Gas Chromatography

Capillary GC 208
- Equity Columns 208
- Equity-1 Columns 210
- Equity-5 Columns 211
- General Purpose Columns 212
- Special Purpose Columns (Chiral) 216
- Special Purpose Columns (Environmental) 218
- Special Purpose Columns (Air Monitoring, High Temperature) 220
- Special Purpose Columns (Solvents, Steroids) 221
- Special Purpose Columns (Sulfur Compounds, SCOT Columns) 222
- Special Purpose Columns (Gases – PLOT Columns) 223
- Special Purpose Columns (FAMES) 224
- Special Purpose Columns (Petroleum – Hydrocarbons, MTBE) 226
- Special Purpose Columns (Petroleum – Hydrocarbons, SIMDIS) 227
- Special Purpose Columns (Amines, Aromatics) 228
- Other Columns 229
- Capillary Column Equivalents 231
- Custom Columns 232
- Fused Silica Tubing 233
- Test Mixes for Capillary Columns 234

Packed Columns 236
- Agilent Technologies Cross Reference 236
- Stock Packed Columns 238
- Custom Packings/Custom Packed Columns 240
- Empty Glass Columns 242
- Stationary Phases 244
- Supports 246
- Stock Packings 248

GC Accessories 252
- Agilent Technologies Instruments 252
- PerkinElmer Instruments 254
- Varian Instruments 255
- Ferrules and Accessories 256
- Septa and Accessories 258
- Inlet Liners 261
- Injection Sleeves 267
- Capillary GC 268
- Packed Column GC 272
- Packed Column/Capillary Conversion Kits 277

Gas Delivery 278
- Hydrogen Generators 278
- Pure Air Generators 280
- Zero Air Generators 282
- Nitrogen Generators 284
- Air Compressors 286
- Particle and Oil Filters 287
- Gas Cylinder Accessories 288
- Pressure Regulators 291
- Shutoff Valves 293
- Gauges 293
- Flow Control 294
- Flow Measurement 295
- Leak Detectors 298
- Gas Purifiers 300
- Tubing and Accessories 310
- Tubing Fittings 312
- Manual Sampling/Switching Valves 316

GC Applications 318
- Alcohols 318
- Amines 320
- Anilines 321
- Aromatics 321
- Alditol Acetates 321
- Drugs 322
- Enantiomers 323
- FAMEs 323
- Fatty Acids 326
- Foods, Flavors, and Fragrances 327
- Permanent Gases and Light Hydrocarbons 332
- Glycols 332
- Hydrocarbons 333
- Free Acids 336
- Pesticides 336
- Phenols 338
- Semivolatiles 339
- Solvents 342
- Sterols 344
- Sulfur Compounds 345
- Volatiles 346

Capillary GC
Equity Columns

eQuity
Capillary GC Columns

The performance you demand...
the service you deserve...
from the company you trust.

Supelco's new and improved line of capillary GC columns deliver the capillary GC column performance you demand for your general purpose, special purpose GC/MS, or environmental applications.

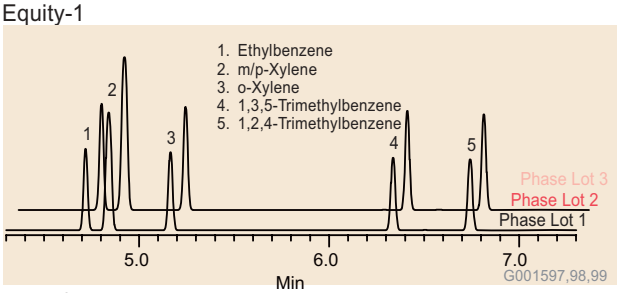
Significant improvements in the polymer chemistry are at the heart of the enhanced performance you will receive with our new Equity Capillary GC Columns. The polymer improvements result in better cross-linking, higher thermal stability, and superior product reproducibility.

The consistent resolution, analyte response, low bleed, and column life from one Equity column to the next will allow you to readily transfer methods between sites or instruments within the same site. Also, maintain the expected column performance over time with the same instrument when you need to replace your column. The reproducible performance Equity provides will minimize time consuming method adjustments and troubleshooting with column changes which means more tests run with higher confidence.

The Resolution You Need

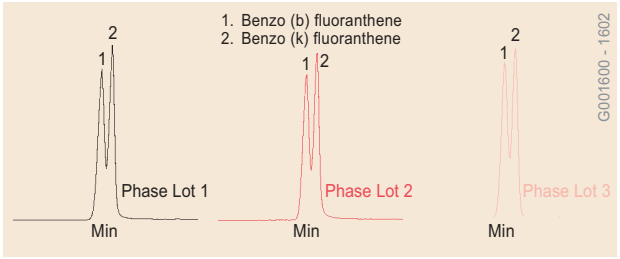
For accurate identification, reliable quantitation, and confidence in your results choose Equity Capillary GC Columns. The consistently high resolution you demand and the service you deserve.

Equity-1



Column: 30m x 0.25mm ID, 0.25µm
Cat. No.: 28046-U
Oven: 50°C to 200°C @ 10°C/min. (5 min.)
Inj.: 200°C
Det.: FID, 250°C
Flow: 30cm/sec. @ 50°C
Injection: 1.0µL, 100:1 split
Sample: UST Modified Gasoline Range Organics (48167)

Equity-5

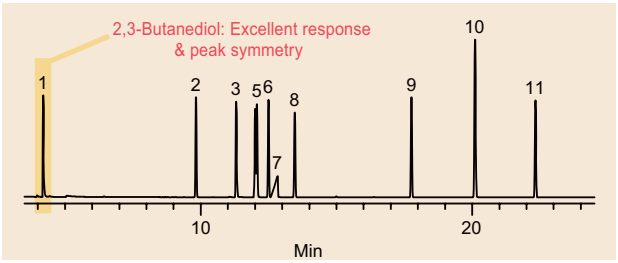


Column: 30m x 0.25mm ID, 0.25µm
Cat. No.: 28089-U
Oven: 40°C (4 min.) to 325°C @ 10°C/min (5 min.)
Inj.: 250°C
MSD Interface: 325°C
Scan Range: 45-450 amu
Flow: 12.5psi constant pressure
Injection: 1.0µL, splitless
Sample: 25ng on-column of a 16 component semivolatile standard

The Analyte Response You Require

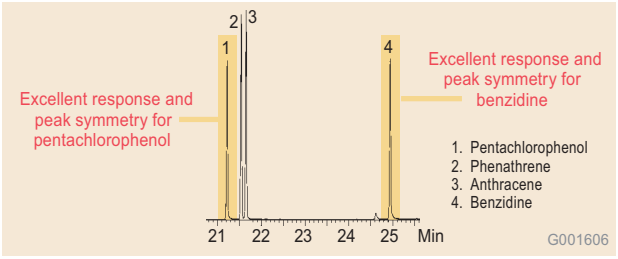
For lower detection limits and less instrument downtime, you can depend on Equity Capillary GC Columns. The reproducible analyte response you demand and the service you deserve.

Equity-1



Column: 30m x 0.25mm ID, 0.25µm
Cat. No.: 28046-U
Oven: 110°C (14 min.) to 325°C (15 min) @ 15°C/min.
Inj.: 250°C
Det.: FID, 360°C
Flow: 30cm/sec. @ 110°C
Injection: 1.0µL, 100:1 split
Sample: Nonpolar Column Test Mix (47300-U)
% Response: Calculated relative to the predicted hydrocarbon response at the same retention time

Equity-5

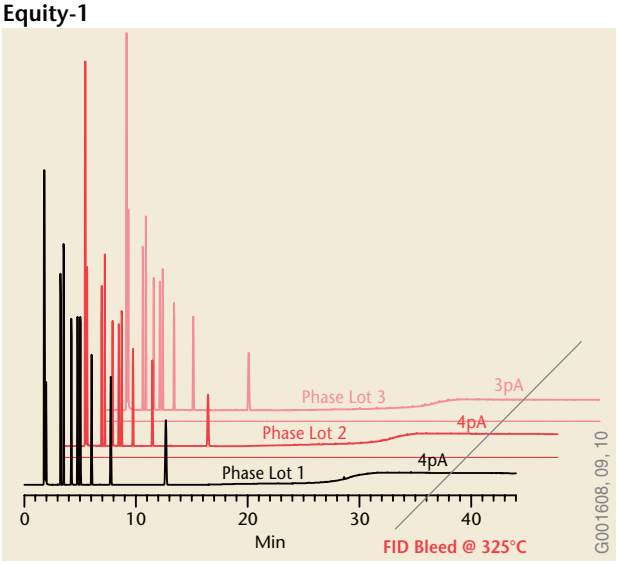


Column: 30m x 0.25mm ID, 0.25µm
Cat. No.: 28089-U
Oven: 40°C (4 min.) to 325°C @ 10°C/min. (5 min.)
Inj.: 250°C
MSD Interface: 325°C
Scan Range: 45-450 amu
Flow: 12.5psi constant pressure
Injection: 1.0µL, splitless
Sample: 25ng on-column of a 16 component semivolatile standard

The Low Bleed You Expect

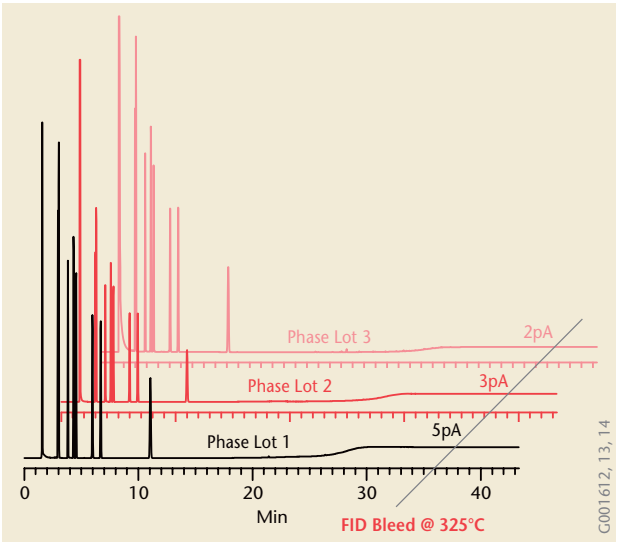
For great sensitivity, reliable identification, and increased sample throughput rely on Equity Capillary GC Columns. The consistent low bleed performance you demand and the service you deserve.

Equity-1



Column: **30m x 0.25mm ID, 0.25µm**
Cat. No.: **28089-U**
Oven: 110°C (14 min.) to 325°C (15 min) @ 15°C/min.
Inj.: 250°C
Det.: FID, 360°C
Flow: 30cm/sec. @ 110°C
Injection: 1.0µL, 100:1 split
Sample: Nonpolar Column Test Mix (47300-U)

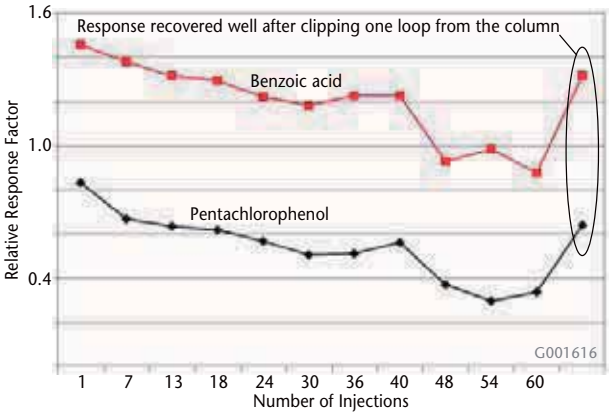
Equity-5



Column: **30m x 0.25mm ID, 0.25µm**
Cat. No.: **28089-U**
Oven: 110°C (14 min.) to 325°C (15 min) @ 15°C/min.
Inj.: 250°C
Det.: FID, 360°C
Flow: 30cm/sec. @ 110°C
Injection: 1.0µL, 100:1 split
Sample: Nonpolar Column Test Mix (47300-U)

The Column Life You Count On

To increase your productivity and reduce your instrument downtime, use Equity Capillary GC Columns. The durable, consistent column life you demand and the service you deserve.



Durability Challenge

Column: **30m x 0.25mm ID, 0.25µm**
Oven: 35°C (4 min.) to 325°C @ 10°C/min. (15 min.)
Inj.: 250°C
Det.: FID, 360°C
Flow: 27psi constant pressure
Injection: 1.0µL, 100:1 split of test mix
Sample: Test Mix – 2.5 to 5ng on-column of a 16 component semivolatile standard; the column challenge mix is a high concentration waste sample.

Response factor is calculated relative to the internal standard 2,2'-Difluorobiphenyl

Durability Test:

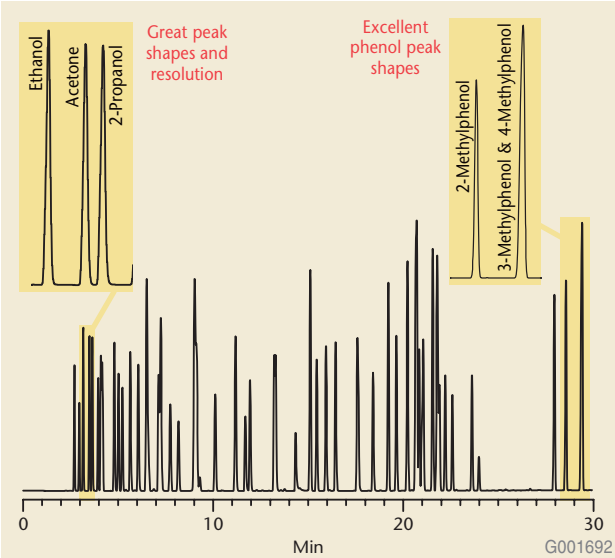
The column durability and life was challenged for over 60 injections by alternating injections of the 1µL test mix followed by 5 consecutive 2µL splitless injections of the high concentration waste sample. Column maintenance was performed at the end of the test and a final test mix was injected.

Supelco plans to add more phases and dimensions to the Equity line of capillary GC columns.
Our original nonpolar capillary GC columns are still available and are located on the "Other Columns" pages following the Capillary GC section.

RELATED INFORMATION

For more information on the Equity line of capillary GC columns request T402049.

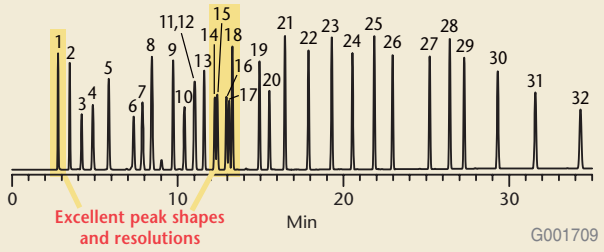
Capillary GC
Equity-1 Columns



Industrial Solvents (GC)

Column: **Equity-1, 30m x 0.32mm ID, 1.0µm**
Cat. No.: **28057-U**
Oven: 35°C (8 min) to 130°C @ 4°C/min. (2 min)
Inj.: 250°C
Det.: FID, 250°C
Flow: Helium, 25cm/sec constant @ 35°C
Inj.: 0.5µL, split (200:1)
Liner: Split, cup design
Sample: 0.5µL of a 59 component neat solvent mixture

1. Methanol
2. Ethanol
3. Isopropanol
4. t-Butanol
5. Propanol
6. 2-Butanol
7. Hexane
8. Isobutanol
9. Butanol
10. 3-Methyl-2-butanol
11. 2-Pentanol
12. 3-Pentanol
13. Heptane
14. 3-Methyl-1-butanol
15. 2-Methyl-1-butanol
16. 3-Methyl-3-pentanol
17. 4-Methyl-2-pentanol
18. Pentanol
19. Octane
20. 4-Methyl-1-pentanol
21. Hexanol
22. Nonane
23. Heptanol
24. Decane
25. Octanol
26. Undecane
27. Dodecane
28. Decanol
29. Tridecane
30. Tetradecane
31. Pentadecane
32. Hexadecane



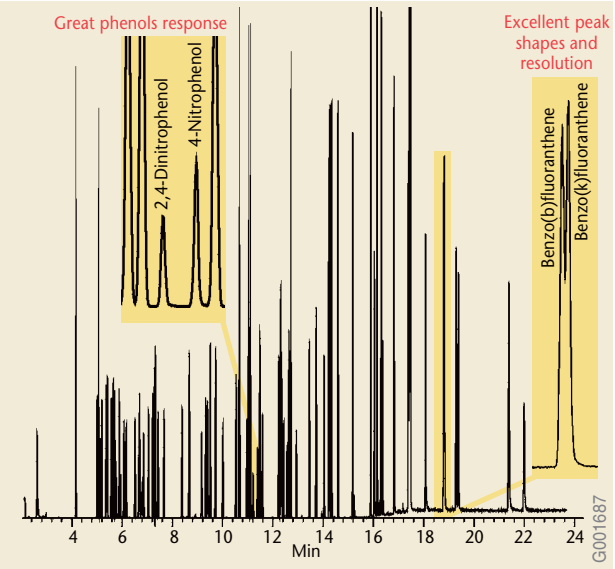
Hydrocarbons and Alcohols (GC)

Column: **Equity-1, 30m x 0.53mm ID, 3.0µm**
Cat. No.: **28076-U**
Oven: 40°C (5 min.) to 225°C @ 8°C /min.
Inj.: 250°C
Det.: FID, 275°C
Flow: Helium, 30 cm/sec @ 40°C
Inj.: 0.10µL, split 100:1
Liner: Split, cup design
Sample: 32 component mixed solvent sample, equal by weight

Equity-1 Capillary GC Columns

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: 0.25 and 0.32mm ID: -60°C to 325/350°C
0.53mm ID: -60°C to 300/320°C (<=1.5µm d_f)
-60°C to 260/280°C (>1.5µm d_f)

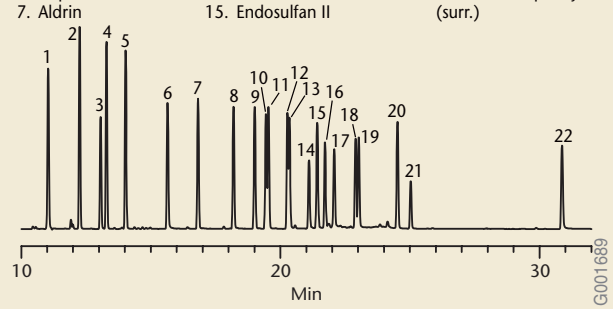
LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.10mm ID				
15	0.10	250	**28039-U**	
0.20mm ID				
12	0.33	152	**28041-U**	
25	0.33	152	**28042-U**	
10	1.2	42	**28043-U**	
0.25mm ID				
30	0.10	625	**28044-U**	
15	0.25	250	**28045-U**	
30	0.25	250	**28046-U**	
60	0.25	250	**28047-U**	
15	1.0	63	**28048-U**	
30	1.0	63	**28049-U**	
60	1.0	63	**28050-U**	
100	1.0	63	**28052-U**	
0.32mm ID				
30	0.10	800	**28053-U**	
15	0.25	320	**28054-U**	
30	0.25	320	**28055-U**	
60	0.25	320	**28056-U**	
30	1.0	80	**28057-U**	
60	1.0	80	**28058-U**	
100	1.0	80	**28060-U**	
30	2.0	40	**28061-U**	
30	5.0	16	**28062-U**	
60	5.0	16	**28063-U**	
0.53mm ID				
15	0.10	1325	**28064-U**	
30	0.10	1325	**28065-U**	
15	0.5	265	**28067-U**	
30	0.5	265	**28068-U**	
15	1.0	133	**28069-U**	
30	1.0	133	**28071-U**	
15	1.5	88	**28072-U**	
30	1.5	88	**28073-U**	
60	1.5	88	**28074-U**	
15	3.0	44	**28075-U**	
30	3.0	44	**28076-U**	
60	3.0	44	**28077-U**	
15	5.0	27	**28079-U**	
30	5.0	27	**28081-U**	
60	5.0	27	**28082-U**	



US EPA Method 8270 Semivolatile Compounds (GC/MS)

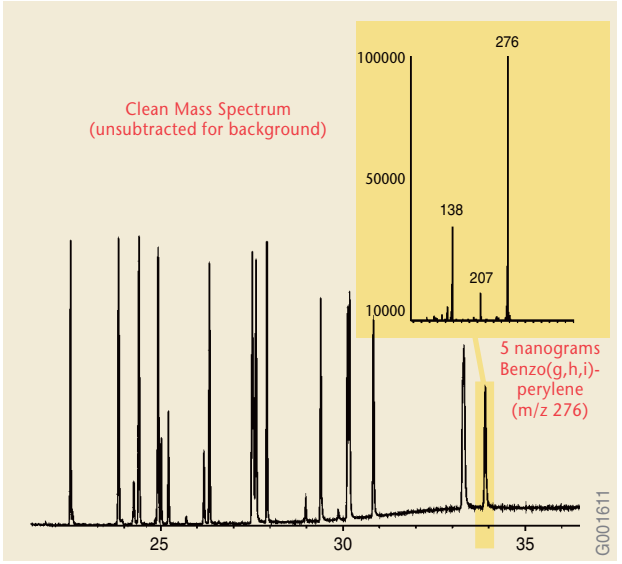
Column: **Equity-5, 30m x 0.25mm ID, 0.5µm**
Cat. No.: **28092-U**
Oven: 40°C (2 min) to 100°C @ 50°C/min to 200°C @ 10°C/min to 325°C @ 30°C/min (7.5 min)
Inj.: 280°C
Det.: 5973 MSD, Scan range 45-450 amu, 325°C transfer line
Flow: Pressure programmed, 20psi (0.0 min.), ramp to 80psi (0.0 min), ramp to 16.5psi (3 min), ramp to 25psi (hold for remainder of run)
Injection: 1.0µL, splitless (0.61 min)
Liner: Single taper, unpacked
Sample: 50ng on-column of a 74 component semivolatile standard, 6 internal standards, and 8 surrogates

1. 2,4,5,6-Tetrachloro-m-xylene (surr.)
2. α-BHC
3. β-BHC
4. γ-BHC
5. δ-BHC
6. Heptachlor
7. Aldrin
8. Heptachlor epoxide
9. γ-Chlordane
10. Endosulfan I
11. α-Chlordane
12. 4,4′-DDE
13. Dieldrin
14. Endrin
15. Endosulfan II
16. 4,4′-DDD
17. Endrin aldehyde
18. Endosulfan Sulfate
19. 4,4′-DDT
20. Endrin ketone
21. Methoxychlor
22. Decachlorobiphenyl (surr.)



US EPA Method 8081 Chlorinated Pesticides (GC)

Column: **Equity-5, 30m x 0.25mm ID, 0.25µm**
Cat. No.: **28089-U**
Oven: 100°C (2 min) to 160°C @ 15°C/min to 300°C @ 5°C/min (10 min)
Inj.: 225°C
Det.: ECD, 310°C
Flow: Helium, 30cm/sec @ 100°C
Injection: 2.0µL, splitless (0.5 min)
Liner: Splitless double taper, unpacked
Sample: 50ppb of a 22 component chlorinated pesticide standard (Cat. No. 46845-U)



Low GC/MS Column Bleed Equity-5 Capillary GC Columns

New!

Phase: bonded; poly(5% diphenyl/95% dimethylsiloxane)
Temp. Limits: 0.25 and 0.32mm ID: -60°C to 325/350°C
0.53mm ID: -60°C to 300/320°C(<=1.5µm d_f)
-60°C to 260/280°C (>1.5µm d_f)

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.10mm ID				
15	0.10	250	**28083-U**	
0.20mm ID				
15	0.20	250	**28084-U**	
30	0.20	250	**28085-U**	
60	0.20	250	**28086-U**	
12	0.33	152	**28087-U**	
0.25mm ID				
15	0.25	250	**28088-U**	
30	0.25	250	**28089-U**	
60	0.25	250	**28090-U**	
30	0.5	125	**28092-U**	
15	1.0	63	**28093-U**	
30	1.0	63	**28094-U**	
60	1.0	63	**28095-U**	
0.32mm ID				
15	0.25	320	**28096-U**	
30	0.25	320	**28097-U**	
60	0.25	320	**28098-U**	
30	0.32	250	**28099-U**	
30	0.5	160	**28195-U**	
30	1.0	80	**28199-U**	
60	1.0	80	**28251-U**	
0.53mm ID				
15	0.5	265	**28252-U**	
30	0.5	265	**28259-U**	
60	0.5	265	**28263-U**	
30	1.0	133	**28264-U**	
15	1.5	88	**28265-U**	
30	1.5	88	**28267-U**	
30	3.0	44	**28268-U**	
60	3.0	44	**28269-U**	
15	5.0	27	**28278-U**	
30	5.0	27	**28279-U**	
60	5.0	27	**28293-U**	

Capillary GC
General Purpose Columns

SPB-Octyl

Polarity approaches that of squalane, and is substantially less than that of the widely used "nonpolar" methyl silicone phase. Because these columns offer unique selectivity compared to the commonly used low and intermediate polarity columns, we recommend SPB-Octyl columns for multidimensional or confirmational analyses of PCB-containing samples.

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(50% n-octyl/50% methylsiloxane)
Temp. Limits: -60°C to 280°C (isothermal)
McReynolds Nos.: x′ y′ z′ u′ s′ = 3 14 11 12 11

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.25	250	**24218-U**	
60	0.25	250	**24219-U**	
30	1.00	63	**24232**	
60	1.00	63	**24233-U**	
0.53mm ID FUSED SILICA				
60	3.0	44	**25398**	

SPB-20

SPB-20 columns have intermediate polarity as a result of the higher (20%) phenyl content of the stationary phase. The higher polarity produces different elution order for polar compounds, providing confirmational information.

This column meets USP G28 and G32 requirements

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(20% diphenyl/80% dimethylsiloxane)
Temp. Limits: -25°C to 300°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 67 116 117 174 131

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.2	250	**24086**	
60	0.25	250	**24087-U**	
30	1.0	63	**24196-U**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24088**	
60	1.0	80	**24194-U**	
0.53mm ID FUSED SILICA				
30	0.50	265	**25329-U**	
30	1.0	133	**25333**	

SPB-35

SPB-35 columns have higher polarity than SPB-20 columns as a result of a greater phenyl content (35%). These columns are useful for analyses of polar compounds, because these compounds are retained longer, relative to nonpolar compounds.

This column meets USP G42 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(35% diphenyl/65% dimethylsiloxane)
Temp. Limits: 0°C to 300°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 101 146 151 219 202

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.25	250	**24092**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24094**	
0.53mm ID FUSED SILICA				
30	0.50	265	**25331**	
30	1.0	133	**25335**	

SPB-50

These columns have the highest phenyl content of the common phenyl-containing series of phases, and hence provide the highest polarizability. They are useful for analyses of polar materials and provide useful confirmational information.

This column meets USP G3 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(50% diphenyl/50% dimethylsiloxane)
Temp. Limits: 30°C to 310°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 125 175 183 268 220

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.25	250	**24181**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24187**	
0.53mm ID FUSED SILICA				
30	0.50	265	**25363**	

SP-2250

The nonbonded 50% phenyl polymer that is matched in polarity by the bonded version, SPB-50.

This column meets USP G3 requirements.

Phase: nonbonded; poly(50% phenyl/ 50% methylsiloxane)
Temp. Limits: 0°C to 250°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 119 158 162 243 202

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.20	313	**24009**	
30	0.20	313	**24010**	
60	0.20	313	**24011-U**	
0.32mm ID FUSED SILICA				
15	0.20	320	**24147**	
30	0.20	320	**24148**	

SPB-17

This bonded, crosslinked (50%-phenyl)-methylpolysiloxane, intermediate polarity phase is excellent for confirmational analyses.

This column meets USP G3 requirements.

Operating Conditions: Columns can be rinsed.

Phase: bonded; (50% phenyl) methylpolysiloxane
Temp. Limits: 0.25 and 0.32mm ID: 40°C to 280/300°C
0.53mm ID: 40°C to 260/280°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 125 169 174 253 207

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.25	250	**24374-U**	
30	0.25	250	**24380-U**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24381**	
30	0.50	160	**24376**	
0.53mm ID FUSED SILICA				
15	1.0	250	**25472**	

SPB-1701

Intermediate polarity SPB-1701 columns have a mixed functionality which provides unique elution order characteristics, relative to the phenyl-containing silicone phases.

This column meets USP G46 requirements.

Phase: bonded; poly(14% cyanopropylphenyl/ 86% dimethylsiloxane)
Temp. Limits: subambient to 280°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 67 170 153 228 171

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.25	250	**24112**	
30	0.25	250	**24113**	
60	0.25	250	**24114**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24184**	
60	0.25	320	**24185**	
0.53mm ID FUSED SILICA				
15	0.50	265	**25368**	
30	0.50	265	**25369**	
15	1.0	133	**25366**	
30	1.0	133	**25367**	

PAG

Less polar than polyethylene glycol phases, due to the incorporation of propylene oxide into the polymer backbone. Fills the polarity gap between 50% phenyl columns and Carbowax-type columns (polarity similar to UCON and Pluronics phases).

This column meets USP G18 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents, but solvents such as water and methanol must be vaporized before reaching the column inlet. Avoid these solvents when using on-column injection techniques. Sensitive to strong inorganic acids. Columns can be rinsed.

Phase: bonded; poly(alkylene glycol)
Temp. Limits: 30°C to 220°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 252 499 310 489 416

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.25	250	**24222-U**	
30	0.25	250	**24223**	
0.32mm ID FUSED SILICA				
15	0.25	320	**24225-U**	
30	0.25	320	**24226**	
0.53mm ID FUSED SILICA				
15	0.50	265	**25422-U**	
30	0.50	265	**25423-U**	
60	0.50	265	**25424**	

Capillary GC
General Purpose Columns

SUPELCOWAX 10

The bonded equivalent to the CARBOWAX 20M phase, with much higher thermal stability. Because this phase offers higher polarity than any of the phenylsilicone phases, it is widely used for separation and purity analyses of many polar compounds, including alcohols, aromatics, and other solvents, flavors, fragrances and FAMEs.

This column meets USP G16 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents, but solvents such as water and methanol must be vaporized before reaching the column inlet. Avoid these solvents when using on-column injection techniques. Sensitive to strong inorganic acids. Columns can be rinsed.

Phase: bonded; CARBOWAX 20M poly (ethylene glycol)
Temp. Limits: 35°C to 280°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 305 551 360 562 484

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.10mm ID FUSED SILICA				
5	0.10	250	**25025-U**	
10	0.10	250	**25026-U**	
15	0.10	250	**24343**	
0.20mm ID FUSED SILICA				
30	0.20	250	**24169**	
60	0.20	250	**24170**	
0.25mm ID FUSED SILICA				
15	0.25	250	**24077**	
30	0.25	250	**24079**	
60	0.25	250	**24081**	
30	0.50	125	**24284**	
0.32mm ID FUSED SILICA				
15	0.25	320	**24078**	
30	0.25	320	**24080-U**	
60	0.25	320	**24082**	
15	0.50	160	**24083**	
30	0.50	160	**24084**	
60	0.50	160	**24085-U**	
30	1.0	80	**24211**	
60	1.0	80	**24212**	
0.53mm ID FUSED SILICA				
15	0.50	265	**25324**	
30	0.50	265	**25325**	
60	0.50	265	**25385**	
15	1.0	133	**25300-U**	
30	1.0	133	**25301-U**	
60	1.0	133	**25391**	
30	2.0	63	**25375-U**	
60	2.0	63	**25376**	

SPB-1000

An improved version of our Nukol phase, SPB-1000 is a bonded, PEG-type phase incorporating acidic functional groups and displaying a polarity closer to the SP-1000 phase than does Nukol. It displays the acidic character necessary for analyses of volatile acidic compounds. It also offers improved performance for analyses of glycols, compared to the Nukol phase. It is the recommended column for ethylene glycol analysis.

This column meets USP G25 and G35 requirements.

Operating Conditions: Columns can be rinsed.

Phase: bonded; modified poly(ethylene glycol)
Temp. Limits: 60°C to 200°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 308 565 368 567 511

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.25	250	**24313**	
0.32mm ID FUSED SILICA				
30	0.25	320	**24315**	
0.53mm ID FUSED SILICA				
30	0.50	265	**25445**	

Nukol (Bonded Free Fatty Acid Phase)

This bonded PEG-type phase, incorporating acidic functional groups, displays an acidic character and is useful for analyses of volatile acidic compounds. Even free carboxylic acids can be analyzed with excellent peak shape and minimal adsorption.

This column meets USP G25 and G35 requirements.

Operating Conditions: Sensitive to strong inorganic acids. Columns can be rinsed.

Phase: bonded; modified poly(ethylene glycol)
Temp. Limits: 60°C to 200°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 314 569 372 578 504

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.25	250	**24106-U**	
30	0.25	250	**24107**	
60	0.25	250	**24108**	
0.32mm ID FUSED SILICA				
15	0.25	320	**24130**	
30	0.25	320	**24131**	
60	0.25	320	**24132**	
15	1.0	80	**24206-U**	
30	1.0	80	**24207**	
60	1.0	80	**24208**	
0.53mm ID FUSED SILICA				
15	0.50	265	**25326**	
30	0.50	265	**25327**	
60	0.50	265	**25386**	

SPB-225

This bonded, crosslinked (50% cyanopropylphenyl) methylpolysiloxane, intermediate-high polarity phase is excellent for separations of cis and trans FAMEs.

This column meets USP G7 and G19 requirements.

Operating Conditions: Columns can be rinsed.

Phase: bonded; (50% cyanopropylphenyl) methylpolysiloxane
Temp. Limits: 45°C to 220/240°C

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
30	0.15	417	**24334**	
30	0.25	250	**24335**	
0.32mm ID FUSED SILICA				
30	0.15	533	**24336**	
30	0.25	320	**24337**	

SP-2330

Substitution of the bis-cyanopropyl and phenyl groups on the polymer backbone provides the phase with both polar and polarizable characteristics. These columns (and all high cyanopropyl-substituted polymers) are useful for both high and low temperature separations of samples such as geometric isomers of fatty acid methyl esters, dioxins, and aromatic compounds.

This column meets USP G8 requirements.

Operating Conditions: More susceptible to damage by oxygen, moisture, and HCl than other silicone phases. Avoid solvents such as water and methanol when using on-column injection techniques. Columns should not be rinsed.

Phase: nonbonded; poly(80% biscyanopropyl/ 20% cyanopropylphenyl siloxane
Temp. Limits: subambient to 250°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 382 610 506 710 591

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.20	313	**24018**	
30	0.20	313	**24019**	
60	0.20	313	**24020-U**	
0.32mm ID FUSED SILICA				
15	0.20	320	**24102-U**	
30	0.20	320	**24073**	
60	0.20	320	**24074**	

SP-2380

Between the traditional nonbonded cyanosilicone phases SP-2330 and SP-2340 in polarity. The high polarity of this phase allows the separation of geometric (cis/trans) fatty acid methyl ester isomers as a group. Stabilized phase with a maximum temperature slightly higher than SP-2330 or SP-2340. Significantly more stable than SP-2330.

This column meets USP G48 requirements.

Operating Conditions: More susceptible to damage by oxygen, moisture, and HCl than other silicone phases. Avoid solvents such as water and methanol when using on-column injection techniques. Columns should not be rinsed.

Phase: stabilized poly(90% biscyanopropyl/ 10% cyanopropylphenyl siloxane)
Temp. Limits: subambient to 275°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 402 629 520 744 623

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.20	313	**24109**	
30	0.20	313	**24110-U**	
60	0.20	313	**24111**	
0.32mm ID FUSED SILICA				
30	0.20	320	**24116-U**	
60	0.20	320	**24117**	
0.53mm ID FUSED SILICA				
30	0.20	663	**25319**	

SP-2340

The highest polarity of any of the general purpose cyanosilicone phases. As with all cyano phase columns, these columns are useful for both high and low temperature separations of samples such as geometric isomers of fatty acid methyl esters, dioxins, and aromatic compounds.

This column meets USP G5 requirements.

Operating Conditions: More susceptible to damage by oxygen, moisture, and HCl than other silicone phases. Avoid solvents such as water and methanol when using on-column injection techniques. Columns should not be rinsed.

Phase: nonbonded; poly(biscyanopropyl siloxane)
Temp. Limits: subambient to 250°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 419 654 541 758 637

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID FUSED SILICA				
15	0.20	313	**24021**	
30	0.20	313	**24022**	
60	0.20	313	**24023**	
0.32mm ID FUSED SILICA				
15	0.20	320	**24138**	
30	0.20	320	**24075**	
60	0.20	320	**24076**	

Capillary GC
Special Purpose Columns (Chiral)

α-DEX 120

α-DEX 120 columns provide unique selectivity for enantiomeric separations of small molecules; also recommended for separating positional isomers (phenols, xylenes, etc.).

Phase: nonbonded; 20% permethylated α-cyclodextrin in SPB-35 poly(35% phenyl/65% dimethylsiloxane)

β-DEX 110, β-DEX 120

We recommend β-DEX columns for enantiomeric separations of a wide range of chiral compounds (ketones, esters, alkanes, alkenes, alcohols, acids, ethers, etc.). The 10% (β-DEX 110) and 20% (β-DEX 120) β-cyclodextrin content alters the elution order while maintaining similar enantioselectivity.

Phase: nonbonded; 10% and 20% permethylated β-cyclodextrin in SPB-35 poly(35% diphenyl/ 65% dimethylsiloxane)

γ-DEX 120

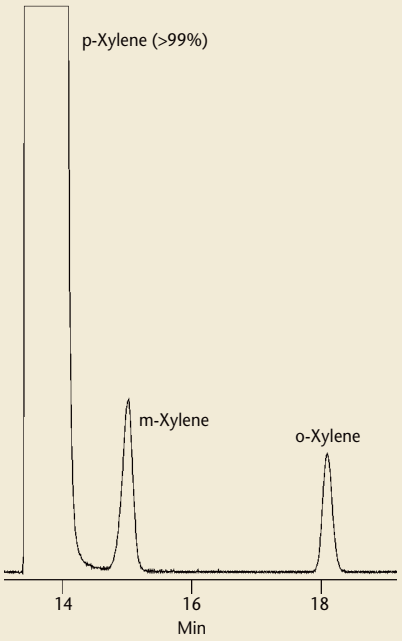
Because the elution order of the members of a chiral pair frequently reverses (enantioreversal) on a γ-DEX column, compared to the elution order on an α-DEX or β-DEX column, we recommend γ-DEX columns as complements to α-DEX and β-DEX columns.

Phase: nonbonded; 20% permethylated γ-cyclodextrin in SPB-35 poly(35% diphenyl/65% dimethylsiloxane)

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
α-DEX 120				
0.25mm ID FUSED SILICA				
30	0.25	250	**24310**	
β-DEX 110				
0.25mm ID Fused Silica				
30	0.25	250	**24301**	
60	0.25	250	**24302**	
β-DEX 120				
0.25mm ID Fused Silica				
30	0.25	250	**24304**	
60	0.25	250	**24305-U**	
γ-DEX 120				
0.25mm ID Fused Silica				
30	0.25	250	**24307**	

Temperature limits for all DEX columns: 30°C to 230°C.

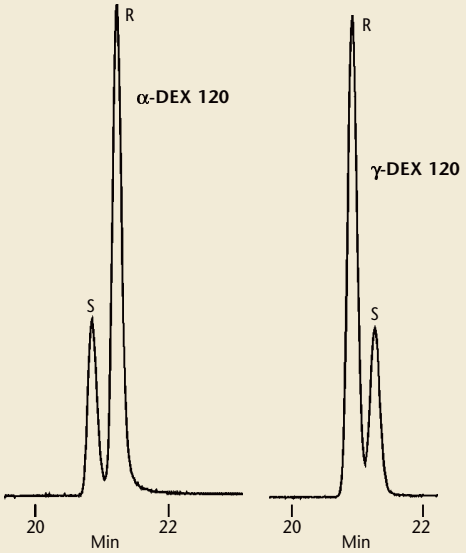
Resolve positional isomers in highly disproportionate mixtures



794-0648

Column: **α-DEX 120, 30m x 0.25mm ID, 0.25µm film**
Cat. No.: **24310**
Oven: 50°C
Carrier: helium, 30cm/sec
Det.: FID, 300°C
Inj.: 0.6µL each analyte (neat), split (100:1), 80°C

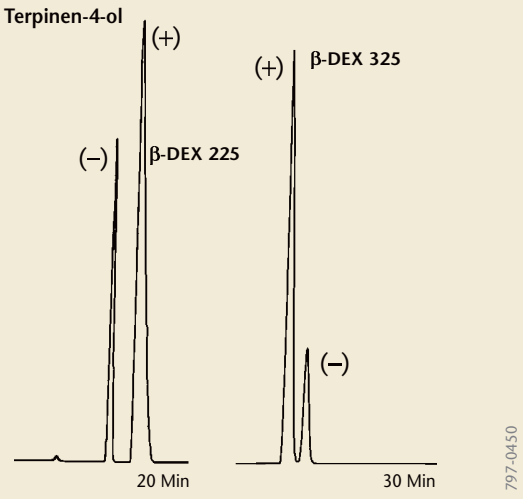
Use γ-DEX to reverse elution order for many compounds (methyl mandelate shown)



794-0282,0283

Column: **α-DEX 120 and γ-DEX 120, 30m x 0.25mm ID, 0.25µm film**
Cat. No.: **24310 (α-DEX 120), 24307 (γ-DEX 120)**
Oven: 130°C
Carrier: helium, 35cm/sec
Det.: FID, 300°C
Inj.: 1µL methylene chloride (1mg/mL each analyte), split (100:1), 250°C

Selection kits offer the greatest likelihood of providing the separation you want



Column: **β-DEX 225 and β-DEX 325, 30m x 0.25mm ID, 0.25µm film**
Cat. No.: **24348** (β-DEX 225), **24308** (β-DEX 325)
Oven: 100°C
Carrier: helium, 25cm/sec
Det.: FID, 300°C
Inj.: 1µL methylene chloride (1mg/mL), split 100:1, 250°C

Cyclodextrin Column Selection Kits

These kits provide the tools you need to perform most chiral separations. Confirm identities of enantiomers by monitoring elution order changes (enantioreversal) from one column to another. In combination, the columns in the two kits span the full range of DEX column enantioselectivity, at substantial savings relative to purchasing individual columns.

Kit I: one 30m x 0.25mm ID, 0.25µm film column of each type: α-DEX 120, β-DEX 120, γ-DEX 120.

Kit II: one 30m x 0.25mm ID, 0.25µm film column of each type: β-DEX 120, β-DEX 225, γ-DEX 225, β-DEX 325.

DESCRIPTION	CAT. NO.	PRICE
Chiral Column Kit I	**24340**	
Chiral Column Kit II	**24328-U**	

RELATED INFORMATION

Request free literature by phone or fax, or see our website.

No.	Subject
T194877	*Chiral applications/selection guide*
T499055	*Using DEX Column Selection Kit II*

DEX-225 and DEX-325 Columns

It is difficult to predict the best phase for a given chiral or positional isomer separation, so we offer a broad range of DEX selectivities. We prepare DEX-225 and DEX-325 columns using dimethyl- and diacetyl-derivatized cyclodextrins. These columns can separate volatile chiral molecules, including alcohols, aldehydes, carboxylic acids, epoxides, esters, and halogenated compounds. We are continually developing specific applications on all our cyclodextrin columns, and suggest that you regularly consult our Web site for the most current chiral applications.

α-DEX 225

Phase: nonbonded; 25% 2,3-di-O-acetyl-6-O-TBDMS-α-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

β-DEX 225

These columns provide unique selectivity for enantiomeric separations of small molecules: alcohols, aldehydes (e.g., 2-phenylpropionaldehyde), esters (e.g., methyl malate, methyl lactate), flavor compounds, and ketones.

Phase: nonbonded; 25% 2,3-di-O-acetyl-6-O-TBDMS-β-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

γ-DEX 225

Phase: nonbonded; 25% 2,3-di-O-acetyl-6-O-TBDMS-γ-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

α-DEX 325

Phase: nonbonded; 25% 2,3-di-O-methyl-6-O-TBDMS-α-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

β-DEX 325

Phase: nonbonded; 25% 2,3-di-O-methyl-6-O-TBDMS-β-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

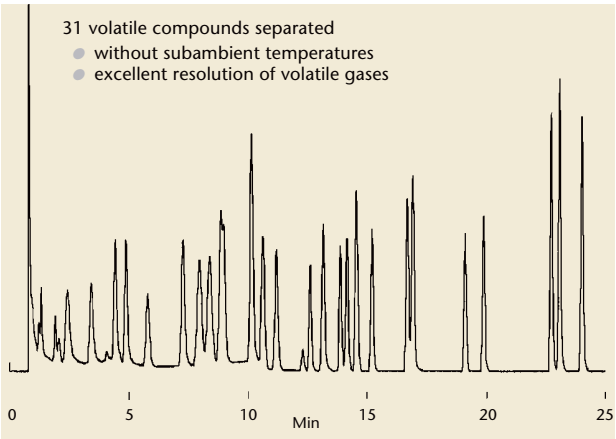
γ-DEX 325

Phase: nonbonded; 25% 2,3-di-O-methyl-6-O-TBDMS-γ-cyclodextrin in SPB-20 poly(20% phenyl/80% dimethylsiloxane)

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
α-DEX 225				
30	0.25	250	**24311**	
β-DEX 225				
30	0.25	250	**24348**	
γ-DEX 225				
30	0.25	250	**24312**	
α-DEX 325				
30	0.25	250	**24303**	
β-DEX 325				
30	0.25	250	**24308**	
γ-DEX 325				
30	0.25	250	**24306**	

Fused silica columns, 0.25mm ID

Capillary GC
Special Purpose Columns (Environmental)



Column: **VOCOL, 30m x 0.53mm ID, 3.0µm film**
Cat. No.: **25320-U**
Oven: 5°C (2 min) to 200°Cat 5°C/min
Carrier: helium, 7.5mL/min
Det.: MS, Scan Range m/z = 35-260 at 0.6 sec/scan
Inj.: 11min, 40mL/min, Dry Purge 3min, Desorb 250°C, 4 min

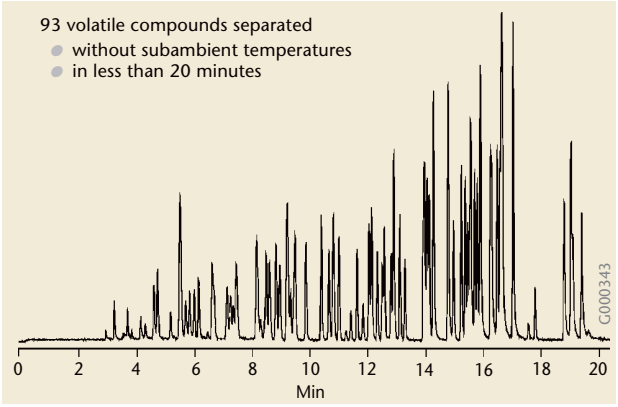
Proprietary bonded phase

Volatiles: VOCOL

These intermediate polarity columns, designed for volatile organic compounds (VOCs) analysis, ensure greater retention and resolution of the more volatile compounds. Use in direct injection ports or coupled to purge-and-trap systems, for US EPA volatiles methods, including 502.2, 524.2, 624, 8240, 8260, and 8021.

Temp. Limits: subambient to 250°C (1.5µm film) or 230°C (3µm film)

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.20mm ID Fused Silica				
10	1.2	42	**24129-U**	
0.25mm ID Fused Silica				
30	1.5	42	**24205-U**	
60	1.5	42	**24154**	
0.32mm ID Fused Silica				
60	1.8	44	**24217-U**	
60	3.0	27	**24157**	
0.53mm ID Fused Silica				
30	3.0	44	**25320-U**	
60	3.0	44	**25381**	
105	3.0	44	**25358**	



Column: **SPB-624, 75m x 0.53mm ID, 3µm film**
Cat. No.: **25432**
Oven: 40°C (2 min) to 65°C at 5°/min, to 155°C at 12°/min, to 210°C at 25°/min
Carrier: helium, 10mL/min
Det.: MSD, m/z = 35-260
Inj.: Purge 11 min, Dry Purge 3min, Desorb 250°C, 5 min

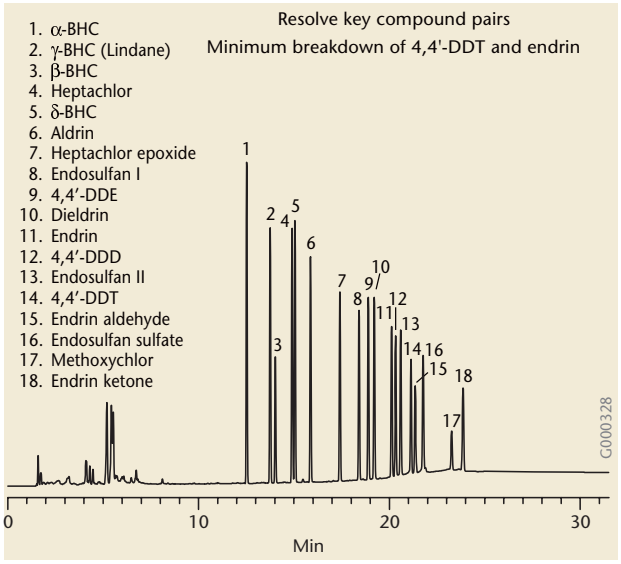
Proprietary bonded phase

Volatiles: SPB-624

For purge-and-trap analyses of volatile compounds - Specially tested for separation, efficiency, and baseline bleed. Designed for purge-and-trap analyses of volatile halogenated, nonhalogenated and aromatic contaminants from air, drinking and waste water, and soil. SPB-624 columns meet the requirements of various US EPA methods: CLP-VOA, 502.2, 524.2, 601, 602, 624, 1624, TO-1, TO-2, TO-3, TO-14, 5041, 8010, 8015, 8020 and 8260.

Temp. Limits: subambient to 250°C (1.4µm or 1.8µm film) or 230°C (3.0µm film)

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	1.4	44	**24255**	
60	1.4	44	**24256**	
0.32mm ID Fused Silica				
60	1.8	44	**24251**	
0.53mm ID Fused Silica				
30	3.0	44	**25430**	
75	3.0	44	**25432**	



Column: **SPB-608, 30m x 0.25mm ID, 0.25µm film**
Cat. No.: **24103-U**
Oven: 150°C (4 min) to 290°C at 8°C/min, hold 10 min
Carrier: helium, 38cm/sec, set at 150°C
Det.: ECD, 300°C
Inj.: 1µL (0.4µg/mL each analyte), on-column, 220°C

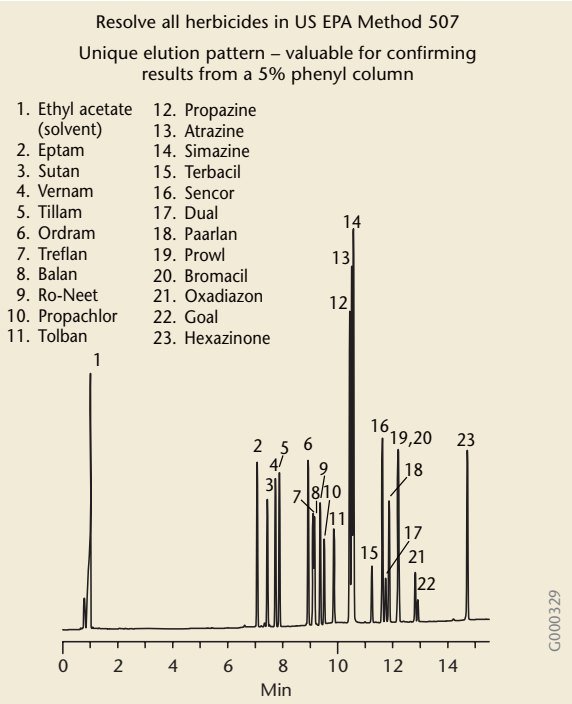
Pesticides/Herbicides: SPB-608

Proprietary bonded phase

For chlorinated pesticides - Specially tested with low concentrations of 18 chlorinated pesticides, with an electron capture detector (ECD). These columns meet the criteria for minimum breakdown of 4,4'-DDT and endrin for US EPA Methods 508, 608, 8080, 8081, and SW-Pesticides.

Temp. Limits: subambient to 300°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.25	250	**24103-U**	
0.53mm ID Fused Silica				
15	0.50	265	**25310-U**	
30	0.50	265	**25312**	



Column: **Sup-Herb, 15m x 0.53mm ID, 0.5µm film**
Cat. No.: **25322**
Oven: 60°C (1 min) to 280°C at 16°C/min
Carrier: helium, 5mL/min
Det.: NPD, 300°C
Inj.: 0.5µL 22 Herbicides Mix (5µg/mL each analyte in ethyl acetate), direct, 220°C

Pesticides/Herbicides: Sup-Herb

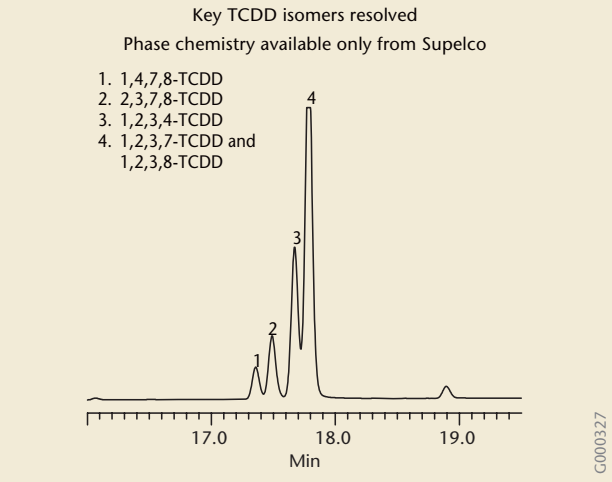
Specially tested intermediate polarity column for analyses of herbicides, per US EPA Method 507.

Temp. Limits: subambient to 300°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.53mm ID Fused Silica				
15	0.50	265	**25322**	

Capillary GC

Special Purpose Columns (Environmental, Air Monitoring, High Temperature)



Column: **SP-2331, 60m x 0.32mm ID, 0.2µm film**
Cat. No.: **24105-U**
Oven: 200°C (1 min) to 250°C at 3°C/min, hold 10 min
Carrier: helium, 30cm/sec (set at 200°C)
Det.: ECD, 270°C
Inj.: 1µL TCDD PE Mix (1.5µg/mL each analyte in n-dodecane), on-column, 200°C

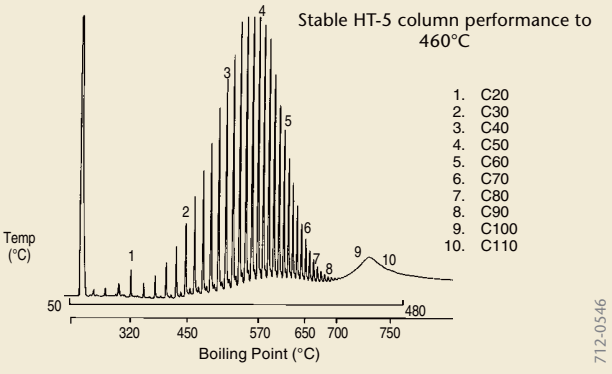
Proprietary stabilized phase

Dioxins: SP-2331

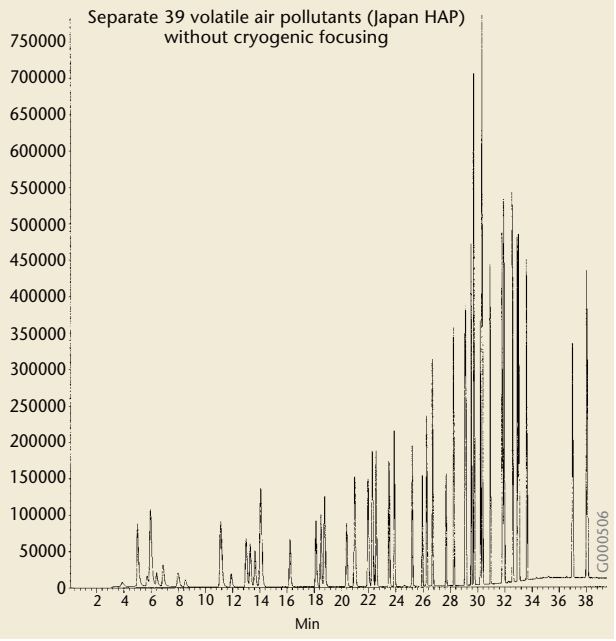
For TCDD (dioxin) isomers - A highly polar cyanosilicone stationary phase, specially tested for analyses of TCDD isomers. The phase is stabilized, providing a maximum temperature slightly higher than nonbonded cyanosilicone phases, such as SP-2330.

Temp. Limits: subambient to 275°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.20	313	**24257**	
60	0.20	313	**24104-U**	
0.32mm ID Fused Silica				
60	0.20	400	**24105-U**	



Column: **HT-5, 6m x 0.53mm ID, 0.10µm film**
Cat. No.: **25004**
Oven: 50°C to 480°C at 10°C/min
Inj.: on-column



Column: **SPB-HAP, 60m x 0.32mm ID, 4.0µm film**
Cat. No.: **25020-U**
Oven: 35°C (8 min) to 230°C at 8°C/min, hold 10 min
Carrier: helium, 2.5mL/min
Det.: FID, 250°C
Inj.: thermal desorption

Air Monitoring: SPB-HAP

For hazardous air pollutants - This column was developed to provide the best resolution of very volatile, regulated components. The thick film focuses analyses on the front of the column, without cryogenic focusing.

Phase: bonded poly(dimethylsiloxane)
Temp. Limits: -60°C to 300°C

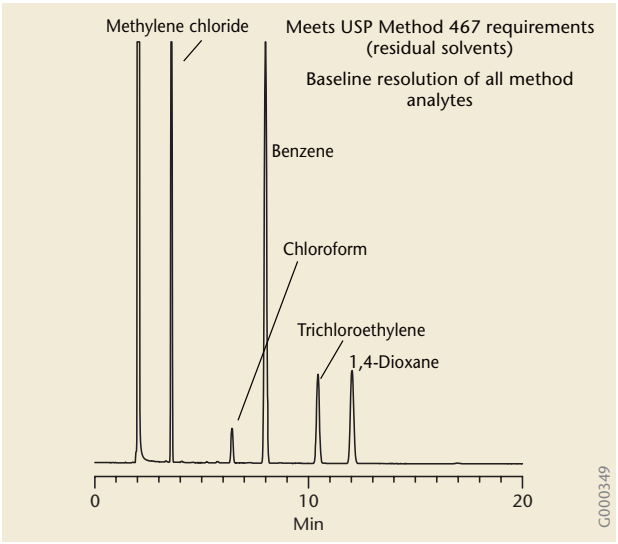
LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.32mm ID Fused Silica				
60	4.0	20	**25020-U**	

High Temperature: HT-5

For highest-temperature separations - SGE aluminum-clad columns coated with a carborane phase, offering the highest maximum temperature of any commercially available column. They display low bleed for GC/MS and simulated distillation analyses.

Phase: bonded; siloxane-carborane (5% phenyl equivalent)
Temp. Limits: 10°C to 460°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.32mm ID Fused Silica				
12	0.10	800	**25002**	
25	0.10	800	**25003**	
0.53mm ID Fused Silica				
6	0.10	1325	**25004**	
12	0.15	883	**25005-U**	



Column: **OVI-G43, 30m x 0.53mm ID, 3.0µm film**
Cat. No.: **25396**
Oven: 40°C
Carrier: helium, 35cc/min
Det.: FID, 260°C
Inj.: 1µL, direct, 140°C

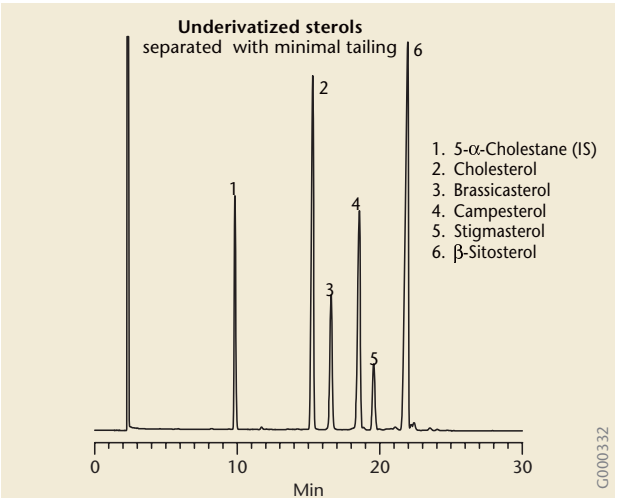
Solvents: OVI-G43

For USP Analysis of organic volatile impurities (OVIs) - This column is specially prepared and tested to meet the requirements of United States Pharmacopoeia (USP) Method 467 and the European Pharmacopoeia general method for determining residual organic solvents in pharmaceutical preparations. Use this column to separate OVIs for research purposes or qualitative analysis. The USP and European Pharmacopoeia methods also specify using a deactivated 5-meter guard column.

This column meets USP G43 requirements.

Phase: bonded; poly(6% cyanopropylphenyl/ 94% dimethylsiloxane)
Temp. Limits: -20°C to 260°C

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.53mm ID Fused Silica				
30	3.0	44	**25396**	
Deactivated Guard Column for OVI-G43				
5m x 0.53mm ID			**25339**	
Other Columns for Residual Solvents Analysis				
G27 (SPB-5) 30m x 0.53mm ID, 5.0µm			**25347**	
G16 (SUPELCOWAX 10) 30m x 0.53mm ID, 1.0µm			**25301-U**	



Column: **SAC-5, 30m x 0.25mm ID, 0.25µm film**
Cat. No.: **24156**
Oven: 285°C
Carrier: helium, 25cm/sec, set at 265°C
Det.: FID, 300°C
Inj.: 1µL Sterol Standard Test Mix (25mg/mL total analytes in methylene chloride), split (100:1), 300°C

Steroids: SAC-5

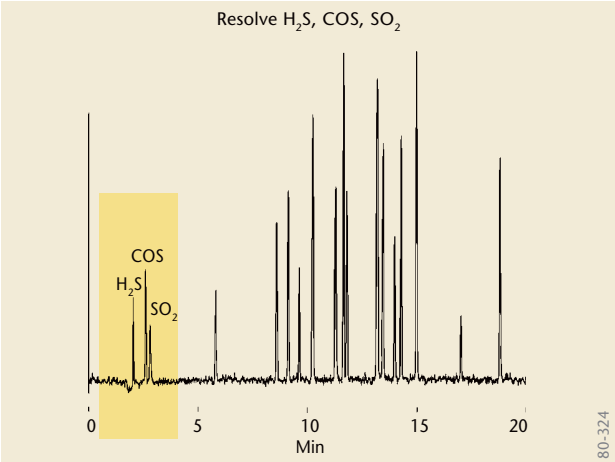
An SE-54 type phase, developed and tested for reproducible analyses of plant sterols, cholesterol, and other animal sterols.

Phase: bonded; poly(5% diphenyl/ 95% dimethylsiloxane)
Temp. Limits: -60°C to 320°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 19 74 64 93 62

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
15	0.25	250	**24151**	
30	0.25	250	**24156**	

Capillary GC

Special Purpose Columns (Sulfur Compounds, SCOT Columns)



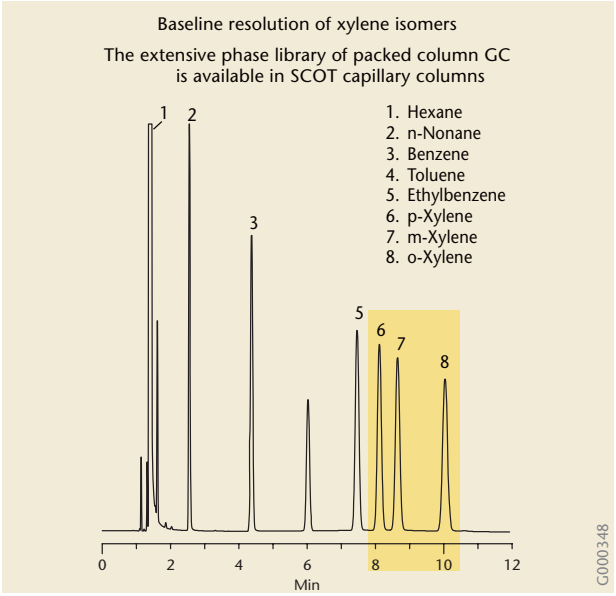
Column: **SPB-1 SULFUR, 30m x 0.32mm ID, 4µm film**
Cat. No.: **24158**
Oven: -10°C (3min) to 300°C at 10°C/min
Carrier: helium, 20cm/sec
Det.: sulfur chemiluminescence
Inj.: 0.1mL sulfur gas standard, split 10:1

Sulfur Compounds (Volatile): SPB-1 SULFUR

A very thick film version of our SPB-1 columns, specially developed for analyses of sulfur gases and other volatile sulfur compounds. The column displays relatively low column bleed, even for the exceptionally thick film (4µm) of stationary phase, which makes it compatible for use with the Sievers Sulfur Chemiluminescence Detector (SCD) and other sulfur-specific detectors.

Phase: bonded; poly(dimethylpolysiloxane)
Temp. Limits: -60°C to 300°C

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.32mm ID Fused Silica				
30	4.0	20	**24158**	



Column: **Bentone 34/DNDP SCOT, 50′ x 0.02″ ID**
Cat. No.: **25521**
Oven: 90°C
Carrier: helium, 27cm/sec, set at 90°C
Det.: 220°C
Inj.: 220°C

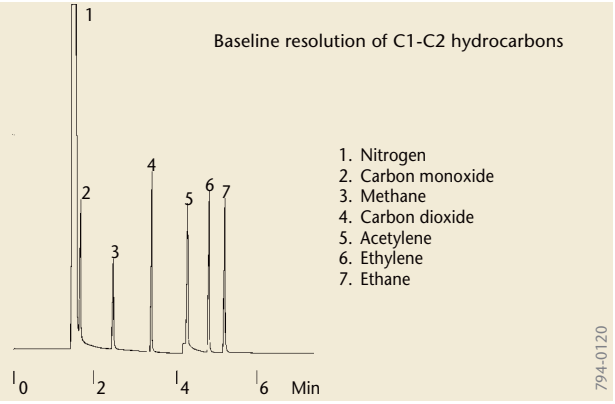
Gases: SCOT Stainless Steel

Support-coated open tubular (SCOT) columns are prepared by depositing a layer of liquid phase-coated support particles on the inner wall of the tubing. This technology, developed by PerkinElmer, makes available many phases that cannot be obtained on conventional wall-coated open tubular capillary columns. SCOT columns combine the sensitivity and excellent sample resolution of capillary GC with the extensive stationary phase library of packed column GC.

50' x 1/32" OD x 0.02" ID with 1/16" connections

LIQUID PHASE	MAX. TEMP. (°C)	BETA	CAT. NO.	PRICE
Stainless Steel SCOT Columns				
Bentone 34/DNDP[2]	150	45	**25521**	
BMEA	100	40	**25538**	
Squalane	120	50	**25535**	
TCEP	150	40	**25536**	

[2] Di-n-decylphthalate

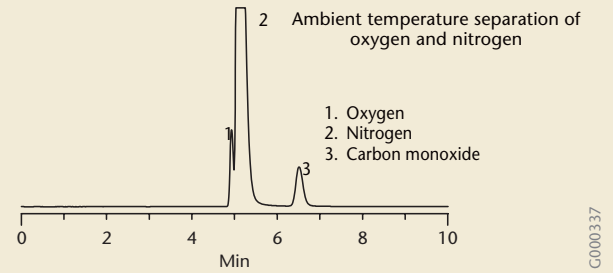


Column: **Carboxen-1006 PLOT, 30m x 0.53mm ID**
Cat. No.: **25461**
Oven: 35°C (5min) to 225°C at 24°C/min

Gases: Carboxen-1006 PLOT[1]

For permanent gases and C1 – C3 light hydrocarbons - The porous carbon molecular sieve (surface area ~ 750m²/gram) in Carboxen-1006 porous layer open tubular (PLOT) columns separates permanent gases and C1, C2, and C3 light hydrocarbons, using above-ambient initial temperatures. The columns also are ideal for resolving formaldehyde/water/methanol (formalin) mixtures and monitoring impurities in ethylene. Use Carboxen-1006 columns with high flow rates and rapid temperature programs, up to 250°C, to ensure excellent, fast separations.

DIMENSIONS (FUSED SILICA)	MAX. TEMP. (°C)	CAT. NO.	PRICE
30m x 0.32mm ID	250	**24241-U**	
30m x 0.53mm ID[2]	250	**25461**	

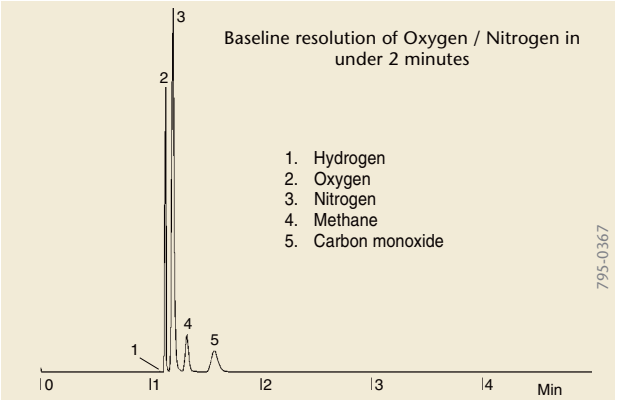


Column: **Carboxen-1010 PLOT, 30m x 0.53mm ID**
Cat. No.: **25467**
Oven: 35°C

Gases: Carboxen-1010 PLOT[1]

For permanent gases, C2 and C3 hydrocarbons - A carbon molecular sieve column for separating hydrogen, nitrogen, carbon monoxide, methane, carbon dioxide, and C2 and C3 hydrocarbons. Oxygen is separated from nitrogen.

DIMENSIONS (FUSED SILICA)	MAX. TEMP. (°C)	CAT. NO.	PRICE
30m x 0.32mm ID	250	**24246**	
30m x 0.53mm ID[2]	250	**25467**	

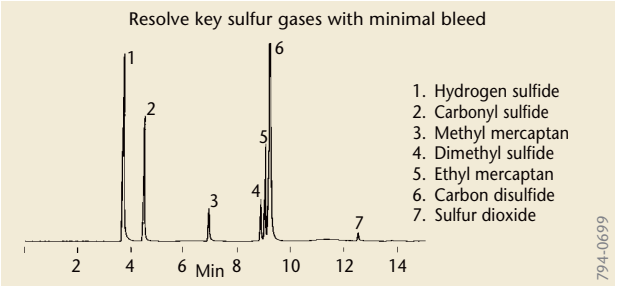


Column: **Mol Sieve 5A PLOT, 30m x 0.53mm ID**
Cat. No.: **25463**
Oven: 65°C, helium, 10mL/min.

Gases: Mol Sieve 5A PLOT[1]

For permanent gases - Oxygen, nitrogen, carbon monoxide and methane can be separated in less than 5 minutes. More difficult separations, such as argon from oxygen, can be achieved by using subambient temperatures (15°C or below).

DIMENSIONS (FUSED SILICA)	MAX. TEMP. (°C)	CAT. NO.	PRICE
30m x 0.32mm ID	300	**24243**	
30m x 0.53mm ID[2]	300	**25463**	



Column: **Supel-Q PLOT, 30m x 0.53mm ID**
Cat. No.: **25462**
Oven: 50°C (min) to 250°C at 10°C/min

Gases: Supel-Q PLOT[1]

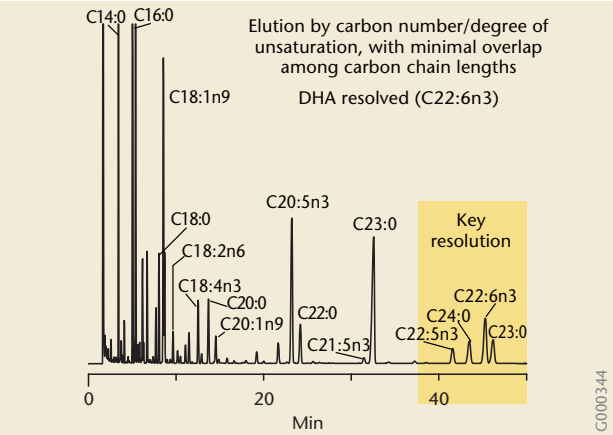
For many hydrocarbon and other compounds - Supel-Q PLOT columns contain a porous divinylbenzene polymer that effectively resolves carbon dioxide and C1-C4 hydrocarbons at above ambient temperatures. It also is suitable for analyses of other gases, such as sulfur gases, and alcohols, ketones, aldehydes, and many polar compounds. Gasoline and other petroleum fractions can be analyzed as well. These columns exhibit very little bleed, even at the maximum temperature. Relative to packed columns (e.g., Porapak-Q), Supel-Q PLOT columns offer better resolution in less time.

DIMENSIONS (FUSED SILICA)	MAX. TEMP. (°C)	CAT. NO.	PRICE
30m x 0.32mm ID	250	**24242**	
30m x 0.53mm ID[2]	250	**25462**	

[1] A proprietary procedure fixes particles to the fused silica tubing and ensures they will not be dislodged in normal use. Manufactured under US patents 5,599,445; 5,607,580; 5,609,756; 5,620,603; and 5,630,937.

[2] 0.53mm ID column can be used in packed column chromatographs.

Capillary GC
Special Purpose Columns (FAMES)



Column: **Omegawax 320, 30m x 0.32mm ID, 0.25µm film**
Cat. No.: **24152**
Oven: 200°C
Carrier: helium, 25cm/sec, set at 200°C(135-140cc/min split vent flow, 30cc/min nitrogen make-up gas)
Det.: FID, 260°C
Inj.: 1µL of Omegawax Test Mix (50mg FAMEs/mL hexane), split 100:1, 250°C

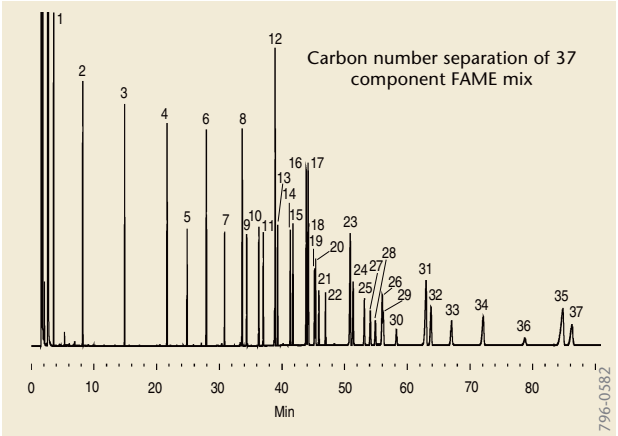
Fatty Acids (FAMEs): Omegawax

For omega 3 and 6 fatty acids - These columns were developed to provide highly reproducible analyses of fatty acid methyl esters, specifically the omega 3 and 6 fatty acids. The columns are checked for reproducibility of FAME equivalent chain length (ECL) values and resolution of key components.

This column meets USP G16 requirements.

Phase: bonded; poly(ethylene glycol)
Temp. Limits: 50°C to 280°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
OMEGAWAX 250				
0.25mm ID Fused Silica				
30	0.25	250	**24136**	
OMEGAWAX 320				
0.32mm ID Fused Silica				
30	0.25	320	**24152**	
OMEGAWAX 530				
0.53mm ID Fused Silica				
30	0.50	265	**25374**	



Column: **SPB-PUFA, 30m x 0.32mm ID, 0.20µm film**
Cat. No.: **24323**
Oven: 50°C (hold 2 min), 4°C/min to 210°C
Carrier: helium, 25cm/sec, set at isothermal temp.
Det.: FID, (2 x 10-11), 260°C
Inj.: 1µL of 37 Component FAME Mix (Cat. No. 47885-U), split 100:1, 250°C

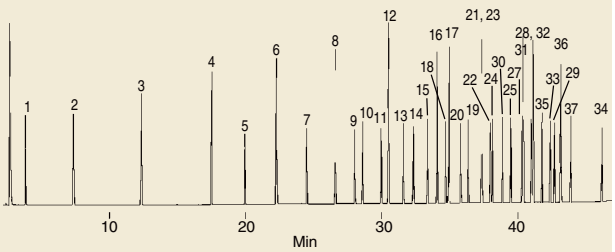
Fatty Acids (FAMEs): SPB-PUFA

For polyunsaturated fatty acid methyl esters - These columns provide highly reproducible analyses of polyunsaturated fatty acid methyl esters. The lower polarity poly (alkylene glycol) phase features improved "carbon number" separations, compared to poly(ethylene glycol) columns such as Omegawax columns and SUPELCOWAX 10 columns.

Phase: bonded; poly(alkylene glycol)
Temp. Limits: 50°C to 220°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.20	313	**24314**	
0.32mm ID Fused Silica				
30	0.20	400	**24323**	

Fast carbon number separation of 37 component FAME mix



Component (acid methyl esters)	Weight %	Component (acid methyl esters)	Weight %
1. C4:0 (Butyric)	4	22. C18:3n3 (α-Linolenic)	2
2. C6:0 (Caproic)	4	23. C20:0 (Arachidic)	4
3. C8:0 (Caprylic)	4	24. C20:1n9 (*cis*-11-Eicosenoic)	2
4. C10:0 (Capric)	4	25. C20:2 (*cis*-11,14-Eicosadienoic)	2
5. C11:0 (Undecanoic)	2	26. C20:3n6 (*cis*-8, 11,14-Eicosatrienoic)	2
6. C12:0 (Lauric)	4	27. C20:3n3 (*cis*-11, 4,17-Eicosatrienoic)	2
7. C13:0 (Tridecanoic)	2	28. C20:4n6 (Arachidonic)	2
8. C14:0 (Myristic)	4	29. C20:5n3 (*cis*-5, 8,11,14,17-Eicosapentaenoic)	2
9. C14:1 (Myristoleic)	2	30. C21:0 (Henicosanoic)	2
10. C15:0 (Pentadecanoic)	2	31. C22:0 (Behenic)	4
11. C15:1 (*cis*-10-Pentadecenoic)	2	32. C22:1n9 (Erucic)	2
12. C16:0 (Palmitic)	6	33. C22:2 (*cis*-13, 16-Docosadienoic)	2
13. C16:1 (Palmitoleic)	2	34. C22:6n3 (*cis*-4,7,10, 13,16,19-Docosahexaenoic)	2
14. C17:0 (Heptadecanoic)	2	35. C23:0 (Tricosanoic)	2
15. C17:1 (*cis*-10-Heptadecenoic)	2	36. C24:0 (Lignoceric)	4
16. C18:0 (Stearic)	4	37. C24:1n9 (Nervonic)	2
17. C18:1n9c (Oleic)	4		
18. C18:1n9t (Elaidic)	2		
19. C18:2n6c (Linoleic)	2		
20. C18:2n6t (Linolelaidic)	2		
21. C18:3n6 (γ-Linolenic)	2		

795-0781

Column: **SP-2380, 30m x 0.25mm ID, 0.20µm film**
Cat. No.: **24110-U**
Oven: 50°C (2 min) to 250°C at 4°C/min, hold 15 min
Carrier: helium, 20cm/sec, 150°C
Det.: FID, 260°C
Inj.: 1µL of Supelco 37 Component FAME Mix (Cat. No. 47885-U, 10mg/mL total), split 100:1, 250°C

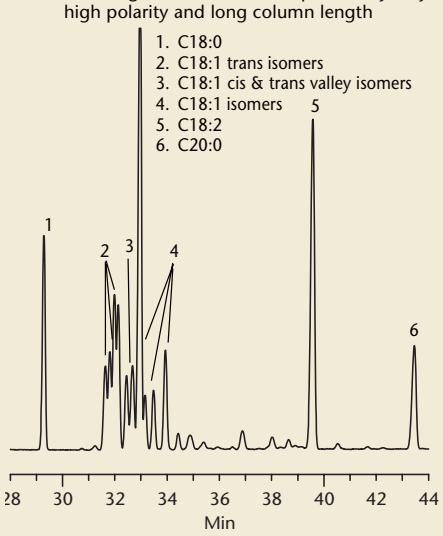
Fatty Acids (FAMEs): SP-2380

For separations by carbon number - This column was developed for high resolution and efficiency, and fast analyses of positional and geometric isomers of fatty acid methyl esters.

Phase: stabilized poly(90% biscyanopropyl/ 10% cyanopropylphenyl siloxane)
Temp. Limits: subambient to 275°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
100	0.20	313	**24317**	

Positional and geometric isomers separated by very high polarity and long column length



G000345

Column: **SP-2560, 100m x 0.25mm, 0.20µm film**
Cat. No.: **24056**
Oven: 170°C
Carrier: helium, 20cm/sec, set at 170°C
Det.: FID, 200°C
Inj.: 1µL positional cis/trans standard (Cat. No. 45170) (5.0mg/mL FAME isomers in methylene chloride), split 100:1, 200°C

Fatty Acids (FAMEs): SP-2560

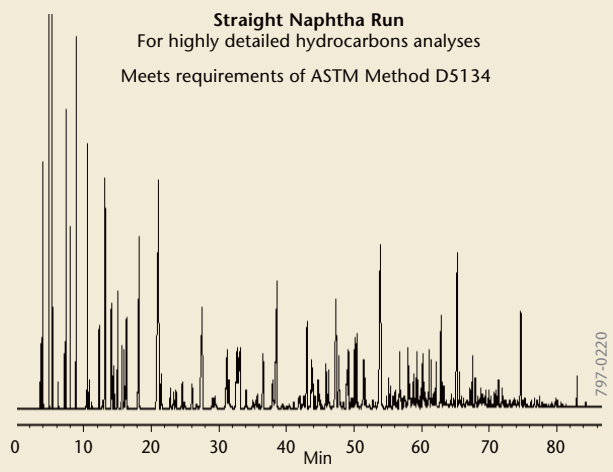
For cis/trans positional isomers - Specially prepared and tested columns, designed to separate geometric-positional (cis/trans) isomers of fatty acid methyl esters. Recommended for separating FAMEs in hydrogenated vegetable oil samples.

Phase: nonbonded; biscyanopropyl polysiloxane
Temp. Limits: subambient to 250°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
100	0.20	313	**24056**	

Capillary GC

Special Purpose Columns (Petroleum - Hydrocarbons, MTBE)



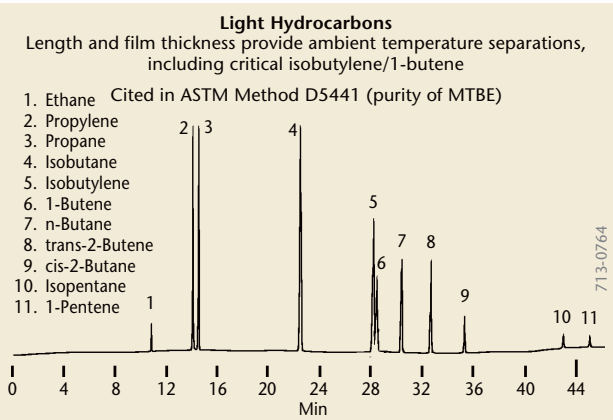
Column: **Petrocol DH 50.2, 50m x 0.20mm ID x 0.50µm film**
Cat. No.: **24133-U**
Oven: 35°C (30min) to 200°C (20min) at 2°C/min

Hydrocarbons: Petrocol DH 50.2

For detailed hydrocarbons analyses - A narrow bore column for detailed hydrocarbon analyses of naphthas, gasolines, and similar samples, according to ASTM Test Method D5134.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: -60°C to 320°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.20mm ID Fused Silica				
50	0.50	100	**24133-U**	

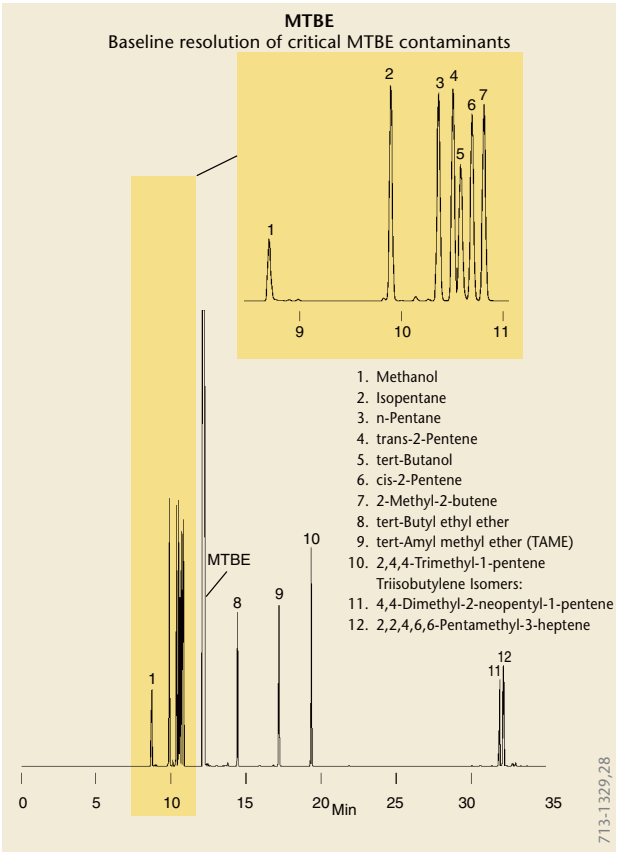


Column: **Petrocol DH 150, 150m x 0.25mm ID, 1.0µm film**
Cat. No.: **24155**
Oven: -20°C (30min) to 75°C at 5°C/min

Hydrocarbons: Petrocol DH 150

For detailed hydrocarbons analyses - The longest capillary column commercially available as a stock item. Columns typically display more than 600,000 theoretical plates. For detailed purity analyses of light hydrocarbon gases and petroleum products (oxygenates, solvents, naphthas, gasolines, etc.).

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
150	1.0	63	**24155**	



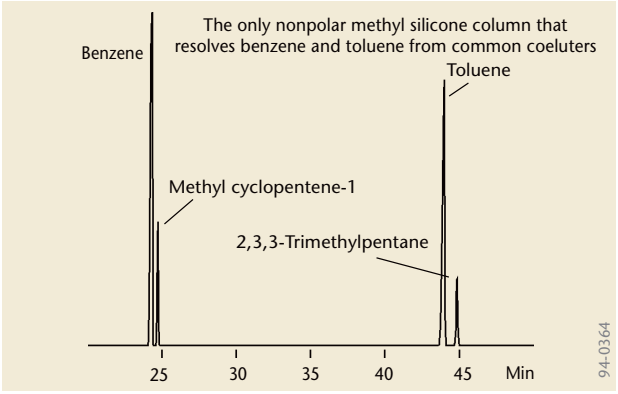
Column: **Petrocol DH, 100m x 0.25mm ID, 0.50µm film**
Cat. No.: **24160-U**
Oven: 50°C (13 min) to 180°C at 10°C/min
Carrier: helium, 20cm/sec; vent flow 140mL/min (set at 35°C)
Det.: FID (310°C)
Inj.: 1µL MTBE containing 1% each analyte (MTBE Contaminants Mix A, Cat. No. 47942) split (200:1) (250°C)

Hydrocarbons: Petrocol DH

For PNA, PONA, PIANO-type analyses - A highly reproducible column displaying more than 400,000 theoretical plates, designed for detailed analyses of petroleum products. Includes an extensive retention index data sheet of 400+ analytes.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: -60°C to 320°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
100	0.50	125	**24160-U**	



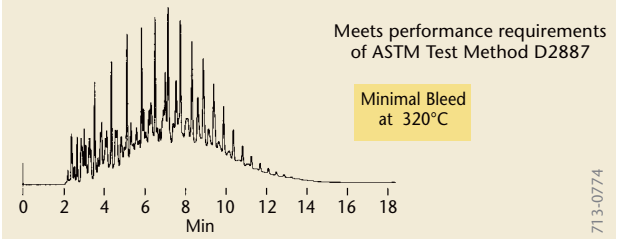
Column: **Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film**
Cat. No.: **24282**
Oven: 35°C (15min hold) to 200°C (15min hold)at 1°C/min
Det.: FID, 260°C
Inj.: 1µL, split (215:1), 250°C

Hydrocarbons: Petrocol DH Octyl

For detailed analyses of petroleum products - This highly reproducible column offers unique selectivity not obtainable with poly(dimethylsiloxane) columns, such as baseline separations of benzene/1-methylcyclopentene and toluene/2,3,3-trimethylpentane.

Phase: bonded; poly(50% n-octyl/50% methylsiloxane)
Temp. Limits: -60°C to 220°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
100	0.50	125	**24282**	



Column: **Petrocol 2887, 5m x 0.53mm ID, 5.0µm film**
Cat. No.: **25323**
Oven: -20°C to 320°C at 20°C/min, hold 5 min
Carrier: nitrogen, 6mL/min
Det.: FID
Inj.: 0.1µL Cat. No. 48873, direct (350°C)

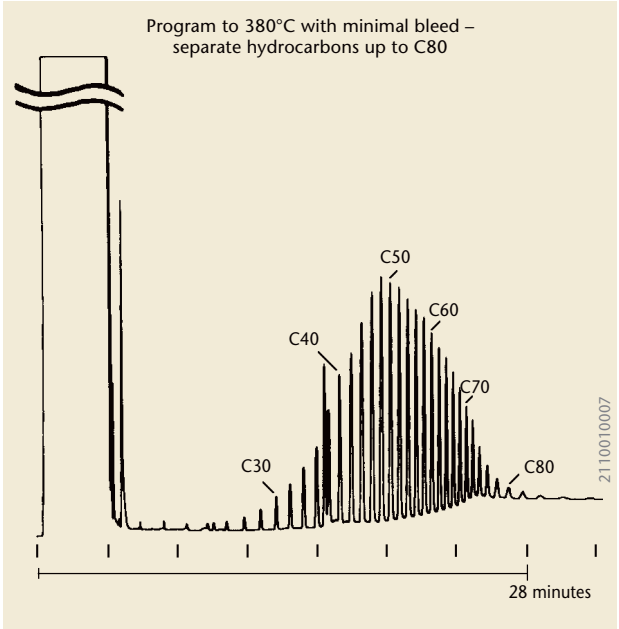
SIMDIS: Petrocol 2887

For ASTM Test Method D2887 - Developed and tested to meet or exceed column performance requirements for simulated distillation of petroleum fractions having boiling points up to 1000°F, according to ASTM Test Method D2887.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: subambient to 350°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.53mm ID Fused Silica				
5[1]	0.50	265	**25323**	

[1] 5" cage



Column: **Petrocol EX2887, 5m x 0.53mm ID, 0.10µm film**
Cat. No.: **25337**
Oven: 50°C (3min) to 380°C at 15°C/min
Carrier: helium, 5mL/min
Det.: FID, 400°C
Inj.: 0.2µL (10mg/mL Polywax 655 in p-xylene), cool on-column injection

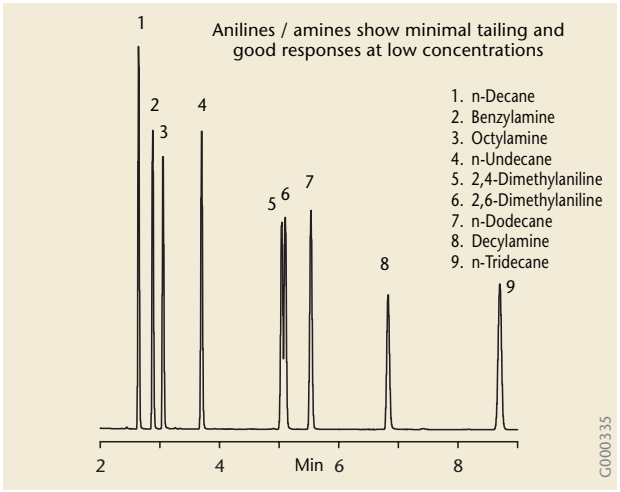
SIMDIS: Petrocol EX2887

For extended ASTM Test Method D2887 - A thin film version of the Petrocol 2887 column, developed for extended D2887 SIMDIS analysis of samples having final boiling points greater than 1000°F.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: subambient to 380°C

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.53mm ID Fused Silica				
5	0.10	1325	**25337**	

Capillary GC
Special Purpose Columns (Amines, Aromatics)



Column: **PTA-5, 30m x 0.25mm ID, 0.5µm film**
Cat. No.: **24277**
Oven: 128°C
Carrier: helium, 40cm/sec
Det.: FID, 220°C
Inj.: 1µL PTA-5 Test Mix (500µg/mL each analyte in methyl tert butyl ether), split (100:1), 220°C

Amines: PTA-5

This column is a specially prepared, base-deactivated poly(5% diphenyl/95% dimethylsiloxane) column designed for analyses of amines and other basic analytes.

Phase: bonded; base-modified poly(5% diphenyl/95% dimethylsiloxane)
Temp. Limits: -60°C to 320°C

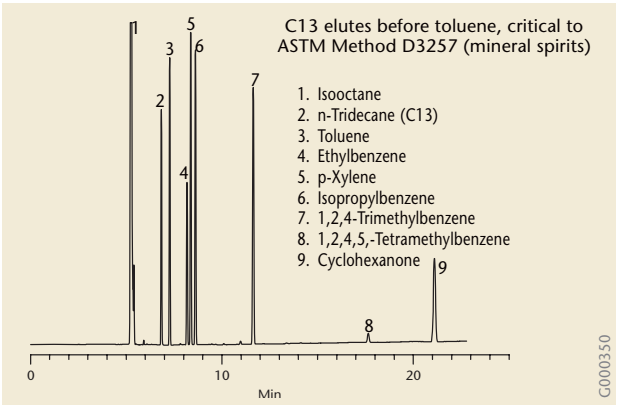
LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.50	125	**24277**	
30	1.0	625	**24330**	
0.32mm ID Fused Silica				
30	0.5	160	**24331**	
30	1.0	80	**24332**	
30	1.5	53	**24333**	
0.53mm ID Fused Silica				
30	0.5	265	**25437**	
30	1.5	88	**25438**	
30	3.0	44	**25439**	

Amines: Carbowax Amine

For primary, secondary, and tertiary amines - The Carbowax Amine column is a specially prepared, base-deactivated polyethylene glycol column designed for the analysis of primary, secondary, and tertiary amines and other volatile basic analytes.

Phase: nonbonded; base-modified poly(ethylene glycol)
Temp. Limits: 60°C to 200°C

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.53mm ID Fused Silica				
15	1.0	133	**25352**	
30	1.0	133	**25353**	
60	1.0	133	**25354**	



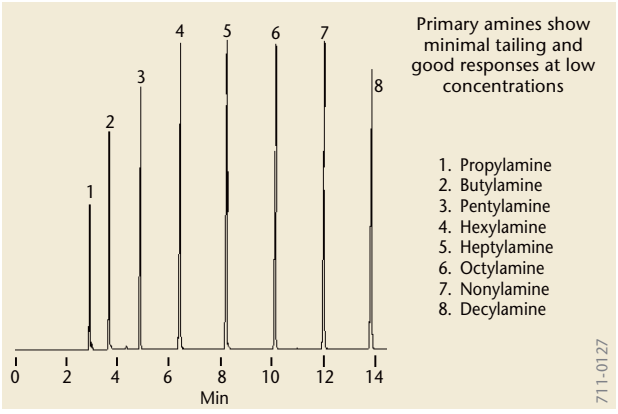
Column: **TCEP, 60m x 0.25mm ID, 0.44µm film**
Cat. No.: **24153**
Oven: 110°C
Carrier: helium, 20cm/sec
Det.: FID, 170°C
Inj.: 1µL TCEP test mix, split (100:1), 170°C

Aromatics: TCEP

This highly polar phase offers unique polarity for certain separations, despite its relatively low temperature limit and the fact that it is not a bonded phase. Because many aromatic compounds have retention indices greater than 1100 on TCEP, it is used for analyses of aromatics in mineral spirits and impurities in individual aromatics and oxygenates.

Phase: nonbonded; 1,2,3-tris-2-cyano-ethoxypropane
Temp. Limits: subambient to 145°C
McReynolds Nos.: x′ y′ z′ u′ s′ = 594 857 759 1031 917

LENGTH (m)	D_F (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
60	0.44	142	**24153**	
0.32mm ID Fused Silica				
60	0.51	157	**24161**	



Column: **Carbowax Amine, 30m x 0.53mm ID, 1.0µm film**
Cat. No.: **25353**
Oven: 50°C to 200°C at 8°C/min, hold 10 min
Carrier: helium, 20cm/sec (set at 170°C)
Det.: FID, 220°C
Inj.: 0.02µL neat amines mix, split (100:1), 220°C

SPB-1

Nonpolar methylsilicone columns that separate sample components according to boiling point. This bonded polymer matches the polarity of its nonbonded predecessors, SE-30 and SP-2100. The SPB-1 phase is used in many of our Petrocol specialty columns.

This column meets USP G1, G2 and G9 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: -60°C to 320°C
McReynolds Nos.: x' y' z' u' s' = 4 58 43 56 38

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.10mm ID FUSED SILICA				
15	0.10	250	24338	
0.20mm ID FUSED SILICA				
15	0.20	250	24162	
30	0.20	250	24163	
12	0.33	152	24229-U	
25	0.33	152	24230-U	
0.25mm ID FUSED SILICA				
30	0.10	625	24261	
15	0.25	250	24026	
30	0.25	250	24028	
60	0.25	250	24030-U	
100	0.25	250	24198	
15	1.0	63	24027	
30	1.0	63	24029	
60	1.0	63	24031	
100	1.0	63	24220-U	
0.32mm ID FUSED SILICA				
30	0.10	800	24290	
15	0.25	320	24099	
30	0.25	320	24044	
60	0.25	320	24046	
100	0.25	320	24228-U	
15	1.0	80	24098-U	
30	1.0	80	24045-U	
60	1.0	80	24047	
100	1.0	80	24213-U	
30	2.0	40	24215-U	
60	2.0	40	24216-U	
30	5.0	16	24296	
60	5.0	16	24297	
0.53mm ID FUSED SILICA				
15	0.10	1325	25360	
30	0.10	1325	25361	
15	0.50	265	25314	
30	0.50	265	25315	
60	0.50	265	25382	
15	1.0	133	25416	
30	1.0	133	25417	
15	1.5	88	25302-U	
30	1.5	88	25303	
60	1.5	88	25388	
15	3.0	44	25340	
30	3.0	44	25341-U	
60	3.0	44	25348	
15	5.0	27	25344	
30	5.0	27	25345-U	
60	5.0	27	25349	

SPB-5

The low phenyl content, 5%, improves thermal stability of the phase, while still providing essentially a boiling point elution order, and a slight increase in selectivity, especially for aromatic compounds.

This column meets USP G27 and G36 requirements.

Operating Conditions: Chemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

Phase: bonded; poly(5% diphenyl/ 95% dimethylsiloxane)
Temp. Limits: -60°C to 320°C
McReynolds Nos.: x' y' z' u' s' = 19 74 64 93 62

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.10mm ID FUSED SILICA				
15	0.10	250	24341	
0.20mm ID FUSED SILICA				
15	0.20	250	24165-U	
30	0.20	250	24166	
60	0.20	250	24167	
12	0.33	152	24234-U	
0.25mm ID FUSED SILICA				
15	0.25	250	24032	
30	0.25	250	24034	
60	0.25	250	24036	
15	1.0	63	24033	
30	1.0	63	24035	
60	1.0	63	24037	
0.32mm ID FUSED SILICA				
15	0.25	320	24101-U	
30	0.25	320	24048	
60	0.25	320	24050	
30	0.50	160	24360	
15	1.0	80	24100-U	
30	1.0	80	24049	
60	1.0	80	24051	
0.53mm ID FUSED SILICA				
15	0.50	265	25316	
30	0.50	265	25317	
60	0.50	265	25383	
30	1.0	133	25420-U	
15	1.5	88	25304	
30	1.5	88	25305-U	
60	1.5	88	25389	
15	3.0	44	25342	
30	3.0	44	25343	
60	3.0	44	25350	
15	5.0	27	25346	
30	5.0	27	25347	
60	5.0	27	25351	

SE-30 and SE-54

The SE-54 column meets USP G36 requirements.

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
SE-30, 0.25mm ID FUSED SILICA				
30	0.25	250	24004-U	
SE-54, 0.25mm ID FUSED SILICA				
30	0.25	250	24001	

Capillary GC
Other Columns

PTE-5/QTM - meets or exceeds performance specifications of US EPA Methods 625, 1625, 8270, and QTM protocols. Low bleed, recommended for use with GC/MS systems.

Phase: bonded; poly(5% diphenyl/95% dimethylsiloxane)
Temp. Limits: -60°C to 320°C
McReynolds Nos.: x' y' z' u' s' = 19 74 64 93 62

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
PTE-5				
0.25mm ID Fused Silica				
30	0.25	250	24135-U	
0.32mm ID Fused Silica				
30	0.25	320	24143	
30	0.32	250	24214	
30	1.0	80	24159	
PTE-5 QTM				
0.53mm ID Fused Silica				
15	0.50	265	25355	

MDN-1 - Nonpolar methylsilicone column that separates analytes according to boiling point. The bonded polymer matches the polarity of nonbonded phases SE-30 and SP-2100, and of bonded phase SPB-1.

Phase: bonded; poly(dimethylsiloxane)
Temp. Limits: -60°C to 320°C
Similar Phases: SPB-1, DB-1, ULTRA-1, RTx-1, CP-SIL-5CB

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.25	250	24258	
30	1.0	63	24259	
0.32mm ID Fused Silica				
30	0.25	320	24299	
30	1.0	80	24300-U	

MDN-5 - The low phenyl content (5%) improves the thermal stability of the phase, while still providing essentially a boiling point elution order, and a slight increase in selectivity, especially for aromatic compounds.

Phase: bonded; poly(5% diphenyl/95% dimethylsiloxane)
Temp. Limits: -60°C to 320°C
Similar Phases: DB-5MS, HP-5MS, PTE-5, XTI-5

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.25	250	24096	
0.32mm ID Fused Silica				
30	0.25	320	24097	
30	0.32	250	24203	
30	1.0	80	24204-U	

MDN-5S - These nonpolar columns feature very low bleed, and excellent inertness for active compounds. High sensitivity and integrity due to a better signal-to-noise ratio.

Phase: bonded and crosslinked; (5% phenyl) methylpolysiloxane
Temp. Limits: 0.25 and 0.32mm ID: -60°C to 325/350°C
0.53mm ID: -60°C to 300/320°C
Similar Phases: DB-5MS, HP-5MS, PTE-5, RTx-5MS, ULTRA-2

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.10	625	24378	
15	0.25	250	24377-U	
30	0.25	250	24384	
60	0.25	250	24392	
30	0.50	125	24379	
30	1.0	63	24385-U	
0.32mm ID Fused Silica				
30	0.25	320	24386	
60	0.25	320	24394	
30	0.50	160	24393	
30	1.0	80	24387-U	
0.53mm ID Fused Silica				
30	1.5	88	25474	

MDN-12 - Low polarity and unique selectivity make these columns ideal for confirmational analyses and for separating active compounds, pesticides, herbicides, PCBs, and PAHs.

Phase: bonded and crosslinked; proprietary
Temp. Limits: 30°C to 340/360°C
Similar Phase: DB-XLB

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.25	250	24388	
60	0.25	250	24396	
0.32mm ID Fused Silica				
30	0.25	320	24390-U	
60	0.25	320	24398	
30	1.0	80	24391	

MDN-35 - These low polarity columns have exceptional inertness for active compounds. They are ideal for confirmational analyses.

Phase: bonded and crosslinked; (35% phenyl) methylpolysiloxane
Temp. Limits: 50°C to 340/360°C
Similar Phases: AT-35, DB-35MS, RTx-35, SPB-35

LENGTH (m)	D_f (µm)	BETA	CAT. NO.	PRICE
0.25mm ID Fused Silica				
30	0.25	250	24382-U	
0.32mm ID Fused Silica				
30	0.25	320	24383-U	

Operating Conditions For All Columns On This PageChemically compatible with water and other injection solvents. Sensitive to strong inorganic acids and bases. Columns can be rinsed.

General Purpose Column Equivalency (Listed in order of increasing Phase Polarity)

	AGILENT / J&W	ALLTECH	CHROMPACK	MACHERY-NAGEL	QUADREX	RESTEK	SGE	PACKED COLUMN EQUIVALENT
SPB-Octyl	—	—	—	—	—	—	—	Squalane
Equity-1 / SPB-1	HP-1 / DB-1	AT-1000	CP-Sil5CB	Optima 1	007-1	RTx-1	BP-1	SE-30, SP-2100
Equity-5 / SPB-5	HP-5, HP-Ultra 2 / DB-5	AT-5	CP-Sil 8CB	Optima 5	007-2	RTx-5	BP-5	SE-54, SE-52, OV-73
SPB-20	—	AT-20	—	—	007-20	RTx-20	—	OV-7
SPB-1701	HP-1701 / DB-1701	AT-1701	CP-Sil19CB	Optima 1701	007-1701	RTx-1701	BP-10	OV-1701
SPB-35	HP-35 / DB-35	AT-35	—	—	007-11	RTx-35	BPX-35	OV-11
SP-2250	HP-50, HP-17 / DB-17	AT-50	CP-Sil 24CB	Optima 17	007-17	RTx-50	—	OV-17
SPB-17	HP-50, HP-17 / DB-17	AT-50	CP-Sil 24CB	Optima 17	007-17	RTx-50	—	OV-17, SP-2250
SPB-50	HP-50 / DB-17	AT-50	CP-Sil 24CB	—	—	RTx-50	—	OV-17, SP-2250
PAG	—	—	—	—	—	—	—	Pluronics F68
SUPELCOWAX 10	HP-Wax, HP-INNOWax / DB-WAX, DB-WAXetr	AT-Wax	CP-Wax 52CB	Permabond CW 20M	007-CW	Stabilwax	BP-20	Carbowax 20M
SPB-1000	HP-FFAP / DB-FFAP	AT-1000	CP-Wax 58CB	Permabond FFAP	007-FFAP	Stabilwax-DA	BP-21	SP-1000, OV-351
Nukol	HP-FFAP / DB-FFAP	— / AT-1000	— / CP-Wax 58CB	— / Permabond FFAP	— / 007-FFAP	— / Stabilwax-DA	— / BP-21	— / SP-1000, OV-351
SPB-225	HP-225 / DB-225	AT-225	CP-Sil 43CB	Optima 225	007-225	RTx-225	BP-225	OV-225
SP-2330	DB-23	AT-Silar	CP-Sil 84	—	007-23	RTx-2330	BPX-70	SP-2330
SP-2380	HP-23 / DB-23	—	CP-Sil 88	—	—	RTx-2330	—	—
SP-2340	—	—	CP-Sil 88	—	—	RTx-2330	—	SP-2340

Specially Tested Column Equivalency

	AGILENT / J&W	ALLTECH	CHROMPACK	MACHERY-NAGEL	QUADREX	RESTEK	SGE
Chiral							
α-DEX	—	—	—	LIPODEX A	—	—	—
ß-DEX	HP Chiral / Cyclodex-B	Chiraldex-B	CP-Chirasil DEX CB	HYDRODEX	—	RT-ßDEX	Cydex B
γ-DEX 120	—	—	—	LIPODEX E	—	RTßDEX	—
Environmental							
Equity-5 / PTE-5	HP-5MS	AT-5	CP-Sil 8CB	Permabond SE-54-HKW	007-2	XTI-5	BPX-5
SP-2331	DB-Dioxin	—	—	—	—	—	—
SPB-608	HP-608 / DB-608	AT-Pesticides			007-608		BP608
SPB-624	HP-624 / DB-624, DB-VRX	AT-624	CP-Sil 13CB	Optima 624	007-624	RTx-624	BP624
SPB-HAP	—	—	—	—	—	—	—
Sup-Herb	—	—	—	—	—	—	—
VOCOL	HP-VOC / DB-502.2	—	—	—	—	RTx-502.2	—
GC/MS							
Equity-1 / MDN 1	HP-1MS	—	CP-Sil 1CB MS	Optima 1MS	—	—	—
Equity-5 / MDN-5	HP-5MS	—	CP-Sil 8CB MS	Optima 5MS	—	—	BPX5
Equity-5 / MDN-5S	HP-5TA / DB-5MS, DB-625	—	—	—	—	RTx-5Sil MS	—
Food & Beverage / Fatty Acids							
Omegawax	—	—	—	—	—	Famewax	—
SAC-5	—	—	—	—	—	—	—
SP-2380	HP-23 / DB-23	—	CP-Sil 88	—	—	RTx-2330	—
SP-2560	—	—	—	—	—	—	—
SPB-PUFA	—	—	—	—	—	—	—
Petroleum / Industrial Chemical							
Carbowax Amine	HP-BasicWax/ DB-CAM	—	CP-Wax 51	FS-CW 20 M-AM	—	Stabilwax-DB	—
Carboxen-1006 PLOT	—	—	—	—	—	—	—
Carboxen-1010 PLOT	—	—	—	—	—	—	—
Mol Sieve 5A PLOT	HP-PLOT MoleSieve / GS-Molesieve	—	CP-MoleSieve 5A	—	—	RT-MoleSieve 13X	—
Petrocol 2887	DB-2887	—	CP-SimDist CB	—	007-1-10V-1.0F	RTx-2887	—
Petrocol DH	DB-Petro 100	AT-Petro	CP-Sil PONA	Permabond P-100	—	RTx1-PONA	BP-1 PONA
Petrocol DH 150	—	—	—	—	—	—	—
Petrocol DH 50.2	HP-PONA	—	Squalane	—	007-1-50-0.5F	—	BP-1 PONA
Petrocol DH Octyl	—	—	—	—	—	—	—
Petrocol EX2887	DB-2887	—	CP-SimDist CB	—	007-1-10V-1.0F	—	—
PTA-5	—	—	—	Optima-5 Amine	—	RTx-5 Amine	—
SCOT							
SPB-1 Sulfur	—	AT-Sulfur	—	—	—	—	—
Supel-Q PLOT	HP-PLOT Q / GS-Q	—	PoraPLOT Q	—	—	RT-Q PLOT	—
TCEP			TCEP			RTx-TCEP	
Pharmaceutical							
OVI-G43	HP-624 / DB-624	AT-624	—	—	007-624	RTx-624	BP624

Capillary GC
Custom Columns

Custom Capillary GC Columns

The information below provides a general overview of the Supelco custom capillary GC capabilities. Supelco manufactures all custom capillary GC columns using our ISO 9001-registered processes to achieve the performance and reproducibility you expect. Custom capillary GC columns are tested for k' and coating efficiency.

To order your custom column, call and provide us with the phase, film thickness, ID, length, and any additional details or special needs.

Custom Fused Silica Capillary Columns

PHASES AVAILABLE*		
Carbowax Amine	SE-30	SPB-35
Equity-1	SE-54	SPB-225
Equity-5	SP-2100	SPB-608
Nukol	SP-2250	SPB-624
Omegawax	SP-2330	SPB-1000
OS-138	SP-2331	SPB-1701
OV-1	SP-2340	SPB-Octyl
OV-1701	SP-2380	SPB-PUFA
OVI-G43	SPB-1	SUPELCOWAX 10
PAG	SPB-1 Sulfur	TCEP
PTA-5	SPB-5	VOCOL
PTE-5	SPB-20	
SAC-5	SPB-50	

DIMENSIONS AVAILABLE

Inside diameter: Available in 0.10mm, 0.20mm, 0.25mm, 0.32mm, 0.53mm, and 0.75mm sizes.
Film thickness: Varies from 0.05µm to 7.0µm. Actual film thickness will depend on the phase and column ID selected.
Column length: Varies from 1m to 100m. Actual lengths will depend on the column ID selected and cage style selected.
Cage: The 0.10mm to 0.25mm ID columns are placed on our standard 6"/15cm cage. All others are placed on our standard 8"/20cm cage. The smaller HP6850 column cage is also available upon request.

Custom PLOT Capillary Columns

PHASES AVAILABLE*		
Carboxen 1006	Alumina KCl	G-45
Carboxen 1010	Alumina Sodium Sulfate	HayeSep N
Mol Sieve 5A	Tenax	HayeSep R
Supel-Q		

DIMENSIONS AVAILABLE

Inside diameter: Available in 0.32mm & 0.53mm sizes.
Column length: Varies from 1m to 60m.

Custom SCOT Capillary Columns

PHASES AVAILABLE*		
Bentone 34	MBMA	TCEP
BMEA	Squalene	UCON LB-550-X
DEGS		

DIMENSIONS AVAILABLE

Inside diameter: Available in .020 inch (.50mm) size.
Column length: Varies from 1 foot to 100 feet.

* Additional phases may be available. Please inquire if you require a phase not listed.

Supelco Capillary Columns for Agilent 6850 (HP6850)

Now, any Supelco capillary GC column can be made compatible with your Agilent/HP 6850 instrument by simply specifying code "PRO100060" when you order.

Until now, transferring your lab method to the Agilent/HP 6850 GC meant specifying different column part numbers because of the different size of the 6850 column cage. This meant risking a method change because you changed the purchasing information. This is no longer necessary.

- No method headaches – your Supelco capillary will fit perfectly in your 6850 instrument.
- No new part numbers to remember – just specify "PRO100060" when you order any Supelco capillary.
- No delay – columns are shipped within 24 hours.

If you are changing a lab method to a 6850, you can continue to use the same Supelco capillary column and ordering information. To order any Supelco capillary column on a 6850 cage, simply ask for order code PRO100060, and then provide the Supelco column ordering information already in your method.

Upon receipt of your order, we will coil the stock or custom Supelco capillary column on an authentic Agilent Technologies 6850 GC cage and ship it within 24 hours. Transferring column ordering information from lab to 6850 methods has never been easier!

DESCRIPTION	CAT. NO.	PRICE
Supelco capillary in an Agilent/HP 6850 column cage	PRO100060	No extra charge!

Fused Silica Tubing

Use as transfer lines, guard columns, or retention gaps, or to make your own columns.

Tubing can be coupled through fused silica or glass GlasSeal connectors. If necessary, use polyimide glue to provide a permanent seal. These products are listed in the index.

TUBING TREATMENT	APPLICATION	MAX. TEMP
Untreated	General purposes, where high inertness is not necessary	360°C
Nonpolar (methyl)	Low polarity solvents (e.g., alkanes, carbon disulfide, ethers)	360°C
Intermediate Polarity (phenyl/methyl)	Intermediate polarity solvents (e.g., acetone, methylene chloride, toluene)	360°C
Polar (PEG)	Polar solvents (e.g., acetonitrile, methanol, water)	260°C

	UNTREATED		DEACTIVATED TUBING NONPOLAR		DEACTIVATED TUBING INTERMEDIATE POLARITY		DEACTIVATED TUBING POLAR	
ID (mm)	CAT. NO.	PRICE	CAT. NO.	PRICE	CAT. NO.	PRICE	CAT. NO.	PRICE
3 x 1-meter lengths								
0.10	25700-U		25704		25705		25710	
0.20	—	—	—	—	25706		—	—
0.25	24024		24025		25707		25712	
0.32	25702		24058		25708		—	—
0.53	25703		25307		25709		25714	
3-meter length								
0.10	25715		25720-U		—	—	—	—
0.20	—	—	—	—	25726		—	—
0.25	25717		25722		25727		—	—
0.32	25718		25723		25728		—	—
0.53	25719		25724		25729		25734	
5-meter length								
0.10	25735		25740-U		25745-U		—	—
0.20	—	—	25741		25746		—	—
0.25	25737		25742		25747		—	—
0.32	25738		25743		25748-U		25752-U	
0.53	25739		25744		25339[1]		25753	
15-meter length								
0.20	—	—	25755		—	—	25763	
0.25	24059		25756		25760-U		—	—
0.32	24062		25757		25761		25765	
0.53	25306		25758		25762		25766	
30-meter length								
0.20	25767		25768-U		25772		—	—
0.25	—	—	25769-U		—	—	25777	
0.32	24063		25770-U		25774		25778	
0.53	25308		25771		25775-U		25779	
60-meter length								
0.20	—	—	—	—	25786		—	—
0.25	24061		25783		25787		—	—
0.32	24064		25784		25788-U		25792	
0.53	25781		25785		25789		—	—

[1] Deactivated according to USP 467.

Capillary GC
Test Mixes for Capillary Columns

Column Test Mixes

After you install a column in your system, use a test mix to make sure you haven't also installed some surprises, such as broken fragments in the column, or small leaks. Weekly tests thereafter will keep little problems from growing into big problems. Test mixes are an inexpensive aid to obtaining high quality chromatograms.

Acidity Test Mix

Even a highly efficient column can adsorb acidic or basic compounds. To determine the acid/base affinity of your column, simply inject this mix and compare peak heights (Grob & Grob, Chromatographia 4: 421, 1971). Instructions included. 0.05% each component in methylene chloride.

2,6-Dimethylaniline
2,6-Dimethylphenol

DESCRIPTION	QTY.	CAT. NO.	PRICE
Acidity Test Mix	2mL	48255-U	

Hydrocarbon Test Mix

An ideal mix for checking column installation when you use a capillary column in a modified packed column system. Also used to determine theoretical plates. C12-C17 hydrocarbons, 500-2000µg/mL in chloroform.

DESCRIPTION	QTY.	CAT. NO.	PRICE
Hydrocarbon Test Mix	2mL	48244	

Isothermal Test Mixes

Use these mixes to indicate column efficiency, leaks, dead volume, and sample adsorption. Each mix includes simple, detailed instructions.

Isothermal Test Mix Kit - 2mL each of the three isothermal test mixes described below.

Nonpolar Column Test Mix - For all nonpolar phases. 500µg/mL each component in methylene chloride.

2-Octanone
Decane (C10)
1-Octanol
2,6-Dimethylphenol
Undecane (C11)
2,6-Dimethylaniline
Dodecane (C12)
Tri decane (C13)

Intermediate Polarity Column Test Mix- For SPB-20, SPB-35, and other intermediate polarity phases. 500µg/mL each component in methylene chloride.

Decane (C10)
2-Octanone
Undecane (C11)
1-Octanol
Dodecane (C12)
2,6-Dimethylphenol
Tridecane (C13)
2,6-Dimethylaniline
Tetradecane (C14)

Polar Column Test Mix - For SUPELCOWAX 10, SP-1000, and other polar phases. 500µg/mL each component in methylene chloride.

2-Octanone
Pentadecane (C15)
1-Octanol
Hexadecane (C16)
Heptadecane (C17)
Octadecane (C18)
2,6-Dimethylaniline
2,6-Dimethylphenol
Eicosane (C20)

DESCRIPTION	QTY.	CAT. NO.	PRICE
Isothermal Test Mix Kit	3x3mL	47303	
Nonpolar Column Test Mix	2mL	47300-U	
Intermediate Polarity Column Test Mix	2mL	47301	
Polar Column Test Mix	2mL	47302	

Methane Standard

Use 40µL injections of this dilute methane standard (100ppm in helium) for more accurate flow measurements than with smaller quantities of more concentrated methane. Use with the methane syringe, syringe adapter, and pressure regulator listed. Disposable cylinder.

DESCRIPTION	QTY.	CAT. NO.	PRICE
100ppm in helium	14L	307200	
Accessories for Methane Standard			
Hamilton 1725N Syringe		20705	
Syringe Adapter		609010	
Pressure Regulator		513010	

Programmed Test Mix

This mix is for a sensitive, temperature programmed analysis (Grob, et al.,J. Chromatogr. 156: 1, 1978) that tests a column's affinity for many compounds. Prepared at concentrations convenient for setting split ratios and sample sizes. In use, on-column quantities are those recommended by Grob, et al. Each component at quantity indicated, in methylene chloride.

2,3-Butanediol	530µg/mL
Decane	280µg/mL
1-Octanol	360µg/mL
2,6-Dimethyl phenol	320µg/mL
Nonanal	400µg/mL
Undecane	290µg/mL
2-Ethylhexanoic acid	380µg/mL
2,6-Dimethylan iline	320µg/mL
C10 acid methyl ester	420µg/mL
Dicyclohexylamine	310µg/mL
C11 acid methyl ester	420µg/mL
C12 acid methyl ester	410µg/mL

DESCRIPTION	QTY.	CAT. NO.	PRICE
Programmed Test Mix	2mL	47304	

Test Mixes for Specific Phases

For popular Supelco capillary columns. Each mix contains active components and inactive hydrocarbons.

COLUMN TEST MIX	COMPOSITION	QTY.	CAT. NO.	PRICE
Carbowax Amine	500µg/mL each component in methyl tert-butyl ether. n-Octylamine, n-Hexadecane (C16), n-Octadecane (C18) n-Nonylamine, n-Benzylamine, 2,6-Dimethylaniline n-Pentadecane (C15), n-Heptadecane (C17), 2,4-Dimethylaniline n-Decylamine, Tri-n-hexylamine, n-Eicosane (C20)	1mL	48278	
α-DEX 120	500µg/mL each component in methylene chloride Nonane (C9), Decane (C10), (-)-1,2-Propanediol[1] p-Xylene, (+)-1,2-Propanediol[1], Undecane (C11) m-Xylene	1mL	48013	
β-DEX 120	500µg/mL each component in methylene chloride Nonane (C9), Decane (C10), 1-Hexanol (±)-3,3-Dimethyl-2-butanol, (±)-3-Methyl-2-heptanone, Undecane (C11)	1mL	48028	
OMEGAWAX TEST MIXES				
Omegawax[2]	Approximately 50mg FAMEs/mL in hexane	1mL	48476	
Menhaden Oil[2]	Approximately 100mg FAMEs/mL in hexane	1mL	48473	
PETROCOL TEST MIXES				
Petrocol DH	Each hydrocarbon (v/v) in cyclohexane n-Hexane, 1%, Toluene, 1%, p-Xylene, 2% Benzene, 1%, n-Octane, 1%, n-Nonane, 1% n-Heptane,1%, m-Xylene, 4%	1mL	48872	
Petrocol D2887	1% each component in n-octane n-Hexadecane, n-Octadecane	6 x 1mL	48889	
EQUITY/SPB TEST MIXES				
Equity/SPB Thin Film For 0.10µm film Equity/SPB columns	500µg/mL each component in cyclohexane n-Octadecane (C18), n-Nonadecane (C19) Cetyl alcohol, n-Eicosane (C20)	1mL	48273	
Equity/SPB Thick Film For 3µm and 5µm film Equity/SPB columns	500µg/mL each component in methylene chloride n-Nonane (C9), 1-Octanol, n-Dodecane (C12) 2-Octanone, 2,6-Dimethylphenol, n-Tridecane (C13) n-Decane (C10), 2,6-Dimethylaniline	1mL	48275-U	
SPB-50	500µg/mL each component in methylene chloride n-Decane (C10), 1-Octanol, 2,6-Dimethylphenol n-Undecane (C11), n-Dodecane (C12), 2,6-Dimethylaniline 2-Octanone, n-Tridecane (C13), n-Pentadecane (C15)	1mL	48280-U	
SUP-HERB COLUMN TEST MIXES				
Herbicides Mix 1	100µg/mL each component in ethyl acetate Eptam, Treflan (Trifluralin), Paarlan (Isopropalin) Sutan, Atrazine, GOAL (Oxyfluorfen) Tillam (Pebulate), Terbacil, Velpar (Hexazinone) Ordram (Molinate), Sencor Ro-Neet (Cycloate), Bromacil	1mL	49136	
Herbicides Mix 2	100µg/mL each component in ethyl acetate Vernam, Simazine, Dual Propachlor, Propazine, Prowl Balan, Tolban (Profluralin), Oxadiazon	1mL	49138-U	

[1] Total concentration 1000µg/mL for the two isomers.

[2] The Omegawax Column Test Mix and the Menhaden Oil standard are based on naturally occurring mixtures of fatty acids –relative p eak sizes may vary from lot to lot.

Packed Columns

Agilent Technologies Cross Reference

SUPELCO

Now the Authorized Supplier
of all Packed GC Columns for
Agilent Technologies

Agilent Technologies has made a decision to exit the packed GC column business. In an effort to maintain a continuous supply of product to their customers, Agilent Technologies has named Supelco the authorized supplier of packed GC columns for Agilent Technologies and Agilent Technologies customers.

For your convenience, you may reference an Agilent Technologies part number with your first order. In most cases, you or your Sigma-Al Supelco representative will provide you with a corresponding Supelco part number for future orders.

- All glass columns will fit Agilent/HP 5880, 5890, 5987 and 6890 GCs of configuration A, on-column injection, all detectors exce TCD.
- All stainless steel columns are general configuration. You can carefully bend to fit most GCs.

AGILENT CROSS	PACKING DESCRIPTION	TYPE	LENGTH	OD	ID	CAT. NO.	PRIC
19001A-101	80/100 Chromosorb 101	SS	6 ft	1/8“	2.1mm	12712	
19001A-102	80/100 Chromosorb 102	SS	6 ft	1/8“	2.1mm	13794	
19001A-103	80/100 Chromosorb 103	SS	6 ft	1/8“	2.1mm	13104-U	
19001A-A01	80/100 HayeSep A	SS	6 ft	1/8“	2.1mm	13105-U	
19001A-A11	10% OV-1 on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13106-U	
19001A-A52	5% OV-1 on 100/120 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13107-U	
19001A-B11	10% OV-17 on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13109-U	
19001A-B51	5% OV-17 on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13114-U	
19001A-D11	10% OV-101 on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13115-U	
19001A-D12	10% OV-101 on 100/120 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13116-U	
19001A-F12	10% OV-225 on 100/120 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13119-U	
19001A-G11	10% Silar 5 CP on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13121-U	
19001A-J11	10% SE-30 on80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13122-U	
19001A-J51	5% SE-30 on80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13124-U	
19001A-K11	10% Silar 10 CP on 80/100 Chromosorb W HP	SS	6 ft	1/8”	2.1mm	13125-U	
19001A-M11	10% Carbow ax 20M on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13126-U	
19001A-M12	10% Carbowax 20M on 100/120 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13127-U	
19001A-M51	5% Carbowax 20M on 80/100 Chromosorb W HP	SS	6 ft	1/8“	2.1mm	13128-U	
19001A-MA1	45/60 M olecular Sieve 5A	SS	6 ft	1/8“	2.1mm	13130-U	
19001A-MA2	60/80 M olecular Sieve 5A	SS	6 ft	1/8“	2.1mm	13133-U	
19001A-MX1	45/60 Molecular Sieve 13X	SS	6 ft	1/8“	2.1mm	13134-U	
19001A-MX2	60/80 Molecular Sieve 13X	SS	6 ft	1/8“	2.1mm	13136-U	
19001A-N00	80/100 Porapak N	SS	6 ft	1/8“	2.1mm	13141-U	
19001A-N01	80/100 HayeSep N	SS	6 ft	1/8“	2.1mm	13144-U	
19001A-P00	80/100 Porapak P	SS	6 ft	1/8“	2.1mm	13146-U	
19001A-Q00	80/100 Porapak Q	SS	6 ft	1/8“	2.1mm	12437	
19001A-Q01	80/100 HayeSep Q	SS	6 ft	1/8“	2.1mm	13801	
19001A-QS0	80/100 Porapak QS	SS	6 ft	1/8“	2.1mm	13787	
19001A-R00	80/100 Porapak R	SS	6 ft	1/8“	2.1mm	13156-U	
19001A-S00	80/100 Porapak S	SS	6 ft	1/8“	2.1mm	13161-U	
19001A-T00	80/100 Porapak T	SS	6 ft	1/8“	2.1mm	13163-U	

Packed Columns
Agilent Technologies Cross Reference

AGILENT CROSS	PACKING DESCRIPTION	TYPE	LENGTH	OD	ID	CAT. NO.	PRI
19001C-001	1.95% QF-1 + 1.5% OV-17 on 100/120 Chromosorb W H	Glass	6 ft	1/4"	2mm	13078-U	
19001C-002	1.95% OV-210 + 1.5% OV-17 on 100/120 Chromosorb	Glass	6 ft	1/4"	2mm	13079-U	
19001C-003	10% FFAP + 1% H3P04 on 100/120 W AW	Glass	6 ft	1/4"	2mm	13081-U	
19001C-102	80/100 Chromosorb 102	G lass	6 ft	1/4"	2mm	13082-U	
19001C-A31	3% OV-1 on 80/100 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13083-U	
19001C-B12	10% OV-17 on 100/120 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13084-U	
19001C-B31	3% OV-17 on 80/100 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13085-U	
19001C-D11	10% OV-101 on 80/100 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13086-U	
19001C-D32	3% OV-101 on 100/120 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13087-U	
19001C-M11	10% Carbowax 20M on 80/100 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13088-U	
19001C-M12	10% Carbowax 20M on 100/120 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13089-U	
19001C-M51	5% Carbowax 20M on 80/100 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13090-U	
19001C-M52	5% Carbowax 20M on 100/120 Chromosorb W HP	Glass	6 ft	1/4"	2mm	13091-U	
19001C-P00	80/100 Porapak P	Glass	6 ft	1/4"	2mm	13092-U	
19001C-Q00	80/100 Porapak Q	Glass	6 ft	1/4"	2mm	13093-U	
19001C-QS0	80/100 Porapak QS	Glass	6 ft	1/4"	2mm	13094-U	
19006-60026	10% UCW-982 on 80/100 Chromosorb P AW	SS	18 in	1/4“	5.3mm	13075-U	
19006-60028	10% UCW-982 on 80/100 Chromosorb P AW	SS	20 in	1/8“	2.1mm	13041-U	
19006-80005	35% DC-200 (350 cstks) on 80/100 Chromosorb P AW	SS	5 ft	1/8“	2.1mm	13044-U	
19006-80015	80/100 Porapak Q	SS	6 ft	1/8“	2.1mm	13037-U	
19006-80020	45/60 Molecular Sieve 13X	SS	10 ft	1/8“	2.1mm	13036-U	
19006-80025	80/100 Porapak N	SS	10 ft	1/8“	2.1mm	13052-U	
19006-80030	45/60 Molecular Sieve 13X	SS	3 ft	1/8“	2.1mm	13047-U	
19006-80035	20% Sebaconitrile on 80/100 Chromosorb P AW	SS	2 ft	1/8“	2.1mm	13059-U	
19006-80040	20% Sebaconitrile on 80/100 Chromosorb P AW	SS	30 ft	1/8“	2.1mm	13043-U	
19006-80045	45/60 Molecular Sieve 13X	SS	4 ft	1/8“	2.1mm	13061-U	
19006-80051	20% OV-101 on 80/100 Chromosorb W HP	SS	4 ft	1/8“	2.1mm	13035-U	
19006-80060*	20% TCEP on 80/100 Chromosorb P AW	SS	56 cm	1/16“	0.75mm	12873	
19006-80070	35% DC-200 (350cstks) on 80/100 Chromosorb P AW	SS	10 ft	1/8“	2.1mm	13064-U	
19006-80080	80/100 Porapak N	SS	6 ft	1/8“	2.1mm	13063-U	
19006-80085	80/100 Porapak QS	Teflon	6 ft	1/8“	2.1mm	13071-U	
19006-80095	20% Sebaconitrile +2% H3PO4 on 80/100 Chromosorb	SS	30 ft	1/8“	2.1mm	13066-U	
19006-80100	12% UCW-982 on 80/100 Chromosorb P AW	SS	2 ft	1/8“	2.1mm	13049-U	
19006-80105	25% DC-200 (350 cstks) on 80/100 Chromosorb P AW	SS	15 ft	1/8“	2.1mm	13039-U	
19006-80110	80/100 Hayesep Q	SS	10 ft	1/8“	2.1mm	13038-U	
19006-80115	45/60 Molecular Sieve 13X	SS	2 ft	1/8“	2.1mm	13069-U	
19006-80120	80/100 Hayesep N	SS	8 ft	1/8“	2.1mm	13067-U	
19006-80132	35% DC-200 (350cstks) on 80/100 Chromosorb P AW	SS	30 ft	1/8“	2.1mm	13072-U	
19006-80134	80/100 HayeSep Q	SS	9 ft	1/8“	2.1mm	13073-U	
19006-80136	45/60 M olecular Sieve 5A	SS	9 ft	1/8“	2.1mm	13074-U	
19006-80141	60/80 Chromosorb P AW	SS	3 ft	1/8“	2.1mm	13068-U	
19301-60570	3% OV-101 on 100/120 Chromosorb W HP	SS	20 in	1/4“	5.3mm	13095-U	
4330-0937	Empty	Glass	12 ft	1/8“	1.8mm	13077-U	
4330-0941	Empty	Glass	10 ft	1/4“	2mm	21683	
5080-6759	45/60 Molecular Sieve 5A, 50g					20301	
5080-6761	60/80 Molecular Sieve 5A, 50g					20302	
5080-6763	45/60 Molecular Sieve 13X, 50g					20304	
5180-4194	1% SP-1000 on 60/80 Carbopack B	SS	8 ft	1/8“	2.1mm	12545-U	
5181-1245	1% SP-1000 on 60/80 Carbopack B	SS	6 ft	1/8“	2.1mm	12489	
7157-0206	Empty	SS	6 ft	1/8“	2.1mm	13096-U	
7157-0207	Empty	SS	8 ft	1/8“	2.1mm	13097-U	
7157-0208	Empty	SS	10 ft	1/8“	2.1mm	13098-U	
7157-0209	Empty	SS	12 ft	1/8“	2.1mm	13099-U	
7157-0210	Empty	SS	20 ft	1/8“	2.1mm	13100-U	
8501-0008	60/80 Tenax, 10g					11982	

* Column contains stainless steel screens.

Packed Columns

Stock Packed Columns

General Configuration	Agilent/HP	Perkin Elmer	Varian
You can carefully bend this column to fit most chromatographs	5880, 5890, 5987, 6890 (Configuration A)	8300, 8400, 8500, 8600, 8700, Auto System (not on-column injection)	3300/3400, 3700, Vista Series (FID)

COLUMN DESCRIPTION	COLUMN TYPE[1]	GENERAL CONFIG.	AGILENT/ HP	PERKIN ELMER	VARIAN	PRICE
CARBOPACK PACKINGS						
1% SP-1000 on 60/80 Carbopack B						
6' x 2.1mm ID	SS	12485-U	12487	—	12489	
8' x 2.1mm ID	SS	12543-U	12548-U	13730-U	12545-U	
2.4m x 2mm ID TightSpec	Glass	—	23084	—	—	
2m x 2mm ID TightSpec	Glass	—	23093	—	—	
0.1% SP-1000 on 80/100 Carbopack C						
6' x 2.1mm ID	SS	12495-U	12500-U	13736-U	—	
2m x 2mm ID TightSpec	Glass	—	26003	—	—	
6' x 2mm ID	Glass	—	26012	26015	—	
3% SP-1500 on 80/120 Carbopack B, 10'	SS	12592	12594	13734-U	12596	
0.2% Carbowax 1500 on 60/80 Carbopack C, 6'	SS	13860-U	—	—	—	
0.2% Carbowax 1500 on 80/100 Carbopack C, 6'	SS	12501-U	12506-U	13738-U	—	
4% Carbowax 20M/0.8% KOH on 60/80 Carbopack B						
2m x 2mm ID TightSpec	Glass	—	26021	26024	26027-U	
6' x 2mm ID	Glass	—	26030-U	26033-U	—	
4% Carbowax 20M on 80/120 Carbopack B-DA [2]						
2m x 2mm ID TightSpec	Glass	—	23110-U	25931-U	—	
6' x 2mm ID	Glass	—	25936	—	25942	
GP[4] 5% Carbowax 20M on 60/80 Carbopack B Guaranteed Performance for Blood Alcohol Analysis						
2m x 2mm ID TightSpec	Glass	—	26039	—	—	
6' x 2mm ID	Glass	—	26048	26051	—	
5% Carbowax 20M on 80/120 Carbopack B-AW						
2m x 2mm ID TightSpec	Glass	—	25945	25947	—	
6' x 2mm ID	Glass	—	25953	—	—	
0.8 % THEED on 80/100 Carbopack C						
1m x 2mm ID TightSpec	Glass	—	26057	—	—	
3' x 2mm ID	Glass	—	—	26069	—	
CARBON MOLECULAR SIEVE PACKINGS						
100/120 Carbosieve S-II, 10'	SS	12577	12581	13821-U	—	
45/60 Carboxen-1000, 2'	SS	12370-U	—	—	—	
45/60 Carboxen-1000, 5'	SS	12380	12382	—	12384	
60/80 Carboxen-1000, 15'	SS	12390-U	12392-U	13744-U	12394	
POROUS POLYMER PACKINGS						
80/100 Chromosorb 101, 6'	SS	12712	13782	—	—	
80/100 Chromosorb 102, 6'	SS	13794	13796	—	—	
80/100 HayeSep Q, 6'	SS	13801	13803-U	—	—	
80/100 Porapak Q, 6'	SS	12437	12792-U	13785	12469	
80/100 Porapak QS, 6'	SS	13787	13789	—	—	
60/80 Tenax TA, 6'	SS	—	12554	—	—	
DIATOMITE PACKINGS						
10% Carbowax 20M on 80/100 Chromosorb W AW, 6'	SS	12212	12785-U	13746-U	12456	
10% Carbowax 20M on 80/100 SUPELCOPORT, 6'	SS	12713	12787-U	13748-U	12768	
3% OV-17 on 80/100 SUPELCOPORT, 6'	SS	12210	—	13750-U	—	
10% SP-1000 on 80/100 SUPELCOPORT, 10'	SS	12537-U	—	—	—	
10% SP-1000 on 80/100 SUPELCOPORT, 20'	SS	12719	12794-U	13755	—	
10% SP-2100 on 80/100 SUPELCOPORT, 6'	SS	12429	12801-U	—	—	
10% SP-2100 on 80/100 SUPELCOPORT, 10'	SS	13766-U	12530-U	—	—	
10% SP-2100 on 100/120 SUPELCOPORT, 6'	SS	—	—	13769	12771	
10% SP-2100 on 100/120 SUPELCOPORT, 10'	SS	12717	12803-U	—	—	
20% SP-2100/0.1% Carbowax 1500 on 100/120 SUPELCOPORT, 10'	SS	—	12804-U	13773	—	
1.5% SP-2250/1.95% SP-2401 on 100/120 SUPELCOPORT						
2m x 4mm ID TightSpec	Glass	—	23077	—	—	
6' x 4mm ID	Glass	—	25965	—	—	
10% SP-2330 on 100/120 Chromosorb W AW, 6'	SS	—	13776	13778	—	
MICROPACKED COLUMNS (2M X 1/16" OD X 0.75MM ID) [3]						
80/100 Carboxen-1004	SS	12854	12846	—	—	
80/100 HayeSep D	SS	12917	12921-U	—	—	
80/100 HayeSep Q	SS	12875	12879	—	—	
80/100 Molecular Sieve 5A	SS	12959-U	12963-U	—	—	

[1] All glass columns are 1/4" OD unless noted otherwise. All stainless steel columns are 1/8" OD x 2.1mm ID unless noted otherwise

[2] Deactivated for acidic compounds.

[3] All micropacked stainless steel columns (1/16" OD) include stainless steel screens.

[4] GP indicates packing is pre tested for a specific analysis.

Packed Columns
Stock Packed Columns

Specialty 1/16" and 1/8" Columns - All are general configuration columns.

C1-C5 Hydrocarbons - Our durable 23% SP-1700 on Chromosorb P AW column can withstand the punishment of sample valve or valve switching operations. It is ideal for monitoring impurities in any of the C1-C5 hydrocarbons, and can be used with some oxygenated compounds.

APPLICATION & COLUMN DESCRIPTION (CAT. NO. OF PACKING)	CAT. NO.	PRICE
23% SP-1700 on 80/100 Chromosorb P AW[1], 30' x 1/8" stainless steel	12809-U	

Freons - 5% Fluorcol on 60/80 Carbopack B resolves a wide range of fluorocarbons, including isomers of many compounds. Column performance is distinctly superior to that of other packings. The column is unaffected by large amounts of HF, HCl, or other reactive gases that may be mixed with the fluorocarbons.

APPLICATION & COLUMN DESCRIPTION (CAT. NO. OF PACKING)	CAT. NO.	PRICE
5% Fluorcol on 60/80 Carbopack B, 10' x 1/8" SP Alloy	12425	

Simulated Distillation - Our 10% Petrocol A on 80/100 SUPELCOPORT column meets all criteria of American Society for Testing and Materials (ASTM) Method D3710 for simulated distillation of gasoline fractions having a final boiling point of 500°F (260°C). Our 3% Petrocol B on 80/100 SUPELCOPORT column meets all criteria of ASTM Method D2887 for simulated distillation of petroleum products and fractions having a final boiling point of 1000°F (538°C). Our 10% Petrocol C on 80/100 SUPELCOPORT column meets all criteria of ASTM Method D5307 for determining the boiling range distribution of crude petroleum through 1000°F (538°C). We construct these columns with special care to minimize baseline rise or bleed. Each lot of packing is tested to ensure proper resolution, boiling point elution order, boiling point/retention time linearity, and minimal bleed. These columns will fit most GCs, and we include stainless steel nuts and ferrules.

APPLICATION & COLUMN DESCRIPTION (CAT. NO. OF PACKING)	CAT. NO.	PRICE
ASTM D3710 - 10% Petrocol A on 80/100 SUPELCOPORT, 20" x 1/8" stainless steel[2]	12445	
ASTM D2887 - 3% Petrocol B on 80/100 SUPELCOPORT, 20" x 1/8" stainless steel[2]	12449	
ASTM D5307 - 10% Petrocol C on 80/100 SUPELCOPORT, 20" x 1/8" stainless steel[2]	12455	

Sulfur Compounds - 40/60 Carbopack B-HT 100 resolves H_2S, SO_2, COS, and methyl sulfide at ppm or ppb levels. It also will separate a variety of mercaptans, sulfides, and disulfides. Chromosil 310 separates percent or trace concentrations of H_2S, SO_2, COS, and methyl mercaptan. COS elutes before H_2S, which allows determinations of trace concentrations of COS in the presence of H_2S. Chromosil 330 separates ppb concentrations of light sulfur gases, C1-C3 mercaptans, and alkyl sulfides. 12% polyphenyl ether/1.5% H_3PO_4 on 40/60 Chromosorb T columns separate H_2S, SO_2, methyl and ethyl mercaptans, and dimethyl sulfide at ppm and ppb concentrations, for air pollution studies. The Teflon packing (Chromosorb T) ensures maximum inertness toward the sulfur compounds. Supelpak S separates H_2S, SO_2, COS, methanethiol, methyl sulfide, and dimethyl sulfide at low ppm concentrations. This column typically is used in analyzing kraft pulp mill, nylon plant, and petroleum refinery samples.

APPLICATION & COLUMN DESCRIPTION (CAT. NO. OF PACKING)	CAT. NO.	PRICE
40/60 Carbopack B HT[4] 100, 1.4m x 1/8" Teflon (FEP) (2-0272) ASTM D5303	11502-U	
Chromosil 310[2], 8' (6' packed) x 1/8" Teflon (FEP)	11501-U	
Chromosil 330[2], 8' (6' packed) x 1/8" Teflon (FEP)	11496	
12% polyphenyl ether/1.5% H_3PO_4 on 40/60 Chromosorb T[2], 36' x 0.085" Teflon (FEP)	11500	
Supelpak S[3], 30" (18" packed) x 1/8" Teflon (FEP)	12255-U	

Aromatics/Aliphatics - 20% TCEP on 80/100 Chromosorb P AW separates aromatic hydrocarbons in the presence of aliphatic hydrocarbons. Benzene elutes between nC11 and nC12. The 22" column meets the criteria of ASTM D4815 (C1-C4 alcohols and MTBE in gasoline).

APPLICATION & COLUMN DESCRIPTION (CAT. NO. OF PACKING)	CAT. NO.	PRICE
20% TCEP, 22" x 1/16" stainless steel[5]	12873	

[1] Acid-washed support.
[2] Packing available only in columns. Inlet temperature affects packing; 1' left unpacked at both ends.
[3] U-shaped; stainless steel nuts and ferrules included (not attached).
[4] HT - Hydrogen-treated for deactivation.
[5] Column is shipped with stainless steel screens

HELPFUL HINTS

TightSpec metric length columns conform to within ±6mm of their stated lengths. If you are developing a new method, and you might be using several instruments, we recommend TightSpec columns.

Supelco nominal length columns conform to instrument manufacturers' length specifications, in feet or meters, to within 1.5%. We recommend using nominal length columns only when you are trying to duplicate a method on the same model of instrument as was originally used to develop the method.

RELATED INFORMATION

Fluorcol columns: Glajch, Schindel, LC-GC 4: 574, 1986. Reference not available from Supelco.

Request the following free literature by phone or fax, or see our website.

No.	Subject
T397142	C1-C5 hydrocarbons by packed column GC
T100722	sulfur gases by packed column GC
T100743	hydrocarbons by packed column GC
T195890	packed GC column applications

Packed Columns

Custom Packings / Custom Packed Columns

Ordering Custom Packings and Custom Packed Columns

If you do not find the packing or packed column that you need, we may be able to manufacture the packing or packed column that you require through our custom program. Please follow the steps below and contact either Order Processing or Technical Service.

To order a custom packing, please specify:

1. The percent coating(s) and stationary phase(s).
2. The mesh size and support.
3. Any special treatments required (AW, AW-DMDCS, DA, DB, HT).
4. The amount required (20g, 30g, 50g, 60g, or 100g).

NOTE: Custom packings using Carbopack B or Carbopack C are only available in 15g quantities. Custom packings using Carbopack B HT or Carbopack C HT are only available in 10g quantities.

To order a custom packed column, please specify:

1. If the column catalog number if known, provide it and skip to step7.
2. The column material.
3. The GC make and model.
4. The detector type.
5. The injection configuration; either on-column (see Figure A next page) or not on-column (see Figure B, next page).
6. The column dimensions (length, OD, and ID).
7. The packing required, either by catalog number if a stock packing or by description (see above) if a custom packing.
8. Whether the column inlet is to be packed full. Not on-column configurations are typically packed full. A space of 2 ½ inches is typically left empty with on-column configurations to make room for the syringe needle, unless a gas sampling loop is being used, then the inlet is typically packed full.
9. If the column is to be preconditioned.
10. The number of columns needed.

NOTE: We can also manufacture custom empty columns (follow steps 2-6).

Things you should know about metal columns

- We make all stainless steel columns from our premium gr stainless steel tubing.
- We normally attach brass Swagelok nuts and ferrules to packed metal columns. If you want stainless steel fittings, or if you don't want fittings attached to your column, please specify this.
- If you would like stainless steel screen ends on either or both ends of a 1/8" OD metal column, please specify.
- All 1/16" OD stainless steel columns include stainless steel screens.

Things you should know about glass columns

- We include brass nuts and Supeltex M-2A front ferrules with packed glass columns (Supeltex M-4 ferrules with Dexsil phases).
- Glass columns up to 10' (3.05m) long have one-piece construction – no butt seams.
- Most 2mm ID glass columns have chamfered inlets, to prevent bent needles.
- For an inert glass frit in the exit end of a glass column (prevents column debris from plugging a chromatograph-mass spectrometer interface), please specify.

Stationary Phase and Support

Phases which have been synthesized specifically for GC use typically are purer, of narrower molecular weight range, and without trace catalysts or metal impurities. Often they offer a wider minimum/maximum temperature range. Consult our stationary phase listings to determine if a GC-grade phase is available for your application. Descriptions of most of the GC-grade phases we offer begin with the letters DC, SP, or OV.

Be sure to request a coating percentage compatible with the support. Table A indicates examples of how much phase can be added to various types of supports. Excess phase will bleed from the column as it is conditioned, and will prolong the conditioning time (to days).

Many of the supports we offer are available in multiple particle size (mesh) ranges, deactivation, etc. Carefully read our support section to understand the differences in the many types of supports.

Table B indicates the amount of various supports required to pack tubing of different dimensions. This information is useful for customers who pack their own columns.

Table A. General Guidelines for Phase Coating Percentages

SUPPORT	PHASE COATING %
Carbopack B	1-6% nonsilicone phase
Carbopack C	0.1-1% nonsilicone phase
Carbopack F	0.1-1% nonsilicone phase
Chromosorb G	20% (15% gum)
Chromosorb P	30% (25% gum)
Chromosorb T	15% (7% gum)
Chromosorb W	20%
HayeSep Polymers	15% (5% gum)
Porapak Polymers	15% (5% gum)
SUPELCOPORT	20%
Tenax TA	15% (5% gum)

Table B. Column Packing Requirements

	AVERAGE WEIGHT PER FOOT (0.3m) OF TUBING			
	STAINLESS STEEL		GLASS	
SUPPORT	1/8" OD	1/4" OD	2mm ID	4mm ID
Carbopack B	0.5g	2.8g	0.4g	1.5g
Carbopack C	1.0g	5.5g	1.0g	3.5g
Chromosil	0.4g	2.6g	0.4g	1.4g
Chromosorb G	0.8g	3.8g	0.7g	2.3g
Chromosorb P	0.5g	3.3g	0.4g	2.4g
Chromosorb W	0.3g	2.2g	0.3g	1.2g
Chromosorb 101-108	0.3g	2.2g	0.4g	1.2g
Porapak Polymers	0.4g	3.0g	0.5g	1.7g
SUPELCOPORT	0.3g	2.2g	0.3g	1.2g
Tenax TA	0.2g	1.2g	0.2g	0.8g

All weights approximate. Tubing ID, changes in support specifications, etc. affect values.

HELPFUL HINTS

Save time when reordering custom columns. We retain sales order numbers for empty custom columns, custom packings, and packed columns for 3 years. Simply give us the number for your previous custom order.

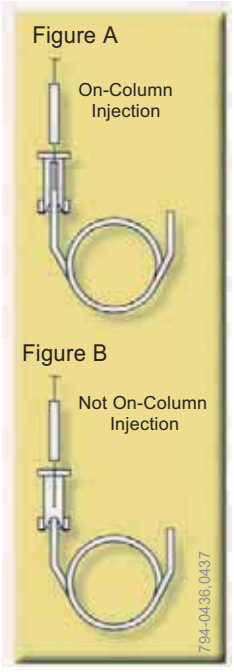
Metal and Teflon Columns

Tubing Composition and Specifications: Various tubing materials have been used for GC. It is best that you use the material specified in your method. All metal tubing is specified by outside diameter, but the inside diameters of the different metals (stainless steel, copper, nickel) differ greatly. This affects the total amount of packing in the column, and a change from one metal to another can noticeably affect your separations.

Column Configuration: Most analysts prefer to have metal columns formed specifically to fit their instruments. However, you can make small modifications to the shape of a general conformation metal column, without damaging the packing, if you bend the tubing carefully (e.g., around a large gas cylinder).

Silane Treated Glass Columns

Our glass shop has been fabricating glass columns for gas chromatography for more than 30 years. We have glass column specifications for more than 500 GC models. We can manufacture glass columns for any GC that we have a drawing for.



Inlet Design: In addition to the make and model of instrument, we will need to know the injector configuration. If the column extends to the septum in the inlet, injections are made "on-column" (Figure A). If the column extends just into the fitting in the oven, injections are "not on- column" (Figure B). This information will tell us how much of the column inlet should be left unpacked. Unless requested otherwise, we prepare all columns for on-column injection, with 2½ inches (63mm) empty at the inlet, to allow for the needle entering the column. If the column is to be used with not on-column injection, you don't need to allow space for the needle, and you probably will want the column completely filled.

TightSpec versus Nominal Dimensions: Variations in column length and ID affect the reproducibility of your retention times. You can be assured of highly consistent dimensions when you use either TightSpec or Supelco nominal length columns, but there is a difference between the two. TightSpec metric length columns conform to within ±6mm of their stated lengths. This means no matter which make or model of instrument you use, your column will have the same length, and you will have the best chance of repeating your results from one instrument to another. Supelco nominal length columns conform to instrument manufacturers' length specifications, in feet or meters, to within ±1.5%. When you compare actual lengths of these columns among instruments, you will find large differences – as much as 1 foot from the stated length (thus the term nominal length). Obviously, these differences will cause problems when you try to reproduce retention times among different instruments. We recommend using nominal length columns only when you are trying to duplicate a method on the same model of instrument as was originally used to develop the method.

Special Column Designs and Considerations: Consider the type of end plugs (typically glass or Teflon wool), the type of deactivation the tubing and plugs should have, and whether you want special end closures such as glass frits. The tubing and plugs should be deactivated in a manner that conforms to the characteristics of your sample. For most applications silanized wool plugs are suitable, but for analyses of ppm levels of acids the glass wool plugs should be treated with H_3PO_4, and analyses of sulfur compounds typically require Teflon wool plugs. We routinely treat glass columns with a silanizing agent, and can rinse them with other chemicals to produce special surface treatment, such as with NaOH for basic compounds.

Analysts using mass spectrometers often request glass frits in their columns, to insure that no particles get into and obstruct the jet separator. If you are using valving in your system, we can install stainless steel frits in the ends of your stainless steel column, to prevent packing particles from entering the valves and scratching their inner surfaces. We will be happy to discuss all of these options with you, and will custom manufacture your column to provide the best possible analytical environment for your samples.

Fittings: We include brass fittings and appropriate ferrules with most packed columns. You can request special fittings (stainless steel) or ferrules for your particular application. Simply tell us what you need when placing your order.

PureCol Column Inlet Liners

When nonvolatiles accumulate in the column inlet, you must replace several inches of packing – or the entire column. A silanized glass PureCol liner, inserted in the column inlet, solves this problem simply and inexpensively. When column performance begins to deteriorate, you can quickly and conveniently replace the insert – often without removing the column from the instrument. Replacement time is comparable to replacing a septum. Replace the PureCol liner when you change the septum, or when you analyze a new type of sample.

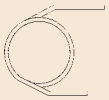
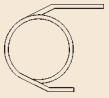
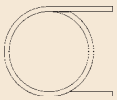
PureCol liners are available in two sizes. The smaller size fits 2mm ID glass columns with chamfered ends and 7cm of straight, unpacked inlet. The larger size fits any 4mm ID glass column that has 7cm of straight, unpacked inlet. Use PureCol liners with a 2" (5cm) 21-gauge or finer needle.

DESCRIPTION	QTY.	CAT. NO.	PRICE
FOR 2mm ID COLUMNS (CHAMFERED INLET ONLY)			
	10	20534	
	50	20536	
FOR 4mm ID COLUMNS			
	10	20540-U	
	50	20543	

Order your glass column with a PureCol liner already in place – at no extra cost. Just specify "glass column with PureCol liner" on your order.

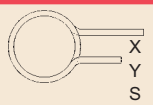
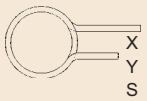
Packed Columns
Empty Glass Columns

Silane Treated Empty Glass Columns
(no fittings, all 1/4" OD)

COLUMN DIMENSIONS LENGTH	ID (mm)	CAT. NO.	PRICE
Agilent/HP 5880, 5890, 5987, 6890 Configuration A 9" span all detectors except TCD  X 11.02" 280mm Y 9.05" 230mm S 9" 229mm			
2'/0.61m	2	21638	
3'/0.91m	2	21838	
1.0m TS	2	21203-U	
4'/1.22m	2	21776	
6'/1.83m	2	21641	
2.0m TS	2	21814	
2.4m TS	2	21816	
10'/3.05m	2	21683	
4'/1.22m	4	21839	
6'/1.83m	4	21681	
2.0m TS	4	21815	
Agilent/HP 5880, 5890, 5987, 6890 Configuration B TCD only  X 11.02" 280mm Y 7.09" 180mm S 9" 229mm			
6'/1.83m	2	20613	
10'/3.05m	2	21642	
6'/1.83m	4	20500-U	
Perkin Elmer 1, 2, 3, 115, 300, 900, 910, 990, F30, 2000, 2100, 3920, Sigma Series (not on-column injection)  X 8 5/8" 219mm Y 8 5/8" 219mm S 8 3/4" 222mm			
4'/1.22m	2	21842	
6'/1.83m	2	20487	
2.0m TS	2	21817	
10'/3.05m	2	20822	
6'/1.83m	4	21654	
Perkin Elmer 1, 2, 3, 300, 910, Sigma Series (heated on-column injection)  X 12 5/8" 321mm Y 7 1/8" 181mm S 8 3/4" 222mm			
1.0m TS	2	21214	
2.0m TS	2	21823	
Perkin Elmer 8300, 8400, 8700 Series (not on-column injection)  X 6 13/16" 173mm Y 6 13/16" 173mm S 6 1/2" 165mm			
3'/0.91m	2	21802	
1.0m TS	2	21206	
6'/1.83m	2	21804	
2.0m TS	2	21179-U	
2.4m TS	2	21197-U	
6'/1.83m	4	21806	
2.0m TS	4	21189-U	
Perkin Elmer 8300, 8400, 8500, 8600, 8700 Series (on-column injection)  X 12" 305mm Y 6 13/16" 173mm S 6 1/2" 165mm			
3'/0.91m	2	21739	
6'/1.83m	2	21799	
6'/1.83m	4	21801	

x = length of injector arm
y = length of detector arm
s = span (injector to detector)
TS = TightSpec column

Silane Treated Empty Glass Columns
(no fittings, all 1/4" OD)

COLUMN DIMENSIONS LENGTH	OD	ID (mm)	CAT. NO.	PRICE
Shimadzu GC-4BM, 4CM, 4MG, GC-6A, 6AM, GC-7AG, 7A, 9A  X 13" 355mm Y 11" 282mm S 1.57" 40mm				
1.7m	5mm	3	20821-U	
2.5m	5mm	3	21687	
Shimadzu GC RIA, GC-8A8IF  X 9" 229mm Y 9" 229mm S 6" 152mm				
1.5m	5mm	3	21632	
2.0m	5mm	3	21633	
Shimadzu 14A, 15A, 16A  X 13" 335mm Y 11" 282mm S 1.57" 40mm				
1.0m TS	5mm	2.6	21190-U	
1.7m	5mm	2.6	21879-U	
1.7m TS	5mm	2.6	21191-U	
2.4m TS	5mm	2.6	21193-U	
2.5m	5mm	2.6	21880-U	
1.7m	5mm	3	21538	
1.7m TS	5mm	3.0	21192-U	
Shimadzu Mini-GC  X 7.48" 190mm Y 5.59" 142mm S 4.72" 120mm				
6'/1.83m	5mm	3.0	20609	

Fittings

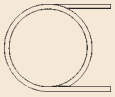
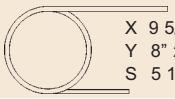
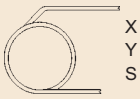
Ferrules: four graphite ferrules for Shimadzu columns, with metal spacers.

Nut Assembly: stainless steel nut, spring, stainless steel front ferrule, metal back spacer.

DESCRIPTION	CAT. NO.	PRICE
Ferrules	23311	
Nut Assembly	23312	

(2 assemblies needed per Shimadzu column)

Silane Treated Empty Glass Columns
(no fittings, all 1/4" OD)

COLUMN DIMENSIONS LENGTH	ID (mm)	CAT. NO.	PRICE
Tremetrics (Tracor) 560, 565, 570, 585	 X 8" 203.2mm Y 8" 203.2mm S 6" 152.4mm		
6'/1.83m	2	21588	
10'/3.05m	2	21780-U	
Varian Universal 3000, 3300, 3400, 3600, 3700, 4400, 4600, 6000, Vista Series	 X 9 1/4" 235mm Y 5 7/8" 149mm with adapter S 9" FID* X 9 1/4" 235mm Y 7 7/8" 200mm S 2 5/8"		
6'/1.83m	2	20845	
2m	2	21882-U	
6'/1.83m	4	20847	
Union: A special bored-through union is required to join the two-piece column. This union is not supplied with columns - order separately. We furnish graphite ferrules with the union.		21495-U	
Varian 3300/3400 FID (injector A to detector A)	 X 9 5/16" 236.5mm Y 8" 203.2mm S 5 1/2" 139.7mm		
3'/0.91m	2	21720-U	
1.0m TS	2	21207	
6'/1.83m	2	21721	
2.0m TS	2	21181-U	
2.4m TS	2	21199-U	
6'/1.83m	4	21722	
2.0m TS	4	21194-U	
Varian 3300/3400 FID (Injector B to detector B)	 X 9 5/16" 236.5mm Y 8" 203.2mm S 6.82" 173.2mm		
3'/0.91m	2	20840-U	
6'/1.83m	2	20841	
6'/1.83m	4	20843	

Silane Treated Empty Glass Columns
(no fittings, all 1/4" OD)

COLUMN DIMENSIONS LENGTH	ID (mm)	CAT. NO.	PRICE
Varian 3600, 3700, 4400, 4600, 6000, Vista series FID ECD TSD FPD	 X 9 5/16" 236.5mm Y 8" 203.2mm S 5 1/2" 139.7mm		
2'/0.61m	2	21784	
1.0m TS	2	21208	
3'/0.91m	2	21720-U	
4'/1.22m	2	21847	
6'/1.83m	2	21721	
2m	2	21853-U	
2.0m TS	2	21829	
8'/2.44m	2	21765	
2.4m TS	2	21831	
10'/3.05m	2	23738	
12'/3.66m	2	21849	
1m	4	21852-U	
6'/1.83m	4	21722	

HELPFUL HINTS

TightSpec metric length columns conform to within ±6mm of their stated lengths.If you are developing a new method, and you might be using several instruments, we recommend TightSpec columns.

Supelco nominal length columns conform to instrument manufacturers' length specifications, in feet or meters, to within 1.5%. We recommend using nominal length columns only when you are trying to duplicate a method on the same model of instrument as was originally used to develop the method.

* One long adapter and one short adapter supplied with each column.
x = length of injector arm
y = length of detector arm
s = span (injector to detector)
TS = TightSpec column

Packed Columns
Stationary Phases

Your Analyses Deserve the Best Column You Can Make

Our exclusive SP phases are silicone, ester, and other materials specifically manufactured or purified for use as chromatograph stationary phases. They ensure consistent analyses and much less bleed than generic substitutes. Many of the analyses shown on the SPC Applications pages of this catalog were performed on columns incorporating these phases.

DESCRIPTION [USP CODE], QTY. (SOLVENT)	TEMP. (°C) MIN/MAX	CAT. NO.	PRICE
Apiezon L, 25g (C,T)	50/300	21006	
BC-120 (C)	0/125	●	
Bentone 34, 50g (T)	0/180	21013-U	
Bis(2-ethoxyethyl)adipate, 50g (A)	0/150	21146	
Bis(2-ethylhexyl)phthalate [G22], 50g (M)	/150	21010-U	
Bis(2-methoxyethyl)adipate (A)	20/100	●	
n,n'-Bis(p-methoxylbenzylidene)-α,α'-bi-p-toluidine (BMBT) (C)	189/225	●	
Butanediol succinate, purified (C)	50/225	●	
Carbowax 20M [G16], 50g (C)	60/225	21032	
Carbowax 20M-terephthalic acid [G25], 50g (C)	60/225	11033-U	
Carbowax 400 [G20], 50g (C)	10/100	21023-U	
Carbowax 600, 50g (C)	30/125	21025-U	
Carbowax 1000 [G14], 50g (C)	40/150	21027	
Carbowax 1540, 50g (C)	50/175	21028	
Carbowax 4000 [G15], 50g (C)	60/120	21029	
Cyclohexanedimethanol succinate (CHDMS)[t] (C)	100/250	●	
DC-11 (C,T) (suggested substitute: SP-2100)	0/300	●	
DC-200 (500 cstks) (C,T) (suggested substitute: SP-2100)	0/200	●	
DC-200 (12,500 cstks) (C,T) (suggested substitute: SP-2100)	0/250	21095	
DC-550 [G28] (A,T) (suggested substitute: OV-7)	20/250	21096	
DC-710 (A) (suggested substitute: OV-11)	5/250	●	
DC QF-1 (FS 1265) (A) (suggested substitute: SP-2401)	0/250	21098-U	
DEGS-PS (A)	20/200	●	
Dexsil 300 carborane/methyl silicone, 5g (T)	50/450	21258	
Dexsil 400 carborane/methyl phenyl silicone (T)	50/400	●	
Dexsil 410 carborane/methyl cyanoethyl silicone (T)	50/375	●	
Dibutyl maleate, 50g (A)	0/50	21040-U	
Di-n-decyl phthalate (high purity), 25g (A)	10/175	21042-U	
Di(2-ethylhexyl)sebacate [G11], 50g (A)	0/125	21046-U	
Diethylene glycol adipate (DEGA) (A)	0/200	●	
Diethylene glycol succinate (DEGS)[G4], 25g (A)	20/200	11045	
Diglycerol, 10g (C,M)	20/100	21047-U	
Diisodecyl phthalate [G24] (A)	0/175	●	
2,4-Dimethylsulfolane, 10g (C)	0/50	21050-U	
Dinonyl phthalate, 50g (A)	20/150	21052-U	
Dioctyl sebacate, 50g (A)	0/125	21054-U	
EPON 1001 (A◆,C)	50/225	●	
Ethyl n,n-dimethyloxamate (EDO-1)	/40	●	
Ethylene glycol adipate (EGA)[G23], 25g (A)	100/225	11060	
Ethylene glycol phthalate (C)	100/200	●	
Ethylene glycol succinate (C)	100/200	●	
Ethylene glycol tetrachlophthalate (C)	120/200	●	
Fluorad FC-431, 50% solution in ethyl acetate, 50g (E)	40/200	21102-U	
Free Fatty AcidPhase (FFAP)[G25], 10g (C)	50/250	21063-U	
Hallcomid M-18-OL, 50g (C, M)	8/150	21068-U	
Halocarbon 10-25 (C)	20/100	●	
Halocarbon K-352 (F)	0/250	●	
Halocarbon wax (A)	50/150	●	
1,2,3,4,5,6-Hexakis (2 cyanoethoxycyclohexane) (C, T)	125/150	●	
Igepal CO-880 (Nonoxynol) [G31], 50g (A)	100/200	21072	
Igepal CO-990, 50g (A)	100/200	21073	
N-n-Lauryl-N-L-valine-t-butylamide (SP-300) (C)	60/140	●	
Neopentyl glycol adipate (C)	50/225	●	
Neopentyl glycol sebacate (C)	50/225	●	
Neopentyl glycol succinate [G21] (C)	50/225	●	
Nonoxynol (Igepal CO-880) [G31], 50g (A)	100/200	21072	
OV-1 (vinyl) [G9] (C, T) (suggested substitute: SP-2100)	100/350	●	
OV-1 (dimethyl, gum) [G2] 10g (C, T)	100/350	21104	
OV-3 (phenyl methyl dimethyl, 10% phenyl) (C,T)	0/350	●	
OV-7 (phenyl methyl dimethyl, 20% phenyl) [G32] (C, T)	0/350	●	
OV-11 (phenyl methyl dimethyl, 35% phenyl) (C, T)	0/350	●	
OV-17 (phenyl methyl, 50% phenyl) [G3], 25g (C, T) (suggested substitute: SP-2250)	0/375	21105	
OV-22 (phenyl methyl diphenyl, 65% phenyl) (C)	0/350	●	
OV-25 (phenyl methyl diphenyl, 75% phenyl) [G17], 10g (C)	0/350	21234	
OV-61 (diphenyl, 33% phenyl) (C ,T)	0/350	●	
OV-73 (5.5% diphenyl) (T)	0/325	●	
OV-101 (dimethyl, fluid) [G1], 20g (C) (suggested substitute: SP-2100)	0/350	21228	
OV-105 (cyanopropylmethyl) (A)	0/275	●	
OV-202 (trifluoropropyl, fluid) (C)	0/275	●	
OV-210 (trifluoropropyl, fluid) [G6], 25g (A) (suggested substitute: SP-2401)	0/275	21240-U	
OV-215 (trifluoropropyl, gum) (E)	0/275	●	
OV-225 (cyanopropylmethyl-phenylmethyl) [G19], 5g (A,C)	0/265	21241	

Packed Columns
Stationary Phases

DESCRIPTION [USP CODE], QTY. (SOLVENT)	TEMP. (°C) MIN/MAX	CAT. NO.	PRICE
OV-275 (dicyanoallyl), 5g (A)	25/250	21278-U	
OV-330 silicone - Carbowax (A, T)	0/250	●	
OV-351 (C)(suggested substitute: SP-1000)	50/270	●	
OV-1701 (vinyl), 3g	0/250	21281-U	
β,β-Oxydipropionitrile, 50g (M)	0/75	21086	
Phenyldiethanolamine succinate [G12], 25g (C)	0/230	21087	
Polyethylene glycol adipate (EGA)[G23], 25g (A)	0/225	11060	
Polyethyleneimine, 50g (A)	0/175	21195-U	
Polyphenyl ether (5 rings) OS-124, 25g (A)	0/200	21089	
Polyphenyl ether (6 rings) OS-138, 25g (A)	0/225	21088	
Polypropylene glycol, 50g (M)	0/150	21090-U	
Polypropyleneimine (C)	0/200	●	
PPE-20 (poly-M-phenoxylene) (C)	125/375	●	
PPE-21 (C)	125/375	●	
Propylene carbonate (C)	0/50	●	
Quadrol, 50g (C)	0/150	21092	
SE-30 (methyl silicone, GC grade)[G2], 10g (C) (suggested substitute: SP-2100)	50/300	21099-U	
SE-52 (methyl silicone)[G27], 50g (C, T) (suggested substitute: OV-73)	50/300	21100-U	
SE-54 (methyl silicone: 5% phenyl, 1% vinyl silicone) [G36], 50g (C, T)	50/300	21106	
SF-96 (methyl silicone), 50g (C, T) (suggested substitute: SP-2100)	0/250	21101-U	
Silar 5 CP (C, A) (suggested substitute: SP-2300)	0/250	●	
Silar 10 CP[G5] (C, A) (suggested substitute: SP-2340)	0/250	●	
Sorbitol [G13] (M)	/150	●	
SP-216-PS (A)	25/200	●	
SP-300 (N-n-Lauroyl-N-L-valine-T-butylamide) (C)	60/140	●	
SP-301 (C)	260/290	●	
SP-400, chlorophenyl methyl silicone	0/350	●	
SP-1000[G25], (C)	50/250	●	
SP-1200, 10g (C)	25/200	21263	
SP-1220 (C)	50/200	●	
SP-1500 (C)	50/230	●	
SP-1510 (C)	50/230	●	
SP-1700 (A)	0/110	●	
SP-2100 (methyl silicone)[G1], 10g (C)	0/350	21284-U	
SP-2250 (methyl phenyl silicone, 50% phenyl) [G3], (C, T)	0/375	●	
SP-2300 (poly(cyanopropylphenyl siloxane))[G7], 5g (C, A)	20/275	21889	
SP-2310 (poly(50% biscyanopropyl / 50% cyanopropylphenyl siloxane)) (A)	25/275	●	
SP-2330(poly(80% biscyanopropyl / 20% cyanopropylphenyl siloxane)) [G8], 5g (A)	25/275	21287-U	
SP-2340 (poly(biscyanopropyl siloxane))[G5], 5g (A)	25/275	21288	
SP-2380 (poly(90% biscyanopropyl / 10% cyanopropylphenyl siloxane)) (A)	25/275	●	
SP-2401 (methyl silicone, trifluoropropyl) [G6], (A)	0/275	●	
SP-2510 (C)	50/250	●	
Squalane, 50g (C, T)	20/100	21109	
Squalene, (C, T)	0/100	●	
Sucrose acetate isobutyrate (SAIB) (C)	0/200	●	
Tetracyanoethylated pentaerythritol (C, T)	30/175	●	
Tetraethylene glycol dimethyl ether [G30] (M)	/80	●	
1,2,3,4-Tetrakis (2-cyanoethoxy)butane (C)	110/200	●	
Tetraethylenepentamine (M)	0/125	●	
Tetrahydroxyethylethylenediamine (THEED) (C)	0/125	●	
β,β'-Thiodipropionitrile (TDPN) [G29] (C)	/100	●	
Tricresyl phosphate (C,M)	20/125	●	
Tris (2-cyanoethyl) nitromethane (TCENM) (C)	20/140	●	
1,2,3-Tris (2-cyanoethoxy)propane (TCEP), 50g (M,C)	0/175	21217	
Triton X-100, 50g (A)	0/200	21123	
Triton X-305 (A)	0/200	●	
UC W982 (methyl silicone) [G9], 50g (C,T) (suggested substitute: SP-2100)	0/300	21272-U	
UCON 50-HB-280-X (C,M)	0/200	●	
UCON 50-HB-2000 (C,M)	0/200	●	
UCON 50-HB-5100 (C,M)	0/200	●	
UCON LB-550-X[G18] (C,M)	0/200	●	
UCON LB-1800-X (M)	/200	●	
Versamid 900 (M)	190/275	●	

[1] US Patent No. 3,239,997.

● Available in packed columns or as a coated packing only.

SOLVENTS	
A – acetone	C – chloroform
E – ethyl acetate	F – Freon
M – methanol	P – pyridine
T – toluene	◆ – hot solvent

Packed Columns
Supports

Graphitized Carbon Blacks (GCB)

Nonporous, nonspecific, highly inert graphitic carbon adsorbents/solid supports which separate compounds according to the size and shape of the molecule (e.g., polarizability). Addition of a liquid phase allows unique separations, based on analyte interactions with both the carbon surface and the liquid phase (i.e., gas-liquid-solid chromatography, or GLSC).

Carbopack B -USP code [S12]. Surface area: ~100m²/g.

Carbopack C -USP code [S7]. Surface area: ~ 10m²/g. Separation mechanism equivalent to that of Carbopack B, but a larger molecular size range typically is chosen.

Carbopack F -Surface area: ~ 5m²/g. Can reduce separation times by 50%, compared to Carbopack C.

Carbopack X -A unique graphitized carbon black with porosity (absent in most GCBs). The 240m²/g surface area provides greater adsorption strength, relative to other GCBs, making Carbopack X a unique bridge between GCBs and carbon molecular sieves. Density: 0.41g/mL.

Carbopack Y -Surface area: 24m²/g; density: 0.42g/mL. A bridge between Carbopack B and Carbopack C.

Carbotrap -Surface area: 100m²/g; available in 20/40 mesh. Traps many airborne C4-C8 compounds.

Carbotrap C -Surface area: 10m²/g; available in 20/40 mesh. Traps many airborne C8 and heavier compounds.

Carbon Molecular Sieves

Carbosieve S-III[1] - Primarily for purge and trap of C2 and smaller molecules. A large surface area, 820m²/g, and 15/40Å pores, excellent for trapping airborne molecules.

Carboxen-563 – Carboxen-564 – Carboxen-569Our versions of Ambersorb XE-347 and Ambersorb XE-340 adsorbents, Carboxen-563 and Carboxen-564[2]carbon molecular sieves provide higher capacity for many volatile organics. Carboxen-569 is an exclusive material with no close equivalents. Carboxen-563 is for analyses of water or airborne compounds. Its range for airborne compounds is similar to that of Carboxen-564, but with a somewhat lower capacity. Carboxen-564 traps many C2-C5 volatile organic compounds. Carboxen-569 has the highest capacity for organic molecules and the lowest capacity for water.

Carboxen-1000 -Large surface area (>1200 m²/g) for excellent kinetics and thermodynamics, designed for analyses of permanent gases and light hydrocarbons. Carboxen-1000 GSC columns are direct replacements for Carbosieve S-II columns.

Carboxen-1001 -Surface area: 560 m²/g; packing density: 0.47g/mL; available in 60/80 mesh. Traps C1 and C2 hydrocarbons. Available only in ORBO tubes or purge traps.

Carboxen-1003 -Large surface area (~ 1000m²/g); a combination of efficient adsorption/desorption and hydrophobic surface characteristics. Density: 0.46g/mL; porosity: macropores – 0.28cc/g, mesopores – 0.26c micropores – 0.38cc/g.

Carboxen-1004 -Improved sieving characteristics for analyses of permanent gases and light hydrocarbons. Available in 80/100 mesh size for micropacked columns.

Supelcarb -A high-capacity sieve, capable of trapping a broad range of organic compounds. Specifically prepared for split vent trap and carrier gas purification applications. Trapping capacity is much higher than that of activated charcoal – by a factor of two for lighter hydrocarbons. Allows less gas channeling in a packed bed than activated charcoal particles.

[1] Patented. See Legally Speaking in the index.

[2] Supelco US Patent No. 4,839,331.

Polymers

Chromosorb 101 -USP code [S2]. Surface area: <50m²/g; packing density: 0.30g/mL. For free fatty acids, glycols, alcohols, alkanes, esters, ketones, hydrocarbons, ethers.

Chromosorb 102 -USP code [S6]. Surface area: 350m²/g; packing density: 0.29g/mL. For alcohols, light and permanent gases, oxygenated compounds, or as an adsorbent to trap organics in air or water.

Chromosorb 103 -Surface area: 350m²/g; packing density: 0.32g/mL. For basic compounds such as alcohols, amides, amines, arsines, hydrazines, ketones, NH_3, phosphines, or as an adsorbent to trap acidic compounds in air.

Chromosorb 104 -Surface area: 100-200m²/g; packing density: 0.32g/mL. For polar compounds.

Chromosorb 105 -Surface area: 600-700m²/g; packing density: 0.34g/mL. For formaldehyde, various classes of organic compounds (boiling point approx. 200°C), to separate acetylene from other small hydrocarbons, or as an adsorbent for trapping organics in air or water.

Chromosorb 106 -Surface area: 700-800m²/g; packing density: 0.28g/mL. For gases, C2-C5 alcohols, low boiling compounds; an adsorbent for organics in air or water.

Chromosorb 107 – Chromosorb 108 -Supply limited; available in columns only until supply runs out.

HayeSep A -Separates permanent gases at ambient temperatures. Use at higher temperatures to analyze C2 hydrocarbons, hydrogen sulfide, and water.

HayeSep B -Separates C1 and C2 amines and trace levels of ammonia and water.

HayeSep C -USP code [S10]. For analyses of polar molecules. Separation characteristics similar to Chromosorb 104.

HayeSep D and DB -Superior separation characteristics for light gases, carbon monoxide, carbon dioxide, and acetylene (elutes before other C2 hydrocarbons). Use D for analyses of water and hydrogen sulfide.

HayeSep Q -USP code [S3].

HayeSep R -USP code [S4].

HayeSep S -USP code [S8].

HayeSep N-P-T -Also available.

Tenax TA - Use for analyses of high boiling alcohols, polyethylene glycols, diols, phenols, mono- and diamines, ethanolamines, aldehydes, ketones, chlorinated aromatics. Widely mentioned in US EPA and NIOSH methods. A replacement for Tenax GC. Tenax GR (30% graphitzed carbon in Tenax) is still available – please inquire.

Porapak

Polarity increases from Porapak P through Porapak T.

Porapak Packing	Surface Area (m^2/g)	Packing Density (g/mL)
P	100-200	0.27
PS[3]	100-200	0.27
Q	500-600	0.34
QS[4]	500-600	0.34
R	450-600	0.30
S	300-450	0.35
N	225-350	0.38
T	250-350	0.43

[3] Silanized version of Porapak P.

[4] Silanized version of Porapak Q.

Chromosorb T (Teflon) - USP code [S5]. Popular for analyses of small polar molecules such as water, acids, amines, alcohols, and corrosives such as HF, HCl, and chlorosilanes. Difficult to pack. Upper temperature limit: 250°C.

Silica

Chromosil 310 and Chromosil 330 packings are specially tested for specific sulfur applications (e.g. COS, SH_2, CS_2 and SO_2), and are available only in prepared columns. For more information about these columns, request Bulletin 722.

Davison Silica Grade 12 - Surface area: 750 m^2/g; pore volume: 0.45cc/g; pore diameter: 22Å. Used for collecting or separating light volatile compounds; often used for analyses of CO_2. High affinity for water.

Diatomites

Chromosorb G -For analyses of polar compounds. Maximum phase loading: ~ 5% by weight (equivalent to a Chromosorb W loading of ~ 12.5% because of higher density). Available only as a custom product.

Chromosorb P -USP code [S1C]. Particularly well suited for nonpolar compounds, must be deactivated for use with polar compounds. Can support high phase loadings, up to 35% by weight in some cases.

Chromosorb W -USP code [S1A]. Suitable for use with polar compounds, due to its low surface area and high inertness. Frag

Chromosorb 750 -Developed for pesticide and biological applications. Available only as a custom product.

SUPELCOPORT - USP code [S1A]. The most inert diatomite support available. Acid washed to remove mineral impurities, then DMDCS treated. Density and particle size distribution are tightly controlled to assure batch-to-batch reproducibility. Each lot is tested to conform to US EPA Method 608 for organochlorine pesticides and PCBs.

Activated Alumina F-1

Extremely wide pore diameter range, 0-100,000Å, very useful for separating saturated light (C1-C5) hydrocarbons from unsaturates. Also very useful for air monitoring. Often used as a drying medium. Available only as a custom product.

Zeolite Molecular Sieves

Molecular Sieve 5A and Molecular Sieve 13X are commonly used for separations of H_2, O_2, N_2, CH_4, and CO, argon, neon, and other rare gases. Also used as trapping materials, in particular, for removing water vapor from gas streams. When three-foot columns of the molecular sieves are compared, elution of H_2, O_2, N_2, and CH_4, is approximately equal, but elution of CO takes twice as long on Molecular Sieve 5A.

Support Treatments

AW	acid washed
AW-DMDCS	silane treated, acid washed
BW	base washed (only available on SUPELCOPORT)
DA	deactivated for acidic compounds
DB	deactivated for basic compounds
HT	hydrogen-treated
NAW	nonacid washed

Diatomite Supports

DESCRIPTION [USP CODE] MESH SIZE	SURFACE AREA (m^2/g)	PACKING DENSITY (g/mL)	CAT. NO.	PRICE
CHROMOSORB P NAW, 100g				
60/80	4-6	0.32-0.38	20193	
80/100			20194-U	
100/120			20103	
CHROMOSORB P AW [S1C], 100g				
60/80	4-6	0.32-0.38	20198-U	
80/100			20203-U	
100/120			20110	
CHROMOSORB P AW-DMDCS [S1C] 100g				
60/80	4-6	0.32-0.38	20206	
80/100			20207	
100/120			20117	
CHROMOSORB W HP [S1A], 100g				
60/80	0.6-1.3	0.23	20152	
80/100			20153	
100/120			20159-U	
CHROMOSORB W AW, 100g				
60/80	1.0-3.5	0.21-0.27	20123	
80/100			20124	
100/120			20126	

Available Mesh Sizes

SUPPORT	MESH SIZE
Carbopack B	60/80, 80/100, 80/120
Carbopack B HT	40/60, 60/80
Carbopack C	60/80, 80/100
Carbopack C HT	60/80, 80/100
Alumina F-1	60/80, 80/100, 100/120
Anachrom	80/100, 100/120
Celite 545 (AW)	filter aid, fine mesh
Chromosorb 101-108 [1]	60/80, 80/100, 100/120
Chromosorb 750	60/80, 80/100, 100/120
Chromosorb W HP	60/80, 80/100, 100/120
Chromosorb G HP	80/100, 100/120
Chromosorb G, P, or W (AW or NAW)	45/60, 60/80, 80/100, 100/120
Chromosorb G, P, or W (AW-DMDCS)	60/80, 80/100, 100/120
Chromosorb T [2]	30/60, 40/60
Glass beads	60/80
HayeSep	60/80, 80/100, 100/120
Mol Sieve 5A	60/80, 80/100, 100/120
Mol Sieve 13X	60/80, 80/100, 100/120
Porapak	50/80, 80/100, 100/120
Silica gel	60/80, 80/100, 100/120
SUPELCOPORT	60/80, 80/100, 100/120
SUPELCOPORT BW	60/80, 80/100, 100/120

[1] Chromosorb 104 is not available in 80/100 mesh.

[2] Suggested substitute: Haloport F

HELPFUL HINTS

Catalog numbers for supports can be found in the Stock Packings section of this catalog.

Packed Columns
Stock Packings

Stock Packings for GC Columns

PACKING DESCRIPTION		USE	MIN./MAX. TEMP. (°C)	QTY.	CAT. NO.	PRIC
APIEZON						
10% Apiezon L/2% KOH on 80/100 Chromosorb W AW		amines	50/225	20g	11893	
CARBOPACK B						
Carbopack B, 60/80		light hydrocarbons	>500	10g	20273	
Carbopack B HT[1], 60/80			/225	10g	20274	
4% CARBOWAX 20M/0.8% KOH/60/80 Carbopack B		amines	/220	15g	11887	
5% CARBOWAX 20M/GP 60/80 Carbopack B		blood alcohols	/225	15g	11766	
4% CARBOWAX 20M /80/120 Carbopack B-DA[2]		C2-C5 acids	/200	15g	11889	
5% CARBOWAX 20M/80/120 Carbopack B AW		alcoholic beverages	/225	15g	11812-U	
6.6% CARBOWAX 20M/80/120 Carbopack B AW		alcoholic beverages	/225	15g	11814	
2.5% Oronite NIW/60/80 Carbopack B		alcohols, esters, ketones, general	/200	15g	11800-U	
1% SP-1000/60/80 Carbopack B		halogenated organics	/225	15g	11815	
3% SP-1500/80/120 Carbopack B		industrial solvents	/230	15g	11813-U	
1% SP-1510/60/80 Carbopack B		industrial solvents	/230	15g	11809	
CARBOPACK C						
Carbopack C	60/80	light hydrocarbons	>500	10g	10257	
	80/100	light hydrocarbons	>500	10g	10258	
0.2% CARBOWAX 1500/60/80 Carbopack C		alcohols, esters, ketones, general	/175	15g	11826	
0.2% CARBOWAX 1500/80/100 Carbopack C		alcohols, esters, ketones, general	/175	15g	11827	
0.3% CARBOWAX 20M/0.1% H_3PO_4/60/80 Carbopack C		C2-C5 acids	/200	15g	11825-U	
0.1% SP-1000/80/100 Carbopack C		phenols	/225	15g	11820	
0.8% THEED/80/100 Carbopack C		ethylene oxide (EtO) residues, glycols	/115	15g	11880-U	
CARBOPACK X						
Carbopack X	40/60	light hydrocarbons	>500	10g	10436	
	60/80			10g	10437-U	
	120/400			50g	10439-U	
CARBOPACK Y						
Carbopack Y	40/60	light hydrocarbons	>500	10g	10461-U	
	60/80			10g	10462	
	120/400			50g	10464-U	
CARBOSIEVE						
Carbosieve[3] G	45/60	permanent gases,	/200	5g	10197	
	60/80	C2-C3		5g	10198	
	80/100	hydrocarbons		5g	10199	
Carbosieve S-II	60/80	permanent gases,		10g	10189	
	80/100	C2-C3 hydrocarbons,		10g	10190-U	
Carbosieve S-III	60/80			10g	10184	
CARBOTRAP						
Carbotrap	20/40	air monitoring	/350	10g	20287	
Carbotrap C	20/40			10g	20309	
Carbotrap X	20/40			10g	10435-U	
Carbotrap Y	20/40			10g	10460-U	
CARBOXEN						
Carboxen-563	20/45	permanent gases		10g	10263	
Carboxen-564	20/45	permanent gases		10g	10264	
Carboxen-569	20/45	permanent gases		10g	10269	
Carboxen-1000	45/60	permanent gases,	/225	50g	10477-U	
	60/80	C2-C3 hydrocarbons		10g	10478-U	
Carboxen-1003	40/60	permanent gases	/225	10g	10471	
CARBOWAX 20M						
3% CARBOWAX 20M on 100/120 SUPELCOPORT		general	60/225	20g	11792	
3% CARBOWAX 20M on 80/100 Chromosorb 101		ethylene oxide (EtO) & residues	60/220	20g	11780-U	
5% CARBOWAX 20M on 40/60 Chromosorb T		general	60/225	50g	11993	
5% CARBOWAX 20M on 100/120 SUPELCOPORT		general	60/225	20g	11793-U	
10% CARBOWAX 400 on 80/100 SUPELCOPORT		general	10/100	20g	11808	

Packed Columns
Stock Packings

PACKING DESCRIPTION		USE	MIN./MAX. TEMP. (°C)	QTY.	CAT. NO.	PRIC
CARBOWAX 20M (CONT'D)						
10% CARBOWAX 20M on 80/100 Chromosorb W AW		general	60/225	20g	11994	
10% CARBOWAX 20M/2% KOH on 80/100 Chromosorb W AW		amines	60/225	20g	11805	
10% CARBOWAX 20M/TPA on 80/100 Chromosorb W AW		acids	60/225	20g	11874	
10% CARBOWAX 20M on 80/100 SUPELCOPORT		general	60/225	20g	11810	
10% CARBOWAX 20M on 100/120 SUPELCOPORT		general	60/225	20g	11794-U	
15% CARBOWAX 20M on 80/100 SUPELCOPORT		general	60/225	20g	11796	
20% CARBOWAX 20M on 80/100 SUPELCOPORT		sulfur gases, light hydrocarbons	60/225	20g	11795-U	
DC PHASES						
10% DC-200 on 100/120 SUPELCOPORT		pesticides	0/250	20g	11964	
DEGS						
5% DEGS-PS on 100/120 SUPELCOPORT		C14-C20 fatty acids	20/200	20g	11870-U	
10% DEGS on 80/100 Chromosorb W AW		fatty acid esters	20/200	20g	11903	
GP 10% DEGS-PS on 80/100 SUPELCOPORT		fatty acid esters	20/200	20g	11999	
15% DEGS on 80/100 Chromosorb W AW		fatty acid esters	20/200	20g	11904	
DEXSIL						
3% Dexsil 300 on 80/100 Chromosorb W AW		general	50/450	20g	11995	
3% Dexsil 300 on 100/120 SUPELCOPORT		general	50/450	20g	11973	
MOLECULAR SIEVE						
Molecular Sieve 5A	30/40	permanent gases	/400	50g	20300	
	45/60			50g	20301	
	60/80			50g	20302	
Molecular Sieve 13X	45/60	permanent gases	/400	50g	20304	
	60/80			50g	20305	
	100/120			50g	20307	
OV PHASES						
3% OV-1 on 80/100 SUPELCOPORT		general	100/350	20g	11951	
3% OV-1 on 100/120 SUPELCOPORT		general	100/350	20g	11750-U	
3% OV-7 on 100/120 SUPELCOPORT		general	0/350	20g	11788-U	
3% OV-17 on 80/100 SUPELCOPORT		general	0/350	20g	11953	
3% OV-17 on 100/120 SUPELCOPORT			0/350	20g	11754	
3% OV-17 on 80/100 Chromosorb W HP			0/350	20g	12099	
3% OV-101 on 80/100 SUPELCOPORT			0/350	20g	11752	
10% OV-101 on 80/100 SUPELCOPORT			0/350	20g	11753	
3% OV-210 on 80/100 SUPELCOPORT		general	0/275	20g	11956	
3% OV-225 on 80/100 SUPELCOPORT		general	0/265	20g	11957-U	
3% OV-225 on 100/120 SUPELCOPORT		general	0/265	20g	11992	
15% OV-275 on 100/120 Chromosorb P AW-DMDCS		cis/trans FAMEs	0/250	20g	11844-U	
POROUS POLYMERS: CHROMOSORB CENTURY SERIES						
Chromosorb 101	60/80	general	/250	50g	20213	
	80/100				20214	
	100/120				20215	
Chromosorb 102	60/80	general	/250	50g	20200-U	
	80/100				20201	
	100/120				20202	
Chromosorb 103	60/80	polar compounds	/250	50g	20216	
	80/100				20217	
	100/120				20218	
Chromosorb 105	60/80	formaldehyde, acetylene	/250	50g	20222	
	80/100				20223	

GP Indicates packing has been tested for a specified analysis.

[1] HT – Hydrogen-treated for deactivation.

[2] DA – Deactivated for acidic compounds.

[3] Trademark, patented.

[4] DB – Deactivated for basic compounds.

[5] Porapak PS and QS are silanized versions of Porapak P and Q, treated to reduce surface adsoprtion.

HELPFUL HINT

Guaranteed Performance packings, designated GP, are made and tested for a specific application and are guaranteed to perform that application as specified. Quality control tests for these packings ensure that results for every batch will be the same, and will be as shown in our literature. Always buy a GP packing when available for your application.

Packed Columns

Stock Packings

PACKING DESCRIPTION		USE	MIN./MAX. TEMP. (°C)	QTY.	CAT. NO.	PRIC
POROUS POLYMERS: CHROMOSORB CENTURY SERIES (CONT'D)						
Chromosorb 106	60/80	C2-C3 gases, alcohols	/250	50g	20225	
	80/100				20226	
	100/120				20227	
Chromosorb 107	80/100		/250	50g	20233	
Chromosorb 108	60/80		/250	50g	20131	
	80/100				20132	
	100/120				20133	
POROUS POLYMERS: HAYESEP SERIES						
HayeSep A	60/80	permanent gases	/165	75cc	10282	
	80/100				10283	
	100/120				10284	
HayeSep B	60/80	C1-C2 amines,	/190	75cc	10285	
	80/100	ammonia in water			10286	
HayeSep C	60/80	polar compounds	/250	75cc	10288	
	80/100				10289	
	100/120				10290	
HayeSep D	60/80	light gases,	/290	75cc	10291	
	80/100	CO, CO_2			10292	
	100/120				10293	
HayeSep DB[3]	80/100	light gases, CO, CO_2	/290	75cc	10280-U	
	100/120				10281-U	
HayeSep N	60/80	acetylene,	/165	75cc	10294	
	80/100	ethylene			10295	
	100/120				10296	
HayeSep P	60/80	ammonia,	/250	75cc	10297	
	80/100	alcohols in water			10298	
HayeSep Q	60/80	hydrocarbons,	/275	75cc	10300-U	
	80/100	sulfur gases,			10301-U	
	100/120	general			10302-U	
HayeSep R	60/80	light hydrocarbons,	/250	75cc	10303	
	80/100	chlorinated			10304	
	100/120	compounds			10305-U	
HayeSep S	60/80	C2-C3 hydrocarbons	/250	75cc	10306	
	80/100	polar compounds			10307	
HayeSep T	60/80	light hydrocarbons	/165	75cc	10309	
	80/100	formaldhyde			10310	
	100/120				10311	
POROUS POLYMERS: PORAPAK SERIES						
Porapak N	50/80	ammonia,	/190	75cc	20324	
	80/100	acetylene,			20325	
	100/120	C2 hydrocarbons			20326	
Porapak P	50/80	carbonyl compounds	/250	75cc	20327	
	80/100				20328	
	100/120				20329	
Porapak PS[3]	50/80		/250	75cc	20345	
	80/100				20346	
	100/120				20347	
Porapak Q	50/80	aliphatic	/250	75cc	20330-U	
	80/100	hydrocarbons,			20331	
	100/120	general			20332	
Porapak QS[3]	50/80	organic acids,	/250	75cc	20342	
	80/100	other polar			20343	
	100/120	compounds			20344	
Porapak R	50/80	moderately	/250	75cc	20333	
	80/100	polar ethers			20334	
	100/120				20335	
Porapak S	50/80	alcohols	/250	75cc	20336	
	80/100	(normal & branched)			20337	
	100/120				20338	
Porapak T	50/80	formaldehyde, other	/190	75cc	20339	
	80/100	polar compounds			20340	

Packed Columns
Stock Packings

PACKING DESCRIPTION	USE	MIN./MAX. TEMP. (°C)	QTY.	CAT. NO.	PRIC
SE-30					
3% SE-30 on 80/100 Chromosorb W HP	general	50/300	20g	12097-U	
GP 4% SE-30/6% SP-2401 on 100/120 SUPELCOPORT	pesticides	100/250	20g	11948	
5% SE-30 on 80/100 SUPELCOPORT	general	50/300	20g	11784	
10% SE-30 on 80/100 SUPELCOPORT	general	50/300	20g	11785-U	
SILICA GEL					
Silica Gel (Davison Grade 12), 60/80	hydrocarbons, CO, CO_2, sulfur gases		100g	20290-U	
SP PHASES					
10% SP-1000 on 80/100 SUPELCOPORT	general	50/250	20g	11872	
10% SP-1000/1% H_3PO_4 on 100/120 Chromosorb W AW	anaerobic fermentation	/200	20g	11841	
5% SP-1200/1.75% Bentone 34 on 100/120 SUPELCOPORT	xylenes	25/175	20g	12134	
10% SP-1200/1% H_3PO_4 on 80/100 Chromosorb W AW	C2-C5 volatile fatty acids	25/200	20g	11965	
15% SP-1220/1% H_3PO_4 on 100/120 Chromosorb W AW	volatile fatty acids	/200	20g	12144	
1% SP-1240-DA[2] on 100/120 SUPELCOPORT	phenols	70/180	20g	11832	
23% SP-1700 on 80/100 Chromosorb P AW	C1-C6 hydrocarbons	0/110	25g	11865	
3% SP-2100 on 80/100 SUPELCOPORT	steroids	0/350	20g	11987	
3% SP-2100 on 100/120 SUPELCOPORT	steroids	0/350	20g	12138	
5% SP-2100 on 100/120 SUPELCOPORT	general	0/350	20g	11782-U	
10% SP-2100 on 80/100 SUPELCOPORT	hydrocarbons	0/350	20g	12140	
GP 10% SP-2100 on100/120 SUPELCOPORT	phenols	0/350	20g	11989	
GP 20% SP-2100/0.1% Carbowax 1500 on 100/120 SUPELCOPORT	solvents	0/175	20g	11821	
3% SP-2250 on 80/100 SUPELCOPORT	general	0/350	20g	11980	
3% SP-2250 on 100/120 SUPELCOPORT	bile acid methyl esters	0/350	20g	11878	
10% SP-2250 on 100/120 SUPELCOPORT	general	0/350	20g	12132	
GP 1.5% SP-2250/1.95% SP-2401 on 100/120 SUPELCOPORT	pesticides	0/250	20g	11947	
GP 3% SP-2310/2% SP-2300 on 100/120 Chromosorb W AW	rapeseed FAMEs	25/275	20g	11833	
10% SP-2330 on 100/120 SUPELCOPORT	general	0/275	20g	11858	
GP10% SP-2330 on 100/120 Chromosorb W AW	fatty acid esters	0/275	20g	11851	
3% SP-2340 on 100/120 SUPELCOPORT	carbohydrates	0/275	20g	11863	
10% SP-2340 on 100/120 Chromosorb W AW	general	0/275	20g	11852	
3% SP-2401 on 100/120 SUPELCOPORT	steroids	0/275	20g	11978	
TENAX					
Tenax TA, 60/80	high boiling compounds	/350	10g	11982	
80/100	amines, alcohols	/350	10g	21009-U	
TCEP					
GP 10% 1,2,3-Tris(2-cyanoethoxy)propane (TCEP) on 80/100 Chromosorb P AW	oxygenates, hydrocarbons, aromatics	0/175	20g	12122	
20% 1,2,3-Tris(2-cyanoethoxy)propane (TCEP) on 80/100 Chromosorb P AW	aromatics, oxygenates in gasoline	0/175	20g	11779	

HELPFUL HINT

Guaranteed Performance packings, designated GP, are made and tested for a specific application and are guaranteed to perform that application as specified. Quality control tests for these packings ensure that results for every batch will be the same, and will be as shown in our literature. Always buy a GP packing when available for your application.

GP Indicates packing has been tested for a specified analysis.

[1] HT – Hydrogen-treated for deactivation.

[2] DA – Deactivated for acidic compounds.

[3] Trademark, patented.

[4] DB – Deactivated for basic compounds.

[5] Porapak PS and QS are silanized versions of Porapak P and Q, treated to reduce surface adsoprtion.