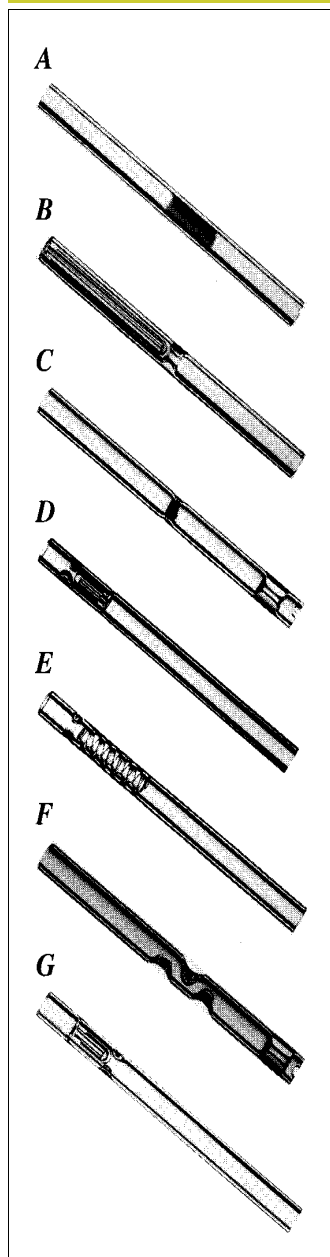




Split Injector Inlet Sleeves

Try Restek's
New
CarboFrit
an alternative
for inlet liners
(see p239)



■ Inlet Sleeves for Split Injectors

Split sleeves are designed with mixing chambers and tortuous flow paths to fully vaporize the sample into a homogeneous vapor cloud before the sample reaches the split point. All Restek splitter sleeves are fully deactivated with a high temperature silanizing reagent to cap surface silanol groups so active compounds in the sample don't adsorb onto the hot glass surface.

Pack splitter sleeves with wool, fused silica beads, or CarboFrit™ inlet liners when analyzing dirty samples to trap non-volatile residue and prevent column contamination. Some of the more commonly used inlet sleeves are described:

■ A) Split Sleeve with Wool

The wool provides a high surface area to allow rapid vaporization of the sample and deliver a uniform vapor cloud to the split point. The low mass of the wool fiber prevents the Liedenfrost effect and yields energy to promote complete vaporization.

Benefits:

- Low cost.
- Simple to manufacture.

Drawbacks:

- Glass wool can be adsorptive.
- High maintenance requirements.

■ [B] Laminar Cup Splitter

The sample flows through a small opening and smashes against the head of a glass cup. Then it travels around the outside of an elongated cup before the flow is inverted twice. Larger volume injections are possible because the liquid is trapped at the inner base and cannot escape until vaporized.

Benefits:

- Recommended by Grob'.
- Vaporizes up to 5ul samples.
- Best splitter sleeve for high molecular weight compounds.
- Laminar flow profile provides highest resolution.

Drawbacks:

- Costly to manufacture.

■ Frit Splitter

The sample must pass through the porous ceramic frit. The high surface area and tortuous flow path ensures complete vaporization.

Benefits:

- Traps septa particles and residue.

Drawbacks:

- Ceramic frit can be active.
- Difficult to clean.

■ D) Cup Splitter Sleeve

The sample flows through a mini funnel and smashes into a glass cup. The flow path then inverts twice before reaching the split point.

Benefits:

- Tortuous flow path aids in sample vaporization.
- Minimizes molecular weight discrimination.
- Can be packed with wool to trap particles,

Drawbacks:

- Difficult to clean.

■ E) Cycloplitter (Patent#: 5,119,669)

This patented design incorporates a cylindrical glass screw in the sample pathway, providing a large area for sample vaporization.

Benefits:

- Ideal for dirty samples
- Allows many injections of dirty samples before cleaning is required.
- Easy to clean.
- **Drawback**
- Not recommended for large volume injections.

■ F) Baffle Splitter

The baffle deduces turbulent flow that directs the sample against the wall of the glass sleeve.

Benefits:

- Simple to manufacture

Drawbacks:

- Prone to molecular weight discrimination.
- Septa particles / residue can enter column.
- Subject to Liedenfrost effect.

■ G) mini-Lam Split Sleeve

The flow principle is basically the same as in the laminar cup splitter. The *mini-Lam* sleeve's design utilizes a shortened, inverted laminar cup. It can be used for dual column analysis in a capillary injection port using a two-hole ferrule.

Benefits:

- Less expensive than the laminar cup.
- Vaporizes up to 4ul samples.
- Ideal for high molecular weight compounds.
- Similar to laminar cup splitter.

Easy to clean.

"Injectors Providing Complete Sample Evaporation Above the Column Entrance in Vaporizing GC Injections", K. Grob and C. Wagner, *HRC & GC*, Vol. 16, pg. 429.

See pages 251-272 for
HP, Varian, Fisons and Shimadzu
catalog numbers.

Restek
Australian
Distributors

Chromalytic Technology Pty Ltd

Fax : +61 3 9761 1169 Phone : +61 3 9762 2034

E-mail : jimjeffs@chromtech.net.au

Copyright Restek Corp.
and Chromtech : 1997
- All rights reserved



Splitless Injector Inlet Sleeves

Inlet Sleeves for Splitless Injectors

The residence time of the sample in a splitless sleeve is long, between 0.5 and 2 minutes. Therefore, splitless inlet sleeves do not require high surface areas (unless rapid-injecting autosamplers are used). Splitless sleeves are usually designed as straight tubes. Alternative splitless sleeve designs, such as a gooseneck restriction, help contain the sample cloud in the injector and minimize the breakdown of compounds sensitive to catalytic decomposition from metal inletparts. Double gooseneck sleeves work particularly well with HP 5890 GCs because the column sits several millimeters above the hot metal inlet seal. The double gooseneck effectively isolates the sample from the metal inlet seal, increasing sensitivity by reducing breakdown and adsorption of active components. All splitless sleeves are fully deactivated with a silanizing reagent to cap surface silanol groups. Splitless sleeves should be packed with wool or fused silica beads when analyzing dirty samples to trap non-volatile residue and prevent column contamination. Some of the more commonly used splitless sleeves are described below.

A) Straight Tube Design

Use for samples containing a narrow molecular weight distribution and for those not prone to thermal decomposition. Wool is recommended. Packing with wool aids in vaporization of high molecular weight compounds and minimizes discrimination.

Benefits:

- Low cost.

Drawbacks:

Potential decomposition of active compounds such as endrin and DOT when packed with wool.

- Prone to high molecular weight discrimination.

B) Gooseneck

C) Recessed Gooseneck

Benefits

Increases splitless efficiency. Decreases breakdown of active compounds such as endrin and DDT. Chamber contains sample vaporization cloud.

- Can be packed with wool.:
- **Drawbacks:** No known drawbacks.

GC Specific Sleeves

Restek offers inlet sleeves to fit a variety of gas chromatographs. For ordering information . . .

D) Double Gooseneck

E) Recessed Double Gooseneck

Best sleeve for catalytically labile or high molecular weight compounds. Isolates sample from metal injection port parts.

Use the cyclo-version for dirty samples.

Benefits:

- Highest splitless efficiency.
- Breakdown of active compounds decreased.
- Chamber contains vaporization cloud.

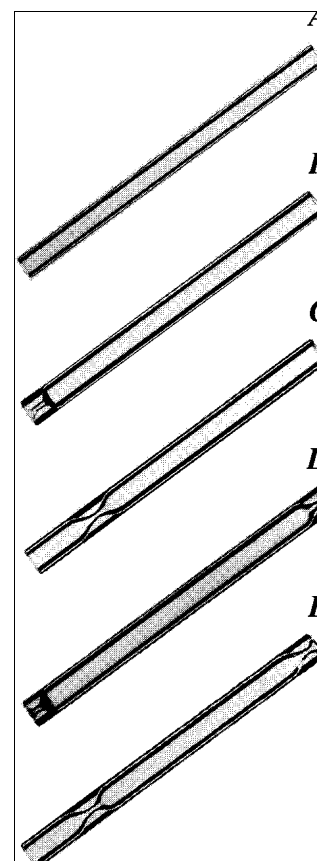
Drawbacks:

- Higher cost than straight splitless sleeves.

Only recessed double goosenecks can be packed with wool.

Note: Recessed goosenecks have the same benefits as the single or double gooseneck sleeves, except the base of the recessed gooseneck can be packed with wool and used for dual column analysis with a two-hole ferrule.

Sleeve Type	Endrin Breakdown	
	clean seal	dirty seal
splitless w/wool	6.0%	12.8%
double gooseneck	2.0%	2.4%



Inlet sleeves for:

See Pages:

Hewlett-Packard GCs	251 -252
Varian GCs	262 -263
Shimadzu GCs	266-267
Perkin-Elmer GCs	270-271
Carlo-Erba GCs	271
Fisons GCs	272
Finnigan 9001m GCQ (use HP sleeves)	251-251

Restek
Australian
Distributors

Chromalytic Technology Pty Ltd

Fax : +61 3 9761 1169 Phone : +61 3 9762 2034

E-mail : jimjeffs@chromtech.net.au

Copyright Restek Corp.
and **Chromtech** : 1997
- All rights reserved