

ZB-5MS_{PLUS}TM

The Next Generation
of Inertness

- Improved responses
- Better peak shapes
- Same 5ms selectivity

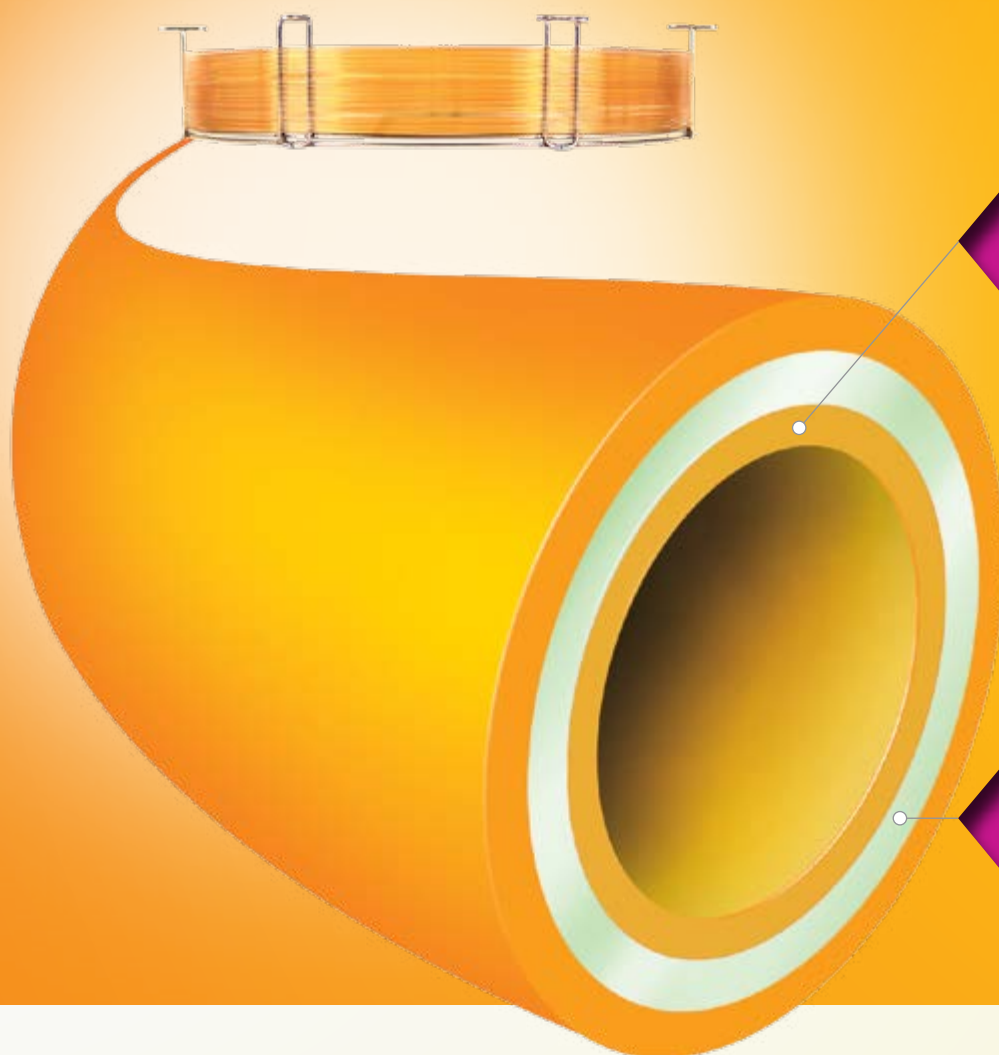


GUARANTEED alternative to:

- Agilent® DB®-5ms Ultra Inert
- Agilent HP®-5ms Ultra Inert
- Restek® Rxi®-5Sil MS
- Supelco® SLB®-5ms



New Innovations, More Versatility

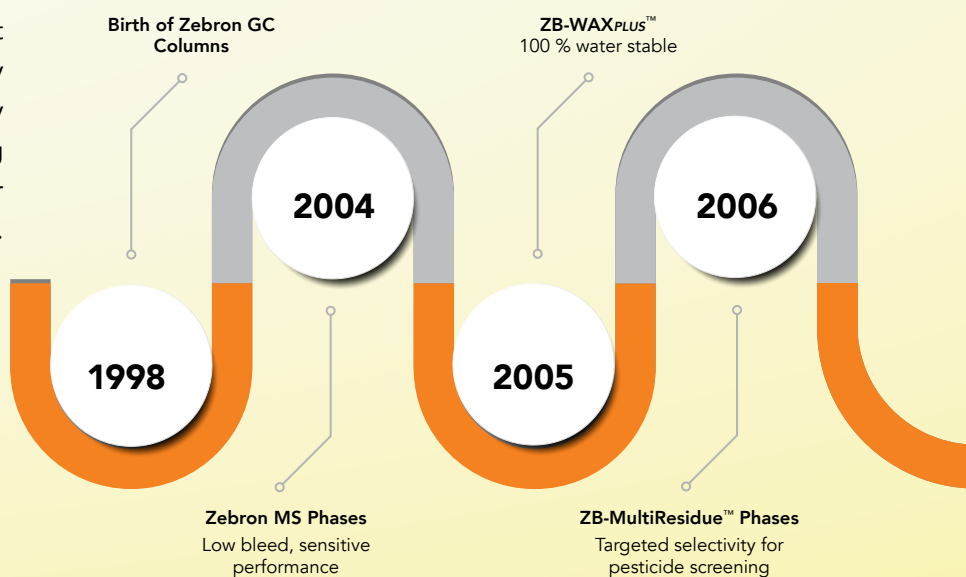


Low bleed 5 % phenyl-arylene phase maintains the same selectivity you're used to.

Ultra inert deactivation dramatically reduces analyte adsorption, maximizing your detection power.

An Award-Winning History of GC Innovation

Zebron GC columns are engineered by expert Phenomenex GC scientists that created key J&W technologies. Our inventive philosophy and expertise in GC column manufacturing has resulted in 3 R&D 100 Awards, an honor that no other GC manufacturer has received.



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Zebron™ ZB-5MS_{PLUS}™

Upgrade Your 5 Phase

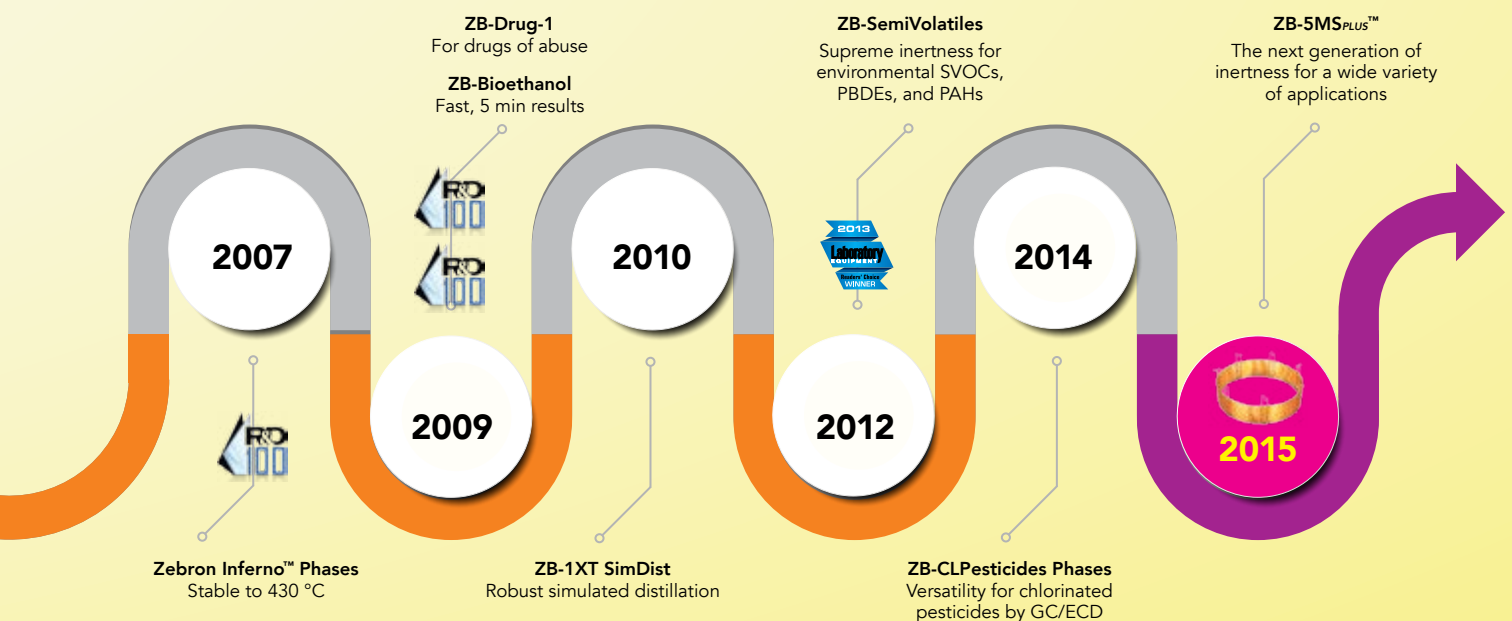
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- 6 A Performance Test To Surpass The Rest
- 7 Your Ultra Inert GC Column Won't Want To See this Data

Wide Applicability for Multiple Analyses

- p. 8 Get Ultra-Sensitive Detection of Cannabinoids In Food by GC/MS
- 8 Accurately Analyze Melamine In Pet Food by GC/MS
- 9 Separate A Variety of Abused Drugs by GC/MS
- 9 Improve Ethanolamine Testing by GC/MS

Ready To Order?

- p. 10 Customized Support To Solve Your Biggest Challenges
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The Next Generation of Inertness

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 and peak shapes for troublesome compounds.

Improve Your Analysis

Conditions for both columns:

Column: As listed

Dimensions: 30 meter x 0.25mm x 0.25 µm

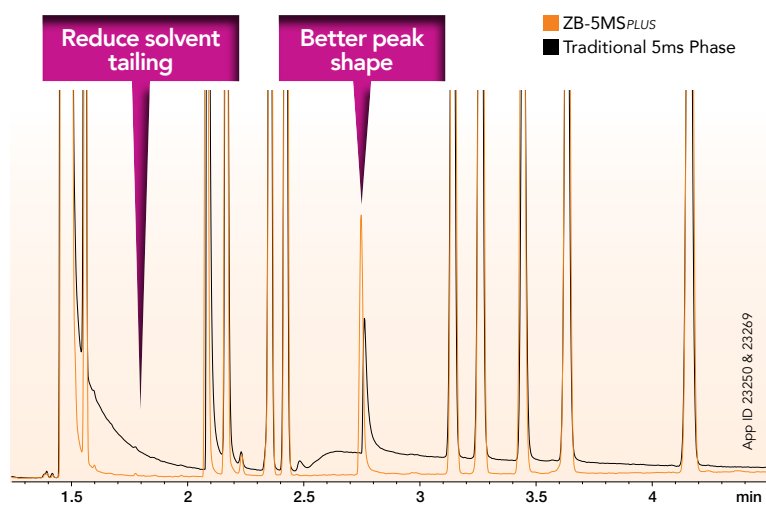
Injection: Split 200:1 @ 250 °C, 1 µL

Carrier Gas: Helium @ 2.4 mL/min (constant flow)

Oven Program: 140 °C (Isothermal)

Detector: FID @ 325 °C

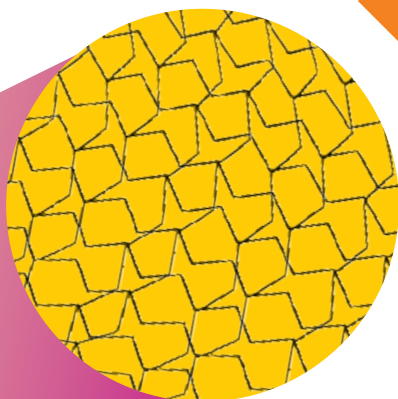
- Sample:**
- | | |
|-----------------------------|----------------------|
| 1. Pyridine | 7. p-Xylene |
| 2. 1-Pentanol | 8. 2-Heptanone |
| 3. 1-Octene | 9. n-Nonane |
| 4. n-Octane | 10. Isopropylbenzene |
| 5. 1,2-Butanediol | 11. Decane |
| 6. 1-Chloro-2-Fluorobenzene | |



Clean, highly inert fused silica surface due to very few active sites

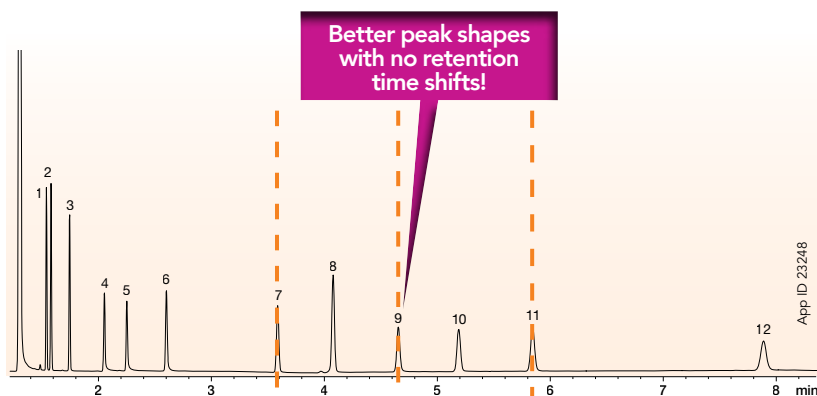
Change Your Column, Not Your Method

Low bleed 5 % phenyl-arylene phase chemistry for versatile applications

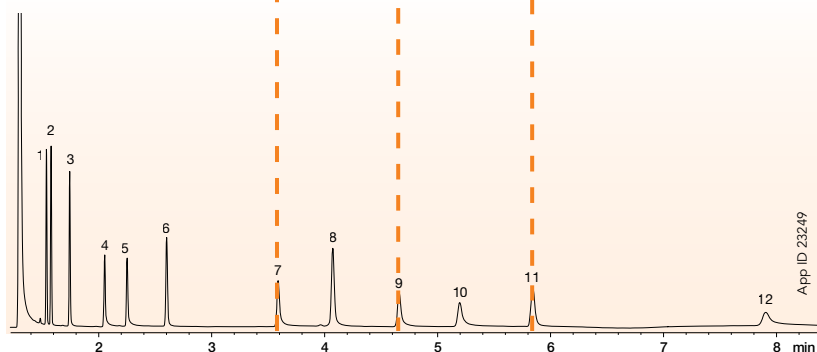


No one wants to redevelop their existing methods. Zebron™ ZB-5MS^{PLUS}™ maintains the same selectivity you're used to in a 5 % phenyl-arylene phase while providing tremendous inertness. Instantly achieve higher responses for active compounds compared to your current 5ms phase column, without changing your selectivity.

Zebron ZB-5MS^{PLUS}



Traditional 5ms Phase



Conditions for both columns:

Column: As listed

Dimensions: 30 meter x 0.25mm x 0.25 μm

Injection: Split 200:1 @ 250 °C, 1 μL

Carrier Gas: Helium @ 2.4 mL/min (constant flow)

Oven Program: 140 °C (Isothermal)

Detector: FID @ 325 °C

Sample: 1. m-Xylene

7. Tridecane

2. o-Xylene

8. 1-Methylnaphthalene

3. Decane

9. 1-Undecanol

4. 2-Ethylhexanoic Acid

10. Tetradecane

5. 1,6-Hexanediol

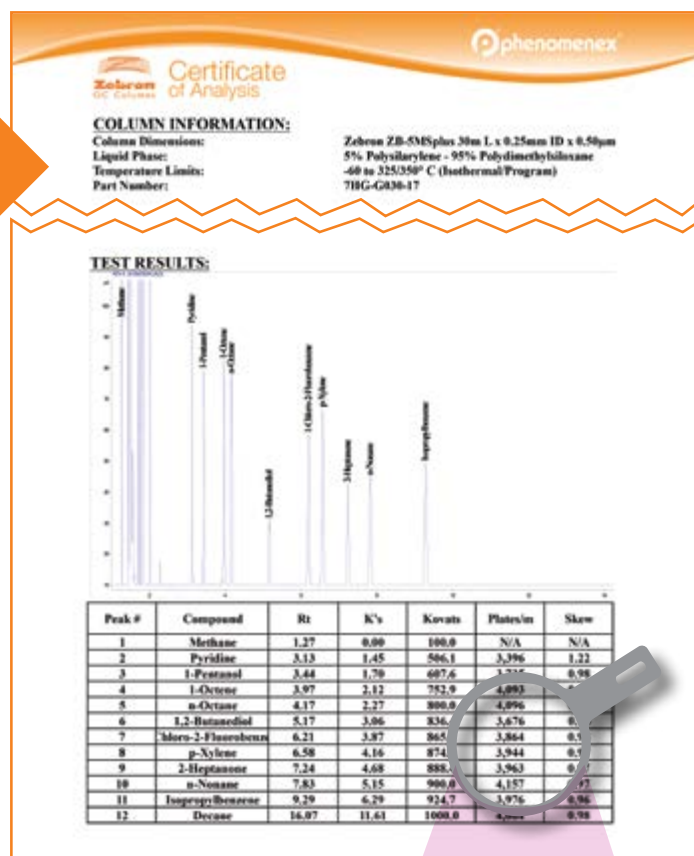
11. Dicyclohexylamine

6. 4-Chlorophenol

12. Pentadecane

A Performance Test To Surpass The Rest

You want great results on every injection, and so do we! We put our columns to the test so you don't have to. That's why Zebron™ ZB-5MS_{PLUS}™ columns are held to industry leading quality standards to ensure reliability and reproducibility, even for the most challenging analytes. If it doesn't pass our test, it's not a ZB-5MS_{PLUS}.



How Does Our QC Test Benefit You?

Test Probe	The PLUS Advantage	Quality Measure
Pyridine 1-Pentanol 1,2-Butanediol	We monitor specific analytes to mimic your most challenging compounds.	Inertness
1-Octene 1-Chloro-2-fluorobenzene p-Xylene 2-Heptanone Isopropylbenzene (cumene)	We screen specific compounds for polarity to ensure your column maintains the same selectivity you're used to.	Polarity
n-Octene n-Nonane Decane	We closely monitor retention characteristics, using hydrocarbons as a reference point.	Retention
Efficiency	Acceptable efficiency is typically defined as 3,700 plates/meter or more. The average ZB-5MS _{PLUS} efficiency exceeds 4,000 plates/meter for maximum separation.	Separation Power
Bleed	Zebron columns provide low bleed for maximum sensitivity and stability.	Stability / Lifetime

Your Ultra Inert GC Column Won't Want To See This Data

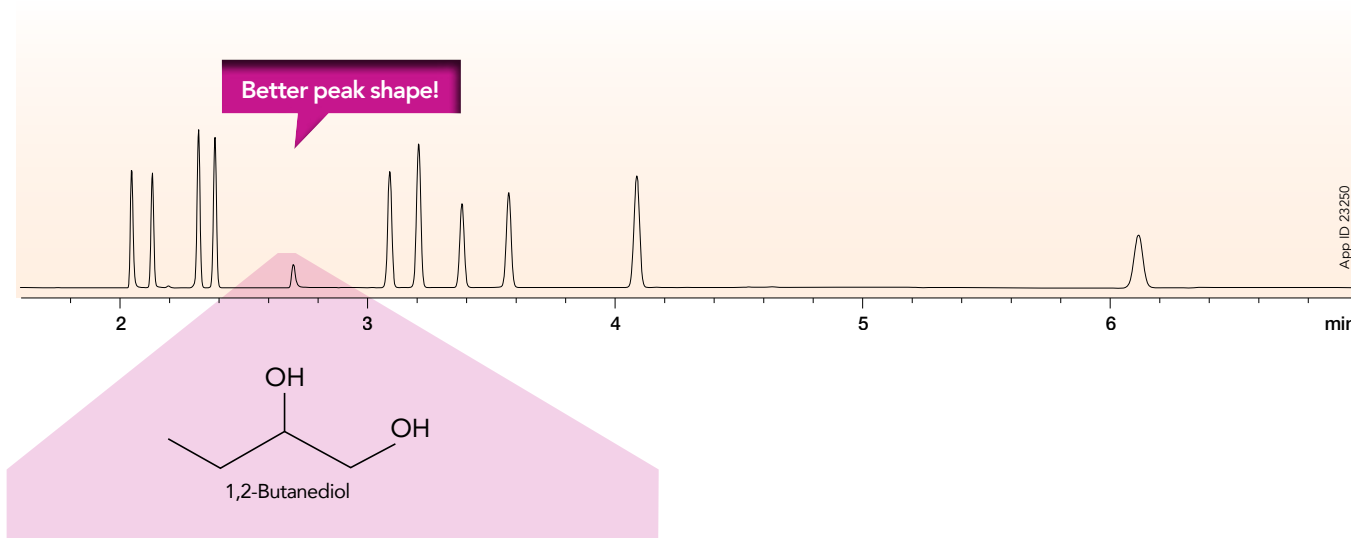
Conditions for all columns:

Column: As listed
Dimensions: 30 meter x 0.25mm x 0.25µm
Injection: Split 200:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 2.4 mL/min (constant flow)
Oven Program: 140 °C (Isothermal)
Detector: FID @ 325 °C

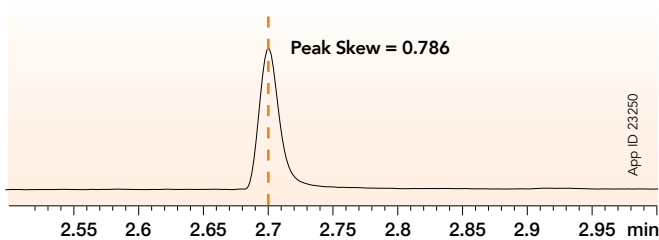
How inert is your ultra inert GC column?

Zebtron™ ZB-5MS^{PLUS}™ outperforms its competitors in a column activity test that is performed by measuring the peak shape of 1,2-Butanediol.

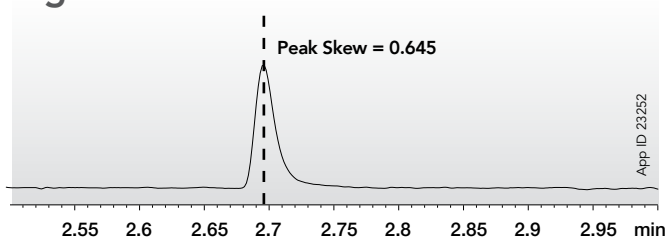
Achieve Peak Performance



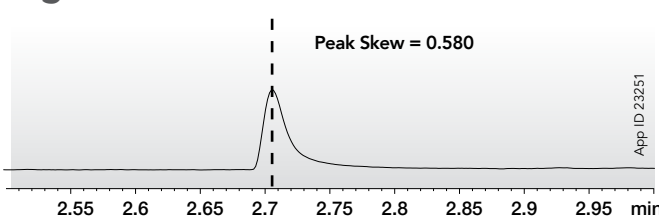
Zebtron ZB-5MS^{PLUS}



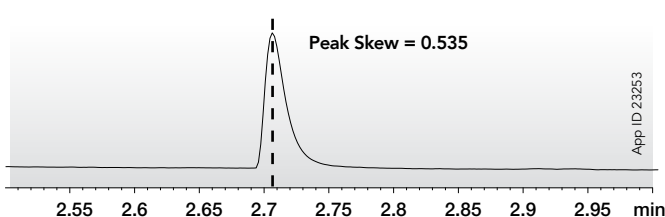
Agilent® DB®-5ms Ultra Inert



Agilent HP®-5ms Ultra Inert



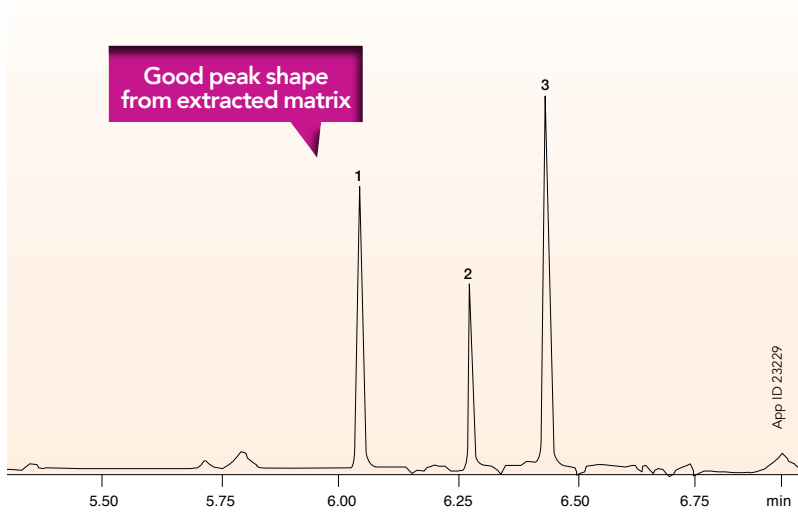
Restek® Rxi®-5Sil MS



Comparative separations may not be representative of all applications.

Cannabinoids In Brownies By GC/MS

TIC of spiked brownies (1µg/g)



- 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 (KS0-8909) 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 0.25mm x 0.25µm

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

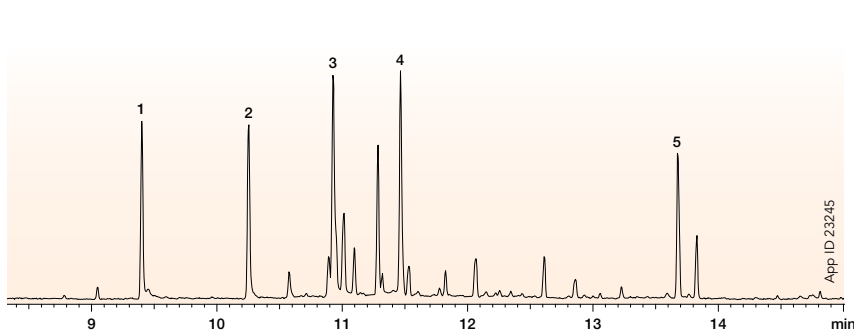
2. Δ-9-Tetrahydrocannabinol

3. Cannabinol



Melamine In Dog Food By GC/MS

TIC of spiked dog food (100µg/g)



- 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 0.25mm x 0.25µm

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

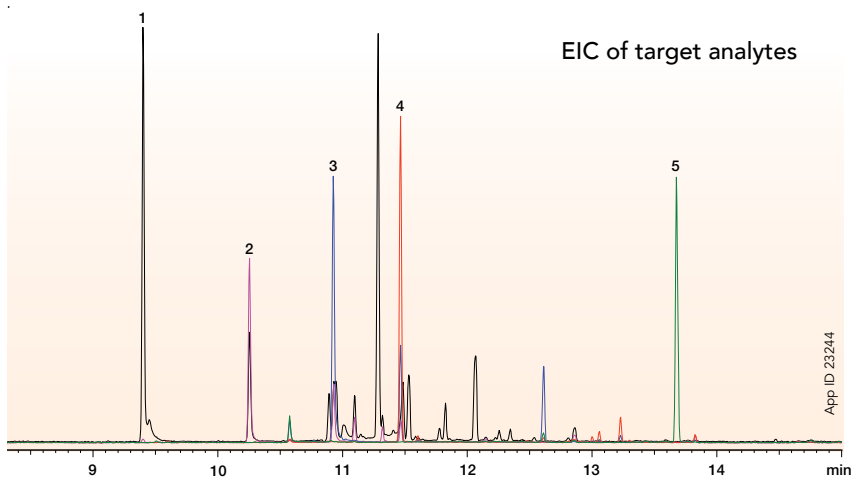
Sample: 1. Cyanuric acid

2. Ammelide

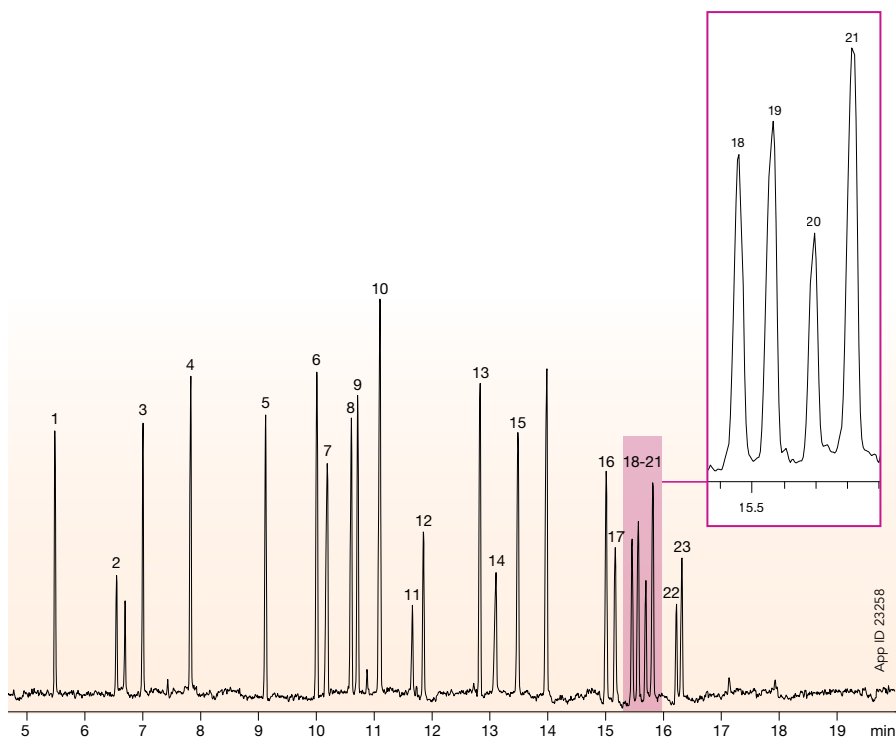
3. Ammeline

4. Melamine

5. Benzoguanamine



Drugs of Abuse By GC/MS

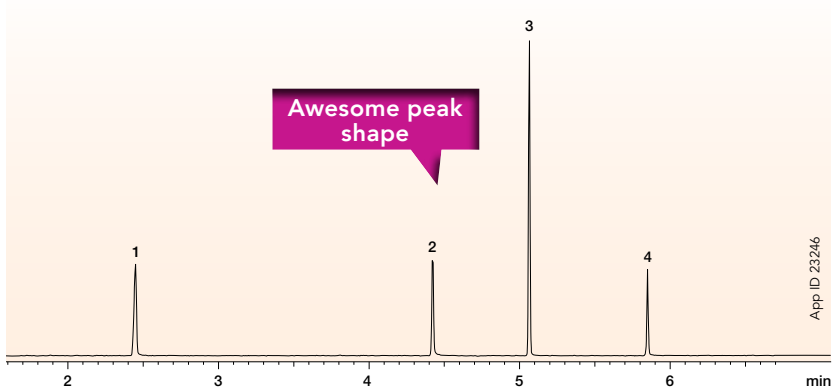


Column: Zebron™ ZB-5MS_{PLUS}™
Dimensions: 30 meter x 0.25mm x 0.25µm
Part No.: 7HG-G030-11
Injection: Splitless @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.4mL/min (constant flow)
Oven Program: 70 °C for 1 min to 150 °C @ 30 °C/min to 320 °C @ 10 °C/min for 5.5 min
Detector: MSD @ 250 °C; 45–450 amu
Note: Analytes are 25ppm in Methanol
Sample:

1. Nicotine	12. Methadone
2. MDA	13. Topiramate
3. MDMA	14. Cocaine
4. MBDB	15. Cocaethylene
5. Meperidine	16. CBD
6. Benzamphetamine	17. Codeine
7. Glutethimide	18. Ethylmorphine
8. PCP	19. Diazepam
9. Doxylamine	20. Hydrocodone
10. Tramadol	21. Δ-9-Tetrahydrocannabinol
11. Procaine	22. 6-MAM
	23. Oxycodone



Ethanolamines By GC/MS



Column: Zebron ZB-5MS_{PLUS}
Dimensions: 30 meter x 0.25mm 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



Customized Support To Solve Your Biggest Challenges



Your Personal GC Specialists

Contact us for method development and optimization assistance for all of your GC needs.

Our Lab Works for You

Meet PhenoLogixSM, our full-service analytical lab that is ready and willing to customize a solution for you.



www.phenomenex.com/PhenoLogix

Best Website In The Industry!

And that's no joke! The Web Marketing Association (WMA) said so. Their annual WebAward names the best websites in 96 industries while setting the standard of excellence for all website development.



“ Phenomenex has become my first stop for web searching GC...applications in our lab. Kudos.

Brandon Doss
Algenol Biofuels ”

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Easily select a column by part number, manufacturer, industry, application or official method in under 1 minute.



Get it all at
www.phenomenex.com/FindGC



Find Your Zebron™ ZB-5MS_{PLUS}™ Column

Ordering Information

Length (m)	ID (mm)	Film (µm)	Temp Limits (°C)	Part No.	Price	with 5 m Guardian™		with 10 m Guardian	
						Part No.	Price	Part No.	Price
15	0.25	0.25	-60 to 325/350	7EG-G030-11	-	-	-	-	-
20	0.18	0.18	-60 to 325/350	7FD-G030-08	-	-	-	-	-
	0.18	0.36	-60 to 325/350	7FD-G030-53	-	-	-	-	-
30	0.25	0.25	-60 to 325/350	7HG-G030-11	-	7HG-G030-11-GGA	-	7HG-G030-11-GGC	-
	0.25	0.50	-60 to 325/350	7HG-G030-17	-	-	-	7HG-G030-17-GGC	-
	0.25	1.00	-60 to 325/350	7HG-G030-22	-	-	-	-	-
	0.32	0.25	-60 to 325/350	7HM-G030-11	-	-	-	-	-
	0.32	1.00	-60 to 325/350	7HM-G030-22	-	-	-	-	-
60	0.25	0.25	-60 to 325/350	7KG-G030-11	-	-	-	-	-

guarantee

If Zebron columns do not provide you with equivalent or better separations as compared to any other GC column of the same phase and comparable dimensions, return the product with comparative data within 45 days for a FULL REFUND.

Expand Your 5 Phase Work!

Phenomenex carries a complete line of 5 phase GC columns and accessories for a versatile set of options tailored to your work. Explore the full selection of Zebron columns — from high temperature to fit-for-purpose 5 % phenyl type phases.



ZB-5



ZB-5MSi



ZB-5HT Inferno™



ZB-5MS



ZB-5MS_{PLUS}



ZB-SemiVolatiles

Learn more at
www.phenomenex.com/5MSplus

Terms and Conditions

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Disclaimer

Comparative separations may not be representative of all applications. Phenomenex is in no way affiliated with Agilent Technologies, Inc. Restek Corporation, or Sigma-Aldrich Co. LLC. The opinions stated herein are solely those of the speaker and not necessarily those of any company or organization.

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Zebtron
GC Columns

ZB-5MS^{PLUS}™

The Next Generation of Inertness

www.phenomenex.com/5MSplus

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- Agilent HP®-5ms Ultra Inert
- Restek® Rxi®-5Sil MS
- Supelco® SLB®-5ms

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