate	: 1.0 mL/min	4. Butylbenzene
Col.Temp.	: 40 °C	5. *o*-Terphenyl
Detection	: UV 254 nm	6. Amylbenzene
		7. Triphenylene

Figure 2 : Comparison of Loading Capacity



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3OH
	B) H_2O
	A/B = 90/10, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 270 nm
Sample	: *tert*-Buthylbenzene (100 mg/mL)



* The loading capacity varies depending on the column I.D. size and length.

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	
Particle Size: 2 µm	30	5020-84650	5020-84660	
	50	5020-84652	5020-84662	
	75	5020-84653	5020-84663	
	100	5020-84654	5020-84664	
	150	5020-84655	5020-84665	
	Length \ I.D. (mm)	**2.1**	**3.0**	**4.6**
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	30	5020-14081	5020-14084	5020-14087
	50	5020-14082	5020-14085	5020-14088
	75	5020-14083	5020-14086	5020-14089
	100	5020-14011	5020-14014	5020-14017
	150	5020-14012	5020-14015	5020-14018
	250	5020-14013	5020-14016	5020-14019

* End-fittings are 1/16" Waters-compatible.
* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.
* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)
* For maximum operating pressure information, please refer to page 46.

Analytical Columns

Particle Size: 3 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84411	5020-84421		
	50	5020-84412	5020-84422		
	75	5020-84413	5020-84423		
	100	5020-84414	5020-84424		
	150	5020-13360	5020-13350		
	250	5020-	5020-		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04411	5020-04421	5020-04431	5020-04441
	50	5020-04412	5020-04422	5020-04432	5020-01774
	75	5020-04413	5020-04423	5020-04433	5020-01770
	100	5020-04414	5020-04424	5020-01790	5020-01775
	125	5020-04417	5020-04427	5020-01791	5020-01776
	150	5020-04415	5020-04425	5020-04435	5020-01771
	250	5020-04416	5020-04426	5020-04436	5020-01772
Particle Size: 4 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04611	5020-04621	5020-04631	5020-04641
	50	5020-04612	5020-04622	5020-04632	5020-04642
	75	5020-04613	5020-04623	5020-04633	5020-04643
	100	5020-04614	5020-04624	5020-04634	5020-04644
	125	5020-04617	5020-04627	5020-04637	5020-04647
	150	5020-04615	5020-04625	5020-04635	5020-04645
	250	5020-04616	5020-04626	5020-04636	5020-04646
Particle Size: 5 µm	Length \ I.D. (mm)	1.0	1.5		
	33	5020-84511	5020-84521		
	50	5020-84512	5020-84522		
	75	5020-84513	5020-84523		
	100	5020-84514	5020-84524		
	150	5020-13251	5020-13241		
	250	5020-13252	5020-13242		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04511	5020-04521	5020-04531	5020-04541
	50	5020-04512	5020-04522	5020-04532	5020-01763
	75	5020-04513	5020-04523	5020-04533	5020-01764
	100	5020-04514	5020-04524	5020-01766	5020-01765
	125	5020-04515	5020-04525	5020-01767	5020-01768
	150	5020-01741	5020-01751	5020-01761	5020-01731
	250	5020-01742	5020-01752	5020-01762	5020-01732
Particle Size: 10 µm	Length \ I.D. (mm)	4.6			
	150	5020-01631			
	250	5020-01632			

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)			Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)		
			Particle Size			Particle Size		
			3 µm	4 µm	5 µm	3 µm	4 µm	5 µm
1.0	10	1.0	5020-19205	5020-19204	5020-19203	5020-19255	5020-19254	5020-19253
1.5, 2.1		1.5	5020-19305	5020-19304	5020-19303	5020-19355	5020-19354	5020-19353
2.1, 3.0		3.0	5020-19105	5020-19104	5020-19103	5020-19155	5020-19154	5020-19153
4.0, 4.6		4.0	5020-19005	5020-19004	5020-19003	5020-19055	5020-19054	5020-19053
2.1, 3.0	20	3.0	5020-19505	5020-19504	5020-19503	5020-19555	5020-19554	5020-19553
4.0, 4.6		4.0	5020-19405	5020-19404	5020-19403	5020-19455	5020-19454	5020-19453
Holder for Cartridge Guard Column E				For 10 mm Length				5020-08500
				For 20 mm Length				5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-4V

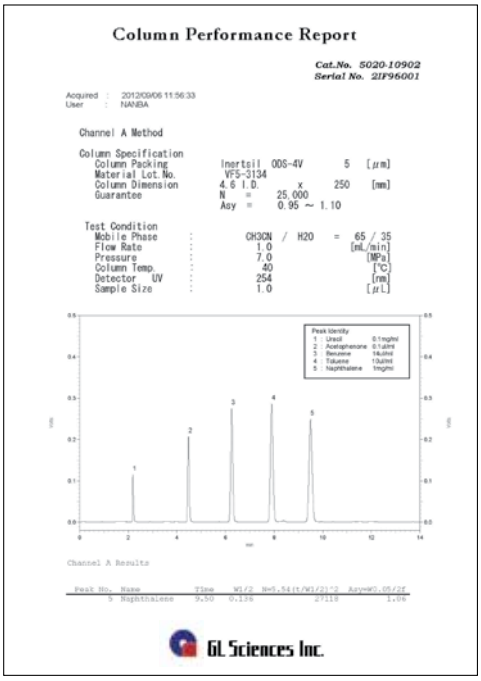
(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 11 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

Inertsil ODS-4 columns have proven superior worldwide for analysis of strong pharmaceutical bases, acids, chelating compounds, and zwitterions. The long-awaited validated Inertsil ODS-4V has now been added to our product lineup.
Each Inertsil ODS-4V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing.
By choosing Inertsil ODS-4V, you can be assured that you are using one of the most trusted and enduring HPLC columns for validation.

Details of Column Performance Report (Front Page)


Column Performance Report

Cat.No. 5020-10902
Serial No. 2IF96001

Acquired : 2012/09/06 11:56:33
User : NANBA

Channel A Method

Column Specification
Column Packing : Inertsil ODS-4V 5 [µm]
Material Lot.No. : VF5-3134
Column Dimension : 4.6 I.D. x 250 [mm]
Guarantee : N = 25,000
Asy = 0.95 ~ 1.10

Test Condition
Mobile Phase : CH3CN / H2O = 65 / 35
Flow Rate : 1.0 [mL/min]
Pressure : 7.0 [MPa]
Column Temp. : 40 [°C]
Detector UV : 254 [nm]
Sample Size : 1.0 [µL]

Peak Identity
1 : Uracil 0.1mg/ml
2 : Acetophenone 0.1µl/ml
3 : Benzene 16µl/ml
4 : Toluene 10µl/ml
5 : Naphthalene 1mg/ml

Channel A Results

Peak No.	Name	Time	W1/2	N=5.54(t/W1/2)^2	Asy=W0.05/2f
5	Naphthalene	9.50	0.136	27118	1.06

GL Sciences Inc.

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30212	5020-30222	5020-30232	5020-30242
	75	5020-30213	5020-30223	5020-30233	5020-30243
	100	5020-30214	5020-30224	5020-30234	5020-30244
	150	5020-30215	5020-30225	5020-30235	5020-30245
	250	5020-30216	5020-30226	5020-30236	5020-30246
	Length \ I.D. (mm)	3.0	4.0	4.6	
Particle Size: 5 µm	150	5020-10921	5020-10911	5020-10901	
	250	5020-10922	5020-10912	5020-10902	

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

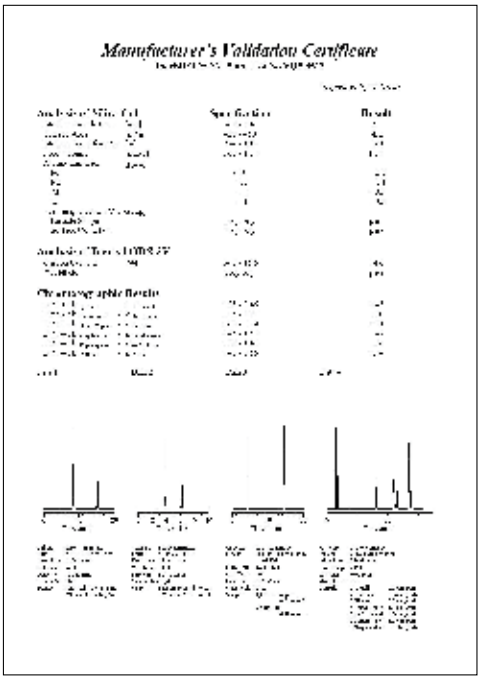
Inertsil® ODS-3V
(Specifically Qualified HPLC columns for GLP/GMP Compliance Validation)

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 15 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

Inertsil ODS-3V offers all of the outstanding chromatographic benefits of Inertsil ODS-3 with the added benefit of a more thoroughly documented, validated QC procedure consistent with the demands of GLP/GMP compliance. Each Inertsil ODS-3V is delivered with a Manufacturer's Validation Certificate showing the detailed results of every QA and QC step in manufacturing. The use of Inertsil ODS-3V columns provides an extra measure of assurance of consistent performance from column to column and batch to batch. Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies.

Details of Manufacturer's Validation Certificate (Back Page)



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	50	5020-30112	5020-30122	5020-30132	5020-30142
	75	5020-30113	5020-30123	5020-30133	5020-30143
	100	5020-30114	5020-30124	5020-30134	5020-30144
	150	5020-30115	5020-30125	5020-30135	5020-30145
	250	5020-30116	5020-30126	5020-30136	5020-30146
	Length \ I.D. (mm)	3.0	4.0	4.6	
Particle Size: 5 µm	150	5020-01821	5020-01811	5020-01801	
	250	5020-01822	5020-01812	5020-01802	

Validation Packs (3-Column-Sets)

Inertsil ODS-3V columns are also available in 3-column-sets packed with your choice of 3 different silica batches or a single silica batch to assist in reproducibility studies. Choose the column dimension and one of the following batch requirements.All three columns with single batch 2. Two columns with single batch and other a different batch 3. All three columns with different batches

	Length \ I.D. (mm)	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-	5020-	5020-
	250	5020-	5020-	5020-

* *End-fittings are 1/16" Waters-compatible.
* *For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-SP

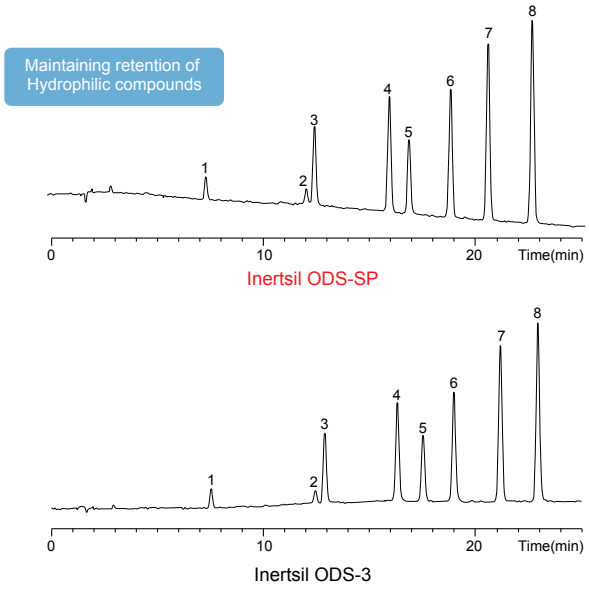
Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : Yes
- **Carbon Loading** : 8.5 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

As shown in figure 1, Inertsil ODS-SP is super base deactivated and optimally bonded to retain hydrophilic compounds without excessive retention of hydrophobic compounds achieving better separations faster than before.
As the carbon load of Inertsil ODS-SP is relatively low, it is compatible with 100 % aqueous eluents and offer faster equilibration of column for gradient analysis.

Figure 1 : Comparison of Retention Behavior between Inertsil® ODS-3 and Inertsil ® ODS-SP

Conditions
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) 10 mM NaH_2PO_4
A/B = 10/90 – 30 min – 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Sample : 1. Gallocatechin (GC)
2. Epigallocatechin (EGC)
3. Catechin (C)
4. Epigallocatechin gallate (EGCg)
5. Epicatechin (EC)
6. Gallocatechin gallate (GCg)
7. Epicatechin gallate (ECg)
8. Catechin gallate (Cg)



Conditions
Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) 20 mM KH_2PO_4 (pH 3.0, H_3PO_4)
A/B = 70/30, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 280 nm
Sample : 1. Phenol
2. Bisphenol A
3. 4-Octylphenol
4. 4-Nonylphenol

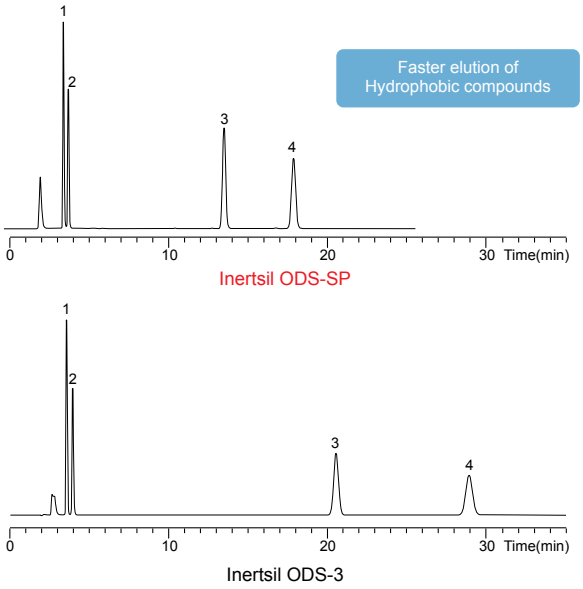
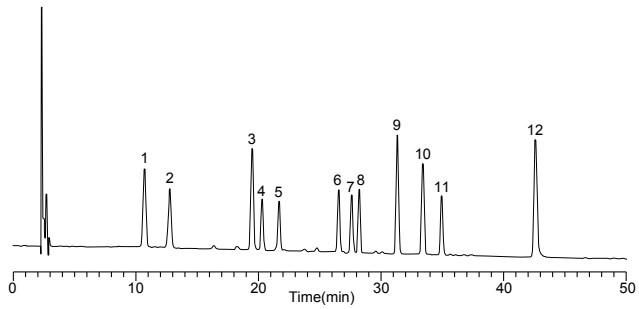


Figure 2 : Simultaneous Analysis of Soybean Isoflavone



Conditions
Column : Inertsil ODS-SP
(5 µm, 250 × 4.6 mm I.D.)
Eluent : A) 0.1 % CH_3COOH in CH_3CN
B) 0.1 % CH_3COOH in H_2O
A/B = 15/85 – 8 min – 15/85 – 42 min – 35/65 – 10 min hold, v/v
Flow Rate : 1.5 mL/min
Col. Temp. : 35 °C
Detection : UV 254 nm
Sample : 1. Daidzin (D)
2. Glycitin (Gly)
3. Genistin (GI)
4. 6"-O-malonyldaidzin (MD)
5. 6"-O-malonylglycitin (MGI)
6. 6"-O-acetyldaidzin (AD)
7. 6"-O-acetylglycitin (AGI)
8. 6"-O-malonylgenistin (MG)
9. Daizein (De)
10. Glycitein (Gle)
11. 6"-O-acetylgenistin (AG)
12. Genistein (Ge)

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.6
HPSeries Particle Size: 3 µm 50 MPa (500 Bar)	30	5020-14091	5020-14094	5020-14097
	50	5020-14092	5020-14095	5020-14098
	75	5020-14093	5020-14096	5020-14099
	100	5020-14021	5020-14024	5020-14027
	150	5020-14022	5020-14025	5020-14028
	250	5020-14023	5020-14026	5020-14029

* End-fittings are 1/16" Waters-compatible.
* UHPLC compatible end-fittings are also available upon request for UHPLC systems (Ex: UPLC) to avoid dead volume.
* Indicate "UP Type end-fittings" when ordering. (Please note that UP type is not available for a 4.6 mm I.D. column)
* For maximum operating pressure information, please refer to page 46.

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 3 µm	20	5020-02811	5020-02821	5020-02831	5020-02841
	50	5020-02812	5020-02822	5020-02832	5020-02842
	75	5020-02813	5020-02823	5020-02833	5020-02843
	100	5020-02814	5020-02824	5020-02834	5020-02844
	150	5020-02815	5020-02825	5020-02835	5020-02845
	250	5020-02816	5020-02826	5020-02836	5020-02846
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	20	5020-02711	5020-02721	5020-02731	5020-02741
	50	5020-02712	5020-02722	5020-02732	5020-02742
	75	5020-02713	5020-02723	5020-02733	5020-02743
	100	5020-02714	5020-02724	5020-02734	5020-02744
	150	5020-02715	5020-02725	5020-02735	5020-02745
	250	5020-02716	5020-02726	5020-02736	5020-02746

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19207	5020-19206	5020-19257	5020-19256
1.5, 2.1		1.5	5020-19307	5020-19306	5020-19357	5020-19356
2.1, 3.0		3.0	5020-19107	5020-19106	5020-19157	5020-19156
4.0, 4.6		4.0	5020-19007	5020-19006	5020-19057	5020-19056
2.1, 3.0	20	3.0	5020-19507	5020-19506	5020-19557	5020-19556
4.0, 4.6		4.0	5020-19407	5020-19406	5020-19457	5020-19456
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

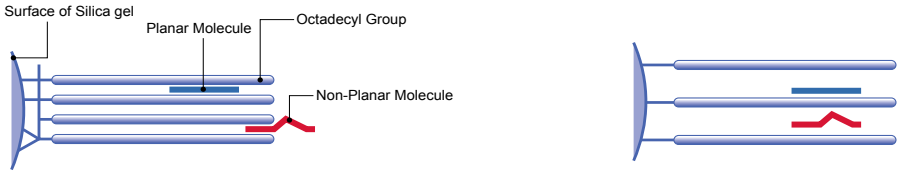
Inertsil® ODS-P

Physical Properties

- **Silica** : 3 Series High Purity Silica Gel
- **Particle Size** : 3 µm, 5 µm
- **Surface Area** : 450 m^2/g
- **Pore Size** : 100 Å (10 nm)
- **Pore Volume** : 1.05 mL/g
- **Bonded Phase** : Octadecyl Groups
- **End-capping** : None
- **Carbon Loading** : 29 %
- **USP Code** : L1
- **pH Range** : 2 ~ 7.5

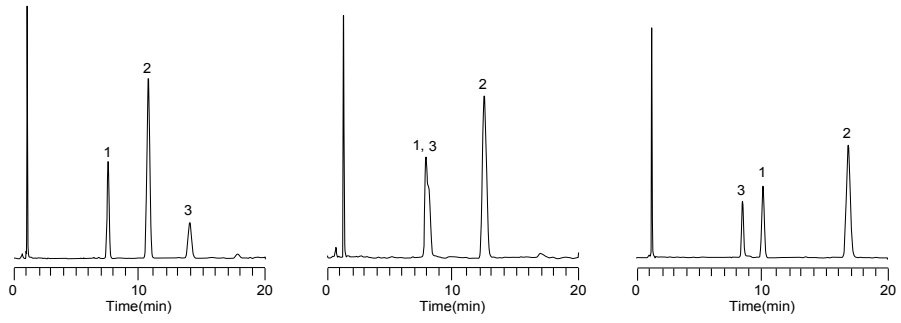
GL Sciences offers a polymerically bonded ODS-P phase which provide high steric selectivity for separation of planar and non-planar compounds as shown in figure 1. This polymeric type C18 column delivers complete baseline separation of structurally similar compounds such as vitamins D2 and D3 which is illustrated in figure 2. Inertsil ODS-P columns are also ideal for the HPLC analysis of 16 PAH compounds, listed as target pollutants by the U.S. EPA.

Figure 1 : Classification of Inertsil® ODS phases by Standard Reference Material 869

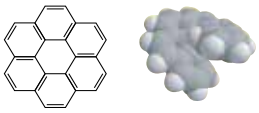


Conditions
Column Size : 5 µm, 250 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) H_2O
A/B = 85/15, v/v
Flow Rate : 2.0 mL/min
Col. Temp. : 30 °C
Detection : UV 254 nm

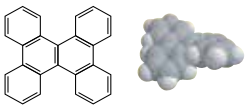
Polymeric	Intermediate	Monomeric
$\alpha = k'_{TBN}/k'_{BaP} = 0.7$	$\alpha = 1.7$	$\alpha = 2.2$
$\alpha \geq 1$: Polymeric-like	$1 < \alpha < 1.7$: Intermediate	$\alpha \geq 1.7$: Monomeric-like



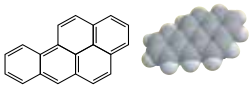
Inertsil ODS-P | Inertsil ODS-2 | Inertsil ODS-3



1. Phenanthro[3,4-c]phenanthrene (PhPh)

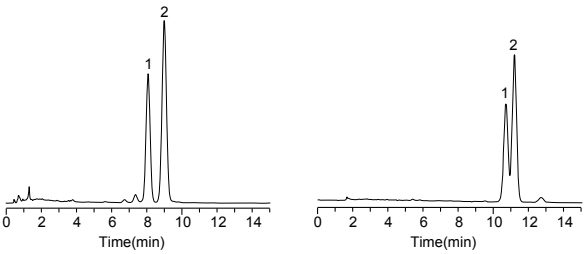


2. Tetrabenzonaphthalene (TBN)



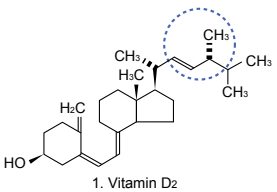
3. Benzo[a]pyrene (BaP)

Figure 2 : Comparison of Selectivity between a Polymeric and Monomeric type C18 phase

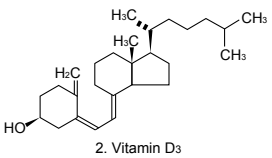


Inertsil ODS-P | Inertsil ODS-3

Conditions
Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3CN
B) CH_3OH
A/B = 75/25, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 30 °C
Detection : UV 280 nm



1. Vitamin D_2



2. Vitamin D_3

Analytical Columns

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 3 µm	33	5020-84731	5020-84741		
	50	5020-84732	5020-84742		
	75	5020-84733	5020-84743		
	100	5020-84734	5020-84744		
	150	5020-84735	5020-84745		
	250	5020-84736	5020-84746		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04661	5020-04671	5020-04681	5020-04691
	50	5020-04662	5020-04672	5020-04682	5020-04692
	75	5020-04663	5020-04673	5020-04683	5020-04693
	100	5020-04664	5020-04674	5020-04684	5020-04694
	150	5020-04665	5020-04675	5020-04685	5020-04695
	250	5020-04666	5020-04676	5020-04686	5020-04696
	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	33	5020-84711	5020-84721		
	50	5020-84712	5020-84722		
	75	5020-84713	5020-84723		
	100	5020-84714	5020-84724		
	150	5020-84715	5020-84725		
	250	5020-84716	5020-84726		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-04711	5020-04721	5020-04731	5020-04741
	50	5020-04712	5020-04722	5020-04732	5020-04742
	75	5020-04713	5020-04723	5020-04733	5020-04743
	100	5020-04714	5020-04724	5020-04734	5020-04744
	150	5020-04715	5020-04725	5020-04735	5020-02001
	250	5020-04716	5020-04726	5020-04736	5020-02002

* End-fittings are 1/16” Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			3 µm	5 µm	3 µm	5 µm
1.0	10	1.0	5020-19209	5020-19208	5020-19259	5020-19258
1.5, 2.1		1.5	5020-19309	5020-19308	5020-19359	5020-19358
2.1, 3.0		3.0	5020-19109	5020-19108	5020-19159	5020-19158
4.0, 4.6		4.0	5020-19009	5020-19008	5020-19059	5020-19058
2.1, 3.0	20	3.0	5020-19509	5020-19508	5020-19559	5020-19558
4.0, 4.6		4.0	5020-19409	5020-19408	5020-19459	5020-19458
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16” Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS-EP

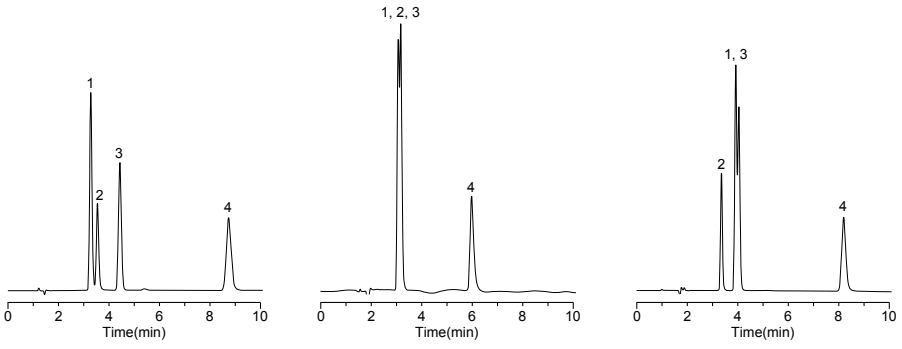
Physical Properties

- **Silica** : **3 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **450 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **1.05 mL/g**
- **Bonded Phase** : **Octadecyl Groups**
- **End-capping** : **None**
- **Carbon Loading** : **9 %**
- **USP Code** : **L1**
- **pH Range** : **2 ~ 7.5**

PG : Polar Group

Inertsil ODS-EP contains a polar functional group embedded between the silica surface and the C18 group.
The embedded polar group makes the C18 phase stable in 100 % aqueous eluents without "phase collapse."
This phase is also extremely "base deactivated" and provides superior peak shape for acids and bases in organic eluents as well as acidified eluents typically used in LC/MS.

Figure 1 : Comparison of Selectivity between various reversed phased columns



Conditions

Column Size : 5 µm, 150 × 4.6 mm I.D.
Eluent : A) CH_3OH
B) 10 mM KH_2PO_4(pH 7.0, K_2HPO_4)
A/B = 50/50, v/v
Flow Rate : 1.0 mL/min
Col. Temp. : 40 °C
Detection : UV 210 nm

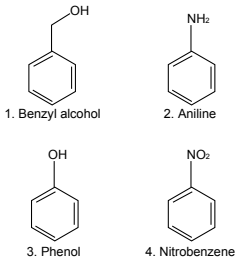
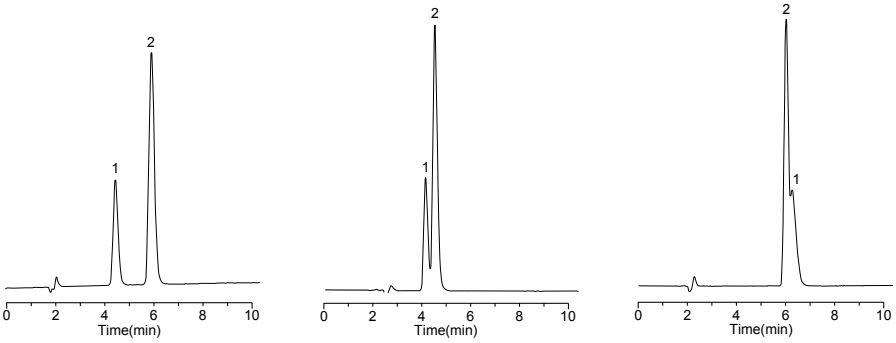
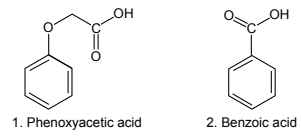


Figure 2 : Unique Selectivity of an Embedded Polar C18 Phase



Conditions

Column Size : 5 µm, 150 × 3.0 mm I.D.
Eluent : A) CH_3OH
B) 0.1 % HCOOH in H_2O
A/B = 50/50, v/v
Flow Rate : 0.4 mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm



Analytical Columns

	Length \ I.D. (mm)	1.0	1.5		
Particle Size: 5 µm	33	5020-18211	5020-18221		
	50	5020-18212	5020-18222		
	75	5020-18213	5020-18223		
	100	5020-18214	5020-18224		
	150	5020-18215	5020-18225		
	250	5020-18216	5020-18226		
	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	33	5020-02611	5020-02621	5020-02631	5020-02641
	50	5020-02612	5020-02622	5020-02632	5020-02642
	75	5020-02613	5020-02623	5020-02633	5020-02643
	100	5020-02614	5020-02624	5020-02634	5020-02644
	150	5020-02615	5020-02625	5020-02635	5020-02645
	250	5020-02616	5020-02626	5020-02636	5020-02646

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
1.0	10	1.0	5020-19210	5020-19260
1.5, 2.1		1.5	5020-19310	5020-19360
2.1, 3.0		3.0	5020-19110	5020-19160
4.0, 4.6		4.0	5020-19010	5020-19060
2.1, 3.0	20	3.0	5020-19510	5020-19560
4.0, 4.6		4.0	5020-19410	5020-19460
Holder for Cartridge Guard Column E			For 10 mm Length	5020-08500
			For 20 mm Length	5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

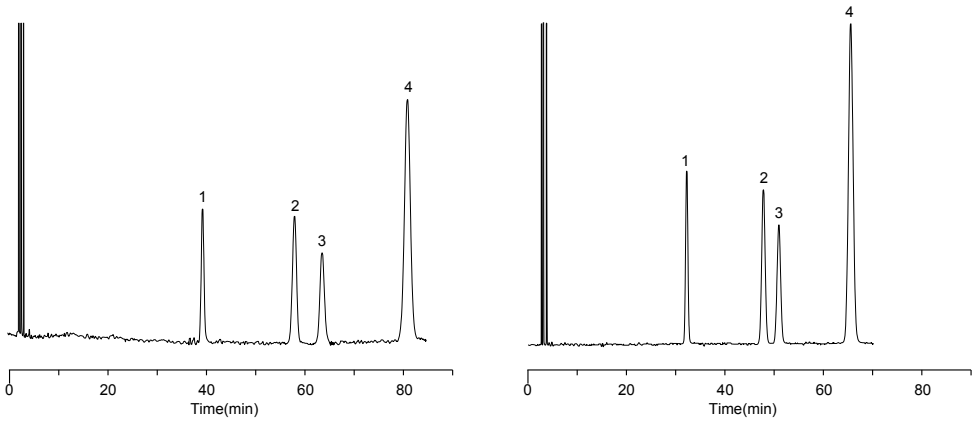
Inertsil® ODS-80A

Physical Properties

- **Silica** : **2 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **450 m^2/g**
- **Pore Size** : **80 Å (8 nm)**
- **Pore Volume** : **0.80 mL/g**
- **Bonded Phase** : **Octadecyl Groups**
- **End-capping** : **Yes**
- **Carbon Loading** : **17.5 %**
- **USP Code** : **L1**
- **pH Range** : **2 ~ 7.5**

A relatively small pore size of 80 Å with high surface area silica delivers high number of theoretical plates for small molecule samples.
GL Sciences' InertSustain C18 and Inertsil ODS-4 were a major advancement on the Inertsil ODS-80A columns, and generally provide superior chromatography and alternative selectivity to the Inertsil ODS-80A.
We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison With Inertsil® ODS-2

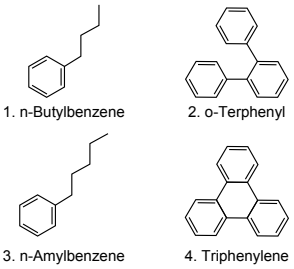


Guaranteed Number of Theoretical Plates Above 25,000
Inertsil ODS-80A[Pore Size 80 Å(8 nm)]

Guaranteed Number of Theoretical Plates Above 22,000
Inertsil ODS-2[Pore Size 150 Å(15 nm)]

Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3OH
	B) H_2O
	A/B = 70/30, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm



1. n-Butylbenzene
2. o-Terphenyl
3. n-Amylbenzene
4. Triphenylene

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01621	5020-01622	5020-01623	5020-01624
	250	5020-01625	5020-01626	5020-01627	5020-01628

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19140	5020-19190
4.0, 4.6		4.0	5020-19040	5020-19090
2.1, 3.0	20	3.0	5020-19540	5020-19590
4.0, 4.6		4.0	5020-19440	5020-19490
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

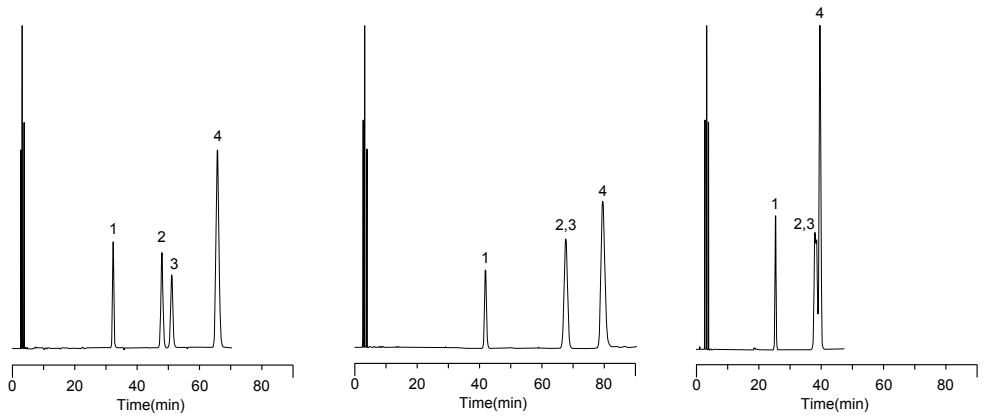
Inertsil® ODS-2

Physical Properties

- **Silica** : **2 Series High Purity Silica Gel**
- **Particle Size** : **5 µm**
- **Surface Area** : **320 m^2/g**
- **Pore Size** : **150 Å (15 nm)**
- **Pore Volume** : **1.20 mL/g**
- **Bonded Phase** : **Octadecyl Groups**
- **End-capping** : **Yes**
- **Carbon Loading** : **18.5 %**
- **USP Code** : **L1**
- **pH Range** : **2 ~ 7.5**

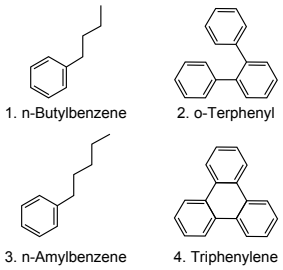
Inertsil ODS-2 columns have a pore size of 150 Å offering symmetric peaks for bases, acids with low pressure. When Inertsil ODS-2 was introduced in 1987s, this HPLC transformed the entire industry. Inertsil ODS-2 was the first HPLC phase created using ultra high purity silica, which produced superior base deactivation. Until this phase was eclipsed by the performance of it's sibling Inertsil ODS-4, it was GL Sciences' most popular phase and continues to be used widely and reliably for long established methods in pharmaceutical and environmental labs. We recommend Inertsil ODS-4 columns for all new method development.

Figure 1 : Comparison of Retentivity with various Inertsil® ODS Bonded Phases



Conditions

Column Size	: 5 µm, 250 × 4.6 mm I.D.
Eluent	: A) CH_3OH B) H_2O A/B = 70/30, v/v
Flow Rate	: 1.0 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm



Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-01121	5020-01122	5020-01123	5020-01124
	250	5020-01125	5020-01126	5020-01127	5020-01128

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

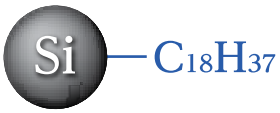
I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)	Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)
			Particle Size	Particle Size
			5 µm	5 µm
2.1, 3.0	10	3.0	5020-19135	5020-19185
4.0, 4.6		4.0	5020-19035	5020-19085
2.1, 3.0	20	3.0	5020-19535	5020-19585
4.0, 4.6		4.0	5020-19435	5020-19485
Holder for Cartridge Guard Column E		For 10 mm Length		5020-08500
		For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Inertsil® ODS

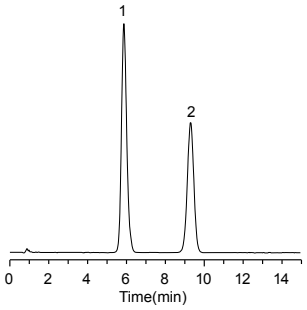
Physical Properties

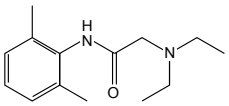
- **Silica** : **Spherical Silica Gel**
- **Particle Size** : **5 µm, 10 µm**
- **Surface Area** : **350 m^2/g**
- **Pore Size** : **100 Å (10 nm)**
- **Pore Volume** : **1.00 mL/g**
- **Bonded Phase** : **Octadecyl Groups**
- **End-capping** : **Yes**
- **Carbon Loading** : **14 %**
- **USP Code** : **L1**
- **pH Range** : **2 ~ 7.5**



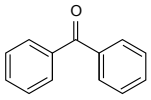
Inertsil ODS columns are general purpose, reversed phase C18 columns available in 5 µm and 10 µm particle sizes.
It was the first ODS bonded phase introduced from GL Sciences back in 1986.
We recommend InertSustain C18 or Inertsil ODS-4 columns for all new method development.

Figure 1 : Analysis of Lidocain under a condition based on the 16th Edition Japanese Pharmacopeia





1. Lidocain



2. Benzophenone

Conditions

Column : Inertsil ODS (10 µm, 150 × 4.0 mm I.D.)
Eluent : A) 2.88 g Sodium laulyl salfate in CH_3CN
B) 0.02 M NaH_2PO_4 (pH 3.0, H_3PO_4)
A/B = 9/11, v/v
Flow Rate : 1.4 mL/min
Col. Temp. : 25 °C
Detection : UV 254 nm

Analytical Columns

	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
Particle Size: 5 µm	150	5020-02121	5020-02122	5020-02123	5020-02124
	250	5020-02125	5020-02126	5020-02127	5020-02128
Particle Size: 10 µm	Length \ I.D. (mm)	2.1	3.0	4.0	4.6
	150	5020-02221	5020-02222	5020-02223	5020-02224
	250	5020-02225	5020-02226	5020-02227	5020-02228

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.

Cartridge Guard Column E

I.D. of the Analytical Column Applicable (mm)	Length (mm)	I.D. (mm)	Replacement Cartridge E Guard Column (2 EA.)		Cartridge E Holder / Cartridge Set (2 Cartridge E Guard Columns & 1 Holder)	
			Particle Size		Particle Size	
			5 µm	10 µm	5 µm	10 µm
2.1, 3.0	10	3.0	5020-19141	5020-19142	5020-19191	5020-19192
4.0, 4.6		4.0	5020-19041	5020-19042	5020-19091	5020-19092
2.1, 3.0	20	3.0	5020-19541	5020-19542	5020-19591	5020-19592
4.0, 4.6		4.0	5020-19441	5020-19442	5020-19491	5020-19492
Holder for Cartridge Guard Column E				For 10 mm Length		5020-08500
				For 20 mm Length		5020-08550

* End-fittings are 1/16" Waters-compatible.
* For maximum operating pressure information, please refer to page 46.