

# RESTEK

# The Advantage

Innovators of  
High Resolution  
Chromatography

## Rtx-5MS

### The True LOW BLEED LEADER !

Every column manufacturer claims to have the lowest bleed capillary column for use with GC/MS. Restek decided to conduct a side-by-side test of several commercially available "MS" columns for bleed, response and performance. Our testing indicates that the Rtx@-5MS is the ideal column for GC/MS applications requiring high sensitivity.

#### Bleed

The Rtx@-5MS was compared to two other "MS" columns in an HP 5890 Series II GC with an HP 597 1 Mass Selective Detector. Each column was tested under identical conditions with respect to both GC and MSD param-

eters (e.g. linear velocity, temperatures, tuning, etc.). Figure 1 shows the plot of mass 207, the most characteristic bleed ion of a polysiloxane stationary phase. The Rtx@-5MS column exhibits lower bleed at both 325°C

and 360°C compared to the other two "MS" columns.

#### How important is having a column with low bleed?

Column bleed can ultimately effect sensitivity, spectral quality, and source contamination. When a column exhibits high bleed, the signal-to-noise (s/n) ratio is reduced. A low s/n ratio results in poor sensitivity and can decrease the quality of analyte spectra. A decrease in spectral quality complicates the interpretation of mass spectra that makes accurate compound identification difficult or impossible. Reduced column bleed is critical for ion trap mass

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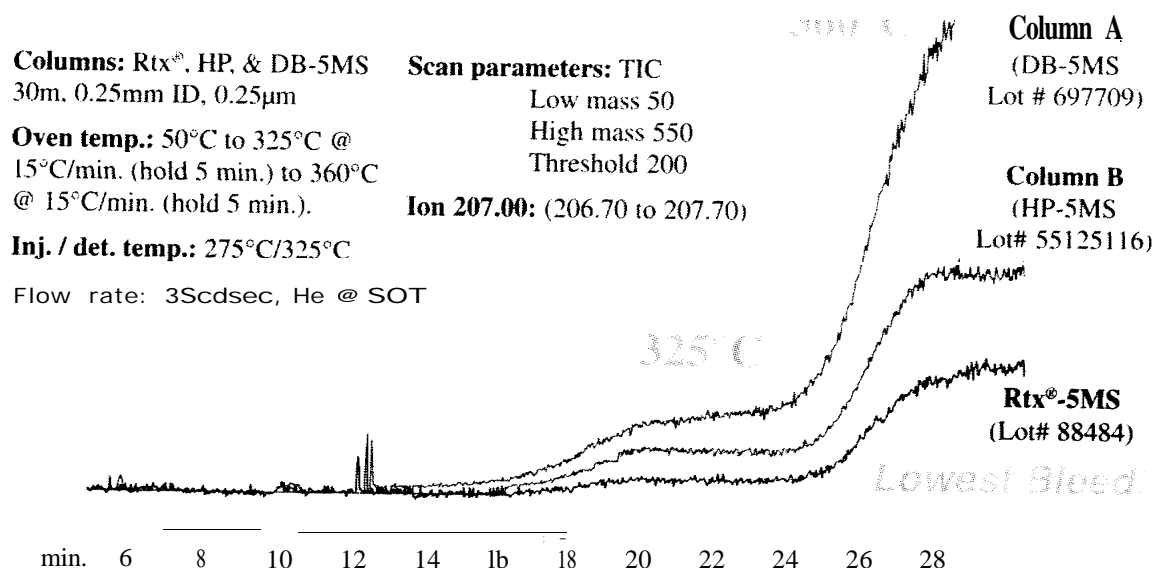
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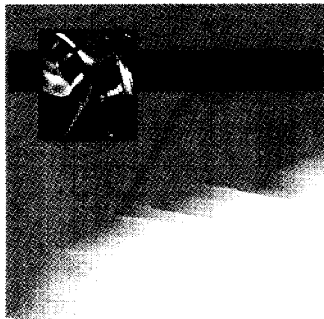
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**FIGURE 1: Rtx@-5MS exhibits lower bleed than other "MS" columns!**





# Rtx<sup>®</sup>-5MS

## The Rtx<sup>®</sup>-5MS - True LOW BLEED LEADER!

**TABLE I: Rtx<sup>®</sup>-5MS demonstrates better response of active environmental compounds.**

| Components                 | Rtx <sup>®</sup> -5MS | DB-5MS | HP-5MS |
|----------------------------|-----------------------|--------|--------|
| n-nitroso-di-n-propylamine | 0.30                  | 0.28   | 0.25   |
| 2,4-dinitrophenol          | 0.62                  | 0.53   | 0.52   |
| 4-nitrophenol              | 0.83                  | 0.82   | 0.76   |
| 4-nitroaniline             | 0.93                  | 0.69   | 0.80   |
| pentachlorophenol          | 1.38                  | 1.30   | 1.34   |

spectrometers. The automatic gain control feature of these instruments will significantly reduce sensitivity as column bleed increases during temperature programming. Using low bleed Rtx<sup>®</sup>-5MS columns will result in increased sensitivity of ion trap GC/MS systems. If a column continues to contribute high bleed, it may result in source contamination. A contaminated source should be cleaned, which may take up to a full day, resulting in lost manpower and valuable

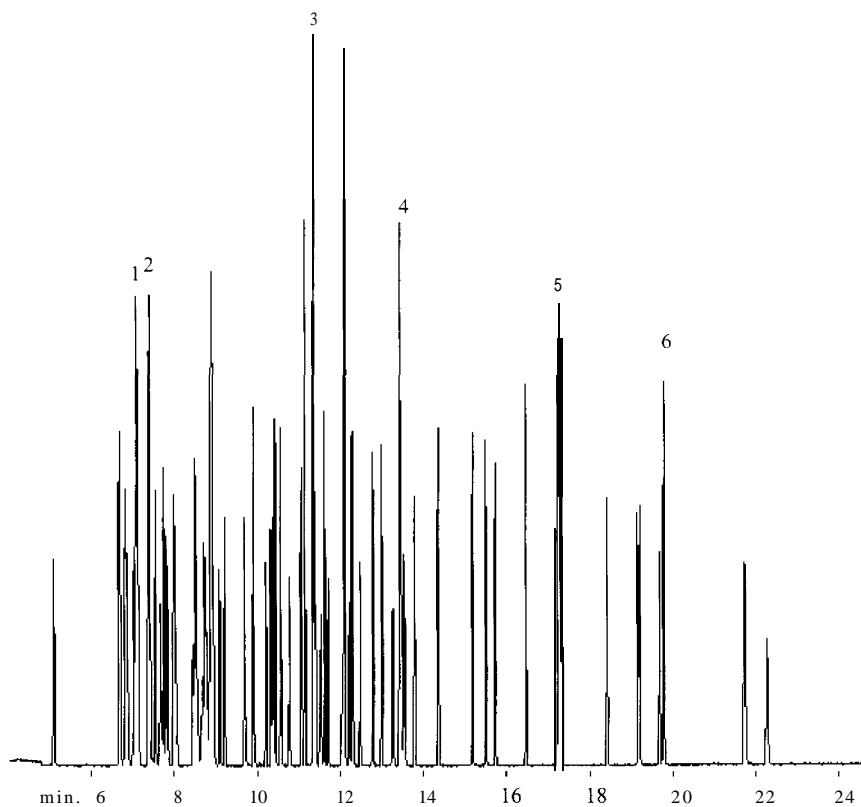
instrument time. Because each Rtx<sup>®</sup>-5MS column is thoroughly tested for low bleed, it is the column of choice for the prevention of these problems.

### Inertness

Low bleed levels are important, but inertness is also a critical factor when choosing a capillary column for GC/MS analysis. How do active environmental compounds

respond on the Rtx<sup>®</sup>-5MS compared to other "MS" columns? A 14 component test mixture containing five highly active compounds was injected onto each of the three "MS" columns. The results of

**FIGURE 2: The Rtx<sup>®</sup>-5MS GUARD column shows excellent inertness and low bleed for the analysis of semi-volatile pollutants without increasing analysis time.**



30m. 0.25mm ID. 0.25um Rtx<sup>®</sup>-5MS  
 Integra-Guard (cat.# 12623-124)  
 2.0ul injection of Semi-Volatile  
 Calibration mix. Concentration: 20ng/ul.

Oven temp.: 45°C (hold 3.5 min.) to 95°C  
 @ 40C/min.. to 295°C @ 17C/min.  
 (hold 2 min.), to 320°C @ 40C/min.  
 (hold 5.9 min.).

Inj/Det. temp.: 250/310C  
 Linear velocity: 32cm/sec. @ 40°C  
 Scan rate: 0.8 sec./scan  
 Scan range: 35-500amu  
 Flow rate: 1.03ml/min. after EPC  
 pressure pulse  
 Ionization: EI  
 Electron range: 70eV  
 Splitless hold time: 0.95 min.

- Internal Standards:
- 1,4-dichlorobenzene-d4
  - naphthalene-d8
  - acenaphthene-d10
  - phenanthrene-d10
  - chrysene-d12
  - perylene-d12

Analysis courtesy of Inhccape Testing Services -  
 Aquatec Laboratories, Burlington, Vermont. Image  
 file courtesy Thru-Put Systems, Inc.



## PRODUCT LISTING

five replicate analyses on each column is shown in Table I. The average response for each of these difficult compounds is higher on the Rtx@-5MS than on either of the competitive columns.

When performing EPA Semi-volatile analyses, the Rtx@-5MS column will exceed the QA performance criteria for inertness and offer considerably low bleed. An example chromatogram is shown in Figure 2.

### Column Lifetime

The "MS" column you choose not only must have low bleed and excellent inertness, but it also needs to last. Only Restek offers Integra-Guard" technology for your mass spec columns. Integra-Guard" columns have built-in protection without any connectors that can leak and cause loss in sensitivity and possible damage to the mass spec. The built-in guard column prevents sample contaminants from reaching the coated portion of the column. For more information on Restek's Integra-Guard" columns, please call Technical Service at 800-356 1688. ext. 4.

### Get the Facts

Are low bleed, excellent inertness, and long column lifetime too much to ask for in one capillary column? No! The Rtx@-5MS offers you the most column for your money.

### Rtx@-5MS (Crossbond@ 5% diphenyl - 95% dimethyl polysiloxane)

| ID     | um   | 15-Meter     | 30-Meter    |
|--------|------|--------------|-------------|
| 0.25mm | 0.10 | cat.# 12605, | cat.# 12608 |
|        | 0.25 | cat.# 12620, | cat.# 12623 |
|        | 0.50 | cat.# 12635, | cat.# 12638 |
| 0.32mm | 1.00 | cat.# 12650, | cat.# 12653 |
|        | 0.10 | cat.# 12606, | cat.# 12609 |
|        | 0.25 | cat.# 12621, | cat.# 12624 |
| 0.53mm | 0.50 | cat.# 12636, | cat.# 12639 |
|        | 1.00 | cat.# 12651, | cat.# 12654 |
|        | 1.50 | cat.# 12667, | cat.# 12670 |

### Rtx@-5MS INTEGRA-GUARD" (30meter column with a built-in 5meter guard column)

| um   | 0.25mm ID  | 0.32mm ID  | 0.53mm ID  |
|------|------------|------------|------------|
| 0.25 | 12623-124, | 12624-125, |            |
| 0.50 | 12638-124, | 12639-125, | 12640-126, |
| 1.00 | 12653-124, | 12654-125, | 12655-126, |
| 1.50 |            |            | 12670-126, |

### SEMI-VOLATILE ORGANICS KIT (3/90 SOW)

contains 1ml ea. of these mixes:

SV Screening Mix (#31000)  
 SV Tuning Compound (#31001 )  
 B/N Surrogate Std. Mix  
 (3/90 SOW) (#31002)  
 Acid Surrogate Std. Mix  
 (3/90 SOW) (#31003)  
 B/N Matrix Spike Mix (#31004)  
 Acid Matrix Spike Mix (#31005)  
 SV Internal Standard Mix (#31006)  
 SV Calibration Mix #1 (#31007)  
 SV Calibration Mix #2 (#31008)  
 SV Calibration Mix #3 (#31009)  
 SV Calibration Mix #4 (#31010)  
 SV Calibration Mix #5 (#31011)  
 SV Calibration Mix #6 (#31012)  
 SV Calibration Mix #7 (#31013)  
 3,3'-dichlorobenzidine (#31026)

Cat.# 31051, each  
Cat.# 31151, w/ data pk.

Restek has offered low bleed GC/MS columns since 1991.

The Rtx@-5MS continues this tradition and gives the best overall performance for bleed, response, and resolution when compared to competitive offerings. Rtx@-5MS bleed and response factor specifications have been established to ensure that every column exceeds the requirements of the EPA Semi-volatile Pollutants Methods 625 and 8270.

**Are low bleed, excellent inertness,  
and long column lifetime too much  
to ask for in one capillary columns**

**No! The Rtx@-5 offers you the  
most column for you money.**