



Analytical columns 0.46 cm ID ADVANTIX 5 µm

Packing	Funct.	µm	Length	Diameter	Cat.Nbr.
			cm	cm	
Advantix	ODS	5	3	0.46	TR-010221
Advantix	ODS	5	4	0.46	TR-010222
Advantix	ODS	5	5	0.46	TR-010223
Advantix	ODS	5	10	0.46	TR-010224
Advantix	ODS	5	15	0.46	TR-010225
Advantix	ODS	5	20	0.46	TR-010226
Advantix	ODS	5	25	0.46	TR-010080

Analytical columns 0.40 cm ID ADVANTIX 5 µm

Packing	Funct.	µm	Length	Diameter	Cat.Nbr.
			cm	cm	
Advantix	ODS	5	3	0.4	TR-410221
Advantix	ODS	5	4	0.4	TR-410222
Advantix	ODS	5	5	0.4	TR-410223
Advantix	ODS	5	10	0.4	TR-410224
Advantix	ODS	5	15	0.4	TR-410225
Advantix	ODS	5	20	0.4	TR-410226
Advantix	ODS	5	25	0.4	TR-410080

Microbore columns 0.21 cm ID ADVANTIX 5 µm

Packing	Funct.	µm	Length	Diameter	Cat.Nbr.
			cm	cm	
Advantix	ODS	5	3	0.21	TR-010227
Advantix	ODS	5	5	0.21	TR-010228
Advantix	ODS	5	10	0.21	TR-010229
Advantix	ODS	5	15	0.21	TR-010230
Advantix	ODS	5	20	0.21	TR-010231
Advantix	ODS	5	25	0.21	TR-010232

Microbore columns 0.30 cm ID ADVANTIX 5 µm

Packing	Funct.	µm	Length	Diameter	Cat.Nbr.
			cm	cm	
Advantix	ODS	5	3	0.3	TR-010233
Advantix	ODS	5	5	0.3	TR-010234
Advantix	ODS	5	10	0.3	TR-010235
Advantix	ODS	5	15	0.3	TR-010236
Advantix	ODS	5	20	0.3	TR-010237
Advantix	ODS	5	25	0.3	TR-010238

New packing made of spherical ultra-pure silica particles, with extremely low metals content, functionalized with groups octadecilsilane of polar embedded type. This polar group included in the base of the hydrocarbonate chains confers to the packing a high deactivation in front of basic compounds, being able to chromatograph with perfectly symmetric peaks all kind of bases, including the most difficult ones. Working with acid pH's are able to easily cromatograph acid compounds, basic and quelants.

Also, the polar group included in the functionalization of the packing provides an especial selectivity very useful in the resolution of mixtures separated in conventional C18 packings.

Semi-preparative columns ADVANTIX 5 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	5	10	0.78		TR-010239
Advantix	ODS	5	15	0.78		TR-010240
Advantix	ODS	5	25	0.78		TR-010241
Advantix	ODS	5	10	1.00		TR-010242
Advantix	ODS	5	15	1.00		TR-010243
Advantix	ODS	5	25	1.00		TR-010244
Advantix	ODS	5	5	2.12		TR-010245
Advantix	ODS	5	10	2.12		TR-010246
Advantix	ODS	5	15	2.12		TR-010247
Advantix	ODS	5	25	2.12		TR-010248

Novafix™ Cartridges 0.40 cm ID ADVANTIX 5 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	5	7,5	0.4		TR-010249
Advantix	ODS	5	10	0.4		TR-010250
Advantix	ODS	5	15	0.4		TR-010251
Advantix	ODS	5	25	0.4		TR-010252

Ultrarapid columns 0.46 cm ID ADVANTIX 3 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	3	3	0.46		TR-010253
Advantix	ODS	3	4	0.46		TR-010254
Advantix	ODS	3	5	0.46		TR-010255
Advantix	ODS	3	10	0.46		TR-010256
Advantix	ODS	3	15	0.46		TR-010257
Advantix	ODS	3	20	0.46		TR-010258
Advantix	ODS	3	25	0.46		TR-010259

Ultrarapid columns 0.40 cm ID ADVANTIX 3 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	3	3	0.4		TR-410253
Advantix	ODS	3	4	0.4		TR-410254
Advantix	ODS	3	5	0.4		TR-410255
Advantix	ODS	3	10	0.4		TR-410256
Advantix	ODS	3	15	0.4		TR-410257
Advantix	ODS	3	20	0.4		TR-410258
Advantix	ODS	3	25	0.4		TR-410259

Microbore columns 0.21 cm ID ADVANTIX 3 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	3	3	0.21		TR-010260
Advantix	ODS	3	5	0.21		TR-010261
Advantix	ODS	3	10	0.21		TR-010262
Advantix	ODS	3	15	0.21		TR-010263
Advantix	ODS	3	20	0.21		TR-010264
Advantix	ODS	3	25	0.21		TR-010265

Microbore columns 0.30 cm ID ADVANTIX 3 µm

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Advantix	ODS	3	3	0.3		TR-010266
Advantix	ODS	3	5	0.3		TR-010267
Advantix	ODS	3	10	0.3		TR-010268
Advantix	ODS	3	15	0.3		TR-010269
Advantix	ODS	3	20	0.3		TR-010270
Advantix	ODS	3	25	0.3		TR-010271

For Guard Columns please refer to pages 198-199



Due to its characteristics of pore size, surface area, percentage of covering (%C), and the kind of silica it is build of, it is the suitable alternative to Hypersil ODS packings. Its chromatographic behavior exactly reproduces the one of this popular packing, being able to transfer the chromatographic methods without any kind of adjustment.

5 Microns Packing

Analytical columns 45 mm i.d. HYPERPACK

Packing	Funct.	μm	Length		Diameter	Cat.Nbr.
			μm	cm		
Hyperpack	ODS	5	3	0.46	0.46	TR-011000
Hyperpack	ODS	5	4	0.46	0.46	TR-011001
Hyperpack	ODS	5	5	0.46	0.46	TR-011002
Hyperpack	ODS	5	10	0.46	0.46	TR-011003
Hyperpack	ODS	5	15	0.46	0.46	TR-011004
Hyperpack	ODS	5	20	0.46	0.46	TR-011005
Hyperpack	ODS	5	25	0.46	0.46	TR-011006
Hyperpack	C8	5	3	0.46	0.46	TR-011021
Hyperpack	C8	5	4	0.46	0.46	TR-011022
Hyperpack	C8	5	5	0.46	0.46	TR-011023
Hyperpack	C8	5	10	0.46	0.46	TR-011024
Hyperpack	C8	5	15	0.46	0.46	TR-011025
Hyperpack	C8	5	20	0.46	0.46	TR-011026
Hyperpack	C8	5	25	0.46	0.46	TR-011027

5 Microns Packing

Analytical columns 40 mm i.d. HYPERPACK

Packing	Funct.	μm	Length		Diameter	Cat.Nbr.
			μm	cm		
Hyperpack	ODS	5	3	0.4	0.4	TR-411000
Hyperpack	ODS	5	4	0.4	0.4	TR-411001
Hyperpack	ODS	5	5	0.4	0.4	TR-411002
Hyperpack	ODS	5	10	0.4	0.4	TR-411003
Hyperpack	ODS	5	15	0.4	0.4	TR-411004
Hyperpack	ODS	5	20	0.4	0.4	TR-411005
Hyperpack	ODS	5	25	0.4	0.4	TR-411006
Hyperpack	C8	5	3	0.4	0.4	TR-410081
Hyperpack	C8	5	4	0.4	0.4	TR-410082
Hyperpack	C8	5	5	0.4	0.4	TR-410083
Hyperpack	C8	5	10	0.4	0.4	TR-410084
Hyperpack	C8	5	15	0.4	0.4	TR-410085
Hyperpack	C8	5	20	0.4	0.4	TR-410086
Hyperpack	C8	5	25	0.4	0.4	TR-410087

5 Microns Packing

Microbore columns 2.1 mm i.d. HYPERPACK

Packing	Funct.	μm	Length		Diameter	Cat.Nbr.
			μm	cm		
Hyperpack	ODS	5	3	0.21	0.21	TR-010272
Hyperpack	ODS	5	5	0.21	0.21	TR-010273
Hyperpack	ODS	5	10	0.21	0.21	TR-010274
Hyperpack	ODS	5	15	0.21	0.21	TR-010275
Hyperpack	ODS	5	20	0.21	0.21	TR-010276
Hyperpack	ODS	5	25	0.21	0.21	TR-010277
Hyperpack	C8	5	3	0.21	0.21	TR-011028
Hyperpack	C8	5	5	0.21	0.21	TR-011029
Hyperpack	C8	5	10	0.21	0.21	TR-011030
Hyperpack	C8	5	15	0.21	0.21	TR-011031
Hyperpack	C8	5	20	0.21	0.21	TR-011032
Hyperpack	C8	5	25	0.21	0.21	TR-011033

5 Microns Packing

Microbore columns 3.0 mm i.d. HYPERPACK

Packing	Funct.	μm	Length		Diameter	Cat.Nbr.
			μm	cm		
Hyperpack	ODS	5	3	0.3	0.3	TR-010278
Hyperpack	ODS	5	5	0.3	0.3	TR-010279
Hyperpack	ODS	5	10	0.3	0.3	TR-010280
Hyperpack	ODS	5	15	0.3	0.3	TR-010281
Hyperpack	ODS	5	20	0.3	0.3	TR-010282
Hyperpack	ODS	5	25	0.3	0.3	TR-010283
Hyperpack	C8	5	3	0.3	0.3	TR-011160
Hyperpack	C8	5	5	0.3	0.3	TR-011034
Hyperpack	C8	5	10	0.3	0.3	TR-011035
Hyperpack	C8	5	15	0.3	0.3	TR-011036
Hyperpack	C8	5	20	0.3	0.3	TR-011037
Hyperpack	C8	5	25	0.3	0.3	TR-011038

5 Microns Packing

Semi-preparative columns HYPERPACK

Packing	Funct.	μm	Length		Diameter	Cat.Nbr.
			μm	cm		
Hyperpack	ODS	5	10	0.78	0.78	TR-010284
Hyperpack	ODS	5	15	0.78	0.78	TR-010285
Hyperpack	ODS	5	25	0.78	0.78	TR-010286
Hyperpack	ODS	5	10	1.00	1.00	TR-010287
Hyperpack	ODS	5	15	1.00	1.00	TR-010288

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	5	25	1.00		TR-010289
Hyperpack	ODS	5	5	2.12		TR-010290
Hyperpack	ODS	5	10	2.12		TR-010291
Hyperpack	ODS	5	15	2.12		TR-010292
Hyperpack	ODS	5	25	2.12		TR-010293
Hyperpack	C8	5	10	0.78		TR-011039
Hyperpack	C8	5	15	0.78		TR-011040
Hyperpack	C8	5	25	0.78		TR-011041
Hyperpack	C8	5	10	1.00		TR-011042
Hyperpack	C8	5	15	1.00		TR-011043
Hyperpack	C8	5	25	1.00		TR-011044
Hyperpack	C8	5	5	2.12		TR-011045
Hyperpack	C8	5	10	2.12		TR-011046
Hyperpack	C8	5	15	2.12		TR-011047
Hyperpack	C8	5	25	2.12		TR-011048

5 Microns Packing Novafix™ Cartridges 4 mm i.d. HYPERPACK

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	5	7,5	0.4		TR-010294
Hyperpack	ODS	5	10	0.4		TR-010295
Hyperpack	ODS	5	15	0.4		TR-010296
Hyperpack	ODS	5	25	0.4		TR-010297
Hyperpack	C8	5	7,5	0.4		TR-011049
Hyperpack	C8	5	10	0.4		TR-011050
Hyperpack	C8	5	15	0.4		TR-011051
Hyperpack	C8	5	25	0.4		TR-011052

3 Microns Packing Ultrarapid columns 4.6 mm i.d. HYPERPACK

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	3	3	0.46		TR-010298
Hyperpack	ODS	3	4	0.46		TR-010299
Hyperpack	ODS	3	5	0.46		TR-010300
Hyperpack	ODS	3	10	0.46		TR-010301
Hyperpack	ODS	3	15	0.46		TR-010302
Hyperpack	ODS	3	20	0.46		TR-010303
Hyperpack	ODS	3	25	0.46		TR-010304
Hyperpack	C8	3	3	0.46		TR-011053
Hyperpack	C8	3	4	0.46		TR-011054
Hyperpack	C8	3	5	0.46		TR-011055
Hyperpack	C8	3	10	0.46		TR-011056
Hyperpack	C8	3	15	0.46		TR-011057
Hyperpack	C8	3	20	0.46		TR-011058
Hyperpack	C8	3	25	0.46		TR-011059

3 Microns Packing Analytical columns 4.0 mm i.d. HYPERPACK

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	3	3	0.4		TR-410298
Hyperpack	ODS	3	4	0.4		TR-410299
Hyperpack	ODS	3	5	0.4		TR-410300
Hyperpack	ODS	3	10	0.4		TR-410301
Hyperpack	ODS	3	15	0.4		TR-410302
Hyperpack	ODS	3	20	0.4		TR-410303
Hyperpack	ODS	3	25	0.4		TR-410304
Hyperpack	C8	3	4	0.4		TR-011060
Hyperpack	C8	3	5	0.4		TR-011061
Hyperpack	C8	3	10	0.4		TR-011062
Hyperpack	C8	3	15	0.4		TR-011063
Hyperpack	C8	3	20	0.4		TR-011064
Hyperpack	C8	3	25	0.4		TR-011065

3 Microns Packing Microbore columns 2.1 mm i.d. HYPERPACK

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	3	3	0.21		TR-010305
Hyperpack	ODS	3	5	0.21		TR-010306
Hyperpack	ODS	3	10	0.21		TR-010307
Hyperpack	ODS	3	15	0.21		TR-010308
Hyperpack	ODS	3	20	0.21		TR-010309
Hyperpack	ODS	3	25	0.21		TR-010310
Hyperpack	C8	3	3	0.21		TR-011066
Hyperpack	C8	3	5	0.21		TR-011067
Hyperpack	C8	3	10	0.21		TR-011068
Hyperpack	C8	3	15	0.21		TR-011069
Hyperpack	C8	3	20	0.21		TR-011070
Hyperpack	C8	3	25	0.21		TR-011071

3 Microns Packing Microbore columns 3.0 mm i.d. HYPERPACK

Packing	Funct.	Length		Diameter		Cat.Nbr.
		µm	cm	cm	cm	
Hyperpack	ODS	3	3	0.3		TR-010311
Hyperpack	ODS	3	5	0.3		TR-010312
Hyperpack	ODS	3	10	0.3		TR-010313
Hyperpack	ODS	3	15	0.3		TR-010314
Hyperpack	ODS	3	20	0.3		TR-010315
Hyperpack	ODS	3	25	0.3		TR-010316
Hyperpack	ODS	3	3	0.3		TR-011072
Hyperpack	ODS	3	5	0.3		TR-011073
Hyperpack	ODS	3	10	0.3		TR-011074
Hyperpack	ODS	3	15	0.3		TR-011075
Hyperpack	ODS	3	20	0.3		TR-011076
Hyperpack	ODS	3	25	0.3		TR-011077



It reproduces with total fidelity the chromatographic behavior of the columns Hypersil BDS C18.
Available in 3 and 5µm and in all length and diameter configurations.

5 Microns Packing

Analytical columns 4.6 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	3	0.46	TR-011007
Hyperpack BASIC	ODS	5	4	0.46	TR-011008
Hyperpack BASIC	ODS	5	5	0.46	TR-011009
Hyperpack BASIC	ODS	5	10	0.46	TR-011010
Hyperpack BASIC	ODS	5	15	0.46	TR-011011
Hyperpack BASIC	ODS	5	20	0.46	TR-011012
Hyperpack BASIC	ODS	5	25	0.46	TR-011013
Hyperpack BASIC	C8	5	3	0.46	TR-011108
Hyperpack BASIC	C8	5	4	0.46	TR-011109
Hyperpack BASIC	C8	5	5	0.46	TR-011110
Hyperpack BASIC	C8	5	10	0.46	TR-011111
Hyperpack BASIC	C8	5	15	0.46	TR-011112
Hyperpack BASIC	C8	5	20	0.46	TR-011113
Hyperpack BASIC	C8	5	25	0.46	TR-011114

5 Microns Packing

Analytical columns 4.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	3	0.4	TR-411007
Hyperpack BASIC	ODS	5	4	0.4	TR-411008
Hyperpack BASIC	ODS	5	5	0.4	TR-411009
Hyperpack BASIC	ODS	5	10	0.4	TR-411010
Hyperpack BASIC	ODS	5	15	0.4	TR-411011
Hyperpack BASIC	ODS	5	20	0.4	TR-411012
Hyperpack BASIC	ODS	5	25	0.4	TR-411013

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	C8	5	3	0.4	TR-411108
Hyperpack BASIC	C8	5	4	0.4	TR-411109
Hyperpack BASIC	C8	5	5	0.4	TR-411110
Hyperpack BASIC	C8	5	10	0.4	TR-411111
Hyperpack BASIC	C8	5	15	0.4	TR-411112
Hyperpack BASIC	C8	5	20	0.4	TR-411113
Hyperpack BASIC	C8	5	25	0.4	TR-411114

5 Microns Packing

Microbore columns 21 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	3	0.21	TR-010317
Hyperpack BASIC	ODS	5	5	0.21	TR-010318
Hyperpack BASIC	ODS	5	10	0.21	TR-010319
Hyperpack BASIC	ODS	5	15	0.21	TR-010320
Hyperpack BASIC	ODS	5	20	0.21	TR-010321
Hyperpack BASIC	ODS	5	25	0.21	TR-010322
Hyperpack BASIC	C8	5	3	0.21	TR-011115
Hyperpack BASIC	C8	5	5	0.21	TR-011116
Hyperpack BASIC	C8	5	10	0.21	TR-011117
Hyperpack BASIC	C8	5	15	0.21	TR-011118
Hyperpack BASIC	C8	5	20	0.21	TR-011119
Hyperpack BASIC	C8	5	25	0.21	TR-011120

5 Microns Packing

Microbore columns 3.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	3	0.3	TR-010323
Hyperpack BASIC	ODS	5	5	0.3	TR-010324
Hyperpack BASIC	ODS	5	10	0.3	TR-010325
Hyperpack BASIC	ODS	5	15	0.3	TR-010326
Hyperpack BASIC	ODS	5	20	0.3	TR-010327
Hyperpack BASIC	ODS	5	25	0.3	TR-010328
Hyperpack BASIC	C8	5	3	0.3	TR-011121
Hyperpack BASIC	C8	5	5	0.3	TR-011122
Hyperpack BASIC	C8	5	10	0.3	TR-011123
Hyperpack BASIC	C8	5	15	0.3	TR-011124
Hyperpack BASIC	C8	5	20	0.3	TR-011125
Hyperpack BASIC	C8	5	25	0.3	TR-011126

5 Microns Packing

Semi Preparative columns HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	10	0.78	TR-010329
Hyperpack BASIC	ODS	5	15	0.78	TR-010330
Hyperpack BASIC	ODS	5	25	0.78	TR-010331
Hyperpack BASIC	ODS	5	10	1.00	TR-010332

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	15	1.00	TR-010333
Hyperpack BASIC	ODS	5	25	1.00	TR-010334
Hyperpack BASIC	ODS	5	5	2.12	TR-010335
Hyperpack BASIC	ODS	5	10	2.12	TR-010336
Hyperpack BASIC	ODS	5	15	2.12	TR-010337
Hyperpack BASIC	ODS	5	25	2.12	TR-010338
Hyperpack BASIC	C8	5	10	0.78	TR-011127
Hyperpack BASIC	C8	5	15	0.78	TR-011128
Hyperpack BASIC	C8	5	25	0.78	TR-011129
Hyperpack BASIC	C8	5	10	1.00	TR-011130
Hyperpack BASIC	C8	5	15	1.00	TR-011131
Hyperpack BASIC	C8	5	25	1.00	TR-011132
Hyperpack BASIC	C8	5	5	2.12	TR-011133
Hyperpack BASIC	C8	5	10	2.12	TR-011134
Hyperpack BASIC	C8	5	15	2.12	TR-011135
Hyperpack BASIC	C8	5	25	2.12	TR-011136

5 Microns Packing Cartridge System 4 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	5	7,5	0.4	TR-010339
Hyperpack BASIC	ODS	5	10	0.4	TR-010340
Hyperpack BASIC	ODS	5	15	0.4	TR-010341
Hyperpack BASIC	ODS	5	25	0.4	TR-010342
Hyperpack BASIC	C8	5	7,5	0.4	TR-011137
Hyperpack BASIC	C8	5	10	0.4	TR-011138
Hyperpack BASIC	C8	5	15	0.4	TR-011139
Hyperpack BASIC	C8	5	25	0.4	TR-011140

3 Microns Packing Analytical Columns 4.6 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	3	3	0.46	TR-011014
Hyperpack BASIC	ODS	3	4	0.46	TR-011015
Hyperpack BASIC	ODS	3	5	0.46	TR-011016
Hyperpack BASIC	ODS	3	10	0.46	TR-011017
Hyperpack BASIC	ODS	3	15	0.46	TR-011018
Hyperpack BASIC	ODS	3	20	0.46	TR-011019
Hyperpack BASIC	ODS	3	25	0.46	TR-011020
Hyperpack BASIC	C8	3	3	0.46	TR-011141
Hyperpack BASIC	C8	3	4	0.46	TR-011142
Hyperpack BASIC	C8	3	5	0.46	TR-011143
Hyperpack BASIC	C8	3	10	0.46	TR-011144
Hyperpack BASIC	C8	3	15	0.46	TR-011145
Hyperpack BASIC	C8	3	20	0.46	TR-011146
Hyperpack BASIC	C8	3	25	0.46	TR-011147

3 Microns Packing Ultrarapid Columns 4.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	3	3	0.4	TR-411014
Hyperpack BASIC	ODS	3	4	0.4	TR-411015
Hyperpack BASIC	ODS	3	5	0.4	TR-411016
Hyperpack BASIC	ODS	3	10	0.4	TR-411017
Hyperpack BASIC	ODS	3	15	0.4	TR-411018
Hyperpack BASIC	ODS	3	20	0.4	TR-411019
Hyperpack BASIC	ODS	3	25	0.4	TR-411020
Hyperpack BASIC	C8	3	3	0.4	TR-411141
Hyperpack BASIC	C8	3	4	0.4	TR-411142
Hyperpack BASIC	C8	3	5	0.4	TR-411143
Hyperpack BASIC	C8	3	10	0.4	TR-411144
Hyperpack BASIC	C8	3	15	0.4	TR-411145
Hyperpack BASIC	C8	3	20	0.4	TR-411146
Hyperpack BASIC	C8	3	25	0.4	TR-411147

3 Microns Packing Microbore Columns 2.1 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	3	3	0.21	TR-010343
Hyperpack BASIC	ODS	3	5	0.21	TR-010344
Hyperpack BASIC	ODS	3	10	0.21	TR-010345
Hyperpack BASIC	ODS	3	15	0.21	TR-010346
Hyperpack BASIC	ODS	3	20	0.21	TR-010347
Hyperpack BASIC	ODS	3	25	0.21	TR-010348
Hyperpack BASIC	C8	3	3	0.21	TR-011148
Hyperpack BASIC	C8	3	5	0.21	TR-011149
Hyperpack BASIC	C8	3	10	0.21	TR-011150
Hyperpack BASIC	C8	3	15	0.21	TR-011151
Hyperpack BASIC	C8	3	20	0.21	TR-011152
Hyperpack BASIC	C8	3	25	0.21	TR-011153

3 Microns Packing Microbore Columns 3.0 mm i.d. HYPERPACK BASIC

Packing	Funct.	Length Diameter			Cat.Nbr.
		µm	cm	cm	
Hyperpack BASIC	ODS	3	3	0.3	TR-010349
Hyperpack BASIC	ODS	3	5	0.3	TR-010350
Hyperpack BASIC	ODS	3	10	0.3	TR-010351
Hyperpack BASIC	ODS	3	15	0.3	TR-010352
Hyperpack BASIC	ODS	3	20	0.3	TR-010353
Hyperpack BASIC	ODS	3	25	0.3	TR-010354
Hyperpack BASIC	C8	3	3	0.3	TR-011154
Hyperpack BASIC	C8	3	5	0.3	TR-011155
Hyperpack BASIC	C8	3	10	0.3	TR-011156
Hyperpack BASIC	C8	3	15	0.3	TR-011157
Hyperpack BASIC	C8	3	20	0.3	TR-011158
Hyperpack BASIC	C8	3	25	0.3	TR-011159



Nucleosil is a totally porous silica packing, which is available with a full range of substituents. For its high quality level it has come to be one of the most popular HPLC packings.

There are a great variety of particle sizes, so that practically all the field of chromatography is covered, from ultrarapid columns with

packings of 3µm, to preparative scale, with packings of 25-40µm, the same selectivity being always maintained.

The packings of 3, 5, 10µm are characterized by their well adapted distribution of particle sizes, which produces a high efficiency and great stability in the HPLC columns.

The Nucleosil packings are also distinguished by their great stability when subject to extreme values of pH, being able to work between pH 1 and 9. These values are unreachable by the majority of silica packings.

Analytical columns NUCLEOSIL 100

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-011331	TR-411331	TR-011333	TR-411333	TR-011335	TR-411335	TR-011337	TR-411337	TR-011339	TR-411339
C-18	5	TR-011341	TR-411341	TR-011343	TR-411343	TR-011345	TR-411345	TR-011347	TR-411347	TR-011349	TR-411349
C-8	5	TR-011351	TR-411351	TR-011353	TR-411353	TR-011355	TR-411355	TR-011357	TR-411357	TR-011359	TR-411359
P	5	TR-011361	TR-411361	TR-011363	TR-411363	TR-011365	TR-411365	TR-011367	TR-411367	TR-011369	TR-411369
C-2	7	TR-016031	TR-416031	TR-016032	TR-416032	TR-016033	TR-416033	TR-016034	TR-416034	TR-016035	TR-416035
CN	5	TR-011371	TR-411371	TR-011373	TR-411373	TR-011375	TR-411375	TR-011377	TR-411377	TR-011379	TR-411379
Diol	7	TR-011391	TR-411391	TR-011393	TR-411393	TR-011395	TR-411395	TR-011397	TR-411397	TR-011399	TR-411399
NH2	5	TR-011381	TR-411381	TR-011383	TR-411383	TR-011385	TR-411385	TR-011387	TR-411387	TR-011389	TR-411389
NO2	5	TR-016036	TR-416036	TR-016037	TR-416037	TR-016038	TR-416038	TR-016039	TR-416039	TR-016040	TR-416040
N(CH3)2	5	TR-016041	TR-416041	TR-016042	TR-416042	TR-016043	TR-416043	TR-016044	TR-416044	TR-016045	TR-416045
SA	5	TR-011401	TR-411401	TR-011403	TR-411403	TR-011405	TR-411405	TR-011407	TR-411407	TR-011409	TR-411409
SB	5	TR-011411	TR-411411	TR-011413	TR-411413	TR-011415	TR-411415	TR-011417	TR-411417	TR-011419	TR-411419
Si	10	TR-016600	TR-416600	TR-016601	TR-416601	TR-016602	TR-416602	TR-016603	TR-416603	TR-016604	TR-416604
C-18	10	TR-016605	TR-416605	TR-016606	TR-416606	TR-016607	TR-416607	TR-016608	TR-416608	TR-016609	TR-416609
C-8	10	TR-016610	TR-416610	TR-016611	TR-416611	TR-016612	TR-416612	TR-016613	TR-416613	TR-016614	TR-416614
CN	10	TR-016615	TR-416615	TR-016617	TR-416617	TR-016618	TR-416618	TR-016619	TR-416619	TR-016620	TR-416620
NH2	10	TR-016621	TR-416621	TR-016622	TR-416622	TR-016623	TR-416623	TR-016624	TR-416624	TR-016625	TR-416625
NO2	10	TR-016626	TR-416626	TR-016627	TR-416627	TR-016628	TR-416628	TR-016629	TR-416629	TR-016630	TR-416630
SA	10	TR-016631	TR-416631	TR-016632	TR-416632	TR-016633	TR-416633	TR-016634	TR-416634	TR-016635	TR-416635
SB	10	TR-016636	TR-416636	TR-016637	TR-416637	TR-016638	TR-416638	TR-016639	TR-416639	TR-016640	TR-416640

Analytical columns NUCLEOSIL 120

Function		Dimensions									
Particle size (µm)		4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si	5	TR-016300	TR-416300	TR-016301	TR-416301	TR-016302	TR-416302	TR-016303	TR-416303	TR-016304	TR-416304
C-18	5	TR-016305	TR-416305	TR-016306	TR-416306	TR-016307	TR-416307	TR-016308	TR-416308	TR-016309	TR-416309
C-8	5	TR-016310	TR-416310	TR-016311	TR-416311	TR-016312	TR-416312	TR-016313	TR-416313	TR-016314	TR-416314
C4	5	TR-016162	TR-416162	TR-016163	TR-416163	TR-016164	TR-416164	TR-016165	TR-416165	TR-016166	TR-416166
P	7	TR-016315	TR-416315	TR-016316	TR-416316	TR-016317	TR-416317	TR-016318	TR-416318	TR-016319	TR-416319
CN	7	TR-016320	TR-416320	TR-016321	TR-416321	TR-016322	TR-416322	TR-016323	TR-416323	TR-016324	TR-416324
NH2	7	TR-016325	TR-416325	TR-016326	TR-416326	TR-016327	TR-416327	TR-016328	TR-416328	TR-016329	TR-416329
Si	10	TR-016641	TR-416641	TR-016642	TR-416642	TR-016643	TR-416643	TR-016644	TR-416644	TR-016645	TR-416645
C-18	10	TR-016646	TR-416646	TR-016647	TR-416647	TR-016648	TR-416648	TR-016649	TR-416649	TR-016650	TR-416650
C-8	10	TR-016651	TR-416651	TR-016652	TR-416652	TR-016653	TR-416653	TR-016654	TR-416654	TR-016655	TR-416655

Ultrarapid columns NUCLEOSIL

Function		Dimensions									
Particle size (µm)		4 x 0.46 cm	4 x 0.4 cm	10 x 0.46 cm	10 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
100 C18	3	TR-013110	TR-413110	TR-013111	TR-413111	TR-013112	TR-413112	TR-013113	TR-413113	TR-013119	TR-413119
120 C18	3	TR-013101	TR-413101	TR-013103	TR-413103	TR-013105	TR-413105	TR-013107	TR-413107	TR-013109	TR-413109
120 C8	3	TR-013115	TR-413115	TR-013116	TR-413116	TR-013117	TR-413117	TR-013118	TR-413118	TR-013124	TR-413124

Microbore columns NUCLEOSIL 100

Function		Dimensions			
Particle size (µm)		10 x 0.21 cm	20 x 0.21 cm	10 x 0.03 cm	20 x 0.03 cm
Si	5	TR-021125	TR-021126	TR-021258	TR-021259
C-18	5	TR-021127	TR-021128	TR-021260	TR-021261
C-8	5	TR-021129	TR-021130	TR-021262	TR-021263
C6 H5	5	TR-021131	TR-021132	TR-021264	TR-021265
C-2	7	TR-021133	TR-021134	TR-021266	TR-021267
CN	5	TR-021135	TR-021136	TR-021268	TR-021269
Diol	7	TR-021137	TR-021096	TR-021270	TR-021271
NH2	5	TR-021097	TR-021098	TR-021272	TR-021273
NO2	5	TR-021099	TR-021100	TR-021274	TR-021275
N(CH3)2	5	TR-021101	TR-021102	TR-021350	TR-021276
SA	5	TR-021103	TR-021104	TR-021277	TR-021278
SB	5	TR-021105	TR-021106	TR-021279	TR-021280

Microbore columns NUCLEOSIL 120

Function		Dimensions			
Particle size (µm)		10 x 0.21 cm	20 x 0.21 cm	10 x 0.3 cm	20 x 0.3 cm
Si	5	TR-021115	TR-021116	TR-021283	TR-021284
C-18	5	TR-021065	TR-021067	TR-021281	TR-021282
C-8	5	TR-021117	TR-021118	TR-021285	TR-021286
C6 H5	7	TR-021119	TR-021120	TR-021287	TR-021288
CN	7	TR-021121	TR-021122	TR-021289	TR-021290
NH2	7	TR-021123	TR-021124	TR-021291	TR-021292

Semi-preparative columns NUCLEOSIL 120

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014294	TR-014296	TR-014298	TR-014300
C-18	5	TR-014286	TR-014288	TR-014290	TR-014292
C-8	5	TR-014302	TR-014304	TR-014306	TR-014308
C-4	5	TR-014600	TR-014601	TR-014602	TR-014603
C6 H5	7	TR-014310	TR-014312	TR-014314	TR-014316
CN	7	TR-014318	TR-014320	TR-014322	TR-014324
NH2	7	TR-014326	TR-014328	TR-014330	TR-014332
Si	10	TR-014366	TR-014368	TR-014370	TR-014372
C-18	10	TR-014358	TR-014360	TR-014362	TR-014364
C-8	10	TR-014374	TR-014376	TR-014378	TR-014380

Semi-preparative columns NUCLEOSIL 100

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
Si	5	TR-014476	TR-014477	TR-014478	TR-014479
C-2	7	TR-014488	TR-014489	TR-014490	TR-014491
C-8	5	TR-014484	TR-014485	TR-014486	TR-014487
C-18	5	TR-014480	TR-014481	TR-014482	TR-014483
Phenyl	7	TR-014492	TR-014493	TR-014494	TR-014495
CN	5	TR-014496	TR-014497	TR-014498	TR-014499
Diol	7	TR-014585	TR-014586	TR-014587	TR-014588
NH2	5	TR-014589	TR-014590	TR-014591	TR-014592
N(CH3)2	5	TR-014597	TR-014598	TR-014599	TR-014769
SA	5	TR-014770	TR-014771	TR-014772	TR-014773
SB	5	TR-014774	TR-014775	TR-014776	TR-014777

Function		Dimensions			
Particle size (µm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
NO2	5	TR-014593	TR-014594	TR-014595	TR-014596
Si	10	TR-014733	TR-014734	TR-014735	TR-014736
C-8	10	TR-014737	TR-014738	TR-014739	TR-014740
C-18	10	TR-014741	TR-014742	TR-014743	TR-014744
CN	10	TR-014745	TR-014746	TR-014747	TR-014748
NO2	10	TR-014749	TR-014750	TR-014751	TR-014752
NH2	10	TR-014753	TR-014754	TR-014755	TR-014756
N(CH3)2	10	TR-014757	TR-014758	TR-014759	TR-014760
SA	10	TR-014761	TR-014762	TR-014763	TR-014764
SB2	10	TR-014765	TR-014766	TR-014767	TR-014768

Novafix™ Cartridge NUCLEOSIL 100

Function		Dimensions			
Particle size (µm)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm	
Si	3	TR-015462	TR-015463	TR-015464	
C-18	3	TR-015465	TR-015466	TR-015467	
Si	5	TR-015514	TR-015515	TR-015516	
C-18	5	TR-015517	TR-015518	TR-015519	
C-8	5	TR-015520	TR-015521	TR-015522	
C-2	7	TR-015523	TR-015524	TR-015525	
C6H5	5	TR-015526	TR-015527	TR-015528	
CN	5	TR-015529	TR-015530	TR-015531	
NO2	5	TR-015532	TR-015533	TR-015534	
NH2	5	TR-015535	TR-015536	TR-015537	
N(CH3)2	5	TR-015538	TR-015539	TR-015540	
DIOL	7	TR-015118	TR-015119	TR-015120	
SA	5	TR-015121	TR-015122	TR-015123	
SB	5	TR-015124	TR-015125	TR-015126	
Si	10	TR-016598	TR-015541	TR-015542	
C-18	10	TR-015543	TR-015544	TR-015545	
C-8	10	TR-015546	TR-015547	TR-015548	
CN	10	TR-015549	TR-015550	TR-015551	
NO2	10	TR-015552	TR-015553	TR-015554	
NH2	10	TR-015555	TR-015556	TR-015559	
SA	10	TR-015151	TR-015152	TR-015153	
SB	10	TR-015154	TR-015155	TR-015156	

Novafix™ Cartridge NUCLEOSIL 120

Function		Dimensions			
Particle size (µm)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm	
Si	3	TR-015468	TR-015469	TR-015470	
C-8	3	TR-015471	TR-015472	TR-015473	
C-18	3	TR-015474	TR-015475	TR-015476	
Si	5	TR-015100	TR-015101	TR-015102	
C-18	5	TR-015103	TR-015104	TR-015105	
C-8	5	TR-015106	TR-015107	TR-015108	
C6H5	7	TR-015109	TR-015110	TR-015111	
CN	7	TR-015112	TR-015113	TR-015114	
NH2	7	TR-015115	TR-015116	TR-015117	
Si	10	TR-015130	TR-015131	TR-015132	
C-18	10	TR-015133	TR-015134	TR-015135	
C-8	10	TR-015136	TR-015137	TR-015138	



This traditional irregular packing is packed following completely optimized methods, ensuring maximum efficiency, stability and reproductibility in all the columns.

With this irregular packing, the efficiencies normally obtained are of 30-40000 N/m for the 5 μ m packings, and 50-70,000 N/m for the 5 μ m.

Analytical columns LICHROSORB

Function			Dimensions									
Particle size (μ m)			10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si 60	5	TR-011421	TR-411421	TR-011423	TR-411423	TR-011425	TR-411425	TR-011427	TR-411427	TR-011429	TR-411429	
RP-8	5	TR-011441	TR-411441	TR-011443	TR-411443	TR-011445	TR-411445	TR-011447	TR-411447	TR-011449	TR-411449	
RP-18	5	TR-011431	TR-411431	TR-011433	TR-411433	TR-011435	TR-411435	TR-011437	TR-411437	TR-011439	TR-411439	
RP-Select B	5	TR-016046	TR-416046	TR-016047	TR-416047	TR-011969	TR-411969	TR-016048	TR-416048	TR-011970	TR-411970	
Diol	5	TR-011451	TR-411451	TR-011453	TR-411453	TR-011455	TR-411455	TR-011457	TR-411457	TR-011459	TR-411459	
NH2	5	TR-011461	TR-411461	TR-011463	TR-411463	TR-011465	TR-411465	TR-011467	TR-411467	TR-011469	TR-411469	
CN	5	TR-011471	TR-411471	TR-011473	TR-411473	TR-011475	TR-411475	TR-011477	TR-411477	TR-011479	TR-411479	
Si 60	10	TR-011481	TR-411481	TR-011483	TR-411483	TR-011485	TR-411485	TR-011487	TR-411487	TR-011489	TR-411489	
RP-8	10	TR-011501	TR-411501	TR-011503	TR-411503	TR-011505	TR-411505	TR-011507	TR-411507	TR-011509	TR-411509	
RP-18	10	TR-011491	TR-411491	TR-011493	TR-411493	TR-011495	TR-411495	TR-011497	TR-411497	TR-011499	TR-411499	
Diol	10	TR-011511	TR-411511	TR-011513	TR-411513	TR-011515	TR-411515	TR-011517	TR-411517	TR-011519	TR-411519	
NH2	10	TR-011521	TR-411521	TR-011523	TR-411523	TR-011525	TR-411525	TR-011527	TR-411527	TR-011529	TR-411529	
CN	10	TR-011531	TR-411531	TR-011533	TR-411533	TR-011535	TR-411535	TR-011537	TR-411537	TR-011539	TR-411539	

Novafix™ Cartridge LICHROSORB

Function		Dimensions		
Particle size (μ m)		7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 60	5	TR-015196	TR-015197	TR-015198
RP-18	5	TR-015199	TR-015200	TR-015201
RP-8	5	TR-015202	TR-015203	TR-015204
Diol	5	TR-015205	TR-015206	TR-015207
NH2	5	TR-015208	TR-015209	TR-015210
CN	5	TR-015211	TR-015212	TR-015213
RP-Select B	5	TR-015345	TR-015346	TR-015347
Si 60	10	TR-015178	TR-015179	TR-015180
RP-18	10	TR-015181	TR-015182	TR-015183
RP-8	10	TR-015184	TR-015185	TR-015186
Diol	10	TR-015187	TR-015188	TR-015189
NH2	10	TR-015190	TR-015191	TR-015192
CN	10	TR-015193	TR-015194	TR-015195
RP-Select B	10	TR-015561	TR-015562	TR-015563

Semi-preparative Tracer columns LICHROSORB

Function		Dimensions			
Particle size (μ m)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
RP-18	7	TR-014429	TR-014431	TR-014433	TR-014436

For Guard Columns please refer to pages 198-199

For precolumns of cartridge system Novafix please refer to page 193.



Lichrospher's spherical packing of 5 and 10 μm particle size, giving all the advantages that are common to all the spherical packings: high permeability, high efficiency and excellent column stability.

Analytical columns LICHROSPHER

Function			D i m e n s i o n s								
Particle size (μm)	10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm	
Si 100	5	TR-011541	TR-411541	TTR-011543	TR-411543	TR-011545	TR-411545	TR-011547	TR-411547	TR-011549	TR-411549
100 RP-18	5	TR-011551	TR-411551	TR-011553	TR-411553	TR-011555	TR-411555	TR-011557	TR-411557	TR-011559	TR-411559
100 RP-18 ec	5	TR-011561	TR-411561	TR-011563	TR-411563	TR-011565	TR-411565	TR-011567	TR-411567	TR-011569	TR-411569
100 RP-8	5	TR-011571	TR-411571	TR-011573	TR-411573	TR-011575	TR-411575	TR-011577	TR-411577	TR-011579	TR-411579
100 RP-8 ec	5	TR-011581	TR-411581	TR-011583	TR-411583	TR-011585	TR-411585	TR-011587	TR-411587	TR-011589	TR-411589
100 NH ₂	5	TR-011591	TR-411591	TR-011593	TR-411593	TR-011595	TR-411595	TR-011597	TR-411597	TR-011599	TR-411599
100 CN	5	TR-011601	TR-411601	TR-011603	TR-411603	TR-011605	TR-411605	TR-011607	TR-411607	TR-011609	TR-411609
100 Diol	5	TR-011611	TR-411611	TR-011613	TR-411613	TR-011615	TR-411615	TR-011617	TR-411617	TR-011619	TR-411619
60 RP-Select B	5	TR-016813	TR-416813	TR-016814	TR-416814	TR-016815	TR-416815	TR-016816	TR-416816	TR-016817	TR-416817
Si 100	10	TR-011621	TR-411621	TR-011623	TR-411623	TR-011625	TR-411625	TR-011627	TR-411627	TR-011629	TR-411629
100 RP-18	10	TR-011631	TR-411631	TR-011633	TR-411633	TR-011635	TR-411635	TR-011637	TR-411637	TR-011639	TR-411639
100 RP-18 ec	10	TR-011641	TR-411641	TR-011643	TR-411643	TR-011645	TR-411645	TR-011647	TR-411647	TR-011649	TR-411649
100 RP-8	10	TR-011651	TR-411651	TR-011653	TR-411653	TR-011655	TR-411655	TR-011657	TR-411657	TR-011659	TR-411659
100 RP-8 ec	10	TR-011661	TR-411661	TR-011663	TR-411663	TR-011665	TR-411665	TR-011667	TR-411667	TR-011669	TR-411669
100 CN	10	TR-011681	TR-411681	TR-011683	TR-411683	TR-011685	TR-411685	TR-011687	TR-411687	TR-011689	TR-411689
100 Diol	10	TR-011691	TR-411691	TR-011693	TR-411693	TR-011695	TR-411695	TR-011697	TR-411697	TR-011699	TR-411699
60 RP-Select B10		TR-016808	TR-416808	TR-016809	TR-416809	TR-016810	TR-416810	TR-016811	TR-416811	TR-016812	TR-416812

Semi-preparative Tracer columns LICHROSPHER

Function		Dimensions			
Particle size (μm)		15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm
RP-18	10	TR-014437	TR-014439	TR-014441	TR-014443
RP-18 EC	10	TR-014445	TR-014447	TR-014449	TR-014451

Microbore Tracer columns LICHROSPHER

Function		D i m e n s i o n s			
Particle size (μm)	15 x 0.7 cm	25 x 0.7 cm	15 x 1.0 cm	25 x 1.0 cm	
RP-18	5 TR-021069	TR-021071	TR-021293	TR-021294	
RP-18 EC	5 TR-021073	TR-021075	TR-021295	TR-021296	

Novafix™ Cartridge LICHROSPHER

Function		Dimensions		
Particle size	(μm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Si 100	5	TR-015238	TR-015239	TR-015240
100 RP-18	5	TR-015241	TR-015242	TR-015243
100 RP-18 ec	5	TR-015244	TR-015245	TR-015246
100 RP-8	5	TR-015247	TR-015248	TR-015249
100 RP-8 ec	5	TR-015250	TR-015251	TR-015252
100 NH2	5	TR-015253	TR-015254	TR-015255
100 CN	5	TR-015256	TR-015257	TR-015258
100 Diol	5	TR-015259	TR-015260	TR-015261
60 RP-Select B	5	TR-015572	TR-015573	TR-015574
Si 100	10	TR-015214	TR-015215	TR-015216
100 RP-18	10	TR-015217	TR-015218	TR-015219
100 RP-18 ec	10	TR-015220	TR-015221	TR-015222
100 RP-8	10	TR-015223	TR-015224	TR-015225
100 RP-8 ec	10	TR-015226	TR-015227	TR-015228
100 NH2	10	TR-015229	TR-015230	TR-015231
100 CN	10	TR-015232	TR-015233	TR-015234
100 Diol	10	TR-015235	TR-015236	TR-015237
60 RP-Select B	10	TR-015569	TR-015570	TR-015571



A totally porous spherical packing, with a particle size of 4µm, giving a compromise alternative between the packings of 3 and 5µm.

Novafix™ Cartridge SUPERSPHER

Function		D i m e n s i o n s			
Particle size	(µm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm	
Si 60	4	TR-015262	TR-015263	TR-015264	
60 RP-8	4	TR-015265	TR-015266	TR-015267	
100 RP-18	4	TR-015268	TR-015269	TR-015270	
60 RP-8 ec	4	TR-015271	TR-015272	TR-015273	
100 RP-18 ec	4	TR-015274	TR-015275	TR-015276	

Analytical columns SUPERSPHER

Function		D i m e n s i o n s									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Si 60	4	TR-011701	TR-411701	TR-011703	TR-411703	TR-011705	TR-411705	TR-011707	TR-411707	TR-011709	TR-411709
60 RP-8	4	TR-011711	TR-411711	TR-011713	TR-411713	TR-011715	TR-411715	TR-011717	TR-411717	TR-011719	TR-411719
100 RP-18	4	TR-011721	TR-411721	TR-011723	TR-411723	TR-011725	TR-411725	TR-011727	TR-411727	TR-011729	TR-411729
60 RP-8 ec	4	TR-011731	TR-411731	TR-011733	TR-411733	TR-011735	TR-411735	TR-011737	TR-411737	TR-011739	TR-411739
100 RP-18 ec	4	TR-011741	TR-411741	TR-011743	TR-411743	TR-011745	TR-411745	TR-011747	TR-411747	TR-011749	TR-411749

For Guard Columns please refer to pages 198-199

For precolumns of cartridge system Novafix please refer to page 193.



Partisil's high quality irregular packing with a very high surface area. Different degrees of coating for the ODS packings permit optimum selectivity.

Partisil ODS is 5% coated, while Partisil ODS2 has 15% and the Partisil ODS3 is covered by a 10% of carbon.

Novafix™ Cartridge PARTISIL

Function		Dimensions		
Particle size	(µm)	7.5 x 0.4 cm	15 x 0.4 cm	25 x 0.4 cm
Silica	5	TR-015423	TR-015424	TR-015425
ODS 3	5	TR-015426	TR-015427	TR-015428
C-8	5	TR-015429	TR-015430	TR-015431
PAC	5	TR-015432	TR-015433	TR-015434
Silica	10	TR-015435	TR-015436	TR-015437
ODS	10	TR-015438	TR-015439	TR-015440
ODS 2	10	TR-015441	TR-015442	TR-015443
ODS 3	10	TR-015444	TR-015445	TR-015446
PAC	10	TR-015447	TR-015448	TR-015449
SAX	10	TR-015450	TR-015451	TR-015452
SCX	10	TR-015453	TR-015454	TR-015455

Analytical columns PARTISIL

Function		Dimensions									
Particle size (µm)		10 x 0.46 cm	10 x 0.4 cm	12.5 x 0.46 cm	12.5 x 0.4 cm	15 x 0.46 cm	15 x 0.4 cm	20 x 0.46 cm	20 x 0.4 cm	25 x 0.46 cm	25 x 0.4 cm
Silica	5	TR-016205	TR-416205	TR-016206	TR-416206	TR-016207	TR-416207	TR-016208	TR-416208	TR-016209	TR-416209
ODS3	5	TR-016211	TR-416211	TR-016212	TR-416212	TR-016213	TR-416213	TR-016214	TR-416214	TR-016215	TR-416215
C-8	5	TR-016217	TR-416217	TR-016218	TR-416218	TR-016219	TR-416219	TR-016220	TR-416220	TR-016221	TR-416221
PAC	5	TR-016222	TR-416222	TR-016223	TR-416223	TR-016224	TR-416224	TR-016225	TR-416225	TR-016226	TR-416226
Silica	10	TR-016227	TR-416227	TR-016228	TR-416228	TR-016229	TR-416229	TR-016230	TR-416230	TR-016231	TR-416231
ODS	10	TR-016330	TR-416330	TR-016331	TR-416331	TR-016332	TR-416332	TR-016333	TR-416333	TR-016334	TR-416334
ODS2	10	TR-011817	TR-411817	TR-011819	TR-411819	TR-011821	TR-411821	TR-011823	TR-411823	TR-011825	TR-411825
ODS3	10	TR-011827	TR-411827	TR-011829	TR-411829	TR-011831	TR-411831	TR-011833	TR-411833	TR-011835	TR-411835
PAC	10	TR-016232	TR-416232	TR-016233	TR-416233	TR-016234	TR-416234	TR-016235	TR-416235	TR-016236	TR-416236
SAX	10	TR-011837	TR-411837	TR-011839	TR-411839	TR-011841	TR-411841	TR-011843	TR-411843	TR-011845	TR-411845
SCX	10	TR-016237	TR-416237	TR-016238	TR-416238	TR-016239	TR-416239	TR-016240	TR-416240	TR-016241	TR-416241

TSK has available a wide range of columns with different percentages of coating, degree of endcapping, etc. which cover a wide field of applications.

The nomenclature used by TosoHass describes each packing. Thus, for example, a packing ODS-80TM indicates a packing of 80A pores substituted with octadecylsilane groups. The letter T

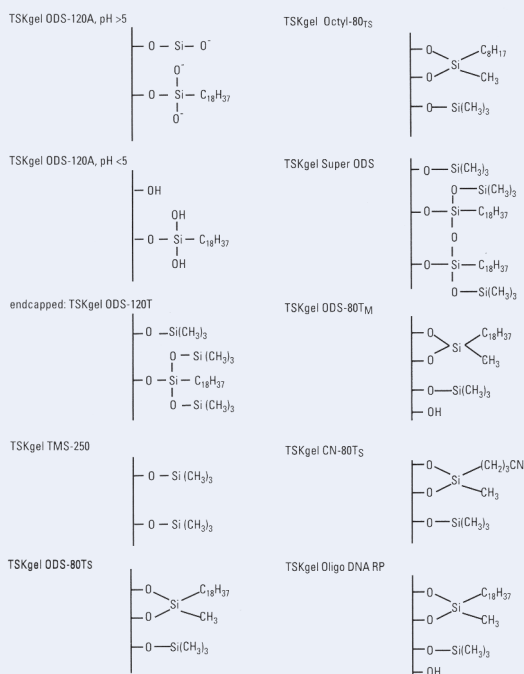
means that the packing has been processed by endcapping with TMS groups.

The letter A describes a packing without endcapping, and the letter M means that the coating is of a monolayer of C18 groups. If an S appears in the description it means that the packing is totally endcapping.

Properties of silica-based TSK-GEL RPC columns

Column	Functional Group	Endcapped	% Carbon	Particle size (μm)	Pore size (μm)	Exclusion limit (Da)
ODS-80 _M	C ₁₈ alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
ODS-80 _S	C ₁₈ alkyl, monomeric	Yes	15%	5, 10, 20	80	100-6,000
OCTYL-80T _S	C ₈ alkyl, monomeric	Yes	11%	5	80	10,000
CN-80T _M	CN, monomeric	Yes	8%	5	80	10,000
SUPER-ODS	C ₁₈ alkyl, polymeric	Yes	8%	2	110	20,000
SUPER-Octyl	C ₁₈ alkyl, polymeric	Yes	5%	2	110	20,000
SUPER-Phenyl	Phenyl, polymeric	Yes	3%	2	110	20,000
ODS-120T	C ₁₈ alkyl, polymeric	Yes	22%	5, 10, 20	120	100-10,000
ODS-120A	C ₁₈ alkyl, polymeric	No	22%	5, 10	120	100-10,000
TMS-250	C ₁ alkyl, monomeric	Yes	5%	10	250	100-200,000
OligoDNA RP	C ₁₈ alkyl, monomeric	No	10%	5	250	up to 165,000

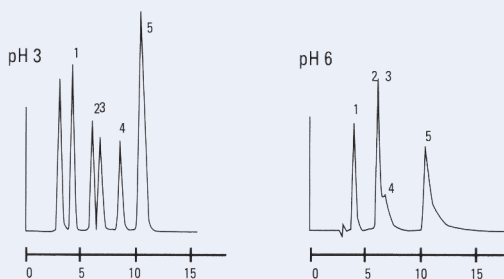
TSK-Gel bonded silica stationary phases



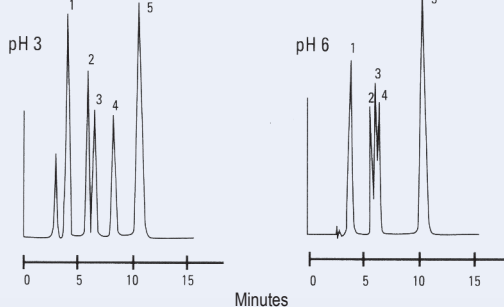
TKL 1016

Effect of pH and degree of endcapping on the resolution of catecholamines

TSKgel ODS-120A



TSKgel ODS-120T (endcapped)



Column: TSKgel ODS-120A, 4.6mm x 25cm
TSKgel ODS-120T, 4.6mm x 25cm
Sample: 1 norepinephrine, 2 epinephrine
3 3,4-dihydroxybenzylamine, 4 DL-DOPA,
5 dopamine-HCl
Elution: 0.1M phosphate buffer, pH 3.0 or 6.0
Flow rate: 1.0ml/min
Detection: UV @ 254nm

TK TSK Gel Reversed Phase - TSK Gel SUPER-ODS

Analytical Columns TSK Gel Reversed Phase

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (μ m)
TH-18150	ODS-80T _S 80A	2,0	15	5
TH-18151	ODS-80T _S 80A	2,0	25	5
TH-17200	ODS-80T _S 80A	4,6	7,5	5
TH-17201	ODS-80T _S 80A	4,6	15	5
TH-17202	ODS-80T _S 80A	4,6	25	5
TH-16651	ODS-80T _M 80A	4,6	7,5	5
TH-08148	ODS-80T _M 80A	4,6	15	5
TH-08149	ODS-80T _M 80A	4,6	25	5
TH-17344	Octyl-80T _S 80A	4,6	15	5
TH-17345	Octyl-80T _S 80A	4,6	25	5
TH-17348	CN-80T _S 80A	4,6	15	5
TH-17349	CN-80T _S 80A	4,6	25	5
TH-07636	ODS-120A 120A	4,6	15	5
TH-07124	ODS-120A 120A	4,6	25	5
TH-18152	ODS-120T 120A	2,0	15	5
TH-18153	ODS-120T 120A	2,0	25	5
TH-07637	ODS-120T 120A	4,6	15	5
TH-07125	ODS-120T 120A	4,6	25	5
TH-07190	TMS-250 250A	4,6	7,5	10

Guard Columns TSK Gel Reversed Phase

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (μ m)
TH-17242	ODS-80TS, Guard Cartridge, pk 3	3,2	5	1,5
TH-14100	Cartridge Holder	3,2		1,5

TSK Gel SUPER-ODS

- Efficiencies of 200,000N/m
- 2 μ m particles
- Extremely short analysis times
- Reduced working pressures
- Lower costs of analysis

TSKgel Super-ODS is a reverse phase column that contains 2 μ m particles of silica with 150 Å pore size.

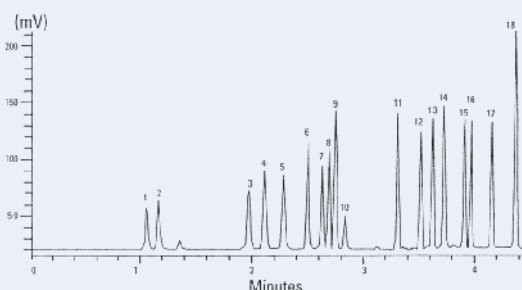
This column is the best choice when it is required to shorten the analysis time for all types of compounds up to 20,000 Daltons, including the most basic.

Ultrarapid columns TSKgel Super-ODS

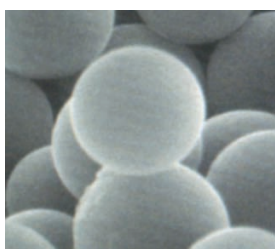
Analytical and preparative column specifications, in reversed phase TSK-GEL.

Code	TSKgel	ID) (mm)	Length (cm)	Particle size (μ m)
TH-18154	Super-ODS, 110A	4,6	5	2
TH-18197	Super-ODS, 110A	4,6	10	2
TH-18275	Super-Octyl, 110A	4,6	5	2
TH-18176	Super-Octyl, 110A	4,6	10	2
TH-18177	Super-Phenyl, 110A	4,6	5	2
TH-18178	Super-Phenyl, 110A	4,6	10	2
TH-18206	Super-ODS			
	Guard filter holder	10	2,6	For P/N 18207
TH-18207	Super-ODS Guard filter	4,0	2,6	For Super-ODS, Phenyl and -Octyl 2 μ m pore size

TSKgel Super-ODS for rapid separation of eighteen PTC-derivatized amino acids



Column: TSKgel Super-ODS (4.6mm x 10cm)
Sample: 1. Asp, 2. Glu, 3. Ser, 4. Gly, 5. His, 6. Arg, 7. Thr, 8. Ala, 9. Pro, 10. PTC-NH₂, 11. Try, 12. Val, 13. Met, 14. Cys, 15. Ile, 16. Leu, 17. Phe, 18. Lys
Elution: CH₃CN/H₂O = 60/40
 0min (b:5%), 4min (b:100%)
Flow Rate: 1.5mL/min
Detection: UV @ 254nm
Injection: 5 μ L
Temperature: ambient



YMC is known worldwide for the variety, versatility and quality of its HPLC packings. An attention centred originally in the analytical requirements of their clients has evolved to develop a full range of packings whose special selectivity characteristics have made

them essential chromatographic tools in the fields of advanced techniques such as that of combinatorial chemistry, LC-MS, etc.

- Spherical materials of high purity, available in particle sizes between 3 and 150 μm .
- The largest range of substitutions, including packings substituted with 30 atom carbon chains, packings resistant to extreme pHs, etc.
- Manufacture in batches of more than 100 kg/batch, for a better reproducibility and scaling.
- Columns of all diameters between 0.05mm and 1000mm internal diameter (From nano-chromatography to industrial scale chromatography, passing through analytical and preparative.)

PRODUCT	CODE	PHASE (silica-based noted)	END-CAPPED	USP CLASS NO	PARTICLE SIZE (μm spherical)	PORE SIZE (nm)	CARBON LOAD (%C)	pH	TYPICAL APPLICATIONS
YMC30	CT	proprietary, polymeric bonding chemistry	proprietary	n/a	3.5	proprietary	proprietary	2-6	isomeric carotenes, retinols, steroids, fat-soluble vitamins
Pro C18	AS	latest generation C18 using ultrapure silica base (99.999%), with very low residual non-specific interactions	yes	L1	3.5	120	17	2-8	fat-soluble vitamins, antioxidants, metabolites, acidic, neutral, basic and chelating compounds
Pro C18 RS	RS	high carbon load with polymeric bonding C18, ultrapure silica base (99.999%)	yes	L1	3.5	80	22	1-10 ²	suitable for a wide range of samples including acidic and basic compounds
Hydrosphere C18	HS	based on the same ultrapure silica base as ProFamily, can be used in 100% aqueous eluent	yes	L1	3.5	120	12	2-8	strong polar compounds, antibiotics, catecholamines, nucleic acids, water-soluble vitamins. Acidic, neutral, basic and chelating compounds
ODS-A	AA	one of YMC's international bestsellers, traditional high performance C18 column	yes	L1	3.5	120,200,300	17,12,6	2-7	pharmaceuticals, vitamins, amino acids, peptides, general purpose phase
ODS-AM	AM	strict QC controlled production provides a high performance C18 column for validated methods operations	yes	L1	3.5	120	17	2-7	purines, phenols, PTC-amino acids, angiotensins, alkaloids
ODS-AQ	AQ	"hydrophilic" endcapping, for 100% aqueous eluent systems, substantially increased retention of polar compounds	yes	L1	3.5	120,200	14,11	2-6.5	strong polar compounds, pharmaceuticals, antibiotics, peptides and proteins, nucleic acids
J'sphere	JH,JM,JL	C18-family with differently controlled hydrophobicity for method development	yes	L1	4	80	22,14,9 (JH,JM,JL)	1-9 (H) 2-7 (M+L)	positional isomers, complexing agents, pharmaceuticals
ODS-AL	AL	traditional C18 for "mixed mode" separations	no	L1	3.5	120	17	2-6	Tocopherols, fat-soluble vitamins, disinfectants
Polymer C18	PC	polymethacrylate-matrix, stable towards shrinking and swelling, wide pH applicability	n/a	n/a	6.10	proprietary	C18=10%	2-12	Phenols, anilins, peptides in high pH, pharmaceuticals, quaternary amines
Pro C8	OS	latest generation C8 using ultrapure silica base (99.999%) with very low residual non-specific interactions	yes	L7	3.5	120	11	2-8	acidic, neutral, basic and chelating compounds, drugs and metabolites
C8 (Octyl)	OC	traditional C8, high coverage monomeric bonding chemistry	yes	L7	3.5	120,200,300	10,7,4	2-7	proteins and peptides, estrogens, general purpose phase
YMC Basic	BA	specifically designed for the separation of basic compounds	yes	L7	3.5	proprietary	7	2-7	basic molecules w/o modifiers, anilines, alkaloids, antidepressants
Phenyl	PH	monomeric bonded phenyl	yes	Lit	3.5	120,300	9.3	2-7	Phenols, fulwerenes, sweeteners
Pro C4	BS	latest generation C4 using ultrapure silica base (99.999%) with very low residual non-specific interactions	yes	L26	3.5	120	8	2-8	polar acidic, neutral, basic and chelating compounds, polar peptides
C4 (Butyl)	BU	traditional C ₄ , high coverage monomeric bonding chemistry	yes	L26	3.5	120,200,300	7,5,2,5	2-7	biological separations, polar compounds
Protein-RP	PR	specifically designed to withstand exposure to TFA, good recovery rates	yes	L26	5	proprietary	proprietary	1.5-7	Proteins, peptides
C1 (TMS) ³	TM	trimethyl silane, excellent hydrolytic stability	n/a	L13	3.5	120,300	4,3	2-7	water-soluble vitamins
PVA-SIL ³	PV	polyvinyl alcohol bonded on silica support, suitable for normal or reversed phase applications	n/a	L24	5	120	n/a	2-9.5	Proteins, phospholipids, retinoids, lipids
Polyamin II (PBMN)	PS	mixed secondary and tertiary amino derivative gives improved hydrolytic stability and alternative selectivity compared to conventional amino-phases, increased life time, rapid equilibration time	n/a	n/a	5	120	n/a	2-9	malto-oligosaccharides, tocopherols, nucleotides, sugars
Amino ³	NH	Primary amino derivative, high coverage monomeric bonding chemistry	n/a	L8	3.5	120	3	2.7	Sugars, nucleotides, water-soluble vitamins
Cyano ³	CN	Traditional cyano derivative, useful also for SFC applications	yes	L10	3.5	120,300	7,2,5	2-7	Proteins, steroids, catechols
Diol ³	DL	For aqueous GPC or normal phase applications, high recovery for biological material	n/a	L20	5	60,120,200,300	n/a	2-7	Peptides, proteins, malto-oligosaccharides
Silica	SL	Ultra high purity mechanical stability	n/a	L3	3.5	60,120,200,300	n/a	n/a	small organic molecules, fat-soluble vitamins, tocopherols

YMC columns - Guide to IPC (International Product Code)

The following table provides a full listing of stationary phases and column dimensions available from YMC. However, please note that combinations of features cannot be selected at random, but only from the possible specifications for a chosen stationary phase.

Chemistry code		Pore size in nm		Particle shape		Particle size in (µm)		Length in mm		Inner diameter in mm	
YMC30	CT	6	06	spherical	S	3	03	10	01	0.05	E5
Pro C18	AS	8	08			4	04	20	02	0.075	E8
ProC18RS	RS	12	12	irregular	I	5	05	33	03	0.1	FO
Hydrosphere C18	HS	20	20			6	06	50	05	0.2	GO
ODS-A	AA	30	30					75	L5	0.3	HO
ODS-AM	AM	100	A0			5/15	11	100	I 10	0.5	JO
ODS-AQ	AQ	proprietary	99			10/20	16	125	R5	0.8	MO
J'sphere ODS-H80	JH					15/30	21	150	15	1.0	01
J'sphere ODS-M80	JM					30/50	41	250	25	2.1	02
J'sphere ODS-L80	JL					50	50			3.0	03
ODS-AL	AL					75	75	300	30	4.0	04
Polymer C18	PC					63/210	A4	500	50	4.6	46
Pro C8	OS					150	AS	1000	AO	6.0	06
C8 (Octyl)	OC					350	C5	1500	AS	8.0	08
YMCbasic	BA							2000	BO	10	10
Phenyl	PH					5/20	12			20	20
Pro C4	BS					1 0/25	17			30	30
C4 (Butyl)	BU					40/63	52				
Protein-RP	PR					63/210	A4			40	40
C1 (TMS)	TM									50 (2000 psi)	52
PVA-SIL	PV									70 (2000 psi)	72
Polyamine II	PB									100 (2000 psi)	A2
Amino	NH									150 (2000 psi)	B2
Cyano	CN									200 (2000 psi)	C2
Diol	DL										
Silica	SL										
Chiral K	CK										
Chiral L	CL										
Chiral NEA (R)	NR										
Chiral NEA (S)	NS										
Chiral CD BR α	DA										
Chiral CD BR β	DB										
Chiral CD BR γ	DG										
Chiral Prep CD ST	ST										
Chiral Prep CD PM	PM										

Example:

For ordering a YMC-Pack Pro C18 column with 12 nm pore size, 3 µm particle size, 50 mm length and 2.1 mm ID the corresponding product number will be: **AS12S030502**. Should you require assistance, please contact us.

HALO™ column packings are not made the typical way. Instead, the particles packed into HALO columns are manufactured using Fused-Core particle technology that was specially developed to deliver hyper-fast chromatographic separations while avoiding the reliability issues so often associated with fast HPLC (Figure 1).

The ability of HALO to generate hyper-fast separations comes not only from their small particle size (2.7 μm) but also from the unique Fused-Core particle technology that creates a 0.5 μm porous shell fused to a solid core particle. As mobile phase flow rate is increased to speed-up a separation, the slow mass transfer

of solute molecules inside the particles limits resolving power. Fused-Core particle technology addresses this limitation by providing an incredibly small path (0.5 μm) for diffusion of solutes into and out of the stationary phase, thereby reducing the time solute molecules spend inside the particles and minimizing a major barrier to fast chromatographic separations (Figure 2).

HALO columns deliver over 50% more separating power (theoretical plates) than a column of the same length packed with 3.5 μm particles and more than twice the plates of a column packed with 5 μm particles (Figure 3).

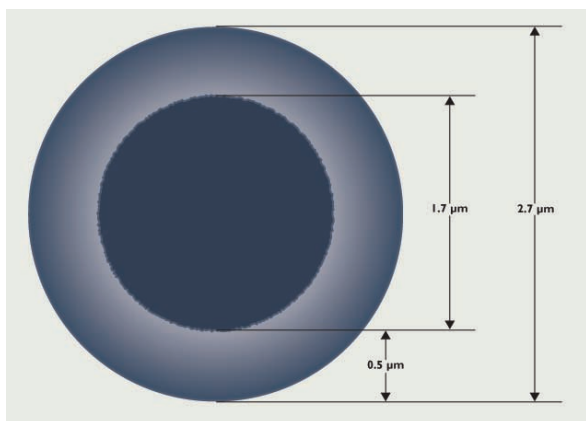


Figure 1 - Fused-Core Particle Technology

Fused-Core particle technology was developed by Jack Kirkland to produce HPLC columns that provide faster separations and higher sample throughput without sacrificing column ruggedness and reliability. As the name implies, Fused-Core particles are manufactured by "fusing" a porous silica layer onto a solid silica particle.

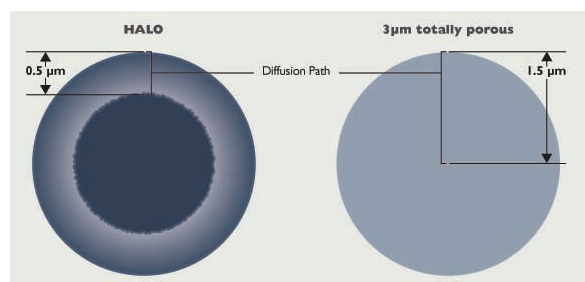


Figure 2 - The shorter diffusion path of HALO reduces axial dispersion

The shorter diffusion path of HALO particles reduces axial dispersion of solutes and minimizes peak broadening. A Halo particle has only a 0.5 μm diffusion path compared to the approximately 1.5 μm diffusion path of a 3 μm totally porous particle. Because of the shorter diffusion path, the performance advantages of HALO become even more apparent when separating larger solute molecules and operating at faster mobile phase flow rates.

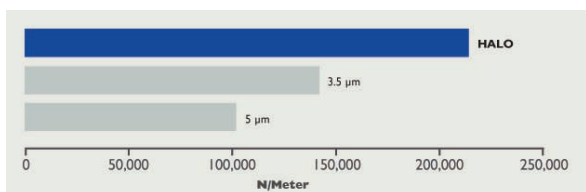
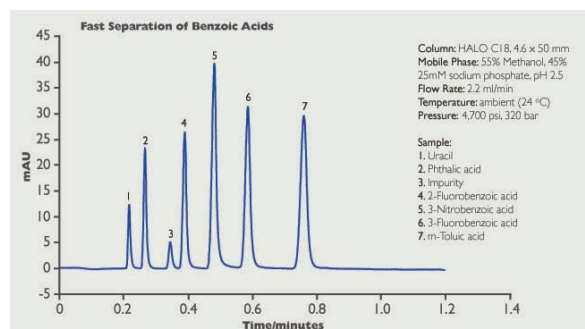


Figure 3. HALO columns deliver more separating power

HALO columns deliver over 50% more separating power (plates) than columns of the same length packed with 3.5 μm particles and more than twice the separating power of columns packed with 5 μm particles.

Note: N/Meter values were calculated at the optimum mobile phase linear velocity for each of these stationary phases. Naphthalene was used as the test probe and the mobile phase conditions used were 60% acetonitrile and 40% water at 24 °C.

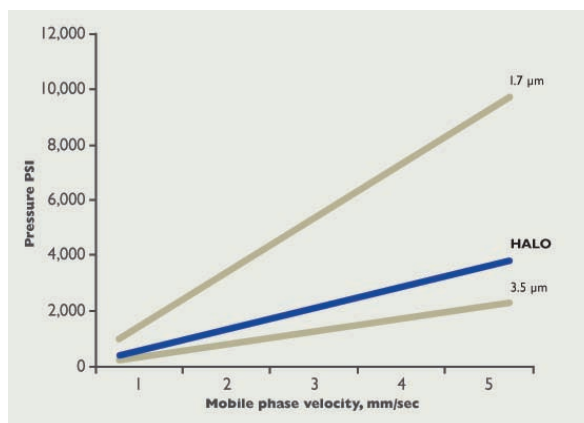


HALO columns are designed for hyper-fast separations so that higher sample throughput can be achieved. In this example, the HALO column separated seven compounds in less than 48 seconds with better than baseline resolution for all peak pairs.

Tk HALO™ HyperFast HPLC Column

Halo columns do not require ultra-high pressure

Fused-Core particle technology produces hyper-fast columns that can be used on practically all HPLC systems. Figure 7 provides a comparison of system back pressure for the HALO column versus other fast HPLC columns. Columns packed with stationary phases smaller than 2 μm often require pressures in excess of what is achievable with typical HPLC instrumentation. A very real bonus that comes with using a HALO column is that expensive ultra-high pressure instrumentation does not have to be purchased and new laboratory protocols do not have to be developed. HALO columns can turn almost any HPLC system into a high speed workhorse for your lab.



Most HPLC systems have operating pressure limits of 6,000 psi (400 bar), or less. As the column packing particle size decreases, the column back pressure increases rapidly.

To use columns packed with sub-2 μm size particles at their optimum flow rate, pressure that exceeds 6,000 psi is often encountered. This necessitates purchasing very expensive "ultra-pressure" equipment to achieve optimum performance. HALO columns, even though they do generate slightly higher back pressure than columns packed with 3.5 μm particles, can be used with most existing HPLC equipment.

Halo Specifications

Stationary Phase Support

- Ultra-pure, "Type B" silica
- 1.7 μm solid core particle with a 0.5 μm porous silica layer fused to the surface
- 150 m^2/gram surface area
- 90 $\text{\AA}$ pore size

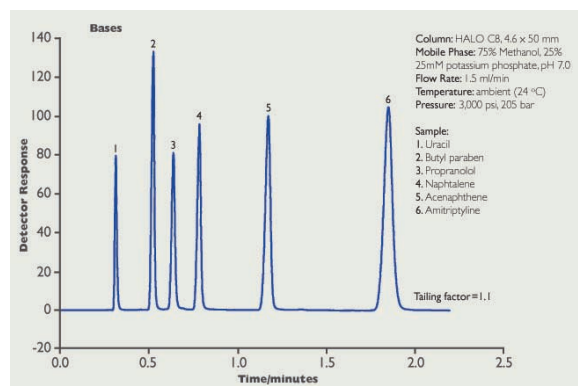
Bonded Phase

- Monomeric bonding chemistry
- Densely bonded phase
- Maximized endcapping
- C18: Octadecyldimethylsilane, 3.5 $\mu\text{moles}/\text{m}^2$
- C8: Octyldimethylsilane, 3.7 $\mu\text{moles}/\text{m}^2$
- pH Range: 2 to 9

Maximum Pressure: 9,000 psi, 600 Bar

Halo is base-deactivated for excellent peak shape

HALO stationary phases are made using ultra-pure reagents and "Type B" silica. The peak shapes for bases and acids are excellent on HALO columns because metal contamination has been virtually eliminated and interference from silanol groups has been minimized (see figure below). Because of the elimination of "secondary retention" of solutes from metal contamination or silanol interaction, column-to-column reproducibility is also excellent.



Peak tailing due to trace metals or silanol groups is essentially non-existent on HALO stationary phases. The examples here show the excellent peak shape that can be achieved for either bases or acids when using a HALO column. The conditions used for the bases were chosen to encourage any potential silanol interference. Note the excellent peak shape for amitriptyline under these conditions.

Ordering Information

Column Dimensions	HALO C18	HALO C8
2.1 x 30mm	HAL-92812-302	HAL-92812-308
2.1 x 50mm	HAL-92812-402	HAL-92812-408
2.1 x 75mm	HAL-92812-502	HAL-92812-508
2.1 x 100mm	HAL-92812-602	HAL-92812-608
2.1 x 150mm	HAL-92812-702	HAL-92812-708
3.0 x 30mm	HAL-92813-302	HAL-92813-308
3.0 x 50mm	HAL-92813-402	HAL-92813-408
3.0 x 75mm	HAL-92813-502	HAL-92813-508
3.0 x 100mm	HAL-92813-602	HAL-92813-608
3.0 x 150mm	HAL-92813-702	HAL-92813-708
4.6 x 30mm	HAL-92814-302	HAL-92814-308
4.6 x 50mm	HAL-92814-402	HAL-92814-408
4.6 x 75mm	HAL-92814-502	HAL-92814-508
4.6 x 100mm	HAL-92814-602	HAL-92814-608
4.6 x 150mm	HAL-92814-702	HAL-92814-708

Zirconia or zirconium dioxide (ZrO₂) is a metal oxide that exists in a variety of crystalline and amorphous forms. The chief advantage of Zirconia in comparison with the traditional silica base packings is its unique and specific selectivity as well as outstanding thermal stability and chemical resistance.

In contrast to silica, Zirconium is totally stable within the complete pH range (0-14) and allows operation at temperatures as high as 200°C.

With respect to the polymeric packings on the market, Zirconia has an advantage in its exceptional mechanical resistance, and in not having the problems of incompatibility with certain organic solvents as is the case with the polymeric packings.

Available in a variety of particle sizes, between 3 and 20 µm, the operation of separations from ultrarapid to semi preparative is possible.

- Superior selectivity and better chromatographic peaks in the separation of basic compounds.
- Easy transfer of methods from conventional ODS columns.
- Stable between pHs of 1 to 14.
- Excellent thermal stability for rapid separations.
- High efficiency (> 120,000 plates/metre.)

ZirChrom™ -PDB

Composed of particles of ultra -stable Zirconia, coated with fine layer of cross linked polybutadiene. Its selectivity for non-ionizable compounds is similar to that of traditional packings C8 or C18. In the case of ionizable compounds, multiple secondary interactions can help the appropriate resolution of analytes, permitting a practically unlimited adjustment of operating conditions.

Thanks to its thermal stability, times of analysis can be reduced by half simply by raising the operating temperature into the 50°C range.

DiamondBond™ -C18

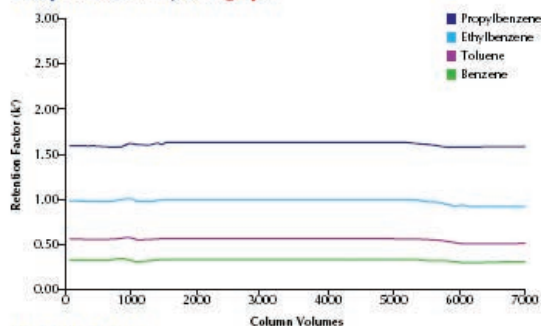
- Excellent selectivity for acidic compounds.
- pH stable between 1 and 14
- Excellent thermal stability for rapid analyses.

This packing contains C18 groups co-valently bonded to the carbon coated surface of the Zirconia. The extreme strength of the carbon-carbon bonds practically eliminates any bleeding of the column whatever, improving derived from the base line, preventing falls in retention times and bettering the sensitivity in all LC/MS applications.

References

The catalogue references for ZirChrom R are made in the following way: PPP-XXYY, where PPP is the number of the phase, XX is the length of the column and YY is the diameter of the same. For example, DBOI-1546 describes a column of 15 cm by 4.6 mm containing DiamondBond -C18.

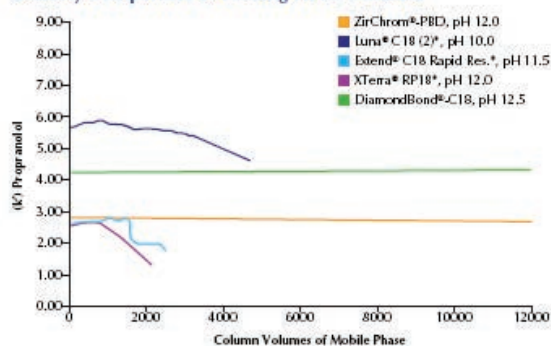
Exceptional Stability at High pH



LC CONDITIONS

Mobile phase: 15/85 ACN/Water, pH 13
Flow rate: 1.0 ml/min
Column: ZirChrom®-PDB, 150 x 4.6 mm i.d.

Stability Comparison of Leading HPLC Columns



Column Format

5 cm Columns

0521 (5 cm x 2.1 mm)
0546 (5 cm x 4.6 mm)

15 cm Columns

1521 (15 cm x 2.1 mm)
1546 (15 cm x 4.6 mm)

Guard Columns Holders

852-00 (use with 2.1 mm)
850-00 (use with 4.6 mm)

10 cm Columns

1021 (10 cm x 2.1 mm)
1046 (10 cm x 4.6 mm)

Guard Columns

G20 (use with 2.1 mm)
G20 (use with 4.6 mm)

Ordering Information

Phase

Number	Phase Name	Mode of use
DB01	DiamondBond-C18	Reversed-Phase
ZR01	ZirChrom-CARB	Reversed-Phase
ZR02	ZirChrom-PHASE	Normal Phase and SEC
ZR03	ZirChrom-PBD	Reversed-Phase
ZR04	ZirChrom-WCX	Weak cation-Exchange
ZR06	ZirChrom-SAX	Strong Anion-Exchange
ZR07	ZirChrom-SHAX	Strong Anion-Exchange
ZR08	ZirChrom-PEZ	Cation-Exchange for Proteins
ZR09	ZirChrom-PS	Reversed-Phase

Tk Hamilton PRP®-h1 HPLC Columns



Hamilton PRP®-h1 Polymer HPLC Columns

- Chemical Stability
- Full pH Range Stability
- Temperature Stability

The PRP-h1 column line from Hamilton offers a robust alternative to silica based and traditional polymer HPLC columns.

Total Compatibility

The PRP-h1 is a high performance, polymeric, reversed-phase column that delivers separations of a wide variety of analytes under the most extreme analytical conditions. Virtually any organic solvent and mobile phase additives can be employed to optimize analyte separation.

Extended Column Life

Because there is no bonded phase in polymer materials as is the case with silica columns, even harsh solvents such as 1 molar sodium hydroxide can be used to wash contaminants from the column, thus increasing column lifetime.

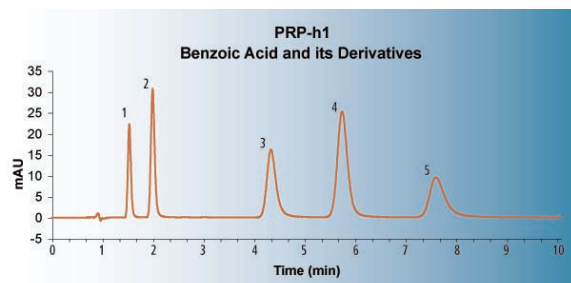
Mobile phases with pH ranging from 1 to 13 can be used without damaging or degrading the stationary phase. This wide pH range opens up more possibilities of solvents and buffers that can be used to elucidate a great separation.

Wide Temperature Range

Common HPLC separation temperatures range between 20 and 85 °C and in some cases may go above 100 °C.

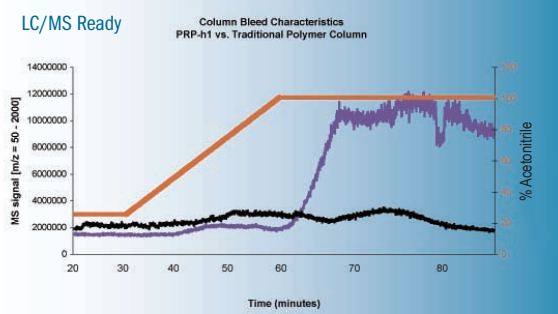
Technical Data

Material:	Cross-linked poly(styrene-co-divinylbenzene) polymer
Particle size:	5 µ
Pore size:	100 Å



Column:	PRP-h1, 5µ, 100Å
Dimensions:	4.1 x 150 mm
Mobile Phase:	A: 10 mmol/L sodiumdihydrogenphosphate, pH = 2.2 B: Acetonitrile
Gradient:	18% B (Isocratic)
Flow Rate:	0.60 mL/min
Temperature:	50 °C
Detection:	UV @ 230 nm
Injection Volume:	5 µL
Sample:	1. 2,4-Dihydroxybenzoic Acid 2. 4-Hydroxybenzoic Acid 3. 2-Acetoxybenzoic Acid (Aspirin) 4. Benzoic Acid 5. 2-Hydroxybenzoic Acid (Salicylic Acid)

LC/MS Ready



Ordering Information

HPLC Columns	PRP-h1 (100Å)			
	50 mm	100 mm	150 mm	250 mm
2.1 mm ID		HA-79250	HA-79249	
4.6 mm ID	HA-79251	HA-79252	HA-79253	HA-79256
10 mm ID		HA-79255	HA-79266	
100 mm ID				HA-79523

Guard Columns

Reference	Description
HA- 79257	Analytical Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79258	Analytical Replacement Cartridges (5/pk)
HA-79275	Semiprep/Prep Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79276	Semiprep/Prep Replacement Cartridges (2/pk)

Bulk Resin

Reference	Description
HA- 79279	12-20 µm Bulk Resin (1 Gram)



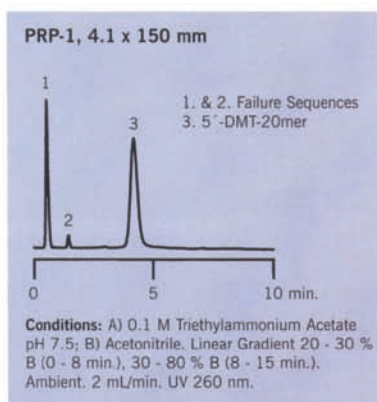
Hamilton Company is the pioneer company in the development and manufacture of polymers for HPLC separations. These polymeric supports combine the inertia, resistance and pH stability of the polymeric resins with the stability under pressure of the silica based packings. Hamilton has developed a full range of resins for the most diverse applications.

The column, Hamilton PRP-1, is a specially designed column for reverse phase separations and exactly fulfills the USP-NF L21 specifications.

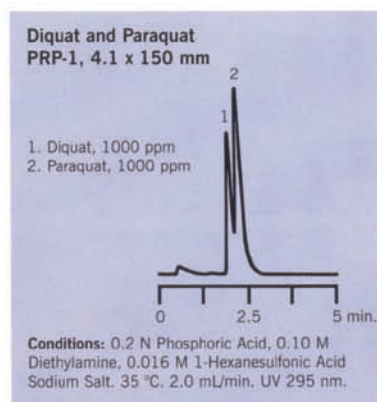
- Columns of 100 Å pore size suitable for general reverse phase applications.
- Stable at pHs of 0 to 14
- Better sample recovery than a silica-base column (thanks to the total absence of silanols).
- Extraordinary lifetime (compatible with whatever concentration of water or organic solvent).
- Various particle sizes.
- Eleven internal diameters of columns.
- Stainless steel or PEEK columns.
- Precolumns

Reversed Phase HPLC Columns

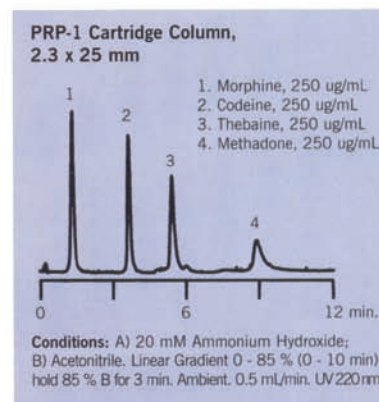
DNA



Herbicides



Pharmaceuticals



Ordering Information

PRP-1 100Å	Reversed Phase		Particle Size		
I.D. X Length	3 (µm)	5 (µm)	7 (µm)	10 (µm)	
1.0 x 50 mm		HA-79751	HA-79755	HA-79759	
1.0 x 100 mm		HA-79752	HA-79756	HA-79760	
1.0 x 150 mm	HA-79847	HA-79753	HA-79757	HA-79761	
1.0 x 250 mm		HA-79754	HA-79758	HA-79762	
2.1 x 50 mm	HA-79854		HA-79554		
2.1 x 100 mm	HA-79844	HA-79790			
2.1 x 150 mm	HA-79845	HA-79366		HA-79480	
2.1 x 150 mm*		HA-79796			
2.1 x 250 mm			HA-79390	HA-79391	
2.3 x 25 mm		HA-79789**			
4.1 x 50 mm	HA-79804	HA-79443			
4.1 x 100 mm	HA-79805	HA-79479		HA-79565	
4.1 x 150 mm	HA-79806	HA-79444	HA-79529	HA-79425	
4.1 x 250 mm		HA-79820	HA-79422	HA-79427	
4.6 x 100 mm*		HA-79558			
4.6 x 150 mm*		HA-79423		HA-79351	
4.6 x 250 mm*		HA-79571	HA-79380	HA-79381	

PRP-1 100Å	Reversed Phase		Particle Size		
I.D. X Length	5 (µm)	7 (µm)	10 (µm)	12-20 (µm)	
7.0 x 100 mm			HA-79495	HA-79713	
7.0 x 300 mm			HA-79719		
7.0 x 305 mm	HA-79795	HA-79545	HA-79426		
10.0 x 100 mm	HA-79355		HA-79499		
10.0 x 150 mm			HA-79349		
10.0 x 250 mm		HA-79531	HA-79496		
21.5 x 150 mm			HA-79532	HA-79497	
21.5 x 250 mm		HA-79352	HA-79478	HA-79428	
30.0 x 300 mm				HA-79718	
50.8 x 100 mm				HA-79498	
50.8 x 150 mm				HA-79716	
50.8 x 250 mm			HA-79567	HA-79493	
101.6 x 250 mm				HA-79525	

* PEEK Hardware.

** Cartridge Column. Cartridge Holder P/N HA-32908 must be purchased separately.

Guard Columns

PRP Guard Columns for:	Steel columns	PEEK columns
Starter Kits (1 holder, 2 cartridges)	HA-79447	HA-79317
Replacement Cartridges (5/pk)	HA-79445	HA-79318

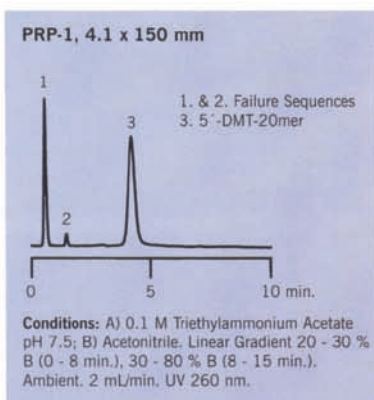
Tk Hamilton PRP-3 HPLC Columns

Polymeric packing of 300 Å pore size, specially for the separation of proteins by reversed phase.

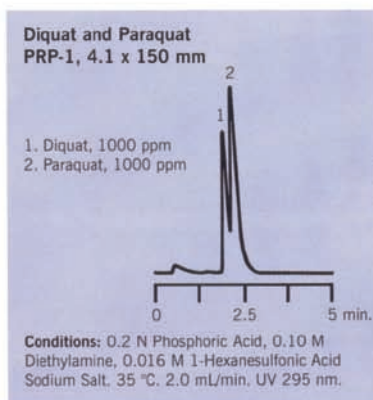
- Stable at pHs between 0 and 14.
- Total absence of silanols.
- Excellent column lifetime (the support can be cleaned with strong acids or bases to eliminate sample residues).
- 100% compatible with whatever organic solvent.
- Particle sizes from 3 µm for highly efficient separations

What Types of Samples can PRP-3 Columns separate?

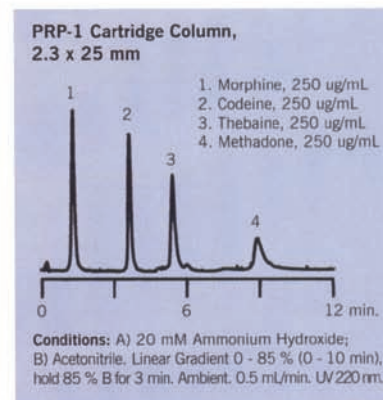
Peptides



Proteins



Proteins



PRP-3 Reversed Phase

PRP-3	Reversed Phase	Particle Size	
I.D. X Length		3 (µm)	10 (µm)
1.0 x 50 mm			HA-79763
1.0 x 100 mm			HA-79764
1.0 x 150 mm			HA-79765
1.0 x 250 mm			HA-79766
2.1 x 150 mm		HA-79846	HA-79392
4.1 x 50 mm		HA-79807	HA-79467
4.1 x 100 mm		HA-79808	
4.1 x 150 mm		HA-79809	HA-79466

PRP-3 Reversed Phase

PRP-3	Reversed Phase	Particle Size	
I.D. X Length		10 (µm)	12 (µm)
4.1 x 250 mm		HA-79794	
4.6 x 150 mm*		HA-79382	
4.6 x 250 mm*		HA-79574	
7.0 x 305 mm		HA-79468	
10.0 x 250 mm		HA-79526	
21.5 x 250 mm			HA-79469

* PEEK Hardware

PRP-3 Guard Columns

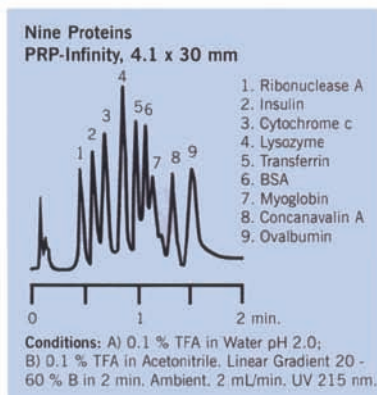
PRP-3	Reversed Phase	Particle Size	
I.D. X Length		3 (µm)	10 (µm)
Starter Kits (1 holder, 2 cartridges)		HA-79461	HA-79393
Replacement cartridges (5/pk)		HA-79454	HA-79395

Non-porous polymeric packing, specially useful for the reverse phase separation of proteins by means of the use of fast gradients.

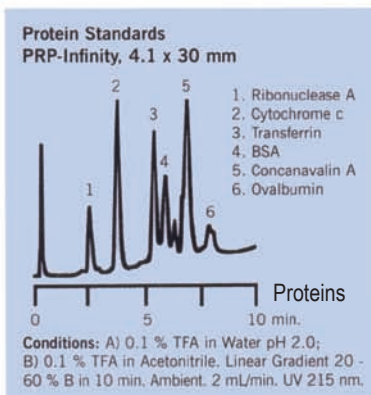
- High efficiency due to its particle size of 4µm.
- Stable at pHs between 0 and 14.
- Total absence of silanols.
- Excellent column lifetime. (the support can be cleaned with strong acids or bases to remove sample residues).
- 100% compatible with all organic solvents.

What Types of Samples can PRP-Infinity Columns separate?

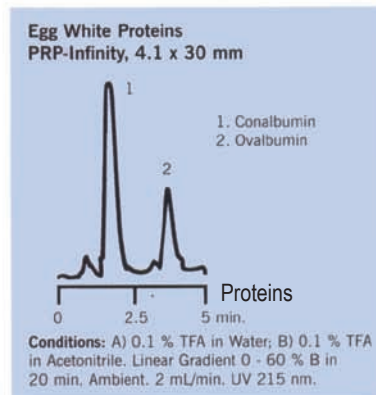
Proteins



Proteins



Proteins



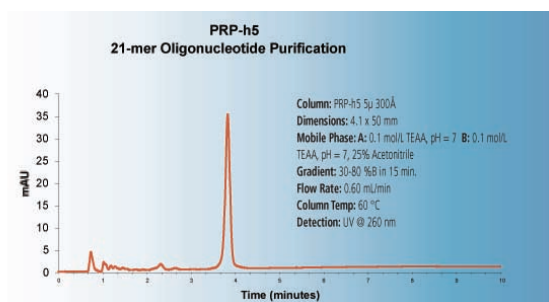
PRP-Infinity. Nonporous Reversed Phase

PRP-3	Reversed Phase	Particle Size
I.D. X Length		4 (µm)
2.1 x 30 mm		HA-79576
2.1 x 100 mm		HA-79748
4.1 x 30 mm		HA-79470
4.1 x 50 mm		HA-79533
10.0 x 60 mm		HA-79527

Tk Hamilton PRP®-h5 Polymer HPLC Columns



- Chemical Stability
- Full Range stability
- Enhanced Sample Recovery



The PRP-h5 HPLC column line from Hamilton offers a robust alternative to silica based and traditional polymer HPLC columns for oligonucleotide and protein separations.

Total Compatibility

The PRP-h5 is a high performance, polymeric, reversed-phase column that delivers separations of a wide variety of analytes under the most extreme analytical conditions. Virtually any organic solvent and mobile phase additives can be employed to optimize analyte separation.

Extended Column Life

Mobile phases with pH ranging from 1 to 13 can be used without damaging or degrading the stationary phase. This wide pH range opens up more possibilities of solvents and buffers that can be used to elucidate a great separation.

Technical Data

Material:	Cross-linked poly(styrene-co-divinylbenzene) polymer
Particle size:	5 µ
Pore size:	300 Å

Ordering Information

Column I.D.	PRP-h5 (300Å)			
	50 (mm)	100 mm	150 mm	250 mm
2.1 mm ID		HA-79270	HA-79271	
4.6 mm ID	HA-79261	HA-79262	HA-79272	HA-79273
10 mm ID		HA-79263	HA-79274	

Guard Columns

Cat.No.	Description
HA-79267	Analytical Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79268	Analytical Replacement Cartridges (5/pk)
HA-79277	Semiprep/Prep Guard Column Starter Kit (1 holder, 2 cartridges)
HA-79278	Semiprep/Prep Replacement Cartridges (2/pk)

Bulk Resin

Cat.No.	Description
HA-79280	12-20 µm Bulk Resin (1 Gram)

HAMILTON PRP-X400 Analysis for Glifosate Tk

Glifosate and of metabolite amniomethylphosphonic acid in drinking waters. (EPA 547).

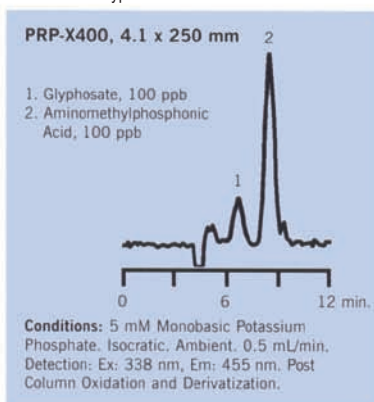
The column PRP-X400, a packing of polystyrene-divinyl-benzo sulphonate with 7µm particle diameter and 2.5 meq./gm, separates both compounds according to their ionic charges in less than 10 minutes. The detection requires a post-column oxidation and derivization.

This column improves on the recommendation of the EPA547 given that it does not require thermostating at 65°C, eliminates the use of methanol, and also demonstrates a significantly shorter analysis time.

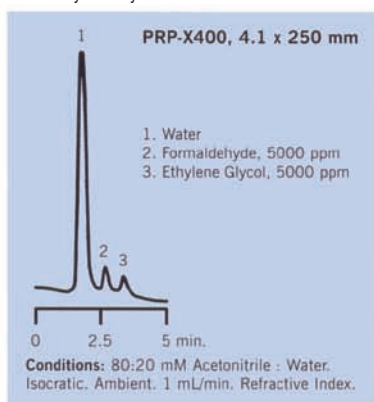
- Analysis times eight minutes less in comparison with other columns.
- Detection of levels of 10ppb with the technique of post-column derivization with OPA.
- Applicable to other separations like ethylene glycol.
- Hamilton recommend the column PRP-X400 for the analysis of the herbicides.

What Types of Samples can PRP-Infinity Columns separate?

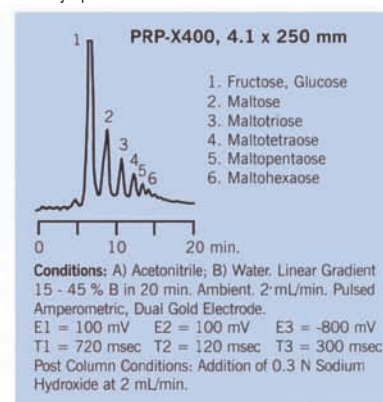
Glifosate



Ethylene Glycol



Corn Syrup



Ordering Information

PRP-X400

Cat.No.	Description
HA-79398	PRP-X400 7 µm 150 x 2.1 mm
HA-79717	PRP-X400 7 µm 150 x 4.1 mm
HA-79473	PRP-X400 7 µm 250 x 4.1 mm
HA-79387	PRP-X400 7 µm 250 x 4.6 mm (PEEK)
HA-79376	Guard Columns Starter Kit (Holder + 2 Cartridges) (PEEK)
HA-79377	Replacement cartridges (5/pk) (PEEK)
HA-79459	Guard Columns Starter Kit for analysis of Glifosate
HA-79452	Replacement cartridges (5/pk) for analysis of Glifosate

Tk Hamilton Columns for the Analysis of Anions

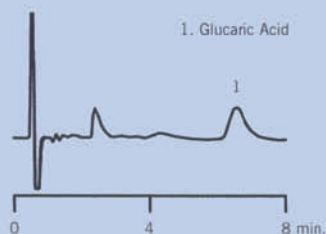
Hamilton columns are an excellent choice for the technique of ionic chromatography due to their high efficiency, strength and economy.

- Easily separate all the anions specified in the EPA300 .0 Part A.
- Perfect separation of the fluoride anion
- Permits the use of organic eluants, facilitating column cleaning.
- Stable at pHs between 0 and 14.
- The PRP-X110 column is recommended for ionic chromatography with direct conductivity or UV detection.
- The PRP-X 110S column is recommended for ion suppression analysis.
- Available in a wide range of column dimensions and particle sizes.

What Types of Samples can PRP-X100 Columns separate?

Anticancer Agents

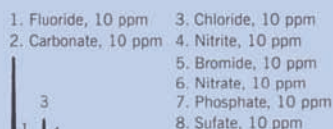
Glucaric Acid PRP-X100, 4.1 x 150 mm



Conditions: 1:1 Acetonitrile : 40 mM Potassium Phosphate pH 6.2. Isocratic. Ambient. 2 mL/min. UV 210 nm.

Common Anions

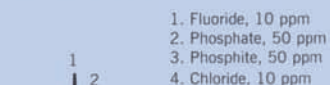
Eight Anions by Conductivity PRP-X100, 4.1 x 150 mm



Conditions: 4 mM p-Hydroxybenzoic Acid pH 8.9 with 2.5 % Methanol. Isocratic. Ambient. 2 mL/min. Conductivity.

Common Anions

Phosphate, Phosphite and Other Anions PRP-X100, 4.1 x 150 mm



Conditions: 20 mM Succinic Acid, pH 2.9. Isocratic. Ambient. 2 mL/min. Conductivity.

Ordering Information

PRP-X100 Anion Exchange

I.D. X Length	3 (µm)	7 (µm)
1.0 x 50 mm		HA-79775
1.0 x 100 mm		HA-79776
1.0 x 150 mm		HA-79777
1.0 x 250 mm		HA-79778
2.1 x 100 mm		HA-79742
2.1 x 150 mm		HA-79744
2.1 x 250 mm		HA-79746
4.1 x 100 mm	HA-79814	HA-79730
4.1 x 150 mm	HA-79815	HA-79732
4.1 x 250 mm		HA-79734
4.6 x 100 mm*		HA-79736
4.6 x 150 mm*		HA-79738
4.6 x 250 mm*		HA-79740

PRP-X100 Anion Exchange

I.D. X Length	I.D. X 7 (µm)
2.1 x 100 mm	HA-79743
2.1 x 150 mm	HA-79745
2.1 x 250 mm	HA-79747
4.1 x 100 mm	HA-79731
4.1 x 150 mm	HA-79733
4.1 x 250 mm	HA-79735
4.6 x 100 mm*	HA-79737
4.6 x 150 mm*	HA-79739
4.6 x 250 mm*	HA-79741

* PEEK Hardware

Guard Columns

PRP Guard Columns for:	Steel columns	PEEKcolumns
Starter Kits (1 holder, 2 cartridges)	HA-79726	HA-79727
Replacement Cartridges (5/pk)	HA-79728	HA-79729

A list of compounds (and their chromatograms) that have been separated using PRP-X110 and PRP-X110S columns can be found on the Hamilton Company web site at <http://www.hamiltoncompany.com>.

ICsep Columns for Organic Acid Analysis

The technique of ion exclusion is preferred for the separation of weakly ionizable types such as the organic acids and the alcohols. Transgenomic has developed a full range of columns that for efficiency and specificity are unique when dealing with this class of separations.

- Polymeric substrate.
- High Efficiency.
- High resolution.
- Separate organic acids, carbohydrates and alcohols on a single column.
- Extremely resistant and with a long useful lifetime.

Column	Dimensions	Cat.No.
COREGEL 87H1	7,8 X 100 mm	TG-ICE-99-5861
COREGEL 87H3	7,8 X 300 mm	TG-ICE-99-9861
COREGEL 107H	7,8 X 300 mm	TG-ICE-99-9866
COREGEL 64H	7,8 X 300 mm	TG-ICE-99-9860
ION-310	6,5 X 150 mm	TG-ICE-99-7752
ION-300	7,8 X 300 mm	TG-ICE-99-9850
ORH 801	6,5 X 300 mm	TG-ICE-99-9754
WINE ANALYSIS WA-1	7,8 X 300 mm	TG-ICE-99-9810
ARH 601	6,5 X 100 mm	TG-ICE-99-5753

Precolumns for every type of column available on application.

Compound	Coregel 87 H @ 85 °C (units in minutes)	Coregel 64 H @ 65 °C (units in minutes)	ION-300 @ 65 °C (units in minutes)	ORH-801 @ 45 °C (units in minutes)
Acetic acid	13.8	15.0	14.9	10.4
Acetoacetic acid	n/d	n/d	n/d	10.2
Aconitic acid	8.6	9.8	10.7	7.2
Acrylic acid	15.9	17.7	17.9	13.1
Adiptic acid	12.5	15.1	15.8	11.6
Butanol	32.9	35.1	25.2	18.4
Butyric acid	18.4	21.0	20.8	15.2
Citraconic acid	10.1	11.0	11.5	n/d
Citric acid	7.5	8.0	8.6	5.5
Ethanol	21.4	21.7	20.6	14.6
Formic acid	12.9	13.8	13.9	9.6
Fumaric acid	11.5	13.4	14.7	10.0
2-Furoic acid	22.1	26.9	29.0	22.0
Glucuronic acid	n/d	n/d	n/d	5.3
Glycolic acid	11.4	13.0	12.9	8.5
Glucoxylic acid	9.2	9.7	10.3	6.5
Hydroxybutyric acid	12.8	14.0	14.1	9.5
Iso-butyric acid	17.3	19.6	19.5	14.0
Itaconic acid	11.1	12.8	13.4	9.1
Keto-butyric acid	n/d	n/d	11.4	7.4
Keto-gutaric acid	7.8	8.2	n/d	5.6
Keto-valeric acid	11.7	12.6	13.1	8.6
Lactic acid	11.9	12.9	11.6	8.7
Maleic acid	8.2	8.6	9.0	5.9
Malic acid	8.8	9.6	10.3	6.6
Malonic acid	9.3	10.0	10.7	6.9
Methanol	18.7	19.0	18.7	12.9
Methylglutaic acid	11.8	13.9	14.5	10.0
Methylsuccinic acid	10.9	12.5	13.0	8.8
Oxalic acid	6.7	6.6	n/d	4.5
Propanol	25.9	26.7	22.2	16.1
Propionic acid	15.8	17.4	17.4	12.3
Pyruvic acid	9.2	9.5	9.9	6.3
Quinic acid	9.4	10.3	11.4	6.9
Shikimic acid	10.5	11.8	12.9	8.2
Succinic acid	10.4	11.7	12.2	8.2
Tartaric acid	8.0	8.6	9.5	5.9

Flow rate: 0.6 mL/minute. n/d = not determined

Tk Transgenomic™ CARBOSep Columns

CARBOSep Columns for Carbohydrates Analysis

CARBOSep is the name of the complete range of columns that Transgenomic has developed for the analysis of carbohydrates. These columns employ the technique called ligand-exchange for the separation of mono-, di-, and oligosaccharides of upto 15 glucose units.

In this technique it is the different metals bonded to the polymeric matrix of the packing which react selectively with the weakly negatively charged hydroxyls of the sugar molecules. The selectivity is controlled by means of the appropriate choice of resin type and of the metallic species bonded to it, as well as other factors, such as the temperature of the column.

CARBOSep is the most complete range, and with the best efficiency of all those on the market.

Column	Dimensions	Cat.No.
CARBOSep CHO-620	6,5 X 300 mm	TG-CHO-99-9753
CARBOSep CHO-611 OH	6,5 X 150 mm	TG-CHO-99-7752
CARBOSep CHO-411	7,8 X 300 mm	TG-CHO-99-9850
CARBOSep CHO-611	6,5 X 300 mm	TG-CHO-99-9751
CARBOSep USP-19 CA-FORM	4,0 X 250 mm	TG-CHO-99-8453
CARBOSep CHO-682	7,8 X 200 mm	TG-CHO-99-9854
CARBOSep CHO-682	7,8 X 300 mm	TG-CHO-99-9854
CARBOSep CHO-820	7,8 X 200 mm	TG-CHO-99-9855
CARBOSep CHO-820	7,8 X 300 mm	TG-CHO-99-9855
COREGEL 87P	7,8 X 300 mm	TG-CHO-99-9864
COREGEL 87N	7,8 X 300 mm	TG-CHO-99-9863
COREGEL 87K	7,8 X 300 mm	TG-CHO-99-9862
COREGEL 87C	7,8 X 300 mm	TG-CHO-99-9860
COREGEL 87MM	7,8 X 300 mm	TG-CHO-99-9865
COREGEL 42Ag	7,8 X 300 mm	TG-CHO-99-9851

Precolumns for every type of column available on application.

Carbohydrate Columns Specifications Chart

Column	Application	Form	Particle size (µm)	Typical Mobile Phase	Recom'd Rate Flow (mL/min)	Recom'd Temp (°C)
CARBOSepCHO-411	oligosaccharides up to DP10, corn syrup, molasses	sodium	20	water	0.4	75
CARBOSepCHO-611	oligosaccharides up to DP5	sodium	10	water	.05	90
CARBOSepCHO-611 OH	mono and oligosaccharides w/PAD detection	sodium	10	sodium hydroxide	0.5	90
CARBOSepCHO-620	high fructose corn syrup, mono-, di-, trisaccharides and sugar alcohols	calcium	10	water	0.5	90
CARBOSepCHO-682	mono and disaccharides, sucrose, maltose lactose	lead	7	water	0.4	80
CARBOSepCHO-820	mono and disaccharides, sucrose, maltose lactose	calcium	8	water	0.5	90
CARBOSepCORGEL- 87C	simple sugars, sugar alcohols	calcium	9	water	0.6	85
ICSepCORGEL 87H1	fast analysis of organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
ICSepCORGEL 87H3	organic acids, alcohols, sugar mixtures	hydrogen	9	sulfuric acid	0.6	85
CARBOSepCORGEL- 42Ag	oligosaccharides up to DP11	silver	20	water	0.4	75
CARBOSepCORGEL- 47K	beet sugar, cane sugar, corn syrup, molasses	potassium	8	water	0.6	85
CARBOSepCORGEL- 87N	beet sugars, mono and oligosaccharides	sodium	8	water	0.6	85
CARBOSepCORGEL- 87P	pentose, hexose, monosaccharides, alcohols	lead	8	water	0.8	85
CARBOSep USPL19	USP L-19 specifications for separation of sorbitol and mannitol	calcium	9	water	0.2	30
CARBOSepCORGEL- 87MM	mono, di, and trisaccharides, and sugar alcohols	calcium/sodium	8	water	0.5	85
ICSep ION300	glucose and fructose in organic acid mixtures	hydrogen	8	sulfuric acid	0.4	70
ICSep ION310	grape must analysis	hydrogen	8	sulfuric acid	0.8	50

Mobile Phase: 100% water. Flow Rate: 0.5 mL/minute. Temperature 90°C

Transgenomic™ CARBOSep Columns **Tk**

Compound	CHO-620 (units in minutes)	CHO-611 (units in minutes)	CHO-682 (units in minutes)	COREGEL 87H (units in minutes)	COREGEL 87P (units in minutes)	COREGEL 87N (units in minutes)	COREGEL 87K (units in minutes)	COREGEL 87C (units in minutes)
Arabinose	10.64	11.08	23.95	12.08	16.32	12.64	14.72	13.92
Digitoxose	10.26	10.18	21.95	--	15.48	11.40	12.32	14.19
Fructose	10.07	10.33	25.84	11.25	16.96	11.61	13.31	13.63
Fucose	10.57	10.96	24.16	12.80	16.44	12.34	14.39	13.82
Galactose	9.58	10.22	22.32	11.12	15.16	11.44	13.36	13.82
Glucose	8.72	9.53	19.14	10.57	13.38	10.72	12.55	11.17
Mannose	9.79	10.27	25.50	11.13	16.76	11.57	13.74	12.76
Rhamnose	9.64	9.88	22.56	11.94	15.26	11.08	12.83	12.86
Sorbose	9.50	9.93	22.38	10.08	15.24	11.08	12.66	12.86
Tagatose	11.53	10.29	--	11.15	20.80	11.36	12.82	16.46
Xylose	9.56	10.34	20.64	11.32	14.42	11.77	13.69	12.32
Cellobiose	6.65	7.17	15.58	8.43	10.98	7.90	9.26	8.94
Lactose	7.01	7.51	17.37	8.77	11.84	8.18	9.63	9.44
Lactulose	7.57	7.85	20.70	9.00	13.24	8.48	10.08	10.17
Melibiose	6.99	7.46	17.63	8.56	12.02	8.19	9.72	9.36
Trehalose	6.70	7.14	15.98	8.64	11.20	7.85	9.02	9.07
Sucrose	6.76	7.27	15.70	--	11.10	7.99	9.11	9.09
Maltose	6.89	7.37	16.61	8.57	11.54	8.08	9.48	9.17
Ribitol	10.94	10.13	30.72	12.44	20.44	11.26	11.84	15.55
Arabitol	12.32	10.52	39.82	12.65	25.24	11.64	12.10	18.36
Galactitol	13.05	10.23	52.43	11.80	31.60	11.15	11.61	20.46
Myo-inositol	10.82	11.01	35.58	11.02	20.06	12.48	14.08	14.27
Lactitol	8.55	7.87	33.23	9.26	19.50	8.45	9.34	12.17
Maltitol	8.54	7.68	30.38	9.00	17.76	8.28	9.06	12.22
Mannitol	11.84	9.90	40.03	11.66	24.98	10.81	11.42	17.81
Sorbitol	13.64	10.38	56.56	11.77	33.40	11.32	11.86	21.34
Xylitol	13.93	11.01	51.15	12.82	31.10	12.16	12.64	21.30
Amiprylose	4.50	4.20	--	6.86	9.46	5.74	6.42	7.68
Melezitose	5.78	6.01	13.85	--	13.08	6.81	7.82	8.20
Maltotriose	5.91	6.22	15.17	7.72	10.54	6.98	8.16	8.28
Raffinose	5.86	6.10	14.40	--	10.22	6.88	7.92	8.24
Stachyose	5.28	5.39	13.41	--	9.58	6.33	7.28	7.77
Maltotetrose	5.37	5.54	14.07	7.30	9.84	6.42	7.46	7.80
Maltopentose	5.00	5.08	13.08	7.10	9.34	6.11	7.02	7.53
Maltohexose	4.78	4.87	12.24	7.00	8.80	5.94	6.74	7.38
Maltoheptose	4.66	4.60	11.74	6.96	8.52	5.84	6.61	7.28
Nitrate	4.55	4.20	10.30	6.85	8.40	5.70	6.40	7.30

Mobile Phase: 100% water. Flow Rate: 0.5 mL/minute. Temperature 90°C

Tk Transgenomic™ Ion Chromatography

The resins used by TRANSGENOMIC for the chromatography of inorganic ionic species (cations and anions) are composed of a macroporous co-polymer of polystyrene-divinylbenzene.

Those substituted with alkyl or alkyl quaternary ammonia are used for the separation of anions using carbonate type eluents. The resins substituted with sulphonic or carboxylic acids are used in the separation of cations employing acidic eluents.

- Polymeric substrate.
- Compatibility with organic solvents.
- High efficiency.
- Reproducibility.
- pH stability from 0 to 14.

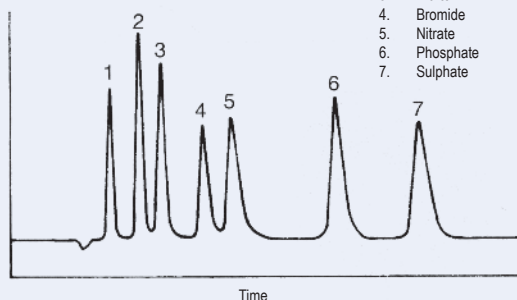
Anions by E.P.A. Method 300.0(a)

Conditions:

Column: ICsep AN300
Eluent: 1.7mM Sodium Carbonate, 1.8mM Sodium Bicarbonate
Flow rate: 2.0 mL/min
Detection: suppressed conductivity

Sample:

1. Fluoride
2. Chloride
3. Nitrite
4. Bromide
5. Nitrate
6. Phosphate
7. Sulphate



TKL 1021

Transgenomic Column	Competitive Columns	Application
ICSepAN300	Dionex AS4A	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , By E.P.A. Method 300.0(a)
ICSepANI	Dionex AS9-HC	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices Cr(III), Cr(VI) as CrO ₃ , CrO ₄ ²⁻
ICSepANSC	Dionex AS4A-SC	Polyvalent Phosphates, Arsenate, Sulfite Selenate, Arsenite, Selenite, F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids
ICSepANISC	Dionex AS9-HC	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight, Organic acids in medium to high ionic strength matrices
ICSepAN2	Dionex AS14	Arsenate, Sulfite, Selenate, Arsenite, Selenite F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , Low molecular weight Organic acids
ICSepAN300B	Dionex AS9	F ⁻ , Cl ⁻ , NO ₂ ⁻ , Br ⁻ , NO ₃ ⁻ , HPO ₄ ²⁻ , SO ₄ ²⁻ , ClO ₂ ⁻ , ClO ₃ ⁻ , BrO ₃ ⁻
ICSepCN2	Dionex CS15	Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺ , Mg ²⁺ , Ca ²⁺ , NH ₄ ⁺ , Cu ²⁺ , Ni ²⁺ , Zn ²⁺ , Co ²⁺ , Cd ²⁺ , Pb ²⁺ , Mn ²⁺ , Fe ²⁺ , Fe ³⁺

ICSep Ordering Information

Description	Cat.No.	Description	Cat.No.
ICSep AN2, 4.6mm x 250mm	TG-ANX-99-8515	ICSep AN2, 4.6mm x 250mm	TG-ANX-99-8515
ICSep AN2 Guard Column, 4.6mm x 50mm	TG-ANX-99-3515	ICSep AN300B, 4.6mm x 250mm	TG-ANX-99-8516
ICSep AN2 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0015	ICSep AN300B Guard Column, 4.6mm x 50mm	TG-ANX-99-3516
ICSep AN1, 4.6mm x 250mm	TG-ANX-99-8511	ICSep AN300B Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0016
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510	ICSep ANSC, 4.6mm x 250mm	TG-ANX-99-8512
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010	ICSep ANSC Guard Column, 4.6mm x 50mm	TG-ANX-99-3512
ICSep AN1-SC, 4.6mm x 250mm	TG-ANX-99-8514	ICSep ANSC Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0012
ICSep AN1-SC Guard Column, 4.6mm x 50mm	TG-ANX-99-3514	ICSep ION-120, 4.6mm x 120mm	TG-ANX-99-6550
ICSep AN1-SC Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0014	ICSep ION-120 Guard Kit, 4.0mm x 24mm	TG-ANX-99-2350
ICSep AN300, 5.5mm x 150mm	TG-ANX-99-7613	ICSep ION-120 Guard Cartridges, 3/pk, 4.0mm x 24mm	TG-ANX-99-0090
ICSep AN1 Guard Column, 4.6mm x 50mm	TG-ANX-99-3510	ICSep CN2, 3.2mm x 100mm	TG-CTX-99-5250
ICSep AN1 Guard Cartridges, 3/pk, 3.0mm x 10mm	TG-ANX-99-0010	ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350
		ICSep CN2 FA, 4.6mm x 50mm	TG-CTX-99-3550
		ICSep CN2 Guard Cartridges, 2/pk, 3.0mm x 10mm	TG-CTX-99-1350

The TSK-GEL (SEC) columns include both types of molecular exclusion chromatography: GFC or Gel Filtration Chromatography for the separation of water soluble polymers, and GPC (Gel Permeation Chromatography) for polymeric compounds soluble in organic solvents.

TSK-GEL SW; TSK-GEL SWXL and TSK-GEL Super SW for the analysis of peptides and proteins by Gel Filtration Chromatography.

The silica based TSK columns are the best choice for the separation by molecular size of peptides and proteins thanks to their high efficiency, low adsorption, and their well defined and controlled distribution of pore size.

The SW columns, of 10µm particle size, have been the most popular since their introduction in the year 1978, and now constitute a market standard. The SWXL are improved on the earlier ones, due to their particle size of 5 microns, which, while maintaining efficiency, cuts analysis time by half. Finally, the columns SuperSW, with 4 micron particles of high efficiency, allows operation with columns of 4.6 mm I.D., achieving a spectacular increase of efficiency and detection sensitivity.

Analytical and preparative TSK-Gel Size Exclusion Silica based products

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Void Columns for each column size				
<i>Guard columns</i>				
TH-08805	SW Guard column, Glass	8.0	4.0	10
TH-14465	SW Guard column, Glass	20.0	4.0	20
TH-18762	Super, SW Guard column	4.6	3.5	4
TH-08543	SW _{XL} Guard column	6.0	4.0	7
TH-05371	SW Guard column	7.5	7.5	10
<i>Bulk packing</i>				
TH-08544	SW _{XL} Top-Off, 1g wet gel			5
TH-06819	SW Top-Off, 1g wet gel			10

Analytical and preparative TSK-Gel Size Exclusion Silica based products

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(µm)
Void Columns for each column size				
<i>Glass columns</i>				
TH-16214	CQ-PAK TSK 200GL	8.0	15	5
TH-16216	CQ-PAK TSK 300GL	8.0	15	5
TH-08799	G2000SW, Glass	8.0	30	10
TH-08800	G3000SW, Glass	8.0	30	10
TH-08801	G4000SW, Glass	8.0	30	13
<i>Stainless steel columns</i>				
TH-18674	Super SW2000	4.6	30	4
TH-18675	Super SW3000	4.6	30	4
TH-08540	G2000SW _{XL}	7.8	30	5
TH-08541	G3000SW _{XL}	7.8	30	5
TH-08542	G4000SW _{XL}	7.8	30	8
TH-16215	QC-PAK TSK 200	7.8	15	5
TH-16049	QC-PAK TSK 300	7.8	15	5
TH-05788	G2000SW	7.5	30	10
TH-05789	G3000SW	7.5	30	10
TH-05790	G4000SW	7.5	30	13
TH-05102	G2000SW	7.5	60	10
TH-05103	G3000SW	7.5	60	10
TH-05104	G4000SW	7.5	60	13

Pore sizes: Super SW2000, CQ-PAK TSK 200, G2000SW and G2000SW_{XL} = 125A, Super SW3000, CQ PAK TSK 300, G3000SW, and G3000SW_{XL} = 250A, G4000SW and G4000SW_{XL} = 450A.

Properties and separation rates for TSK-GEL SW-type packings

TSKgel packing	Particle size (µm)	Pore size (a)	Molecular weight of sample (DA)		
			Globular proteins	Dextrans	Polyethylene glycols and oxides
Super SW2000	4	125	5,000 - 1.5 X 10 ⁵	1,000 - 3 X 10 ⁴	500 - 15,000
G2000SW _{XL}	5	125	5,000 - 1.5 X 10 ⁵	1,000 - 3 X 10 ⁴	500 - 15,000
QC-PAK TSK 200	5	125	5,000 - 1.5 X 10 ⁵	1,000 - 3 X 10 ⁴	500 - 15,000
G2000SW	10, 13	125	5,000 - 1.5 X 10 ⁵	1,000 - 3 X 10 ⁴	500 - 15,000
Super SW3000	4	250	1 X 10 ⁴ - 5 X 10 ⁵	2,000 - 7 X 10 ⁴	1,000 - 3.5 X 10 ⁴
G 3000 SW _{XL}	5	250	1 X 10 ⁴ - 5 X 10 ⁵	2,000 - 7 X 10 ⁴	1,000 - 3.5 X 10 ⁴
QC-PAK TSK 300	5	250	1 X 10 ⁴ - 5 X 10 ⁵	1,000 - 3 X 10 ⁴	1,000 - 3.5 X 10 ⁴
G 3000 SW	10	250	1 X 10 ⁴ - 5 X 10 ⁵	2,000 - 7 X 10 ⁴	1,000 - 3.5 X 10 ⁴
G4000SW _{XL}	8	450	2 X 10 ⁴ - 7 X 10 ⁶	4,000 - 5 X 10 ⁵	2,000 - 2.5 X 10 ⁵
G4000SW	13, 17	450	2 X 10 ⁴ - 7 X 10 ⁶	4,000 - 5 X 10 ⁵	2,000 - 2.5 X 10 ⁵

Data generated using the following conditions:

Columns: Two 4 µm, 4.6mm x 30cm TSK-GEL Super SW columns in series, two 5 µm, 7.8mm x 30cm TSK-FEL SW_{XL} columns in series;

two 10 µm, 7.5mm x 60cm TSK-GEL SW columns in series.

Elution: Globular proteins: 0.3M NaCl in 0.1M (0.05M for SW_{XL} columns) phosphate buffer, pH 7

Dextrans and polyethylene glycols and oxides (PEOs): distilled water

TK TSK-GEL PW and TSK-GEL PW_{XL} Columns

for Molecular Exclusion (GFC) of water soluble polymers.

The PW columns, with a spherical packing of porous hydrophilic methacrylate, are the most suitable for molecular exclusion of water soluble synthetic polymers, as they have a more linear calibration curve, a wider range of application and a lower absorption than the SW type columns.

They also demonstrate an excellent mechanical and chemical stability, enabling operation within a pH range of 2 to 12, and can be used with up to 50% of organic solvent as eluant.

Analytical and preparative TSK-Gel Size Exclusion polymer based column

Cat.No.	Description	ID (mm)	Length (cm)	Particle size (μm)
Molecular weight of sample				
Guard columns				
TH-08034	Oligo Guard Column	6.0	4.0	12.0
TH-08033	PW _{XL} Guard Column	6.0	4.0	12.0
TH-06763	PW-L Guard Column	7.5	7.5	12.0
TH-06762	PW-L Guard Column	7.5	7.5	12.0

Bulk packing

TH-08035	PWXL Top-Off, 1g wet resin		10.0	
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Analytical and preparative TSK-Gel Size Exclusion polymer based column

Cat.No.	Description	ID (mm)	Length (cm)	Particle size (μm)
Stainless steel columns				
TH-08031	G-Oligo-PW	7.8	30	6
TH-08032	G-DNA-PW	7.8	30	10
TH-08020	G2500PW _{XL}	7.8	30	6
TH-08021	G3000PW _{XL}	7.8	30	6
TH-08022	G4000PW _{XL}	7.8	30	10
TH-08023	G5000PW _{XL}	7.8	30	10
TH-08024	G6000PW _{XL}	7.8	30	13
TH-08025	GMPW _{XL}	7.8	30	13
TH-05760	G1000PW	7.5	30	10
TH-05761	G2000PW	7.5	30	10
TH-08028	G2500PW	7.5	30	10
TH-05762	G3000PW	7.5	30	10
TH-05763	G4000PW	7.5	30	17
TH-05764	G5000PW	7.5	30	17
TH-05765	G6000PW	7.5	30	17
TH-08026	GMPW	7.5	30	17
TH-05105	G2000PW	7.5	60	10
TH-08029	G2500PW	7.5	60	10
TH-05106	G3000PW	7.5	60	10
TH-05107	G4000PW	7.5	60	17
TH-05108	G5000PW	7.5	60	17
TH-05109	G6000PW	7.5	60	17
TH-08027	GMPW	7.5	60	17

Properties and separation rates for TSK-GEL PW-type packings

TSKgel packing	Particle size (μm)	Average Pore size (a)	Molecular weight of sample (DA)		
			Polyethylene glycols & oxides	Dextrans**	Globular proteins
G1000PW	10	< 100	up to 1,000	---	<2,000
G2000PW	10, 17, 20	125	up to 2,000	---	<5,000
G2500PW _{XL}	6	< 200	up to 3,000	---	<8,000
G2500PW	10, 17, 20				
G3000PW _{XL}	6	200	up to 5 x 10 ⁴	up to 6 x 10 ⁴	500 - 8 x 10 ⁵
G4000PW _{XL}	10	500	2,000 - 3 x 10 ⁴	1,000 - 7 x 10 ⁵	1 x 10 ⁴ - 1.5 x 10 ⁶
G4000PW	17, 22				
G5000PW _{XL}	10	1000	4,000 - 1 x 10 ⁶	5 x 10 ⁴ - 2.5 x 10 ⁶	< 1 x 10 ⁷
G5000PW	17, 20, 22				
G6000PW _{XL}	13	< 1000	4 x 10 ⁴ - 8 x 10 ⁶	5 x 10 ⁵ - 5 x 10 ⁷	< 2 x 10 ⁸
G6000PW	17, 25				
GMPW _{XL}	13	< 100 - 1,000	500 - 8 x 10 ⁶	< 5 x 10 ⁷	< 2 x 10 ⁸
GMPW	17				
G-Oligo-PW	6	125	up to 3,000	---	< 3,000
G-DNA-PW	10	< 1,000	4 X 10 ⁴ - 8 X 10 ⁶	< 5 X 10 ⁷	< 2 X 10 ⁸

Data generated using the following conditions:

Column: TSK-GEL PW columns, 7.5mm x 60cm; TSKgelPW_{XL}, G-Oligo-PW & G-DNA-PW, 7.8mm x 30cm

Elution: Polyethylene glycols and oxides: distilled water, dextrans and proteins: 0.2M phosphate buffer, pH 6.8.

Flow rate: 1.0mL/min

Note: * Larger particle sizes of each group are for 21.5mm x 60cm semi-preparative and 55mm or 108mm x 60cm preparative columns.

** Maximum separation range determined from estimated exclusion limits.

for Molecular Exclusion of polymers soluble in water and in organic media.

A new hydrophilic polyvinyl resin with extraordinary chemical and physical properties allows operation with aqueous as well as organic eluants without the appearance of any phenomenon of "swelling" common to other polymeric packings.

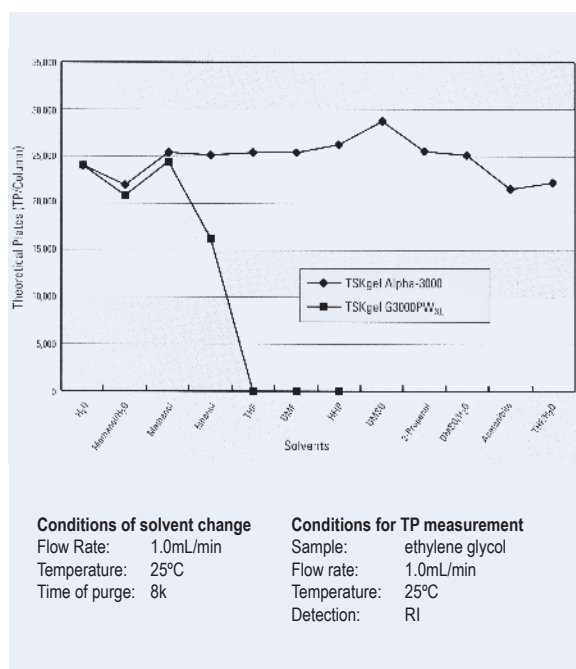
Additionally, absorptions due to hydrophobic inter-actions common to other columns of styrene-divinyl benzene are avoided. This even permits the chromatography of polymers soluble in methanol.

TSK-Gel Alpha Series

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Molecular weight of sample				
Stainless Steel columns				
TH-18339	Alpha-2500	7.8	30	7
TH-18340	Alpha-3000	7.8	30	7
TH-18341	Alpha-4000	7.8	30	10
TH-18342	Alpha-5000	7.8	30	10
TH-18343	Alpha-6000	7.8	30	13
TH-18344	Alpha-M (mixed bed)	7.8	30	13

Guard columns

TH-18345	Alpha Guard column	6	4	13
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Exclusion limits for TSK-GEL Alpha Series columns

Exclusion limit (Da for various standards and eluents)

Column	Particle size (μm)	PEO ^a /H ₂ O	PS ^b /10mM LiBr in DMF	PEG ^c /10mM LiBr in MeOH
Alpha-2500	7	5 x 10 ³	1 x 10 ⁴	1 x 10 ⁴
Alpha-3000	7	9 x 10 ⁴	1 x 10 ⁵	6 x 10 ⁴
Alpha-4000	10	x 10 ⁵	1 x 10 ⁶	3 x 10 ⁶
Alpha-5000	10	1 x 10 ⁶	7 x 10 ⁶	N.D.
Alpha-6000	13	> 1 x 10 ⁷	> 1 x 10 ⁷	N.D.
Alpha-M	13	> 1 x 10 ⁷	> 1 x 10 ⁷	N.D.

N.D. = not determined

a Polyethylene oxide

b Polystyrene Divinyl Benzene

c Polyethylene glycol

TK TSK-GEL H6, TSK-GEL H8 ...

for Molecular Exclusion Chromatography

All the range is made of porous, spherical particles of highly crosslinked polystyrene-divinylbenzene.

H6, H8, and XL designate different sizes of particle and therefore of efficiency. The polymer of the HHR series has special properties of chemical resistance, giving an exceptional resistance to the most diverse organic solvents, so making the column much more versatile than the majority of those on the market.

We also have available Multipore columns, which cover a wide range of molecular weights and give excellent linearity.

Properties of H-type columns

TSKgel column	Average Pore Size (Å)	Exclusion limit*	Temperature (°C)	Application area
G1000H6, H8, H _{XL}	15	1 X 10 ³	60	small molecules, oligomers
G1000H H _{HR}	15	< 1.5 X 10 ³	140	small molecules, oligomers
G2000H6, H8, H _{XL}	20	1 X 10 ⁴	60	oligomers
G2000H H _{HR}	20	< 4 X 10 ³	140	oligomers
G2500H6, H8, H _{XL}	30	2 X 10 ⁴	60	oligomers
G2500H H _{HR}	30	< 1.2 X 10 ⁴	140	oligomers
G3000H6, H8, H _{XL}	75	6 X 10 ⁴	60	oligomers, polymers
G3000H H _{HR}	75	< 3 X 10 ⁴	140	oligomers, polymers
G4000H6, H8, H _{XL}	200	4 X 10 ⁵	80	polymers
G4000H H _{HR}	200	< 1.5 X 10 ⁵	140	polymers
G5000H6, H8, H _{XL}	650	4 X 10 ⁶	80	polymers
G5000H H _{HR}	650	< 1.5 X 10 ⁶	140	polymers
G6000H6, H8, H _{XL}		4 X 10 ⁷	80	polymers
G6000H H _{HR}		< 1 X 10 ⁷	140	polymers
G7000H6, H8, H _{XL}		4 X 10 ⁸ **	80	polymers
G7000H H _{HR}		< 1.5 X 10 ⁷	140	polymers
GMH _{HR} -L (mixed bed)	4 - 500	< 1 X 10 ⁴	140	oligomers with low MW range
GMH _{HR} -N		< 1.5 X 10 ⁵	140	polymers with medium MW range
GMH _{HR} -M		< 1 X 10 ⁶	140	polymers with broad MW range
GMH6, H _{XL}		4 X 10 ⁸ **	80	polymers with BROADMW range
GMH _{XL} -L		4 X 10 ⁸ **	80	high resolution of MW polymers with a total profile of high MW polymers
GMH6, -HT, H _{XL} - HT (Mixed bed/high temperature)		4 X 10 ⁸ **	140	high temperature separations of polymers with broad MW range
MultiporeH _{XL} -m	Wide pore distribution	500 to 2 X 10 ⁶	60	polymers with broad MW range

* polystyrene standards

** estimate

...TSK-GEL HXL, TSK-GEL HHR Columns **Tk**

of polymers soluble in organic media.

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Stainless Steel columns				
TH-17352	G1000H _{HR}	7.8	30	5
TH-17353	G2000H _{HR}	7.8	30	5
TH-17354	G2500H _{HR}	7.8	30	5
TH-17355	G3000H _{HR}	7.8	30	5
TH-17356	G4000H _{HR}	7.8	30	5
TH-17357	G5000H _{HR}	7.8	30	5
TH-17358	G6000H _{HR}	7.8	30	5
TH-17359	G7000H _{HR}	7.8	30	5
TH-17362	GMH _{HR} -L mixed bed	7.8	30	5
TH-18055	GMH _{HR} -N mixed-bed	7.8	30	5
TH-17392	GMH _{HR} -M mixed-bed	7.8	30	5
TH-17360	GMH _{HR} -H mixed-bed	7.8	30	5
TH-18393	GMH _{HR} -H(S) mixed-bed	7.8	30	13

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Stainless Steel columns				
TH-16131	G1000H _{XL}	7.8	30	5
TH-16134	G2000H _{XL}	7.8	30	5
TH-16135	G2500H _{XL}	7.8	30	5
TH-16136	G3000H _{XL}	7.8	30	6
TH-16137	G4000H _{XL}	7.8	30	6
TH-16652	GMH _{XL} -L mixed bed	7.8	30	6
TH-16138	G5000H _{XL}	7.8	30	9
TH-16139	G6000H _{XL}	7.8	30	9
TH-16140	G7000H _{XL}	7.8	30	9
TH-16141	GMH _{XL} - mixed-bed	7.8	30	9
TH-07112	GMH _{XL} - HT	7.8	30	13
TH-18403	Multipore H _{XL} - M	7.8	30	5
TH-05362	G1000H8	7.5	30	10
TH-05363	G2000H8	7.5	30	10
TH-06717	G2500H8	7.5	30	10
TH-05364	G3000H8	7.5	30	10
TH-05365	G4000H8	7.5	30	10

TSK-Gel GCP Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)	Use
Guard columns					
TH-18404	MultiporeH _{XL} -M guard column	6.0	4.0	5	For P/N TH-18403
TH-07113	HXL-L Guard column	6.0	4.0	7	For G1000H _{XL} through GMH _{XL} -L
TH-13727	H _{XL} -H Guard column	6.0	4.0	5	For G5000H _{XL} through GMH _{XL}
TH-05156	H8 Guard column	7.5	7.5	10	For 7.5mm ID H8
TH-05157	H6 Guard column	7.5	7.5	13	For 7.5mm ID H6
TH-05158	HM Guard column	7.5	7.5	40	For 7.5mm ID GMBH6 & P/N TH-07112 (order with ODCB)
TH-17368	Guard column H _{HR} -L and H _{HR}	6.0	4.0	5	For G1000-4000H _{HR} and P/N TH-17362
TH-17369	Guard column H _{HR} -H and H _{HR}	6.0	4.0	5	For G5000-7000H _{HR} and P/Ns 18055, 17392 and 17360

TSK COLUMNS FOR IONIC INTERCHANGE AND HYDROPHOBIC INTERACTION ON DEMAND

TK TSK-GEL Columns

for Ionic Exchange (IEC)

TosoBioScience offer the largest range of high efficiency columns for the analysis and separation of biomolecules using the chromatographic technique of anionic and cationic interchange.

These columns, with silica or methacrylate spherical packings, with controlled porosity and substituted with different interchange groups allow the resolution of proteins, peptides, oligonucleotides derived from DNA and RNA and other fragments of nucleic acids.

We also include a line of polymeric packings of polystyrene-divinylbenzene appropriately substituted for the separation and analysis of low molecular weight molecules such as sugars, aminoacids, etc.

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
<i>Glass columns: polymer-based</i>				
TH-14010	CM-5PW Glass, 1000 A	5.0	5.0	10
TH-14011	CM-5PW Glass, 1000 A	8.0	7.5	10
TH-14012	CM-5PW Glass, 1000 A	20.0	15.0	13
TH-13062	SP-5PW Glass, 1000 A	5.0	5.0	10
TH-08803	SP-5PW Glass, 1000 A	8.0	7.5	10
TH-14017	SP-5PW Glass, 1000 A	20.0	15.0	13

PEEK Columns

TH-19686	BioAssist S, 1300 A	4.6	5.0	7
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TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
<i>Stainless Steel Columns, polymer based</i>				
TH-13068	CM-5PW, 1000 A	7.5	7.5	10
TH-14021	CM-5PW, 1000 A	21.5	15.0	13
TH-18758	SP-5PW, 1000 A	2.0	7.5	10
TH-07161	SP-5PW, 1000 A	7.5	7.5	10
TH-07575	SP-5PW, 1000 A	21.5	15.0	13
TH-07934	SP-5PW, 1000 A	55.0	20.0	20
TH-13076	SP-NPR, nonporous	4.6	3.5	2.5
TH-07156	SCX (Na ⁺)	6.0	15.0	5
TH-07158	SCX (H ⁺)	7.8	30.0	5
TH-16653	OApak-A, 1000 A	7.8	30.0	5
<i>Stainless Steel Columns, silica based</i>				
TH-07165	SP-2SW, 125 A	4.6	25.0	5
TH-07167	CM-2SW, 125 A	4.6	25.0	5
TH-07162	SP-3SW, 250 A	7.5	7.5	10

TSK Cation Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)	Use
<i>Guard columns</i>					
TH-13069	CM-5PW Guardgel Kit			20	For P/N TH-13068
TH-16094	CM-5PW Prep Guardgel Kit			20	For P/N TH-14021
TH-14024	CM-5PW Guardet Kit, Glass			20	For P/Ns 14010 and TH-14011
TH-14068	CM-5PW Guard Column, Glass	20.00	2.0	13	For P/N TH-14012
TH-07211	SP-5PW Guardgel Kit			20.0	For P/N TH-07161
TH-42153	SP-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18758
TH-08807	SP-5PW Guardgel Kit, Glass			20	For P/Ns TH-13062 and TH-08803
TH-14467	SP-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14017
TH-16093	SP-5PW Prep Guardgel Kit			20	For P/N TH-07575
TH-07932	SP-5PW Guard Column	45.0	5.0	20	For P/N TH-07934
TH-07650	CM-SW Guardgel Kit			20	For P/Ns TH-07167 and TH-07162
TH-16654	OApak-P Guard Column	6.0	4.0	10	For P/N TH-16653
TH-19308	Guard cartridge holder	2.0	1.5		For all 2mm ID Guard cartridges

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
<i>Glass columns: polymer-based</i>				
TH-13061	DEAE-5PW Glass, 1000 A	5.0	5.0	10
TH-08802	DEAE-5PW Glass, 1000 A	8.0	7.5	10
TH-14016	DEAE-5PW Glass, 1000 A	20.0	15.0	13
TH-18386	SuperQ-5PW Glass, 1000 A	8.0	7.5	10
<i>PEEK Column</i>				
TH-19685	BioAssist Q, 4000 A	4.6	5.0	10
<i>Stainless Steel Columns, polymer based</i>				
TH-13075	DEAE-NPR, nonporous	4.6	3.5	2.5
TH-18249	DNA-NPR, nonporous	4.6	7.5	2.5
TH-42151	DNA-NPR, nonporous	7.5	7.5	2.5

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
<i>Stainless Steel Columns, polymer based</i>				
TH-18757	DEAE-5PW, 1000 A	2.0	7.5	10
TH-07164	DEAE-5PW, 1000 A	7.5	7.5	10
TH-07574	DEAE-5PW, 1000 A	21.5	15.0	13
TH-07930	DEAE-5PW, 1000 A	55.0	20.0	20
TH-18257	SuperQ-5PW, 1000 A	7.5	7.5	10
TH-18387	SuperQ-5PW, 1000 A	21.5	15.0	13
TH-08639	Sugar AXI, 60 A	4.6	15.0	8
TH-08640	Sugar AXG, 60 A	4.6	15.0	10
TH-07157	SAX	6.0	15.0	5
<i>Stainless Steel Columns, silica-based</i>				
TH-07166	QAE-2SW, 125 A	4.6	25.0	5
TH-18761	DEAE-2SW, 125 A	2.0	25.0	5
TH-07168	DEAE-2SW, 125 A	4.6	25.0	5
TH-07163	DEAE-3SW, 250 A	7.5	7.5	10

TSK Anion Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)	Use
<i>Guard columns</i>					
TH-17088	DEAE-NPR Guard Column	4.6	0.5	5	For P/N TH-13075
TH-18253	DNA-NPR Guard Column	4.6	0.5	5	For P/N TH-18249
TH-18388	SuperQ-5PW Guardgel Kit			20	For P/N TH-18257
TH-18389	SuperQ-5PW Guardgel Kit, Glass			20	For P/N TH-18386
TH-18390	SuperQ-5PW Guardgel Kit			20	For P/N TH-18387
TH-17210	DEAE-5PW Guardgel Kit			20	For P/N TH-07164
TH-42152	DEAE-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18757
TH-08806	DEAE-5PW Guardgel Kit, Glass			20	For P/Ns TH-13061 and TH-08802
TH-14466	DEAE-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14016
TH-16092	DEAE-5PW Prep Guardgel Kit			20	For P/N TH-07574
TH-07928	DEAE-5PW Guard Column	45.0	5.0	20	For P/N TH-07930
TH-07648	DEAE-SW Guardgel Kit			20	For P/Ns TH-07168 and TH-07163
TH-42154	DEAE-2SW Guard Cartridge	2.0	1.0	5	For P/N TH-18761
TH-19308	Guard Cartridge Holder	2.0	1.5		For all 2 mm ID guard cartridges

TK TSK-GEL Columns

for Hydrophobic Interaction Chemistry (HIC)

The great advantage over separations by reverse phase consists in the extremely mild elution conditions which protect the stability of the most sensitive proteins.

TOSO have three different columns available for HIC: TSK-GEL Phenyl-5PW, TSK-GEL Ether-5PW, and TSK-GEL Butyl -NPR.

The two first have as support the packing TSK-GEL G5000PW to which have been bonded respectively phenyl or oligoethylene-glycol groups.

The TSK-GEL Butyl -NPR columns are based on the same materials as the previous but with a non porous particle which is of a size of only 2.5 microns. The very high efficiencies that this column offers make it ideal for high speed applications.

TSK Hydrophobic Interaction Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)
Glass columns: polymer-based				
TH-14013	Ether-5PW Glass, 1000 A	5.0	5.0	10
TH-14014	Ether-5PW Glass, 1000 A	8.0	7.5	10
TH-14015	Ether-5PW Glass, 1000 A	20.0	15.0	13
TH-13063	Phenyl-5PW Glass, 1000 A	5.0	5.0	10
TH-08804	Phenyl-5PW Glass, 1000 A	8.0	7.5	10
TH-14018	Phenyl-5PW Glass, 1000 A	20.0	15.0	13

Stainless Steel Columns

TH-18760	Ether-5PW, 1000 A	2.0	7.5	10
TH-18641	Ether-5PW, 1000 A	7.5	7.5	10
TH-08642	Ether-5PW, 1000 A	21.5	15.0	13
TH-16255	Ether-5PW, 1000 A	55.0	20.0	20
TH-18759	Phenyl-5PW, 1000 A	2.0	7.5	10
TH-07573	Phenyl-5PW, 1000 A	7.5	7.5	10
TH-07656	Phenyl-5PW, 1000 A	21.5	15.0	13
TH-07938	Phenyl-5PW, 1000 A	55.0	20.0	20
TH-14947	Butyl-NPR, nonporous	4.6	3.5	2.5

TSK Hydrophobic Exchange Columns

Cat.No.	Description	ID (mm)	Length (cm)	Particle size(μm)	Use
Guard Column products					
TH-42156	Ether-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18760
TH-14025	Ether-5PW Guardgel Kit, Glass			20	For P/Ns TH-14013 and TH-14014
TH-08643	Ether-5PW Guardgel Kit			20	For P/N TH-08641
TH-16091	Ether-5PW Prep Guardgel Kit			20	For P/N TH-08642
TH-14470	Ether-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14015
TH-16253	Ether-5PW Guard Column	45.0	5.0	20	For P/N TH-16255
TH-42155	Phenyl-5PW Guard Cartridge	2.0	1.0	10	For P/N TH-18759
TH-08808	Phenyl-5PW Guardgel Kit, Glass			20	For P/Ns TH-08804 and TH-13063
TH-07652	Phenyl-5PW Guardgel Kit			20	For P/N TH-07573
TH-16095	Phenyl-5PW Prep Guardgel Kit			20	For P/N TH-07656
TH-14469	Phenyl-5PW Guard Column, Glass	20.0	2.0	13	For P/N TH-14018
TH-07936	Phenyl-5PW Guard Column	45.0	5.0	20	For P/N TH-07938
TH-19308	Guard Cartridge Holder	2.0	1.5		For all 2mm ID Guard Cartridges