



Essentials

A collection of tried-and-true selectivities, Essentials phases are the smart starting point for the GC method developer.

ZB-1	ZB-624
ZB-5	ZB-1701
ZB-5ms	ZB-1701P
ZB-35	ZB-WAX
ZB-50	ZB-FFAP
	ZB-XLB



PLUS

PLUS phases offer a suite of upgrades compared to their Essentials counterparts – from exceptional inertness to enhanced aqueous stability.

ZB-1 ^{PLUS} ™
ZB-5 ^{PLUS} ™
ZB-5MS ^{PLUS} ™
ZB-WAX ^{PLUS} ™
ZB-624 ^{PLUS} ™



Inferno™

Resilient under even the most intense GC conditions, Inferno phases dare to defy high boilers, contaminants, and carry-overs.

ZB-1HT
ZB-5HT
ZB-35HT
ZB-XLB-HT



Unlimited

Designed for the truly bold GC scientist, Unlimited phases unleash the power of selectivity for targeted performance that breaks from the mold.

ZB-PAH-EU
ZB-PAH-CT
ZB-Dioxin
ZB-FAME
ZB-SemiVolatiles
ZB-MultiResidue™ -1 & -2
ZB-CLPesticides -1 & -2
ZB-Drug-1
ZB-BAC-1 & -2
ZB-1XT SimDist
ZB-Bioethanol
ZB-DHA-PONA

Meet Your GC Column Family

Selected Zebron Polarities

Polarity	5	ZB-1	For Non-Polar Analytes
		ZB-DHA-PONA	
		ZB-1PLUS™	
		ZB-1HT Inferno™	
		ZB-1XT SimDist	
	8	ZB-5	• Alkanes • Aromatics • Oils • Boiling Point Separations
		ZB-5ms	
		ZB-5PLUS™	
		ZB-5MSPLUS™	
		ZB-5HT Inferno	
		ZB-SemiVolatiles	
	9	ZB-XLB	
		ZB-XLB-HT Inferno	
	11	ZB-MultiResidue™-1	
	13	ZB-624	For Slightly Polar Analytes
		ZB-624PLUS™	
	15	ZB-MultiResidue-2	• Volatiles • Drugs • Pesticides
	18	ZB-35	
		ZB-35HT Inferno	
	19	ZB-1701	
		ZB-1701P	
	24	ZB-50	
	52	ZB-WAXPLUS™	
	57	ZB-WAX	
	58	ZB-FFAP	

Meet Your GC Column Family Zebron Unlimited

Food Testing

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ZB-Dioxin

Improve Lab Productivity by 50%

- Fast PCB analysis
- Enhanced resolution of TCDD and TCDF
- Improved column lifetime with integrated guard column option
- MS certified, low bleed GC column

Upgrade to Zebtron from traditional phases used for Dioxin analysis:

Agilent®

- DB®-5MSUI
- DB-Dioxin
- DB-225

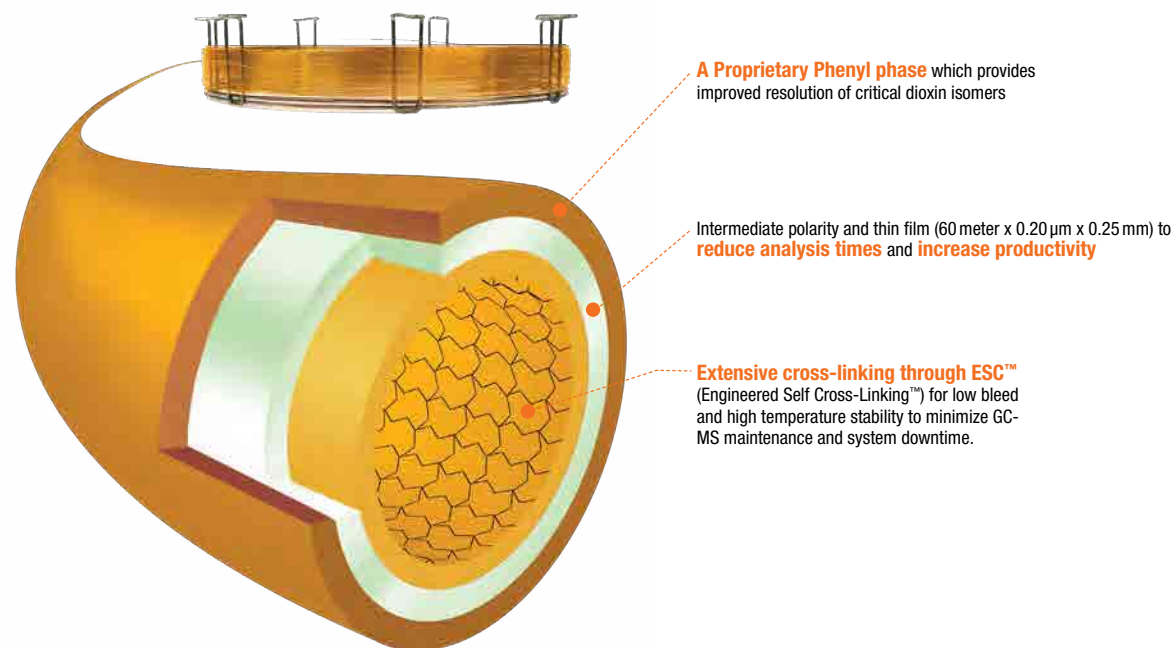
Restek®

- Rtx®-Dioxin2

Supelco®

- SP®-2330

Why Choose ZB-Dioxin?



ZB-Dioxin for Fast Dioxin and PCB Analysis

Zebtron ZB-Dioxin columns are specifically tailored for the analysis of aromatic compounds like dioxins, furans and PCBs in Food and Environmental matrices. The current analysis of Tetra through Octa Dioxin and Furan is time consuming and requires two GC columns and two GC-HRMS instruments. By switching to the unique selectivity of ZB-Dioxin analysis, you will gain enhanced resolution of 2,3,7,8-TCDD and 2,3,7,8-TCDF from its isomers in one run, and only need a single ZB-Dioxin GC column. In addition, ZB-Dioxin serves as your single column solution for Dioxin and PCB analysis. Upgrade your existing GC column for Dioxin analysis to a Zebtron ZB-Dioxin GC column and get all the analytical benefits and productivity gains of a single column solution.

Learn more at:

www.phenomenex.com/GCDioxin

Our Customer Says YES!

“The ZB-Dioxin achieves superior resolution for both 2,3,7,8-TCDD and 2,3,7,8-TCDF while not only maintaining chromatography for the hexes but actually improving it. This is all performed while reducing the overall runtime over traditional 5ms dioxin columns by as much as 25%. The ZB-Dioxin increases throughput by not only eliminating the need for a second column confirmation, but also by allowing additional samples to be analyzed in each 12-hour analytical sequence.”

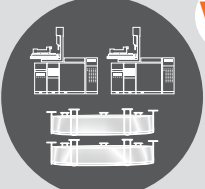
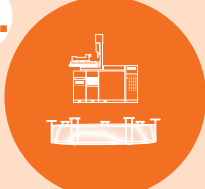
Andrew Patterson, Technical Director
Eurofins Specialty Services, USA

The opinions stated herein are solely those of the speaker and not necessarily those of any company or organization.

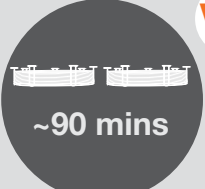
ZB-Dioxin (cont'd)

Increase Throughput and Improve Resolution of Dioxins and PCBs by using Zebron ZB-Dioxin!

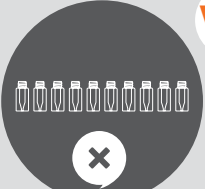
Zebron ZB-Dioxin has a unique phase that allows for improved resolution of critical dioxin and PCB congeners and its consistent film thickness allows for optimal dioxin analysis on a single column.

Traditional	VS.	ZB-Dioxin Upgrade
		
PCB and Dioxin required 2 different GC columns		Zebron ZB-Dioxin is a single column solution for Dioxin and PCB

Traditional	VS.	ZB-Dioxin Upgrade
		
Higher analysis cost: 2 GC-HRMS + 2 GC columns		Lower analysis cost: 1 GC-HRMS + 1 GC column

Traditional	VS.	ZB-Dioxin Upgrade
 ~90 mins		 ~40 mins
- Long run time for Dioxin analysis - First column (5% phenyl phase) ~60 minutes - Second column (225 phase) ~30 minutes		Faster run time using one ZB-Dioxin ~40 minutes

Traditional	VS.	ZB-Dioxin Upgrade
		
Shorter column lifetime for difficult matrix like soil		Longer column lifetime with ZB-Dioxin Guardian™ option (Part No: 7KG-G045-10-GGA)

Traditional	VS.	ZB-Dioxin Upgrade
		
Lower throughput from customer perspective		HIGH throughput from customer perspective

Traditional	VS.	ZB-Dioxin Upgrade
 ~290 °C		 320/340 °C
Some GC Dioxin columns do not exceed 290 °C Temperature Limits		Low Bleed GC column temp with 320/340 °C Temperature Limits, this will provide higher sensitivity for later eluters and the ability to bake out major contaminants.

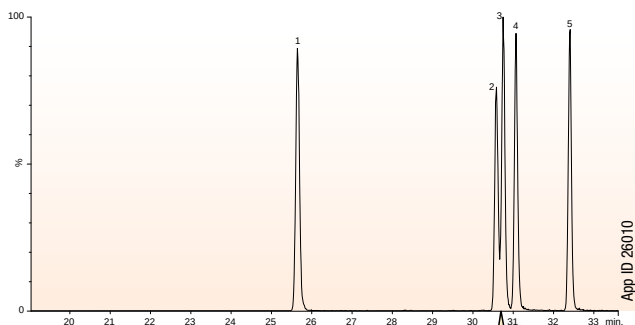
ZB-Dioxin (cont'd)

TCDD on a Zebron ZB-Dioxin and a Popular Brand A

Zebron ZB-Dioxin GC Column

Part No. [7KG-G045-10](#)

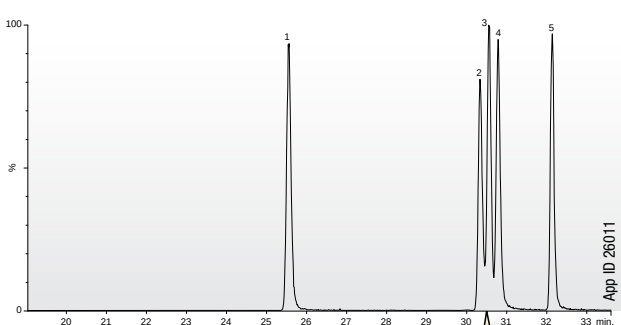
60 meter x 0.25 mm x 0.20 µm



High Resolution of 2,3,7,8-TCDD by using ZB-Dioxin which exceeds 25% valley [EPA-1613](#) method requirement and provided extended lifetime

Brand A Premium 5MS Phase

60 meter x 0.25 mm x 0.25 µm



2,3,7,8-TCDD is not completely resolved which affects the column lifetime

Sample:	ZB-Dioxin	Brand A
1. 1,3,6,8-TCDD	25.65	23.20
2. 1,2,3,7-TCDD	30.58	30.33
3. 1,2,3,8-TCDD	30.75	30.55
4. 2,3,7,8-TCDD	31.07	30.78
5. 1,2,8,9-TCDD	32.41	32.13

Conditions for all separations:

Column 1: Zebron ZB-Dioxin
 Column 1 Dimension: 60 meter x 0.25 mm x 0.20 µm
 Column Part No.: [7KG-G045-10](#)
 Column 2: Brand A Premium 5MS
 Column 2 Dimension: 60 meter x 0.25 mm x 0.25 µm
 Guard Column: 5 meter Z-Guard™ Kit
 Guard Kit Part No.: [7AG-G000-00-GZK](#)
 Injection: Pulse Splitless (2.0 min, 60 psi) @ 280 °C, 1 µL
 Liner: Zebron PLUS 4 mm ID Single Taper Liner
 Liner Part No.: [AG2-0A10-05](#)

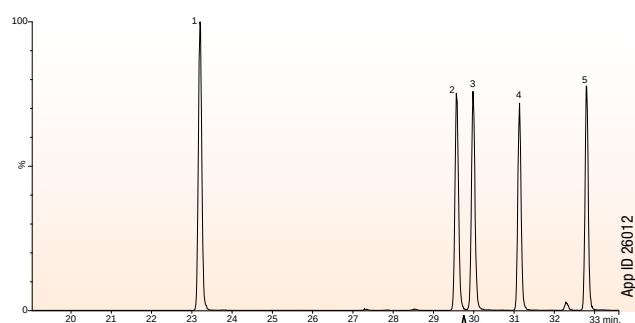
Carrier Gas: Helium @ 1.25 mL/min (constant flow)
 Oven Program: 160 °C for 2.4 min to 200 °C @ 25 °C/min to 220 °C @ 5 °C/min for 19 min to 288 °C @ 4 °C/min to 300 °C @ 5 °C/min for 7.6 min
 Detector: HRMS
 Transfer Line Temperature: 300 °C

TCDF on a Zebron ZB-Dioxin and a Popular Brand A

Zebron ZB-Dioxin GC Column

Part No. [7KG-G045-10](#)

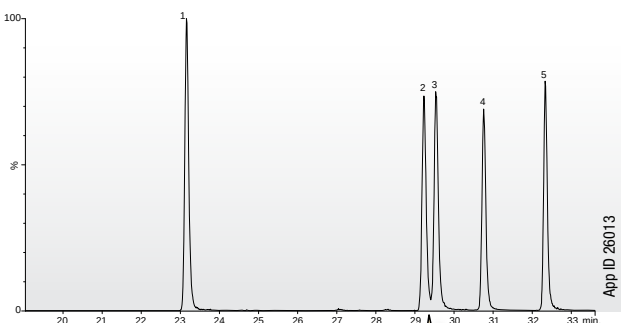
60 meter x 0.25 mm x 0.20 µm



Complete resolution of 2,3,7,8-TCDF on a single column ZB-Dioxin—NO NEED FOR ADDITIONAL CONFIRMATION COLUMN

Brand A Premium 5MS Phase

60 meter x 0.25 mm x 0.25 µm



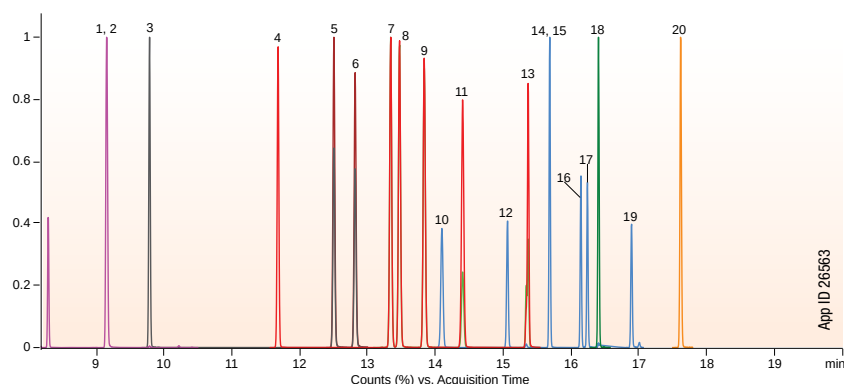
2,3,7,8-TCDF are not completely resolved and need an additional GC column to confirm isomers separation

Sample:	ZB-Dioxin	Brand A
1. 1,3,6,8-TCDF	23.20	23.16
2. 1,3,4,7-TCDF	29.57	29.23
3. 2,3,7,8-TCDF	29.98	29.53
4. 1,2,3,9-TCDF	31.14	30.76
5. 1,2,8,9-TCDF	32.79	32.33

Comparative separations may not be representative of all applications.

ZB-Dioxin (cont'd)

Fast GC-MS/MS Analysis of PCBs on a Single 40 Meter Zebron ZB-Dioxin GC Column



GC-MS/MS Conditions:

Column: Zebron ZB-Dioxin

Dimension: 40 meter x 0.18 mm x 0.14 µm

Part No.: [7PD-G045-47](#)

Injection: Splitless for 1.5 min @ 290 °C, 1 µL

Recommended Liner: Zebron PLUS Z-Liner™
(Compatible with Agilent® & Thermo® GC instrument)

Part No.: [AG2-0A13-05](#)

Carrier Gas: Helium @ 0.8 mL/min (constant flow)

Oven Program: 45 °C for 0 min to 175 °C @ 50 °C/min, to 220 °C @ 15 °C/min, to 250 °C @ 5 °C/min for 3 min, to 300 °C @ 50 °C/min for 10 min

Detector: GC-MS/MS

Transfer Line Temperature: 300 °C

Mode: Scan (100-450 m/z)

Source Temperature: 300 °C

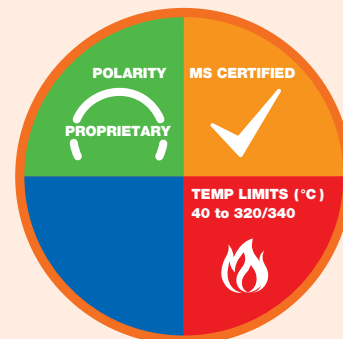
Quad Temperature: 150 °C

Solvent Delay: 8.0 min

Analyte:

1. PCB-28
2. PCB-31
3. PCB-52
4. PCB-101
5. PCB-81
6. PCB-77
7. PCB-123
8. PCB-118
9. PCB-114
10. PCB-153
11. PCB-105
12. PCB-138
13. PCB-126
14. PCB-167
15. PCB-128
16. PCB-156
17. PCB-157
18. PCB-180
19. PCB-169
20. PCB-189

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Dioxin and PCB in Food, Environmental Samples
- POPs in Food



Zebron GC Columns MS Certification, see p. 437



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

Ordering Information

Zebron ZB-Dioxin GC Columns

ID (mm)	df (µm)	Temp. Limits °C	Part No.
40-Meter			
0.18	0.14	40 to 320/340	7PD-G045-47
60-Meter			
0.25	0.20	40 to 320/340	7KG-G045-10
60-Meter with 5-Meter Guardian™ Integrated Guard			
0.25	0.20	40 to 320/340	7KG-G045-10-GGA

ZB-PAH-EU

- Up to 70 % faster PAH analysis
- Elevated temperature stability (340/360 °C)
- Great resolution of critical isomers, e.g. Benzo[b,j,k]fluoranthene

Upgrade to Zebron from traditional phases used for PAHs:

Agilent®

- DB®-EUPAH

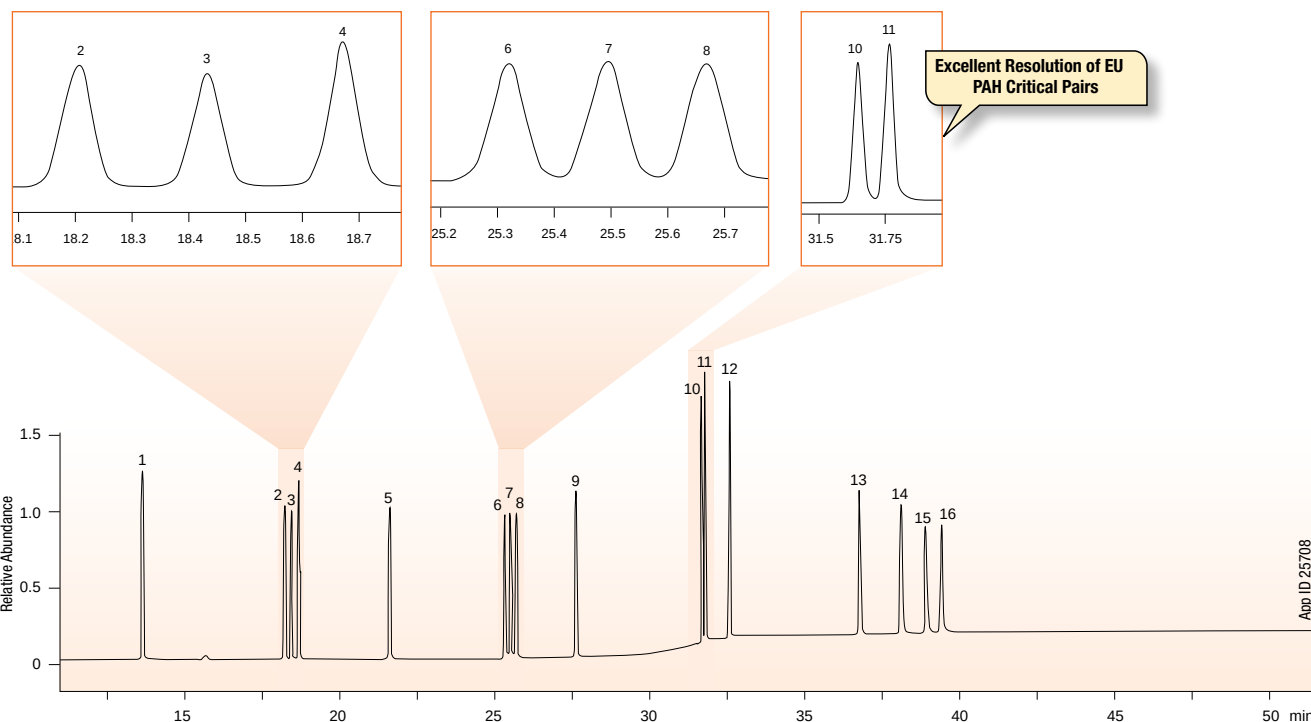
Restek®

- Rxi®-PAH

Priority PAH Analysis by GC

Zebron ZB-PAH-EU columns are designed to move conventional PAH testing to the exceptional, Zebron GC columns come to life through a coupling of innovative spirit and technical excellence. The Zebron ZB-PAH-EU and ZB-PAH-CT offer unparalleled performance through the power of targeted selectivity when analyzing Polycyclic Aromatic Hydrocarbons (PAHs).

Analysis of EU 15+1 PAHs



GC-MS conditions:

Column: Zebron ZB-PAH-EU
Dimensions: 30 meter x 0.25 mm x 0.20 µm
Part No.: ZHG-G043-10
Injection: Split 5:1 @ 330 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™
Liner Part No.: AG2-4B13-05 (for Shimadzu® 2010 GC)
Carrier Gas: Helium @ 24 psi (constant pressure)
Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 226 °C @ 3 °C/min for 0 min to 320 °C @ 10 °C/min for 20 min
Detector: MSD, 50-500 m/z
Transfer Line Temperature: 300 °C
Source Temperature: 300 °C

Sample:

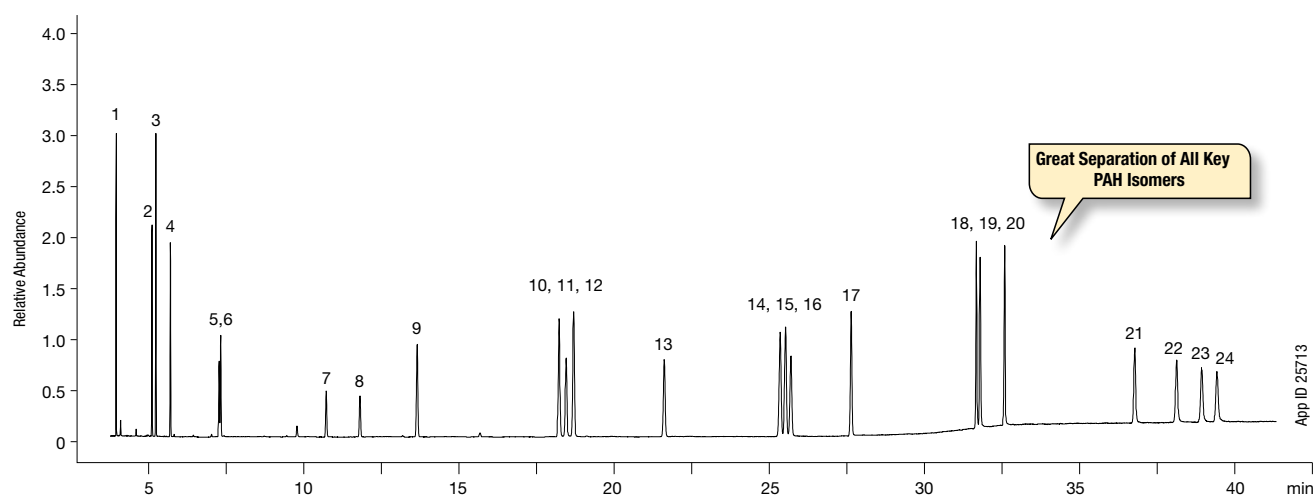
- | | |
|--------------------------|----------------------------|
| 1. Benzo[c]fluorene | 9. Benzo[a]pyrene |
| 2. Benz[a]anthracene | 10. Indeno[1,2,3-cd]pyrene |
| 3. Cyclopenta[c,d]pyrene | 11. Dibenzo[a,h]anthracene |
| 4. Chrysene | 12. Benzo[g,h,i]perylene |
| 5. 5-Methylchrysene | 13. Dibenzo[a,l]pyrene |
| 6. Benzo[b]fluoranthene | 14. Dibenzo[a,e]pyrene |
| 7. Benzo[k]fluoranthene | 15. Dibenzo[a,i]pyrene |
| 8. Benzo[j]fluoranthene | 16. Dibenzo[a,h]pyrene |

ZB-PAH-EU (cont'd)

Complete Resolution of EU 15+1 and EPA 610 PAHs

Zebron ZB-EU-PAH GC column demonstrates excellent resolution and accurate quantitation of European regulated EU 15+1 and EPA 610 PAHs.

Analysis of EU 15+1 and EPA 610 PAHs



GC-MS conditions:

Column: Zebron ZB-PAH-EU
Dimensions: 30 meter x 0.25 mm x 0.20 µm
Part No.: [7HG-G043-10](#)
Injection: Split 5:1 @ 330 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™
Liner Part No.: [AG2-4B13-05](#) (for Shimadzu® 2010 GC)
Carrier Gas: Helium @ 24 psi (constant pressure)
Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 226 °C @ 3 °C/min for 0 min to 320 °C @ 10 °C/min for 20 min
Detector: MSD, 50-500 m/z
Transfer Line Temperature: 300 °C
Source Temperature: 300 °C

Sample:

- | | | |
|-------------------|---------------------------|----------------------------|
| 1. Naphthalene | 9. Benzo[c]fluorene | 17. Benzo[a]pyrene |
| 2. Acenaphthylene | 10. Benz[a]anthracene | 18. Indeno[1,2,3-cd]pyrene |
| 3. Acenaphthene | 11. Cyclopenta[c,d]pyrene | 19. Dibenzo[a,h]anthracene |
| 4. Fluorene | 12. Chrysene | 20. Benzo[g,h,i]perylene |
| 5. Phenanthrene | 13. 5-Methylchrysene | 21. Dibenzo[a,i]pyrene |
| 6. Anthracene | 14. Benzo[b]fluoranthene | 22. Dibenzo[a,e]pyrene |
| 7. Fluoranthene | 15. Benzo[k]fluoranthene | 23. Dibenzo[a,i]pyrene |
| 8. Pyrene | 16. Benzo[j]fluoranthene | 24. Dibenzo[a,h]pyrene |

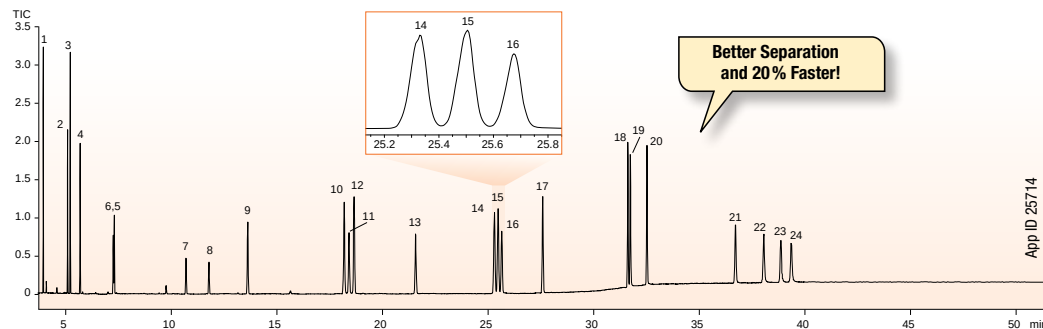
ZB-PAH-EU (cont'd)

Better Combination of Resolution and Speed

Zebron outperforms popular GC columns for the separation of EU 15+1 and EPA 610 PAHs.

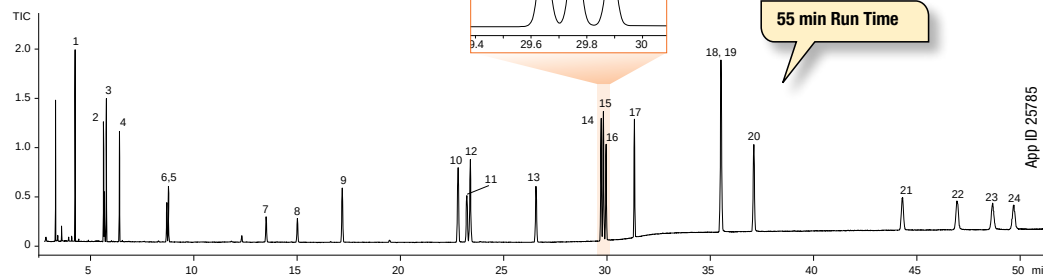
Zebron ZB-PAH-EU

30 meter x 0.25 mm x 0.20 µm



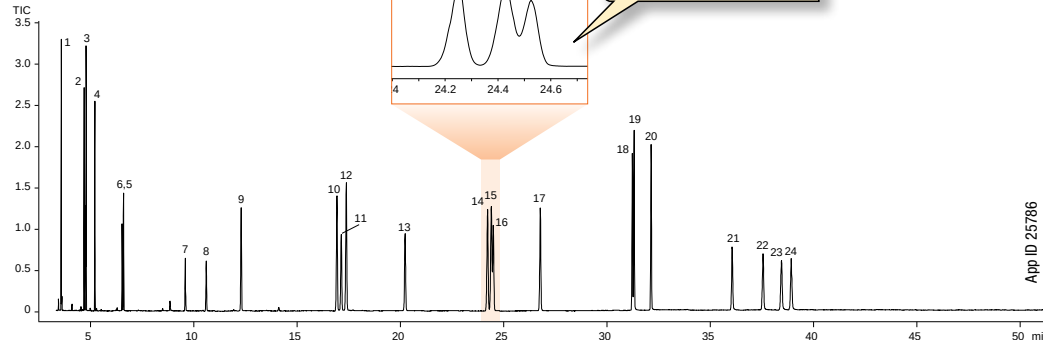
Popular Brand A

30 meter x 0.25 mm x 0.25 µm



Popular Brand B

30 meter x 0.25 mm x 0.10 µm



GC-MS conditions for both applications:

Column: As Indicated
 Dimension: As indicated
 Injection: Split 5:1 @ 330 °C, 1 µL
 Recommended Liner: Zebron PLUS Single Taper Z-Liner™
 Liner Part No.: AG2-4B13-05 (for Shimadzu® 2010 GC)
 Carrier Gas: Helium @ 24 psi (constant pressure)
 Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 226 °C @ 3 °C/min
 for 0 min to 320 °C @ 10 °C/min for 20 min
 Detector: MSD, 50-500 m/z
 Transfer Line Temperature: 300 °C
 Source Temperature: 300 °C

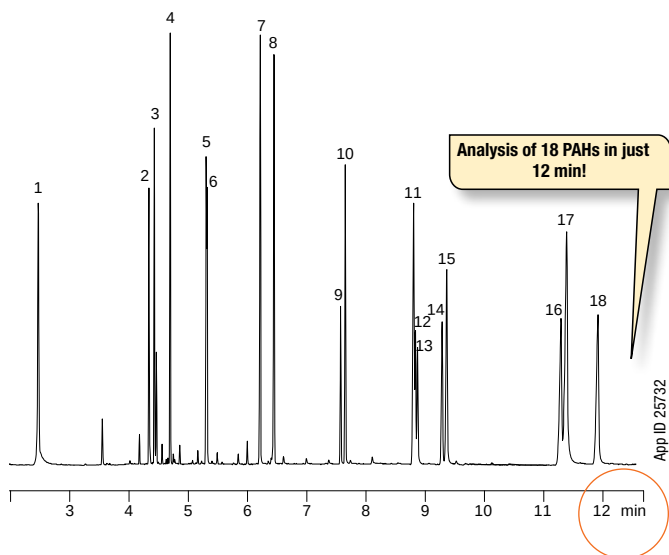
Sample:

- | | | |
|-------------------|---------------------------|----------------------------|
| 1. Naphthalene | 9. Benzo[c]fluorene | 17. Benzo[a]pyrene |
| 2. Acenaphthylene | 10. Benz[a]anthracene | 18. Indeno[1,2,3-cd]pyrene |
| 3. Acenaphthene | 11. Cyclopenta[c,d]pyrene | 19. Dibenzo[a,h]anthracene |
| 4. Fluorene | 12. Chrysene | 20. Benzo[g,h,i]perylene |
| 5. Phenanthrene | 13. 5-Methylchrysene | 21. Dibenzo[a,i]pyrene |
| 6. Anthracene | 14. Benzo[b]fluoranthene | 22. Dibenzo[a,e]pyrene |
| 7. Fluoranthene | 15. Benzo[k]fluoranthene | 23. Dibenzo[a,i]pyrene |
| 8. Pyrene | 16. Benzo[j]fluoranthene | 24. Dibenzo[a,h]pyrene |

ZB-PAH-EU (cont'd)

GC-MS Analysis of PAHs in Rubber and Plastic

Zebron ZB-PAH-EU GC column separates the 18 PAH isomers within 12 minutes, resolving all critical pairs while demonstrating consistent column inertness.



The high temperature limits of the ZB-PAH-EU (340/360 °C) is extremely helpful for easy bakeout of dirty matrices and allows for eluting heavy PAHs!

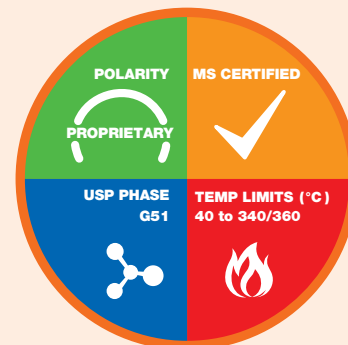
Column: Zebron ZB-PAH-EU
Dimensions: 10 meter x 0.10 mm x 0.08 µm
Part No.: [7CB-G043-59](#)
Injection: Split 5:1 @ 320 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™
Liner Part No.: [AG2-4B13-05](#) (for Shimadzu® 2010 GC System)
Carrier Gas: Helium @ 0.68 mL/min (constant flow)
Oven Program: 100 °C for 3.0 min to 200 °C @ 60 °C/min to 270 °C @ 22 °C/min to 300 °C @ 4.5 °C/min to 330 °C @ 80 °C/min for 0.5 min
Detector: MSD, 50-500 m/z
Transfer Line Temperature: 300 °C
Source Temperature: 330 °C
Sample:

1. Naphthalene	10. Chrysene
2. Acenaphthylene	11. Benzo[b]fluoranthene
3. Acenaphthene	12. Benzo[k]fluoranthene
4. Fluorene	13. Benzo[j]fluoranthene
5. Phenanthrene	14. Benzo[a]pyrene
6. Anthracene	15. Benzo[e]pyrene
7. Fluoranthene	16. Indeno[1,2,3-cd]pyrene
8. Pyrene	17. Dibenzo[a,h]anthracene
9. Benz[a]anthracene	18. Benzo[g,h,i]perylene

Ordering Information

Zebron ZB-PAH-EU GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.08	40 to 340/360	7CB-G043-59
20-Meter			
0.18	0.14	40 to 340/360	7FD-G043-47
30-Meter			
0.25	0.20	40 to 340/360	7HG-G043-10
60-Meter			
0.25	0.20	40 to 340/360	7KG-G043-10

Column Profile



Phase Chemistry

- Proprietary

Recommended Applications

- Analysis of 15+1 EU-regulated and EPA regulated PAHs in food testing, rubber, plastic, coal
- Sources include cigarette smoke, vehicle exhausts, asphalt roads, coal, coal tar, wildfires, agricultural burning, residential wood burning, municipal, industrial waste incineration



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Learn more about: ZB-PAH-EU

ZB-PAH-CT

- Enhanced resolution for chrysene and triphenylene (PAH Interferences)
- Increased Benzo[b,k] fluoranthene separation
- Optimal performance and resolution of regulated PAH isomers
- Great resolution of critical isomers, e.g. Benzo[b,j,k]fluoranthene



Use the column finder to replace or upgrade an existing column:
www.phenomenex.com/FindGC

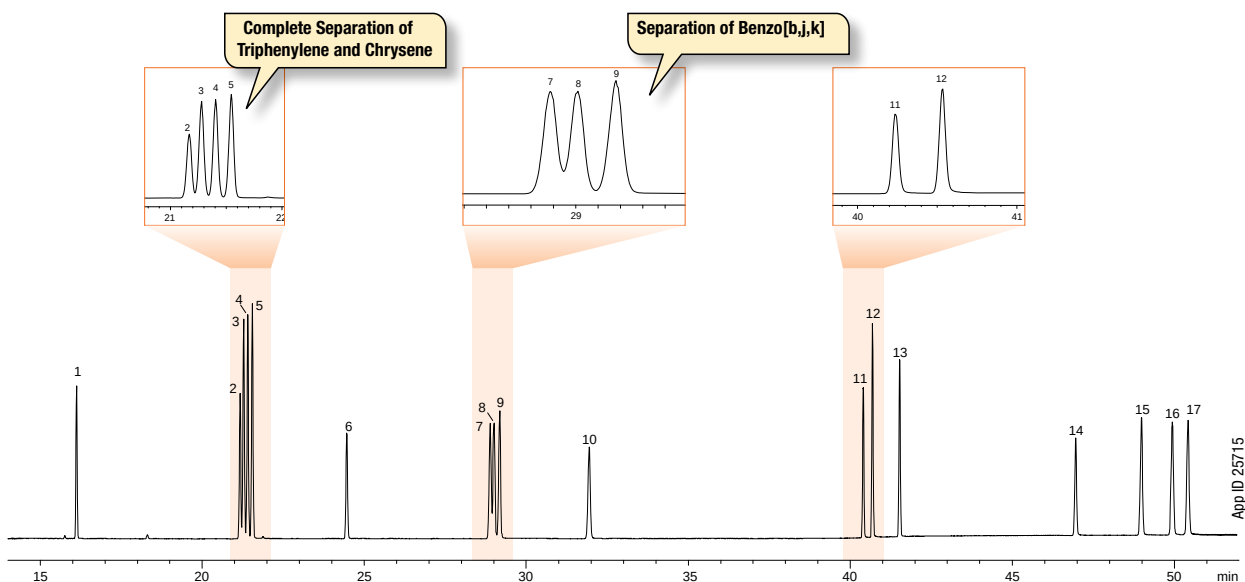
Priority PAH Analysis by GC

Zebron ZB-PAH-CT columns are manufactured to provide the most optimal performance for EU-regulated polycyclic aromatic hydrocarbons (PAHs) and EPA regulated PAHs.

Excellent Resolution of Chrysene and Triphenylene

We designed the Zebron ZB-PAH-CT GC column to achieve complete resolution of Chrysene from Triphenylene along with other EU 15+1 PAH compounds. Its unique selectivity helps eliminate false positives while resolving PAH isomers, providing easy, fast, and accurate quantification of PAHs in environmental and food samples.

EU 15+1 PAH Analysis Using Zebron ZB-PAH-CT



Column: Zebron ZB-PAH-CT
Dimensions: 40 meter x 0.18 mm x 0.14 µm
Part No.: [ZPD-G044-47](#)
Injection: Split 30:1 @ 320 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™
Liner Part No.: [AG2-4B13-05](#) (for Shimadzu® 2010 GC)
Carrier Gas: Helium @ 78 psi (constant pressure)
Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 265 °C @ 3 °C/min for 5 min to 270 °C @ 1 °C/min to 320 °C @ 10 °C/min for 15 min
Detector: MSD (Shimadzu GC-MS-QP2010 Ultra)
Mode: SIM
SIM Ions: 216, 226, 228, 242, 252, 276, 278, 302 m/z
Transfer Line Temperature: 300 °C
Source Temperature: 300 °C

Sample:

1. Benzo[c]fluorene	10. Benzo[a]pyrene
2. Cyclopenta[c,d]pyrene	11. Indeno[1,2,3-c,d]pyrene
3. Benz[a]anthracene	12. Dibenzo[a,h]anthracene
4. Triphenylene	13. Benzo[g,h,i]perylene
5. Chrysene	14. Dibenzo[a,i]pyrene
6. 5-Methylchrysene	15. Dibenzo[a,e]pyrene
7. Benzo[b]fluoranthene	16. Dibenzo[a,j]pyrene
8. Benzo[j]fluoranthene	17. Dibenzo[a,h]pyrene
9. Benzo[k]fluoranthene	

ZB-PAH-CT (cont'd)

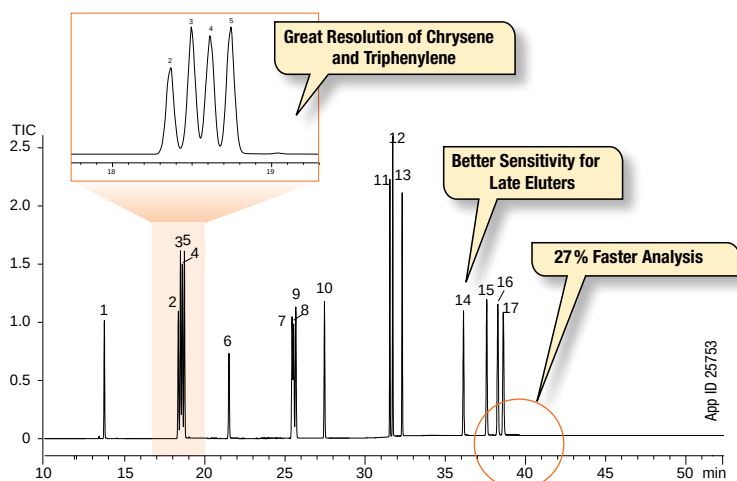
Comparison of ZB-PAH-CT vs. Popular GC PAH column

Shorter Run Time and Better Sensitivity

Analysis of EU 15+1 and Triphenylene PAHs

Zebron ZB-PAH-CT

30 meter x 0.25 mm x 0.20 µm



GC-MS conditions for both applications:

Column: As Indicated

Dimensions: As Indicated

Part No.: [ZHG-G044-10](#) (Zebron ZB-PAH-CT)

Injection: Split 15:1 @ 320 °C, 1 µL

Recommended Liner: Zebron PLUS Single Taper Z-Liner™

Liner Part No.: [AG2-4B13-05](#)

Carrier Gas: Helium @ 23.7 psi (constant pressure)

Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 266 °C @ 3 °C/min for 0 min to 320 °C @ 10 °C/min to 320 °C for 20 min

Detector: MSD (Shimadzu® GC-MS-QP2010 Ultra)

Mode: SIM

SIM Ions: 216, 226, 228, 242, 252, 276, 278, 302 m/z

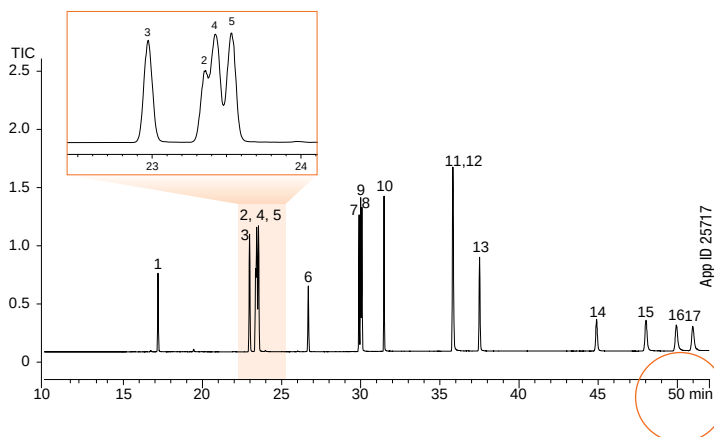
Transfer Line Temperature: 300 °C

Source Temperature: 300 °C

- Sample:
1. Benzo[c]fluorene
 2. Cyclopenta[c,d]pyrene
 3. Benz[a]anthracene
 4. Triphenylene
 5. Chrysene
 6. 5-Methylchrysene
 7. Benzo[b]fluoranthene
 8. Benzo[j]fluoranthene
 9. Benzo[k]fluoranthene
 10. Benzo[a]pyrene
 11. Indeno[1,2,3-c,d]pyrene
 12. Dibenzo[a,h]anthracene
 13. Benzo[g,h,i]perylene
 14. Dibenzo[a,i]pyrene
 15. Dibenzo[a,e]pyrene
 16. Dibenzo[a,l]pyrene
 17. Dibenzo[a,h]pyrene

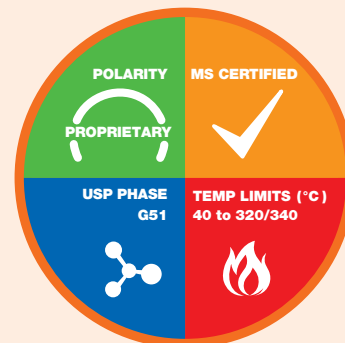
Popular Brand A

30 meter x 0.25 mm x 0.15 µm



Comparative separations may not be representative of all applications.

Column Profile



Phase Chemistry

- Proprietary

Recommended Applications

- Analysis of 15+1 EU-regulated and EPA regulated PAHs in food testing, rubber, plastic, coal
- Sources include cigarette smoke, vehicle exhausts, asphalt roads, coal, coal tar, wildfires, agricultural burning, residential wood burning, municipal, industrial waste incineration.



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.



Zebron ZB-PAH-CT Phase details

Ordering Information

Zebron ZB-PAH-CT GC Columns

ID (mm)	df (µm)	Temp. Limits °C	Part No.
20-Meter			
0.18	0.14	40 to 320/340	7FD-G044-47
30-Meter			
0.25	0.20	40 to 320/340	ZHG-G044-10
40-Meter			
0.18	0.14	40 to 320/340	7PD-G044-47

ZB-FAME

- Reduce traditional run times up to 75 %
- Improve separation of cis/trans FAME isomers
- Suitable with AOAC, AOCS, and IOC methods

Upgrade to Zebron from any high cyanopropyl phase:

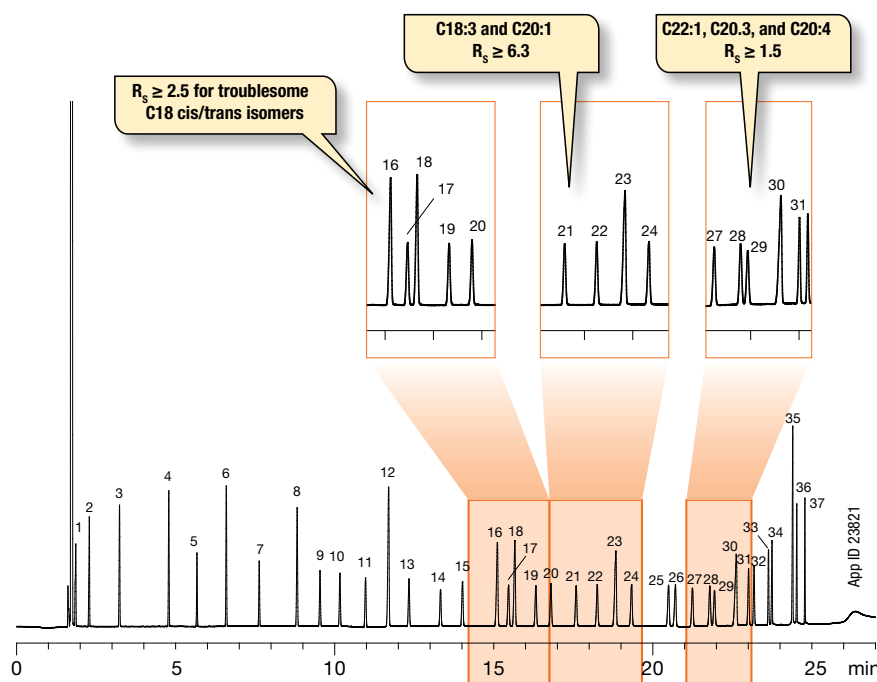
Agilent®

- CP-Sil 88
- HP-88
- DB®-23

Supelco®

- SP®-2380
- SP-2560

Baseline Separation of Common Isomers



Column: Zebron ZB-FAME

Dimensions: 30 meter x 0.25 mm x 0.20 µm

Part No.: ZHG-G033-10

Injection: Split 50:1 @ 240 °C, 1 µL

Recommended Liner: Zebron PLUS Single Taper with Wool, 4 mm ID

Liner Part No.: AG2-0A11-05 (for Agilent® systems)

Carrier Gas: Helium @ 1.2 mL/min (constant flow)

Oven Program: 100 °C for 2 min to 140 °C @ 10 °C/min
to 190 °C @ 3 °C/min to 260 °C @
30 °C/min for 2 min

Detector: FID @ 260 °C

Sample: 37 FAME standard

Easy Liner Selection

Remarkably
Inert!



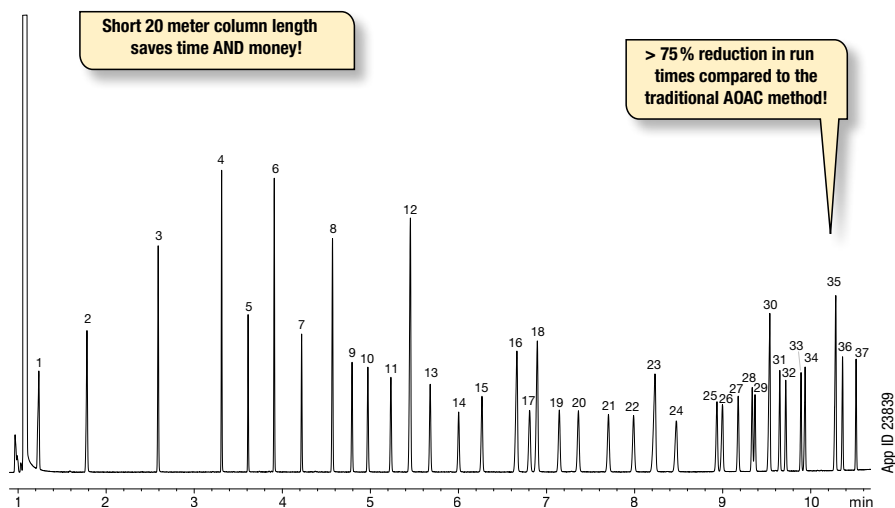
Our GC liner finder tool makes liner selection a breeze. You can even search by application, injection type, GC system, or your current liner part number.

www.phenomenex.com/FindLiner

The Fast FAME GC Column

Traditionally, cis/trans FAME separations require the use of long (100 meters or more) columns and can run up to 60 minutes, resulting in a bottleneck to higher productivity. Zebron ZB-FAME provides targeted selectivity that allows for reduced column length – run times as short as 11 minutes without compromising your results!

37 FAMES In A Short 11 Minute Run



Column: Zebron ZB-FAME
Dimensions: 20 meter x 0.18 mm x 0.15 µm
Part No.: [7FD-G033-05](#)
Injection: Split 100:1 @ 250 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™
Liner Part No.: [AG2-0A13-05](#) (for Agilent® systems)
Carrier Gas: Helium @ 1.0 mL/min (constant flow)
Oven Program: 80 °C for 1.5 min to 160 °C @ 40 °C/min to 185 °C @ 5 °C/min to 260 °C @ 30 °C/min
Detector: FID @ 260 °C
Sample: 37 FAME standard



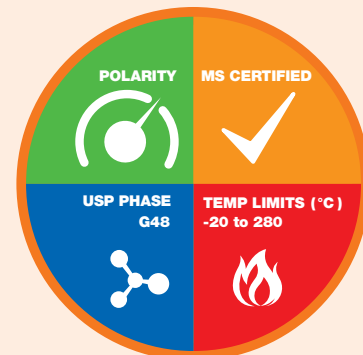
Ordering Information

Zebron ZB-FAME GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
20-Meter			
0.18	0.15	-20 to 280	7FD-G033-05
30-Meter			
0.25	0.20	-20 to 280	7HG-G033-10
30-Meter with 5-Meter Guardian™ Integrated Guard			
0.25	0.20	-20 to 280	7HG-G033-10-GGA
60-Meter			
0.25	0.20	-20 to 280	7KG-G033-10
100-Meter			
0.25	0.20	-20 to 280	7MG-G033-10

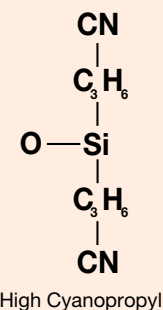
Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Phenomenex

Column Profile



Phase Chemistry



Recommended Applications

- Fatty Acid Methyl Ester (FAMES)
- cis/trans FAME isomers
- Omega 3, Omega 6 FAMES

ZB-SemiVolatiles

Maximize Inertness

- Specifically designed to overcome obstacles for sensitive semi-volatiles methods
- Enviro-Inert™ Technology provides a rugged 5 % phenyl-arylene phase – reduce activity without compromising selectivity
- Rugged QC test includes EPA 8270 tuning standard to ensure column is ready to pass suitability requirements
- Popular for EPA Methods 525, 610, 625, 8100, and 8270D

Upgrade to Zebron from any 5 %-phenyl or 5 % phenyl-arylene / 95 % dimethylpolysiloxane phase:

Agilent®

- DB®-5ms
- DB-5ms Ultra Inert
- DB-5.625
- DB-UI 8270D

- HP-5ms
- HP-5ms Ultra Inert
- VP-5ms
- CP-Sil 8 CB MS

Restek®

- Rxi®-5Sil MS
- Rxi-5ms

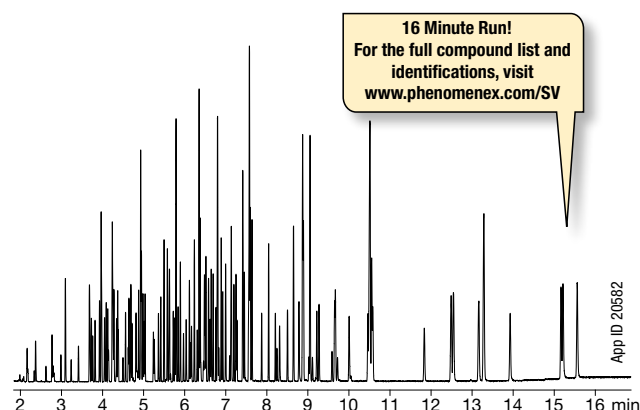
Supelco®

- SLB®-5ms

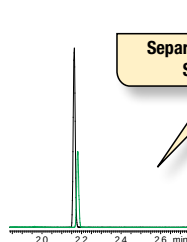
135 Compounds in Under 16 Minutes

ZB-SemiVolatiles provides improved productivity with shorter run times for EPA 8270D, while maintaining resolution of key critical pairs.

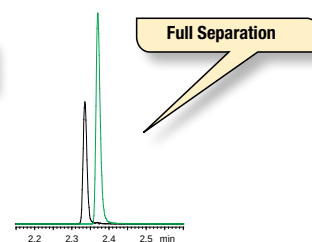
Semivolatile Organic Compounds



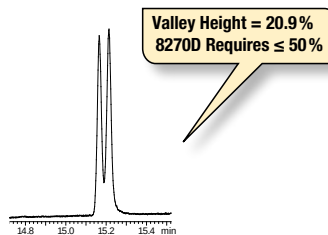
Improved Peak Shapes



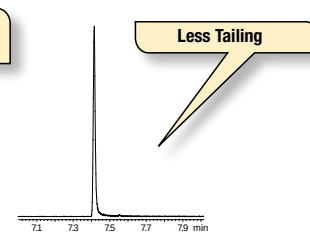
1,4-Dioxane-D8 and 1,4-Dioxane



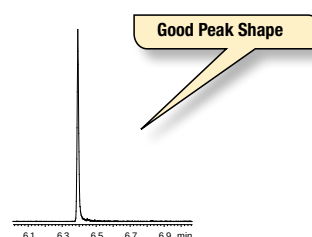
N-Nitrosodimethylamine and Pyridine



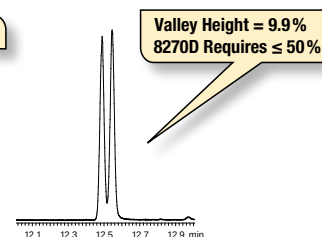
Indeno[1,2,3-cd]pyrene and Dibenz[a,h]anthracene, both share mass 276



Pentachlorophenol



2,4-Dinitrophenol



Benzo[b]fluoranthene and Benzo[k]fluoranthene

Column: Zebron ZB-SemiVolatiles
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G027-11
Injection: Split 10:1 @ 280 °C, 1 µL
Liner: AGO-8499 (Single Taper with Wool)
Septum: AGO-4697 (PhenoRed™-400)
Inlet Seal: AGO-8620 (Easy Seals™ Inlet Base Seal)
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 40 °C for 0.5 min to 260 °C @ 40 °C/min to 295 °C @ 6 °C/min to 325 °C @ 25 °C/min for 2 min
Detector: MSD @ 340 °C; 45 – 450 amu
Sample: Analytes are 25 ppm in Dichloromethane
 135 compounds in EPA Method 8270D

ZB-SemiVolatiles

We QC Test For the Compounds You Analyze

We take the guesswork out of meeting method requirements by aggressively testing ZB-SemiVolatiles with two different test mixes. We incorporated troublesome analytes from your samples and compounds in the EPA 8270D tuning standard into our QC test, so you can be sure your column is ready to meet suitability requirements for the method.

Meet Requirements Out-of-the-Box

Test Probe	Criteria	EPA Requirement	Our Requirement
Pyridine Very active amine that exposes even the smallest amount of column activity. This ensures that our Enviro-Inert™ deactivated column performs at the highest possible level for difficult basic compounds.	Peak Response	Not Specified	≥ 0.6
Pentachlorophenol Disappears and tails on active columns; it is important to measure relative response and peak skew criteria.	Peak Skew Peak Response	≤ 2.0 Not Specified	≤ 2.0 ≥ 0.3
Benzidine Active amine that tails when column activity is present, complicating peak quantification.	Peak Skew	≤ 2.0	≤ 2.0
DDT Breaks down in an active system to DDE and DDD. With our QC test, you are assured that your column will meet the EPA requirements upon installation.	Breakdown	< 20 %	< 20 %
Injection To ensure trace-level sensitivity, QC is performed with a 20 ppm mix using a 100:1 split injection – effectively 250 times less than the EPA maximum allowed.	Sensitivity	50 ng or less on column	0.2 ng on column

Stands Up to Tough Samples for Increased Lifetime

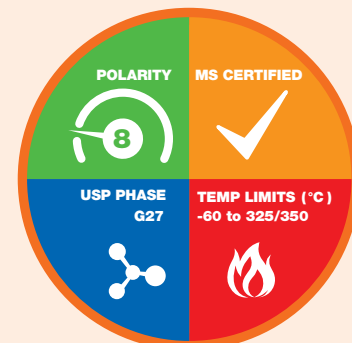
“ I have found the Phenomenex ZB-SemiVolatiles columns to be superior in quality and durability than any other columns we have previously used. The columns not only last longer, but the reproducibility of column is extraordinary. The column holds calibrations particularly well, even after multiple injections of samples with far less than desirable matrices. All of this equates to less downtime and maintenance and more productivity for TestAmerica. ”

Ryan McKernan, GC-MS Semi-Volatile Analyst
TestAmerica Laboratories, Inc. Buffalo



The opinions stated herein are solely those of the speaker and not necessarily those of any company or organization.

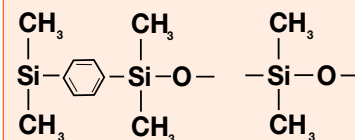
Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

5 % Phenyl-Arylene



95 % Dimethylpolysiloxane

Recommended Applications

- Semivolatiles (SVOCs)
- EPA Methods (525, 610, 625, 8100, 8270D)
- PAHs
- PBDEs



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

Ordering Information

Zebron ZB-SemiVolatiles GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.25	-60 to 325/350	7EG-G027-11
0.25	0.50	-60 to 325/350	7EG-G027-17
20-Meter			
0.18	0.18	-60 to 325/350	7FD-G027-08
0.18	0.36	-60 to 325/350	7FD-G027-53
30-Meter			
0.25	0.25	-60 to 325/350	7HG-G027-11
0.25	0.50	-60 to 325/350	7HG-G027-17
0.32	0.25	-60 to 325/350	7HM-G027-11
30-Meter with 5-Meter Guardian™ Integrated Guard			
0.25	0.25	-60 to 325/350	7HG-G027-11-GGA
0.25	0.50	-60 to 325/350	7HG-G027-17-GGA
30-Meter with 10-Meter Guardian Integrated Guard			
0.25	0.25	-60 to 325/350	7HG-G027-11-GGC
0.25	0.50	-60 to 325/350	7HG-G027-17-GGC
60-Meter			
0.25	0.25	-60 to 325/350	7KG-G027-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

ZB-CLPesticides-1 and -2

7 EPA Methods, One Column Set

- Guaranteed alternative to Restek Rtx-CLPesticides
- Optimized, versatile selectivity for chlorinated pesticides and herbicides
- Well-suited for dual-column configurations using GC-ECD
- Run EPA Methods 8081 and 8081 extended, 8082, 8151, 504, 505, 508, and 552 without changing columns – save time

Direct Replacement for Restek Rtx-CLPesticides Phases

You asked for optimized performance for pesticides by GC-ECD detectors, without time-consuming method development. We've delivered a direct replacement**! ZB-CLPesticides-1 and -2 provide guaranteed drop-in performance compared to your current Rtx-CLPesticides column set, without the hassle.

Upgrade to Zebron from these similar* phases:

Restek®

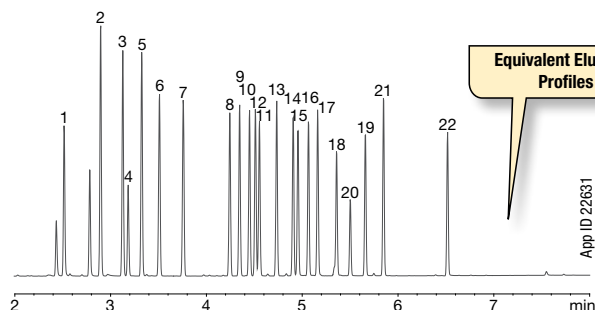
- Rtx®-CLPesticides
- Rtx-CLPesticides2
- Stx®-CLPesticides
- Stx-CLPesticides2

*not exact equivalent, selectivity may differ

Zebron

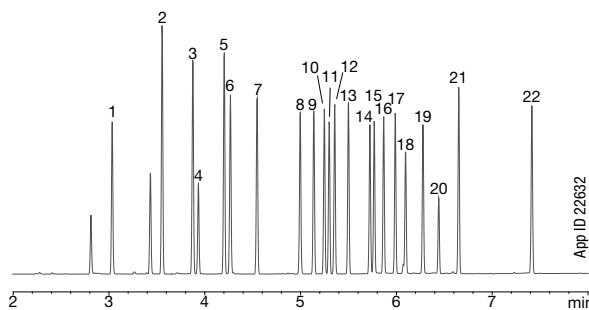
ZB-CLPesticides-1

30 m x 0.32 mm x 0.32 µm



ZB-CLPesticides-2

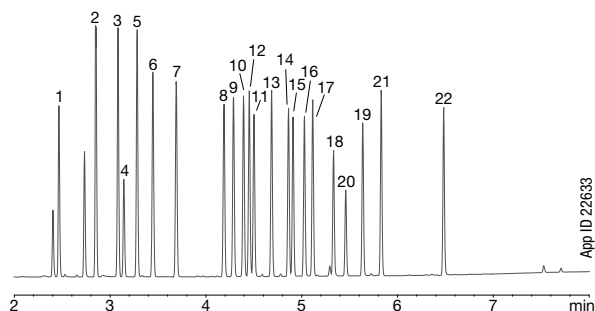
30 m x 0.32 mm x 0.25 µm



Restek®

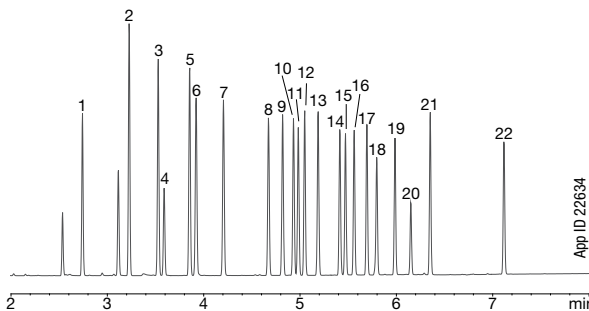
Rtx®-CLPesticides

30 m x 0.32 mm x 0.32 µm



Rtx-CLPesticides2

30 m x 0.32 mm x 0.25 µm



Conditions for all columns:

Columns: As listed
 Dimensions: As listed
 Part No.: [ZHM-G028-51](#) (ZB-CLPesticides-1)
[ZHM-G029-11](#) (ZB-CLPesticides-2)
 Injection: Splitless (hold 0.3 min) @ 250 °C, 1 µL
 Carrier Gas: Helium @ 3.9 mL/min (constant flow)
 Oven Program: 120 °C to 200 °C @ 45 °C/min to 230 °C @ 15 °C/min to 330 °C @ 30 °C/min for 2 min

Detector: ECD @ 330 °C
 Y-Connector: [AG0-4717](#) (Fused Quartz)
 Guard Column: [ZAM-G000-00-GZ0](#) (5 m Z-Guard™)
 Liner: [AG0-8499](#) (Single Taper with Wool at Bottom)
 Septum: [AG0-4696](#) (PhenoRed™-400)
 Inlet Seal: [AG0-8620](#) (Gold-Plated Easy Seals™)
 Sample: Analytes are 250 ng/mL in hexane.

See page 117 for compound list.

**Direct replacement: this category indicates an alternative column which will likely give a similar selectivity. Conditions for each method were the same for all columns tested. Comparative separations may not be representative of all applications.

ZB-CLPesticides-1 and -2

Five-Point Calibration Curve at 5, 15, 25, 100, and 250 ng/mL

Peak No.	Analyte	ZB-CLPesticides-1 % RSD*	ZB-CLPesticides-2 % RSD*	US EPA Specifications
1	2,4,5,6-TCMX (Surr)	3.8	3.0	< 20
2	α-BHC	8.3	3.8	< 20
3	γ-BHC	5.9	5.6	< 20
4	β-BHC	6.9	6.9	< 20
5	δ-BHC	4.9	5.7	< 20
6	Heptachlor	8.0	6.5	< 20
7	Aldrin	4.2	2.3	< 20
8	Heptachlor epoxide	3.8	2.3	< 20
9	trans-Chlordane	4.1	3.8	< 20
10	cis-Chlordane	4.0	3.3	< 20
11	4,4'-DDE	4.8	2.9	< 20
12	Endosulfan I	6.0	2.5	< 20
13	Dieldrin	7.7	4.9	< 20
14	Endrin	9.4	6.6	< 20
15	4,4'-DDD	9.2	3.6	< 20
16	Endosulfan II	6.6	4.1	< 20
17	4,4'-DDT	11.6	6.9	< 20
18	Endrin aldehyde	8.3	7.3	< 20
19	Endosulfan sulfate	8.0	7.1	< 20
20	Methoxychlor	6.7	6.1	< 20
21	Endrin ketone	6.5	7.2	< 20
22	Decachlorobiphenyl (Surr)	6.7	6.6	< 20
Average		6.6%	4.9%	< 20

*Calculated using response factors as per EPA guidelines

ZB-CLPesticides GC Column Kits

Ordering Information

0.25 mm ID Kit (includes 1 of each below) Part No.: KG0-9285		
Description	Dimension	Part No.
ZB-CLPesticides-1	30 meter x 0.25 mm x 0.25 µm	7HG-G028-11
ZB-CLPesticides-2	30 meter x 0.25 mm x 0.20 µm	7HG-G029-10
Z-Guard™ Column	5 meter x 0.25 mm	7AG-G000-00-G20
Y-Connector	Fused Quartz	AG0-4717
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722

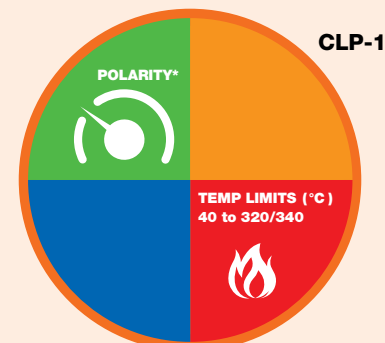
0.32 mm ID Kit (includes 1 of each below) Part No.: KG0-9286		
Description	Dimension	Part No.
ZB-CLPesticides-1	30 meter x 0.32 mm x 0.32 µm	7HM-G028-51
ZB-CLPesticides-2	30 meter x 0.32 mm x 0.25 µm	7HM-G029-11
Z-Guard Column	5 meter x 0.32 mm	7AM-G000-00-G20
Y-Connector	Fused Quartz	AG0-4717
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722

0.53 mm ID Kit (includes 1 of each below) Part No.: KG0-9290		
Description	Dimension	Part No.
ZB-CLPesticides-1	30 meter x 0.53 mm x 0.50 µm	7HK-G028-17
ZB-CLPesticides-2	30 meter x 0.53 mm x 0.42 µm	7HK-G029-16
Z-Guard Column	5 meter x 0.53 mm	7AK-G000-00-G20
Y-Connector	Fused Quartz	AG0-4717
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722

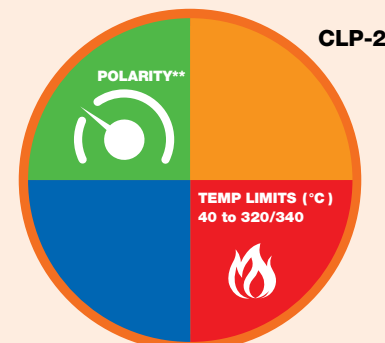


Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

Column Profile



*Similar polarity to ZB-35.



**Similar polarity to ZB-MultiResidue-2

Phase Chemistry

- Proprietary

Recommended Applications

- Dual-Column Chlorinated Pesticide Methods
- EPA Methods (8081 and 8081 extended, 8082, 8151, 504, 505, 508, 552)

ZB-CLPesticides GC Columns

Ordering Information

ZB-CLPesticides-1 GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
30-Meter			
0.25	0.25	40 to 320/340	7HG-G028-11
0.32	0.32	40 to 320/340	7HM-G028-51
0.32	0.50	40 to 320/340	7HM-G028-17
0.53	0.50	40 to 320/340	7HK-G028-17
ZB-CLPesticides-2 GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
30-Meter			
0.25	0.20	40 to 320/340	7HG-G029-10
0.32	0.25	40 to 320/340	7HM-G029-11
0.32	0.50	40 to 320/340	7HM-G029-17
0.53	0.42	40 to 320/340	7HK-G029-16

ZB-MultiResidue™ -1 and -2

Optimized Selectivity for Pesticides

- Specially designed for the separation of all types of pesticides, herbicides, and insecticides
- Baseline resolution and confirmation of all 20 chlorinated pesticides regulated under EPA Method 8081 in ≤ 10 min
- Decreased breakdown of sensitive pesticides such as DDT
- Robust performance for high temperature bakeouts
- Low bleed performance for pesticide confirmation by MS

Upgrade to Zebron from these similar* phases:

Agilent®

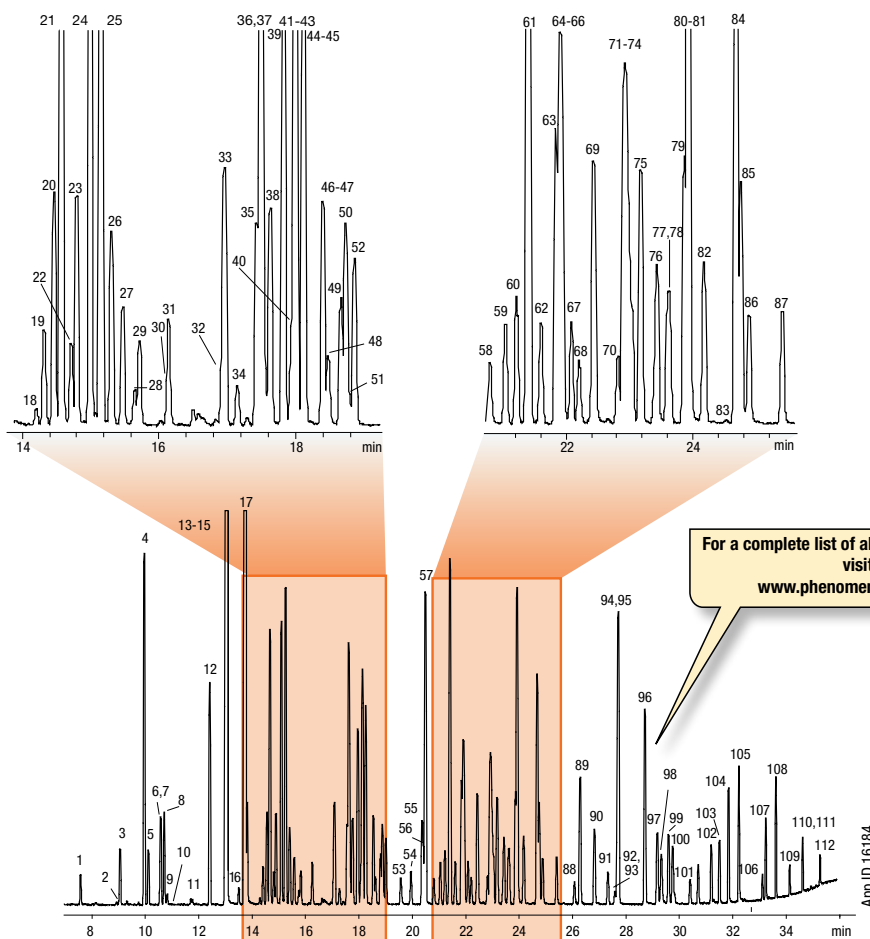
- DB®-CLP1
- DB-CLP2

Restek®

- Rtx®-CLPesticides
- Rtx-CLPesticides2
- Stx®-CLPesticides
- Stx-CLPesticides2

*not exact equivalent, selectivity may differ

Improved Multi-Residue Pesticide Screening by GC-MS



Column: Zebron MultiResidue™ -1

Dimensions: 30 meter x 0.25 mm x 0.25 μ m

Part No.: ZHG-G016-11

Injection: Splitless @ 260 °C, 1 μ L

Carrier Gas: Helium @ 0.9 mL/min (constant flow)

Oven Program: 80 °C for 0.5 min to 150 °C @ 10 °C/min to 240 °C @ 4 °C/min to 320 °C @ 15 °C/min for 3 min

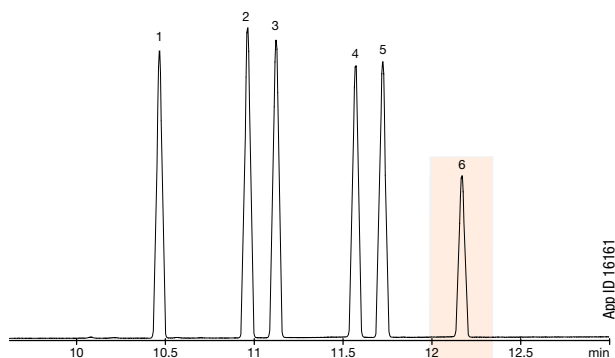
Detector: MSD @ 320 °C; 45-400 amu

Sample: Analytes were 1 ppm in Dichloromethane

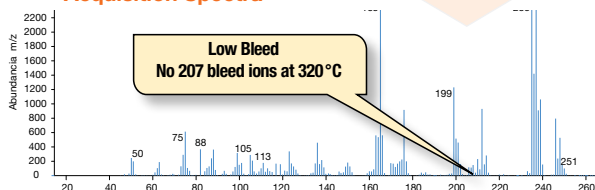
ZB-MultiResidue™ -1 and -2 (cont'd)

Resolve Common Pesticide Isomers

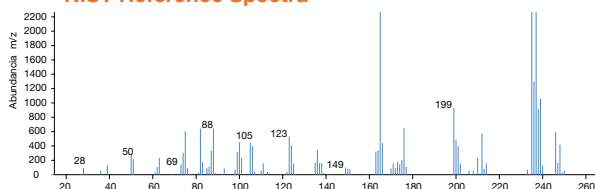
ZB-MultiResidue optimized selectivities improve resolution of complex pesticide, herbicide, and insecticide isomers. Our extremely stable siloxane-based polymer contains absolutely no nitrogen or halogenated functionality, which can be unfriendly to NPD and ECD detectors. Engineered Self-Crosslinking™ (ESC) bonding incorporates ladders into the phase backbone for low bleed and unmatched spectral integrity – even for trace-level samples.



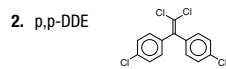
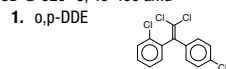
Acquisition Spectra



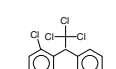
NIST Reference Spectra



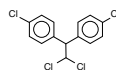
Column: Zebron ZB-MultiResidue-1
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G016-11
Injection: Splitless (hold 0.5 min) @ 260 °C, 1 µL
Carrier Gas: Helium @ 0.8 mL/min (constant flow)
Oven Program: 100 °C for 0.5 min to 200 °C @ 25 °C/min to 320 °C @ 15 °C/min for 2 min
Detector: MSD @ 320 °C, 45-400 amu
Sample: 1. o,p-DDE



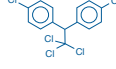
4. o,p-DDT



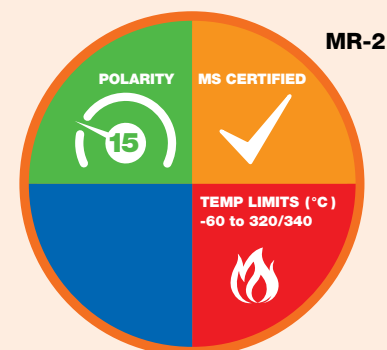
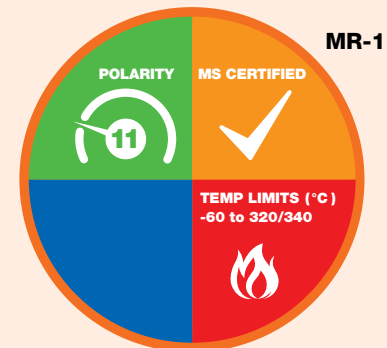
5. p,p-DDD



6. p,p-DDT



Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

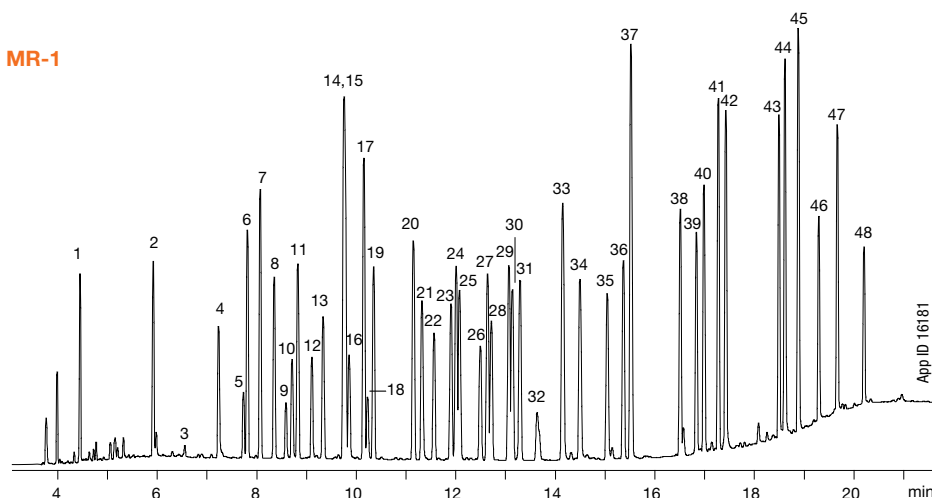
Recommended Applications

- Haloacetic Acids (HAAs)
- Herbicides / Insecticides
- Multi-Pesticide Screening
- Nitrogen Containing Pesticides
- Organochlorine Pesticides
- Organophosphorous Pesticides
- PCBs / Aroclors

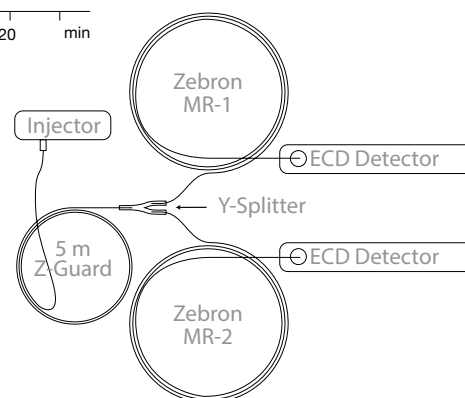
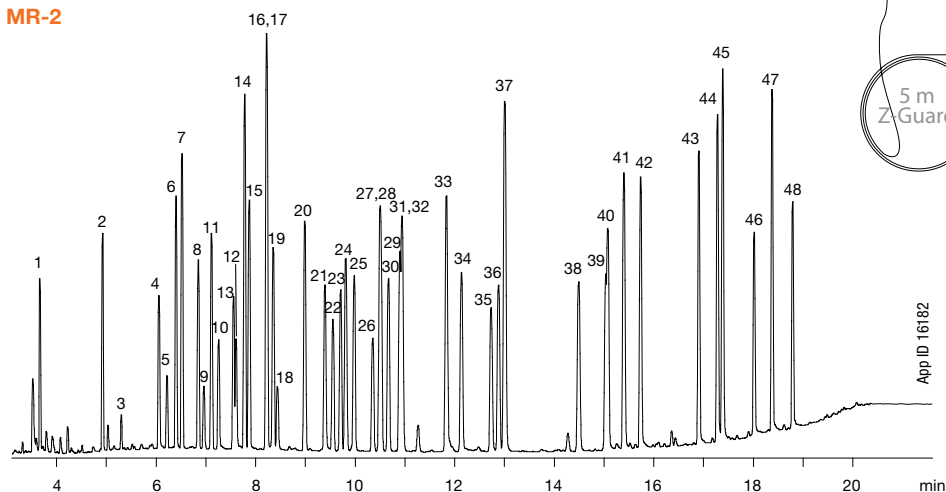
ZB-MultiResidue™ -1 and -2 (cont'd)

Great Results for Organophosphate Pesticides

MR-1



MR-2



Conditions for both column

Columns: Zebron MultiResidue-1

Zebron MultiResidue-2

Dimensions: 30 meter x 0.32 mm x 0.50 µm

30 meter x 0.32 mm x 0.25 µm

Part No.: [ZHM-G016-17](#)

[ZHM-G017-11](#)

Injection: On-Column @ 103 °C, 1 µL

Carrier Gas: Helium @ 2.8 mL/min (constant flow)

Oven Program: 100 °C for 0.5 min to 180 °C @ 20 °C/min to 240 °C @ 6 °C/min to 320 °C @ 15 °C/min for 2 min

Detector: FID @ 340 °C

Note: Columns connected using a 5 m Z-Guard™ Column and a 'Y' splitter.

Sample: Analytes are 2 ppm in Dichloromethane.

- | | | |
|------------------------------------|-------------------------|------------------------------|
| 1. Dichlorvos | 17. Fonofos | 33. Chlorfenvinphos |
| 2. Mevinphos | 18. Phosphamidon Isomer | 34. Crotoxyphos |
| 3. Trichlorfon | 19. Disulfoton | 35. Stirofos |
| 4. TEPP (Tetraethyl Pyrophosphate) | 20. Dichlofenthion | 36. Tokuthion |
| 5. Demeton Isomer | 21. Phosphamidon | 37. Merphos Oxide (Tribufos) |
| 6. Thionazin | 22. Chlorpyrifos Methyl | 38. Ethion |
| 7. Ethoprop | 23. Ronnel | 39. Fensulfothion |
| 8. Sulfotep | 24. Aspon | 40. Contaminant |
| 9. Naled | 25. Methyl Parathion | 41. Carbophenothion |
| 10. Dicrotophos | 26. Malathion | 42. Famfur |
| 11. Phorate | 27. Fenitrothion | 43. EPN |
| 12. Monocrotophos | 28. Chlorpyrifos | 44. Phosmet |
| 13. Demeton | 29. Fenthion | 45. Leptophos |
| 14. Terbufos | 30. Trichloronate | 46. Azinphos Methyl |
| 15. Diazinon | 31. Parathion | 47. Azinphos Ethyl |
| 16. Dimethoate | 32. Merphos | 48. Coumaphos |

ZB-MultiResidue™ -1 and -2 (cont'd)

Ordering Information

Zebron ZB-MultiResidue -1 GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.
20-Meter			
0.18	0.18	-60 to 320/340	7FD-G016-08
30-Meter			
0.25	0.25	-60 to 320/340	7HG-G016-11
0.32	0.25	-60 to 320/340	7HM-G016-11
0.32	0.50	-60 to 320/340	7HM-G016-17
0.53	0.50	-60 to 320/340	7HK-G016-17

Ordering Information

Zebron ZB-MultiResidue -2 GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.
30-Meter			
0.25	0.20	-60 to 320/340	7HG-G017-10
0.32	0.25	-60 to 320/340	7HM-G017-11
0.53	0.50	-60 to 320/340	7HK-G017-17

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.



ZB-MultiResidue Column Kits

Ordering Information

0.25 mm ID (kit consists of products below)			Part No.: KG0-8237
Description	Dimension	Part No.	
ZB-MultiResidue-1 Column	30 meter x 0.25 mm x 0.25 μm df	7HG-G016-11	
ZB-MultiResidue-2 Column	30 meter x 0.25 mm x 0.20 μm df	7HG-G017-10	
Z-Guard™	5 meter x 0.25 mm	7AG-G000-00-GZ0	
Universal Capillary Column Y-connector, Fused Quartz	—	AG0-4717	
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722	
0.32 mm ID (kit consists of products below)			Part No.: KG0-8238
Description	Dimension	Part No.	
ZB-MultiResidue-1 Column	30 meter x 0.32 mm x 0.50 μm df	7HM-G016-17	
ZB-MultiResidue-2 Column	30 meter x 0.32 mm x 0.25 μm df	7HM-G017-11	
Z-Guard	5 meter x 0.32 mm	7AM-G000-00-GZ0	
Universal Capillary Column Y-connector, Fused Quartz	—	AG0-4717	
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722	
0.53 mm ID (kit consists of products below)			Part No.: KG0-8239
Description	Dimension	Part No.	
ZB-MultiResidue-1 Column	30 meter x 0.53 mm x 0.50 μm df	7HK-G016-17	
ZB-MultiResidue-2 Column	30 meter x 0.53 mm x 0.50 μm df	7HK-G017-17	
Z-Guard	5 meter x 0.53 mm	7AK-G000-00-GZ0	
Universal Capillary Column Y-connector, Fused Quartz	—	AG0-4717	
Polyimide Resin	0.5 mL, rated to 350 °C	AG0-5722	



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-Bioethanol

Quicker Bioethanol Testing

- Specially designed for fast and accurate bioethanol testing
- Provides accurate and reproducible results for Certificate of Analysis (COA)
- Resolve methanol and ethanol from all other denaturant peaks
- Great resolution of fusel alcohols
- Allows for quick bake out in between runs to eliminate contaminants

Upgrade to Zebron from traditional phases used for bioethanol:

Agilent®

- DB®-1
- HP-1
- CP-Sil 5 CB

Restek®

- Rtx®-1
- Rxi®-1ms

SGE®

- BP1

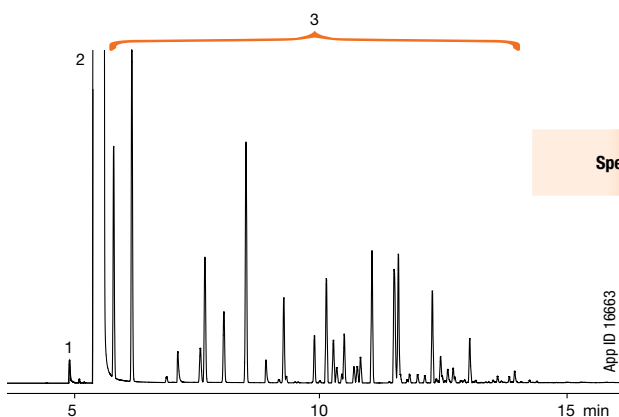
Supelco®

- SPB®-1
- SE-30

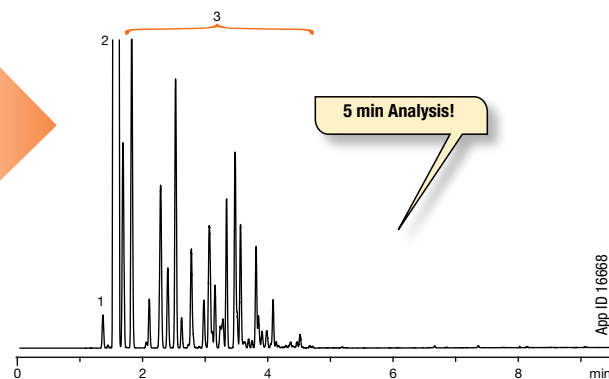


Fast, Accurate Analysis

Determination of Denatured Bioethanol: ASTM Method D5501



Speed It Up!



Column: Zebron ZB-1

Dimensions: 100 meter x 0.25 mm x 0.50 µm

Part No.: [ZMG-G001-17](#)

Injection: Split 50:1 @ 300 °C, 1 µL

Carrier Gas: Helium @ 35 cm/sec (constant flow)

Oven Program: 45 °C for 7 min to 255 °C @ 30 °C/min for 6 min

Detector: FID @ 300 °C

Instrument: Shimadzu® [GC-2010](#) with Flame Ionization

Sample: 1. Methanol
2. Ethanol
3. Denaturant

Column: Zebron ZB-Bioethanol

Dimensions: 15 meter x 0.25 mm x 1.00 µm

Part No.: [ZEG-G020-22](#)

Injection: Split 50:1 @ 300 °C, 1 µL

Carrier Gas: Hydrogen @ 25 cm/sec (constant flow)

Oven Program: 55 °C for 1.7 min to 260 °C @ 40 °C/min (hold 2.67 min)

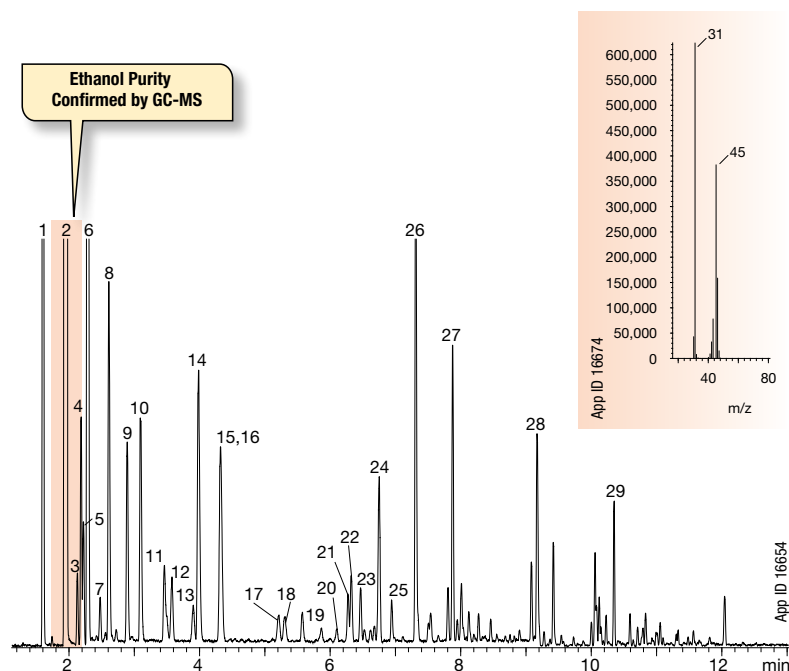
Detector: FID @ 300 °C

Instrument: Shimadzu® [GC-2010](#) with Flame Ionization Detection and AOC-20i Automatic Liquid

Sample: 1. Methanol
2. Ethanol
3. Denaturant

ZB-Bioethanol

Resolve Fusel Alcohols



Column: Zebron ZB-Bioethanol
Dimensions: 30 meter x 0.25 mm x 1.00 µm
Part No.: [7HG-G020-22](#)
Injection: Split 100:1 @ 240 °C, 0.1 µL
Carrier Gas: Helium @ 1.2 mL/min (constant flow)
Oven Program: 40 °C for 5 min to 300 °C @ 25 °C/min
Detector: MSD @ 230 °C; 30-450 amu
Sample:

1. Methanol	17. Methylcyclopentane
2. Ethanol	18. 2,4-Dimethylpentane
3. Acrolein	19. Benzene
4. Acetone	20. Cyclohexane
5. 2-Methylbutane	21. 2-Methylhexane
6. Isopropyl alcohol	22. 2,3-Dimethylpentane
7. Pentane	23. 3-Methylhexane
8. t-Butanol	24. 2,2,4-Trimethylpentane
9. Allyl alcohol	25. Heptane
10. n-Propanol	26. Acetal
11. 2,3-Dimethylbutane	27. Toluene
12. 2-Methylpentane	28. Xylene
13. 3-Methylpentane	29. Trimethylbenzene
14. 2-Butanol	
15. Ethyl acetate	
16. Hexane	

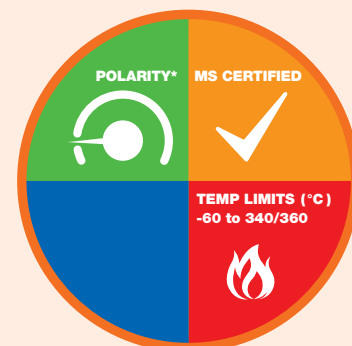
Ordering Information

Zebron ZB-Bioethanol GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	1.00	-60 to 340/360	7EG-G020-22
30-Meter			
0.25	1.00	-60 to 340/360	7HG-G020-22

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Alcohols
- Ethanol Testing
- Fusel Alcohols



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



For Bioethanol fermentation monitoring, use Rezex-ROA HPLC columns, see p. 325

ZB-1XT SimDist

High Efficiency Metal Column Performance

- Glass Infusion™ technology for higher efficiency and greater column-to-column reproducibility
- Individual QC testing for every column
- Up to 70% higher efficiency than other columns
- Increased accuracy for high temperature simulated distillation

Upgrade to Zebron from any 100% dimethylpolysiloxane phase:

Agilent®

- DB®-1
- DB-HT SimDis
- DB-PS1
- DB-PS2887
- CP-SimDist
- CP-SimDist UltiMetal

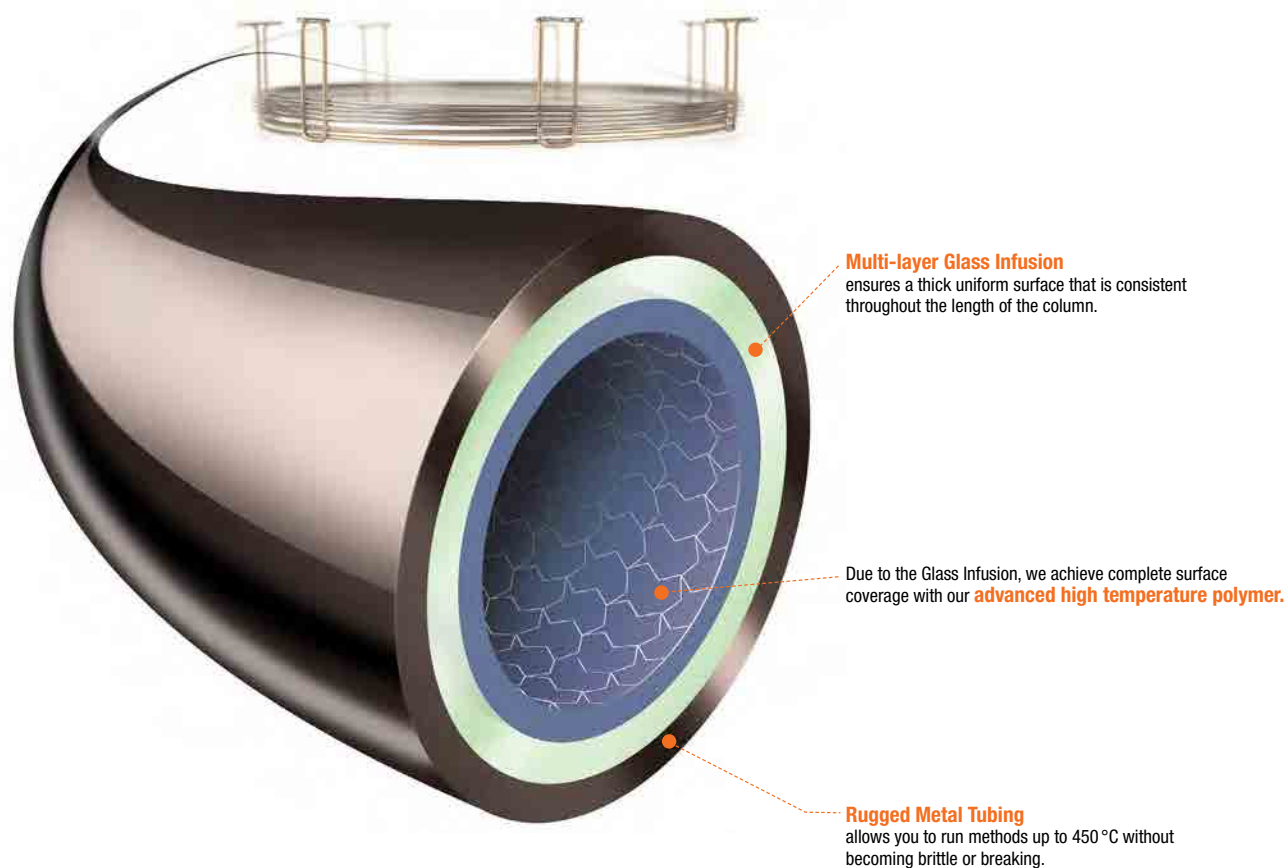
Restek®

- Rtx®-1
- Rxi®-1HT
- MXT®-1HT SimDist

SGE®

- BP1
- BPX1-SimD

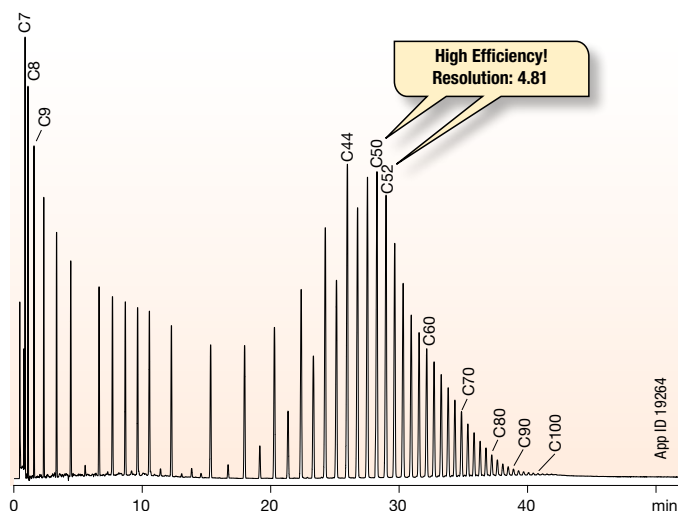
Glass Infusion Technology for Improved Performance



ZB-1XT SimDist

Improve Results for Simulated Distillation

Hydrocarbons C7–C100+: ASTM Method D7169



Column: Zebtron ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.15 µm
Part No.: [7AK-G026-05](#)
Injection: On-Column @ 33 °C, 1 µL
Carrier Gas: Helium @ 7 mL/min (constant flow)
Oven Program: 30 °C to 450 °C @ 10 °C/min for 10 min
Detector: FID @ 450 °C
Sample: C7 to C44 hydrocarbons and POLYWAX® 655 in CS₂
 Note: Chromatogram is baseline subtracted.

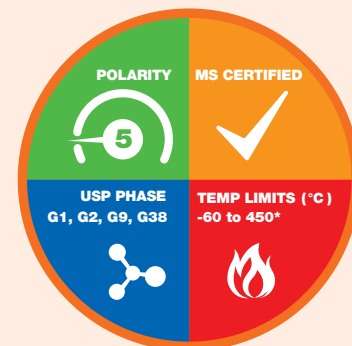
Ordering Information

Zebtron ZB-1XT SimDist GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
5-Meter			
0.53	0.09	-60 to 450	7AK-G026-55
0.53	0.15	-60 to 450	7AK-G026-05
0.53	0.88	-60 to 450	7AK-G046-49
5-Meter with 2-Meter Guardian™ Integrated Guard			
0.53	0.09	-60 to 450	7AK-G026-55-GGT
0.53	0.15	-60 to 450	7AK-G026-05-GGT
10-Meter			
0.53	0.15	-60 to 450	7CK-G026-05
0.53	0.88	-60 to 450	7CK-G026-49
0.53	2.65	-60 to 400	7CK-G026-35
10-Meter with 5-Meter Guardian Integrated Guard			
0.53	2.65	-60 to 450	7CK-G026-35-GGA
15-Meter			
0.53	0.25	-60 to 450	7EK-G026-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

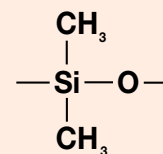
Column Profile



*Thicker film (2.65 µm) is rated to 400 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



100 % Dimethylpolysiloxane

Recommended Applications

- ASTM Methods (D2887, D3710, D6352, D7169)
- Crude Oil
- Gasoline Fractions
- Petroleum Distillates
- Petroleum Fractions
- Simulated Distillation
- Vacuum Distillates



ZB-1XT SimDist Test Mix
 Part No.: [AG0-8645](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Guard Column Connections
 SiTite™ Mini-Unions for
 0.8mm ID columns (P/N: [AG0-8825](#))
 and
 Replacement Ferrules (P/N: [AG0-8824](#))

ZB-DHA-PONA

- Excellent peak shape for polar and nonpolar compounds
- Temperature stability and flexibility
- Highly efficient dimension and consistent film thickness delivers excellent separation of paraffins, iso-paraffins, olefins, naphthenes, aromatics and polar compounds
- Extensive ESC™ provides intact stationary phase and MS certified low bleed
- Well-suited for true boiling point separation
- Excellent resolving power for critical pairs in complex petrochemical samples

The Choice for PIONA, DHA and PONA

Zebron ZB-DHA-PONA is the choice for the analysis of Detailed Hydrocarbon Analysis (DHA) within the fuel industry. The Engineered Self Cross-linking™(ESC) stationary phase provides low bleed and exceptional column life for separation of DHA critical pairs with symmetric peaks. In addition, Zebron ZB-DHA-PONA GC columns provide excellent response and peak symmetry for polar oxygenates.

The Zebron ZB-DHA-PONA GC column provides excellent separation of DHA critical pairs with symmetric peaks suitable for ASTM Method D6730, see table below.

Upgrade to Zebron from any 100 % dimethylpolysiloxane phase:

Agilent®

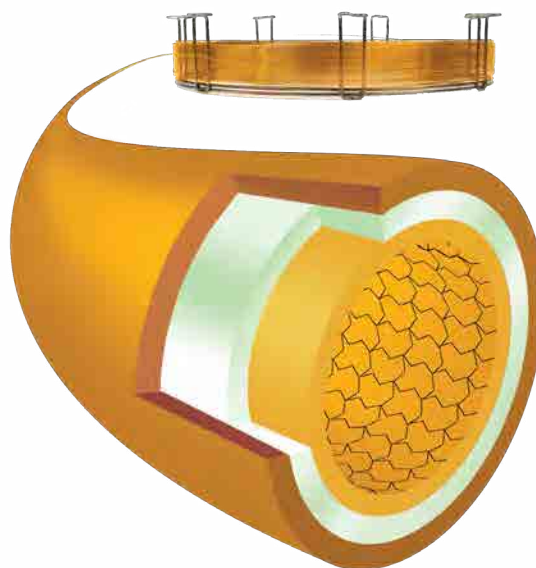
- HP-PONA
- DB®-PETRO
- CP-Sil PONA CB

Restek®

- Rtx®-DHA

Supelco®

- Petrocol®-DH

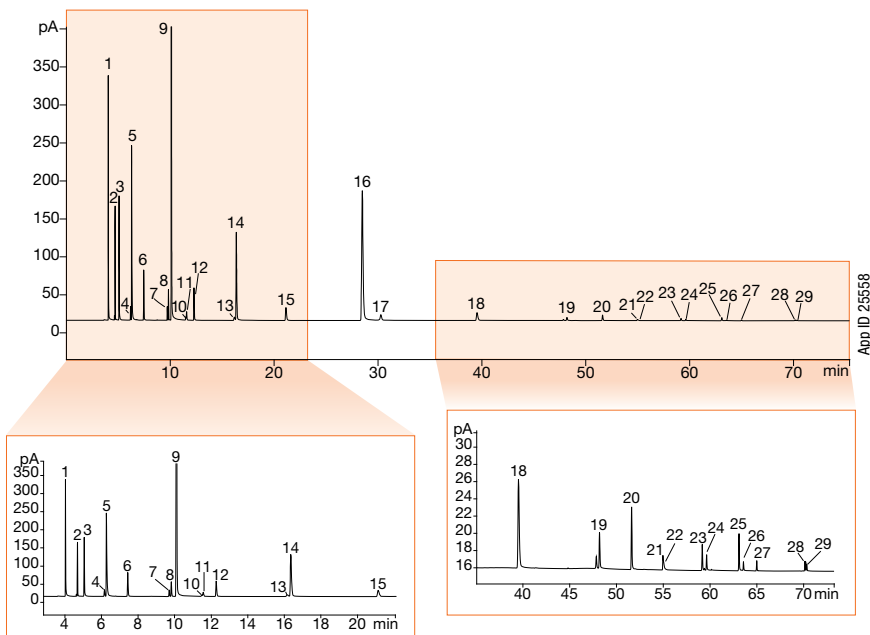


Easy ZB-DHA-PONA Selection for Your ASTM Method

Method	Description	Recommended Column	Recommended Dimensions	Part Number
ASTM D5134	Standard Test Method for Detailed Analysis of Petroleum Naphtha's through n-Nonane by Capillary Gas Chromatography	ZB-DHA-PONA	50 m x 0.20 mm x 0.5 µm	7JE-G042-17
		ZB-DHA-PONA	100 m x 0.25 mm x 0.5 µm	7MG-G042-17
ASTM D5441	Standard Test Method for Analysis of Methyl Tert-Butyl Ether (MTBE) by GC	ZB-DHA-PONA	50 m x 0.20 mm x 0.5 µm	7JE-G042-17
		ZB-DHA-PONA	100 m x 0.25 mm x 0.5 µm	7MG-G042-17
		ZB-DHA-PONA	150 m x 0.25 mm x 1 µm	7QG-G042-22
ASTM D5501	Standard Test Method for Determination of Ethanol and Methanol Content in Fuels Containing Greater than 20 % Ethanol by Gas Chromatography	ZB-DHA-PONA	100 m x 0.25 mm x 0.5 µm	7MG-G042-17
		ZB-DHA-PONA	150 m x 0.25 mm x 1 µm	7QG-G042-22
ASTM D6729	Standard Test Method for Determination of Individual Components in Spark Ignition Engine Fuels by 100 Meter Capillary High Resolution Gas Chromatography	ZB-DHA-PONA	100 m x 0.25 mm x 0.5 µm	7MG-G042-17
ASTM D6730	Standard Test Method for Determination of Individual Components in Spark Ignition Engine Fuels by 100-Meter Capillary (with Pre-column) High-Resolution Gas Chromatography	ZB-DHA-PONA	50 m x 0.20 mm x 0.5 µm	7JE-G042-17
		ZB-DHA-PONA	100 m x 0.25 mm x 0.5 µm	7MG-G042-17
		ZB-DHA-PONA	150 m x 0.25 mm x 1 µm	7QG-G042-22
		ZB-DHA-PONA-TUNE	5 m x 0.25 mm x 1 µm	7AG-G042-22
ASTM D6733	Standard Test Method for Determination of Individual Components in Spark Ignition Engine Fuels by 50-Meter Capillary High Resolution Gas Chromatography	ZB-DHA-PONA	50 m x 0.20 mm x 0.5 µm	7JE-G042-17

ZB-DHA-PONA

Analysis of ASTM D6730 Components by GC-FID on ZB-DHA-PONA & ZB-DHA-PONA-TUNE GC Column



Column 1 (Tuning): Zebron ZB-DHA-PONA-TUNE
Phase: 5% Phenyl 95% Dimethylpolysiloxane
Dimensions: 5 meter x 0.25 mm x 1.00 µm
Part No.: [7AG-G042-22](#)
Column 2: Zebron ZB-DHA-PONA
Phase: 100% Dimethylpolysiloxane
Dimensions: 100 meter x 0.25 mm x 0.50 µm
Part No.: [7MG-G042-17](#)

Recommended Column Union: [AG0-4716](#)
Injection: Split 150:1 @ 200 °C, 0.2 µL
Recommended Liner: Zebron PLUS Straight Z-Liner™
Part No.: [AG2-0A03-05](#)
Carrier Gas: Hydrogen @ 2 mL/min (constant flow)
Oven Program: 30 °C for 8.5 min, to 48 °C @ 22 °C/min for 27 min, to 141 °C @ 3 °C/min for 1 min, to 275 °C @ 1 °C/min for 2 min
Detection: Flame Ionization (FID) @ 275 °C

Sample:

1. Ethanol	16. C8 (n-octane)
2. C5 (n-pentane)	17. Ethylbenzene
3. 2-Methylbutane	18. 2,3-Dimethylheptane
4. Tert-Butanol	19. p-Xylene
5. 2,3-Dimethylbutane	20. C9 (n-nonane)
6. Methyl tert-butyl ether (MTBE)	21. 5-Methylnonane
7. C6 (n-hexane)	22. 1-Methyl-2-ethylbenzene
8. 1-Methylcyclopentene	23. C10 (n-decane)
9. Benzene	24. C11 (undecane)
10. Cyclohexane	25. 1,2,3,5-Tetramethylbenzene
11. 3-Ethylpentane	26. Naphthalene
12. trans-1,2-Dimethylcyclopentane	27. C12 (dodecane)
13. C7 (n-heptane)	28. 1-Methylnaphthalene
14. 2,3,3-Trimethylpentane	29. C13 (Tridecane)
15. Toluene	

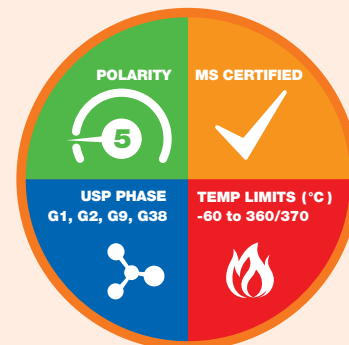
Ordering Information

Zebron ZB-DHA-PONA GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
5-Meter			
0.25	1.00	-60 to 340/360	7AG-G042-22
50-Meter			
0.20	0.50	-60 to 360/370	7GE-G042-17
100-Meter			
0.25	0.50	-60 to 360/370	7MG-G042-17
150-Meter			
0.25	1.00	-60 to 340/360	7QG-G042-22

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

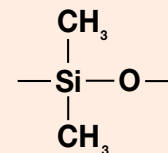
Column Profile



*Thicker films (≥ 1.0 µm) are rated to 340/360 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



100 % Dimethylpolysiloxane

Recommended Applications

- DHA
- PONA
- PIONA
- PIANO
- ASTM D5134, D5441, D5501, D6729, D6730 and D6733

i Zebron GC Columns MS Certification, see p. 437

i Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

△ Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-Drug-1

Faster Drugs of Abuse Testing

- Optimized phase for the separation of drugs of abuse
- Provides fast analysis with great peak shape
- Improves resolution of target analytes from matrix interferences
- Specially deactivated to improve quantitation for drug compounds

Upgrade to Zebron from traditional phases used for drugs of abuse:

Agilent®

- DB®-1ms
- DB-5ms
- DB-35

Restek®

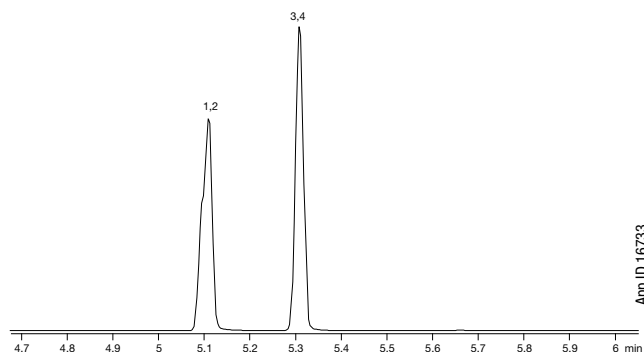
- Rxi®-1ms
- Rtx®-5
- Rtx-5ms
- Rtx-35ms

Supelco®

- SPB®-1

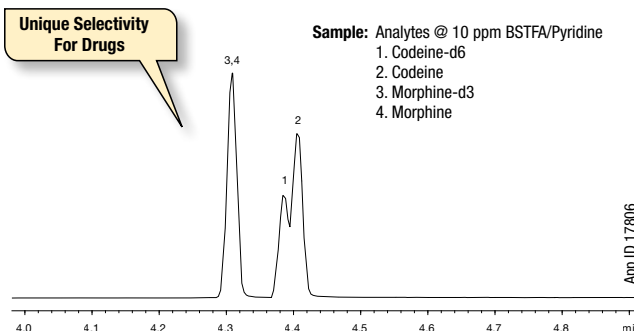
Optimized Selectivity for Multiple Drug Classes

Traditional 5% Phenyl Phase



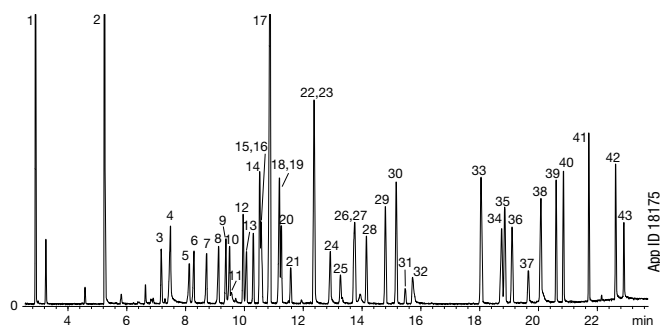
Column: As listed
 Dimensions: 10 meter x 0.18 mm x 0.18 µm
 Injection: Split 10:1 @ 240 °C, 1 µL
 Carrier Gas: Helium @ 1.2 mL/min (constant flow)
 Oven Program: 140 °C to 320 °C @ 20 °C for 1 min
 Detector: MSD @ 230 °C

Zebron ZB-Drug-1



Column: As listed
 Dimensions: 10 meter x 0.18 mm x 0.18 µm
 Part No.: [ZCD-G023-08](#)
 Injection: Split 10:1 @ 280 °C, 1 µL
 Carrier Gas: Helium @ 55 cm/sec (constant flow)
 Oven Program: 180 °C to 340 °C @ 20 °C/min
 Detector: MSD @ 230 °C

Common Drug Screen by GC-MS



Column: Zebron ZB-Drug-1
 Dimensions: 10 meter x 0.18 mm x 0.18 µm
 Part No.: [ZCD-G023-08](#)
 Injection: Split 10:1 @ 260 °C, 1 µL
 Carrier Gas: Helium @ 1 mL/min (constant flow)
 Oven Program: 50 °C to 150 °C @ 15 °C/min to 240 °C @ 7 °C/min to 320 °C @ 25 °C/min for 2 min
 Detector: MSD @ 320 °C; 45-450 amu

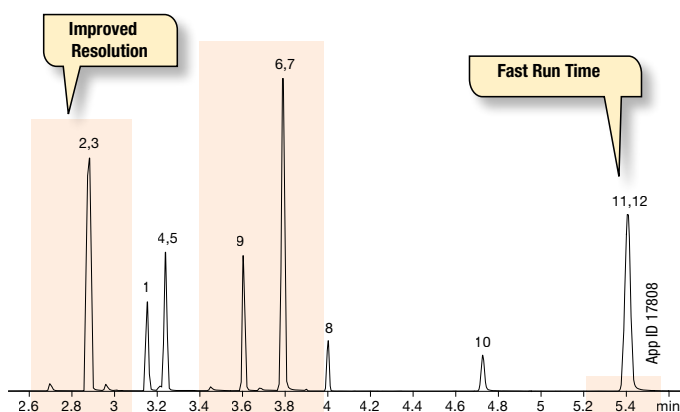
Sample: Analytes are 25 ppm in Methanol

- | | | |
|-------------------|----------------------|--------------------|
| 1. Acetophenone | 15. Meprobamate | 29. Trimipramine |
| 2. Nicotine | 16. Diphenhydramine | 30. Chlorcyclizine |
| 3. Benzocaine | 17. Lidocaine | 31. Cocaine |
| 4. Ibuprofen | 18. Hexobarbital | 32. Desipramine |
| 5. Allobarbitol | 19. Doxylamine | 33. Codeine |
| 6. Aprobarbital | 20. Glutethimide | 34. Morphine |
| 7. Butalbital | 21. Caffeine | 35. Diazepam |
| 8. Amobarbital | 22. Chlorpheniramine | 36. Hydrocodone |
| 9. Phenacetin | 23. Methapyrilene | 37. 6-MAM |
| 10. Pentobarbital | 24. Phenobarbital | 38. Oxycodone |
| 11. Acetaminophen | 25. Procaine | 39. Heroin |
| 12. Benzphetamine | 26. Methadone | 40. Fentanyl |
| 13. Secobarbital | 27. Brompheniramine | 41. Ibogaine |
| 14. Phencyclidine | 28. Propoxyphene | 42. Triazolam |
| | | 43. LSD |

ZB-Drug-1

Faster Run Times and Improved Resolution

Zebron ZB-Drug-1

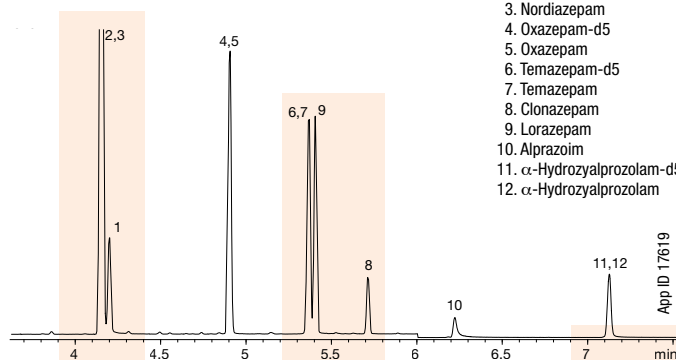


Column: Zebron ZB-Drug-1
Dimensions: 10 meter x 0.18 mm x 0.18 µm
Part No.: [7CD-G023-08](#)
Injection: Split 10:1 @ 280 °C, 1 µL
Carrier Gas: Helium @ 0.7 mL/min (constant flow)
Oven Program: 200 °C to 210 °C @ 20 °C/min at 320 °C @ 30 °C/min for 1 min
Detector: MSD @ 320 °C

Traditional Mid-Polar Phase

Sample:

1. Diazepam
2. Nordiazepam-d5
3. Nordiazepam
4. Oxazepam-d5
5. Oxazepam
6. Temazepam-d5
7. Temazepam
8. Clonazepam
9. Lorazepam
10. Alprazolam
11. α-Hydroxyalprazolam-d5
12. α-Hydroxyalprazolam



Dimensions: 10 meter x 0.18 mm x 0.18 µm
Injection: Split 10:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 0.6 mL/min (constant flow)
Oven Program: 180 °C to 340 °C @ 20 °C/min for 2 min
Detector: MSD @ 320 °C

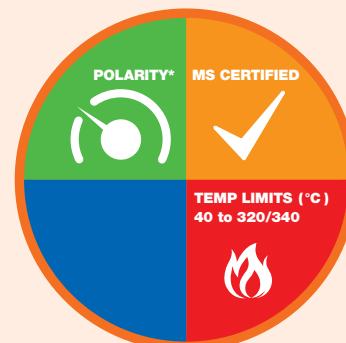
Ordering Information

Zebron ZB-Drug-1 GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.18	0.18	40 to 320/340	7CD-G023-08
15-Meter			
0.25	0.25	40 to 320/340	7EG-G023-11
15-Meter with 5-Meter Guardian™ Integrated Guard			
0.25	0.25	40 to 320/340	7EG-G023-11-GGA
30-Meter			
0.25	0.25	40 to 320/340	7HG-G023-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



*Similar polarity to ZB-MultiResidue™-2.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Drug Screening
- 6-MAM
- Amphetamines
- Barbiturates
- Benzodiazepines
- PCP
- THC



ZB-Drug-1 Test Mix
Part No.: [AG0-8431](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-BAC-1 and -2

Optimized Pair for Blood Alcohol Testing

- Enhanced accuracy for post mortem samples
- Fast run time with baseline resolution of key components in just 2 minutes
- Enhanced resolution of ethanol and acetone peaks
- Achieve confirmation with two elution order changes when running columns in parallel
- Allows for the use of t-butanol or n-propanol as an internal standard

Upgrade to Zebron from these similar* phases:

Agilent®

- DB®-ALC1
- DB-ALC2

Restek®

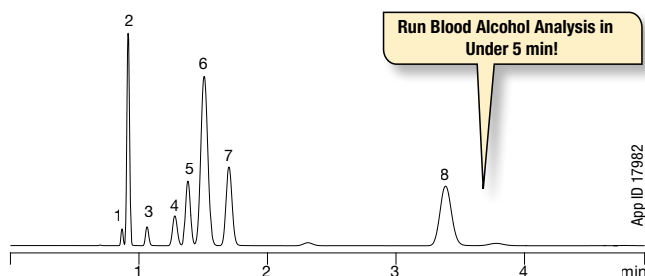
- Rtx®-BAC1
- Rtx-BAC2

*not exact equivalent, selectivity may differ

Faster, More Sensitive Blood Alcohol Analysis

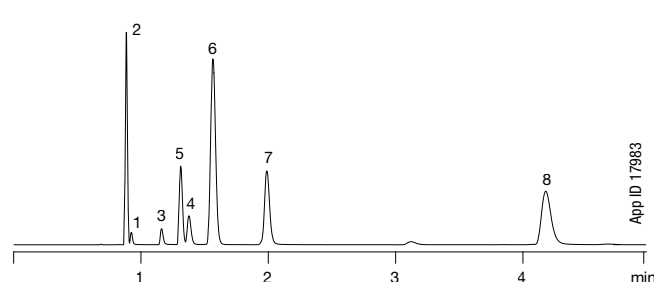
Zebron ZB-BAC-1

30 meter x 0.53 mm x 3.00 µm



Zebron ZB-BAC-2

30 meter x 0.53 mm x 2.00 µm



Conditions for both columns:

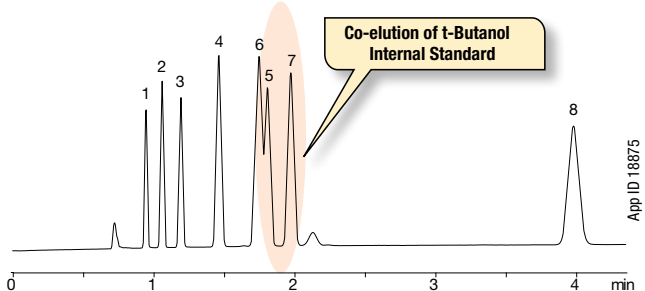
Column: As listed
Dimensions: As listed
Part No.: ZHK-G021-36 (ZB-BAC-1)
 ZHK-G022-32 (ZB-BAC-2)
Injection: Split 0.8:1 @ 150 °C, 1 mL
Carrier Gas: Helium @ 80 cm/sec (constant flow)
Oven Program: 40 °C (Isothermal)
Detector: FID @ 250 °C

Sample: Analytes 0.025 % and internal standards 0.100 % in water

1. Methanol
2. Acetaldehyde
3. Ethanol
4. Isopropanol
5. Acetone
6. t-Butanol (IS)
7. n-Propanol (IS)
8. 2-Butanol (IS)

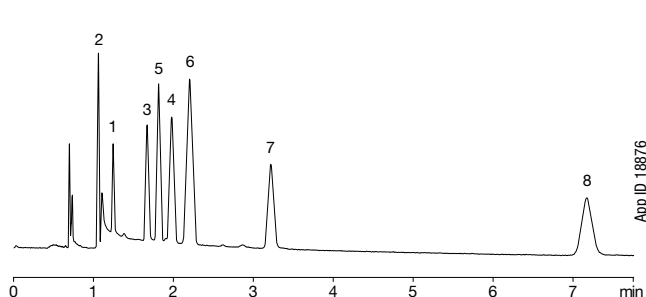
Restek Rtx-BAC1

30 meter x 0.53 mm x 3.00 µm



Restek Rtx-BAC2

30 meter x 0.53 mm x 2.00 µm



Conditions for both columns:

Column: As listed
Dimensions: As listed
Injection: Split 5:1 @ 150 °C, 1 mL
Carrier Gas: Helium @ 80 cm/sec (constant flow)
Oven Program: 40 °C (Isothermal)
Detector: FID @ 220 °C

Sample: Analytes and internal standards 0.100 % in water

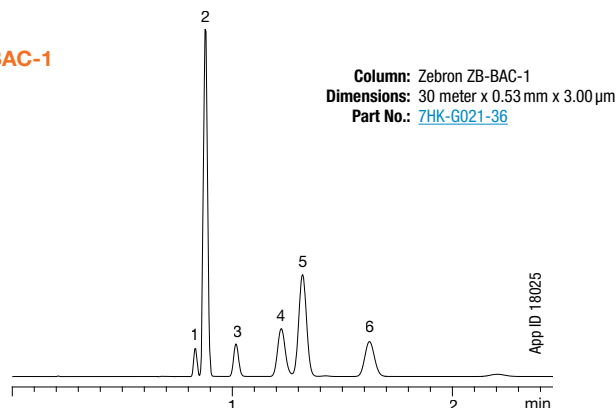
1. Methanol
2. Acetaldehyde
3. Ethanol
4. Isopropanol
5. Acetone
6. t-Butanol (IS)
7. n-Propanol (IS)
8. 2-Butanol (IS)

Comparative separations may not be representative of all applications.

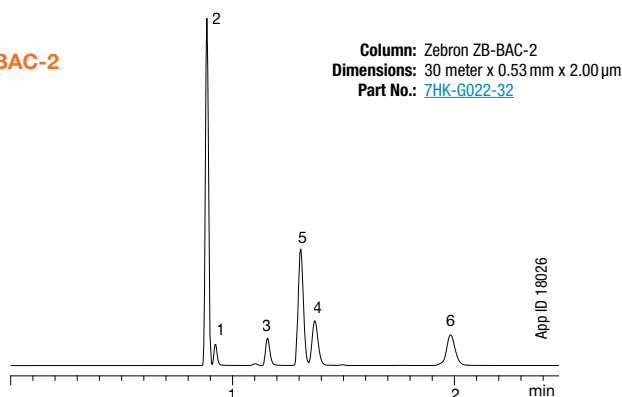
ZB-BAC-1 and -2

Run On Helium Or Hydrogen

BAC-1



BAC-2



Conditions for both columns:

Injection: Split 5:1 @ 150 °C, 1 mL
Carrier Gas: Hydrogen @ 80 cm/sec (constant flow)
Oven Program: 40 °C (Isothermal)
Detector: FID @ 250 °C
Sample: Analytes are 0.100 % in water
1. Methanol
2. Acetaldehyde
3. Ethanol
4. Isopropanol
5. Acetone
6. n-Propanol

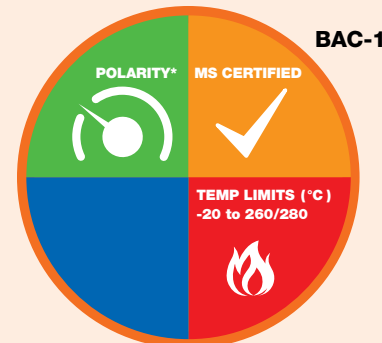
Ordering Information

Zebron ZB-BAC-1 GC Columns			
ID(mm)	df(μ m)	Temp. Limits °C	Part No.
30-Meter			
0.32	1.80	-20 to 260/280	7HM-G021-31
0.53	3.00	-20 to 260/280	7HK-G021-36

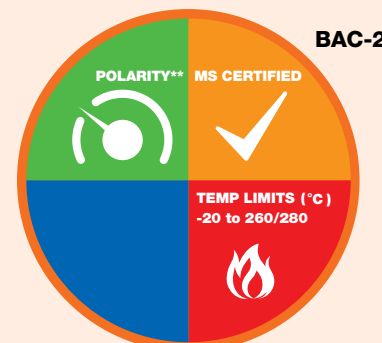
Zebron ZB-BAC-2 GC Columns			
ID(mm)	df(μ m)	Temp. Limits °C	Part No.
30-Meter			
0.32	1.20	-20 to 260/280	7HM-G022-25
0.53	2.00	-20 to 260/280	7HK-G022-32

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



*Similar polarity to ZB-35.



**Similar polarity to ZB-624.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Abused Inhalant Anesthetics
- Blood Alcohol Analysis



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-1^{PLUS}™

MS Certified “1” Phase

- Very low bleed (MS Certified) phase especially suited to high sensitivity GC-MS
- Extremely inert for active compounds such as drugs, pesticides, or acids and bases
- Improved signal-to-noise ratio for better sensitivity and mass spectral integrity
- Identical selectivity to 100% dimethylpolysiloxane phases

Upgrade to Zebron from any 100% dimethylpolysiloxane phase:

Agilent®

- DB®-1
- DB-1ms
- DB-1ms Ultra Inert
- HP-1
- HP-1ms
- HP-1ms Ultra Inert
- VF-1ms
- CP-Sil 5 CB
- Ultra 1

Restek®

- Rtx®-1
- Rtx-1ms
- Rxi®-1ms

SGE®

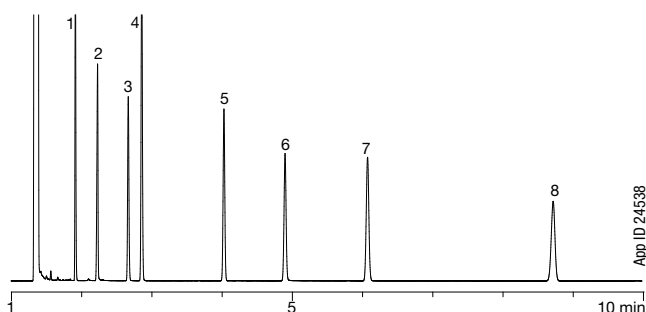
- BP1
- SolGel-1ms™

Supelco®

- SPB®-1
- SE-30
- MET-1
- MDN-1
- Equity®-1

Lower Overall Column Activity

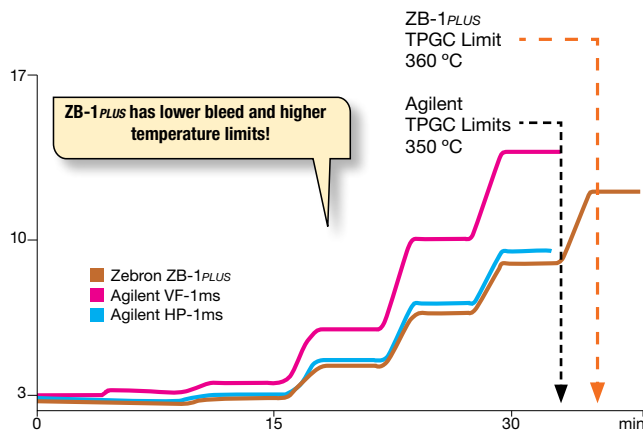
Activity is a key measure of column quality. ZB-1^{PLUS} columns are aggressively tested to ensure full deactivation. Our QC test below demonstrates low tailing on ZB-1^{PLUS} for even the most active compounds, like 2-ethylhexanoic acid.



Column: Zebron ZB-1^{PLUS}
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: ZHG-G031-11
Injection: Split 100:1 @ 250 °C, 1.0 µL
Carrier Gas: Hydrogen @ 1.18 mL/min (constant flow)
Oven Program: 140 °C (Isothermal)
Detector: FID @ 325 °C
Sample: 1. Decane
 2. 2-Ethylhexanoic Acid
 3. 4-Chlorophenol
 4. Naphthalene
 5. Tridecane
 6. 1-Undecanol
 7. Dicyclohexylamine
 8. Pentadecane

Lower Column Bleed

We tested the ZB-1^{PLUS} column bleed profile against other “MS” columns on the market – ZB-1^{PLUS} shows the lowest bleed, even at temperatures up to 360 °C.



Test conditions were stopped at 350 °C for all competitor columns so as not to cause damage to the stationary phase by exceeding their maximum temperature limit.

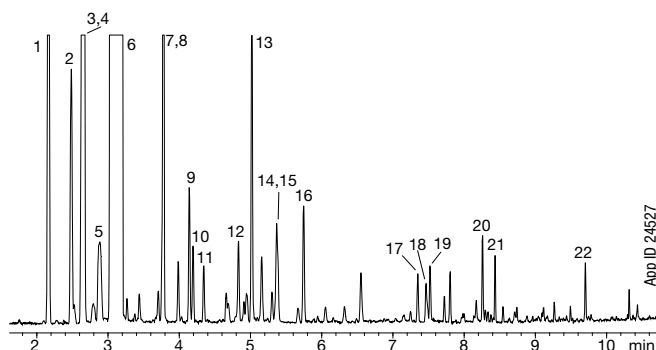
Conditions for all columns:

Columns: As listed
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Injection: Null Injection @ 250 °C
Carrier Gas: Hydrogen @ 100 mL/min (constant flow)
Oven Program: 240 °C for 9 min to 280 °C for 6.3 min to 320 °C for 6.4 min to 340 °C for 5.8 min to 350 °C for 5.5 min to 360 °C
Detector: FID @ 320 °C

ZB-1PLUS™

Well-Suited for Food & Flavors

Cold Pressed Orange Oil by GC-MS



Column: Zebron ZB-1PLUS
Dimensions: 10 meter x 0.10 mm x 0.10 µm
Part No.: [7CB-G031-02](#)
Injection: Split 120:1 @ 160 °C, 0.2 µL
Carrier Gas: Helium @ 0.3 mL/min (constant flow)
Oven Program: 60 °C to 130 °C @ 10 °C/min to 280 °C @ 30 °C/min for 3 min
Detector: MSD
Sample: Sample was 10% in dichloromethane

1. α-Pinene	9. cis-Limonene oxide	17. α-Cubebene
2. β-Phellandrine	10. trans-Limonene oxide	18. β-Cubebene
3. β-Myrcene	11. Citronellal	19. Dodecanal
4. Octanal	12. α-Terpineol	20. Valencene
5. 3-Carene	13. Decanal	21. Cadinene
6. Limonene	14. Carvone	22. Nootkatone
7. Nonanal	15. Neral	
8. Linalool	16. Geranial	

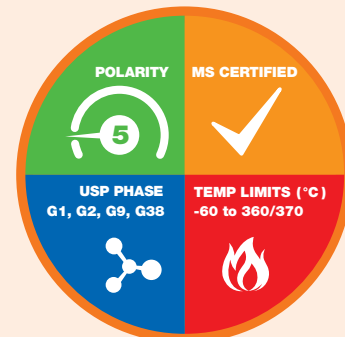
Ordering Information

Zebron ZB-1PLUS GC Columns			
ID(mm)	df(µm)	Temp. Limits °C	Part No.
5-Meter			
0.18	0.18	-60 to 360/370	7AD-G031-08
10-Meter			
0.10	0.10	-60 to 360/370	7CB-G031-02
12-Meter			
0.20	0.33	-60 to 360/370	7DE-G031-14
15-Meter			
0.25	0.25	-60 to 360/370	7EG-G031-11
0.32	0.25	-60 to 360/370	7EM-G031-11
15-Meter with 10-Meter Guardian™ Integrated Guard			
0.25	0.25	-60 to 360/370	7EG-G031-11-GGC
20-Meter			
0.18	0.18	-60 to 360/370	7FD-G031-08
25-Meter			
0.20	0.33	-60 to 360/370	7GE-G031-14
30-Meter			
0.25	0.10	-60 to 360/370	7HG-G031-02
0.25	0.25	-60 to 360/370	7HG-G031-11
0.32	0.25	-60 to 360/370	7HM-G031-11
30-Meter with 5-Meter Guardian Integrated Guard			
0.25	0.25	-60 to 360/370	7HG-G031-11-GGA
30-Meter with 10-Meter Guardian Integrated Guard			
0.25	0.25	-60 to 360/370	7HG-G031-11-GGC
60-Meter			
0.25	0.25	-60 to 360/370	7KG-G031-11
0.25	1.00	-60 to 360/370	7KG-G031-22
0.32	0.25	-60 to 360/370	7KM-G031-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

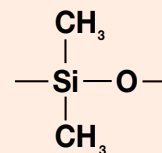
Phenomenex

Column Profile



Engineered Self Cross-linking™ (ESC)

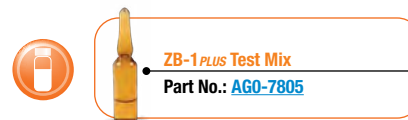
Phase Chemistry



100 % Dimethylpolysiloxane

Recommended Applications

- Acids
- Amines
- Diesel Fuel
- Drugs
- EPA Methods (1668)
- Essential Oils
- Flavors & Fragrances
- Oxygenates and GROs
- PCBs
- Pesticides
- Solvent Impurities
- Sulfur Compounds (Light)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-5PLUS™

Inert 5% Phenyl Selectivity

- Highly inert—improved peak shape for acidic/basic compounds, drugs of abuse, and pesticides
- Very low bleed (MS certified) levels provide maximum sensitivity
- Intense QC specifications ensure column-to-column performance
- ESC™ bonding results in phase stability and high temperature limits
- Traditional bonding chemistry provides the same selectivity as the ZB-5 columns

Upgrade to Zebron from any

5% phenyl / 95% dimethylpolysiloxane phase:

Agilent®

- DB®-5
- HP-5
- HP-5ms
- HP-5msi

Restek®

- Rtx®-5
- Rtx-5MS
- Rtx-5Amine
- Rxi®-5ms

SGE®

- BP5
- BPX5

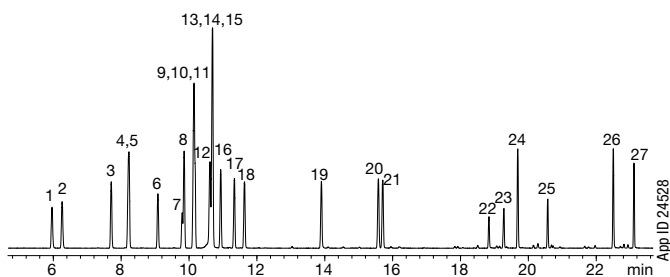
Supelco®

- MDN-5S
- SPB®-5
- Equity®-5

OV®

- OV-5

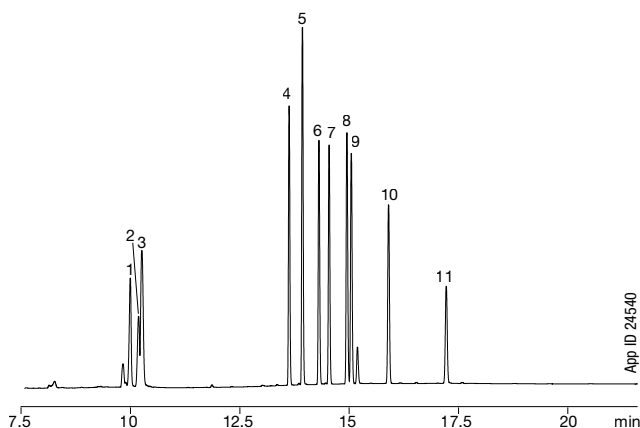
Phenols



Column: Zebron ZB-5PLUS
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: ZHG-G032-11
Injection: Split 5:1 @ 240 °C, 1 µL
Carrier Gas: Helium @ 1.2 mL/min (constant flow)
Oven Program: 60 °C to 140 °C @ 5 °C/min to 280 °C @ 10 °C/min
Detector: MSD @ 230 °C, 45-450 amu
Sample:

1. Phenol	16. 2,3-Dimethylphenol
2. 2-Chlorophenol	17. 3,4-Dimethylphenol
3. 2-Methylphenol	18. 2,6-Dichlorophenol
4. 4-Methylphenol	19. 4-Chloro-3-methylphenol
5. 3-Methylphenol	20. 2,4,6-Trichlorophenol
6. 2,6-Dimethylphenol	21. 2,4,5-Trichlorophenol
7. 2-Nitrophenol	22. 2,4-Dinitrophenol
8. 2-Ethylphenol	23. 4-Nitrophenol
9. 2,4-Dimethylphenol	24. 2,3,4,6-Tetrachlorophenol
10. 3,5-Dimethylphenol	25. 4,6-Dinitro-2-methylphenol
11. 2,5-Dimethylphenol	26. Pentachlorophenol
12. 4-Ethylphenol	27. Dinoseb
13. 3-Ethylphenol	
14. 2,4-Dichlorophenol	
15. Benzoic Acid	

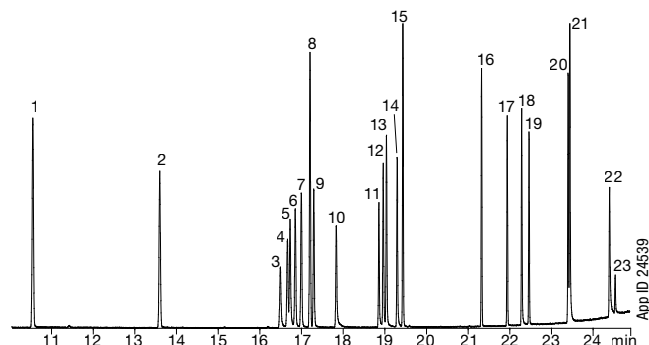
Underivatized Antihistamines by GC-FID



Column: Zebron ZB-5PLUS
Dimensions: 30 meter x 0.25 mm x 1.0 µm
Part No.: ZHG-G032-22
Injection: Split 50:1 @ 305 °C, 1 µL
Carrier Gas: Helium @ 1.3 mL/min (constant flow)
Oven Program: 40 °C for 1 min to 240 °C @ 25 °C/min for 2 min to 305 °C @ 25 °C/min for 8 min
Detector: FID @ 320 °C
Sample:

1. Phenylpropanolamine	7. Phenyltoloxamine
2. Ephedrine	8. Methapyrilene
3. Pseudoephedrine	9. Chlorpheniramine
4. Pheniramine	10. Brompheniramine
5. Diphenhydramine	11. Triprolidine
6. Doxylamine	

Endocrine Disruptors by GC-MS



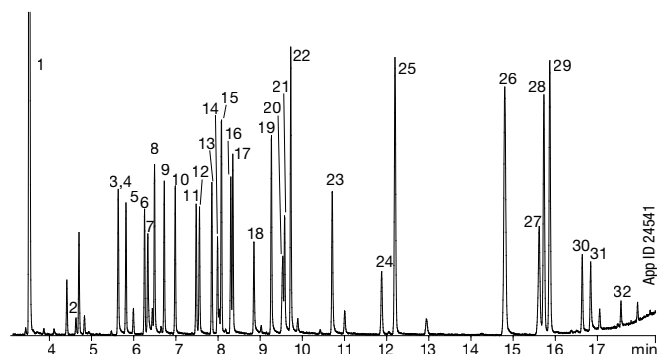
Column: Zebron ZB-5PLUS
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: ZHG-G032-11
Injection: Split 40:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.2 mL/min (constant flow)
Oven Program: 100 °C to 180 °C @ 5 °C/min to 320 °C @ 15 °C/min
Detector: MSD @ 180 °C, 45-450 amu
Sample: Analytes are 50 ppm in acetone

1. Dimethyl phthalate	9. Terbutylazine	17. 4,4'-DDD
2. Diethyl phthalate	10. Secbumeton	18. Di-n-hexyl phthalate
3. Atraton	11. Simetryn	19. 4,4'-DDT
4. Simazine	12. Ametryn	20. Dicyclohexyl phthalate
5. Prometon	13. Prometryn	21. bis(2-Ethylhexyl)phthalate
6. Atrazine	14. Terbutryn	22. Di-n-octyl phthalate
7. Propazine	15. Dibutyl phthalate	23. Ethinyl estradiol
8. Dipropyl phthalate	16. 4,4'-DDE	

ZB-5PLUS™

Good Results for Drugs

Drug Screening by GC-MS



Column: Zebron ZB-5PLUS
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: [7HG-G032-11](#)
Injection: Split 15:1 @ 240 °C, 1 µL
Carrier Gas: Helium @ 1.1 mL/min (constant flow)
Oven Program: 140 °C to 240 °C @ 10 °C/min for 5 min to 320 °C @ 25 °C/min for 2.25 min
Detector: MSD @ 230 °C, 45-450 amu
Sample: Analytes (underivatized) are 25 ppm in dichloromethane

1. Nicotine	14. Caffeine	27. Morphine
2. Methylecgonine	15. Benzphetamine	28. Diazepam
3. Ibuprofen	16. Hexobarbital	29. Hydrocodone
4. Allobarbitol	17. Dimenhydrinate	30. 6-Monoacetylmorphine
5. Aprobital	18. Doxylamine	31. Oxymorphone
6. Butabarbital	19. Phenobarbital	32. Diacetylmorphine (Heroin)
7. Acetaminophen	20. 8-Chlorotheophylline	
8. Phenacetin	21. Methapyrilene	
9. Amobarbital	22. Chlorpheniramine	
10. Pentobarbital	23. Brompheniramine	
11. Secobarbital	24. Cocaine	
12. Meprobamate	25. Chlorcyclizine	
13. Methyl benzilate	26. Codeine	

Ordering Information

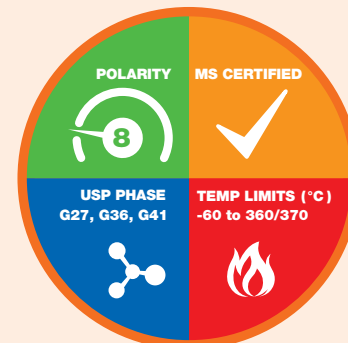
Zebron ZB-5PLUS GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.18	0.18	-60 to 360/370	7CD-G032-08
15-Meter			
0.25	0.25	-60 to 360/370	7EG-G032-11
20-Meter			
0.18	0.18	-60 to 360/370	7FD-G032-08
0.18	0.36	-60 to 360/370	7FD-G032-53
20-Meter with 5-Meter Guardian™ Integrated Guard			
0.18	0.18	-60 to 360/370	7FD-G032-08-GGA
30-Meter			
0.25	0.25	-60 to 360/370	7HG-G032-11
0.25	0.50	-60 to 360/370	7HG-G032-17
0.25	1.00	-60 to 360/370	7HG-G032-22
0.32	0.25	-60 to 360/370	7HM-G032-11
0.32	0.50	-60 to 360/370	7HM-G032-17
0.32	1.00	-60 to 360/370	7HM-G032-22
30-Meter with 5-Meter Guardian Integrated Guard			
0.25	0.10	-60 to 360/370	7HG-G032-02-GGA
0.25	0.25	-60 to 360/370	7HG-G032-11-GGA
60-Meter			
0.25	0.25	-60 to 360/370	7KG-G032-11
60-Meter with 5-Meter Guardian Integrated Guard			
0.25	0.25	-60 to 360/370	7KG-G032-11-GGA

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

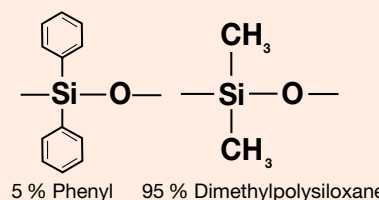
Phenomenex

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry



Recommended Applications

- Barbiturates
- Benzodiazepines
- Drugs of Abuse
- EPA Methods
- FAMES
- Nitrosamines
- Pesticides
- Phenols
- THC Metabolites



ZB-5PLUS Test Mix
Part No.: [AGO-8362](#)



For high temperature analysis, consider using a ZB-5HT, see p. 146



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-5MS^{PLUS}™

The Next Generation of Inertness

- The next generation of inertness for specialty chemical, forensic, toxicology, and food testing applications
- Specialized deactivation for versatile 5% phenyl-arylene selectivity with improved sensitivity
- Low bleed (MS Certified) and well-suited to high sensitivity GC-MS and GC-MS/MS work

Upgrade to Zebron from any

5% phenyl or 5% phenyl-arylene / 95% dimethylpolysiloxane phase:

Agilent®

- DB®-5ms
- DB-5ms Ultra Inert
- HP-5ms
- HP-5ms Ultra Inert
- VF-5ms

Restek®

- Rxi®-5Sil MS

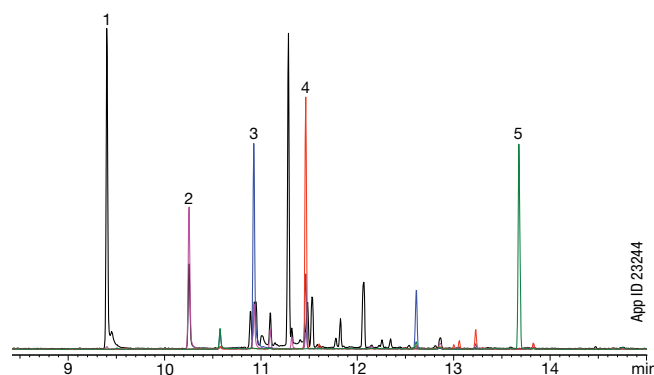
Supelco®

- SLB®-5ms

Engineered for High Performance

Active sites on a GC column's surface can result in analyte adsorption and degradation, negatively affecting peak shape and response. To reduce potential surface activity, Zebron ZB-5MS^{PLUS} is designed with a rigorous fused silica deactivation process that improves inertness for troublesome compounds. Instantly achieve higher responses for active compounds compared to your current 5ms phase column, without changing your selectivity.

Melamine in Dog Food by GC-MS



- Extraction Protocol:**
1. Combine 0.5 g of homogenized dog food with 10 mL of DEA/Water/ Acetonitrile (1:4:5) in a 15 mL centrifuge tube
 2. Sonicate for 30 min
 3. Centrifuge at 5000 rpm for 10 min
 4. Transfer 100 µL of supernatant to an autosampler vial and evaporate to dryness using nitrogen gas
 5. Reconstitute with 100 µL of Acetonitrile/Pyridine (1:1) and then derivatize using 100 µL BSTFA with 1% TCMS at 70 °C for 45 min

Column: Zebron ZB-5MS^{PLUS}

Dimensions: 30 meter x 0.25 mm x 0.25 µm

Part No.: 7HG-G030-11

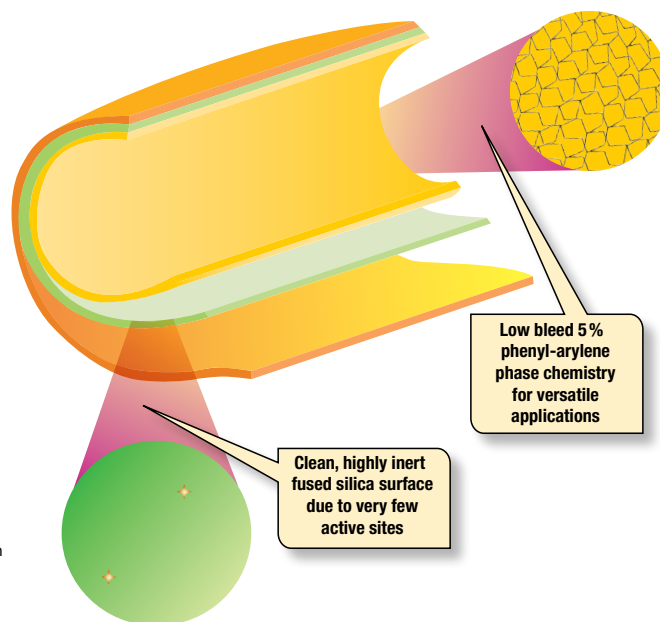
Injection: Splitless @ 280 °C, 1 µL

Carrier Gas: Helium @ 1 mL/min (constant flow)

Oven Program: 75 °C for 1 min to 320 °C @ 15 °C/min hold for 4 min

Detector: MSD @ 320 °C

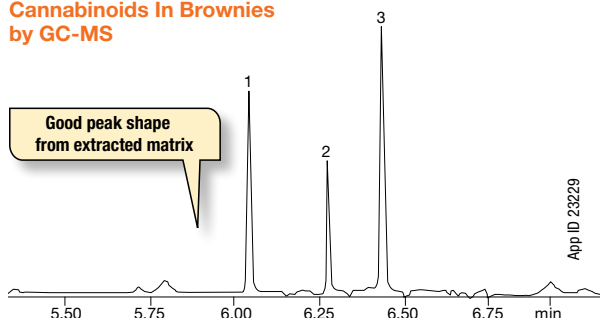
- Sample:**
1. Cyanuric acid
 2. Ammelide
 3. Ammeline
 4. Melamine
 5. Benzoguanamine



ZB-5MS^{PLUS}™

Versatile Performance For Drugs and Chemicals

Cannabinoids In Brownies by GC-MS

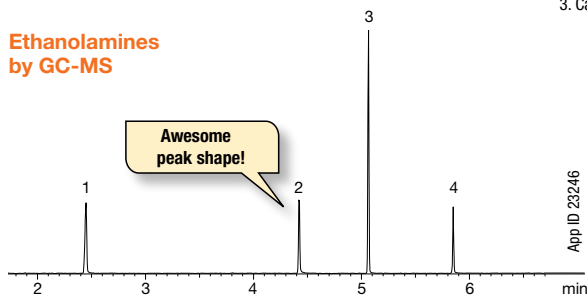


Extraction Protocol:

1. Combine 1 g of chocolate brownie with 10 mL of water in a 50 mL centrifuge tube
2. Shake using a mechanical shaker until dissolved
3. Add roQ™ QuEChERS EN15662 extraction salt packet (KSO-8909) and 10 mL of acetonitrile
4. Shake tube for 3 min using mechanical shaker
5. Centrifuge at 2700 rpm for 5 min
6. Transfer 1 mL of supernatant to an autosampler vial for GC-MS analysis

Column: Zebron ZB-5MS^{PLUS}
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: [7HG-G030-11](#)
Injection: Splitless @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.5 mL/min (constant flow)
Oven Program: 100 °C for 1 min to 320 °C @ 50 °C/min, hold for 2 min
Detector: MSD @ 320 °C
Sample: 1. Cannabidiol
 2. Δ-9-Tetrahydrocannabinol
 3. Cannabinol

Ethanolamines by GC-MS



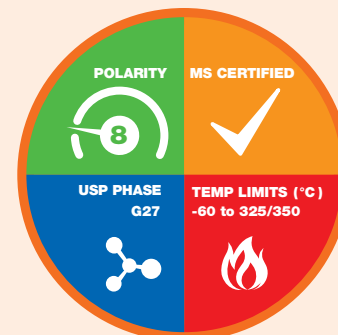
Column: Zebron ZB-5MS^{PLUS}
Dimensions: 30 meter x 0.25 mm x 1.00 µm
Part No.: [7HG-G030-22](#)
Injection: Split 200:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 30 °C to 300 °C @ 40 °C/min
Detector: MSD @ 320 °C
Sample: 1. Monoethanolamine
 2. Diethanolamine
 3. Triethylene glycol monomethyl ether (IS)
 4. Triethanolamine

Ordering Information

Zebron ZB-5MS^{PLUS} GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
1.5-Meter			
0.25	0.25	-60 to 325/350	7XG-G030-11
15-Meter			
0.25	0.25	-60 to 325/350	7EG-G030-11
0.25	0.50	-60 to 325/350	7EG-G030-17
0.25	1.00	-60 to 325/350	7EG-G030-22
20-Meter			
0.18	0.18	-60 to 325/350	7FD-G030-08
0.18	0.36	-60 to 325/350	7FD-G030-53
30-Meter			
0.25	0.25	-60 to 325/350	7HG-G030-11
0.25	0.50	-60 to 325/350	7HG-G030-17
0.25	1.00	-60 to 325/350	7HG-G030-22
0.32	0.25	-60 to 325/350	7HM-G030-11
0.32	0.50	-60 to 325/350	7HM-G030-17
0.32	1.00	-60 to 325/350	7HM-G030-22
0.32	1.50	-60 to 325/350	7HM-G030-28
0.53	1.00	-60 to 325/350	7HK-G030-22
0.53	3.00	-60 to 325/350	7HG-G030-36

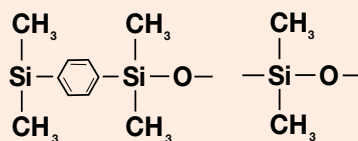
Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

5 % Phenyl-Arylene



95 % Dimethylpolysiloxane

Recommended Applications

- Acids
- Alkaloids
- Amines
- Drugs
- Essential Oils
- Flavors
- Halo-hydrocarbons
- Pesticides
- Phenols
- Residual Solvents
- Solvent Impurities



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

Ordering Information

Zebron ZB-5MS^{PLUS} GC Columns (cont'd)

ID(mm)	df(µm)	Temp. Limits °C	Part No.
30-Meter with 5-Meter Guardian™ Integrated Guard			
0.25	0.25	-60 to 325/350	7HG-G030-11-GGA
0.25	0.50	-60 to 325/350	7HG-G030-17-GGA
30-Meter with 10-Meter Guardian Integrated Guard			
0.25	0.25	-60 to 325/350	7HG-G030-11-GGC
0.25	0.50	-60 to 325/350	7HG-G030-17-GGC
60-Meter			
0.25	0.25	-60 to 325/350	7KG-G030-11
0.25	1.00	-60 to 325/350	7KG-G030-22
0.32	1.00	-60 to 325/350	7KM-G030-22

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

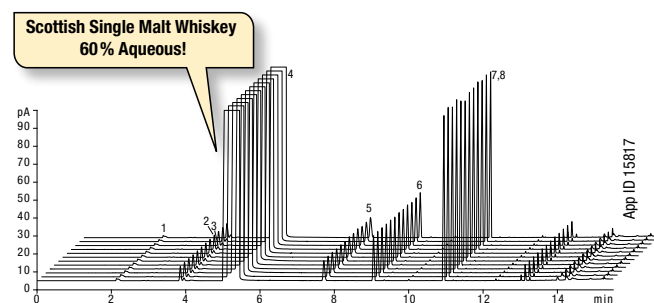
ZB-WAXPLUS™

Enhanced Aqueous Stability

- 100% aqueous stable, excellent for aqueous samples
- Extremely inert for acidic compounds
- Enhanced selectivity for low boiling solvents
- High retention of alcohols and chlorinated solvents
- Increased efficiency at 20 °C

Water Reproducibility of ZB-WAXPLUS

Historically, polyethylene glycol (PEG) phases have been unstable with aqueous samples such as beverages or glycols, resulting in poor reproducibility and decreased lifetime. ZB-WAXPLUS bonding procedure results in exceptional stability to repeated injections of aqueous matrices.



Upgrade to Zebron from any polyethylene glycol phase:

Agilent®

- DB®-WAX
- CAM
- HP-20M
- Carbowax 20M
- CP-Wax 52 CB

Restek®

- Stabilwax®

SGE®

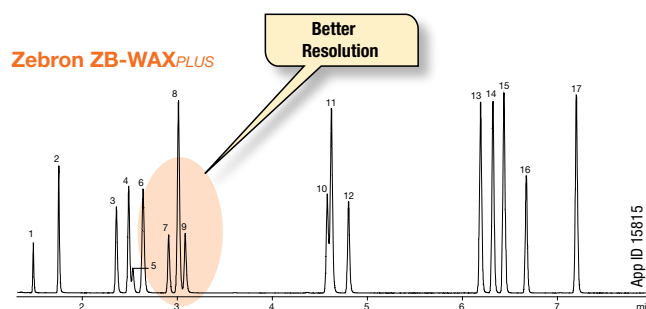
- BP20

Supelco®

- SUPELCOWAX® 10

Column: Zebron ZB-WAXPLUS
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G013-11
Injection: Split 30:1 @ 140 °C, 0.2 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 35 °C for 5 min to 85 °C @ 10 °C/min to 200 °C @ 25 °C/min for 1 min
Detector: FID @ 200 °C
Sample: 1. Acetaldehyde
 2. Ethyl Acetate
 3. Methanol
 4. Ethanol
 5. Propanol
 6. Isobutanol
 7. 2-Methylbutanol
 8. 3-Methylbutanol

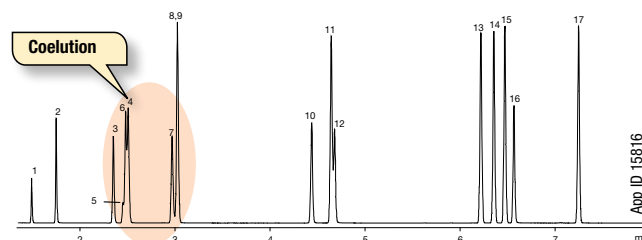
Improve Resolution



Conditions same for both columns:

Dimensions: 30 meter x 0.25 mm x 0.25 µm
Injection: Split 100:1 @ 250 °C, 1 µL
Carrier Gas: Hydrogen @ 1.0 mL/min (constant flow)
Oven Program: 35 °C for 2.5 min to 85 °C @ 10 °C/min and hold until last peak elutes
Detector: FID @ 225 °C

Restek Stabilwax



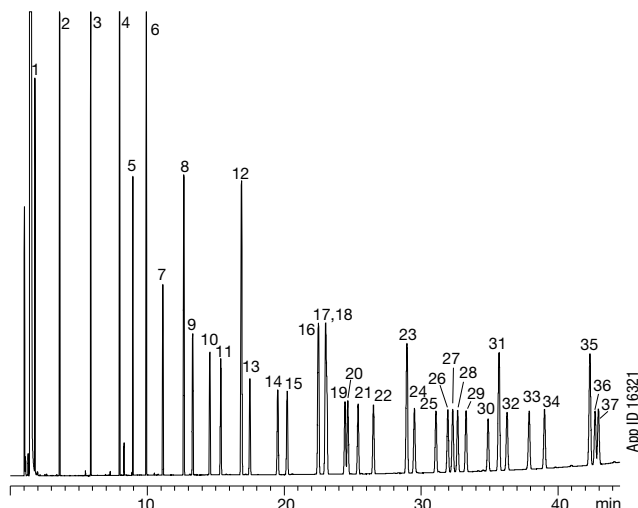
Sample: 1. Methyl Formate
 2. Acetone
 3. Ethyl Acetate
 4. Methyl Ethyl Ketone
 5. Methanol
 6. 2-Methyl-2-propanol
 7. Methylene Chloride
 8. Benzene
 9. Ethanol
 10. 2-Butanol
 11. Toluene
 12. n-Propanol
 13. Ethyl Benzene
 14. p-Xylene
 15. m-Xylene
 16. 1-Butanol
 17. o-Xylene

Comparative separations may not be representative of all applications.

ZB-WAX^{PLUS}™

A Food Testing Must-Have

Food Industry FAMES



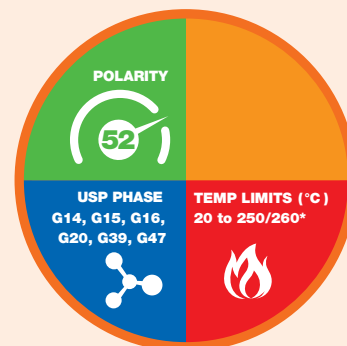
Column: Zebron ZB-WAX^{PLUS}
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: [7HG-G013-11](#)
Injection: Split 5:1 @ 220 °C, 1 µL
Carrier Gas: Helium @ 3 mL/min (constant flow)
Oven Program: 60 °C for 2 min to 150 °C @ 13 °C/min to 240 °C @ 2 °C/min
Detector: FID @ 250 °C
Sample: See the full compound list at www.phenomenex.com/GC

Ordering Information

Zebron ZB-WAX ^{PLUS} GC Columns			
ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.10	20 to 250/260	7CB-G013-02
15-Meter			
0.25	0.25	20 to 250/260	7EG-G013-11
0.53	1.00	20 to 230/240	7EK-G013-22
20-Meter			
0.18	0.18	20 to 250/260	7FD-G013-08
30-Meter			
0.25	0.25	20 to 250/260	7HG-G013-11
0.25	0.50	20 to 250/260	7HG-G013-17
0.32	0.25	20 to 250/260	7HM-G013-11
0.32	0.50	20 to 250/260	7HM-G013-17
0.32	1.00	20 to 230/240	7HM-G013-22
0.53	0.25	20 to 250/260	7HK-G013-11
0.53	1.00	20 to 230/240	7HK-G013-22
60-Meter			
0.25	0.15	20 to 250/260	7KG-G013-05
0.25	0.25	20 to 250/260	7KG-G013-11
0.25	0.50	20 to 250/260	7KG-G013-17
0.32	0.25	20 to 250/260	7KM-G013-11
0.32	0.50	20 to 250/260	7KM-G013-17
0.53	1.00	20 to 230/240	7KK-G013-22

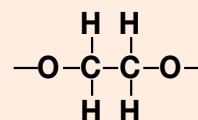
Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



*Thicker films (≥ 1.0 µm) are rated to 230/240 °C.

Phase Chemistry



100 % Polyethylene Glycol

Recommended Applications

- Alcohols
- Aldehydes
- Aromatics
- Essential Oils
- Flavors & Fragrances
- Free Fatty Acids
- Glycols
- OVIs
- Pharmaceuticals
- Solvents / Residual Solvents
- Styrene
- Xylene Isomers



ZB-WAX^{PLUS} Test Mix
Part No.: [AG0-7869](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
 Add a Z-Guard™ to your next Zebron GC order.

ZB-624PLUS™

- Enhanced peak shape with superior deactivation
- Increased sensitivity for high boiling solvents
- Extremely low bleed for GC-MS
- High temperature stability (300/320 °C)

Upgrade to Zebron from these similar* phases:

Agilent®

- CP-Select 624 CB
- DB-624UI Ultra Inert

Restek®

- Rxi®-624SII MS

*not exact equivalent, selectivity may differ

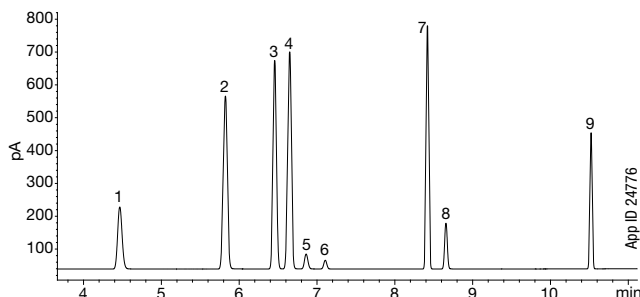
What Makes the PLUS in ZB-624PLUS?

- **Enhanced Inertness**
Proprietary superior deactivation gives great peak shape for troublesome compounds.
- **High Selectivity**
A G43 phase that's highly selective for polar, non-polar, low and high boiling solvents.
- **Column-to-Column Reproducibility**
Excellent column-to-column reproducibility well suited for validated methods.
- **Temperature Limits**
Push the temperature limits of traditional 624 and elute/bake high boiling analytes at 300/320 °C.
- **MS Certified**
Low bleed characteristics makes it the right choice for GC-MS.

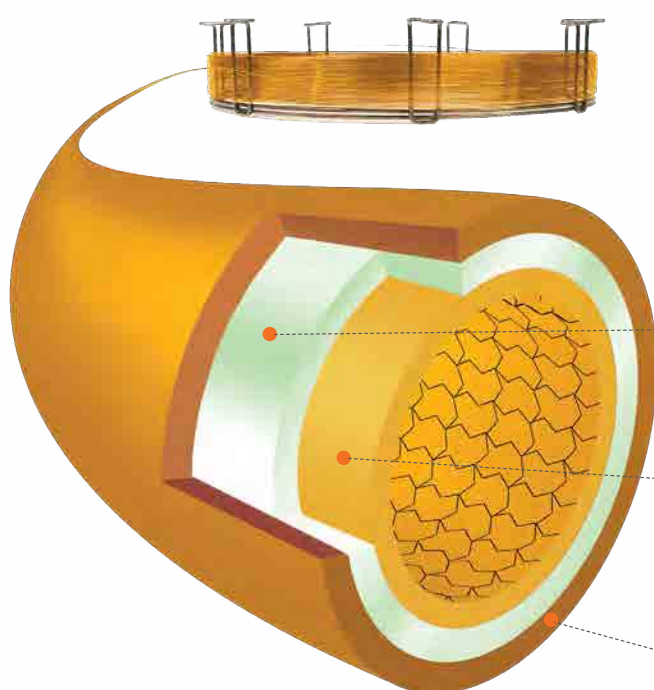
Shorter Residual Solvent Analysis by GC-FID

Why wait for an hour long method. Upgrade to ZB-624PLUS and get short runtime, low bleed, high temperature resistance, and the 624 selectivity, all in one column.

Separation of Residual Solvent Critical Pairs in Less than 15 min



Column: Zebron ZB-624PLUS
Dimensions: 30 meter x 0.32 mm x 1.80 µm
Part No.: [7HM-G040-31](#)
Injection: Split 20:1 @ 200 °C, 1 µL
Recommended Liner: Zebron PLUS Straight Z-Liner™
Liner Part No.: [AG2-0A03-05](#) (for Agilent® & Thermo Scientific® systems)
Carrier Gas: Helium @ 1 mL/min (constant flow)
Oven Program: 40 °C for 5 min to 260 °C @ 25 °C/min for 3 min
Detector: FID @ 250 °C
Sample: 1. Methanol, 2. Ethanol, 3. Acetone, 4. IPA, 5. Acetonitrile, 6. DCM, 7. Ethyl Acetate, 8. THF, 9. Toluene



Superior Deactivated Fused Silica

Dramatically reduces analyte adsorption, maximizing your peak symmetry.

Highly Selective Stationary Phase

Provides excellent separation of polar, nonpolar, low and high boiling solvents, while Engineered Self Cross-linking (ESC™) results in high-thermal stability and low bleed.

Polyimide Coating

Flexibility and temperature resistance (300/320°C).

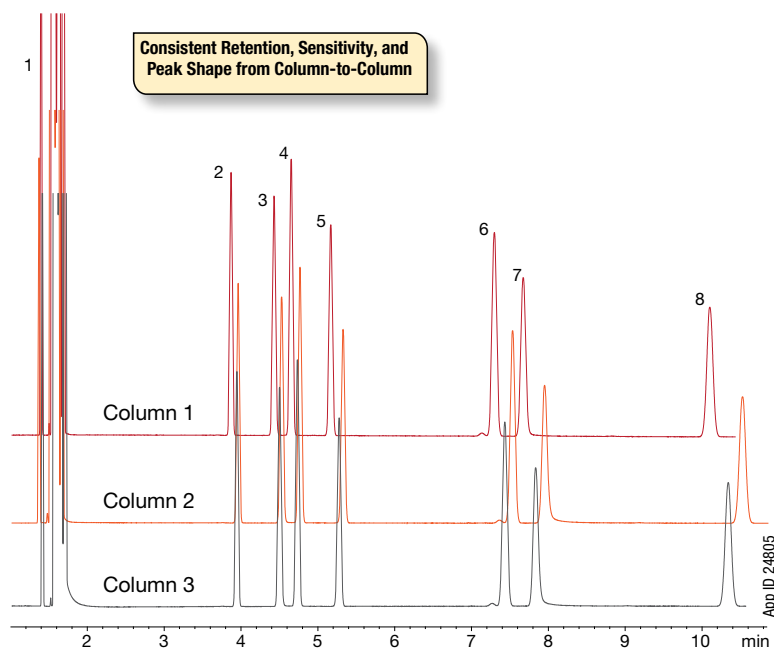
0.53 mm ID ZB-624PLUS™ columns are not MS Certified.



ZB-624PLUS™

We QC Test for the Compounds You Analyze

We added challenging and troublesome analytes to our QC test to make sure each ZB-624PLUS column has superior deactivation.

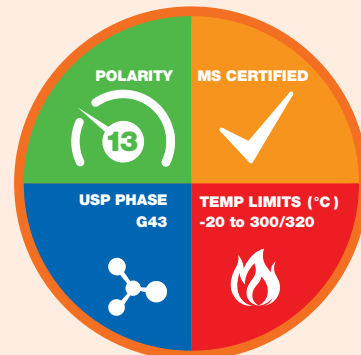


Test Probe	The Plus Advantage	Property
2,4-Dimethylphenol 2,4-Dimethylaniline	We screen challenging analytes, like acids and bases, to mimic your most challenging compounds.	Inertness

Conditions for all separations:

Column:	Zebron ZB-624PLUS
Dimensions:	30 meter x 0.32 mm x 1.80 µm
Part No.:	7HM-G040-31
Injection:	Split 50:1 @ 250 °C, 1 µL
Recommended Liner:	Zebron PLUS Straight Z-Liner™
Liner Part No.:	AG2-0A03-05 (for Agilent® & Thermo Scientific® systems)
Carrier Gas:	Hydrogen @ 6 psi (constant pressure)
Oven Program:	85 °C for 10.5 min
Detector:	FID @ 305 °C
Sample:	1. Methane 2. Dodecane 3. 2,4-Dimethylphenol 4. 2,4-Dimethylaniline 5. Tridecane 6. 1-Methylnaphthalene 7. 1-Undecanol 8. Pentadecane

Column Profile



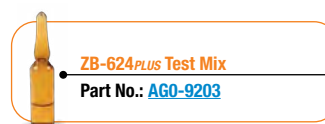
Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Cannabis
- Terpenes
- Residual Solvents
- Volatile Amines
- EPA Method 8260
- EPA Method 524
- EPA Method 624
- Food
- Flavors and Fragrances
- Solvent Purity
- Alcohols



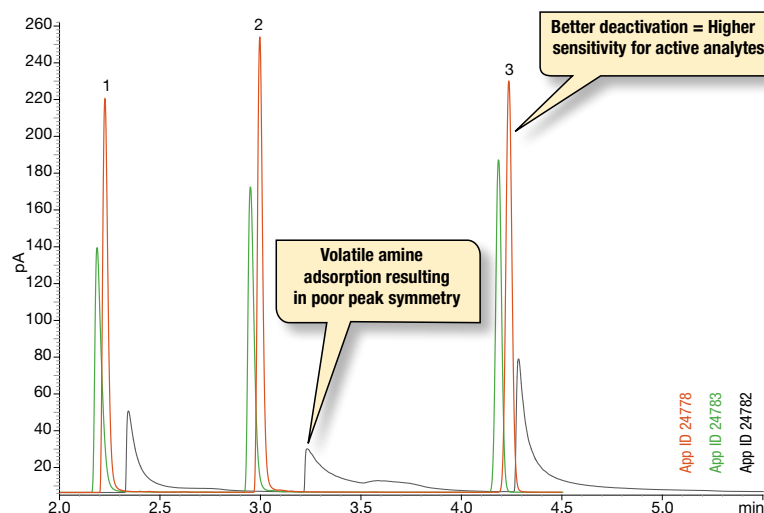
Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

ZB-624PLUS™ (cont'd)

Improved Peak Shape of Volatile Amines

Volatile amines are challenging analytes for GC analysis. They can adsorb to even the smallest imperfections in fused silica. ZB-624PLUS undergoes a superior deactivation process which minimizes active compound adsorption leading to gains in peak response and shape.

Comparison of Volatile Amines on Various 624 Columns



Volatile Amines on a Zebron ZB-624PLUS - 500 ppm

Volatile Amines on a Restek® Rxi®-624SII MS - 500 ppm

Volatile Amines on a Agilent® DB®-624UI Ultra Inert - 500 ppm

Conditions for all separations:

Column: Zebron ZB-624PLUS

Restek Rxi-624SII MS

Agilent DB-624UI Ultra Inert

Dimensions: 30 meter x 0.32 mm x 1.80 µm

Injection: Split 20:1 @ 200 °C, 1 µL

Recommended Liner: Zebron PLUS Straight Z-Liner™

Liner Part No.: AG2-0A03-05 (for Agilent® & Thermo Scientific® systems)

Carrier Gas: Helium @ 1.8 mL/min (constant flow)

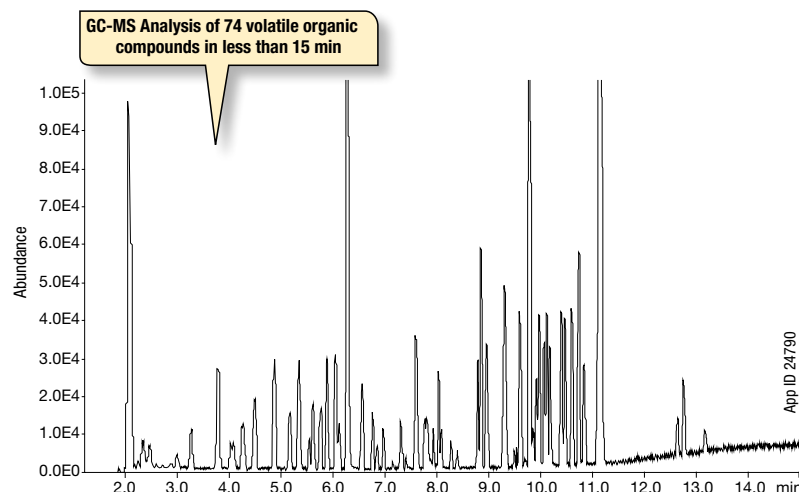
Oven Program: 50 °C for 1 min, to 200 °C @ 20 °C/min for 5 min

Detector: FID @ 250 °C

Sample: 1. Isopropylamine
2. Diethylamine
3. Triethylamine

Volatile Organic Compounds in EPA Methods 8260, 524, and 624

Our high efficiency dimension and superior deactivation can stand real world samples. In addition, MS certification provides extreme low bleed to your GC-MS analysis.



Column: Zebron ZB-624PLUS

Dimensions: 30 meter x 0.25 mm x 1.40 µm

Part No.: ZHG-G040-27

Injection: Split 50:1 @ 230 °C, 1 µL

Recommended Liner: Zebron PLUS Straight Z-Liner™

Liner Part No.: AG2-0A03-05 (for Agilent® & Thermo Scientific® systems)

Carrier Gas: Helium @ 0.7 mL/min (constant flow)

Oven Program: 40 °C for 2 min, to 210 °C @ 17 °C/min for 3 min

Detection: Mass Spec transfer line @ 250 °C

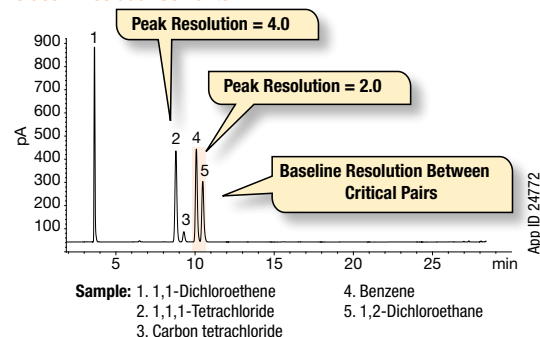
Comparative separations may not be representative of all applications.

ZB-624PLUS™ (cont'd)

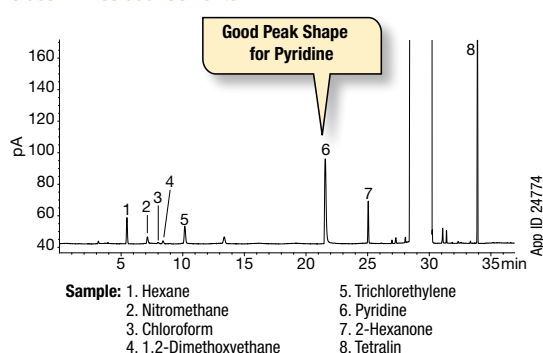
Exceeding USP <467> System Suitability

USP <467> method requires resolution of 1.5 for critical pairs. Zebron ZB-624PLUS took the challenge and succeeded with even greater resolution!

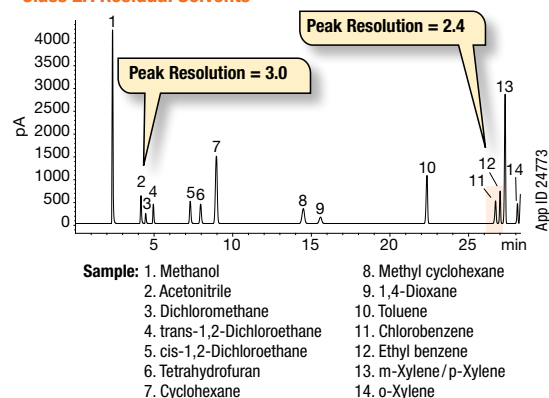
Class 1 Residual Solvents



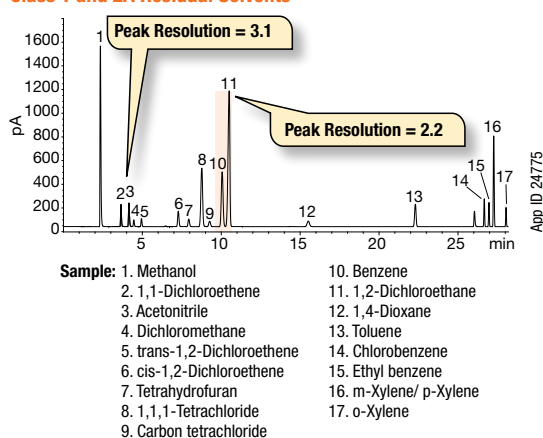
Class 2B Residual Solvents



Class 2A Residual Solvents



Class 1 and 2A Residual Solvents



Same conditions for all separations:

Column: Zebron ZB-624PLUS
Dimensions: 30 meter x 0.32 mm x 1.80 µm
Part No.: [7HM-G040-31](#)
Injection: Split 5:1 @ 140 °C, 1 µL
Recommended Liner: Zebron PLUS Straight Z-Liner™
Liner Part No.: [AG2-0A03-05](#) (for Agilent® & Thermo Scientific® systems)
Carrier Gas: Helium @ 2.2 mL/min (constant flow)
Oven Program: 40 °C for 20 min to 240 °C @ 10 °C/min
Detector: FID @ 250 °C

Ordering Information

Zebron ZB-624PLUS GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
20-Meter			
0.18	1.00	-20 to 300/320	7FD-G040-22
0.25	1.40	-20 to 300/320	7FG-G040-27
30-Meter			
0.25	1.40	-20 to 300/320	7HG-G040-27
0.32	1.80	-20 to 300/320	7HM-G040-31
0.53	3.00	-20 to 300/320	7HK-G040-36
60-Meter			
0.25	1.40	-20 to 300/320	7KG-G040-27
0.32	1.80	-20 to 300/320	7KM-G040-31
0.53	3.00	-20 to 300/320	7KK-G040-36
75-Meter			
0.53	3.00	-20 to 300/320	7LK-G040-36

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages. 0.18 mm, 0.25 mm, and 0.32 mm IDs are MS certified.

ZB-1HT Inferno™

Robust Results Up to 430 °C

- First non-metal columns stable to 430 °C
- Provides true boiling point separation for hydrocarbon distillation methods
- Longer lifetime with rugged high temperature, polyimide coated, fused silica tubing
- Low activity, provides good peak shape for acidic and basic samples
- Provides robust column performance for high temperature bake outs

Upgrade to Zebron from any
100 % dimethylpolysiloxane phase:

Agilent®

- DB®-1
- DB-1ht
- HP-1
- CP-Sil 5 CB
- CP-SimDist

Restek®

- Rtx®-1
- Rxi®-1HT

SGE®

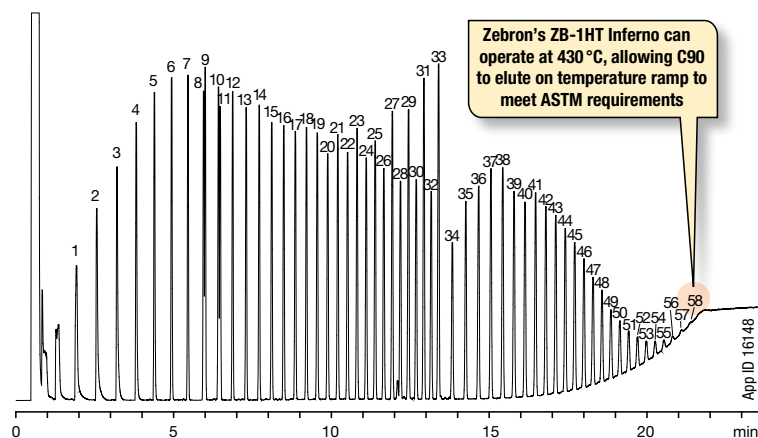
- BP1

Supelco®

- SPB®-1
- Petrocol® 2887

Rugged, High-Temperature Performance

Great Separation of High Boiling Hydrocarbons (ASTM D6352)

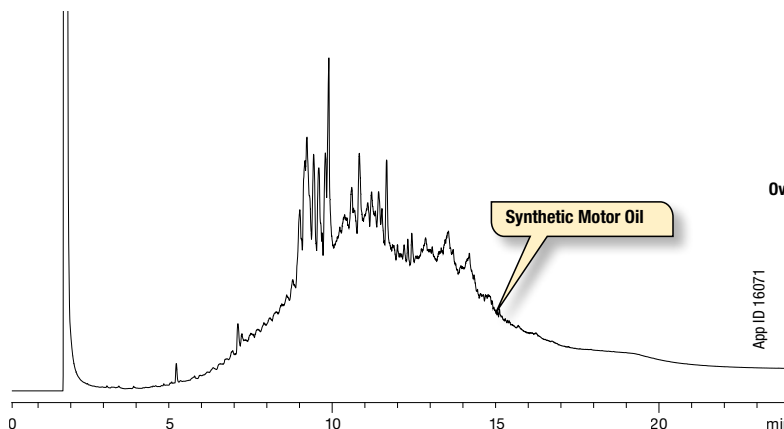


Column: Zebron ZB-1HT Inferno
Dimensions: 5 meter x 0.53 mm x 0.10 µm
Part No.: [7AK-G014-02](#)
Injection: On-Column @ 43 °C, 0.1 µL
Carrier Gas: Helium @ 4.4 mL/min (constant flow)
Oven Program: 40 °C for 0.5 min to 430 °C @ 20 °C/min for 10 min
Detector: FID @ 430 °C

Sample:	1. C10	2. C11	3. C12	4. C13	5. C14	6. C15	7. C16	8. C17	9. Pristane	10. C18	11. Phytane	12. C19	13. C20	14. C21	15. C22	16. C23	17. C24	18. C25	19. C26	20. C27	21. C28	22. C29	23. C30	24. C31	25. C32	26. C33	27. C34	28. C35	29. C36	30. C37	31. C38	32. C39	33. C40	34. C42	35. C44	36. C46	37. C48	38. C50	39. C52	40. C54	41. C56	42. C58	43. C60	44. C62	45. C64	46. C66	47. C68	48. C70	49. C72	50. C74	51. C76	52. C78	53. C80	54. C82	55. C84	56. C86	57. C88	58. C90
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Note: Sample was a combination of PolyWax® 655 and retention time markers C8-C40 in CS₂/Chloroform

Bake Off Contaminants from Dirty Matrices

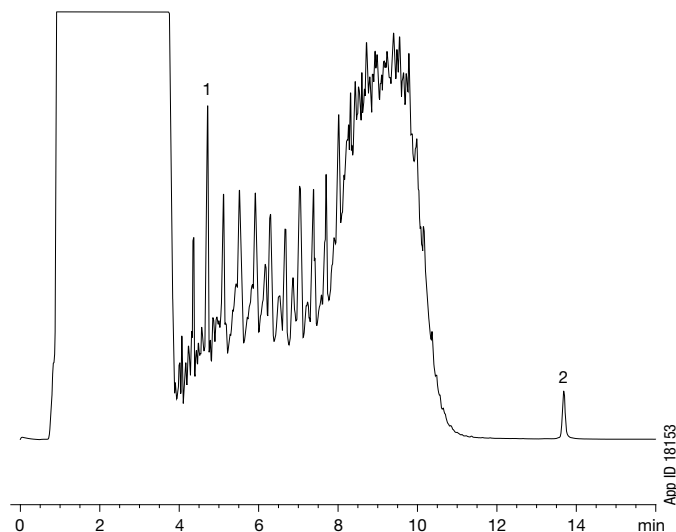


Column: Zebron ZB-1HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: [7HG-G014-02](#)
Injection: On-Column @ 153 °C, 1 µL
Carrier Gas: Helium @ 1 mL/min (constant flow)
Oven Program: 150 °C to 400 °C @ 14 °C/min for 6 min
Detector: FID @ 400 °C
Sample: Sample was 1 % in dichloromethane Mobil® 1 10W-30 Fully Synthetic Motor Oil

ZB-1HT Inferno™

Run Versatile Samples

Hydrocarbons from Water by GC-FID DIN EN ISO 9377-2 (DEV H53)



Column: Zebron ZB-1HT Inferno
Dimensions: 15 meter x 0.32 mm x 0.25 µm
Part No.: [ZEM-G014-11](#)
Injection: Splitless @ 300 °C, 20 µL
Carrier Gas: Helium @ 2.0 mL/min (constant flow)
Oven Program: 50 °C for 2 min to 320 °C @ 30 °C/min for 5 min
Detector: FID @ 330 °C
Sample: 1. Decane (C10)
2. Tetracontane (C40)

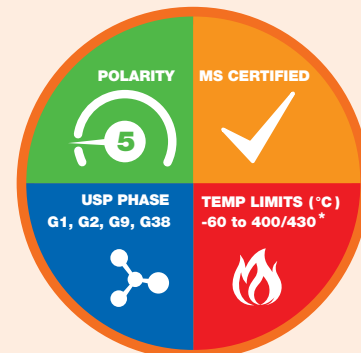
Ordering Information

Zebron ZB-1HT Inferno GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
5-Meter			
0.53	0.10	-60 to 400	7AK-G014-02
10-Meter			
0.32	0.25	-60 to 400/430	7CM-G014-11
15-Meter			
0.25	0.10	-60 to 400/430	7EG-G014-02
0.25	0.25	-60 to 400/430	7EG-G014-11
0.32	0.10	-60 to 400/430	7EM-G014-02
0.32	0.25	-60 to 400/430	7EM-G014-11
0.53	0.15	-60 to 400	7EK-G014-05
20-Meter			
0.18	0.18	-60 to 400/430	7FD-G014-08
30-Meter			
0.25	0.10	-60 to 400/430	7HG-G014-02
0.25	0.25	-60 to 400/430	7HG-G014-11
0.32	0.10	-60 to 400/430	7HM-G014-02
0.32	0.25	-60 to 400/430	7HM-G014-11
0.53	0.15	-60 to 400	7HK-G014-05

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

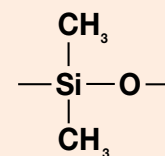
Column Profile



*0.53 mm ID columns are rated to 400 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



100 % Dimethylpolysiloxane

Recommended Applications

- Diesel Fuel
- High Boiling Petroleum Products
- High Molecular Weight Waxes
- Hydrocarbons
- Motor Oils
- Polymers/Plastics
- Simulated Distillation



ZB-1HT Test Mix
Part No.: [AG0-5155](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-5HT Inferno™

Robust Results Up to 430 °C

- First non-metal columns stable to 430 °C
- Robust column for high temperature bake outs and analysis, such as biodiesel, long-chain hydrocarbons, polymers, and high molecular weight compounds
- Provides true boiling point separation for hydrocarbon distillation methods
- Longer lifetime with rugged high temperature, polyimide coated, fused silica tubing
- Low activity, provides good peak shape for acidic and basic samples

Upgrade to Zebron from any
5 % phenyl / 95 % dimethylpolysiloxane phase:

Agilent®

- DB®-5ht
- VF-5ht

Restek®

- Rxi®-5HT
- Sbt®-5HT
- XTI®-5HT
- Rtx®-5HT

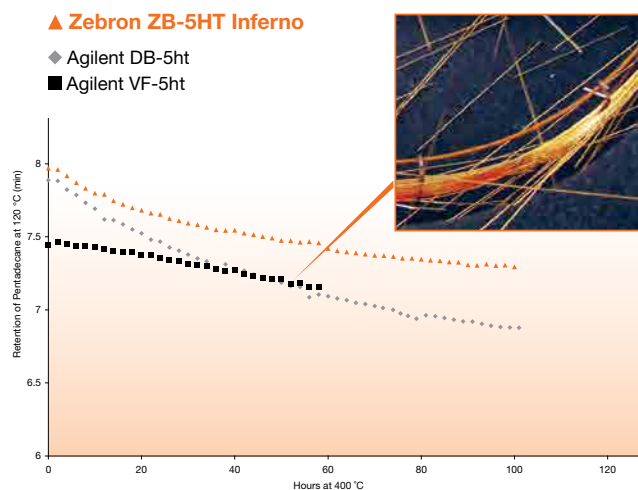
SGE®

- HT-5

Zebron Inferno Columns Win In The Lifetime Test

How does the lifetime test work?

All columns were held at 400 °C for 2 hours and then the oven was lowered to 120 °C for pentadecane analysis. The VF-5ht column broke just after 40 hours at 400 °C. The ZB-5HT had the same retention for pentadecane at 100 hours as the DB-5ht column at 40 hours — over 2X the lifetime!

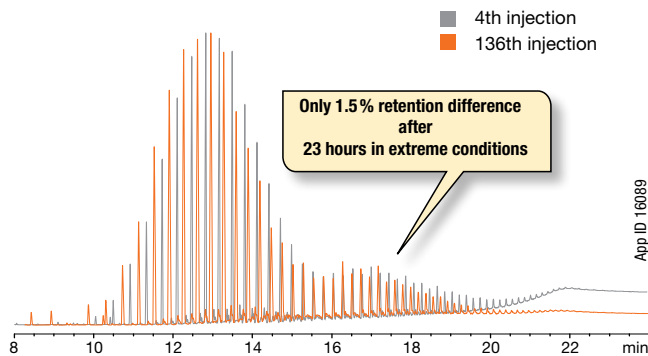


Note that the VF-5ht column died around 40 hours at 400 °C whereas the Zebron ZB-5HT Inferno column maintained great retention of Pentadecane over 100 hours.

Conditions for all columns:

Dimensions: 30 meter x 0.25 mm x 0.10 µm
Injection: 1.0 µL of test mix [AG0-7578](#)
Carrier Gas: Helium @ 1.9 mL/min (constant flow)
Oven Program: 120 °C (Isothermal)
Detector: FID @ 400 °C
Sample: Pentadecane

Paraffin Wax



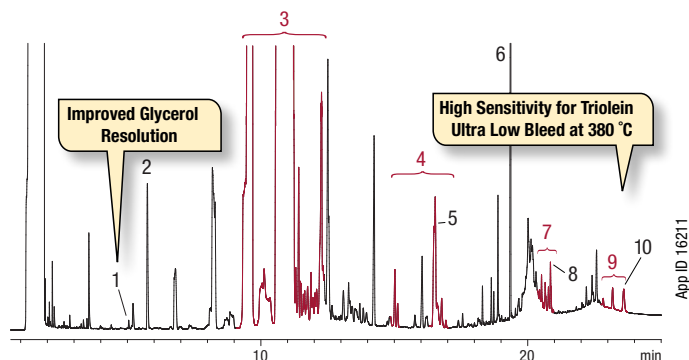
Column: Zebron ZB-5HT Inferno
Dimensions: 15 meter x 0.32 mm x 0.10 µm
Part No.: [ZEM-G015-02](#)
Injection: On Column @ 43 °C, 0.1 µL
Carrier Gas: Helium @ 1.9 mL/min (constant flow)
Oven Program: 40 °C for 2 min to 430 °C @ 20 °C for 10 min
Detector: FID @ 430 °C
Sample: Paraffin Wax

App ID 16089

ZB-5HT Inferno™

Well-Suited for Fuels Analysis

Free Total Glycerin in B100 Biodiesel by GC-FID



Column: Zebron ZB-5HT Inferno
Dimensions: 15 meter x 0.32 mm x 0.10 µm
 + 2 meter x 0.53 mm Z-Guard™
Part No.: [ZEM-G015-02](#)
Injection: On-Column @ 53 °C, 1 µL
Carrier Gas: Helium @ 3.0 mL/min (constant flow)
Oven Program: 50 °C for 1 min to 180 °C @ 15 °C/min to 230 °C @ 7 °C/min to 380 °C
 @ 30 °C/min for 10 min
Detector: FID @ 380 °C
Note: A 2 m x 0.53 mm Guard Column was connected to the analytical column per ASTM method requirement
Sample:

1. Glycerol	6. Tricarpin (ISTD2)
2. Butanetriol (ISTD1)	7. Diglycerides
3. Esters	8. 1,3-Diolein
4. Monoglycerides	9. Triglycerides
5. 1-Monooleoyl-rac-glycerol	10. Triolein

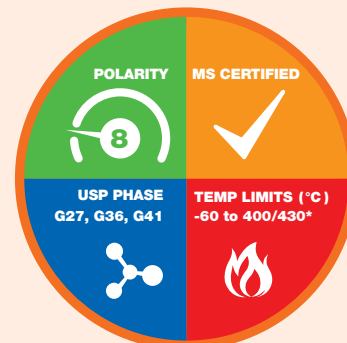
Ordering Information

Zebron ZB-5HT Inferno GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter with 2-Meter Spliced Guard (0.53 mm ID)			
0.32	0.10	-60 to 400/430	ZCM-G015-02-GST
15-Meter			
0.25	0.10	-60 to 400/430	ZEG-G015-02
0.25	0.25	-60 to 400/430	ZEG-G015-11
0.32	0.10	-60 to 400/430	ZEM-G015-02
0.32	0.25	-60 to 400/430	ZEM-G015-11
0.53	0.15	-60 to 400	ZEK-G015-05
15-Meter with 2-Meter Spliced Guard (0.53 mm ID)			
0.32	0.10	-60 to 400/430	ZEM-G015-02-GST
20-Meter			
0.18	0.18	-60 to 400/430	ZFD-G015-08
30-Meter			
0.25	0.10	-60 to 400/430	ZHG-G015-02
0.25	0.25	-60 to 400/430	ZHG-G015-11
0.32	0.10	-60 to 400/430	ZHM-G015-02
0.32	0.25	-60 to 400/430	ZHM-G015-11
0.53	0.15	-60 to 400	ZHK-G015-05
60-Meter			
0.25	0.25	-60 to 400/430	ZKG-G015-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

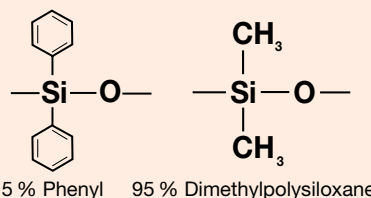
Column Profile



*0.53 mm ID columns are rated to 400 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



Recommended Applications

- Diesel Fuels
- High Boiling Petroleum Products
- High Molecular Weight Waxes
- Hydrocarbons
- Motor Oils
- Polymers/Plastics
- Simulated Distillation
- Surfactants
- Triglycerides



ZB-5HT Test Mix
Part No.: [AG0-5155](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

ZB-35HT Inferno™

High Temperature Stability for Mid-Polarity

- First non-metal, 35% phenyl columns stable to 400 °C
- Longer lifetime with rugged high temperature, polyimide coated, fused silica tubing
- Robust column for high temperature analysis
- Great for high molecular weight compounds
- Eliminate carry-over with high temperature bake outs
- Low activity, provides good peak shape for acidic and basic samples

Upgrade to Zebron from any

35% phenyl / 65% dimethylpolysiloxane phase:

Agilent®

- DB®-35
- HP-35ms
- HP-35

Restek®

- Rtx®-35
- Rtx-35ms

SGE®

- BPX35
- BPX608

Supelco®

- MDN-35
- SPB®-35
- SPB-608

OV®

- OV-11

Lower Bleed Than Other Columns!

Conditions for all columns:

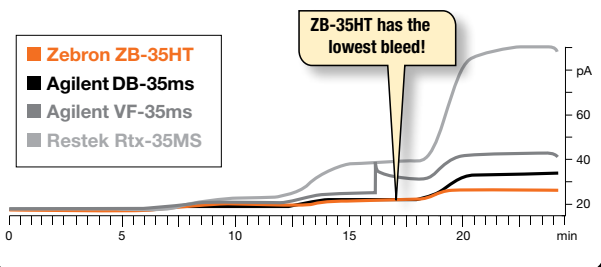
Dimensions: 30 meter x 0.25 mm x 0.25 µm

Injection: Split 20:1 @ 200 °C, 1 µL

Carrier Gas: Helium @ 1.7 mL/min (constant flow)

Oven Program: 100 °C to 320 °C @ 30 °C/min for 5 min to 340 °C @ 20 °C/min for 5 min to 360 °C @ 20 °C/min for 5 min to 380 °C @ 20 °C/min for 5 min to 400 °C @ 20 °C/min for 5 min to 100 °C @ 30 °C/min for 8 min

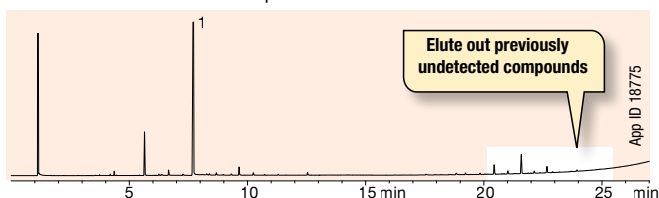
Detector: FID @ 405 °C



See What You've Been Missing

A) ZB-35HT Inferno

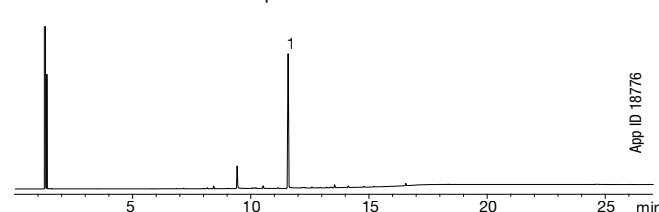
30 meter x 0.25 mm x 0.25 µm



VS.

B) Restek Rtx-35

30 meter x 0.25 mm x 1.00 µm



Column: As listed

Dimensions: As listed

Part No.: 7HG-G025-11 (ZB-35HT Inferno)

Injection: A) Split 50:1 @ 350 °C, 1 µL

B) Split 50:1 @ 300 °C, 1 µL

Carrier Gas: Helium @ 2.1 mL/min (constant flow)

Oven Program: A) 140 °C to 400 °C @ 10 °C/min

B) 140 °C to 300 °C @ 10 °C/min

Detector: A) FID @ 400 °C

B) FID @ 320 °C

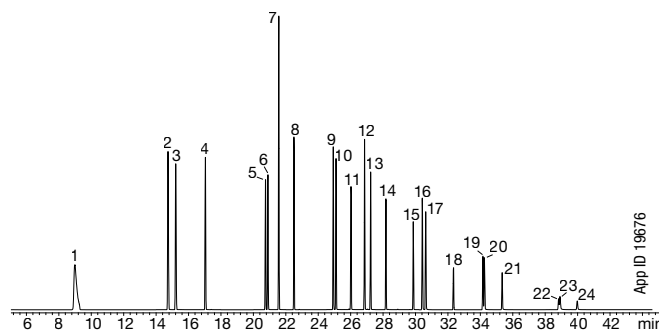
Sample: 1. Hexadecylamine

Note: Chromatogram is courtesy of Northeastern Chemical Company.

ZB-35HT Inferno™

Well-Suited for Environmental Contaminants

PAHs and PCBs In A Single Run



Column: Zebron ZB-35HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: [ZHG-G025-11](#)
Injection: Splitless @ 265 °C, 2 µL
Carrier Gas: Helium @ 1 mL/min (constant flow)
Oven Program: 85 °C for 3 min to 320 °C @ 7 °C /min for 8 min
Detector: MSD @ 280 °C
Sample: Compounds are 5 ppm
 1. Naphthalene 9. PCB 101 17. Chrysene
 2. Acenaphthylene 10. Fluoranthene 18. PCB 194
 3. Acenaphthene 11. Pyrene 19. Benzo[b]fluoranthene
 4. Fluorene 12. PCB 118 20. Benzo[k]fluoranthene
 5. Phenanthrene 13. PCB 153 21. Benzo[a]pyrene
 6. Anthracene 14. PCB 138 22. Indeno[1,2,3-cd]pyrene
 7. PCB 28 15. PCB 180 23. Dibenzo[a,h]anthracene
 8. PCB 52 16. Benz[a]anthracene 24. Benzo[g,h,i]perylene

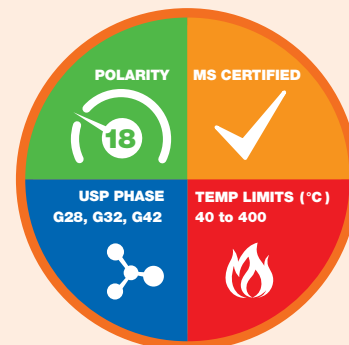
Ordering Information

Zebron ZB-35HT Inferno GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.10	40 to 400	ZEG-G025-02
0.25	0.25	40 to 400	ZEG-G025-11
0.32	0.25	40 to 400	ZEM-G025-11
20-Meter			
0.18	0.18	40 to 400	ZFD-G025-08
30-Meter			
0.25	0.10	40 to 400	ZHG-G025-02
0.25	0.25	40 to 400	ZHG-G025-11
0.32	0.25	40 to 400	ZHM-G025-11

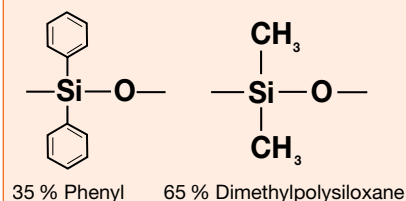
Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



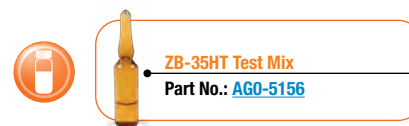
Engineered Self Cross-linking™ (ESC)

Phase Chemistry



Recommended Applications

- Amines
- Chemicals
- Drugs
- EPA Methods (508, 608, 8081, 8141, 8151)
- PCBs / Aroclors
- Pesticides
- Pharmaceuticals
- Steroids



i Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.

△ Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-XLB-HT Inferno™

High Temp Stability, Low Bleed

- Rugged, non-metal si-arylene GC column stable to 400 °C
- Robust column for high temperature bake outs and analysis, such as high molecular weight compounds
- Provides unique selectivity for conformational analyses
- Longer lifetime with high temperature, polyimide coated, fused silica tubing
- Low activity, provides good peak shape for acidic and basic samples
- Good tool for general screening to identify unknown samples

Upgrade to Zebron from these similar* phases:

Agilent®

- DB®-XLB
- VF-XMS

Restek®

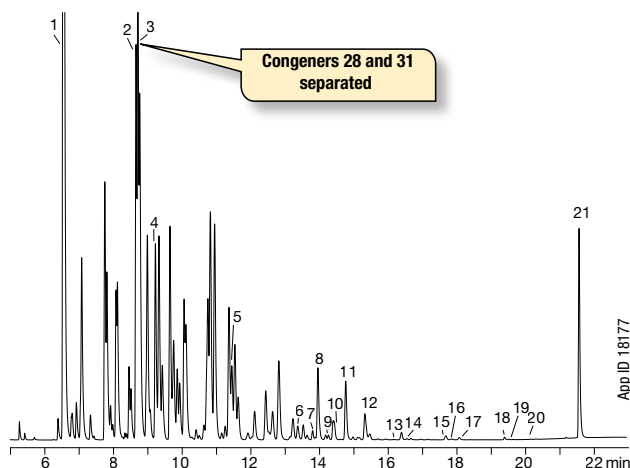
- DB®-XLB

Supelco®

- MDN-12

*not exact equivalent, selectivity may differ

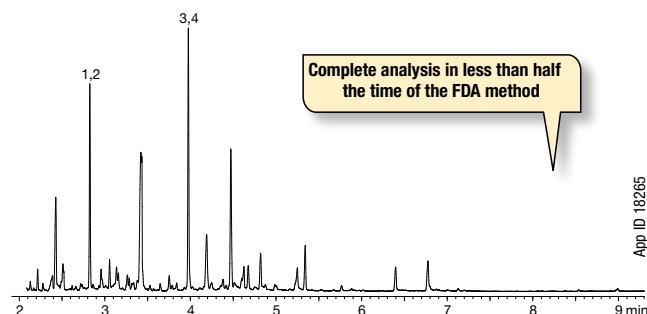
Aroclor 1242: DIN Method 51527



Column: Zebron ZB-XLB-HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: [7HG-G024-11](#)
Injection: Split 2:1 @ 250 °C, 1 µL, pressure pulse @ 40 psi for first 0.25 min
Carrier Gas: Helium @ 1.5 mL/min (constant flow)
Oven Program: 50 °C for 0.5 min to 210 °C @ 40 °C/min for 3 min to 230 °C @ 30 °C/min for 5 min to 250 °C @ 30 °C/min for 5 min to 320 °C @ 40 °C/min for 2 min
Detector: ECD @ 350 °C
Sample: Total concentration of aroclors was 90 ppm in isooctane

- | | |
|-------------|-------------|
| 1. TCMX | 12. BZ# 138 |
| 2. BZ# 31 | 13. BZ# 126 |
| 3. BZ# 28 | 14. BZ# 167 |
| 4. BZ# 52 | 15. BZ# 156 |
| 5. BZ# 101 | 16. BZ# 180 |
| 6. BZ# 77 | 17. BZ# 157 |
| 7. BZ# 123 | 18. BZ# 170 |
| 8. BZ# 118 | 19. BZ# 169 |
| 9. BZ# 153 | 20. BZ# 189 |
| 10. BZ# 114 | 21. DCB |
| 11. BZ# 105 | |

Melamine and Cyanuric Acid by GC-MS

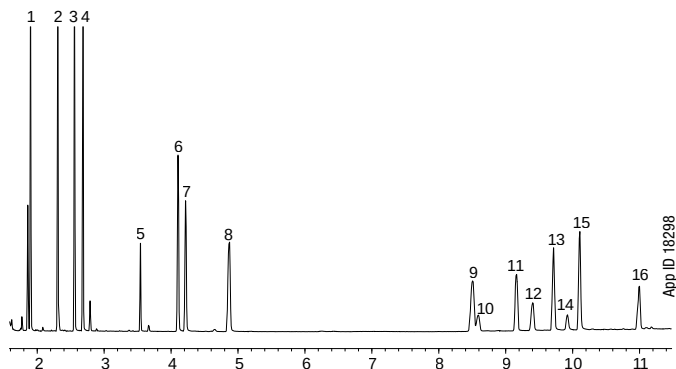


Column: Zebron ZB-XLB-HT Inferno
Dimensions: 15 meter x 0.25 mm x 0.25 µm
Part No.: [7EG-G024-11](#)
Injection: On-Column @ 103 °C, 1 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 100 °C for 0.5 min to 320 °C @ 25 °C/min
Detector: MSD @ 325 °C
Sample: Analytes are 200 ng / 100 µL in BSTFA / Pyridine (1:1)
 1. Cyanuric Acid 13C3 (IS)
 2. Cyanuric Acid
 3. Melamine 13C3 15N3 (IS)
 4. Melamine

ZB-XLB-HT Inferno™

Good Results for Difficult Samples

Explosives by GC-MS



Column: Zebron ZB-XLB-HT Inferno
Dimensions: 15 meter x 0.25 mm x 0.25 µm
Part No.: [7EG-G024-11](#)
Injection: On-Column @ 73 °C, 0.5 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 70 °C for 1 min to 140 °C @ 25 °C/min for 4 min to 280 °C @ 25 °C/min
Detector: MSD @ 300 °C, 40-400 amu
Sample: Analytes are 10 ppm in dichloromethane

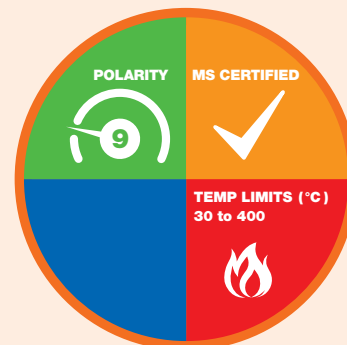
1. Nitrobenzene	9. 2,4,6-Trinitrotoluene (2,4,6-TNT)
2. 2-Nitrotoluene	10. PETN
3. 3-Nitrotoluene	11. 1,3,5-Trinitrobenzene (1,3,5-TNB)
4. 4-Nitrotoluene	12. RDX
5. Nitroglycerin	13. 4-Amino-2,6-dinitrotoluene
6. 2,6-Dinitrotoluene (2,6-DNT)	14. 3,5-Nitroaniline
7. 1,3-Dinitrobenzene (1,3-DNB)	15. 2-Amino-4,6-dinitrotoluene
8. 2,4-Dinitrotoluene	16. Tetryl

Ordering Information

Zebron ZB-XLB-HT Inferno GC Columns			
ID(mm)	df(µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.10	30 to 400	7EG-G024-02
0.25	0.25	30 to 400	7EG-G024-11
0.32	0.10	30 to 400	7EM-G024-02
20-Meter			
0.18	0.18	30 to 400	7FD-G024-08
30-Meter			
0.25	0.10	30 to 400	7HG-G024-02
0.25	0.25	30 to 400	7HG-G024-11
0.32	0.25	30 to 400	7HM-G024-11
60-Meter			
0.25	0.25	30 to 400	7KG-G024-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Herbicides / Insecticides
- PCBs
- Pesticides
- Unknown Samples



ZB-XLB-HT Test Mix
Part No.: [AG0-7578](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
 Add a Z-Guard™ to your next Zebron GC order.

ZB-1

Low Polarity for Versatile Applications

- Low polarity phase suited for true boiling point compounds
- Low bleed (MS Certified), low activity, and high efficiency
- Excellent resolving power of critical pairs in complex petrochemical samples
- Used for “fingerprinting” and routine quality control analyses

Upgrade to Zebron from any 100 % dimethylpolysiloxane phase:

Agilent®

- DB®-1
- DB-2887
- DB-1 EVDX
- HP-1
- HP-101
- HP-PONA
- Ultra 1
- CP-Sil 5 CB

Restek®

- Rtx®-1
- Rtx-1PONA
- Rtx-1 F&F

SGE®

- BP1
- BP1-PONA
- BPX1-SimD

Supelco®

- SPB®-1
- SPB-1 TG
- SE-30
- MET-1
- SPB-1 Sulfur
- SPB-HAP

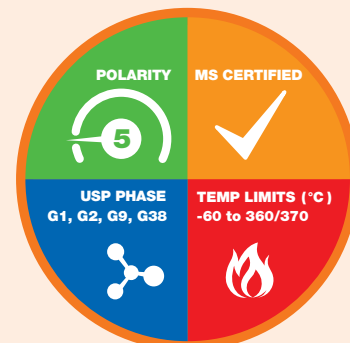
Ordering Information

Zebron ZB-1 GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.53	2.65	-60 to 340/360	7CK-G001-35
15-Meter			
0.25	0.10	-60 to 360/370	7EG-G001-02
0.25	0.25	-60 to 360/370	7EG-G001-11
0.25	1.00	-60 to 340/360	7EG-G001-22
0.32	0.25	-60 to 360/370	7EM-G001-11
0.32	1.00	-60 to 340/360	7EM-G001-22
0.53	0.15	-60 to 360/370	7EK-G001-05
0.53	0.50	-60 to 360/370	7EK-G001-17
0.53	1.50	-60 to 340/360	7EK-G001-28
30-Meter			
0.25	0.10	-60 to 360/370	7HG-G001-02
0.25	0.25	-60 to 360/370	7HG-G001-11
0.25	0.50	-60 to 360/370	7HG-G001-17
0.25	1.00	-60 to 340/360	7HG-G001-22
0.32	0.25	-60 to 360/370	7HM-G001-11
0.32	0.50	-60 to 360/370	7HM-G001-17
0.32	1.00	-60 to 340/360	7HM-G001-22
0.32	3.00	-60 to 340/360	7HM-G001-36
0.32	5.00	-60 to 340/360	7HM-G001-39
0.53	0.50	-60 to 360/370	7HK-G001-17
0.53	1.50	-60 to 340/360	7HK-G001-28
0.53	3.00	-60 to 340/360	7HK-G001-36
0.53	5.00	-60 to 340/360	7HK-G001-39
50-Meter			
0.25	0.50	-60 to 360/370	7JG-G001-17
60-Meter			
0.25	0.25	-60 to 360/370	7KG-G001-11
0.25	1.00	-60 to 340/360	7KG-G001-22
0.32	0.25	-60 to 360/370	7KM-G001-11
0.32	1.00	-60 to 340/360	7KM-G001-22
0.32	3.00	-60 to 340/360	7KM-G001-36
0.53	1.50	-60 to 340/360	7KK-G001-28
100-Meter			
0.25	0.50	-60 to 360/370	7MG-G001-17

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

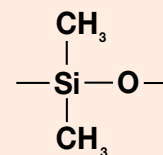
Column Profile



*Thicker films (≥ 1.0 µm) are rated to 340/360 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



100 % Dimethylpolysiloxane

Recommended Applications

- Ethanol
- Hydrocarbons
- Mercaptans
- MTBE
- Natural Gas Odorants
- Oxygenates and GROs
- Solvent Impurities
- Sulfur Compounds (Light)



ZB-1 Test Mix

Part No.: [AGO-5155](#)



Zebron GC Columns MS Certification, see p. 437



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-5

Low Polarity For A Wide Application Range

- Rugged, versatile low polarity column for general lab purpose
- Resilient to dirty samples—long column life
- Low bleed (MS Certified) especially suited to high sensitivity work using GC-MS
- Extremely inert for active compounds such as drugs or pesticides
- Great column for unknown samples

Upgrade to Zebron from any
5% phenyl / 95% dimethylpolysiloxane phase:

Agilent®

- DB®-5
- HP-5
- HP-PAS-5
- CP-Sil 8 CB
- Ultra 2

Restek®

- Rtx®-5

SGE®

- BP5
- BPX5

Supelco®

- MDN-5
- SPB®-5
- PTE-5
- SE-54
- PTA-5
- Equity®-5
- Sac-5

OV®

- OV-5

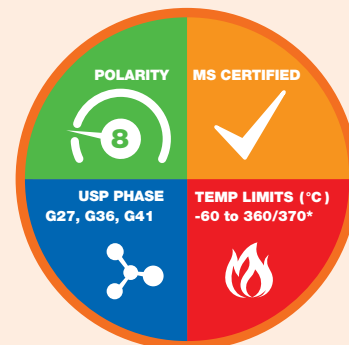
Ordering Information

Zebron ZB-5 GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.10	-60 to 360/370	7EG-G002-02
0.25	0.25	-60 to 360/370	7EG-G002-11
0.25	0.50	-60 to 360/370	7EG-G002-17
0.25	1.00	-60 to 340/360	7EG-G002-22
0.32	0.10	-60 to 360/370	7EM-G002-02
0.32	0.25	-60 to 360/370	7EM-G002-11
0.32	1.00	-60 to 340/360	7EM-G002-22
0.53	0.50	-60 to 360/370	7EK-G002-17
0.53	1.50	-60 to 340/360	7EK-G002-28
0.53	3.00	-60 to 340/360	7EK-G002-36
20-Meter			
0.18	0.18	-60 to 360/370	7FD-G002-08
30-Meter			
0.25	0.10	-60 to 360/370	7HG-G002-02
0.25	0.25	-60 to 360/370	7HG-G002-11
0.25	0.50	-60 to 360/370	7HG-G002-17
0.25	1.00	-60 to 340/360	7HG-G002-22
0.32	0.25	-60 to 360/370	7HM-G002-11
0.32	0.50	-60 to 360/370	7HM-G002-17
0.32	1.00	-60 to 340/360	7HM-G002-22
0.53	0.50	-60 to 360/370	7HK-G002-17
0.53	1.50	-60 to 340/360	7HK-G002-28
0.53	3.00	-60 to 340/360	7HK-G002-36
0.53	5.00	-60 to 340/360	7HK-G002-39
60-Meter			
0.25	0.10	-60 to 360/370	7KG-G002-02
0.25	0.25	-60 to 360/370	7KG-G002-11
0.25	0.50	-60 to 360/370	7KG-G002-17
0.25	1.00	-60 to 340/360	7KG-G002-22
0.32	0.25	-60 to 360/370	7KM-G002-11
0.32	1.00	-60 to 340/360	7KM-G002-22
0.53	1.50	-60 to 340/360	7KK-G002-28

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

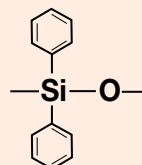
Column Profile



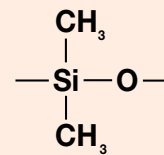
*Thicker films ($\geq 1.0 \mu\text{m}$) are rated to 340/360 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry



5 % Phenyl



95 % Dimethylpolysiloxane

Recommended Applications

- Alkaloids
- Dioxins
- Drugs
- Essential Oils
- Flavors
- FAMES
- Halo-Hydrocarbons
- Herbicides
- PCBs / Aroclors
- Pesticides
- Phenols
- Residual Solvents



ZB-5 Test Mix

Part No.: [AG0-5155](#)



For ultra low bleed, consider using a ZB-5ms, see p. 154
For high temperature analysis, consider using a ZB-5HT, see p. 146



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-5ms

Robust Results, Versatile Performance

- Popular rugged column for general purpose use
- Fully conditioned within 35 minutes
- High response for acids and bases
- Enhanced resolution of polyaromatic hydrocarbons (PAHs) and other multi-ring aromatic compounds

Upgrade to Zebron from any
5 % phenyl-arylene / 95 % dimethylpolysiloxane phase:

Agilent®

- DB®-5ms
- DB-5.625
- DB-5ms EVDX
- CP-Sil 8 CB MS
- VF-5ms

Restek®

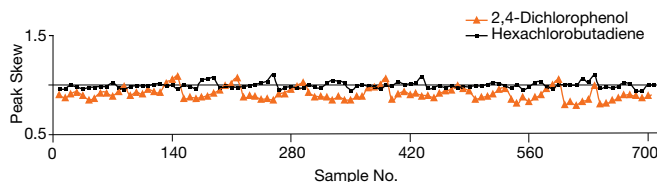
- Rtx®-5Sil MS
- Rxi®-5Sil MS

Supelco®

- SLB®-5ms

Long Lifetime

Consistent response after more than 700 samples at pH 2!

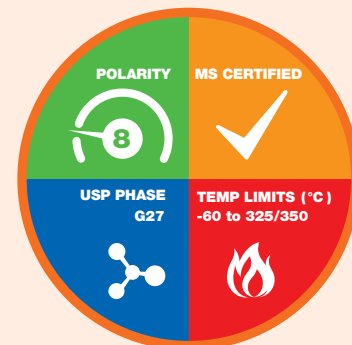


Ordering Information

Zebron ZB-5ms GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.10	-60 to 325/350	7CB-G010-02
0.18	0.18	-60 to 325/350	7CD-G010-08
12-Meter			
0.20	0.33	-60 to 325/350	7DE-G010-14
15-Meter			
0.25	0.25	-60 to 325/350	7EG-G010-11
20-Meter			
0.18	0.18	-60 to 325/350	7FD-G010-08
0.18	0.32	-60 to 325/350	7FD-G010-51
0.18	0.36	-60 to 325/350	7FD-G010-53
25-Meter			
0.20	0.33	-60 to 325/350	7GE-G010-14
30-Meter			
0.25	0.25	-60 to 325/350	7HG-G010-11
0.25	0.50	-60 to 325/350	7HG-G010-17
0.25	1.00	-60 to 325/350	7HG-G010-22
0.32	0.25	-60 to 325/350	7HM-G010-11
0.32	0.50	-60 to 325/350	7HM-G010-17
0.32	1.00	-60 to 325/350	7HM-G010-22
60-Meter			
0.25	0.10	-60 to 325/350	7KG-G010-02
0.25	0.25	-60 to 325/350	7KG-G010-11
0.32	0.25	-60 to 325/350	7KM-G010-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

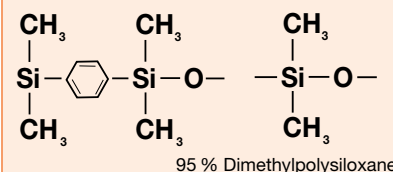
Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry

5 % Phenyl-Arylene



Recommended Applications

- Acids
- Alkaloids
- Amines
- Dioxins
- Drugs
- Essential Oils
- Flavors
- FAMES
- Halo-hydrocarbons
- Herbicides
- PCBs/Aroclors
- Pesticides
- Phenols
- Residual Solvents
- Solvent Impurities



ZB-5ms Test Mix
Part No.: [AGO-7578](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-35

Intermediate Polarity for GC-MS

- Intermediate polarity column with temperature limits up to 360 °C allows high molecular weight analysis
- Excellent inertness to minimize analyte adsorption, improve efficiency, and reproducibility
- More rugged (longer column life) than other polar phases
- Excellent for trace analysis with bleed-sensitive detectors (MS, FID, ECD, NPD)

Upgrade to Zebron from any

35 % phenyl / 65 % dimethylpolysiloxane phase:

Agilent®

- DB®-35
- DB-35ms
- HP-35
- HP-35ms

Restek®

- Rtx®-35
- Rtx-35ms

SGE®

- BPX35
- BPX608

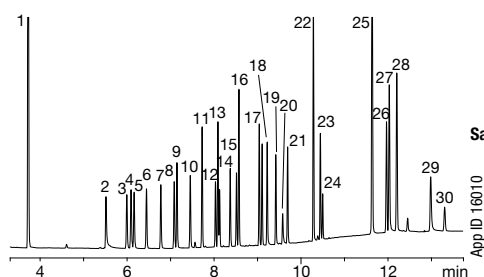
Supelco®

- MDN-35
- SPB®-35
- SPB-608

OV®

- OV-11

Common Drug Screen by GC-FID



Column: Zebron ZB-35

Dimensions: 30 meter x 0.25 mm x 0.25 µm

Part No.: [7HG-G003-11](#)

Injection: Split 10:1 @ 225 °C, 1.5 µL

Carrier Gas: Helium @ 1.4 mL/min (constant flow)

Oven Program: 120 °C to 180 °C @ 25 °C/min to 200 °C @ 6 °C/min to 300 °C @ 20 °C/min for 3 min

Detector: FID @ 300 °C

Sample: All analytes are 25 ppm except nicotine at 100 ppm

- Nicotine
- Ibuprofen
- Allobarbitol
- Acetaminophen
- Aprobarbitol
- Butalbitol
- Amobarbitol
- Pentobarbitol
- Phenacetin
- Secobarbitol
- Benzphetamine
- Meprobamate
- Dimenhydrinate
- Hexobarbitol
- Doxylamine
- Caffeine
- Chlorpheniramine
- Methapyrilene
- Phenobarbitol
- Procaine
- Brompheniramine
- Chlorcyclizine
- Cocaine
- Benactyzine
- Codeine
- Diazepam
- Morphine
- Hydrocodone
- Oxymorphone
- Heroin

Ordering Information

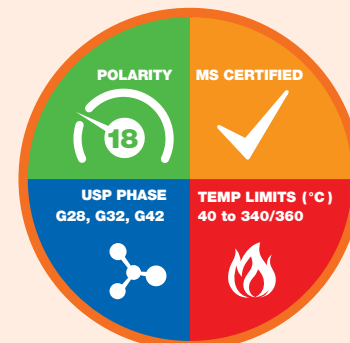
Zebron ZB-35 GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.10	40 to 340/360	7CB-G003-02
15-Meter			
0.25	0.25	40 to 340/360	7EG-G003-11
0.25	0.50	40 to 340/360	7EG-G003-17
0.53	1.00	40 to 340/360	7EK-G003-22
30-Meter			
0.25	0.25	40 to 340/360	7HG-G003-11
0.25	0.50	40 to 340/360	7HG-G003-17
0.32	0.25	40 to 340/360	7HM-G003-11
0.32	0.50	40 to 340/360	7HM-G003-17
0.53	0.50	40 to 340/360	7HK-G003-17
0.53	1.00	40 to 340/360	7HK-G003-22
60-Meter			
0.25	0.25	40 to 340/360	7KG-G003-11
0.32	0.25	40 to 340/360	7KM-G003-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

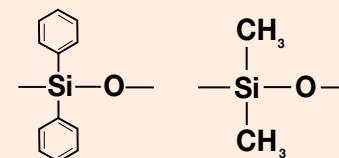
Phenomenex

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry



35 % Phenyl 65 % Dimethylpolysiloxane

Recommended Applications

- Amines
- Drugs
- EPA Methods (508, 608, 8081, 8141, 8151)
- PCBs / Aroclors
- Pesticides
- Pharmaceuticals



ZB-35 Test Mix

Part No.: [AGO-5156](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-50

Robust Results, Rugged Performance

- High polarity column with temperature limits up to 340 °C allows high temperature bake out to remove contaminants
- Excellent inertness to minimize analyte adsorption, improve efficiency, and reproducibility
- More rugged (longer column life) than other polar phases
- Excellent for trace analysis with bleed-sensitive detectors
- Great for drug screening and environmental compounds

Upgrade to Zebron from any 50 % phenyl / 50 % dimethylpolysiloxane phase:

Agilent®

- DB®-17
- DB-17ht
- DB-17ms
- DB-17 EVDX

Restek®

- Rtx®-50

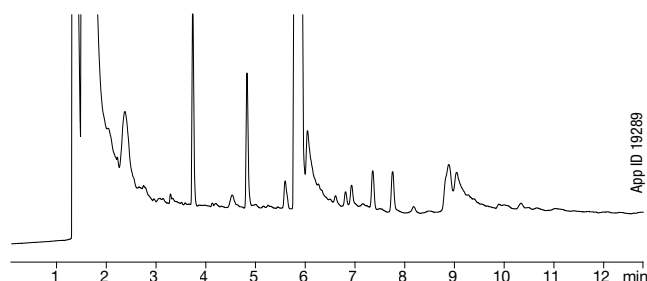
SGE®

- BPX50

Supelco®

- SP®-2250
- SPB®-17
- SPB-50

Antihistamine by GC-FID



Column: Zebron ZB-50
Dimensions: 30 meter x 0.32 mm x 0.50 µm
Part No.: [7HM-G004-17](#)
Injection: Split 20:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 40 cm/sec (constant flow)
Oven Program: 190 °C to 260 °C @ 25 °C/min for 10 min
Detector: FID @ 270 °C
Sample: Brompheniramine

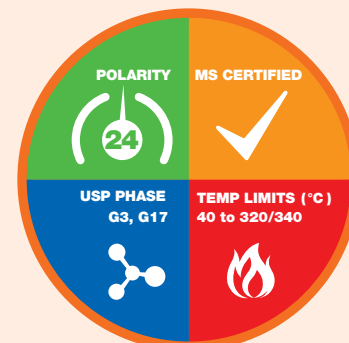
Ordering Information

Zebron ZB-50 GC Columns

ID (mm)	df (µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.10	40 to 320/340	7CB-G004-02
0.53	2.00	40 to 320/340	7CK-G004-32
15-Meter			
0.25	0.15	40 to 320/340	7EG-G004-05
0.25	0.25	40 to 320/340	7EG-G004-11
0.32	0.25	40 to 320/340	7EM-G004-11
0.32	0.50	40 to 320/340	7EM-G004-17
0.53	1.00	40 to 320/340	7EK-G004-22
30-Meter			
0.25	0.25	40 to 320/340	7HG-G004-11
0.25	0.50	40 to 320/340	7HG-G004-17
0.32	0.25	40 to 320/340	7HM-G004-11
0.32	0.50	40 to 320/340	7HM-G004-17
0.53	1.00	40 to 320/340	7HK-G004-22
60-Meter			
0.25	0.25	40 to 320/340	7KG-G004-11
0.25	0.50	40 to 320/340	7KG-G004-17

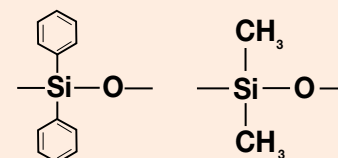
Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Engineered Self Cross-linking™ (ESC)

Phase Chemistry



50 % Phenyl 50 % Dimethylpolysiloxane

Recommended Applications

- Antidepressants
- Cholesterols
- Drugs of Abuse
- EPA Methods (508, 608, 8081, 8141, 8151)
- Glycols
- Herbicides
- Pesticides
- Steroids
- Triglycerides



ZB-50 Test Mix
Part No.: [AG0-5157](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
 Add a Z-Guard™ to your next Zebron GC order.

ZB-624

Robust Results for VOCs and Residual Solvents

- Widely used phase to separate volatile organic flavor and fragrance additives and residual solvents in industrial or pharmaceutical products (OVIs)
- Popular choice for residual solvent testing
- Excellent for US EPA Methods 501.3, 502.2, 503.1, 524.2, 601, 602, 624, 8010, 8015, 8020, 8021, 8240, 8260
- Specifically designed for the separation of volatile organic compounds (VOCs)
- Increased temperature limit speeds run times and re-equilibration

Upgrade to Zebron from any

6 % cyanopropylphenyl / 94 % dimethylpolysiloxane phase:

Agilent®

- DB®-624
- DB-1301
- DB-VRX
- HP-VOC
- CP-1301
- CP-Select 624 CB

Restek®

- Rtx®-624
- Rtx-1301
- Rtx-VMS

SGE®

- BPX624

Supelco®

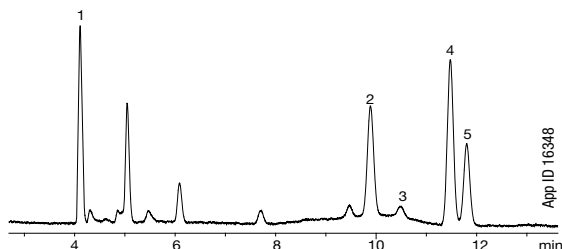
- SPB®-624
- SPB-1301

OV®

- OV-624

Good Performance for Pharmaceuticals

USP <467> Residual Solvents Procedure A — Class 1



Column: Zebron ZB-624

Dimensions: 30 meter x 0.32 mm x 1.80 µm

Part No.: [7HM-G005-31](#)

Injection: Split 5:1 @ 140 °C, 1 mL

Carrier Gas: Helium @ 35 cm/sec (constant flow)

Oven Program: 40 °C for 20 min to 240 °C @ 10 °C/min for 20 min

Detector: FID @ 250 °C

- Sample:
- 1,1-Dichloroethene
 - 1,1,1-Trichloroethane
 - Carbon tetrachloride
 - Benzene
 - 1,2-Dichloroethane

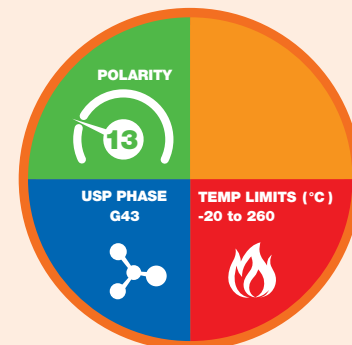
Ordering Information

Zebtron ZB-624 GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
20-Meter			
0.18	1.00	-20 to 260	7FD-G005-22
30-Meter			
0.25	1.40	-20 to 260	7HG-G005-27
0.32	1.80	-20 to 260	7HM-G005-31
0.53	3.00	-20 to 260	7HK-G005-36
60-Meter			
0.25	1.40	-20 to 260	7KG-G005-27
0.32	1.80	-20 to 260	7KM-G005-31
0.53	3.00	-20 to 260	7KK-G005-36
75-Meter			
0.53	3.00	-20 to 260	7LK-G005-36
105-Meter			
0.53	3.00	-20 to 260	7NK-G005-36

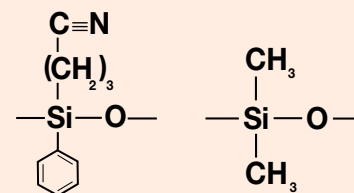
Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Phase Chemistry

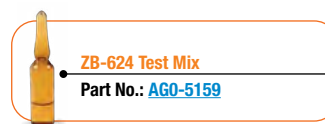
6 % Cyanopropylphenyl



94 % Dimethylpolysiloxane

Recommended Applications

- Pharmaceuticals
- Residual Solvents
- Volatile Organic Compounds (VOCs)
- EPA Methods (501.3, 502.2, 503.1, 524.2, 601, 602, 624, 8010, 8015, 8020, 8021, 8240, 8260)



ZB-624 Test Mix

Part No.: [AG0-5159](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-1701

Alternate Selectivity for Mid-Polarity Analyses

- Fast run and re-equilibration times for enhanced sample throughput and productivity
- Provides alternate selectivity to phenyl phases with similar polarity

Upgrade to Zebron from any

14 % cyanopropylphenyl / 86 % dimethylpolysiloxane phase:

Agilent®

- DB®-1701
- CP-Sil 19 CB

Restek®

- Rtx®-1701
- Rtx-VMS

SGE®

- BP10

Supelco®

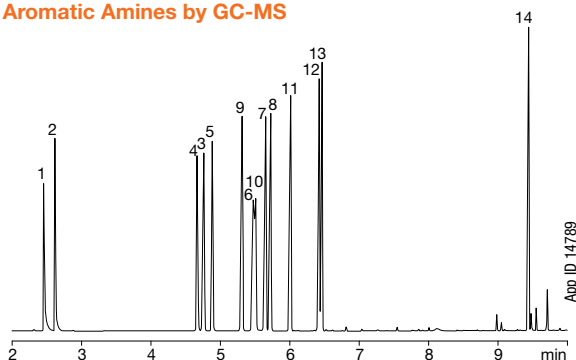
- SPB®-1701
- Equity®-1701

OV®

- OV-1701

Good Peak Shape for Active Analytes

Aromatic Amines by GC-MS



Column: Zebron ZB-1701

Dimensions: 30 meter x 0.25 mm x 0.25 µm

Part No.: ZHG-G006-11

Injection: Split 15:1 @ 220 °C, 1 µL

Carrier Gas: Helium @ 1.0 mL/min (constant flow)

Oven Program: 60 °C for 1 min to 110 °C @ 30 °C/min to 135 °C @ 9 °C/min to 260 °C @ 30 °C/min for 2 min

Detector: MSD @ 180 °C

Sample: Analytes are at 1.58 mg/mL each

- | | |
|-----------------------|-------------------------|
| 1. Piperidine | 8. o-Toluidine |
| 2. 2-Methylpiperidine | 9. N,N-Dimethylaniline |
| 3. Aniline | 10. β-Phenylethylamine |
| 4. Benzylamine | 11. N-Ethylaniline |
| 5. α-Phenylethylamine | 12. 2,4-Dimethylaniline |
| 6. N-Methylaniline | 13. N,N-Diethylaniline |
| 7. m-Toluidine | 14. Dibenzylamine |

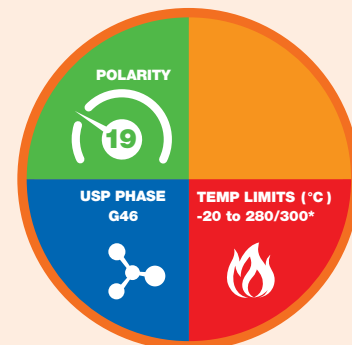
Ordering Information

Zebron ZB-1701 GC Columns

ID (mm)	df (µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.25	-20 to 280/300	ZEG-G006-11
0.32	0.25	-20 to 280/300	ZEM-G006-11
30-Meter			
0.25	0.25	-20 to 280/300	ZHG-G006-11
0.25	1.00	-20 to 260/280	ZHG-G006-22
0.32	0.25	-20 to 280/300	ZHM-G006-11
0.32	1.00	-20 to 260/280	ZHM-G006-22
0.53	1.00	-20 to 260/280	ZHK-G006-22
60-Meter			
0.25	0.25	-20 to 280/300	ZKG-G006-11
0.32	0.25	-20 to 280/300	ZKM-G006-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

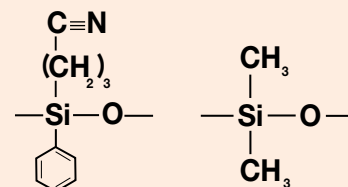
Column Profile



*Thicker films (≥ 1.0 µm) are rated to 260/280 °C.

Phase Chemistry

14 % Cyanopropylphenyl



86 % Dimethylpolysiloxane

Recommended Applications

- | | |
|-------------------------|--------------------------------|
| • Alcohols | • Pharmaceutical Intermediates |
| • Amines | • Phenols |
| • Aromatic Hydrocarbons | • Solvents |
| • Drugs | • Steroids |
| • Esters | • TMS Sugars |
| • PAHs | • Tranquilizers |
| • PCBs | |



ZB-1701 Test Mix
Part No.: [AGO-5156](#)



For enhanced response to Endrin and DDT, consider using ZB-1701P, See p. 159

Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-1701P

Enhanced Response for DDT and Endrin

- Specially tested to ensure response of DDT, Endrin, Endrin Aldehyde, and Endrin Ketone
- Fast run and re-equilibration times for enhanced sample throughput and productivity
- Guaranteed column for pesticide analysis

Upgrade to Zebron from any

14 % cyanopropylphenyl / 86 % dimethylpolysiloxane phase:

Agilent®

- DB®-1701
- DB-1701P
- CP-Sil 19 CB

Restek®

- Rtx®-1701
- Rtx-VMS

SGE®

- BP10

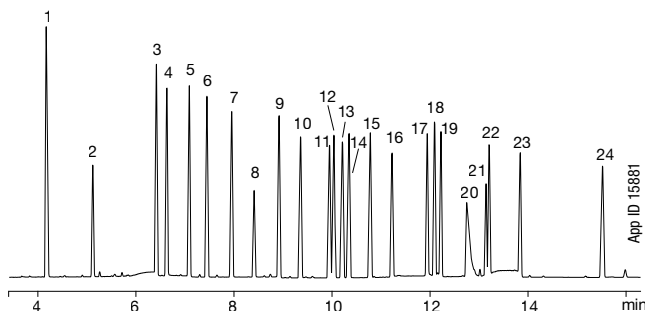
Supelco®

- SPB®-1701
- Equity®-1701

OV®

- OV-1701

Chlorinated Pesticides by GC-ECD: EPA Method 8081



Column: Zebron ZB-1701P

Dimensions: 30 meter x 0.25 mm x 0.25 µm

Part No.: 7HG-G012-11

Injection: Splitless @ 240 °C, 1 µL

Carrier Gas: Helium @ 1.6 mL/min (constant flow)

Oven Program: 100 °C to 200 °C @ 25 °C/min to 240 °C @ 6 °C/min to 265 °C @ 20 °C/min for 5 min

Detector: ECD @ 300 °C

Sample: All compounds are 20 ppm

- | | | |
|---------------------------------|------------------------|-------------------------------|
| 1. 1-Bromo-2-Nitrobenzene (IS) | 9. δ-BHC | 17. DDD |
| 2. Tetrachloro-m-xylene (Surr) | 10. Heptachlor Epoxide | 18. Endosulfan II |
| 3. α-BHC | 11. Endosulfan I | 19. DDT |
| 4. Pentachloronitrobenzene (IS) | 12. γ-Chlordane | 20. Endrin Aldehyde |
| 5. γ-BHC (Lindane) | 13. α-Chlordane | 21. Methoxychlor |
| 6. Heptachlor | 14. DDE | 22. Endosulfan Sulfate |
| 7. Aldrin | 15. Dieldrin | 23. Endrin Ketone |
| 8. β-BHC | 16. Endrin | 24. Decachlorobiphenyl (Surr) |

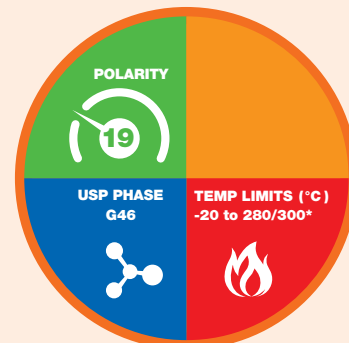
Ordering Information

Zebron ZB-1701P GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
30-Meter			
0.25	0.25	-20 to 280/300	7HG-G012-11
0.32	0.25	-20 to 280/300	7HM-G012-11
0.53	1.00	-20 to 260/280	7HK-G012-22

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

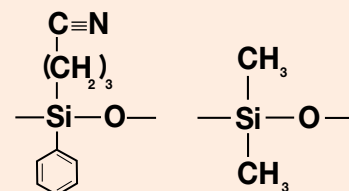
Column Profile



*Thicker films (≥ 1.0 µm) are rated to 260/280 °C.

Phase Chemistry

14 % Cyanopropylphenyl



86 % Dimethylpolysiloxane

Recommended Applications

- Nitrogen Containing Pesticides
- Organochlorine Pesticides
- Organophosphorous Pesticides
- PCBs / Aroclors



ZB-1701 Test Mix
Part No.: [AGO-5156](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime.
Add a Z-Guard™ to your next Zebron GC order.

ZB-WAX

PEG Versatility for Solvents, Acids, and Amines

- High polarity column with low bleed (MS certified) for improved results
- Highly stable, long lifetime
- Low activity for amines
- Bonded, solvent rinsible
- Excellent chromatography of polar complex mixtures
- Widely used for profiling and “fingerprinting”

Upgrade to Zebron from any polyethylene glycol phase:

Agilent®

- DB®-WAXetr
- HP-INNOWax
- CP-Wax 57 CB

Restek®

- Rtx®-WAX
- Famewax
- Stabilwax®-DB

SGE®

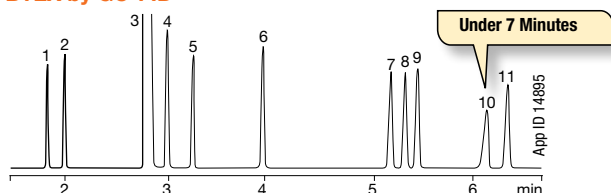
- SolGel-WAX™

Supelco®

- Met-Wax
- Omegawax

Performs for Industrial Chemicals

BTEX by GC-FID



Column: Zebron ZB-WAX

Dimensions: 30 meter x 0.32 mm x 0.50 µm

Part No.: [7HM-G007-17](#)

Injection: Split 20:1 @ 250 °C, 0.2 µL

Carrier Gas: Helium @ 2 mL/min (constant flow)

Oven Program: 60 °C to 75 °C @ 15 °C/min to 90 °C @ 3 °C/min (hold 3 min)

Detector: FID @ 300 °C

Sample:

1. Pentane
2. Heptane
3. Solvent (methylene chloride)
4. Benzene
5. Decane
6. Toluene
7. Ethylbenzene
8. p-Xylene
9. m-Xylene
10. Dodecane
11. o-Xylene

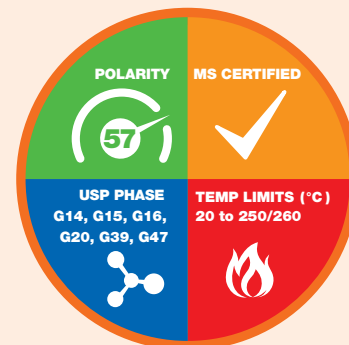
Ordering Information

Zebron ZB-WAX GC Columns

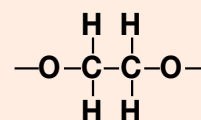
ID (mm)	df (µm)	Temp. Limits °C	Part No.
10-Meter			
0.10	0.10	20 to 250/260	7CB-G007-02
15-Meter			
0.25	0.25	20 to 250/260	7EG-G007-11
0.32	0.25	20 to 250/260	7EM-G007-11
0.32	0.50	20 to 250/260	7EM-G007-17
0.53	1.00	20 to 250/260	7EK-G007-22
20-Meter			
0.18	0.18	20 to 250/260	7FD-G007-08
30-Meter			
0.25	0.15	20 to 250/260	7HG-G007-05
0.25	0.25	20 to 250/260	7HG-G007-11
0.25	0.50	20 to 250/260	7HG-G007-17
0.25	1.00	20 to 250/260	7HG-G007-22
0.32	0.15	20 to 250/260	7HM-G007-05
0.32	0.25	20 to 250/260	7HM-G007-11
0.32	0.50	20 to 250/260	7HM-G007-17
0.53	0.50	20 to 250/260	7HK-G007-17
0.53	1.00	20 to 250/260	7HK-G007-22
60-Meter			
0.25	0.15	20 to 250/260	7KG-G007-05
0.25	0.25	20 to 250/260	7KG-G007-11
0.25	0.50	20 to 250/260	7KG-G007-17
0.32	0.25	20 to 250/260	7KM-G007-11
0.32	0.50	20 to 250/260	7KM-G007-17
0.53	1.00	20 to 250/260	7KK-G007-22

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Phase Chemistry



100 % Polyethylene Glycol

Recommended Applications

- Alcohols
- Aldehydes
- Aromatics
- Basic Compounds
- Essential Oils
- Flavors & Fragrances
- Glycols
- Pharmaceuticals
- Solvents
- Styrene
- Xylene Isomers



ZB-WAX Test Mix

Part No.: [AGO-5158](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-FFAP

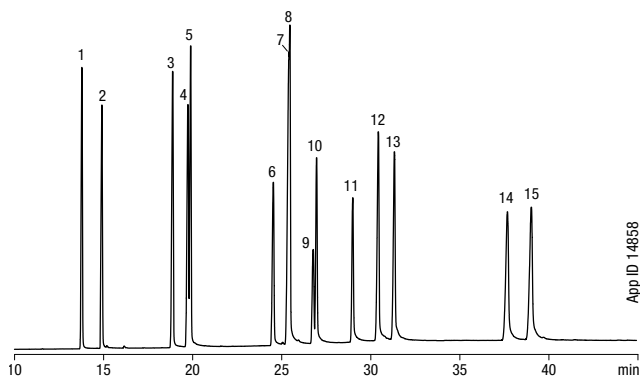
Improve Resolution for Free Fatty Acids

- High polarity column; excellent thermal and chemical stability
- Provides better peak shape for underivatized acids
- Especially suited for organic acids, free fatty acids, and alcohols
- Bonded, solvent rinsable FFAP phase

Upgrade to Zebron from any nitroterephthalic acid modified polyethylene glycol phase:

Agilent®	Restek®	SGE®	Supelco®	OV®
• DB®-FFAP • HP-FFAP • CP-Wax 58 FFAP CB • CP-FFAP CB	• Stabilwax®-DA	• BP21	• Nukol • SPB®-1000	• OV-351

Unsaturated Free Fatty Acids by GC-FID



Column: Zebron ZB-FFAP
Dimensions: 60 meter x 0.25 mm x 0.25 µm
Part No.: [7KG-G009-11](#)
Injection: Split 40:1 @ 220 °C, 0.2 µL
Carrier Gas: Helium @ 2.4 mL/min (constant flow)
Oven Program: 200 °C to 260 °C @ 2 °C/min for 30 min
Detector: FID @ 250 °C

Sample:

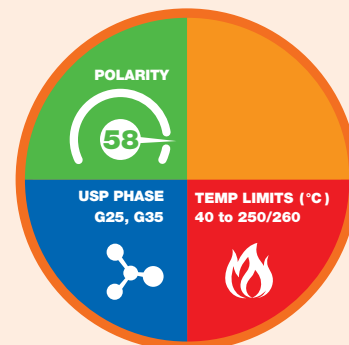
1. Myristic Acid (C14:0)	9. Linolelaidic Acid (C18:2t)
2. Myristoleic Acid (C14:1c)	10. Linoleic Acid (C18:2c)
3. Palmitic Acid (C16:0)	11. Linolenic Acid (C18:3c)
4. Palmitoleic Acid (C16:1t)	12. Arachidic Acid (C20:0)
5. Palmitoleic Acid (C16:1c)	13. Gondoic Acid (C20:1c)
6. Stearic Acid (C18:0)	14. Behenic Acid (C22:0)
7. Elaidic Acid (C18:1t)	15. Erucic Acid (C22:1c)
8. Oleic Acid (C18:1c)	

Ordering Information

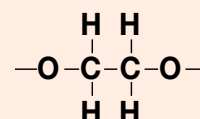
Zebron ZB-FFAP GC Columns			
ID (mm)	df (µm)	Temp. Limits °C	Part No.
15-Meter			
0.25	0.25	40 to 250/260	7EG-G009-11
0.32	0.25	40 to 250/260	7EM-G009-11
0.32	0.50	40 to 250/260	7EM-G009-17
0.53	1.00	40 to 250/260	7EK-G009-22
30-Meter			
0.25	0.25	40 to 250/260	7HG-G009-11
0.32	0.25	40 to 250/260	7HM-G009-11
0.32	0.50	40 to 250/260	7HM-G009-17
0.32	1.00	40 to 250/260	7HM-G009-22
0.53	1.00	40 to 250/260	7HK-G009-22
50-Meter			
0.32	0.50	40 to 250/260	7JM-G009-17
60-Meter			
0.25	0.25	40 to 250/260	7KG-G009-11

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



Phase Chemistry



Nitroterephthalic Acid Modified Polyethylene Glycol

Recommended Applications

- | | |
|--------------------|-----------------------|
| • Acrylates | • Ketones |
| • Alcohols | • Organic Acids |
| • Aldehydes | • Phenols |
| • Free Fatty Acids | • Volatile Free Acids |



ZB-FFAP Test Mix
Part No.: [AG0-5158](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

ZB-XLB

Get Extremely Low Bleed

- Unique, low polarity si-arylene column
- Engineered specifically for use with bleed sensitive detectors such as MS
- Provides alternate selectivity to standard 5-type phases
- Often used for confirmation of pesticides, PCBs, or other environmental samples
- Good tool for sample screening to identify unknown contaminants

Upgrade to Zebron from these similar* phases:

Agilent®

- DB®-XLB
- VF-XMS

Restek®

- Rtx®-XLB
- Rxi®-XLB

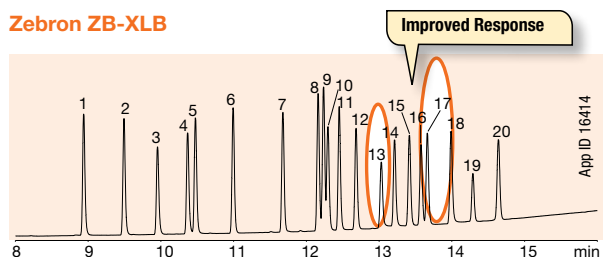
Supelco®

- MDN-12

*not exact equivalent, selectivity may differ

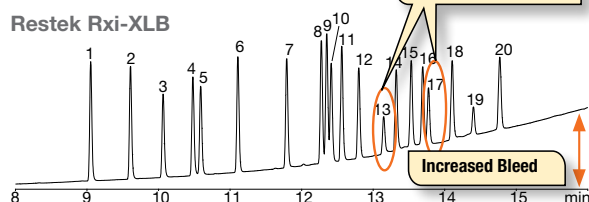
Better Performance for Chlorinated Pesticides EPA Method 8081A

Zebron ZB-XLB



VS.

Restek Rxi-XLB



Conditions for both columns:

Columns: As listed
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Injection: Split 111:1 @ 250 °C, 1.5 µL
Carrier Gas: Helium @ 0.9 mL/min (constant flow)
Oven Program: 110 °C to 320 °C @ 15 °C/min and hold until last peak elutes
Detector: ECD @ 350 °C

Sample:

1. α-BHC	11. 4,4'-DDE
2. γ-BHC	12. Dieldrin
3. β-BHC	13. Endrin
4. δ-BHC	14. 4,4'-DDD
5. Heptachlor	15. Endosulfan II
6. Aldrin	16. Endrin aldehyde
7. Heptachlor epoxide	17. 4,4'-DDT
8. γ-Chlordane	18. Endosulfan sulfate
9. α-Chlordane	19. Methoxychlor
10. Endosulfan I	20. Endrin ketone

Comparative separations may not be representative of all applications.

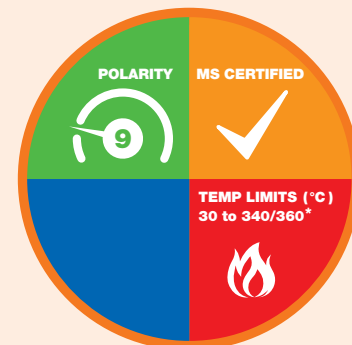
Ordering Information

Zebron ZB-XLB GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.
10-Meter			
0.18	0.18	30 to 340/360	7CD-G019-08
15-Meter			
0.25	0.25	30 to 340/360	7EG-G019-11
20-Meter			
0.18	0.18	30 to 340/360	7FD-G019-08

Note: If you need a 5 in. cage, contact technical support at www.phenomenex.com/chat or simply reach out to your Technical consultant. Conditions may apply. Agilent 6850, some SRI and process GC systems use only 5 in. cages.

Column Profile



*Thicker films (≥ 1.0 µm) are rated to 320/340 °C.

Engineered Self Cross-linking™ (ESC)

Phase Chemistry

- Proprietary

Recommended Applications

- Herbicides / Insecticides
- PCBs
- Pesticides
- Unknown Samples



ZB-XLB Test Mix

Part No.: [AGO-7578](#)



Contact Phenomenex or your local Phenomenex distributor for additional GC products and applications.



Extend column lifetime. Add a Z-Guard™ to your next Zebron GC order.

Ordering Information

Zebron ZB-XLB GC Columns (cont'd)

ID(mm)	df(µm)	Temp. Limits °C	Part No.
30-Meter			
0.25	0.25	30 to 340/360	7HG-G019-11
0.25	0.50	30 to 340/360	7HG-G019-17
0.32	0.25	30 to 340/360	7HM-G019-11
0.32	0.50	30 to 340/360	7HM-G019-17
0.53	1.50	30 to 320/340	7HK-G019-28
60-Meter			
0.25	0.25	30 to 340/360	7KG-G019-11

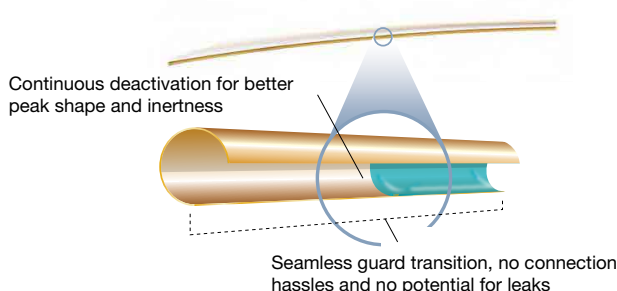
Guardian Integrated Guard Columns

Built-In Column Protection: No Leaks, No Worries!

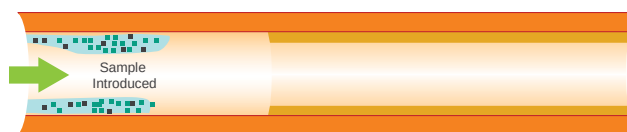
Why Choose Zebron With Guardian?

Guardian columns have the 2 m, 5 m or 10 m guard built directly into the analytical column in one continuous length of tubing. Unlike traditional guard columns, which are known to be difficult to seal and prone to leaking after normal column maintenance, the Guardian system provides the same inert column protection, but eliminates the possibility of leaks.

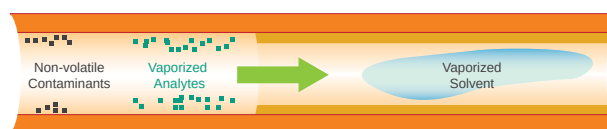
- Eliminate the potential for leaks
- Extend column life
- Improve analyte focusing for low boiling compounds
- Aggressively tested to ensure deactivation



How It Works



The sample is introduced onto the Guardian section of the column.



As temperature increases (oven ramp program), the sample is vaporized and moves unretained through the Guardian section of the column. Non-volatile contaminants are deposited on the Guardian section, better preserving the stationary phase and making it easier to trim contaminants off the front of the column.



When the analytes reach the stationary phase (analytical portion of the column), they are refocused, resulting in a narrower initial peak width. This can help improve resolution.

Ordering Information

Guardian: Integrated Guard Columns

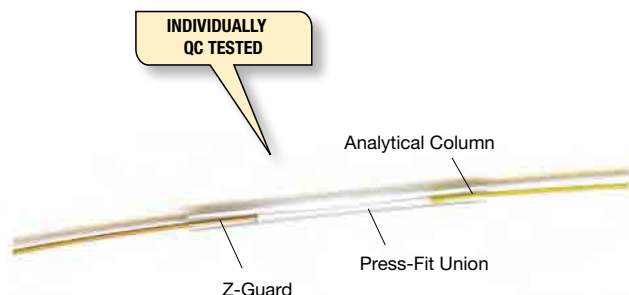
Zebron GC Column Phase	Dimensions	2m Guardian Part No.	5m Guardian Part No.	10m Guardian Part No.
ZB-1PLUS™	15 meter x 0.25 mm x 0.25 µm	—	—	7EG-G031-11-GGC
ZB-1PLUS	30 meter x 0.25 mm x 0.25 µm	—	7HG-G031-11-GGA	7HG-G031-11-GGC
ZB-1HT Inferno™	30 meter x 0.25 mm x 0.10 µm	—	7HG-G014-02-GGA	—
ZB-5ms	15 meter x 0.25 mm x 0.25 µm	—	—	7EG-G010-11-GGC
ZB-5ms	30 meter x 0.25 mm x 0.25 µm	—	7HG-G010-11-GGA	7HG-G010-11-GGC
ZB-5ms	30 meter x 0.25 mm x 0.50 µm	—	7HG-G010-17-GGA	7HG-G010-17-GGC
ZB-5ms	30 meter x 0.32 mm x 0.25 µm	—	7HM-G010-11-GGA	—
ZB-5ms	30 meter x 0.32 mm x 1.00 µm	—	7HM-G010-22-GGA	—
ZB-5MSPLUS™	30 meter x 0.25 mm x 0.25 µm	—	7HG-G030-11-GGA	7HG-G030-11-GGC
ZB-5MSPLUS	30 meter x 0.25 mm x 0.50 µm	—	—	7HG-G030-17-GGC
ZB-5	30 meter x 0.25 mm x 0.25 µm	—	7HG-G002-11-GGA	7HG-G002-11-GGC
ZB-5	30 meter x 0.25 mm x 0.50 µm	—	7HG-G002-17-GGA	7HG-G002-17-GGC
ZB-5	60 meter x 0.25 mm x 0.25 µm	—	7KG-G002-11-GGA	—
ZB-5HT Inferno	30 meter x 0.25 mm x 0.10 µm	—	7HG-G015-02-GGA	—
ZB-5HT Inferno	30 meter x 0.25 mm x 0.25 µm	—	7HG-G015-11-GGA	—
ZB-5PLUS™	20 meter x 0.18 mm x 0.18 µm	—	7FD-G032-08-GGA	—
ZB-5PLUS	30 meter x 0.25 mm x 0.10 µm	—	7HG-G032-02-GGA	—
ZB-5PLUS	30 meter x 0.25 mm x 0.25 µm	—	7HG-G032-11-GGA	—
ZB-50	10 meter x 0.18 mm x 0.18 µm	7CD-G004-08-GGT	—	—
ZB-MultiResidue™-1	30 meter x 0.25 mm x 0.25 µm	—	—	7HG-G016-11-GGC
ZB-SemiVolatiles	30 meter x 0.25 mm x 0.25 µm	—	7HG-G027-11-GGA	7HG-G027-11-GGC
ZB-Dioxin	60 meter x 0.25 mm x 0.20 µm	—	7KG-G045-10-GGA	—

Z-Guard™ Columns

Protect and Extend Column Lifetime

- Individually QC tested to ensure the highest level of quality
- Extend column lifetime by preventing stationary phase damage
- Improve separation and peak shapes (especially early elutors)
- Improve sensitivity and accuracy of quantitative results
- Available as individual guard columns or as complete kits with connectors

To ensure that all Z-Guards are the highest possible quality, we individually test each one! The columns are attached to a reference Zebron ZB-5 column and are tested using our specially designed QC mix. We carefully monitor activity, bleed, and stability. This way, we are able to say with confidence that Z-Guards will provide the low activity and high quality your methods require.



Ordering Information

Metal Z-Guard Column		
ID (mm)	Description	Part No.
5-Meter		
0.53	Guard Column	7AK-G000-00-GMO

High Temperature Z-Guard Columns and Kits			
ID (mm)	Description	Part No.	Part No.
		5-Meter	10-Meter
0.25	Guard Column	7AG-G000-00-GHO	7CG-G000-00-GHO
	Guard Column Kit	7AG-G000-00-GHK	7CG-G000-00-GHK
0.32	Guard Column	7AM-G000-00-GHO	7CM-G000-00-GHO
	Guard Column Kit	7AM-G000-00-GHK	7CM-G000-00-GHK
0.53	Guard Column	7AK-G000-00-GHO	7CK-G000-00-GHO
	Guard Column Kit	7AK-G000-00-GHK	7CK-G000-00-GHK

Standard Z-Guard Columns and Kits			
ID (mm)	Description	Part No.	Part No.
		5-Meter	10-Meter
0.10	Guard Column	7AB-G000-00-GZO	7CB-G000-00-GZO
	Guard Column Kit	7AB-G000-00-GZK	—
0.18	Guard Column	7AD-G000-00-GZO	7CD-G000-00-GZO
	Guard Column Kit	7AD-G000-00-GZK	7CD-G000-00-GZK
0.20	Guard Column	7AE-G000-00-GZO	—
0.25	Guard Column	7AG-G000-00-GZO	7CG-G000-00-GZO
	Guard Column Kit	7AG-G000-00-GZK	7CG-G000-00-GZK
0.32	Guard Column	7AM-G000-00-GZO	7CM-G000-00-GZO
	Guard Column Kit	7AM-G000-00-GZK	7CM-G000-00-GZK
0.53	Guard Column	7AK-G000-00-GZO	7CK-G000-00-GZO
	Guard Column Kit	7AK-G000-00-GZK	7CK-G000-00-GZK

Bulk Z-Guard Columns			
ID (mm)	Description	Part No.	Unit
50-Meter			
0.25	Guard Column	7JG-G000-00-GZO	ea
0.32	Guard Column	7JM-G000-00-GZO	ea
0.53	Guard Column	7JK-G000-00-GZO	ea
5-Meter			
0.53	Guard Column	7AK-G000-00-GZ1	10/pk

ZB-5 Z-Guard Column Multi-Pak			
ID (mm)	Description	Part No.	Unit
2-Meter			
0.25	Zebron ZB-5 Z-Guard Column	KG0-7868	25/pk

i Universal GC Guard Column. Designed for use with virtually any GC Capillary column from virtually any manufacturer. Alternative to: Restek, Supelco, Agilent Technologies, and many more.

i Z-Guard Column Kits include 5 or 10 meters of deactivated fused silica tubing, 5 universal connectors and 0.5 mL of high-temperature polyimide resin.

Replacement Parts for Z-Guard Kits		
Description	Part No.	Unit
Universal Capillary Column Union, Borosilicate	AG0-4716	5/pk
High Temperature Polyimide Resin, 0.5 mL	AG0-8514	ea