

Lower Detection Limits with Ground-Breaking Column Technology

Rxi[®] technology unifies outstanding inertness, low bleed, and high reproducibility into a single high performance column line. Take variation out of the equation and get the most consistent results for trace-level analysis with Rxi[®] columns.

Visit us at www.restek.com/rxi

phases available


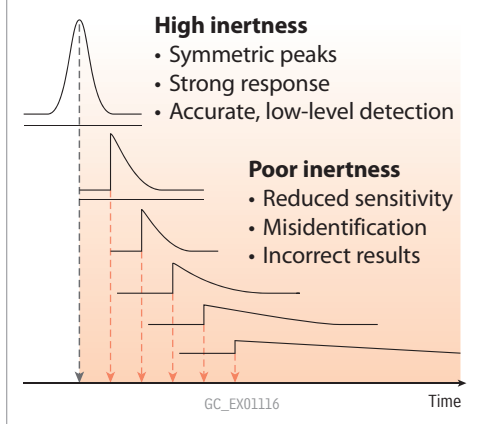
- 
- Rxi[®]-1ms
 - Rxi[®]-1HT
 - Rxi[®]-5ms
 - Rxi[®]-5Sil MS
 - Rxi[®]-5HT
 - Rxi[®]-XLB
 - Rxi[®]-624Sil MS
 - Rxi[®]-35Sil MS
 - Rxi[®]-17
 - Rxi[®]-17Sil MS
 - Rxi[®] guard/retention gap columns

Figure 1 As column activity increases, signal decreases and retention time shifts.



Lower Detection Limits with Ground-Breaking Column Technology

Rxi® columns deliver more accurate, reliable trace-level results than any other fused silica column on the market. To ensure the highest level of performance, all Rxi® capillary columns are manufactured and individually tested to meet stringent requirements for exceptional inertness, low bleed, and unsurpassed column-to-column reproducibility.

Highest Inertness

Inertness is one of the most difficult attributes to achieve in an analytical column, but it is one of the most critical as it improves peak shape, response, and retention time stability. Rxi® technology produces the most inert columns available, providing:

- Increased signal-to-noise ratios to improve low-level detection.
- Reproducible retention times for positive identifications.
- Improved response for polar, acidic, and basic compounds.

Increased Signal and Reproducible Retention Times

When capillaries are not sufficiently deactivated, peaks become asymmetric, resulting in reduced signal and unpredictable retention times. As column activity increases, peak tailing becomes more pronounced, reducing peak height and causing retention time to drift (Figure 1). In practice, this means that sensitivity is lost and trace-level analytes cannot be reliably determined. In addition, even compounds at higher concentrations may be misidentified, due to retention time shifting.

A more significant problem for sample analysis is that retention time can vary with analyte concentration if the column is not highly inert. Since the amount of target analyte in samples is unknown, retention times on a poorly deactivated column can easily vary enough to move compounds outside the retention time window (Figure 2). This can result in inaccurate identifications, the need for manual integration, and additional review or analysis before results can be reported. Using inert Rxi® columns ensures that compounds elute with good signal-to-noise ratios at expected retention times, regardless of analyte concentration.

How did we Create the Rxi Column Family?

We've optimized phase chemistry, column deactivation, and our manufacturing process to ensure exceptional performance.

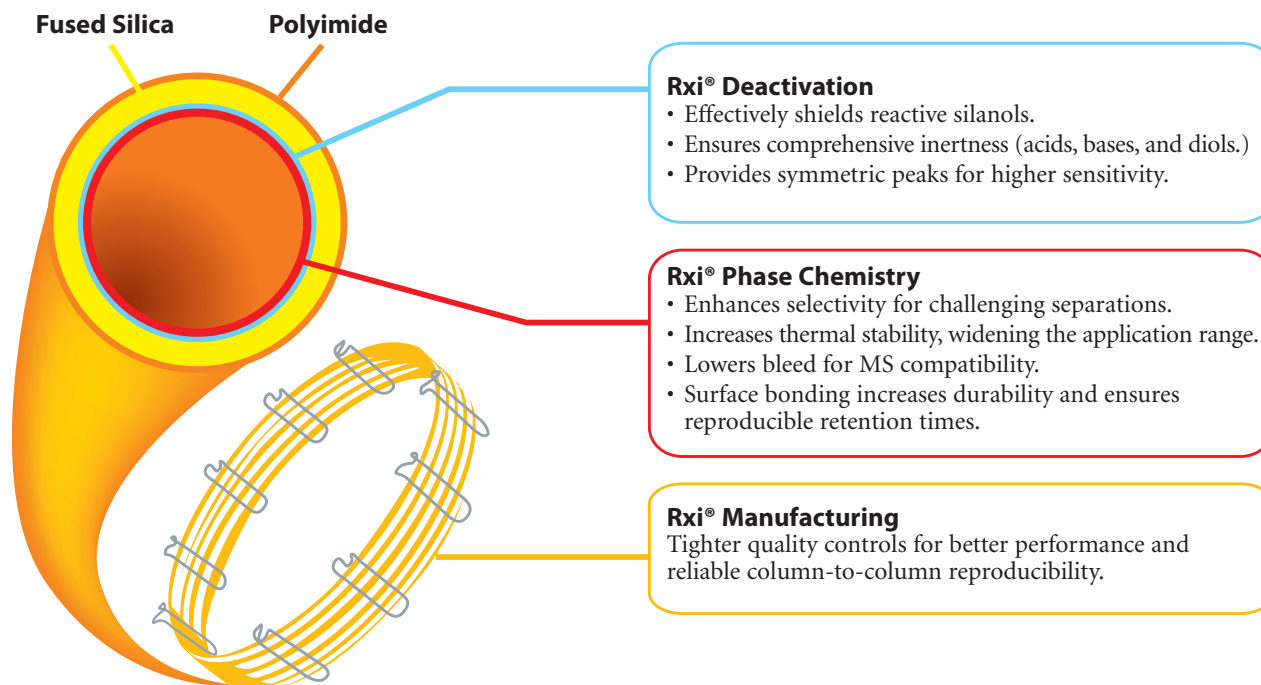
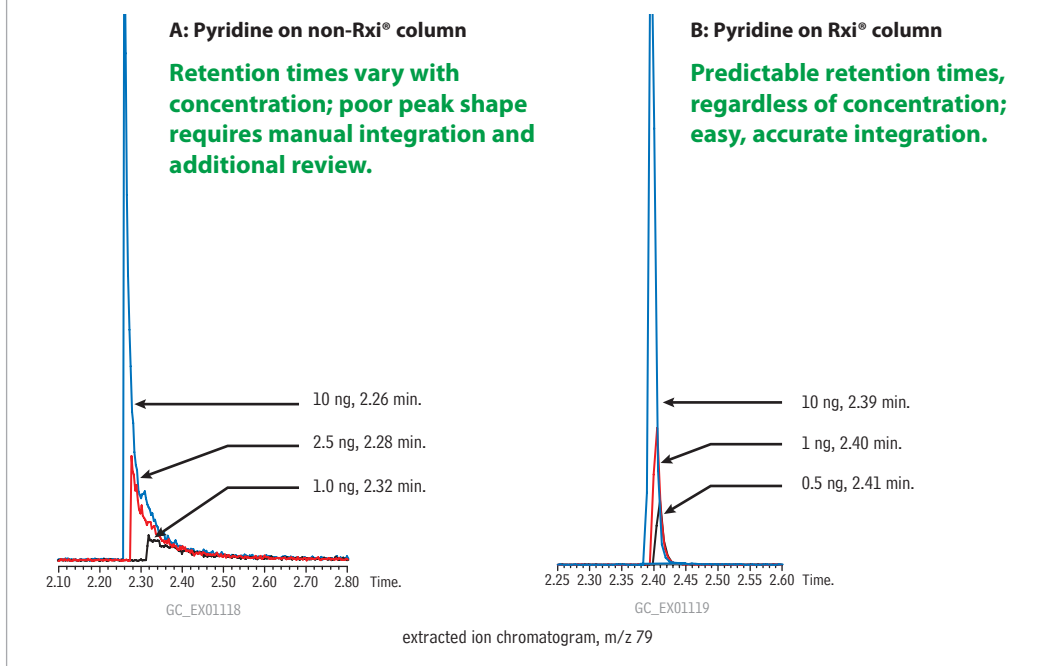


Figure 2 Compared to conventional GC columns, Rxi® columns show excellent inertness and produce good peak shape and reproducible retention for challenging compounds.



Improved Response for Difficult Compounds

Another reason column inertness is important for trace-level analysis is that many acidic, basic, and polar compounds will tail significantly and become difficult to analyze if the column contains active sites. The remarkable neutrality of Rxi® columns solves this problem and allows a wide range of compounds to be analyzed with high sensitivity, often on a single column. All Rxi® columns are exceptionally inert as demonstrated in Figure 3 by high response factors for both pyridine (basic) and 2,4-dinitrophenol (acidic). Rxi® columns reliably produce highly symmetric peaks and improved responses for difficult compounds, indicating greater inertness than columns produced by other manufacturers (Figure 4).

Figure 3 An Rxi® column gives the best overall performance for both basic and acidic compounds.

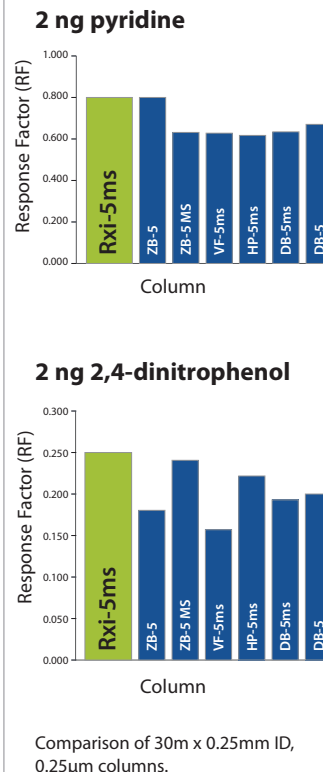
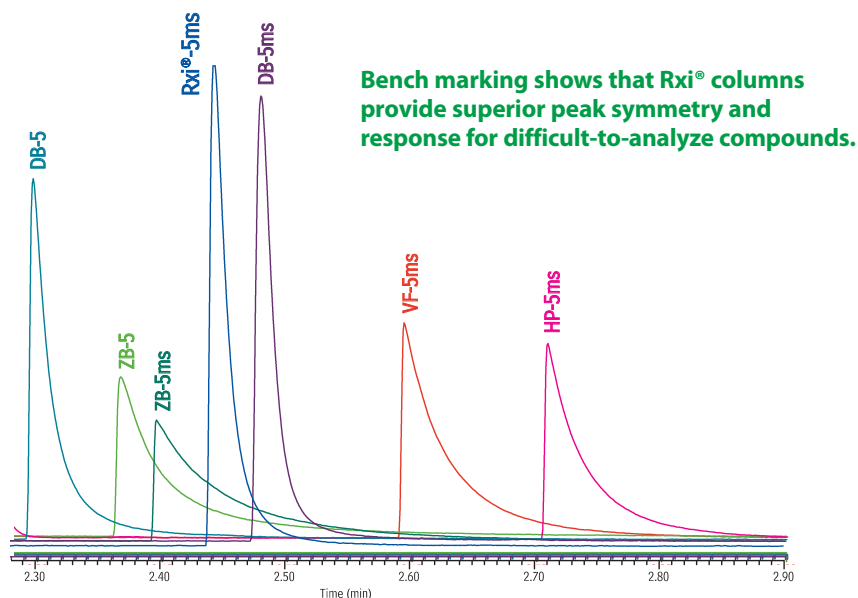


Figure 4 Peak shape comparison of a basic compound on various brands of GC columns.



Comparison of 30m x 0.25mm ID, 0.25µm 5% diphenyl columns, 2ng pyridine on-column, helium carrier gas, Oven temp.: 50°C (3 min.) to 180°C @ 35°C/min. (5 min.), Det.: FID @ 250°C

Innovation & Service

"When my research group needed a GC column for a chiral separation, Restek was the only company that offered to provide us with test columns to evaluate. The willingness of Restek to work with us to find a solution to our separation problem is exceptional."

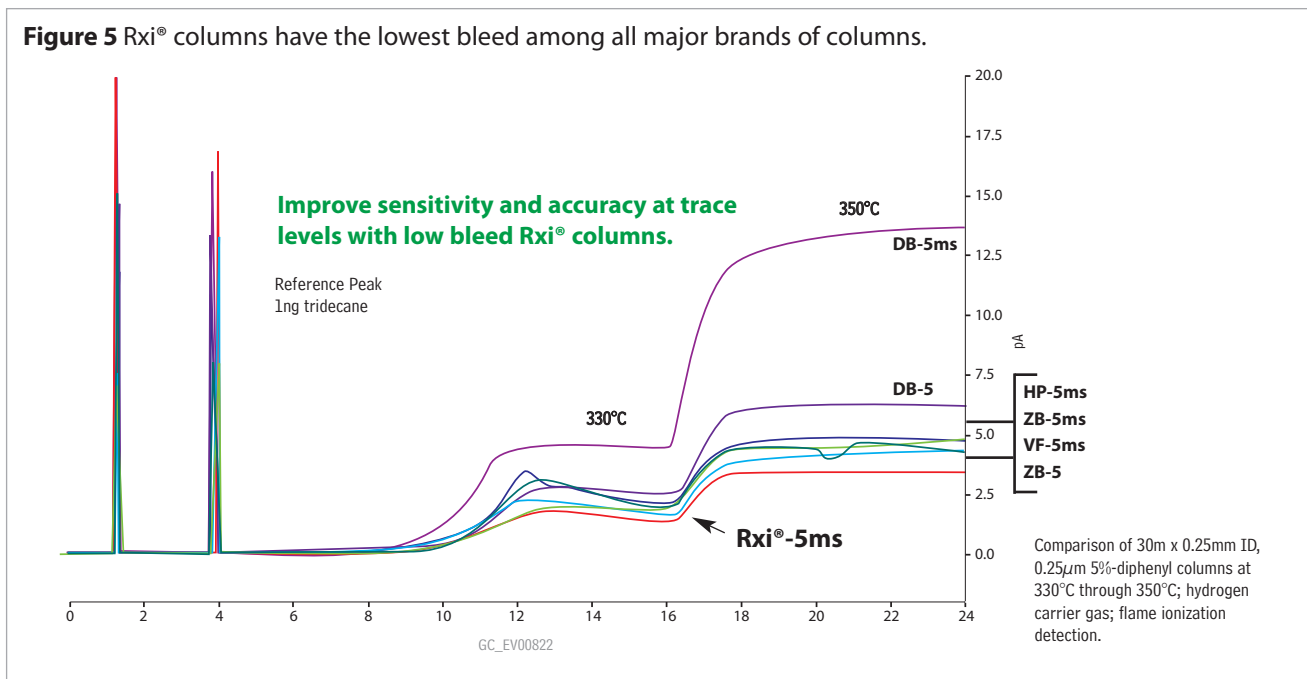
Joe Dinnocenzo,
Professor of Chemistry
Director, Center for
Photoinduced Charge Transfer
University of Rochester

How can we help you today?
Contact support@restek.com or
your local Restek representative
for helpful, knowledgeable
technical support.

Lowest Bleed

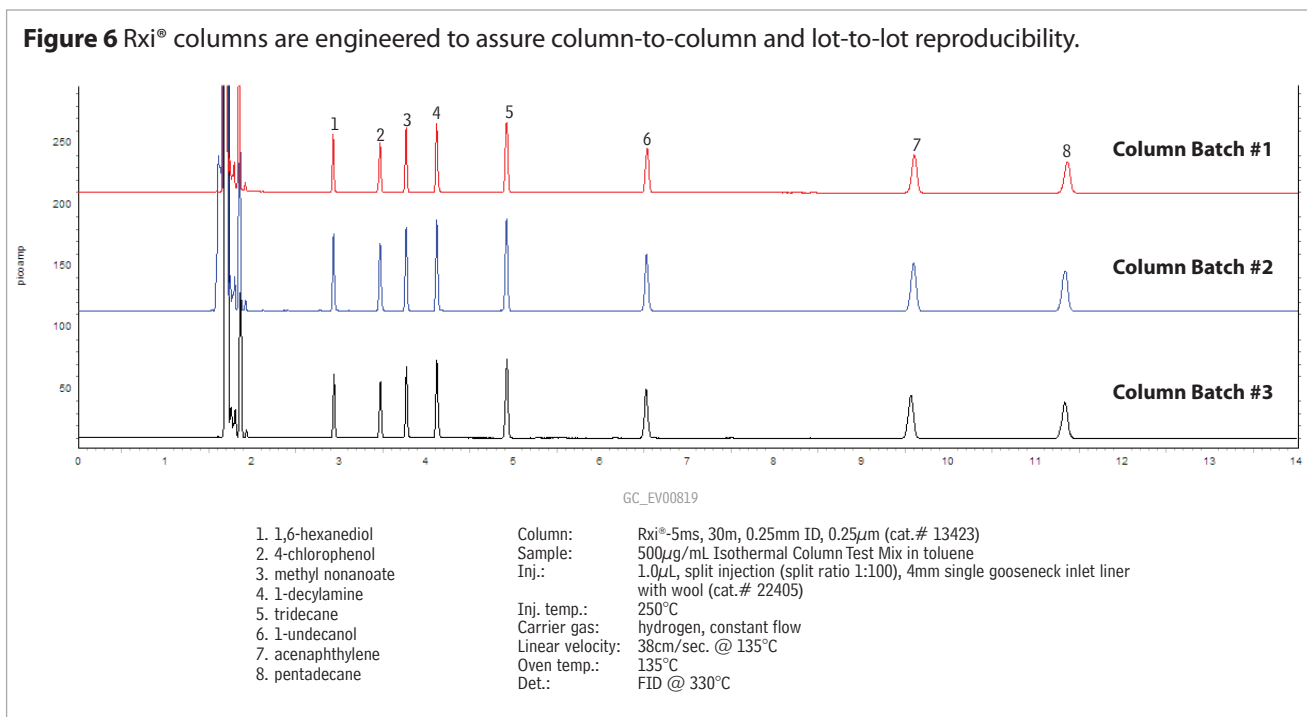
Rxi® columns are more stable at high temperatures than any other manufacturer's column, resulting in higher system sensitivity (Figure 5). This low-bleed characteristic is the result of superior stabilization achieved by optimizing polymer cross-linking and surface deactivation technologies. Benefits of using ultra-low bleed Rxi® columns include:

- Increased sensitivity, for lower detection limits and better matches to mass spectral libraries.
- Faster system stabilization.
- Reduced detector contamination results in less downtime for maintenance.



Exceptional Reproducibility

Chromatographers today need to know that every column they receive is going to perform the same way as the column it replaces. Unmatched manufacturing precision and stringent quality control mean Rxi® columns exceed industry standards, resulting in the best column-to-column reproducibility available as measured by efficiency, retention, bleed, and inertness (Figure 6).



Rxi[®] Column Family

Rxi[®]-1ms Columns (fused silica)

(nonpolar phase, Crossbond[®] 100% dimethyl polysiloxane)

- General purpose columns for drugs of abuse, essential oils, hydrocarbons, pesticides, PCB congeners (e.g. Aroclor mixes), sulfur compounds, amines, solvent impurities, simulated distillation, oxygenates, gasoline range organics (GRO), refinery gases.
- Equivalent to USP G2 phase.
- Use XERT-500 Column Test Mix, cat.# 35247.

ID	df	temp. limits	15-Meter	30-Meter	60-Meter
0.25mm	0.25 μ m	-60 to 330/350°C	13320	13323	13326
	0.50 μ m	-60 to 330/350°C	13335	13338	13341
	1.00 μ m	-60 to 330/350°C	13350	13353	13356
0.32mm	0.25 μ m	-60 to 330/350°C	13321	13324	13327
	0.50 μ m	-60 to 330/350°C	13336	13339	13342
	1.00 μ m	-60 to 330/350°C	13351	13354	13357
	4.00 μ m	-60 to 330/350°C		13396	
0.53mm	0.50 μ m	-60 to 330/350°C	13337	13340	
	1.00 μ m	-60 to 330/350°C	13352	13355	
	1.50 μ m	-60 to 330/350°C	13367	13370	13373

ID	df	temp. limits	10-Meter	12-Meter	20-Meter	25-Meter	50-Meter
0.10mm	0.10 μ m	-60 to 330/350°C	13301				
0.15mm	0.15 μ m	-60 to 330/350°C	43800		43801		
0.18mm	0.18 μ m	-60 to 330/350°C			13302		
	0.36 μ m	-60 to 330/350°C			13311		
0.20mm	0.33 μ m	-60 to 330/350°C		13397		13398	13399

Rxi[®]-1HT Columns (fused silica)

(100% dimethyl polysiloxane)

Outstanding thermal stability; minimal bleed even at 430°C.

- Use NPI-1000 Column Test Mix, cat.# 35224.
- Use NPI-350 Column Test Mix, cat.# 35225.

ID	df	temp. limits	15-Meter	30-Meter
0.25mm	0.10 μ m	-60 to 400°C	13950	13951
	0.25 μ m	-60 to 400°C		13952
0.32mm	0.10 μ m	-60 to 400°C	13953	13954
	0.25 μ m	-60 to 400°C		13955
0.53mm	0.15 μ m	-60 to 400°C		13956

*Column is capable of going to 430°C, but column lifetime will be reduced.

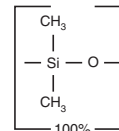
Rxi[®]-5ms Columns (fused silica)

(low polarity phase, Crossbond[®] 5% diphenyl/95% dimethyl polysiloxane)

- General purpose columns for semivolatiles, phenols, amines, residual solvents, drugs of abuse, pesticides, PCB congeners (e.g. Aroclor mixes), solvent impurities.
- Equivalent to USP G27 phase.
- Use XERT-500 Column Test Mix, cat.# 35247.

ID	df	temp. limits	15-Meter	30-Meter	60-Meter
0.25mm	0.25 μ m	-60 to 330/350°C	13420	13423	13426
	0.40 μ m	-60 to 330/350°C		13481	
	0.50 μ m	-60 to 330/350°C	13435	13438	13441
	1.00 μ m	-60 to 330/350°C	13450	13453	13456
0.32mm	0.25 μ m	-60 to 330/350°C	13421	13424	13427
	0.50 μ m	-60 to 330/350°C	13436	13439	13442
	1.00 μ m	-60 to 330/350°C	13451	13454	13457
0.53mm	0.25 μ m	-60 to 330/350°C	13422	13425	
	0.50 μ m	-60 to 330/350°C	13437	13440	
	1.00 μ m	-60 to 330/350°C	13452	13455	
	1.50 μ m	-60 to 330/350°C	13467	13470	

ID	df	temp. limits	10-Meter	12-Meter	20-Meter	25-Meter	50-Meter
0.10mm	0.10 μ m	-60 to 330/350°C	13401				
0.18mm	0.18 μ m	-60 to 330/350°C			13402		
	0.30 μ m	-60 to 330/350°C			13409		
	0.36 μ m	-60 to 330/350°C			13411		
0.20mm	0.33 μ m	-60 to 330/350°C		13497		13498	13499

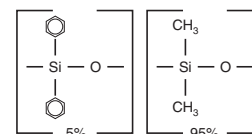


similar phases

DB-1, DB-1ms, HP-1, HP-1ms, Ultra-1, SPB-1, Equity-1, VF-1ms, CP-Sil 5 CB Low Bleed/MS

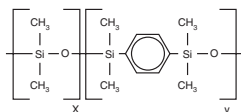
similar phases

DB-1HT, VF-1HT, ZB-1HT



similar phases

DB-5, HP-5, HP-5ms, Ultra-2, Rtx-5, SPB-5, Equity-5, CP-Sil 8



similar phases

DB-5ms, VF-5ms, CP-Sil 8
Low-Bleed/MS, DB-5ms UI,
Rtx-5Sil MS

*60m, 0.18mm ID, 0.10 μ m
column (cat.# 43607) intended
for dioxin and furan analysis
only.

Save Time!
**Eliminate column
coupling with
Integra-Guard®
built-in guard
columns**

Continuous Tubing

Guard Column Liquid Phase

Rxi®-5Sil MS Columns (fused silica)

(low polarity Crossbond® silarylene phase; similar to 5% phenyl/95% dimethyl polysiloxane)

- Phenyl groups improve thermal stability, reduce bleed, and make the phase less prone to oxidation.
- Ideal for GC/MS applications requiring high sensitivity, including use in ion trap systems.
- Use XIL-350 Column Test Mix, cat.# 35226.

ID	df	temp. limits	15-Meter	30-Meter	60-Meter
0.25mm	0.10 μ m	-60 to 330/350°C	13605	13608	
	0.25 μ m	-60 to 330/350°C	13620	13623	13626
	0.50 μ m	-60 to 330/350°C	13635	13638	
	1.00 μ m	-60 to 325/350°C	13650	13653	13697
0.32mm	0.25 μ m	-60 to 330/350°C	13621	13624	
	0.50 μ m	-60 to 330/350°C		13639	
	1.00 μ m	-60 to 325/350°C		13654	
0.53mm	1.50 μ m	-60 to 310/330°C		13670	

ID	df	temp. limits	10-Meter	20-Meter	40-Meter	60-Meter
0.10mm	0.10 μ m	-60 to 330/350°C	43601			
0.15mm	0.15 μ m	-60 to 330/350°C	43815	43816		
	2.0 μ m	-60 to 330/350°C		43817		
0.18mm	0.10 μ m	-60 to 320/350°C				43607*
	0.18 μ m	-60 to 330/350°C		43602	43605	
	0.36 μ m	-60 to 330/350°C		43604		

Rxi®-5Sil MS with Integra-Guard®

Extend column lifetime and eliminate leaks with a built-in retention gap.

Description	qty.	cat.#
15m, 0.25mm ID, 0.25 μ m Rxi-5Sil MS w/10m Integra-Guard Column	ea.	13620-127
30m, 0.25mm ID, 0.25 μ m Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13623-124
30m, 0.25mm ID, 0.25 μ m Rxi-5Sil MS w/10m Integra-Guard Column	ea.	13623-127
15m, 0.25mm ID, 0.50 μ m Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13635-124
30m, 0.25mm ID, 0.50 μ m Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13638-124
30m, 0.25mm ID, 0.50 μ m Rxi-5Sil MS w/10m Integra-Guard Column	ea.	13638-127
30m, 0.32mm ID, 0.50 μ m Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13639-125
30m, 0.32mm ID, 1.00 μ m Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13654-125

Rxi®-5HT Columns (fused silica)

(low polarity phase; 5% diphenyl/95% dimethyl polysiloxane)

- Columns processed for high temperature applications.
- Up to 40% longer lifetime from specially designed fused silica tubing.
- Use NPI-1000 Column Test Mix, cat.# 35224 and NPI-350 Column Test Mix, cat.# 35225.

ID	df	temp. limits	15-Meter	30-Meter
0.25mm	0.10 μ m	-60 to 400°C	13905	13908
	0.25 μ m	-60 to 400°C		13923
0.32mm	0.10 μ m	-60 to 400°C	13906	13909
	0.25 μ m	-60 to 400°C		13924
0.53mm	0.15 μ m	-60 to 400°C		13910

*Column is capable of going to 430°C, but column lifetime will be reduced.

Rxi®-XLB Columns (fused silica)

(low polarity proprietary phase)

- General purpose columns with unique selectivity and extremely low bleed.
- Ideal for many GC/MS applications—pesticides, PCB congeners, Aroclor mixes, and PAHs.
- Use XIL-350 Column Test Mix, cat.# 35226.

ID	df	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.10 μ m	30 to 340/360°C	13705	13708	
	0.25 μ m	30 to 340/360°C	13720	13723	13726
	0.50 μ m	30 to 340/360°C		13738	
	1.00 μ m	30 to 340/360°C	13750	13753	
0.32mm	0.10 μ m	30 to 340/360°C		13709	
	0.25 μ m	30 to 340/360°C	13721	13724	13727
	0.50 μ m	30 to 340/360°C		13739	
	1.00 μ m	30 to 340/360°C		13754	
0.53mm	0.50 μ m	30 to 340/360°C		13740	
	1.50 μ m	30 to 320/340°C	13767	13770	

ID	df	temp. limits	10-Meter	20-Meter
0.10mm	0.10 μ m	30 to 340/360°C	43701	
0.18mm	0.18 μ m	30 to 340/360°C		43702

similar phases

DB-5HT, VF-5HT, ZB-5HT

similar phases

DB-XLB, VF-Xms



Rxi®-624Sil MS Columns (fused silica)

(midpolarity Crossbond® silarylene phase; similar to 6% cyanopropylphenyl/94% dimethyl polysiloxane)

- Inert—excellent peak shape for a wide range of compounds, including acidic and basic compounds.
- Use Inter-Polar Column Test Mix, cat.# 35076.

ID	df	temp. limits	20-Meter	30-Meter	60-Meter
0.18mm	1.00µm	-20 to 300/320°C	13865		
0.25mm	1.40µm	-20 to 300/320°C		13868	
0.32mm	1.80µm	-20 to 300/320°C		13870	13872
0.53mm	3.00µm	-20 to 280/300°C		13871	

Rxi®-35Sil MS Columns (fused silica)

(midpolarity phase; similar to 35% phenyl/65% dimethyl polysiloxane)

- Special selectivity and excellent inertness for substituted polar compounds, such as drugs, pesticides, herbicides, PCBs, phenols, etc.
- Very low bleed phase for GC/MS analysis.
- Use ISO-BB Column Test Mix, cat.# 35290.

ID	df	temp. limits	15-Meter	30-Meter
0.25mm	0.25µm	50 to 340/360°C	13820	13823
	0.50µm	50 to 340/360°C	13835	13838
	1µm	50 to 320/340°C	13850	13853
0.32mm	0.25µm	50 to 340/360°C	13821	13824
	0.50µm	50 to 340/360°C	13836	13839
	1µm	50 to 320/340°C	13851	13854
0.53mm	0.50µm	50 to 320/340°C	13837	13840
	1µm	50 to 320/340°C	13852	13855
	1.50µm	50 to 310/330°C	13856	13857
	3µm	50 to 280/300°C	13858	13859

Rxi®-17 Columns (fused silica)

(midpolarity phase; Crossbond® 50% diphenyl/50% dimethyl polysiloxane)

- General purpose columns for pesticides, herbicides, rosin acids, phthalate esters, triglycerides, sterols.
- Use ISO-TM Column Test Mix, cat.# 35264.

ID	df	temp. limits	15-Meter	30-Meter
0.25mm	0.25µm	40 to 280/320°C	13520	13523
	0.50µm	40 to 280/320°C	13535	13538
	1.00µm	40 to 280/320°C	13550	13553
0.32mm	0.25µm	40 to 280/320°C	13521	13524
	0.50µm	40 to 280/320°C	13536	13539
	1.00µm	40 to 280/320°C	13551	13554
0.53mm	0.25µm	40 to 280/320°C	13522	13525
	0.50µm	40 to 280/320°C	13537	13540
	0.83µm	40 to 280/320°C		13569
	1.00µm	40 to 280/320°C	13552	13555
	1.50µm	40 to 280/320°C	13567	13570

ID	df	temp. limits	10-Meter	20-Meter
0.10mm	0.10µm	40 to 280/320°C	13501	
0.18mm	0.18µm	40 to 280/320°C		13502



Rxi®-17Sil MS Columns (fused silica)

(midpolarity Crossbond® silarylene phase; similar to 50% phenyl/50% dimethyl polysiloxane)

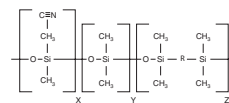
- Low-bleed for use with sensitive detectors, such as MS.
- Use ISO-TM Column Test Mix, cat.# 35264.

ID	df	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.25µm	40 to 340/360°C	14120	14123	
0.32mm	0.25µm	40 to 340/360°C	14121	14124	

ID	df	temp. limits	20-Meter
0.15mm	0.15µm	40 to 340/360°C	43820
0.18mm	0.18µm	40 to 340/360°C	14102
	0.36µm	40 to 340/360°C	14111

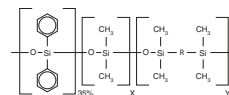
Rxi® Guard/Retention Gap Columns

Nominal ID	Nominal OD	5-Meter	5-Meter/6-pk.	10-Meter	10-Meter/6-pk.
0.25mm	0.37 ± 0.04mm	10029	10029-600	10059	10059-600
0.32mm	0.45 ± 0.04mm	10039	10039-600	10064	10064-600
0.53mm	0.69 ± 0.05mm	10054	10054-600	10073	10073-600



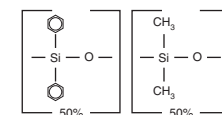
similar phases

DB-624, HP-624, VF-624, BP-624, ZB-624, AT-624, 007-1301, G43R



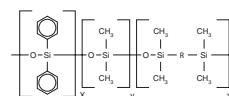
similar phases

DB-35ms, MR2, VF-35ms



similar phases

DB-17, DB-608, CP-Sil 24 CB, HP-50+



similar phases

DB-17ms, VF-17ms, BPX-50, DB-EUPAH

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.

Column Cross-Reference Table

Rxi® columns produce the same selectivity as competitor columns, but are much more inert, exhibit lower bleed, and offer exceptional reproducibility. For more accurate, reliable trace-level results, choose Rxi® columns.

POLARITY	non-polar		Restek	Phase Composition	Agilent	Varian/ Chrompack	SGE	Phenomenex	Machery-Nagel	Supelco
	-	Rxi-1ms	100% dimethyl polysiloxane	HP-1ms UI, DB-1ms UI, HP-1, HP-1ms, DB-1 DB-1ms, Ultra-1	VF-1ms CP-Sil 5 CP Sil 5 CB Low Bleed/MS	BP-1	ZB-1 ZB-1ms	Optima-1 Optima-1ms Optima-1ms Accent	SPB-1 Equity-1	
		Rxi-1HT	100% dimethyl polysiloxane	DB-1HT	VF-1HT		ZB-1HT			
		Rxi-5ms	5% diphenyl/ 95% dimethyl polysiloxane	HP-5ms UI, HP-5, HP-5ms, DB-5, Ultra-2	CP-Sil 8 CP Sil 8 CB	BP-5	ZB-5 ZB-5ms	Optima-5 Optima-5ms	SPB-5 Equity-5	
		Rxi-5Sil MS	5% phenyl, 95% dimethyl polysiloxane	DB-5ms UI, DB-5ms	VF-5ms CP-Sil 8 CB Low Bleed/MS	BPX-5	ZB-5ms	Optima-5ms Accent	SLB-5ms	
		Rxi-5HT	5% diphenyl/95% dimethyl polysiloxane	DB-5HT	VF-5HT		ZB-5HT			
		Rxi-XLB	proprietary phase	DB-XLB	VF-Xms		MR1	Optima-XLB		
	+	Rxi-624Sil MS	6% cyanopropylphenyl, 94% dimethyl polysiloxane	DB-624, HP-624	VF-624ms	BP-624	ZB-624	Optima-624		
		Rxi-35Sil MS	35% phenyl, 65% dimethyl polysiloxane	DB-35ms	VF-35ms	BP-35	MR2	Optima-35ms		
		Rxi-17	50% diphenyl/50% dimethyl polysiloxane	HP-17, DB-17, DB-608, HP-50+	CP-Sil 24 CB		ZB-50	Optima-17		
Rxi-17Sil MS		50% phenyl, 50% dimethyl polysiloxane	DB-17ms, HP-17, DB-17	VF-17ms CP-Sil 24 CB	BPX-50	ZB-50	Optima-17ms			

PATENTS & TRADEMARKS

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Visit www.restek.com/rxi for detailed comparisons and to learn how exceptional Rxi® inertness, bleed, and reproducibility can improve your data.

RESTEK

Lit. Cat.# GNFL1173A

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