

# 3 Ways To Choose

All GC 5 Phases Are Not The Same!

# PHASE

# 5

- ZB-5
- ZB-5MSi
- ZB-5HT Inferno™
- ZB-5ms
- ZB-5MS<sub>PLUS</sub>™
- ZB-SemiVolatiles



# Choosing Your 5 Phase Is Easy

Use the **NEW** GC Column Finder web app for easy column selection in under 1 minute!



## Find The Way You Want

Simply choose by part number, manufacturer, application, or official method to find the right GC column for your analysis.



## Column Selection, Simplified

Choose a category, choose your criteria, get a recommendation instantly. Simple as that.



## Get More Than Just Results

Get applications and column overviews with your results – and save them for easy viewing.

Get it all at  
[www.phenomenex.com/5Phase](http://www.phenomenex.com/5Phase)

# 3 Ways To Choose Your 5 Phase

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## Available Zebron™ 5 Phase Columns

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- 17 ZB-SemiVolatiles

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# Understanding The Selectivities

## How Are They Similar?

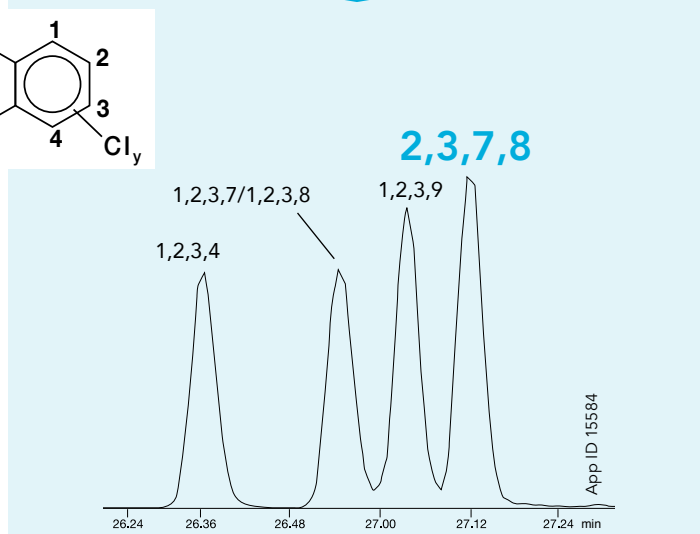
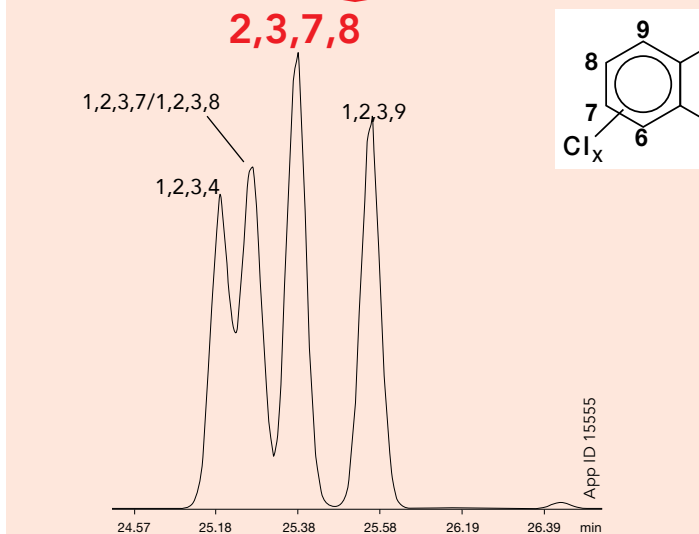
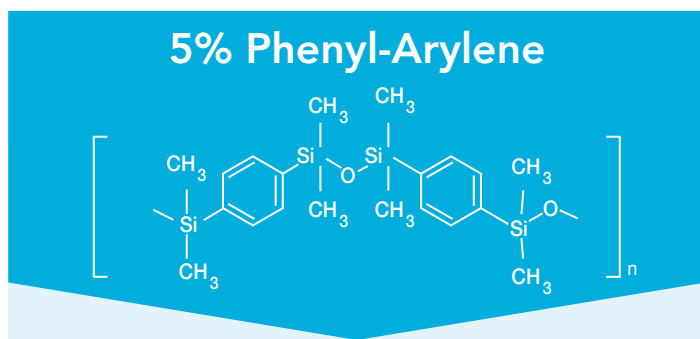
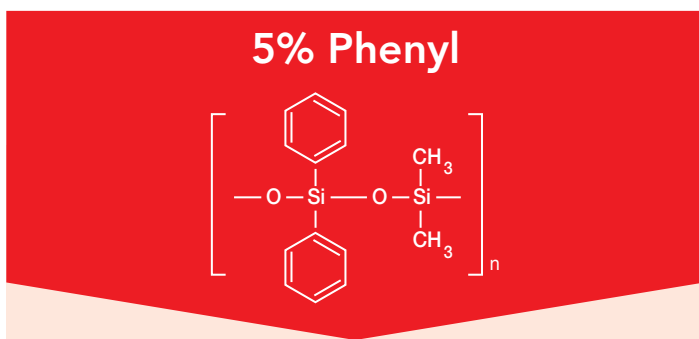
There are many variations of a "5" phase GC column. Nearly all of them work well for a broad range of compound classes, making them an ideal part of a GC analyst's toolkit! From pesticides and PAHs to drugs of abuse, waxes, or fuel hydrocarbons, all Zebron™ 5 phase columns are:

- A low polarity selectivity ideal for a variety of sample types
- Individually tested for reproducible performance
- Equivalent to USP phases G27, G36, and G41
- Certified for use with GC/MS or GC/MS/MS applications

## The Difference – Pendant vs. Arylene

Though similar in many ways, the chemistries of 5 % phenyl (pendant-based) and 5 % phenyl-arylene (arylene-based) phases are not the same. These slight differences are significant to the chromatographic result! In arylene-based phases, the phenyl rings are incorporated into the polymer backbone, which limits their access. Compounds with geometries that better fit into the arylene polymer network – such as polycyclic aromatic hydrocarbons (PAHs) and PCBs, for example – will tend to interact more strongly.

In the example below, both retention times and resolution differ between the 5 % phenyl and 5 % phenyl-arylene phase. The aromatic dioxins are better resolved on the phenyl-arylene phase, but are also retained longer.



**Who says you can't be selective?**  
 p. 10 Pendant phases  
 p. 14 Arylene phases

# Stability, Robustness, and Temperature

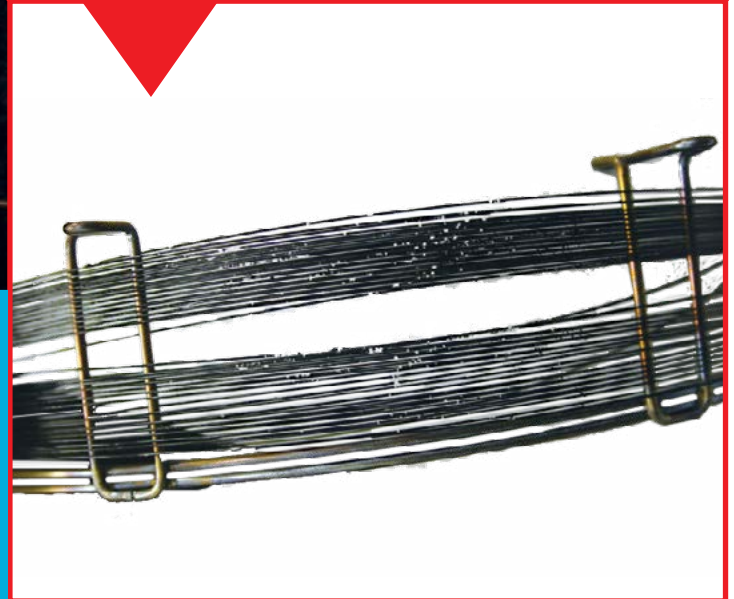
## What To Consider: 5 Phase Fail Modes

GC columns typically have two fail modes. Either internal or external deterioration. Internally, the stationary phase can degrade at high temperatures, resulting in increased bleed. Externally, the polyimide coating can pyrolyze at temperatures above 320 °C, causing flaking or pitting. Be sure to consider these factors when selecting your 5 phase column. All Zebtron™ 5 phases offer good phase stability and robust performance; if however you are ramping to particularly high temperatures or working with dirty samples, consider a Zebtron Inferno™ 5 phase column.



Standard columns can become brittle and break after prolonged high temperature exposure

Standard columns can deteriorate and show pitting at the high temperatures required to bake off contaminants.



### It's getting hot in here.

Zebtron Inferno columns are stable to 430 °C so they remain flexible and easy to work with, even after being exposed to many hours at extreme temperatures. This stability offers the flexibility of a non-metal column while providing long lifetimes, low bleed, and low activity.

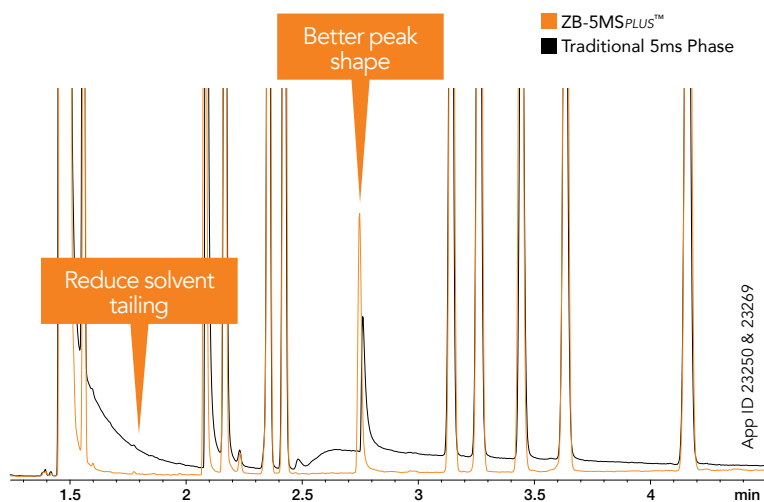


# Review Column Characteristics

## The Importance of Inertness

Increased column activity can lead to low acid / base sensitivity or analyte misidentification, causing incorrect data and big headaches! Active sites on a GC column's surface can result in analyte adsorption and degradation, which negatively affect peak shape and response. If working with active compounds, choose a Zebron™ 5 phase column with improved inertness.

### Better Inertness Reduces Tailing

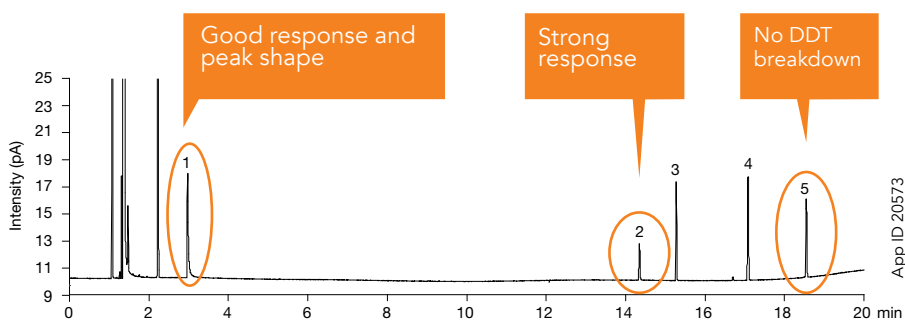


**Conditions for both columns:**

- 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	

### Better Inertness Improves Responses and Reduces Analyte Breakdown



- Column:** Zebron ZB-SemiVolatiles
- Dimensions:** 30 meter x 0.25mm x 0.25 μm
- Part No.:** 7HG-6027-11
- Injection:** Split 100:1 @ 175 °C, 1 μL
- Carrier Gas:** Hydrogen @ 40 cm/sec (constant pressure)
- Oven Program:** 40 °C for 2 min to 300 °C @ 15 °C/min for 3.5 min
- Detector:** FID @ 325 °C
- Sample:** Analytes are 20 ppm in Dichloromethane
 

1. Pyridine
2. Pentachlorophenol
3. DFTPP
4. Benzidine
5. DDT
6. DDD

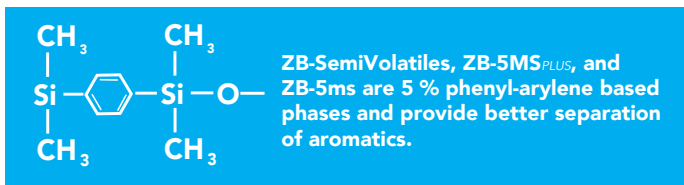
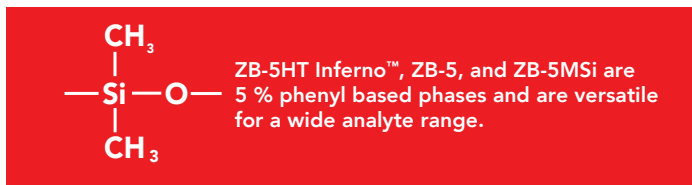
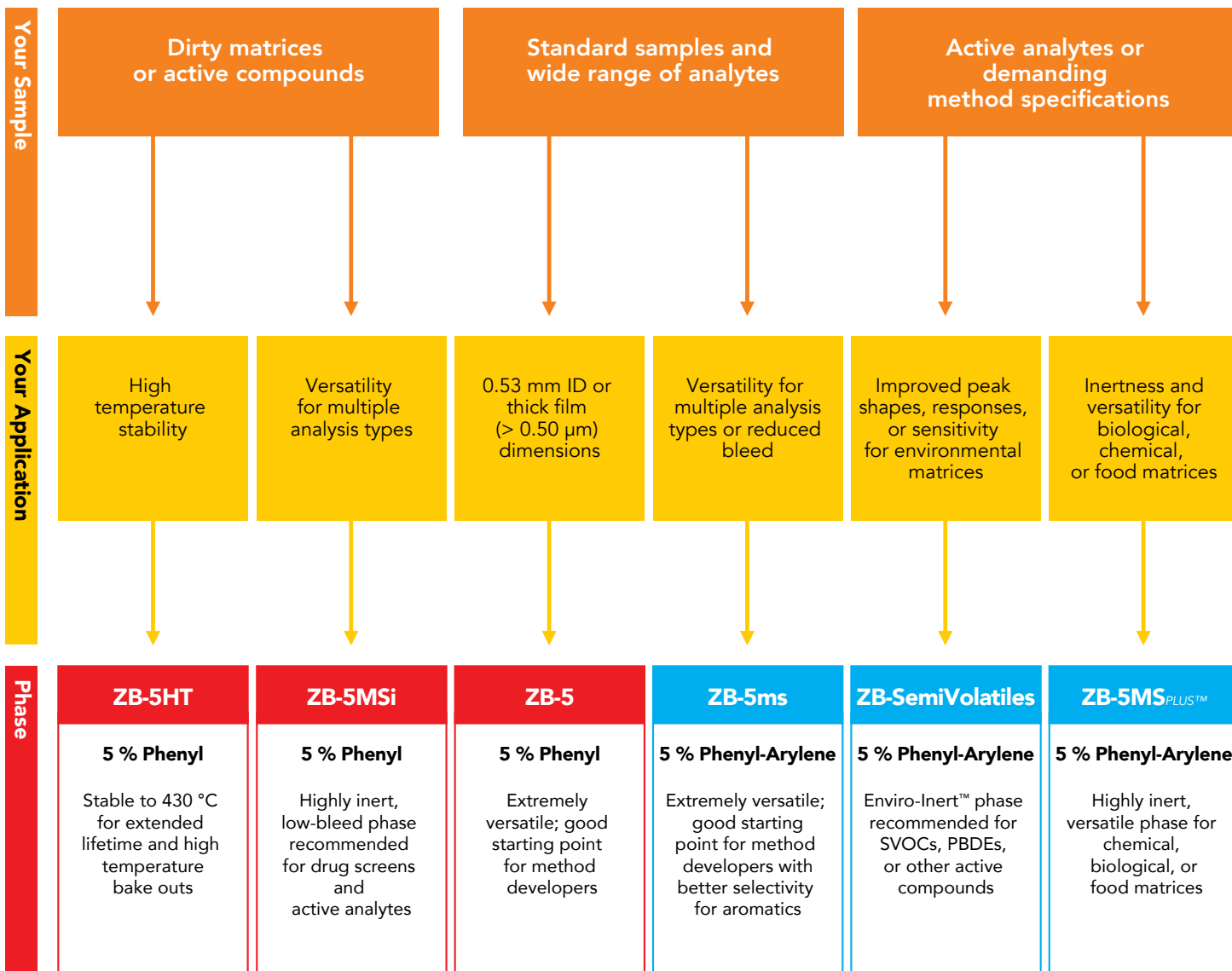
**Inert 5 phases? We've got plenty.**

- p. 12** See ZB-5MSi
- p. 16** See ZB-5MS<sub>PLUS</sub>™
- p. 17** See ZB-SemiVolatiles

Comparative separations may not be representative of all applications.





# General Selection Guidelines

The following selection guidelines are for choosing a Zebron™ 5 phase column. Please contact your Phenomenex representative for additional assistance.



# Selection Chart for Common Applications

The following selection chart can be used as a starting point for choosing a Zebron™ 5 phase column for your application. Please contact your Phenomenex representative for additional assistance.

Industry	Application	ZB-5	ZB-5MSi	ZB-5HT Inferno™	ZB-5ms	ZB-5MS <sub>PLUS</sub> ™	ZB-SemiVolatiles
<b>Cosmetic &amp; Personal Care</b> 	Alkalis		●			●	
	Allergens				●	●	
	Coloring and Fragrance Compounds						
	Preservatives				●	●	
	Solvents in Cleaning Products				●	●	
	Surfactants				●	●	
<b>Environmental</b> 	Acrylamide			●			●
	Carbonyls						●
	Dioxins, Furans, and Polychlorinated Biphenyls (PCBs)				●		●
	Endothall				●		●
	Explosives and Related Compounds	●	●	●		●	
	Nitrosamines		●				●
	Nonhalogenated Organics			●			
	Pesticides		●				●
	Phthalate Esters		●	●	●		●
	Polybrominated Diphenyl Esters (PBDEs)	●		●			●
	Polynuclear Aromatic Hydrocarbons (PAHs)				●	●	●
	Semivolatile Organic Compounds (SVOCs)						●
	<b>Pharmaceutical</b> 	Active Pharmaceutical Ingredient (API)		●			●
Preservatives in Pharmaceuticals			●			●	
Residual Solvents		●					
Surfactants					●	●	
<b>Toxicology &amp; Forensics</b> 	6-Monoacetylmorphine (6-MAM)		●			●	
	Accelerants				●	●	
	Amphetamines and Related Metabolites		●			●	
	Antihistamines and Cold / Sinus Medications		●				
	Bacterial Acid Methyl Esters (BAMEs)				●	●	
	Barbiturates		●			●	
	Benzodiazepines		●			●	
	Cannabinoids		●			●	
	Cocaine		●			●	
	Drug Screening		●			●	
	Estrogens					●	
	Explosives	●	●	●		●	
	Gamma-Hydroxybutyrate (GHB)					●	
	Ketamines					●	
	Lysergic Acid Diethylamide (LSD)					●	
	MDMA (Ecstasy)					●	
	Methadone		●				
	Opiates		●			●	
	Phencyclidine (PCP)		●			●	
	Phenothiazines		●			●	
	Steroids	●	●			●	
Sympathomimetic Amines and Tryptamines		●			●		

**Selection Key**

- = Most popular recommended phase for target separation
- = Alternate phase which may provide similar results



# Selection Chart for Common Applications

The following selection chart can be used as a starting point for choosing a Zebron™ 5 phase column for your application. Please contact your Phenomenex representative for additional assistance.

Industry	Application	ZB-5	ZB-5MSi	ZB-5HT Inferno™	ZB-5ms	ZB-5MSPLUS™	ZB-SemiVolatiles
	<b>Food Quality</b>				●	●	
	Adulterants				●	●	
	Beverage Analysis				●	●	
	Cannabis Testing		●			●	
	Edible and Essential Oils				●	●	
	Fatty Acid Ethyl Esters (FAEEs)				●	●	
	Flavor Volatiles				●	●	
	Nitrosamines			●		●	
	Nutraceuticals, Antioxidants	●			●	●	
	Organic Acids					●	
	Phthalate Esters			●	●	●	
	Preservatives				●	●	
	Sterols, Aliphatic Alcohols, Waxes	●		●			
	Sugars (Alditol Acetates)					●	
	Triglycerides			●			
	<b>Food Safety</b>			●		●	
	Acrylamide			●		●	
	Allergens				●	●	
	Bisphenol A, BADGE, BFDGE, NOGE				●	●	
	Chloropropanols (3-MCPD)				●	●	
	Dioxins, Furans, and PCBs					●	●
	Disinfection By-Products (DBPs) and Solvents				●	●	
	Parabens				●	●	
	Pesticides		●			●	●
	Polynuclear Aromatic Hydrocarbons (PAHs)				●	●	●
	Tocopherols				●	●	
	Veterinary Drug Residues		●			●	●
		<b>Fuels</b>			●		
Biodiesel				●			
Fuels by Pattern Recognition				●	●	●	
	<b>Industrial Chemicals</b>				●	●	
	Alcohols				●	●	
	Amines		●			●	
	Ketones				●	●	
	Pesticides		●			●	●
	Phenols		●			●	
	Solvents				●	●	
Terpenes				●	●		

## Use GC Column Finder Online

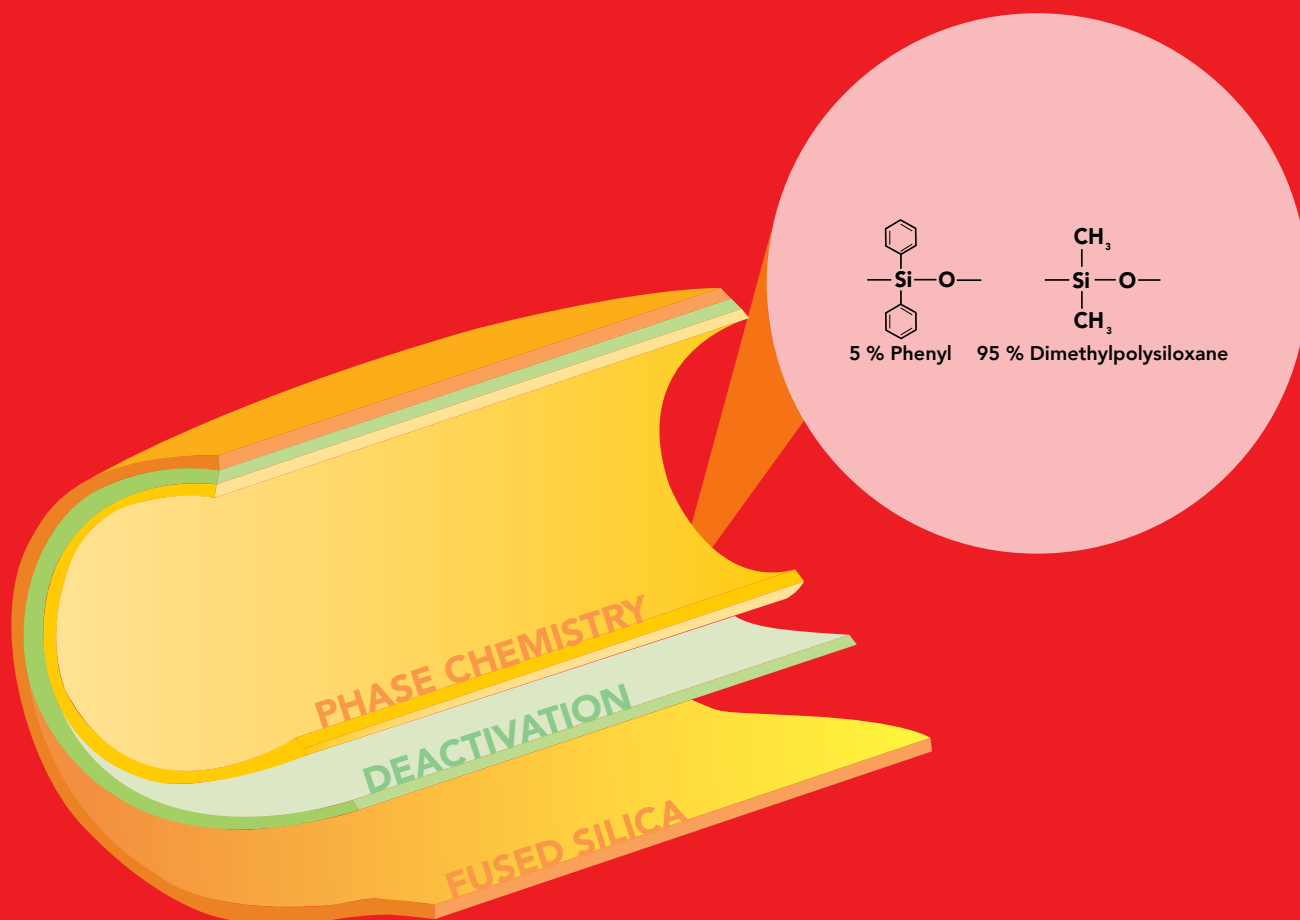
Easily select a 5 phase column by part number, manufacturer, industry, application, or official method in under 1 minute.



[www.phenomenex.com/5Phase](http://www.phenomenex.com/5Phase)

# 5 % Phenyl Phases

- Versatile for a wide analyte range
- Available in standard, inert, and high temperature styles
- Replace 5% phenyl 95% dimethylpolysiloxane phases from Agilent®, Restek®, Supelco®, and other manufacturers

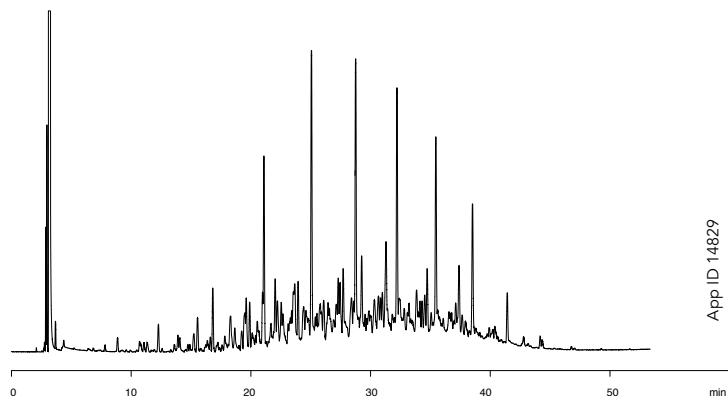


# ZB-5

## Low Polarity For A Wide Application Range

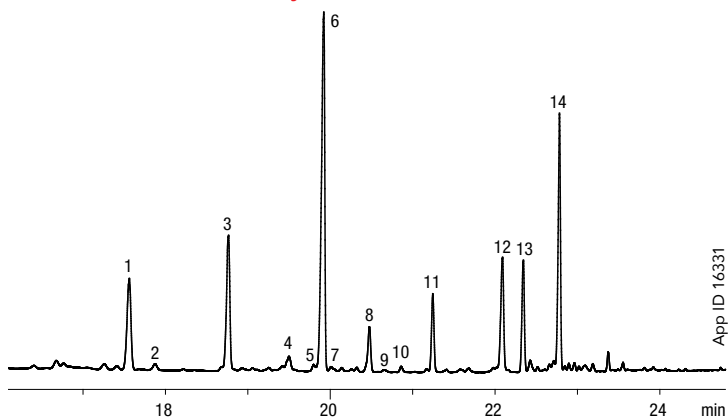
- Rugged, versatile low polarity column for general lab purpose
- Resilient to dirty samples—long column life
- Low bleed (MS Certified) especially suited to high sensitivity work using GC/MS
- Extremely inert for active compounds such as drugs or pesticides
- Great column for unknown samples

### Kerosene by GC/FID



**Column:** Zebron ZB-5  
**Dimensions:** 30 meter x 0.53 mm x 1.50  $\mu$ m  
**Part No.:** 7HK-G002-28  
**Injection:** Split 30:1 @ 275 °C, 1  $\mu$ L  
**Carrier Gas:** Helium @ 4.1 mL/min  
**Oven Program:** 40 °C for 5 min to 300 °C @ 4 °C/min for 5 min  
**Detector:** FID @ 300 °C  
**Sample:** Kerosene

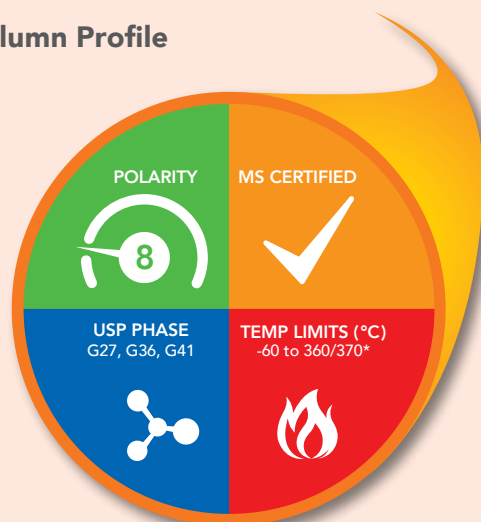
### Vitamin E and Sterols by GC/FID



**Column:** Zebron ZB-5  
**Dimensions:** 30 meter x 0.25 mm x 0.10  $\mu$ m  
**Part No.:** 7HG-G002-02  
**Injection:** Splitless @ 220 °C, 1  $\mu$ L  
**Carrier Gas:** Helium @ 1.8 mL/min (constant flow)  
**Oven Program:** 110 °C for 0.2 min to 140 °C @ 30 °C/min to 230 °C @ 10 °C/min for 6 min to 340 °C @ 10 °C/min for 15.8 min  
**Detector:** FID @ 340 °C  
**Sample:**

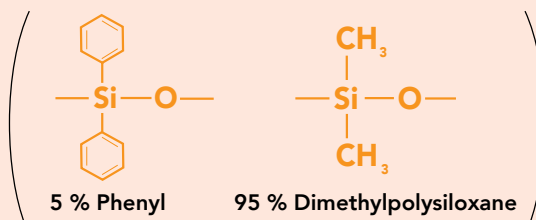
1. Squalene	8. $\gamma$ -Tocomoenoel
2. FFA C24:0	9. Stigmasta-3,5-diene
3. $\delta$ -Tocopherol	10. Cholesterol
4. $\delta$ -Tocomoenoel	11. $\alpha$ -Tocopherol
5. Campesta-3,5-diene	12. Campesterol
6. $\gamma$ -Tocopherol	13. Stigmasterol
7. Stigmasta-3,5,22-triene	14. $\beta$ -Sitosterol

### Column Profile



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

### Phase Chemistry



### Alternative To

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

Agilent®	Alltech®	Restek®	SGE®	Supelco®	OV®
<ul style="list-style-type: none"><li>• DB®-5</li><li>• HP-5</li><li>• HP-PAS-5</li><li>• CP-Sil 8 CB</li><li>• Ultra 2</li></ul>	<ul style="list-style-type: none"><li>• AT-5</li><li>• EC-5</li></ul>	<ul style="list-style-type: none"><li>• Rtx®-5</li></ul>	<ul style="list-style-type: none"><li>• BP5</li><li>• BPX5</li></ul>	<ul style="list-style-type: none"><li>• MDN-5</li><li>• SPB®-5</li><li>• PTE-5</li><li>• SE-54</li><li>• PTA-5</li><li>• Equity®-5</li><li>• Sac-5</li></ul>	<ul style="list-style-type: none"><li>• OV-5</li></ul>

### Applications

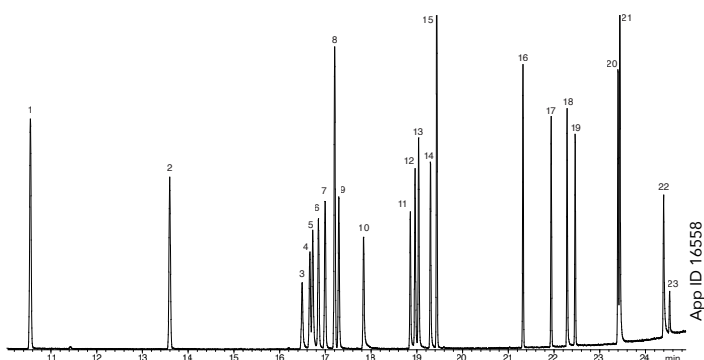
- Alkaloids
- Drugs
- Essential Oils
- Flavors
- Halo-hydrocarbons
- Herbicides
- PCBs / Aroclors
- Pesticides
- Phenols

# ZB-5MSi

## 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

### Endocrine Disruptors by GC/MS



**Column:** Zebron ZB-5MSi

**Dimensions:** 30 meter x 0.25 mm x 0.25 μm

**Part No.:** 7HG-G018-11

**Injection:** Split 40:1 @ 250°C, 1 μL

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

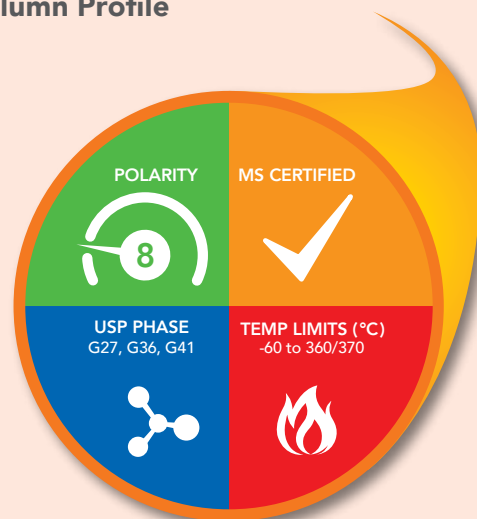
**Oven Program:** 100°C to 180°C @ 5°C/min to 320°C @ 15°C/min

**Detector:** MSD @ 180°C, 45-450 amu

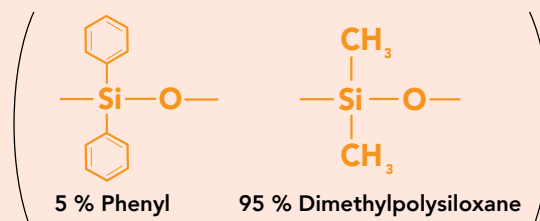
**Sample:** Analytes are 50 ppm in acetone

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

### Column Profile



### Phase Chemistry



### Alternative To

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

Agilent®	Alltech®	Restek®	SGE®	Supelco®	OV®
• DB®-5	• AT-5	• Rtx®-5	• BP5	• MDN-5S	• OV-5
• HP-5		• Rtx-5MS	• BPX5	• SPB®-5	
• HP-5ms		• Rtx-5Amine		• Equity®-5	
• HP-5msi		• Rxi®-5ms			

### Applications

- Drugs
- EPA Methods
- FAMES
- Nitrosamines
- Pesticides
- Phenols

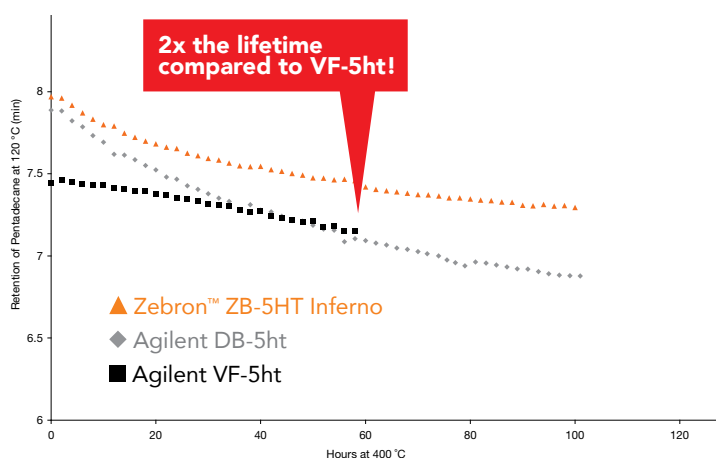
# ZB-5HT Inferno™

## Robust Performance Up To 430 °C

- First non-metal columns stable to 430 °C
- Robust column well suited for analysts struggling with high boilers, contaminants, or carryovers
- Longer lifetime with rugged high temperature, polyimide coated, fused silica tubing
- Low activity, provides good peak shape for acidic and basic samples

### ZB-5HT Inferno Wins In the Lifetime Test

For the test, all columns were held at 400 °C for 2 hours and then the oven was lowered to 120 °C for pentadecane analysis. Pentadecane retention between Zebron ZB-5HT Inferno and another traditional 5% phenyl 95% dimethylpolysiloxane column was compared. The VF-5ht column died around 40 hours at 400 °C whereas ZB-5HT Inferno maintained great retention of pentadecane over 100 hours — over 2X the lifetime!



#### Conditions for all columns:

**Dimensions:** 30 meter x 0.25 mm x 0.10 µm

**Injection:** 1.0 µL of test mix AG0-7578

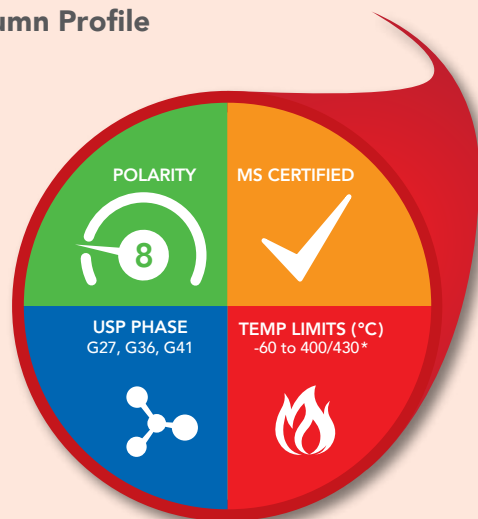
**Carrier Gas:** Helium @ 1.9 mL/min (constant flow)

**Oven Program:** 120 °C (Isothermal)

**Detector:** Flame Ionization Detector (FID) @ 400 °C

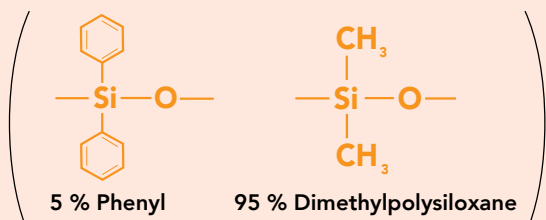
**Sample:** Pentadecane

### Column Profile



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

### Phase Chemistry



### Alternative To

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

Agilent®	Alltech®	Restek®	SGE®	Supelco®
• DB®-5ht	• AT-5	• Stx®-5HT	• BP5	• HT-5
• DB-5	• EC-5	• XTI®-5HT	• BPX5	
• HP-5		• Rtx®-5		
• VF-5ht		• Rxi®-5HT		

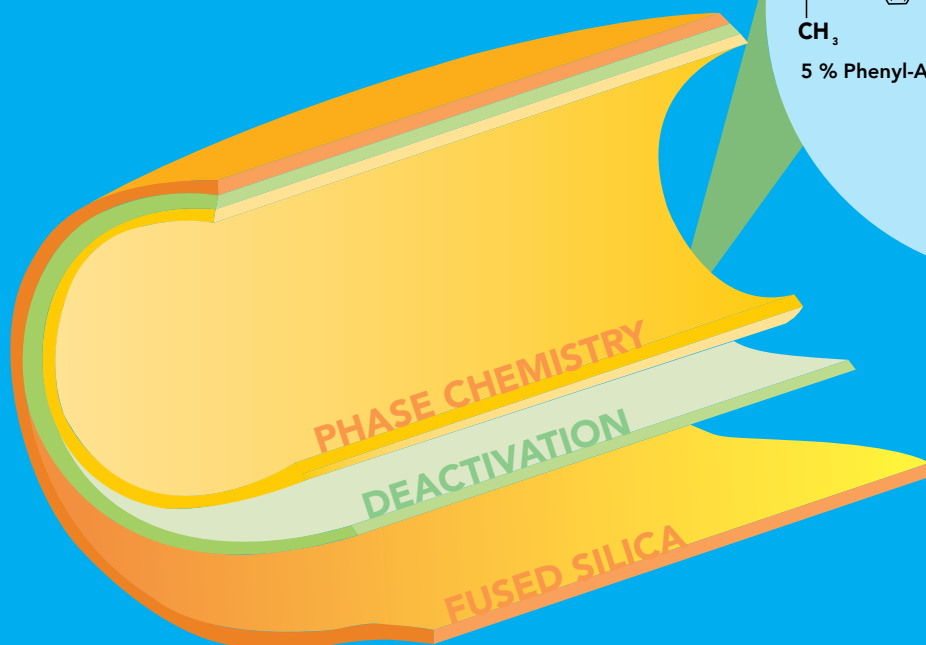
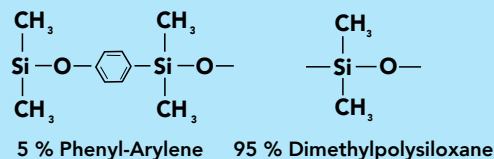
### Applications

- Dirty or Highly Contaminated Samples
- High Boiling Compounds
- High Molecular Weight Waxes
- Hydrocarbon Separations
- Polymers/Plastics
- Sterols
- Triglycerides

Comparative separations may not be representative of all applications.

# 5 % Phenyl-Arylene Phases

- Improve separations for aromatic analytes
- Available in standard, inert, and application-based styles
- Replace 5% phenyl-arylene 95% dimethylpolysiloxane phases from Agilent<sup>®</sup>, Restek<sup>®</sup>, Supelco<sup>®</sup>, and other manufacturers



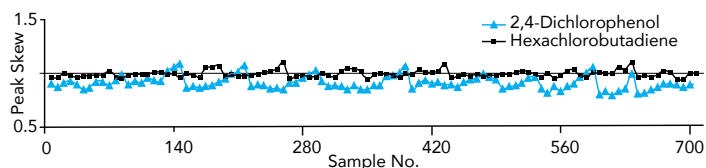
# ZB-5ms

## Robust Results, Versatile Performance

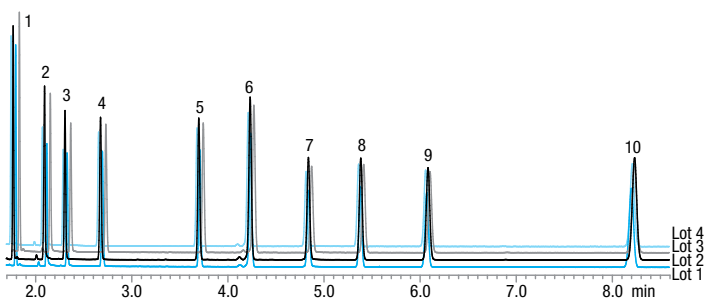
- Popular rugged column for general purpose use
- High response for acids and bases
- Enhanced resolution of polyaromatic hydrocarbons (PAHs) and other multi-ring aromatic compounds

### Long Lifetime

Consistent response after more than 700 samples at pH 2!



### Reproducible Results



**Column:** Zebtron ZB-5ms

**Dimensions:** 30 meter x 0.25 mm x 0.25 μm

**Part No.:** 7HG-G010-11

**Injection:** Split 1:100 @ 250°C, 1.4 μL

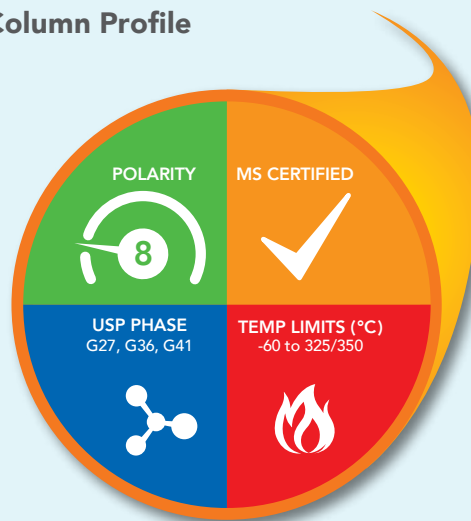
**Carrier Gas:** Hydrogen @ 140°C, 40 cm/sec

**Oven Program:** 140°C (Isothermal)

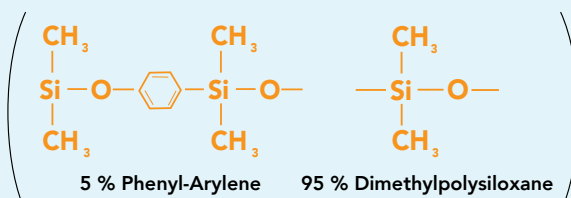
**Detector:** FID @ 325°C

- Sample:**
1. Decane
  2. 2-Ethylhexanoic Acid
  3. 1,6-Hexanediol
  4. 4-Chlorophenol
  5. Tridecane
  6. 1-Methylnaphthalene
  7. 1-Undecanol
  8. Tetradecane
  9. Dicyclohexylamine
  10. Pentadecane

### Column Profile



### Phase Chemistry



### Alternative To

Upgrade to Zebtron™ 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

### Applications

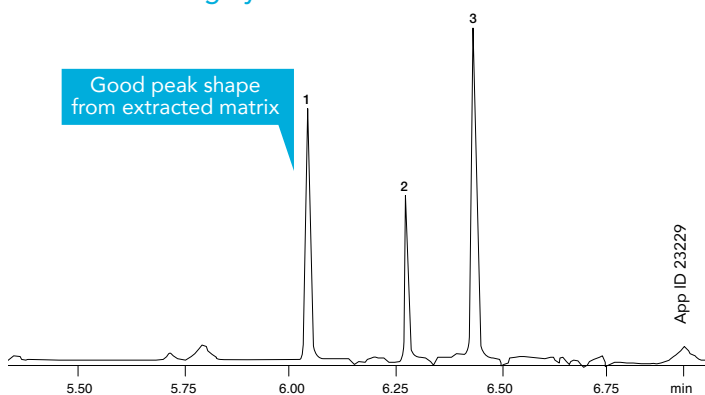
- Acids
- Alkaloids
- Amines
- Dioxins
- Drugs
- Essential Oils
- Flavors
- FAMES
- Halo-hydrocarbons
- Herbicides
- PCBs/Aroclors
- Pesticides
- Phenols
- Solvents and Solvent Impurities

# ZB-5MS<sup>PLUS</sup>™

## 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

### Cannabis Testing by GC/MS



- Extraction Protocol:**
1. Combine 1 g of chocolate brownie containing cannabinoids 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:** Zebtron™ ZB-5MS<sup>PLUS</sup>

**Dimensions:** 30 meter x 0.25 mm x 0.25 μm

**Part No.:** 7HG-G030-11

**Injection:** Splitless @ 250 °C, 1 μL

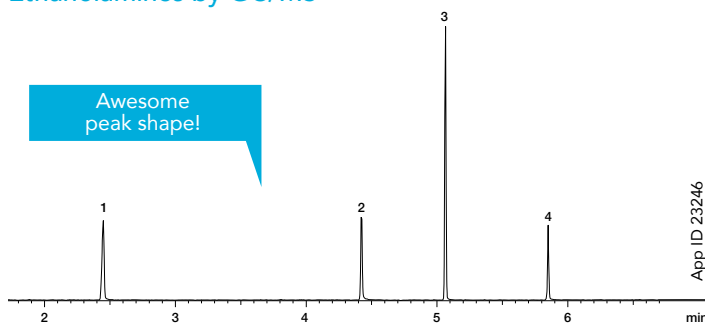
**Carrier Gas:** Helium @ 1.5 mL/min (constant flow)

**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:** Zebtron ZB-5MS<sup>PLUS</sup>

**Dimensions:** 30 meter x 0.25 mm x 1.00 μm

**Part No.:** 7HG-G030-22

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

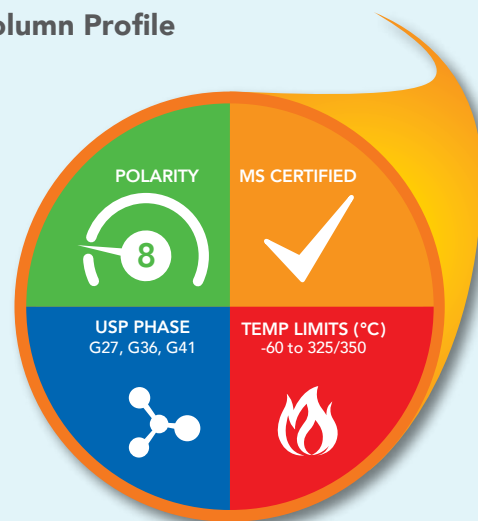
**Carrier Gas:** Helium @ 1.4 mL/min (constant flow)

**Oven Program:** 30°C to 300°C @ 40°C/min

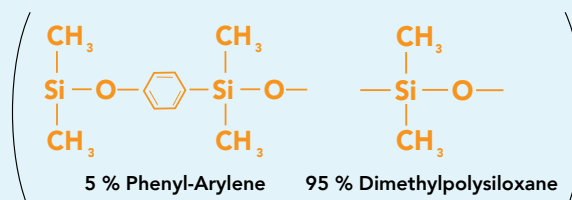
**Detector:** MSD @ 320 °C

- Sample:**
1. Monoethanolamine
  2. Diethanolamine
  3. Triethylene glycol monomethyl ether (IS)
  4. Triethanolamine

### Column Profile



### Phase Chemistry



### Alternative To

Upgrade to Zebtron™ from any 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

### Applications

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

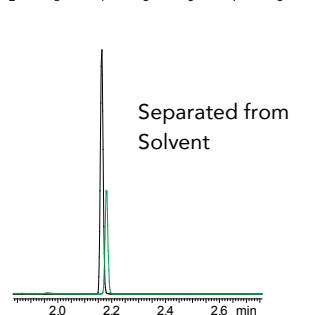
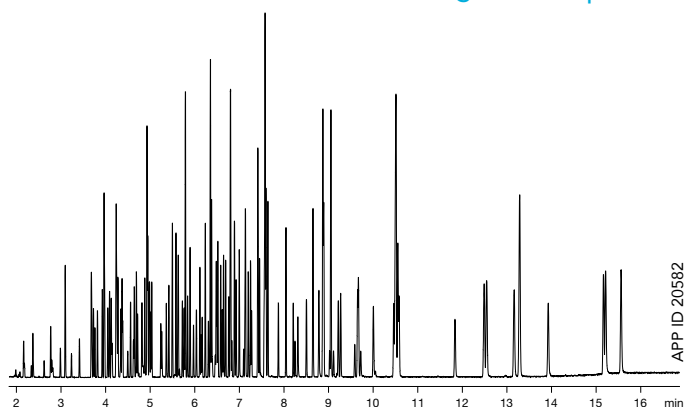


# ZB-SemiVolatiles

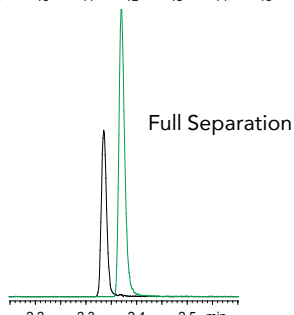
## Best-In-Class Performance for Environmental Samples

- Specifically designed to overcome obstacles for sensitive methods
- Enviro-Inert™ Technology provides improved inertness without compromising selectivity
- Our column of choice for acids, bases, amines, and other active compounds in environmental samples

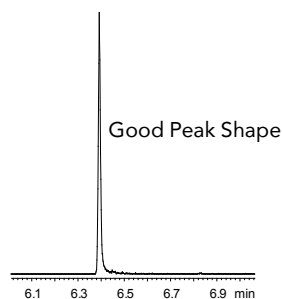
### EPA Method 8270D: Semivolatile Organic Compounds



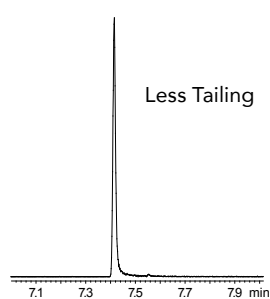
1,4-Dioxane-D8 and 1,4-Dioxane



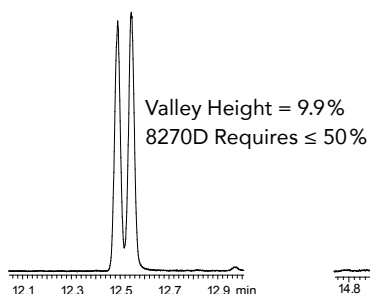
N-Nitrosodimethylamine and Pyridine



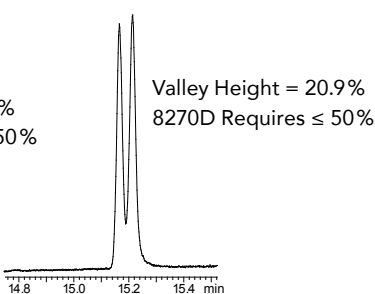
2,4-Dinitrophenol



Pentachlorophenol

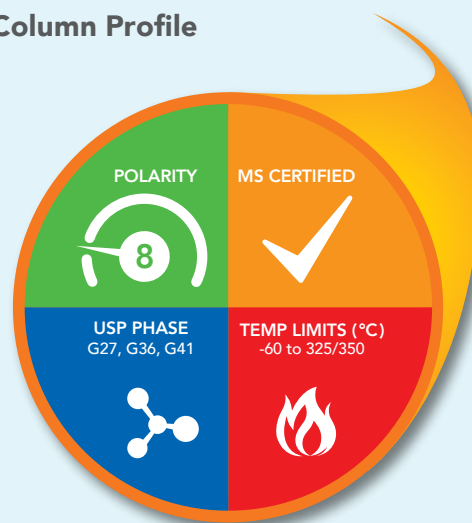


Benzo[b]fluoranthene and Benzo[k]fluoranthene

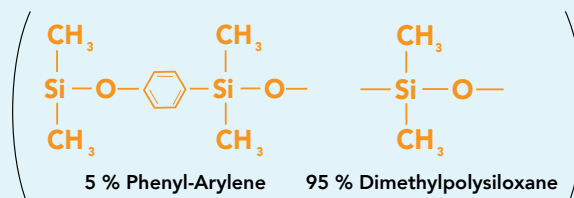


Indeno[1,2,3-cd]pyrene and Dibenz[a,h]anthracene, both share mass 276

### Column Profile



### Phase Chemistry



### Alternative To

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

Agilent®	Restek®	Supelco®
<ul style="list-style-type: none"> <li>• DB®-5ms</li> <li>• DB-5ms Ultra Inert</li> <li>• DB-5.625</li> <li>• HP-5ms</li> <li>• HP-5ms Ultra Inert</li> <li>• VF-5ms</li> </ul>	<ul style="list-style-type: none"> <li>• Rxi®-5Sil MS</li> <li>• Rxi-5MS</li> </ul>	<ul style="list-style-type: none"> <li>• SLB®-5ms</li> </ul>

### Applications

- Dioxins
- Semivolatiles (SVOCs)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polybrominated Diphenyl Ethers (PBDEs)
- Active Compounds Acids Bases

# Ordering Information

Phase	ID (mm)	df (µm)	15 meter	30 meter	60 meter
<b>ZB-5</b> Rugged, low bleed phase for a variety of applications; recommended for additives and preservatives (tocopherols in food)	0.25	0.10	7EG-G002-02	7HG-G002-02	7KG-G002-02
	0.25	0.25	7EG-G002-11	7HG-G002-11	7KG-G002-11
	0.25	0.50	7EG-G002-17	7HG-G002-17	7KG-G002-17
	0.25	1.00	7EG-G002-22	7HG-G002-22	7KG-G002-22
	0.32	0.10	7EM-G002-02	7HM-G002-02	–
	0.32	0.25	7EM-G002-11	7HM-G002-11	7KM-G002-11
	0.32	0.50	–	7HM-G002-17	–
	0.32	1.00	7EM-G002-22	7HM-G002-22	7KM-G002-22
	0.53	0.50	7EK-G002-17	7HK-G002-17	–
	0.53	1.50	7EK-G002-28	7HK-G002-28	7KK-G002-28
	0.53	3.00	7EK-G002-36	7HK-G002-36	–
<b>ZB-5MSi</b> Highly inert 5 % phenyl phase for acidic / basic compounds, drugs of abuse, and pesticides	0.25	0.25	7EG-G018-11	7HG-G018-11	7KG-G018-11
	0.25	0.50	–	7HG-G018-17	–
	0.25	1.00	–	7HG-G018-22	–
	0.32	0.25	–	7HM-G018-11	–
	0.32	0.50	–	7HM-G018-17	–
<b>ZB-5HT Inferno™</b> Robust fused silica phase stable to 430 °C; excellent for testing of triglycerides and sterols	0.25	0.10	7EG-G015-02	7HG-G015-02	–
	0.25	0.25	7EG-G015-11	7HG-G015-11	7KG-G015-11
	0.32	0.10	7EM-G015-02	7HM-G015-02	–
	0.32	0.25	7EM-G015-11	7HM-G015-11	–
	0.53	0.15	7EK-G015-05	7HK-G015-05	–
<b>ZB-5ms</b> Stable, low bleed 5% phenyl-arylene phase for GC and GC/MS; recommended for a variety of food safety applications	0.10	0.10	–	–	–
	0.18	0.18	–	–	–
	0.25	0.25	7EG-G010-11	7HG-G010-11	7KG-G010-11
	0.25	0.50	–	7HG-G010-17	–
	0.25	1.00	–	7HG-G010-22	–
	0.32	0.25	–	7HM-G010-11	7KM-G010-11
	0.32	0.50	–	7HM-G010-17	–
	0.32	1.00	–	7HM-G010-22	–
<b>ZB-5MS<sub>PLUS</sub>™</b> Highly inert 5 % phenyl-arylene phase for chemical, biological, and food testing	0.25	0.25	7EG-G030-11	7HG-G030-11	7KG-G030-11
	0.25	0.50	–	7HG-G030-17	–
	0.25	1.00	–	7HG-G030-22	–
	0.32	0.25	–	7HM-G030-11	–
	0.32	1.00	–	7HM-G030-22	–
<b>ZB-SemiVolatiles</b> 5% phenyl-arylene phase specially deactivated for supreme inertness to acids, neutrals, and amines	0.25	0.25	7EG-G027-11	7HG-G027-11	7KG-G027-11
	0.25	0.50	7EG-G027-17	7HG-G027-17	–



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 column with comparative data within 45 days for a FULL REFUND.

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Brandon Doss  
Algenol Biofuels ”

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