

CUSTOM PACKED GC COLUMNS

We make custom-packed GC columns using high-quality materials. Any stationary phase can be chosen from our listings on page 18, in combination with nearly all listed supports. The use of other stationary phases are subject to special quotation. Columns are supplied as 6" diameter coils, unless instrument make and model is specified or dimensions are specified.

Stationary Phases

Usually the solid support will be coated with a liquid stationary phase. Exceptions are molecular sieves and porous polymers such as HayeSep[®] or Porapak[®], which are normally used un-coated. For a complete listing of available stationary phases.

Solid Supports

Porous Polymer Supports

- HaySep A, B, C, D, DB, DIP, N, P, Q, R, S, T
- Tenax[®]
- Porapak N, P, PS, Q, QS, R, S, T

Molecular Sieves

- 4A, 5A, 13X

Custom Column Ordering

To completely specify a custom column, please provide the information requested below.

- 1. Length** - Feet or Meters
- 2. Tubing Material** - Stainless steel, Silcosteel or Glass
- 3. Stationary Phase**** - See listings page 18. Phases subject to surcharges; see Table 1
 - A) Stationary Phase 1, plus % loading
 - B) Stationary Phase 2* (if dual phase), plus % loading
- 4. Solid Support** - Specify material and grade (for example, HayeSep[®] D) Expensive supports have surcharges; see Table 2
 - A) Support
 - B) Mesh Size - specify one 60/80, 80/100 or 100/120
- 5. Instrument Manufacturer**
- 6. Model Number**
- 7. Fittings** - Brass or stainless steel*

Table 1. Stationary Phase Surcharges

Surcharges apply to the following expensive phases:

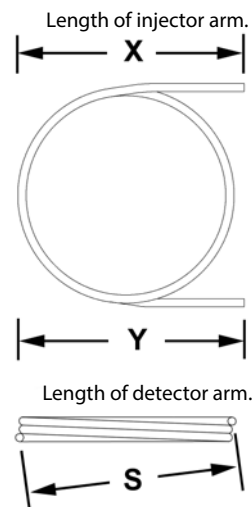
- EGSS-X
- OV-225
- OV-275
- OV-330
- OV-1701
- Polyphenylether
- Silars
- Dexsils

Table 2. Support Surcharges

- Carbon Molecular Sieves
- HayeSep[®]
- Porapak[®]
- Tenax[®]
- Carbopacks



Packed GC Column



Span, the distance between arms, tube center to tube center.

*Surcharge will be added

**Not required with solid adsorbents such as HayeSep, Molecular Sieves, etc.

Glass Columns - Silane Treated



Glass Column

- Custom Packed to your specifications
- Silanized for inertness
- High quality
- Available for most instruments

Column Configuration. The length of the “arms” is indicated by dimensions X and Y. These dimensions along with the span between the arms allows confirmation that the column will fit correctly in your instrument.

Column Installation. All of our glass columns are supplied with nuts and graphite ferrules. We recommend graphite ferrules because they are soft, to seal securely around the column without excessive tightening. They will not stick to the glass, for easy removal. Complete installation instructions are included with each column.

To Order a Packed Column

Please specify the packing (for example: 3% OV-225 on Chromosorb® W-HP, 80/100 mesh). Some expensive packing materials are subject to a surcharge; see the Surcharge Table.

1. Stationary Phase (see listings on page 18)
Expensive phases have surcharges; see Surcharge Table
 - A) Stationary Phase 1
% Loading
 - B) Stationary Phase 2 - Surcharge for dual phase columns
% Loading
2. Solid Support - Specify material and grade (example: Chromosorb W-AW; HayeSep® D)
Expensive supports have surcharges; see Surcharge Table
 - C) Support
 - D) Mesh Size- Specify one: 60/80, 80/100, or 100/120

Surcharge Table: Surcharges apply to the following expensive phases:

Stationary Phase Surcharges

- Dexsils
- EGSS-X
- OV-225
- OV-275
- OV-330
- OV-1701
- Polyphenylether
- Silars

Support Surcharges

- Chromosorb T
- Carbon Molecular Sieves
- HayeSep
- Porapak®
- Chromosorb 101 - 109
- Tenax®
- Carbopacks

STATIONARY PHASES

Description	Sugg. Subst.	Sol	McReynold's					OC Min/Max	Qty
			1	2	3	4	5		
Apiezon L		C	32	22	15	32	42	20/300	50 g
Bentone 34		T,C						20/200	50 g
Carbowax 1000 (G14)		M	347	607	418	626	589	40/150	50 g
Carbowax 1540		C	371	639	453	666	641	40/200	50 g
Carbowax 4000 (G15)		C	317	545	378	578	521	60/200	50 g
Carbowax 20M (G16)		C	322	536	368	572	510	60/200	50 g
Carbowax 20M Terephthalic acid (TPA)(G25)		C	321	537	367	573	520	60/250	50 g
Dexsil 300 (G33)		T	47	80	103	148	96	20/450	5 g
Dexsil 400		T	59	114	140	187	173	20/450	5 g
Dexsil 410		T	85	165	169	242	180	20/450	5 g
Diethylene glycol adipate (DEGA)		A	378	603	460	665	658	20/190	25 g
Diethylene glycol succinate (DEGS) (G4)		A	496	746	590	837	835	20/200	25 g
Di (2-Ethylhexyl) sebacate (Octoil S) (G12)		A	72	168	108	180	125	-20/125	50 g
Diisodecyl phthalate (DIDP) (G24)		A	84	173	137	218	155	-20/150	50 g
Dinonyl phthalate		A	83	183	147	231	159	20/150	25 g
FFAP	OV-351	C	340	580	397	602	627	50/250	25 g
Glycerol		M						20/100	50 g
Halocarbon Oil 14-25		C						20/150	50 g
Igepal CO-880		C	259	461	311	482	426	100/200	50 g
Kel-F Oil No. 10		A						20/100	50 g
Silicone DC-200, 12,500cstk	OV-101	T	16	57	45	66	43	0/200	50 g
Silicone DC-550 (G28)	OV-101	T	81	124	124	189	145	20/225	50 g
Silicone DC-710	OV-101	A	107	149	153	228	190	20/225	50 g
Silicone DC-QF-1	OV-210	A	144	233	355	463	305	20/250	50 g
Silicone GE-SE-30	OV-1	T	15	53	44	64	41	50/300	50 g
Silicone GE-SE-52	OV-73	T	32	72	65	98	67	50/300	50 g
Silicone GE-SE-54	OV-73	T	33	72	66	99	67	100/300	50 g
Silicone OV-1 (Dimethyl) (G2)		T	16	55	44	65	42	100/350	10 g
Silicone OV-3 (Methyl 10% Phenyl)		A	44	86	81	124	88	20/350	25 g
Silicone OV-7 (80% Methyl 20% Phenyl)		A	69	113	111	171	128	20/350	25 g
Silicone OV-17 (50% Methyl 50% Phenyl)		A	119	158	162	243	202	20/350	25 g
Silicone OV-25 (Phenylmethyl diphenyl) (G17)		A	178	204	208	305	280	20/350	10 g
Silicone OV-61 (Diphenyldimethyl)		A	101	143	142	213	174	20/250	10 g
Silicone OV-73 (Diphenyldimethyl Gum) (G27)		T	40	86	76	114	85	20/350	10 g
Silicone OV-101 (Dimethyl) (G1)		T	17	57	45	67	43	20/350	20 g
Silicone OV-105 (Cyanopropyl dimethyl)		A	36	108	93	139	86	20/250	10 g
Silicone OV-202 (Trifluoropropyl methyl) (G6)		T	146	238	358	468	310	0/275	10 g
Silicone OV-210 (Trifluoropropyl methyl)		T	146	238	358	468	310	20/275	25 g
Silicone OV-225 (Cyanopropyl methyl phenyl)		A	228	369	338	493	386	20/250	10 g
Silicone OV-275 (Dicyanoallyl)		A	629	872	763	1106	849	20/275	5 g
Silicone OV-330 (Carbowax-Silicone)		A	222	391	273	417	368	30/250	5 g
Silicone OV-351 (Replaces FFAP)		T	335	552	382	583	540	50/250	10 g
Silicone OV-1701 (Dimethylphenylcyano)		A	67	170	153	228	171	20/325	3 g
Silicone Silar 5CP		T	316	494	637	531		50/275	5 g

McReynold's Code

1 = Benzene
2 = Butanol
3 = 2-Pentanone
4 = Nitropropane
5 = Pyridine

Solvent Code

A = Acetone
T = Toluene
C = Chloroform
M = Methanol

SOLID SUPPORTS AND ADSORBENTS

HayeSep® Porous Polymers



HayeSep D

These polymer supports are suitable for a wide range of separations. HayeSep polymers are direct replacements for the equivalent type of Porapak®; for example HayeSep Q can be directly substituted for methods developed with PoraPak Q. Since there are virtually no chemically active sites in HayeSep polymers, silylation is not required.

HayeSep D - This is a high-purity divinylbenzene polymer with 80% highly-crosslinked DVB. It combines high surface area with a high operating temperature. HayeSep D polymers offer superior separation characteristics for light gases; significant separation abilities include the separation of CO and CO₂ from room air at ambient temperatures and the separation of acetylene prior to other C₂'s. It is highly recommended for the separation of water and hydrogen sulfide. HayeSep D is available in three different porosities with surface areas from 774 to 800 m²/g. This range is especially useful for certain difficult separations; for example water elutes before ethane with DB, but after ethane with Dip. Relative polarity for other HayeSep polymers is shown below; 1 is least polar and 10 is most polar.

Polymer Materials:

- **ACN** - Acrylonitrile
- **EGDM** - Ethyleneglycoldimethacrylate
- **NVP** - N-Vinyl-2-Pyrrolidinone
- **PEI** - Polyethyleneimine
- **VP** - 4-Vinylpyridine
- **DVB** - Divinyl Benzene

Type	Composition	Max. Temp*	Surface Area	Polarity**
A	DVB/EGDM	165°C	526 m ² /g	7
B	DVB/PEI	190	608	8
C	DVB/ACN	250	442	6
D	DVB, 80%	290	803	1
DB	DVB, 80%	290	781	1
DIP	DVB, 80%	290	774	1
N	DVB, EGDM	165	405	9
P	DVB, Styrene	250	165	3
Q	DVB, 60%	275	582	2
R	DVB/NVP	250	344	5
S	DVB/VP	250	583	4
T	EGDM	165	250	10

Molecular Sieve

Molecular sieves are synthetic aluminosilicates of sodium, potassium or calcium, of various pore sizes. The pores are precisely uniform in size. Molecular Sieves are used to separate the fixed gases. CO, CH₄, O₂ and Ar are easily separated at room temperature. 100 g/ bottle



Molecular Sieve 5A

Porapaks®

Porapak column packing materials consist of spherical polymer beads. These packings are chemically and physically stable with consistent particle size, porosity and surface area.

Versatility for Special Applications

Porapak packing is a versatile polymer material available in different chemistries which increase in polarity and vary in retention properties for the efficient analysis of many compounds. These packing materials offer many advantages:

- Polar molecules elute quickly making analysis simple and straight forward
- No liquid phase eliminates stationary phase bleed
- No surface hydroxyl groups eliminates tailing of highly polar molecules or of large sample loads for trace analysis and preparative GC
- Stable baselines at high temperatures



Porapak Q

Porapak Retention Data - minutes*

Compound	P	Q	R	S	N	T
Air	.23	.24	.24	.24	.24	.24
Carbon Dioxide	.36	.65	.60	.66	.90	1.26
Nitric Oxide	.27	.30	.28	.26	.28	.28
Nitrous Oxide	.42	.76	.66	.81	.94	1.22
Methane	.26	.35	.32	.38	.35	.39
Ethylene	.45	1.15	.90	1.01	1.22	1.32
Acetylene	.53	1.15	1.16	1.20	2.00	2.96
Ethane	.54	1.15	1.16	1.36	1.50	1.54
Chlorodifluoromethane	1.22	4.32	5.61	5.61	10.99	13.88
Acetic Acid	.39	1.08	2.14	3.68	4.18	5.21
Propionic Acid	.65	2.42	4.75	9.05	9.11	10.68
Methanol	.24	.35	.39	.48	.61	.69
Ethanol	.30	.60	.63	.76	1.21	1.20
Benzene	.87	2.76	2.56	3.00	4.00	3.74
Toluene	1.33	5.72	5.31	6.41	8.54	7.61
Ethyl Benzene	2.09	11.60	10.69	12.98	17.58	15.05
o-Xylene	2.52	13.48	12.53	15.32	15.32	18.05
Methylene Chloride	.41	.98	.94	1.09	1.48	1.67
Carbon Tetrachloride	.75	2.87	2.42	2.98	3.49	3.04
Methyl Acetate	.38	1.01	.97	1.11	1.74	1.75
Ethylene Glycol	.94	2.39	3.36	4.19	9.34	12.43
Glycerol	4.92	19.15	-	-	-	-

*Operating conditions: 1m x 2.3 mm ID stainless steel column, 80/100 mesh, 175°C, 25 mL/min helium flow; FID detector.

Ordering Information

ERA-PGC1000

STAINLESS STEEL COLUMNS

	EXPORT	EXPORT
DIMENSIONS	1/8"	1/4"
1 METER	97.18	151.31
2 METERS	119.65	232.55
3 METERS	142.11	313.81
4 METERS	164.58	395.57
5 METERS	187.04	476.39
X / METERS	16	

ERA-PGC2000

GLASS COLUMNS

	EXPORT	EXPORT	EXPORT
DIMENSIONS	2mm ID	3mm ID	4mm ID
1 METER	166.62	187.99	209.93
2 METERS	183.48	226.21	270.79
3 METERS	200.39	266.21	332.42
4 METERS	276.84	364.59	452.34
5 METERS	315.93	425.49	535.18
X / METERS	30	50	70

ERA-PGC3000

SILCOSTEEL COLUMNS

	EXPORT
DIMENSIONS	1/8"
1 METER	108.45
2 METERS	142.18
3 METERS	175.91
4 METERS	209.65
5 METERS	243.21
X / METERS	15

SUPPORTS & SPECIAL PHASES: EXTRA COSTS

	€/M	EXPORT
TENAX		59.81
RESSIL		35.15
DEXSIL		10.66
CARBOPACK		54.65
CARBOXEN 1000		156.00
SP-2401,SP-1240, SP17017		21.00
SP-300, OV225		21.00
SP-301		21.00

CONDITIONED COLUMNS:

	EXPORT
Conditioned & Test	110.50
Just conditioned the column	58.50

FITTINGS

	EXPORT
PYE UNICAM	47.00
CARLO ERBA ACERO	47.00
CARLO ERBA VIDRIO	26.00

EMPTY COLUMNS

The fittings, label & boxes are included with this price:

	EXPORT	EXPORT	EXPORT
DIMENSIONS	1/8" Stainless Steel	1/4" Stainless Steel	1/4" Glass
1 METER	50.00	60.00	90.00
2 METERS	60.00	65.00	95.00
3 METERS	65.00	75.00	105.00
4 METERS	75.00	85.00	15.00
5 METERS	85.00	95.00	20.00
X / METERS adc.	9.00	9.00	

For SILCOSTEEL Columns please add to STAINLESS STEEL COLUMNS

Empty tube €/M

EXPORT
16.00

REQUIREMENT IN ORDERTO MANUFACTURE THE COLUMNS

Material of the Column
length
OD
ID
Phase
% Phase
Support
Treatment (WAW,WHP,...)
Mesh
Brand & Model
Configuration