

# 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@-SMS 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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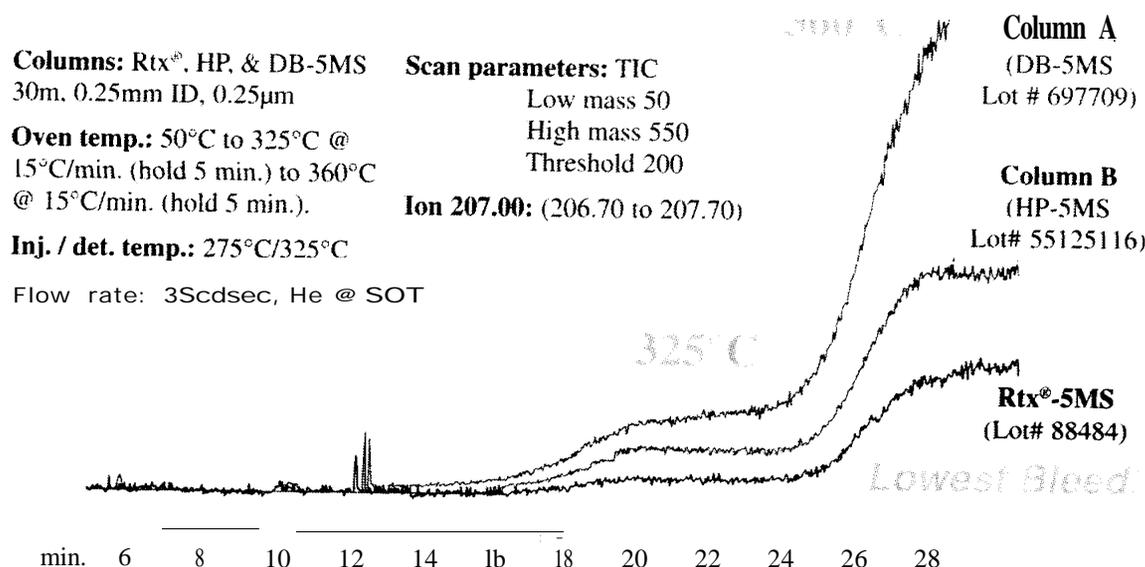
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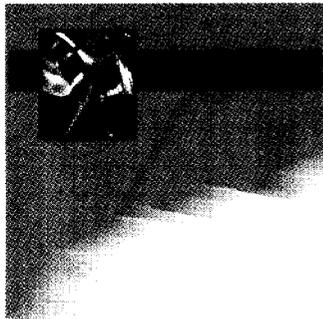
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FIGURE 1: Rtx@-SMS exhibits lower bleed than other "MS" columns!



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# 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

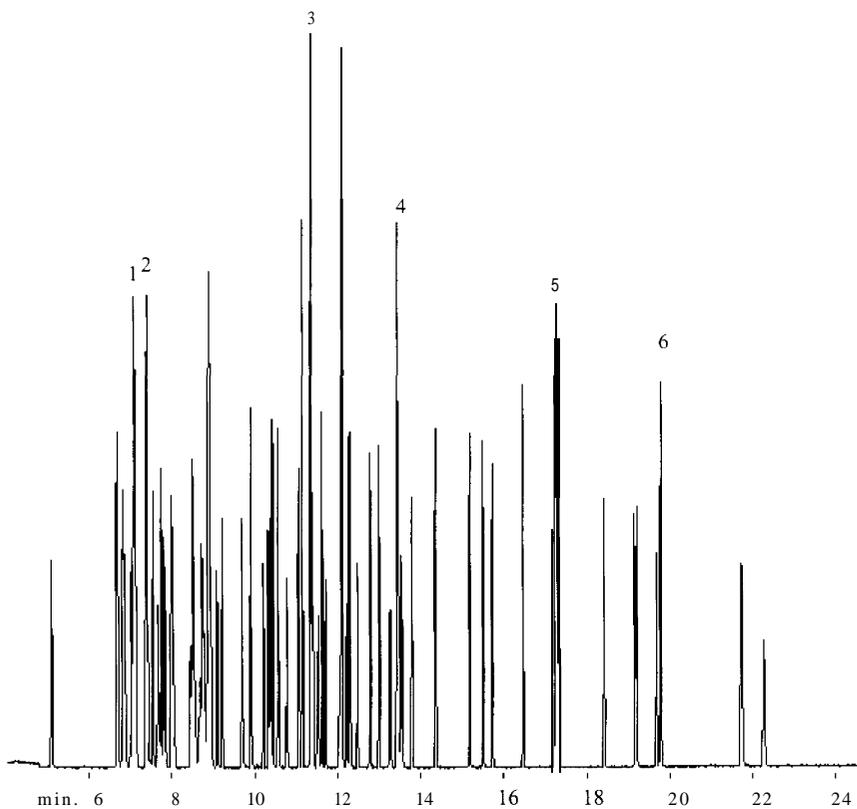
instrument time. Because each Rtx<sup>®</sup>-5MS column is thoroughly tested for low bleed, it is the column of choice for the prevention of these problems.

### 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.**