



TRACER EXCEL™ is a range of totally new packings that employ the most advanced procedures of synthesis and chemical functionalization, resulting in some column packings that completely surpass other silica-based packings on the market.

To manufacture the silica particle, the basis of all TRACER EXCEL packings, we begin with materials of extreme purity and follow strictly controlled processes. In this way, we get a totally porous, spherically perfect particle, without surface irregularities and with an extremely low content of metals (Al, Fe, Ti and Zn).

The rigorous control of the process variables also allows us to obtain a material with a perfectly reproducible porosity and surface area, and with a practical absence of micropores. In other competitors' packings, these micropores cause chromatographic problems due to incomplete substitution of the support, while with TRACER EXCEL packings micropores are totally eliminated.

We are therefore able to offer you a complete line of HPLC packings with characteristics of reproducibility, purity, deactivation, fluido-dynamic behaviour and chemical and physical stability that are difficult to beat.

- Exceptional batch-to-batch reproducibility.
- Ultra-pure silica.
- Extremely low content of metals.
- Perfect sphericity.
- Meticulously controlled materials.
- Maximum pH range (between 1.5 and 11.0)
- 3, 5 and 10 µm particles
- Easily scaled-up, from microbore to preparative HPLC.
- Available with 300Å pore size for biochromatography.
- Exceptional long lifetime.
- Wide range of packings.
- Fully deactivated after functional bonding.

## TRACER EXCEL ODS-A

TRACER EXCEL ODS-A is a totally endcapped packing, notable for its extreme level of deactivation. This minimizes undesirable interactions when chromatographing strongly acidic or basic analytes or chelating compounds.

Additionally TRACER EXCEL ODS-A columns show extraordinary resistance to extreme pH values, between 1.5 to 11.0.

### Maximum Stability

The chemical and structural stability of TRACER EXCEL columns leads to long useful lifetimes, even under extreme conditions where columns of most major manufacturers would suffer rapid degradation.

### Total deactivation

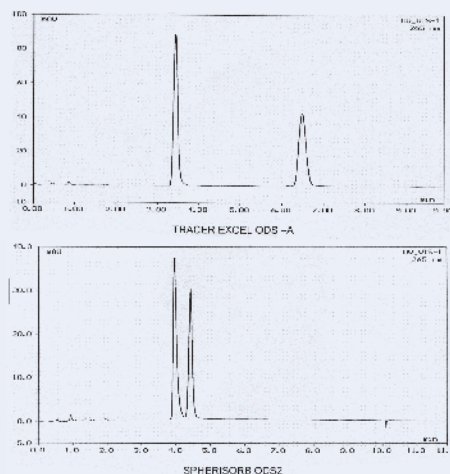
Free surface silanols that are left exposed following functional bonding of the silica particle are the chief cause of peak tailing and distortion that commonly appear with basic compounds.

If the silica particle also contains significant quantities of metals, these markedly increase the acidity of these surface silanols, keeping them ionized even at low pHs. These conditions can cause deleterious effects on eluting chromatographic peaks.

The Pyridine/Phenol test is an excellent marker of the presence of these surface silanols. Under ideal conditions, the pyridine peak should elute before the phenol peak and should also elute with total symmetry without tailing. Furthermore, a broader separation between the two peaks indicates superior deactivation.

The TRACER EXCEL ODS-A column complies with the pyridine/phenol test better than other columns from major manufacturers. This demonstrates the extraordinary deactivation achieved with TRACER EXCEL ODS-A columns. Another test that demonstrates the quality of TRACER EXCEL ODS-A columns is the acidic compounds test. This type of compound yields evidence of the presence of chelating centres or points of ionic interchange that may be present in the silica particle.

### Pyridine/Phenol test



#### Conditions of test

Eluant : Acetonitrile/Water, 30/70 1ml/min  
Lambda: 265nm

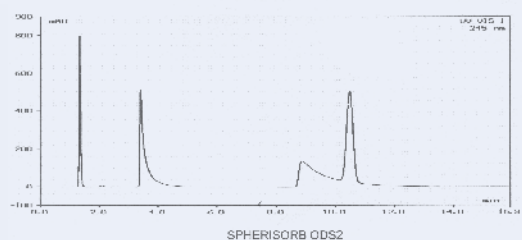
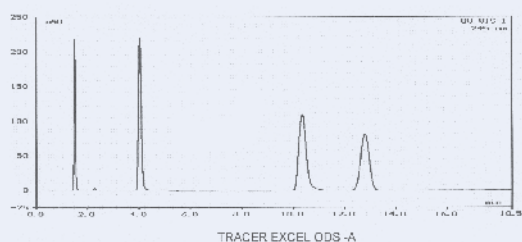
#### Composition:

Pyridine 2.1µl/ml  
Phenol:14 mg/m

TRACER EXCEL columns show perfectly symmetrical peaks in contrast to the significant tailing which appears when this test is done with other columns on the market. Symmetrical peaks are achieved even when separating basic compounds.

Once again, TRACER EXCEL columns show, thanks to their exceptional level of deactivation, excellence in obtaining perfectly symmetrical peaks where other columns on the market clearly fail (giving peaks with pronounced tails or even irreversible adsorption).

## Acid Compounds Test



### Conditions of test

Eluant : 20 mM KH<sub>2</sub>PO<sub>4</sub>pH3.2/CH<sub>3</sub>CN 65:35  
1 ml/min. Temp 40°C UV 245nm

### Composition:

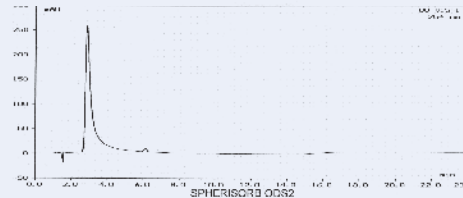
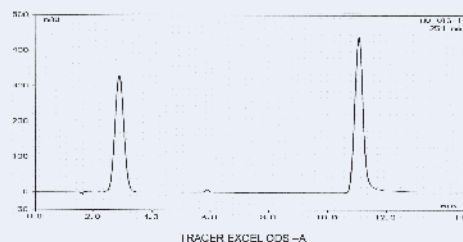
Uracil: 0.5mg/ml  
Benzoic acid: 3.6 mg/ml  
p-Ethylbenzoic acid: 0.9 mg/ml  
Methylbenzene: 3.0 mg/ml

## Purity of material

All of the advantages of TRACER EXCEL columns have as a base the quality of the silica particle. No bonding process can mask silica of inferior quality. Only silica particles absolutely free of metallic impurities, with a pore-size and pore-distribution absolutely controlled and synthesized through fully optimized processes, can give bonded packings of the highest grade.

The 8-quinolinol/acetylacetone test demonstrates the difference in chromatographic behavior between TRACER EXCEL ODS-A and a competitor's column with a high content of metallic impurities for the chelating compound 8-quinolinol.

## Metalic Trace Test



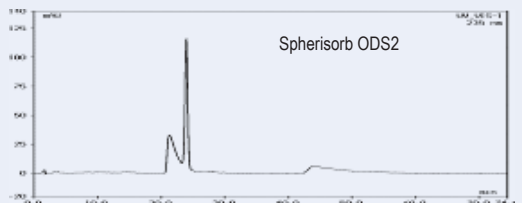
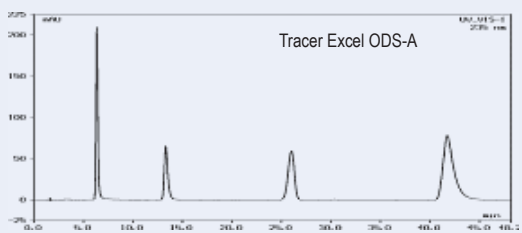
### Conditions of test

Tracer Excel ODS-A  
Eluant : 10 mM KH<sub>2</sub>PO<sub>4</sub>pH6.8/Metanol 60:40  
1 ml/min. Temp 30°C UV 254nm

### Composition:

8-Quinolinol: 0.5mg/ml  
Acetylacetone: 0.5mg/ml

## Basic Compounds Test



### Conditions of test

Tracer Excel ODS-A  
Eluant : 20 mM KH<sub>2</sub>PO<sub>4</sub>pH7/CH<sub>2</sub>CN 35:65  
1 ml/min. Temp 25°C UV 235nm

### Composition:

Propranolol: 0.08mg/ml  
Diphenidramine : 1.28 mg/ml  
Acetonaphthalene: 0.2 mg/ml  
Amyltryptilene: 0.3 mg/ml

## Reproducibility

The high productivity which is now needed in analytical and governmental laboratories oblige everyone to use reliable HPLC equipment and reproducible columns.

TRACER EXCEL columns were developed with the final objective of achieving the very highest quality and reproducibility. Teknokroma's numerous and stringent process controls for every batch of packing fully guarantees high quality and exceptional reproducibility.

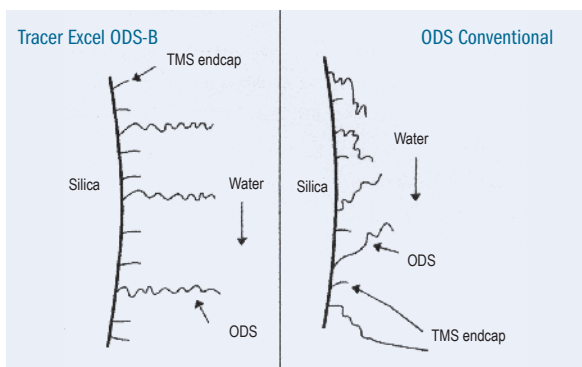
## TRACER EXCEL ODS-B

- Compatible with 100% aqueous eluant.
- Especially suitable for the separation of hydrophilic compounds.
- Strong retention in aqueous eluants.
- Long useful life with aqueous eluants
- Selectivity complementary to TRACER EXCEL ODS-A
- High mechanical stability
- Maximum versatility.

Based on the same principles as the TRACER EXCEL ODS-A columns, the TRACER EXCEL ODS-B column presents a high selectivity for hydrophilic and polar compounds, which are poorly retained on conventional ODS columns.

A special modification in the process of functionalizing the pure silica particle prevents the collapsing effect of the C18 chains when working with mainly aqueous eluants. So you can work with excellent chromatographic performance even when the percentage of the aqueous phase is 100%.

### EFFECT OF AQUEOUS ELUTANTS ON THE ORGANIZATION OF HYDROCARBON CHAINS.

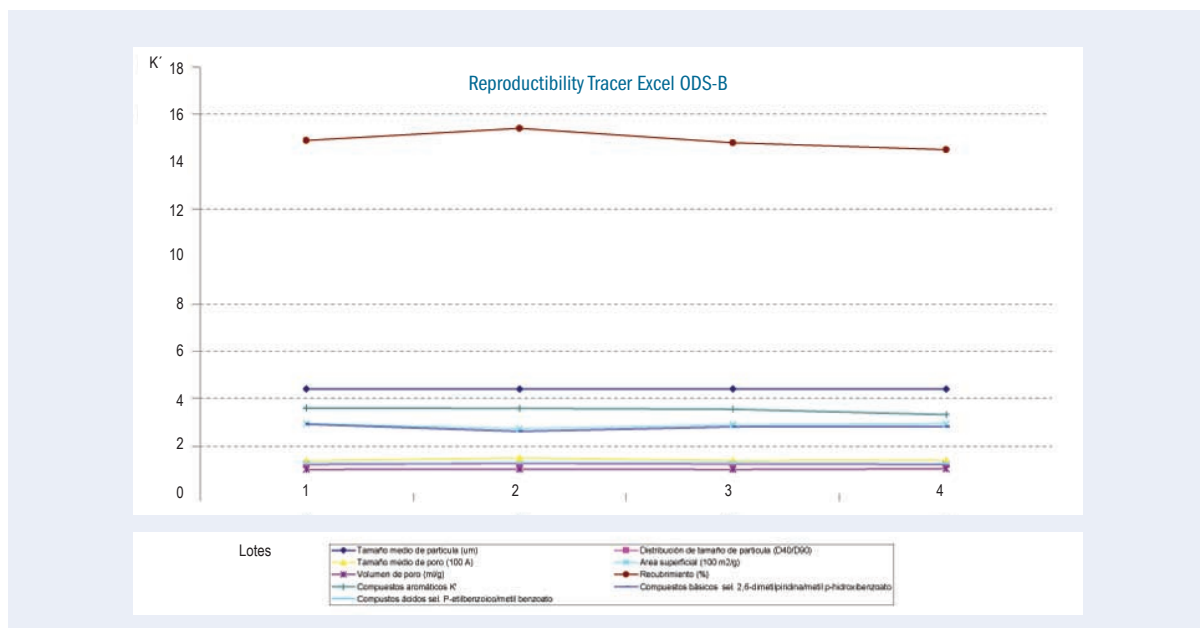
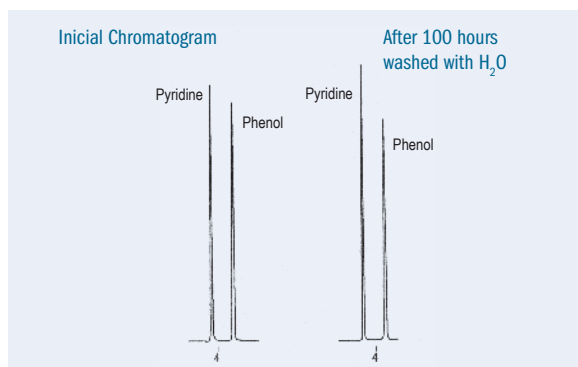


Generally, its field of application is the same as that of the TRACER EXCEL ODS-A, but its field of application is extended for samples which are especially difficult for conventional reversed phases, as is the case in separating oligosaccharides, amino acids, nucleotides and organic acids.

The special chromatographic conditions of TRACER EXCEL ODS-B also provide a specific selectivity for compounds which contain slightly polar groups in their structure.

This column is especially recommended for LC-MS in that, in many cases, the use of plugs or ionic blocking agents are avoided, which negatively affect detection when this technique is used.

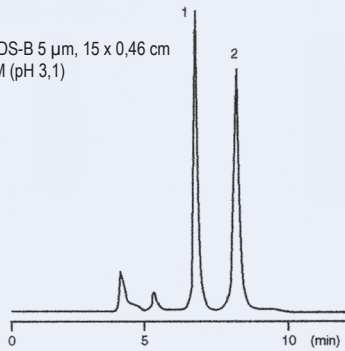
As shown in the chromatogram, after more than 100 hours of operations with water no alteration is observed in retention times, selectivity or distortion in the peaks of pyridine and phenol - a clear indication that no collapse of the bonded phase functionality is adversely achieved with TRACER EXCEL ODS-B columns. Interestingly, the collapsing of bonded phase functionality with the majority of reversed phase columns on the market is typical under these conditions.



## Antioxidants

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: Phosphate Plug 0,1 M (pH 3,1)  
 Flow: 0,6 ml/min.  
 Detector: ECD

Sample: 1 Ascorbic Acid  
 2 GSH



## Water Soluble Vitamins

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: Phosphate Plug 20 mM (pH 7,0)CH<sub>3</sub>CN 95/5 cm  
 Flow: 0,6 ml/min.  
 Detector: UV 210 nm

Sample: 1 Calcium Pantothenate  
 2 Pyridoxine hydrochloride (B<sub>6</sub>)  
 3 Nicotinamide



## Glycolid Acid and Latic Acid

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: H<sub>3</sub>PO<sub>4</sub> 0,1%  
 Flow: 0,6 ml/min.  
 Temperature: 40°C  
 Detector: UV 210 nm

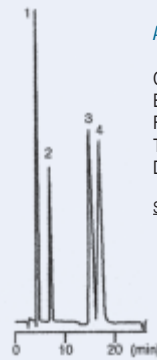
Sample: 1 Glycolic Acid  
 2 Lactic Acid



## Alcohols

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: H<sub>2</sub>O  
 Flow: 0,6 ml/min.  
 Temperature: 40°C  
 Detector: RID

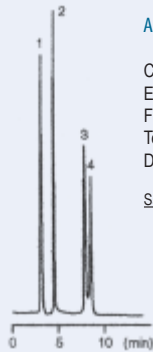
Sample: 1 Methanol  
 2 Ethanol  
 3 Iso-Propanol  
 4 n-propanol



## Aminoacids

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: H<sub>2</sub>O  
 Flow: 0,6 ml/min.  
 Temperature: 40°C  
 Detector: RID

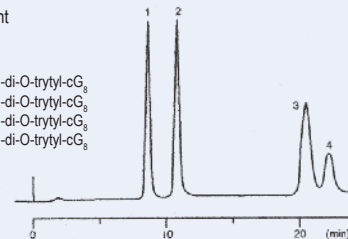
Sample: 1 Alanine  
 2 Valine  
 3 Isoleucine  
 4 Leucine



## Cyclodextrin derivatives

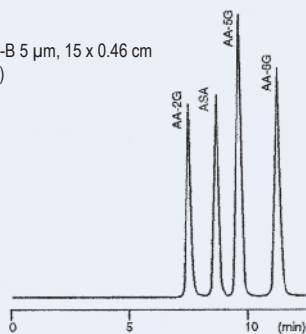
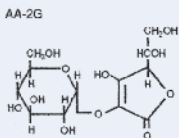
Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: MeOH/H<sub>2</sub>O 70:30  
 Flow: 0,6 ml/min.  
 Temperature: ambient  
 Detector: UV240 nm

Sample: 1 6', 6<sup>5</sup>-di-O-trytyl-cG<sub>3</sub>  
 2 6', 6<sup>1</sup>-di-O-trytyl-cG<sub>3</sub>  
 3 6', 6<sup>3</sup>-di-O-trytyl-cG<sub>3</sub>  
 4 6', 6<sup>2</sup>-di-O-trytyl-cG<sub>3</sub>



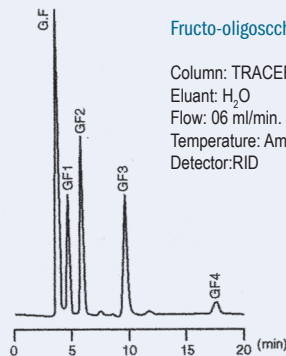
## Ascorbic Acid and Glycosides

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: Phosphate Plug (pH 3,8)  
 Flow: 0,4 ml/min.  
 Temperature: Ambient  
 Detector: UV240 nm



## Fructo-oligosaccharides

Column: TRACER EXCEL ODS-B 5  $\mu$ m, 15 x 0,46 cm  
 Eluant: H<sub>2</sub>O  
 Flow: 0,6 ml/min.  
 Temperature: Ambient  
 Detector: RID



# TK Other Tracer Excel Packings

The extraordinary qualities of TRACER EXCEL packings have been extended to a full range of operations, covering practically all the chromatographer's needs.

Si	Material of the ultrapure silica particle, the basis of all the TRACER EXCEL range.
C8	<p>This packing, made operative with octyl groups and totally endcapped, is extremely versatile.</p> <p>Its use is recommended for highly hydrophobic samples, which are retained excessively on ODS type packings.</p> <p>Developed on the same ultrapure silica as ODS-A and ODS-B, it is extremely reproducible and reliable.</p>
C4	<p>The same ultra pure silica of all the TRACER EXCEL range made operative with butyl groups, giving a moderately hydrophobic packing.</p> <p>Its principle field of application is the separation of peptides and proteins by reverse phase.</p> <p>In this case, the same packing is used with a 300 Å porosity, more suitable for the large size of protein molecules.</p> <p>Another field where this packing can be highly recommended is when the sample contains compounds of a very different hydrophobic nature.</p> <p>This packing permits perfect separation of a sample with a single injection.</p>
C1	<p>The same ultrapure silica of the TRACER EXCEL range is given its special function with tri-methylchlorosilane to create a low hydrophobic reversed phase.</p> <p>Its field of application includes the separation of peptides and proteins by reversed phase.</p> <p>It can also be used as a packing for normal phase with highly polar compounds.</p>
CN	<p>The type CN packings are much appreciated as alternatives to ODS-type packings for their special selectivity, as well as for the possibility they offer for working in both chromatographic modes, normal and reverse phase. However, in comparison with the latter, they have always been characterised by a lesser reproducibility and a notably shorter useful life.</p> <p>Thanks to the extraordinary level of quality of the silica of the particle and the optimization reached by the actuating processes, the new packing TRACER EXCEL 120 CN has satisfactorily overcome these limitations, so giving the chromatographer a completely reliable alternative.</p> <p>As a normal phase it is an excellent alternative to unsubstituted silica, given that retention times are much more reproducible, equilibration times much more rapid, and it does not suffer the problems of de-activation of silica itself.</p>
NH <sub>2</sub>	<p>This packing, with chemically bonded groups of aminopropyl silane, can be used as a phase normal or reverse phase packing depending on the eluant used.</p> <p>It is recommended for separations of basic compounds under normal phase conditions.</p> <p>Additionally, the reactivity of the amino group makes it very suitable as a support for later modifications as for example in the synthesis of quiral phases.</p> <p>It is also very suitable for SFC applications</p>
Ph	<p>In the same way as the CN type packing, the packing substituted with dimethyl phenyl can be used in normal or reversed phase, being in this latter case a very useful alternative to ODS type packings since its aromatic groups give it a special selectivity when polar compounds are being chromatographed.</p>
300 Angstrom	<p>A complete range of packings with a pore diameter of 300 Angstrom units is available, ideal for undertaking separations of complex molecules of very high molecular weight, e.g. proteins and peptides.</p>

# General Properties of Tracer Excel Packings **Tk**

	ODS-A	ODS-B	C8	C4	C1	CN	Ph	NH <sub>2</sub>	SI
<b>Size of pore in A units</b>	120	120	120	120	120	120	120	120	120
<b>Size of particle</b>	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm	3, 5 and 10 µm
<b>Volume of pores in ml/g</b>	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g	1.0 ml/g
<b>Surface area</b>	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g	300 m <sup>2</sup> /g
<b>Purity of silica</b>	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure	Ultrapure
<b>%C</b>	17%	15%	10%	8%	5%	7%	9%	4%	
<b>Type of phase</b>	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional and totally endcapped	Monofunctional	Monofunctional and totally endcapped		Trifunctional	
<b>Metallic impurities (Al, Fe, Ti, Zr)</b>	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one	Less than 10ppm of each one





## Analytical columns 0.4 cm I.D. TRACER EXCEL 120/5 µm

Function	µm	L e n g t h   c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-416336	TR-416337	TR-416338	TR-416339	TR-416340
ODS-B	5	TR-416341	TR-416342	TR-416343	TR-416344	TR-416345
Si	5	TR-416356	TR-416357	TR-416358	TR-416359	TR-416360
C8	5	TR-416361	TR-416362	TR-416363	TR-416364	TR-416365
C4	5	TR-416366	TR-416367	TR-416368	TR-416369	TR-416370
C1	5	TR-416371	TR-416372	TR-416373	TR-416374	TR-416375
NH2	5	TR-416376	TR-416377	TR-416378	TR-416379	TR-416380
CN	5	TR-416381	TR-416382	TR-416383	TR-416384	TR-416385
Ph	5	TR-416386	TR-416387	TR-416388	TR-416389	TR-416390

## Ultrarapid columns 0.4 cm I.D. TRACER EXCEL 120/3 µm

Function	µm	L e n g t h   c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	3	TR-413460	TR-413461	TR-413462	TR-413463	TR-413464
ODS-B	3	TR-413465	TR-413466	TR-413467	TR-413468	TR-413469
Si	3	TR-413470	TR-413471	TR-413472	TR-413473	TR-413474
C8	3	TR-413475	TR-413476	TR-413477	TR-413478	TR-413479
C4	3	TR-413480	TR-413481	TR-413482	TR-413483	TR-413484
C1	3	TR-413485	TR-413486	TR-413487	TR-413488	TR-413489
NH2	3	TR-413490	TR-413491	TR-413492	TR-413493	TR-413494
CN	3	TR-413495	TR-413496	TR-413497	TR-413498	TR-413499
Ph	3	TR-413500	TR-413501	TR-413502	TR-413503	TR-413504

## Analytical columns 0.46 cm I.D. TRACER EXCEL 120/5 µm

Function	µm	L e n g t h   c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-016336	TR-016337	TR-016338	TR-016339	TR-016340
ODS-B	5	TR-016341	TR-016342	TR-016343	TR-016344	TR-016345
Si	5	TR-016356	TR-016357	TR-016358	TR-016359	TR-016360
C8	5	TR-016361	TR-016362	TR-016363	TR-016364	TR-016365
C4	5	TR-016366	TR-016367	TR-016368	TR-016369	TR-016370
C1	5	TR-016371	TR-016372	TR-016373	TR-016374	TR-016375
NH2	5	TR-016376	TR-016377	TR-016378	TR-016379	TR-016380
CN	5	TR-016381	TR-016382	TR-016383	TR-016384	TR-016385
Ph	5	TR-016386	TR-016387	TR-016388	TR-016389	TR-016390

Ultrarapid columns 0.46 cm I.D.  
TRACER EXCEL 120/3  $\mu\text{m}$

Function	$\mu\text{m}$	L e n g t h c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	3	TR-013415	TR-013416	TR-013417	TR-013418	TR-013419
ODS-B	3	TR-013420	TR-013421	TR-013422	TR-013423	TR-013424
Si	3	TR-013425	TR-013426	TR-013427	TR-013428	TR-013429
C8	3	TR-013430	TR-013431	TR-013432	TR-013433	TR-013434
C4	3	TR-013435	TR-013436	TR-013437	TR-013438	TR-013439
C1	3	TR-013440	TR-013441	TR-013442	TR-013443	TR-013444
NH2	3	TR-013445	TR-013446	TR-013447	TR-013448	TR-013449
CN	3	TR-013450	TR-013451	TR-013452	TR-013453	TR-013454
Ph	3	TR-013455	TR-013456	TR-013457	TR-013458	TR-013459

Microbore columns 0.21 cm I.D.  
TRACER EXCEL 120/5  $\mu\text{m}$

Function	$\mu\text{m}$	L e n g t h c m	
		10 cm	20 cm
ODS-B	5	TR-021353	TR-021354
Si	5	TR-021395	TR-021364
C8	5	TR-021365	TR-021366
C4	5	TR-021367	TR-021368
C1	5	TR-021369	TR-021370
NH2	5	TR-021371	TR-021372
CN	5	TR-021373	TR-021374
Ph	5	TR-021375	TR-021376

*Other configurations available on demand*

Microbore columns 0.21 cm I.D.  
TRACER EXCEL 120/3  $\mu\text{m}$

Function	$\mu\text{m}$	L e n g t h c m	
		10 cm	20 cm
ODS-A	3	TR-021407	TR-021408
ODS-B	3	TR-021409	TR-021410
Si	3	TR-021411	TR-021412
C8	3	TR-021413	TR-021414
C4	3	TR-021415	TR-021416
C1	3	TR-021417	TR-021418
NH2	3	TR-021419	TR-021420
CN	3	TR-021421	TR-021422
Ph	3	TR-021423	TR-021424

*Other configurations available on demand*





## Analytical columns 0.3 cm I.D. TRACER EXCEL 120/5 µm

Function	µm	L e n g t h   c m	
		10 cm	20 cm
ODS-A	5	TR-021355	TR-021356
ODS-B	5	TR-021357	TR-021358
Si	5	TR-021381	TR-021382
C8	5	TR-021383	TR-021384
C4	5	TR-021385	TR-021386
C1	5	TR-021387	TR-021388
NH2	5	TR-021389	TR-021390
CN	5	TR-021391	TR-021392
Ph	5	TR-021393	TR-021394

*Other configurations available on demand*

## Microbore columns 0.3 cm I.D. TRACER EXCEL 120/3 µm

Function	µm	L e n g t h   c m	
		10 cm	20 cm
ODS-A	3	TR-021425	TR-021426
ODS-B	3	TR-021427	TR-021428
Si	3	TR-021429	TR-021430
C8	3	TR-021431	TR-021432
C4	3	TR-021433	TR-021434
C1	3	TR-021435	TR-021436
NH2	3	TR-021437	TR-021438
CN	3	TR-021439	TR-021440
Ph	3	TR021441	TR-021442

*Other configurations available on demand*

## NOVAFIX™ Cartridge 0.4 cm I.D. TRACER EXCEL 120/5 µm

Function	µm	L e n g t h   c m		
		7.5 cm	15 cm	25 cm
ODS-A	5	TR-015693	TR-015694	TR-015695
ODS-B	5	TR-015696	TR-015697	TR-015698
Si	5	TR-015705	TR-015706	TR-015707
C8	5	TR-015708	TR-015709	TR-015710
C4	5	TR-015714	TR-015715	TR-015716
C1	5	TR-015717	TR-015718	TR-015719
NH2	5	TR-015720	TR-015721	TR-015722
CN	5	TR-015723	TR-015724	TR-015725
Ph	5	TR-015726	TR-015727	TR-015728

*Other configurations available on demand*

NOVAFIX™ Cartridge 0.4 cm I.D.  
TRACER EXCEL 120/3 µm

Function	µm	L e n g t h c m		
		7.5 cm	15 cm	25 cm
ODS-A	3	TR-016427	TR-016428	TR-015731
ODS-B	3	TR-015732	TR-015733	TR-015734
Si	3	TR-015735	TR-015736	TR-015737
C8	3	TR-015738	TR-015739	TR-015740
C4	3	TR-015741	TR-015742	TR-01543
C1	3	TR-015744	TR-015745	TR-015746
NH2	3	TR-015747	TR-015748	TR-015749
CN	3	TR-015750	TR-015751	TR-015752
Ph	3	TR-015753	TR-015754	TR-015755

*Other configurations available on demand*

Semi-preparative columns 0.78 cm I.D.  
TRACER EXCEL 120/5 µm

Function	µm	L e n g t h c m	
		15 cm	25 cm
ODS-A	5	TR-016167	TR-016168
ODS-B	5	TR-016171	TR-016172
Si	5	TR-016175	TR-016176
C8	5	TR-016179	TR-016180
C4	5	TR-016183	TR-016184
C1	5	TR-016187	TR-016188
NH2	5	TR-016191	TR-016192
CN	5	TR-016195	TR-016196
Ph	5	TR-016199	TR-016200

*Other configurations available on demand*

Semi-preparative columns 1.0 cm I.D.  
TRACER EXCEL 120/5 µm

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-016169	TR-016170
ODS-B	5	TR-016173	TR-016174
Si	5	TR-016177	TR-016178
C8	5	TR-016181	TR-016182
C4	5	TR-016185	TR-016186
C1	5	TR-016189	TR-016190
NH2	5	TR-016193	TR-016194
CN	5	TR-016197	TR-016198
Ph	5	TR-016201	TR-016202





## Analytical columns 0.46 cm I.D. TRACER EXCEL 300/5 µm

Function	µm	L e n g t h c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-016400	TR-016401	TR-016402	TR-016403	TR-016404
C8	5	TR-016400	TR-016406	TR-016407	TR-016408	TR-016409
C4	5	TR-016400	TR-016411	TR-016412	TR-016413	TR-016414

## Analytical columns 0.4 cm I.D. TRACER EXCEL 300/5 µm

Function	µm	L e n g t h c m				
		4 cm	10 cm	15 cm	20 cm	25 cm
ODS-A	5	TR-416400	TR-416401	TR-416402	TR-416403	TR-416404
C8	5	TR-416405	TR-416406	TR-416407	TR-416408	TR-416409
C4	5	TR-416410	TR-416411	TR-416412	TR-416413	TR-416414

## Analytical columns 0.21 cm I.D. TRACER EXCEL 300/5 µm

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-012395	TR-012396
C8	5	TR-012397	TR-012398
C4	5	TR-012399	TR-012400

## Analytical columns 0.3 cm I.D. TRACER EXCEL 300/5 µm

Function	µm	L e n g t h c m	
		10 cm	20 cm
ODS-A	5	TR-021401	TR-021402
C8	5	TR-021403	TR-021404
C4	5	TR-021405	TR-021406

## NOVAFIX™ Cartridge System 0.4 cm I.D. TRACER EXCEL 300/5 µm

Function	µm	L e n g t h c m		
		7.5 cm	15 cm	25 cm
ODS-A	5	TR-416417	TR-416418	TR-416419
C8	5	TR-416420	TR-416421	TR-416422
C4	5	TR-416423	TR-416424	TR-416425

For Guard Columns please refer to pages 197-198