

# Packed Column Instruction Sheet

## Important Notes

- 1) Packing materials used in stock packed columns are conditioned for 16 hours at 5°C below maximum liquid phase operating temperature and should only require a brief 30-minute stabilization period prior to use.
- 2) Custom packed columns require conditioning suitable to your application.
- 3) All molecular sieve columns are fully activated and end-capped to prevent moisture diffusion.
- 4) Columns configured for on-column injection have a 2-inch void at the inlet.
- 5) An injection port adaptor is usually required for column installation into 1/4-inch packed injection ports. A Restek packed column inlet adaptor (below) or the instrument manufacturer's inlet adaptor may be used for installation.

### Restek adaptors for 1/4" injection ports

- \* For 2mm ID packed columns, use inlet adaptor cat.# 21651 with a 1/4" x 1/8" Vespel®/graphite reducing ferrule.
- \* For 3.1mm ID packed columns, use inlet adaptor cat.# 21650 with a 1/4" x 3/16" Vespel®/graphite ferrule.

- 6) Operating temperature limits for most liquid phases available from Restek are listed in Table I (on the back of this instruction sheet).

## Installation Instructions

- 1) Connect the column to the injector by using either a Restek packed column inlet adaptor or the instrument manufacturer's adaptor.
- 2) Stock columns may be immediately connected to the detector using the instrument manufacturer's adaptor or by using the supplied 1/4-inch reducing Vespel®/graphite ferrule. When using the Vespel®/graphite ferrule, insert the column completely into the detector and withdraw approximately 1mm. Secure by turning the nut 1/2-turn.

**Do not connect a custom packed column to the detector until after the conditioning process** (see Step 3, below).

- 3) To condition the column, turn on the carrier gas and adjust the flow rate to the desired velocity. Purge the column at ambient temperature for 10 minutes to remove any trapped air, then elevate to the operating temperature and hold for 30-60 minutes. If your column has not been connected to the detector previous to conditioning, it can be connected now by following the installation instructions in Step 2. Now your column is ready to use.

## Helpful Hints

**Bending Tubing:** Columns may be bent to facilitate installation into various instruments. Avoid sharp (e.g., 90-degree) bends. 1/8" SilcoSmooth® tubing will tolerate a 2-inch minimum coil diameter. 3/16" SilcoSmooth® tubing will tolerate a 3-inch minimum coil diameter.

**Injector and Detector Temperatures:** Be certain the heated zones do not exceed the maximum temperature of the liquid phase. If the column contains multiple liquid phases, the lowest maximum temperature sets the limit for the column.

**Column Operating Pressure:** Table II lists common pressure drops for 2m x 2mm ID packed columns with various solid supports.

**Table II** Pressure drops across 2m x 2mm ID packed columns (ambient temperature).

80/100	Silcoport®	12–15 psig
100/120	Silcoport®	13–18 psig
60/80	CarboBlack™ B	10–15 psig
80/120	CarboBlack™ B	28–33 psig
60/80	CarboBlack™ C	15–22 psig
80/100	CarboBlack™ C	22–26 psig

**Changing Septa/Column Removal:** Allow the oven to cool. Turn off the carrier gas flow and allow sufficient time for the pressure in the column to equilibrate with the atmosphere. Removing the column or the septum under pressure will expel packing material from the column.

**CarboBlack™ Columns:** Avoid rough handling to prevent damage to the CarboBlack™ B or CarboBlack™ C packing. Also, these columns can be overloaded easily. Neat samples require on-column injection volumes of less than 0.2µL. When injecting diluted samples, do not exceed 70µg on-column (each component) for CarboBlack™ B packing or 35µg on-column for CarboBlack™ C packing.

**Table I** Liquid phases available for Restek packed columns. Inquire about others.

Phase	min./max. temp. (°C)	Phase	min./max. temp. (°C)
Apiezon L	50/300	OV-22, phenyl methyl diphenyl, 65% phenyl	0/350
<i>p,p'</i> -Azoxydiphenetole	132/140	OV-25, phenyl methyl diphenyl, 75% phenyl	0/350
BC-120	0/125	OV-61, diphenyl, 33% phenyl	0/350
Bentone-34	0/180	OV-73, 5.5% diphenyl	0/325
bis (2-ethoxyethyl) adipate	0/150	OV-101, dimethyl (fluid)	0/350
bis (2-ethylhexyl) phthalate	150 max.	OV-105, cyanopropyl methyl	0/275
bis (2-methoxyethyl) adipate	20/100	OV-202, trifluoropropyl (fluid)	0/275
<i>n,n'</i> -Bis( <i>p</i> -methoxybenzylidene)- $\alpha,\alpha'$ -bi- <i>p</i> -toluidine (BMBT)	189/225	OV-210, trifluoropropyl (fluid)	0/275
Carbowax 1000	40/150	OV-215, trifluoropropyl (gum)	0/275
Carbowax 20M	60/225	OV-225, cyanopropyl methylphenyl methyl	0/265
Carbowax 20M-terephthalic acid	60/225	OV-275, dicyanoallyl	25/250
Carbowax 400	10/100	OV-330, silicone - Carbowax	0/250
Carbowax 600	30/125	OV-351	50/270
Cyclohexanedimethanol succinate	100/250	OV-1701, vinyl	0/250
DC-11	0/300	Phenyldiethanolamine succinate	0/230
DC-200	0/200	Polyethylene glycol adipate (EGA)	100/225
DC-550	20/250	Polyphenyl ether (5 rings) OS-124	0/200
DEGS-PS	20/200	Polyphenyl ether (6 rings) OS-138	0/225
Di(2-ethylhexyl)sebacate	0/125	Polypropylene glycol	0/150
Diethylene glycol succinate (DEGS)	20/200	Rtx-1 (Rt-101)	0/350
Diethylene glycol adipate (DEGA)	0/200	Rt-1000	50/250
Diisodecyl phthalate	0/175	Rt-1200	25/200
2,4-Dimethylsulfolane	0/50	Rt-1220	50/200
Di- <i>n</i> -decyl phthalate	10/175	Rt-1500, Rt-1510	50/230
Dinonyl phthalate	20/150	Rt-2100	0/350
Ethylene glycol adipate	100/225	Rt-2300	20/275
Ethylene glycol phthalate	100/200	Rt-2330, Rt-2340	25/275
Ethylene glycol succinate	100/200	Rt-608Pkd	0/275
FFAP	50/250	Rt-Sebaconitrile	25/110
Fluorad FC-431, 50% solution in ethyl acetate	40/200	Rt-XLSulfur	250 max.
Hallcomid M-18-OL	8/150	SE-30, SE-52, SE-54	50/300
Halocarbon 10-25	20/100	Silar 5 CP Silar 10 CP	0/250
Halocarbon K-352	0/250	Sorbitol	150 max.
Halocarbon wax	50/150	Squalane	20/100
Igepal® CO-880 (Nonoxynol)	100/200	Squalene	0/100
Igepal CO-890	100/200	Stabilwax	40/240
Krytox	-30/260	Tetracyanoethylated pentaerythritol	30/175
Neopentyl glycol adipate	50/225	THEED (Tetrahydroxyethylenediamine)	0/125
Neopentyl glycol sebacate	50/225	$\beta,\beta$ -Thiodipropionitrile (TDPN)	100
Neopentyl glycol succinate	50/225	Tricresyl phosphate	20/125
Nonoxynol (Igepal CO-880)	100/200	1,2,3-Tris (2-cyanoethoxy) propane (TCEP)	0/175
<i>n</i> -Octane on Res-Sil® C	150 max.	Triton X-100, Triton X-305	0/200
OPN on Res-Sil® C	150 max.	UC W982	0/300
$\beta,\beta$ -Oxydipropionitrile	0/75	UCON 50-HB-2000	0/200
OV-1, dimethyl (gum)	100/350	UCON 50-HB-280-X	0/200
OV-1, vinyl	100/350	UCON 50-HB-5100	0/200
OV-3, phenyl methyl	0/350	UCON HB-1800-X	200 max.
OV-7, phenyl methyl dimethyl, 20% phenyl	0/350	UCON LB-550-X	0/200
OV-11, phenyl methyl dimethyl, 35% phenyl	0/350	Versamid 900	190/275
OV-17, phenyl methyl, 50% phenyl	0/375		

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