



Zebtron™ Inferno™

Rugged High Temperature GC Columns

ZB-1HT

ZB-5HT

NEW! ZB-35HT

NEW! ZB-XLB-HT



 **phenomenex**[®]
...breaking with traditionSM



Manufacturing Award Winning Solutions for GC Analysis



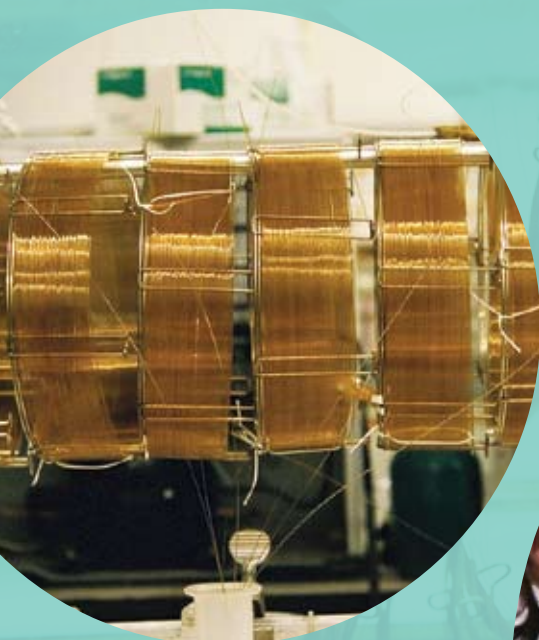
In the field of gas chromatography, not much has changed in the last 15 years. However, technology is our passion and Phenomenex is gaining international recognitions for its GC products that are specially designed for today's most challenging methods.

For chemists struggling with high boilers, contaminants, or carry-overs, Phenomenex developed the Zebron™ Inferno™ line. This line of GC columns have revolutionized GC analysis by allowing chemists to run their analysis at oven temperatures that were never before attainable - all without having to use a metal column!

The Zebron ZB-1HT and ZB-5HT Inferno columns are rugged, mid-polarity columns that allow chemists to push their standard analysis up to 430 °C for increased lab productivity and improved performance. The newly developed Zebron ZB-35HT and ZB-XLB-HT Inferno columns provide high temperature capability up to 400 °C for those using more polar columns.

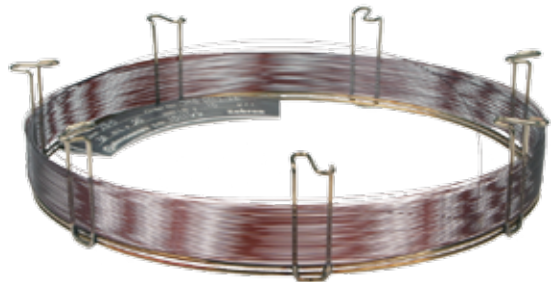
guarantee

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



ZebtronTM InfernoTM

Rugged High Temperature GC Analysis



4	Challenges with Traditional GC Columns
5	Advanced Solutions for High Temperature Analysis
6	Low Bleed
7	Increased Column Lifetime
8	Ideal for High Boiling Compounds
10	Bake-off Contaminants and Eliminate Carry-overs!
11	See What You Have Been Missing!
12	Widely Used Phases (Zebtron ZB-1HT and ZB-5HT)
13	Mid-Polar Phases (Zebtron ZB-35HT and ZB-XLB-HT) NEW!
15	Applications
	Environmental 16
	Petrochemical 21
	Biodiesel 22
	Food and Beverage ... 23
	Chemical 24
	Pharmaceutical 25
25	Ordering Information
	ZB-1HT 12
	ZB-5HT 12
	ZB-35HT 14 NEW!
	ZB-XLB-HT 14 NEW!
	GC Accessories 25

Challenges with Traditional GC Columns

Standard fused silica columns - Shorter lifetime

Unlike the Zebron™ Inferno™ GC columns, most fused silica columns are not developed to handle prolonged exposure to temperatures above 360 °C.

At high temperatures, fused silica GC columns:

- Become inflexible and brittle
- Break easily and are costly to replace
- Require more system downtime to replace columns
- Can't separate high molecular weight compounds

Deterioration of a standard column at high temperatures

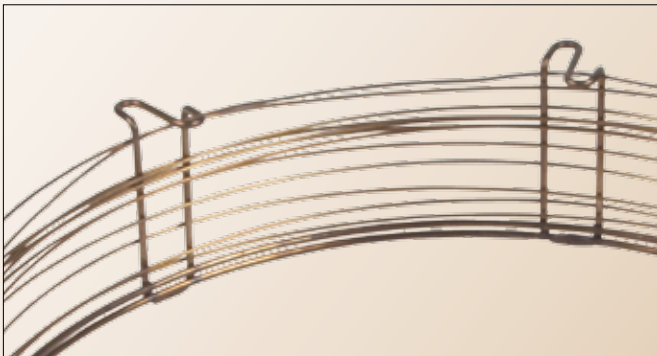


Metal columns – Difficult to use

Though metal columns have higher temperature limits than capillary columns, they are more difficult to use.

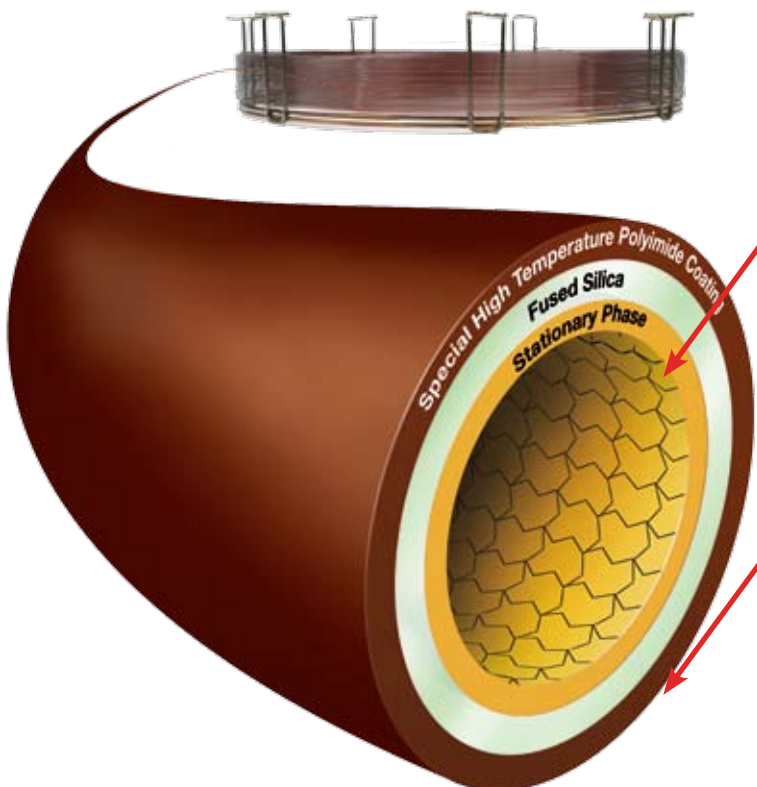
Metal columns:

- Inflexible and hard to use
- Require special tubing cutters for installation
- Prone to leaks from expansion and contraction
- Have active surface, giving poor peak shapes for acids and bases
- Incompatible with MS detectors



Advanced Solutions for High Temperature Analysis

Zebtron™ Inferno™ columns offer enhanced performance where other columns fail. The two critical factors that allow for this are:



1. Advanced ESC™ Bonding Technology

At high temperature ranges, the stability of standard GC columns will deteriorate, resulting in increased bleed. Zebtron's Engineered Self Cross-linking™ (ESC) bonding technology reinforces the stationary phase for enhanced column durability and extremely low bleed levels. The result - our Inferno columns allow for the flexibility to perform GC analysis at high temperatures while providing low bleed and longer column lifetime.

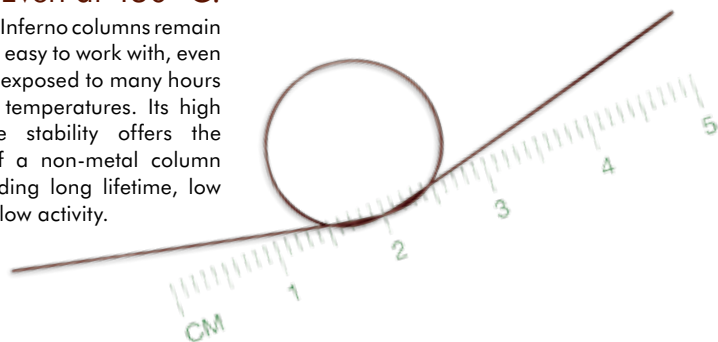
2. Special High Temperature Polyimide Coating

Standard polyimide resin pyrolyzes at temperatures above 360 °C, making the tubing unstable. The Zebtron Inferno columns utilize a special dark polyimide resin that shows minimal thermal degradation even at temperatures up to 430 °C.* This results in longer column lifetime at elevated temperatures.

Phase	Temperature Limit	
ZB-1HT	430 °C	
ZB-5HT	430 °C	
ZB-35HT	NEW!	400 °C
ZB-XLB-HT	NEW!	400 °C

Flexible Even at 430 °C!**

The Zebtron Inferno columns remain flexible and easy to work with, even after being exposed to many hours at extreme temperatures. Its high temperature stability offers the flexibility of a non-metal column while providing long lifetime, low bleed, and low activity.



* Zebtron ZB-1HT and ZB-5HT Inferno columns have an upper temperature limit of 430 °C. Zebtron ZB-35HT and ZB-XLB-HT Inferno columns have an upper temperature limit of 400 °C.

** Evaluated by performing 185 programmed temperature runs, total 23 hours at 430 °C. Polyimide tubing was still flexible as shown here.

Extremely Low Bleed for Rugged Performance

- Longer column lifetime
- Better reproducibility
- Maximum sensitivity
- Accurate quantitation

What is column bleed?

Column bleed is the loss of stationary phase as a result of impurities in the starting polymer or the decomposition of the phase at elevated temperatures.

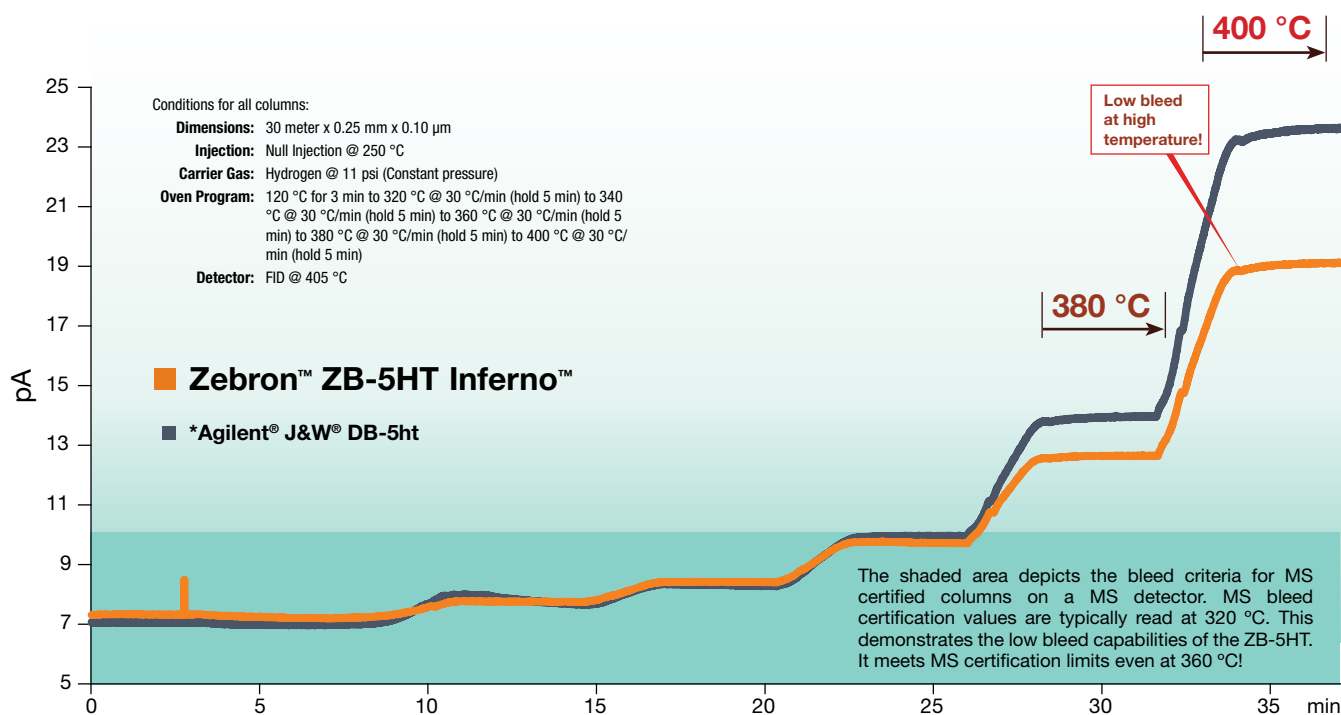
Why is column bleed undesirable?

Column bleed can be an indicator of the stability and lifetime a GC column will offer. When using sensitive detectors such as MS, bleed can impact method detection limits (MDLs) causing difficulties at the low calibration ranges.

What sets Zebron's bleed apart from others?

Our proprietary ESC™ bonding technology and special polyimide tubing provides enhanced column durability for extremely low bleed levels.

Zebron™ Inferno™ Columns Have Lower Bleed than Other Manufacturers†



† All columns were new, never used, prior to this testing. Columns were purchased either directly from the original manufacturer or through an authorized distributor. All testing was carefully controlled to ensure conditions were similar for all columns involved. The comparative data is not representative of every application.

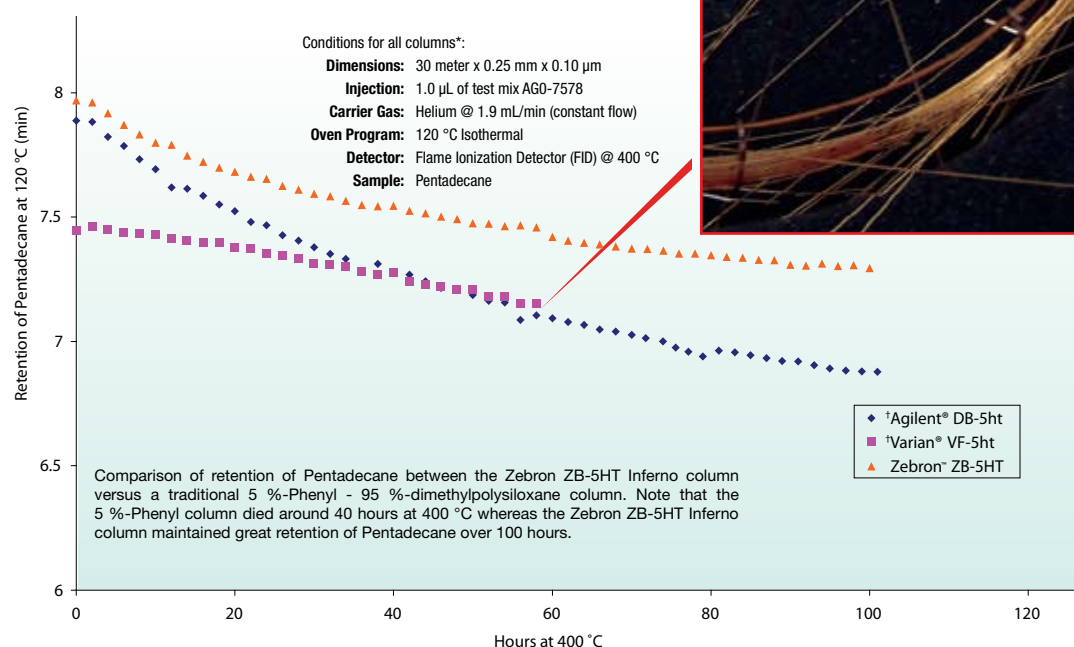
Zebtron™ Inferno™'s High Durability Provides Increased Column Lifetime

- Less instrument downtime
- More productivity
- Lower laboratory costs

Standard GC Columns Cannot Withstand High Temperature

After prolonged exposure to temperatures above 360 °C, most traditional GC columns become brittle and inflexible, often spontaneously breaking in the middle of a run. Work is stopped in order to change out the column and perform system maintenance. Unlike these fragile columns, the Zebtron Inferno columns have a special polyimide coating that provides longer column lifetime at temperatures up to 430 °C. As a result, you will experience longer column lifetime, less instrument downtime, and higher productivity.

Zebtron Inferno Columns Win In The Lifetime Test



*All columns were new, never used, prior to this testing. Columns were purchased either directly from the original manufacturer or through an authorized distributor. All testing was carefully controlled to ensure conditions were similar for all columns involved. The comparative data is not representative of every application.



How does the lifetime test work?

Hydrocarbons are a good way to measure the stability and lifetime of a non-polar column. Because its interaction with the phase is mostly based on London Dispersion forces, any change in retention time is correlated with phase loss. This will result in increased bleed and poor reproducibility.

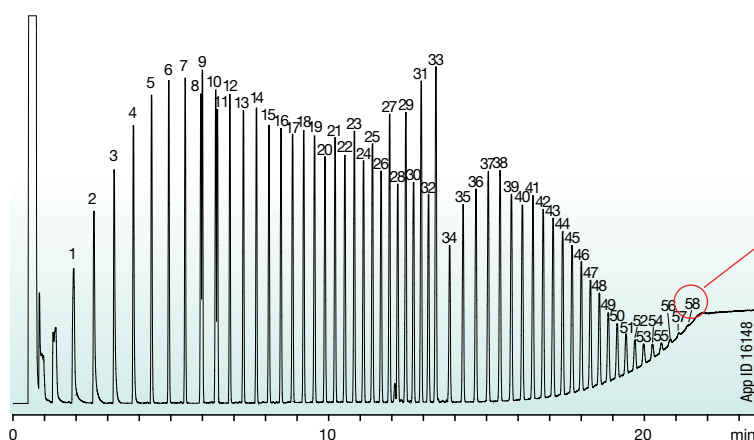
In the lifetime study above, the Zebtron ZB-5HT Inferno column has twice the lifetime as the two comparative columns. For the test, all columns were held at 400 °C for 2 hours and then the oven was lowered to 120 °C for Pentadecane analysis. The Varian® HT column broke just after 40 hours at 400 °C. The Agilent® J&W® DB-5ht column had the same retention for Pentadecane at 40 hours as the ZB-5HT at 100 hours.

Greater Performance for High Boiling Compounds

- Better peak shape
- Improved separation
- More analytes detected

Zebron™ Inferno™ GC columns have the inertness and temperature stability needed for separating high molecular weight compounds. These high boiling compounds require a thermally rugged column with low bleed levels. Zebron Inferno columns have the high temperature stability and durability to provide optimal separation of these compounds.

Great Separation of High Boiling Hydrocarbons (ASTM Method D6352)



Easily Elute Hydrocarbons Up To C90

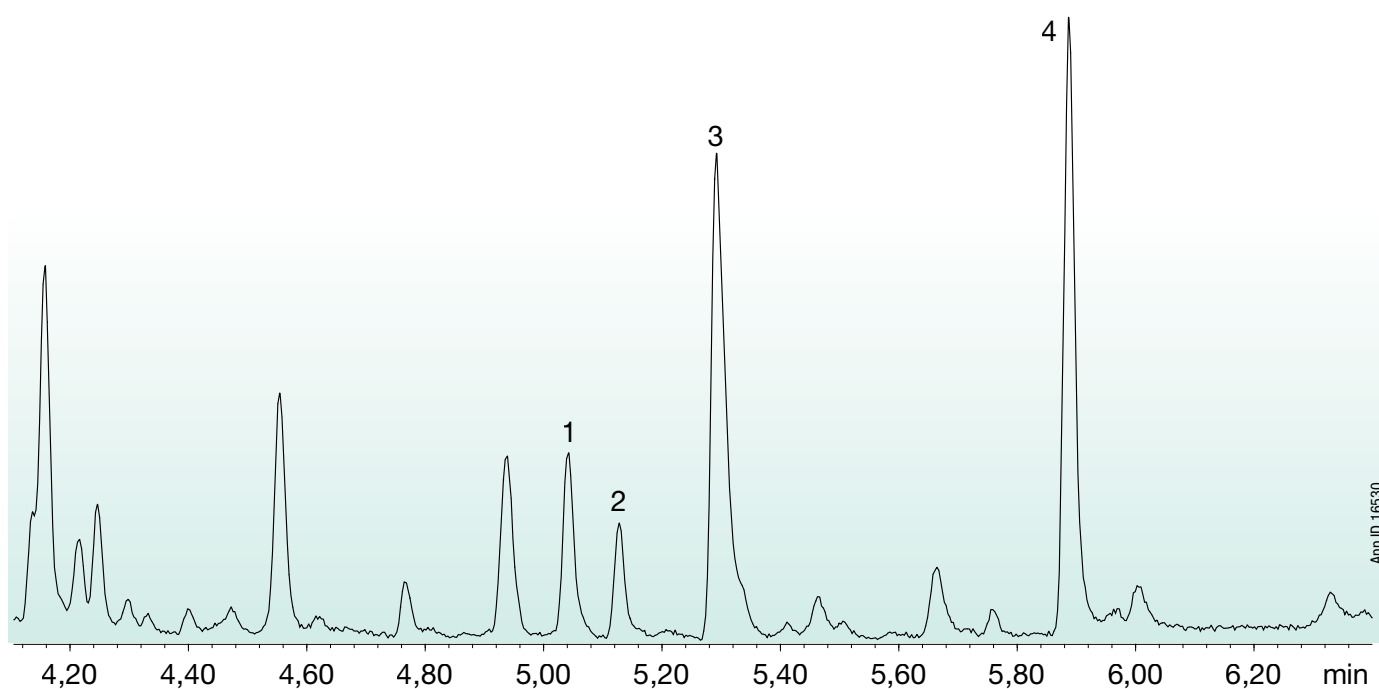
Zebron's ZB-1HT Inferno can operate at 430 °C, allowing C90 to elute on temperature ramp to meet ASTM requirements

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

Note: Sample was a combination of PolyWax 655 and retention time markers C8-C40 in CS2/Chloroform

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

Separation of Sterols from Margarine on a Zebron™ ZB-5HT Inferno™



Column: Zebron ZB-5HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G015-02
Injection: Splitless @ 275 °C, 0.5 µL
Carrier Gas: Helium @ 1.5 mL/min (constant flow)
Oven Program: 220 °C to 350 °C @ 20 °C/min
Detector: MSD @ 275 °C

Sample: 1. Campesterol
2. Stigmasterol
3. β-Sitosterol
4. Betulin (IS)



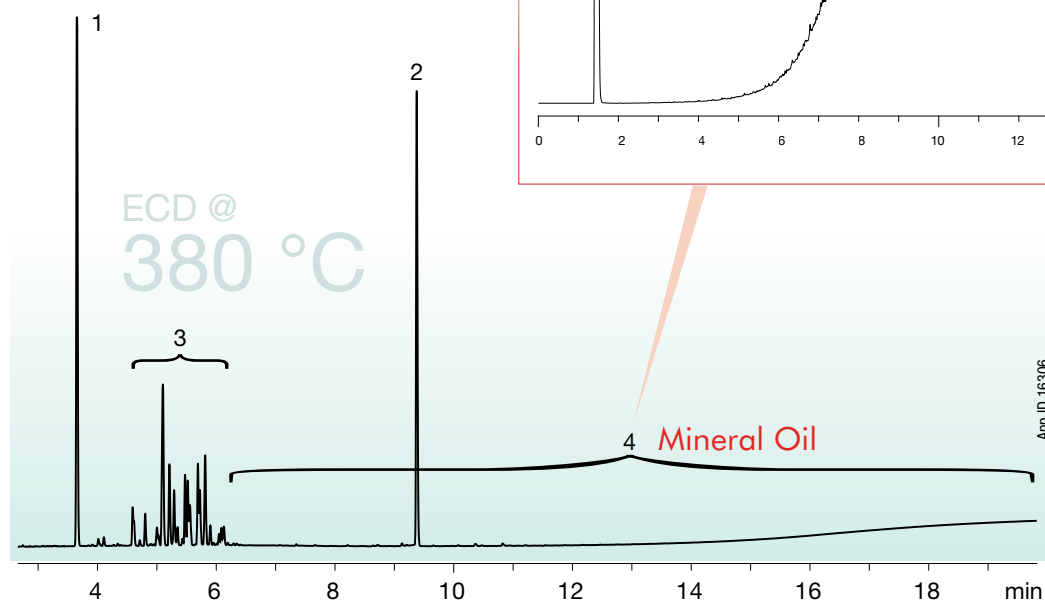
Bake-off Contaminants and Eliminate Carry-overs!

- Achieve better reproducibility
- Extend column lifetime
- Attain sharper peak shapes

Eliminate Problems Associated with Dirty Samples

Dirty samples can linger on a GC column, eventually changing the selectivity and shortening the lifetime of a column. Since Zebron™ Inferno™ columns have extremely high temperature limits, it allows for the use of more aggressive column baking steps to remove persistent contaminants, thus prolonging column lifetimes.

Hydrocarbon contaminants are not detected by ECD!

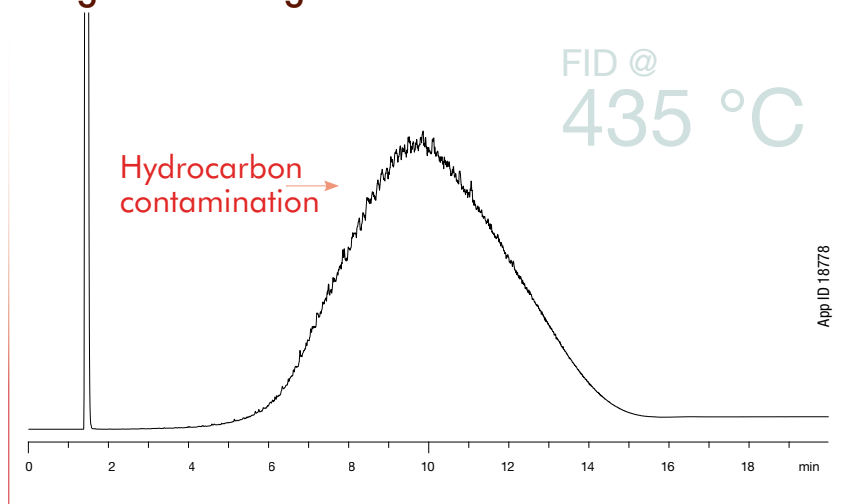


Conditions for App ID 16306:

Column: Zebron ZB-5HT Inferno
Dimensions: 30 meter x 0.32 mm x 0.10 µm
Part No.: 7HM-G015-02
Injection: Split 52:1 @ 330 °C, 1 µL
Carrier Gas: Helium @ 1.9 mL/min (constant flow)
Oven Program: 150 °C for 2 min to 420 °C @ 20 °C/min for 4.5 min
Detector: ECD @ 380 °C
Sample: 1. TCMX
2. DCOB
3. Aroclor 1016
4. Mineral Oil

Note: Aroclor 1016 @ 100 ppb; Mineral Oil @ 1 % in isooctane

Hydrocarbon contaminants revealed using FID starting at 5 minutes



Conditions for App ID 18778:

Column: Zebron ZB-5HT
Dimensions: 30 meter x 0.32 mm x 0.10 µm
Part No.: 7HM-G015-02
Injection: Split 5:1 @ 330 °C, 1 µL
Carrier Gas: Helium @ 1.9 mL/min (constant flow)
Oven Program: 150 °C for 2 min to 420 °C @ 20 °C/min for 4.5 min
Detector: FID @ 435 °C
Sample: Mineral Oil

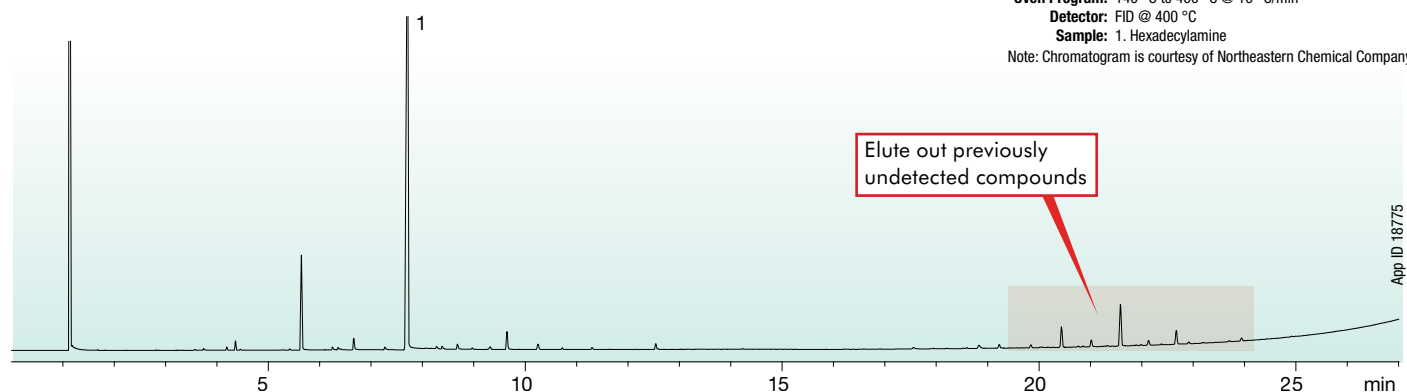
Note: Mineral Oil is 1 % in isooctane

See What You have been Missing!

- Uncover compounds that were previously undetected
- Elute compounds at higher temperatures
- Achieve more accurate, reproducible results

Many high boiling compounds will stay on a column and go undetected run after run. As a consequence, results are inaccurate because of missing data. Running at higher temperatures will allow these formerly undetected compounds to elute and be detected, giving more accurate and reproducible results.

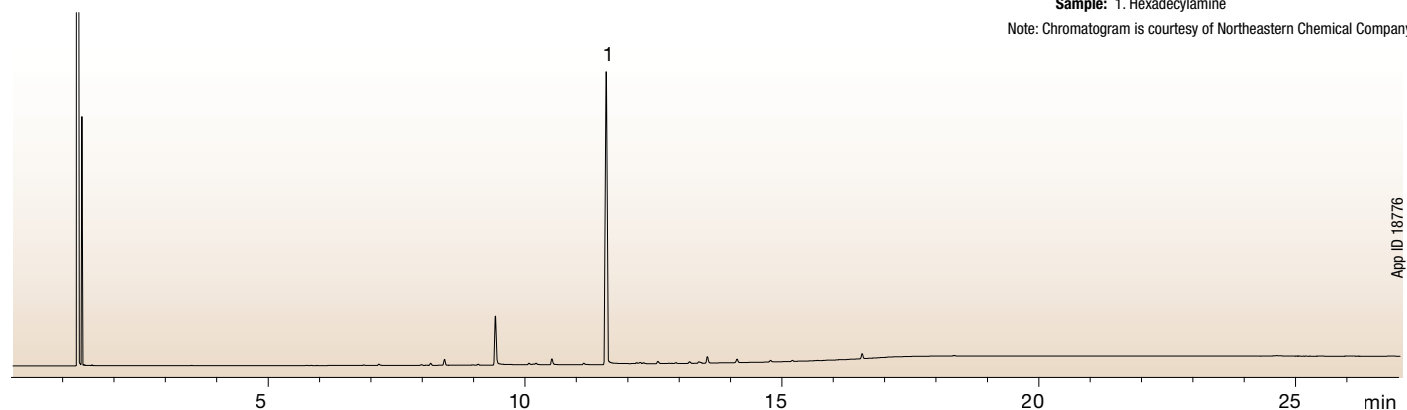
New Zebron™ ZB-35HT Inferno™ Column



Hexadecylamine

Column: Zebron ZB-35HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.25 μ m
Part No.: 7HG-G025-11
Injection: Split 50:1 @ 350 °C, 1 μ L
Carrier Gas: Helium @ 2.1 mL/min (constant flow)
Oven Program: 140 °C to 400 °C @ 10 °C/min
Detector: FID @ 400 °C
Sample: 1. Hexadecylamine
Note: Chromatogram is courtesy of Northeastern Chemical Company.

Restek® Rtx®-35 GC Column



Hexadecylamine

Column: Restek® Rtx®-35
Dimensions: 30 meter x 0.25 mm x 1.00 μ m
Injection: Split 50:1 @ 300 °C, 1 μ L
Carrier Gas: Helium @ 2.1 mL/min (constant flow)
Oven Program: 140 °C to 300 °C @ 10 °C/min
Detector: FID @ 320 °C
Sample: 1. Hexadecylamine
Note: Chromatogram is courtesy of Northeastern Chemical Company.

Available in Widely Used Phases

ZB-1HT Inferno™

- Temperature Limits: -60 to 400/430 °C (Isothermal/TPGC)*
- First non-metal columns stable to 430 °C
- Provides true boiling point separation for hydrocarbon distillation methods
- Individually tested for low bleed, MS certified

Alternative to any 100 % Dimethylpolysiloxane High-Temperature Phase:

• DB-1ht • MXT-1 SimDist • Petrocol 2887 • CP-SimDist

Column Profile



Applications

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

guarantee

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

Ordering Information

Zebron ZB-1HT Inferno GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.	Price
5-Meter				
0.53	0.10	-60 to 400/430	7AK-G014-02	
15-Meter				
0.25	0.10	-60 to 400/430	7EG-G014-02	
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	



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

If you need a 5 in. cage, simply add a (-B) after the part number, e.g., 7HG-G014-11-B. Some exceptions may apply.
*0.53 mm ID columns are rated to 400 °C max operational temperature.

ZB-5HT Inferno™

- Temperature Limits: -60 to 400/430 °C (Isothermal/TPGC)*
- First non-metal columns stable to 430 °C
- Individually tested for low bleed, MS certified

Alternative to Any 5 %-Phenyl-95 % Dimethylpolysiloxane High Temperature Phase:

• DB-5ht • VF-5ht • HT-5 • Stx-5HT • XTI-5HT

Column Profile



Applications

- High Boiling Petroleum Products
- Triglycerides
- Simulated Distillation Methods
- Diesel Fuel
- Long-chained Hydrocarbons
- Motor Oils
- Polymers/Plastics
- Surfactants
- High Molecular Weight Waxes

Ordering Information

Zebron ZB-5HT Inferno GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.	Price
15-Meter				
0.25	0.10	-60 to 400/430	7EG-G015-02	
0.25	0.25	-60 to 400/430	7EG-G015-11	
0.32	0.10	-60 to 400/430	7EM-G015-02	
0.32	0.25	-60 to 400/430	7EM-G015-11	
0.53	0.15	-60 to 400	7EK-G015-05	
15-Meter with 2-Meter Spliced Guard (0.53 mm ID)				
0.32	0.10	-60 to 400/430	7EM-G015-02-GST	
20-Meter				
0.18	0.18	-60 to 400/430	7FD-G015-08	
30-Meter				
0.25	0.10	-60 to 400/430	7HG-G015-02	
0.25	0.25	-60 to 400/430	7HG-G015-11	
0.32	0.10	-60 to 400/430	7HM-G015-02	
0.32	0.25	-60 to 400/430	7HM-G015-11	
0.53	0.15	-60 to 400	7HK-G015-05	



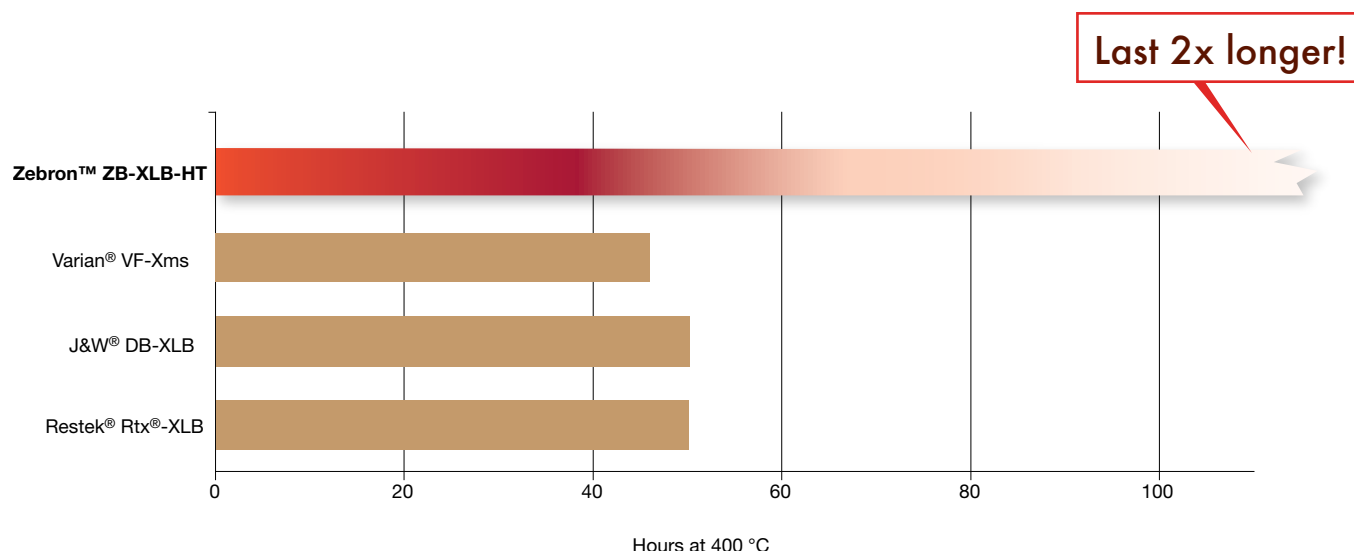
Extend column lifetime. Add a Z-guard to your next Zebron GC order.

If you need a 5 in. cage, simply add a (-B) after the part number, e.g., 7HG-G015-11-B. Some exceptions may apply.
*0.53 mm ID columns are rated to 400 °C max operational temperature.

Two New Innovative Mid-Polar Phases:

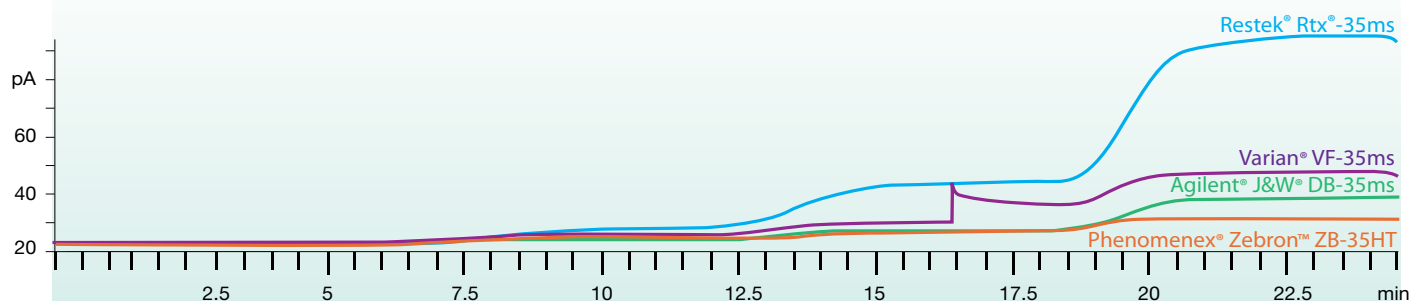
Zebron™ ZB-35HT and ZB-XLB-HT Inferno™

Unlike standard mid-polar GC columns that fail at high oven temperatures, the NEW Zebron ZB-35HT and ZB-XLB-HT Inferno columns have the durability and ruggedness to perform well at extreme temperatures. With an astonishing upper temperature limit of 400 °C, both columns will provide the separation of high boiling compounds at extremely low bleed levels.



Zebron Inferno Provides the Lowest Bleed†

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



†All columns were new, never used, prior to this testing. Columns were purchased either directly from the original manufacturer or through an authorized distributor. All testing was carefully controlled to ensure conditions were similar for all columns involved. The comparative data is not representative of every application.

NEW!

Zebtron ZB-35HT Inferno

- First non-metal, 35 %-Phenyl columns stable to 400 °C
- Great for high molecular weight compounds
- Individually tested for low bleed, MS certified
- Equivalent to USP Phase G42
- Temperature Limits: -60 to 400 °C (Isothermal/TPGC)

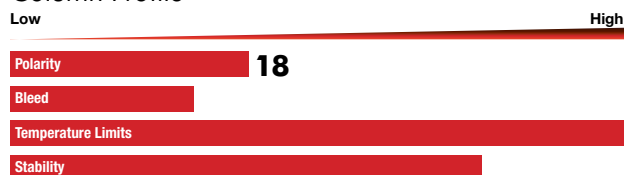
**guarantee**

If Zebtron does not provide you with equivalent separations as compared to any other GC column of the same phase and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

Alternative to Any 35 %-Phenyl-65 % Dimethylpolysiloxane High Temperature Phase:

- | | | | | | | | |
|-----------|---------|------------|-----------|----------|------------|---------|----------|
| • DB-35ms | • AT-35 | • SPB-608 | • HP-35ms | • MDN-35 | • Sup-Herb | • DB-35 | • Rtx-35 |
| • SPB-35 | • OV-11 | • Rtx-35MS | • HP-35 | • 007-11 | • BPX608 | • EC-35 | • BPX35 |

Column Profile



Ordering Information

Zebtron ZB-35HT Inferno GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.	Price
15-Meter				
0.25	0.25	-60 to 400	7EG-G025-11	
30-Meter				
0.25	0.25	-60 to 400	7HG-G025-11	
0.32	0.25	-60 to 400	7HM-G025-11	

Applications

- | | |
|--|-------------------|
| • Aroclors | • Pesticides |
| • Semi-volatiles | • Drugs of Abuse |
| • Amines | • Pharmaceuticals |
| • EPA Methods 508, 608, 8081, 8141, 8151 | • Steroids |
| | • Chemicals |

**NEW!**

Zebtron ZB-XLB-HT Inferno

- Non-metal si-arylene GC column stable to 400 °C
- Good tool for general screening to identify unknown samples
- Individually tested for low bleed, MS certified
- Temperature Limits: -60 to 400 °C (Isothermal/TPGC)



Similar* to:

- | | | |
|----------|----------|-----------|
| • MDN-12 | • DB-XLB | • Rtx-XLB |
|----------|----------|-----------|

*not exact equivalent, selectivity might be different

Column Profile



Ordering Information

Zebtron ZB-XLB-HT Inferno GC Columns

ID(mm)	df(μm)	Temp. Limits °C	Part No.	Price
15-Meter				
0.25	0.10	-60 to 400	7EG-G024-02	
0.25	0.25	-60 to 400	7EG-G024-11	
0.32	0.10	-60 to 400	7EM-G024-02	
30-Meter				
0.25	0.10	-60 to 400	7HG-G024-02	
0.25	0.25	-60 to 400	7HG-G024-11	
0.32	0.25	-60 to 400	7HM-G024-11	

Applications

- | | |
|------------------------------------|---------------|
| • Polychlorinated Biphenyls (PCBs) | • Herbicides |
| • Pesticides | • EPA Methods |



The background of the entire page is a composite image. The top half features laboratory glassware, including a beaker with a stirrer, a graduated cylinder, and a test tube, all containing liquids. The bottom half shows a close-up of green, leafy plants, possibly corn or similar crops. The entire image is overlaid with a semi-transparent orange/red gradient.

Suited for a Wide Range of Applications

For Many Industries:

Environmentalpp.16-20
Petrochemicalp.21
Biodieselp.22
Food/Beveragep.23
Chemicalsp.24
Pharmaceuticals.....p.24

Dual Column Analysis

EPA 552.2..... p.16
EPA 8081 p.18
EPA 8151 p.18
EPA 8270..... p.17

High Molecular Weight Compounds

Heavy PAHs..... p.19
Long chained hydrocarbons..... p.21
Oils..... pp.21, 23
Triglycerides..... p.23

Dirty Samples

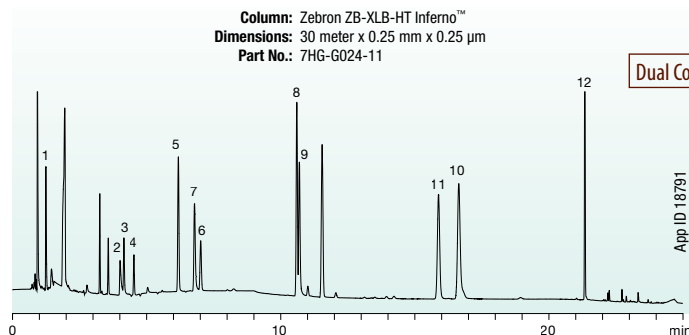
Oils..... pp.21, 23

Low Level Analysis

Environmental contaminantspp.16-20
Pesticidespp.16-20
Biodieselp.22
Pharmaceuticals.....p.24

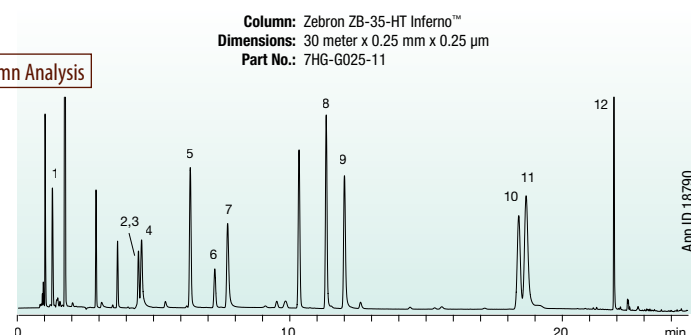
Environmental Applications

EPA Method 552.2 - Haloacetic Acids



Conditions for both columns:

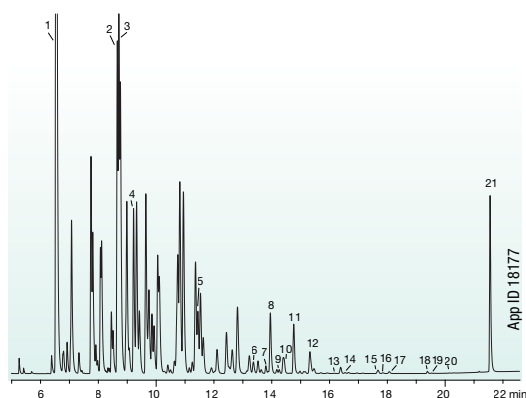
Injection: Split 5:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 4.0 mL/min (constant flow)
Oven Program: 40 °C for 1 min to 55 °C @ 5 °C/min for 5 min to 70 °C @ 10 °C/min for 9 min to 250 °C @ 30 °C/min for 2 min
Detector: ECD @ 300 °C
Note: Analytes are methylated and 100 ppb in isooctane.



Sample:

1. Chloroacetic Acid	7. Bromochloroacetic Acid
2. Bromoacetic Acid	8. Bromodichloroacetic Acid
3. Dichloroacetic Acid	9. Dibromoacetic Acid
4. Dalapon	10. Chlorodibromoacetic Acid
5. Trichloroacetic Acid	11. 2,3-Dibromopropionate
6. 1,2,3-Trichloropropane	12. Tribromoacetic Acid

DIN Method 51527: Aroclors 1242



Column: Zebron ZB-XLB-HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G024-11

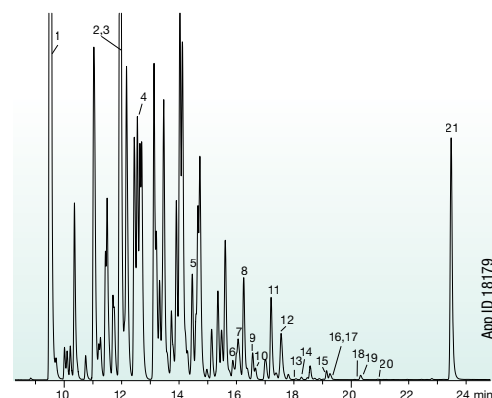
Injection: Split 2:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.5 mL/min (constant flow)
Oven Program: 50 °C for 0.5 min to 210 °C @ 40 °C/min for 3 min to 230 °C @ 30 °C/min for 5 min to 250 °C @ 30 °C/min for 5 min to 320 °C @ 40 °C/min for 2 min
Detector: ECD @ 350 °C

Note: Total concentration of aroclors was 90 ppm in isooctane.

Sample:

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

DIN Method 51527: Aroclors 1242



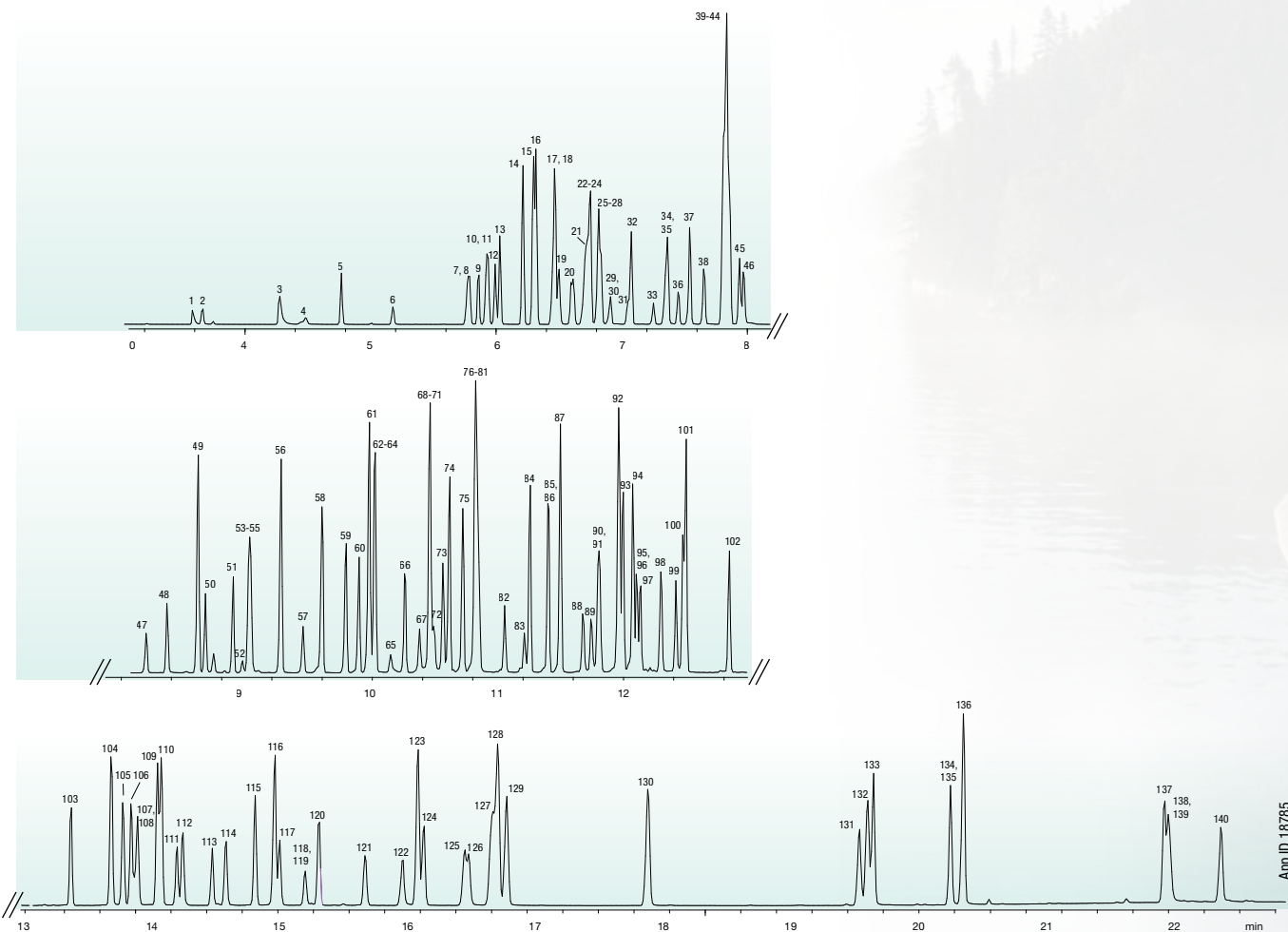
Column: Zebron ZB-35HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G025-11

Injection: Splitless @ 250 °C, 1 µL
Carrier Gas: Helium @ 0.5 mL/min (constant flow)
Oven Program: 50 °C for 0.5 min to 220 °C @ 30 °C/min to 320 °C @ 6 °C/min for 2 min
Detector: ECD @ 350 °C

Sample:

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

EPA Method 8270 - Semi-volatile Organics



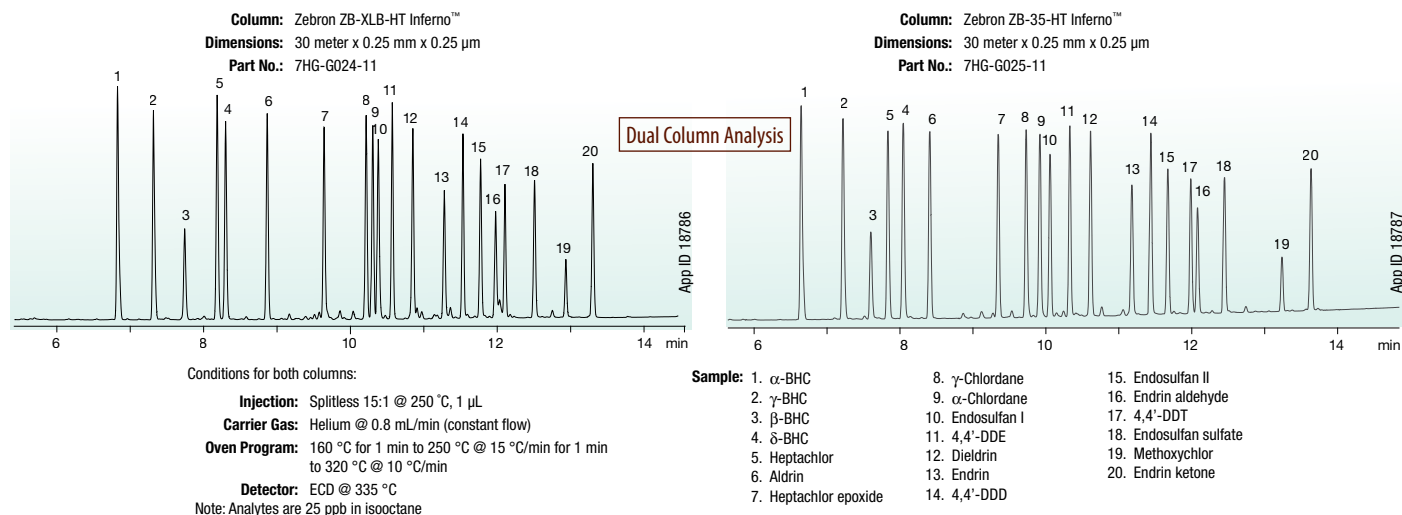
App ID 18785

Column: Zebron ZB-XLB-HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G024-11
Injection: Pulsed @ 280 °C, 1 µL
Carrier Gas: Helium @ 1 mL/min (constant flow)
Oven Program: 40 °C for 1.5 min to 260 °C @ 20 °C/min to 290 °C @ 5 °C/min to 350 °C @ 25 °C/min for 2 min
Detector: MSD @ 350 °C; 45-450 amu
Note: Analytes are 20 ppm in dichloromethane

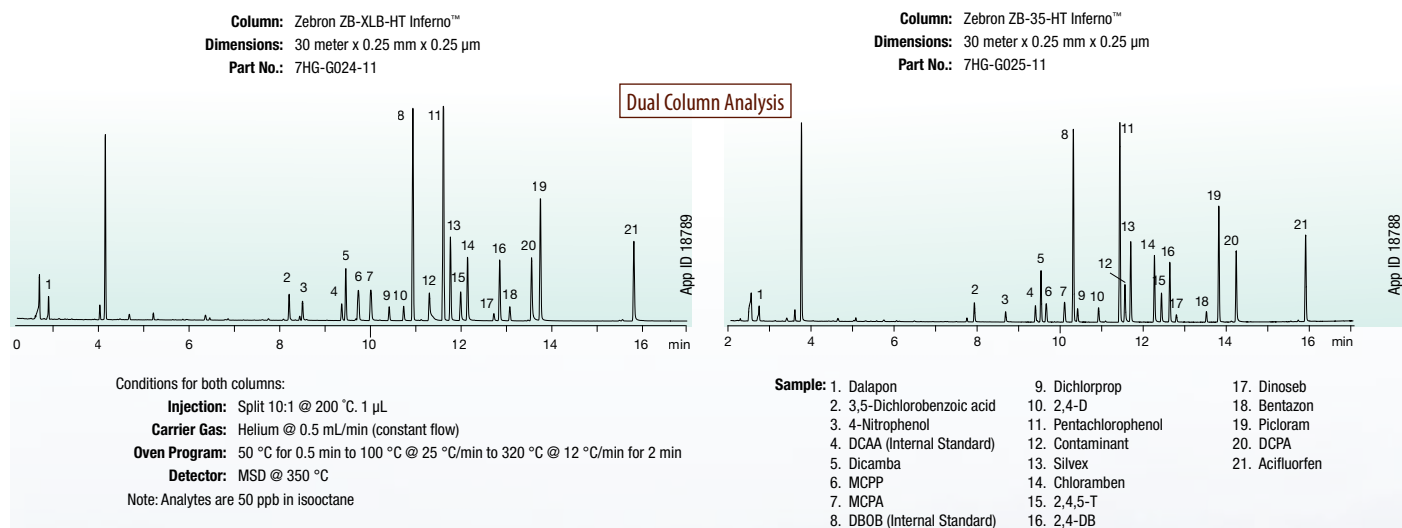
Sample: 1. Pyridine	36. 2-Nitrophenol	71. 2,4-Dinitrophenol	106. α-Chlordane
2. N-Nitrosodimethylamine	37. Bis(2-chloroethoxy)methane	72. 2-Naphthylamine	107. Benzidine
3. 2-Picoline	38. 2,4-Dichlorophenol	73. 2,4-Dinitrotoluene	108. Endosulfan II
4. N-Nitrosomethylethylamine	39. 1,2,4-Trichlorobenzene	74. 4-Chlorophenyl phenyl ether	109. 4,4'-DDE
5. 2-Fluorobiphenyl	40. Naphthalene-D8	75. Fluorene	110. Pyrene
6. N-Nitrosodiethylamine	41. α-Terpineol	76. N-Nitrosodiphenylamine	111. p-Terphenyl-D14
7. Phenol-D5	42. Hexachloro-1,3-butadiene	77. Azobenzene	112. Dieldrin
8. Phenol	43. Hexachloropropene	78. Diphenylamine	113. p-Dimethylaminoazobenzene
9. n-Decane	44. Naphthalene	79. 4-Nitroaniline	114. Endrin
10. Aniline	45. 2,6-Dichlorophenol	80. 5-Nitro-o-toluidine	115. 4,4'-DDD
11. Pentachloroethane	46. p-Chloroaniline	81. Azobenzene	116. Butyl benzyl phthalate
12. 2-Chlorophenol	47. N-Nitrosodi-n-butylamine	82. 2,4,6-Tribromophenol	117. Endosulfan II
13. Bis(2-chloroethyl)ether	48. 4-Chloro-3-methylphenol	83. 2-Methyl-4,6-dinitrophenol	118. Endrin aldehyde
14. 1,3-Dichlorobenzene	49. 2-Methylnaphthalene	84. 4-Bromophenyl phenyl ether	119. 3,3'-Dimethylbenzidine
15. 1,4-Dichlorobenzene-D4	50. Hexachlorocyclopentadiene	85. n-Octadecane	120. 4,4'-DDT
16. 1,4-Dichlorobenzene	51. 1,2,4,5-Tetrachlorobenzene	86. α-BHC	121. Endosulfan sulfate
17. Benzyl alcohol	52. 2,3-Dichloroaniline	87. Hexachlorobenzene	122. 2-Acetylaminofluorene
18. 1,2-Dichlorobenzene	53. 2,4,6-Trichlorophenol	88. 4-Aminobiphenyl	123. Bis(2-ethylhexyl) phthalate
19. o-Cresol	54. 2-Fluorophenol	89. Pentachlorophenol	124. Methoxychlor
20. Bis(2-chloroisopropyl)ether	55. 2,4,5-Trichlorophenol	90. γ-BHC	125. Endrin ketone
21. p-Cresol	56. 2-Chloronaphthalene	91. Pentachloronitrobenzene	126. 3,3'-Dichlorobenzidine
22. m-Cresol	57. 2-Nitroaniline	92. Phenanthrene-D10	127. Benz[a]anthracene
23. 3-Methylphenol	58. Dimethyl phthalate	93. Phenanthrene	128. Chrysene-D12
24. Hexachloroethane	59. Acenaphthylene	94. Anthracene	129. Chrysene
25. Nitrosodi-n-propylamine	60. 2,6-Dinitrotoluene	95. Dinoseb	130. Di-n-octyl phthalate
26. N-Nitroso-di-n-propylamine	61. Acenaphthene-D10	96. 1,3,5-Trinitrobenzene	131. 7,12-Dimethylbenz(a)anthracene
27. o-Toluidine	62. Acenaphthene	97. β-BHC	132. Benzo[b]fluoranthene
28. Acetophenone	63. 3-Nitroaniline	98. Carbazole	133. Benzo[k]fluoranthene
29. N-Nitrosomorpholine	64. 1,3-Dinitrobenzene	99. δ-BHC	134. Hexachlorophene
30. N-Nitrosopyrrolidine	65. 4-Nitrophenol	100. Heptachlor	135. Benzo[a]pyrene
31. Nitrobenzene-D5	66. Pentachlorobenzene	101. Di-n-butyl phthalate	136. Perylene-D12
32. Nitrobenzene	67. 1-Naphthylamine	102. Aldrin	137. Dibenz[a,h]anthracene
33. N-Nitrosopiperidine	68. Diethyl phthalate	103. Heptachlor epoxide	138. Indeno[1,2,3-cd]pyrene
34. Isophorone	69. 2,3,4,6-Tetrachlorophenol	104. Fluoranthene	139. N-Nitrosodiphenylamine
35. 2,4-Dimethylphenol	70. Diethyl phthalate	105. γ-Chlordane	140. Benzo[g,h,i]perylene

Environmental Applications

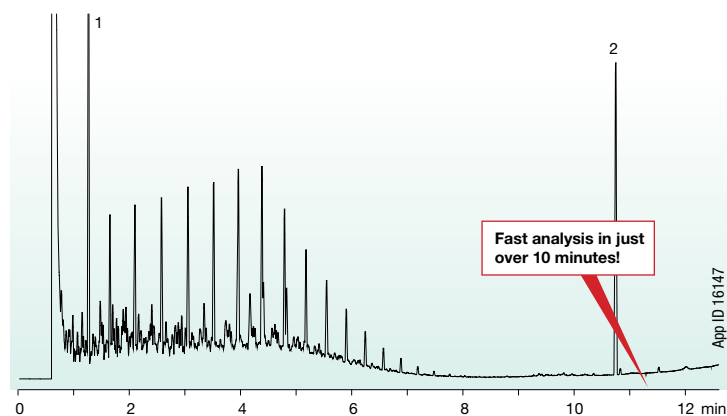
EPA Method 8081 - Chlorinated Pesticides



EPA Method 8151 - Chlorinated Herbicides

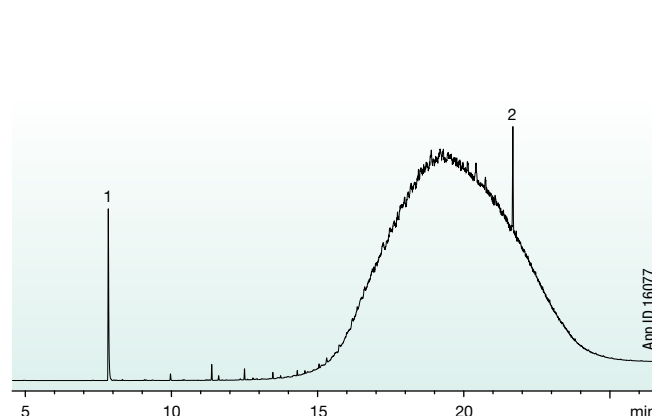


Fast H-53 Analysis of Diesel Fuel



Column: Zebron ZB-5HT Inferno™
Dimensions: 15 meter x 0.32 mm x 0.10 µm
Part No.: 7EM-G015-02
Injection: On-Column @ 63 °C, 0.1 µL
Carrier Gas: Helium @ 2.7 mL/min (constant flow)
Oven Program: 60 °C to 375 °C @ 25 °C/min
Detector: FID @ 400 °C
 Note: Diesel Fuel was 200 ppm in dichloromethane with Internal Standards at 50 ppm
Sample: 1. Decane (C10)
 2. Tetracontane (C40)

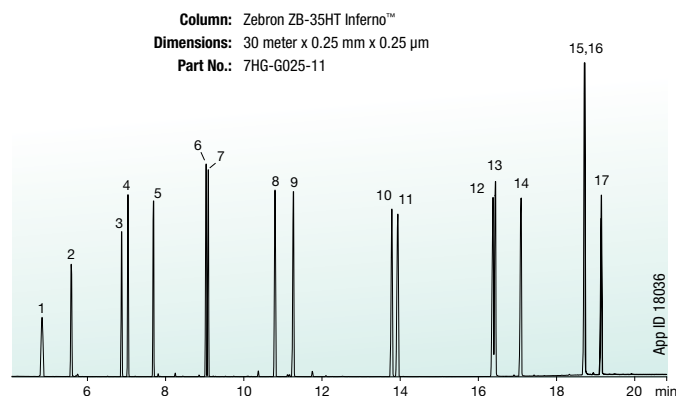
Mineral Oil using H-53 Conditions



Column: Zebron ZB-5HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G015-02
Injection: On-Column @ 53 °C, 0.1 µL
Carrier Gas: Helium @ 1.3 mL/min (constant flow)
Oven Program: 50 °C for 6 min to 400 °C @ 20 °C/min for 15 min
Detector: FID @ 415 °C
 Note: Fuel was 10 mg/mL in dichloromethane with 50 ppm markers
Sample: 1. Decane (C10)
 2. Tetracontane (C40)



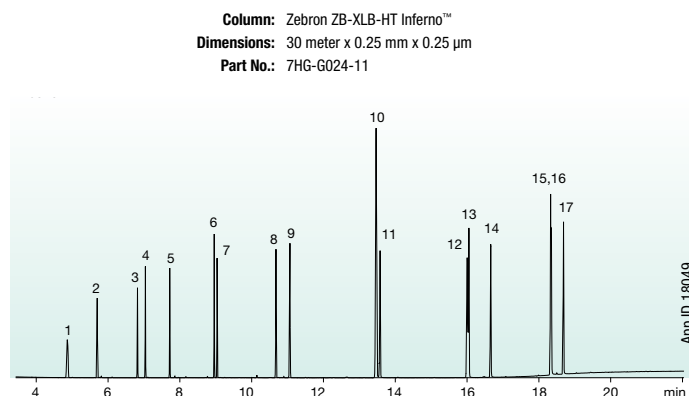
Polynuclear Aromatic Hydrocarbons (PAHs)



Column: Zebron ZB-35HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G025-11

Conditions for both columns:
Injection: Splitless @ 280 °C, 1 µL
Carrier Gas: Helium @ 1.2 mL/min (constant flow)
Oven Program: 80 °C for 0.66 min to 250 °C @ 20 °C/min to 300 °C @ 8 °C/min to 360 °C @ 20 °C/min for 6 min
Detector: MSD @360 °C; 45-400 amu
 Note: Pulsed splitless injection @ 20 psi for 0.66 min. All analytes @ 10 ppm in dichloromethane.

Polynuclear Aromatic Hydrocarbons (PAHs)



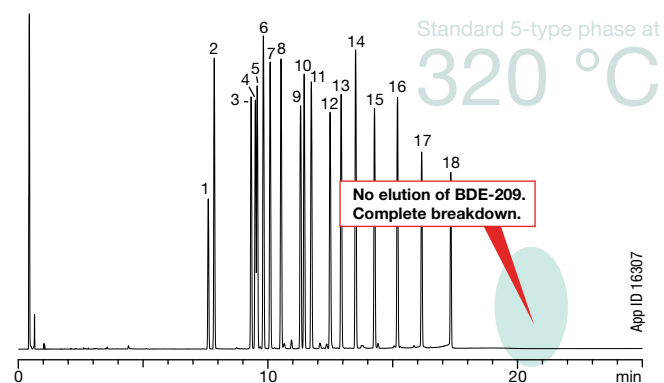
Sample:

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

Environmental Applications

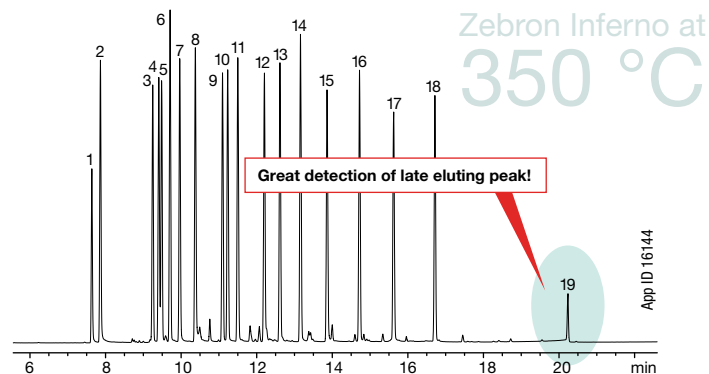
PolyBrominated Diphenyl Ethers (PBDE)

In a GC column, late eluting PBDEs often break down and become difficult to detect. The Zebron™ Inferno™ columns have increased sensitivity for late eluting compounds and thus can easily detect these analytes.



Column: Standard 5-type phase
Dimensions: 15 meter x 0.25 mm x 0.10 µm
Injection: On-Column @ 73 °C, 0.5 µL
Carrier Gas: Helium @ 3.4 mL/min (constant pressure)
Oven Program: 70 °C to 160 °C @ 25 °C/min to 320 °C @ 10 °C/min hold 10 min
Detector: ECD @ 340 °C
Note: PBDE Standard @ 2.5 ppm in isooctane

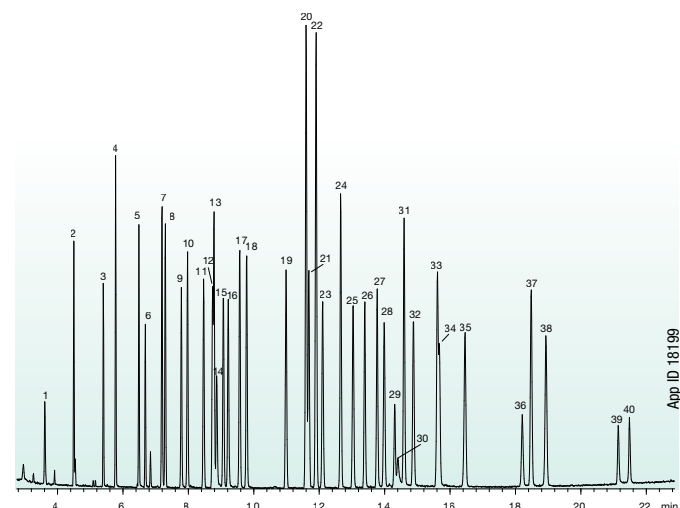
Sample: 1. BDE-25 11. BDE-99
2. BDE-28 12. BDE-85
3. BDE-75 13. BDE-154
4. BDE-49 14. BDE-153
5. BDE-71 15. BDE-138
6. BDE-47 16. BDE-183
7. BDE-66 17. BDE-190
8. BDE-77 18. BDE-203
9. BDE-100
10. BDE-119



Column: Zebron ZB-5HT Inferno
Dimensions: 15 meter x 0.25 mm x 0.10 µm
Part No.: 7EG-G015-02
Injection: On-Column @ 73 °C, 0.5 µL
Carrier Gas: Helium @ 1.5 mL/min (constant flow)
Oven Program: 70 °C to 160 °C @ 25 °C/min to 350 °C @ 10 °C/min for 5 min
Detector: ECD @ 400 °C
Note: Sample was 2.5 ppm in isooctane.

Sample: 1. BDE-25 11. BDE-99
2. BDE-28 12. BDE-85
3. BDE-75 13. BDE-154
4. BDE-49 14. BDE-153
5. BDE-71 15. BDE-138
6. BDE-47 16. BDE-183
7. BDE-66 17. BDE-190
8. BDE-77 18. BDE-203
9. BDE-100 19. BDE-209
10. BDE-119

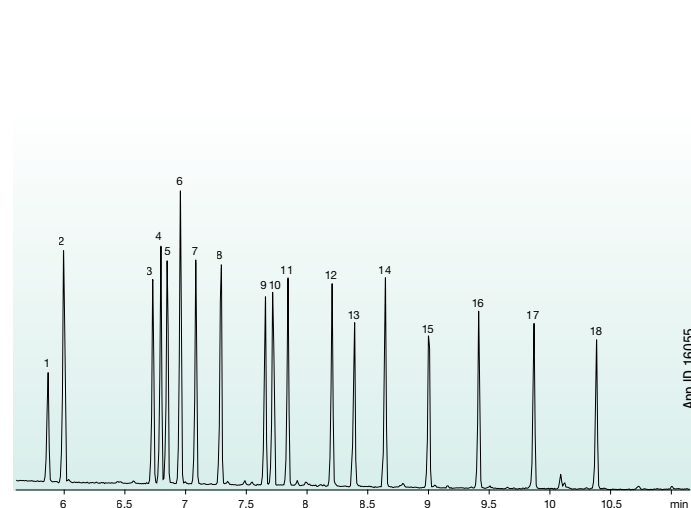
EPA Methods 508 and 8081A



Column: Zebron ZB-35HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G025-11
Injection: Split 10:1 @ 200 °C, 1 µL
Carrier Gas: Helium @ 0.5 mL/min (constant flow)
Oven Program: 100 °C for 0.5 min to 210 °C @ 30 °C/min for 0.5 min to 230 °C @ 10 °C/min for 2 min to 260 °C @ 5 °C/min for 2 min to 300 °C @ 6 °C/min for 2 min
Detector: MSD @ 350 °C; 50-550 amu
Note: All analytes were 10 ppm in isooctane.

1. DBCP	15. δ-BHC	29. Nitrofen
2. Hexachlorocyclopentadiene	16. Chlorothalonil	30. Kepone
3. Etridiazole	17. Aldrin	31. 4,4'-DDD
4. Chloroneb	18. DCPA (Dacthal)	32. Endosulfan II
5. Propachlor	19. Heptachlor epoxide	33. 4,4'-DDT
6. Diallyl	20. trans-Chlordane (gamma)	34. Endrin Aldehyde
7. Hexachlorobenzene	21. trans-Nonachlor	35. Endosulfan sulfate
8. α-BHC	22. cis-Chlordane (alpha)	36. Captafol
9. PCNB	23. Endosulfan I	37. Methoxychlor
10. γ-BHC	24. 4,4'-DDE	38. Endrin Ketone
11. β-BHC	25. Dieldrin	39. Permethrin
12. Alachlor	26. Chloropropylate	40. Permethrin isomer
13. Heptachlor	27. Chlorobenzilate	
14. Dichlone	28. Endrin	

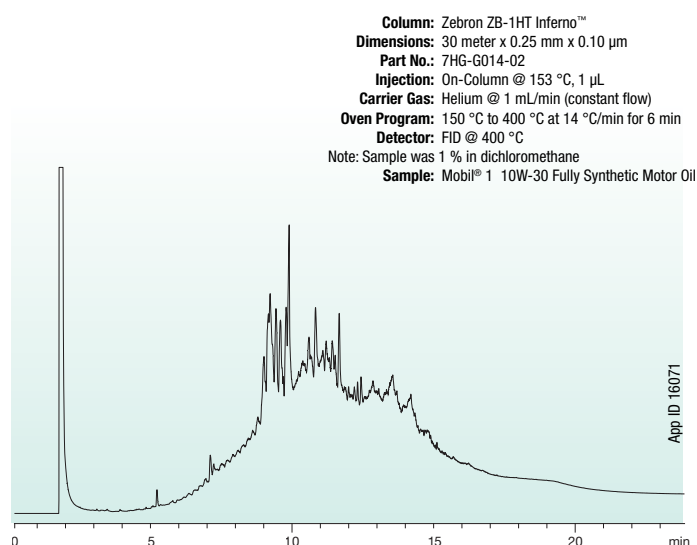
Poly Brominated Diphenyl Ethers (PBDEs)



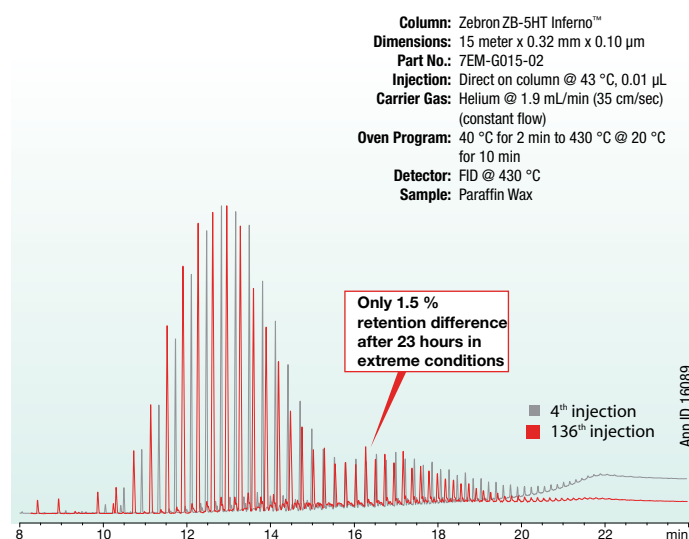
Column: Zebron ZB-5HT Inferno
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G015-02
Injection: Pulsed @ 350 °C, 2 µL
Carrier Gas: Helium @ 1.3 mL/min (constant flow)
Oven Program: 125 °C to 380 °C @ 22 °C/min for 15 min
Detector: MSD; 45 - 800 amu
Note: Analytes were 2.5 ppm in isooctane. Pulsed splitless injection at 50 psi using direct connect liner

1. BDE-25	8. BDE-77	15. BDE-138
2. BDE-28	9. BDE-100	16. BDE-183
3. BDE-75	10. BDE-119	17. BDE-190
4. BDE-49	11. BDE-99	18. BDE-203
5. BDE-71	12. BDE-85	
6. BDE-47	13. BDE-154	
7. BDE-66	14. BDE-153	

Motor Oil



Paraffin Wax

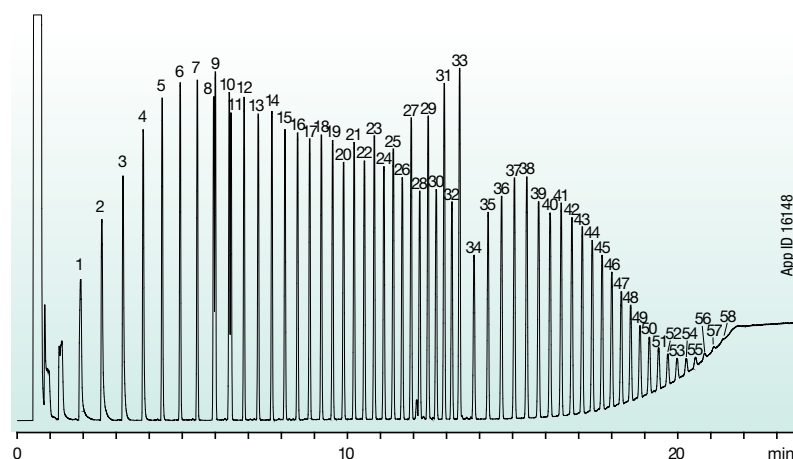


ASTM Methods D2887 and D6352 on One Column

ASTM D2887 and D6352 both set standard test methods for boiling range determination of petroleum fractions by GC. While ASTM D2887 is used for products having a final boiling point of 538 °C or lower, ASTM D6352 is used for determining petroleum distillate fractions with a boiling point (BP) up to 700 °C. The Zebron™ Inferno™ columns make

simulated distillation analysis easier and less expensive. Typically you would have to use a traditional fused silica column for ASTM D2887 and a metal column for ASTM D6352. Zebron Inferno columns provide a robust solution for both analyses.

ASTM Method D6352

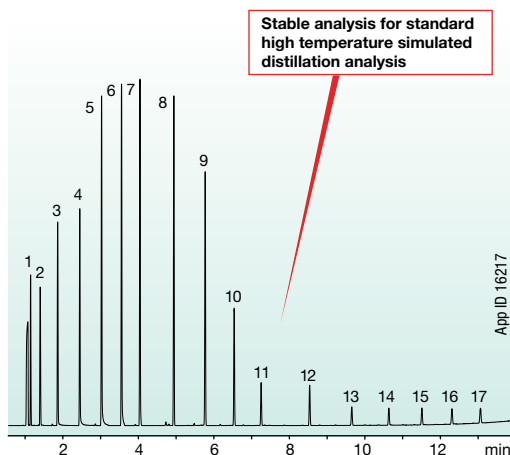


Column: Zebron ZB-1HT Inferno™
Dimensions: 5 meter x 0.53 mm x 0.10 µm
Part No.: 7AK-G014-02
Injection: On-Column @ 43 °C, 0.1 µL
Carrier Gas: Helium @ 4.4 mL/min (constant flow)
Oven Program: 40 °C for 0.5 min to 430 °C @ 20 °C/min for 10 min
Detector: FID @ 430 °C

Note: Sample was a combination of PolyWax 655 and retention time markers C8-C40 in CS2/Chloroform.

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

ASTM Method D2887-97



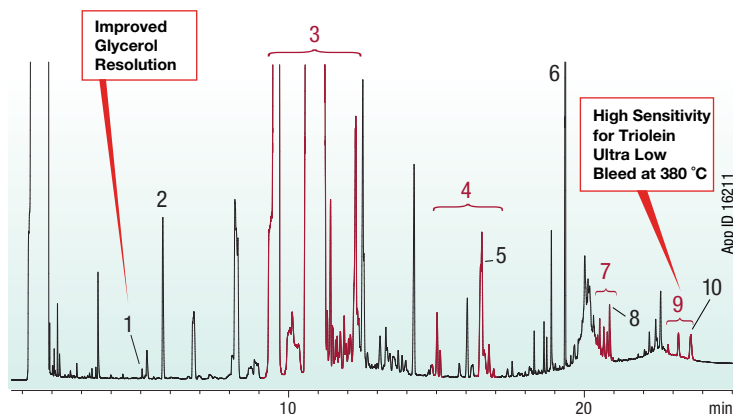
Column: Zebron ZB-1HT Inferno™
Dimensions: 15 meter x 0.53 mm x 0.15 µm
Part No.: 7EK-G014-05
Injection: On-Column @ 38 °C, 0.1 µL
Carrier Gas: Helium @ 10 mL/min (constant flow)
Oven Program: 35 °C for 1 min to 360 °C @ 25 °C/min
Detector: FID @ 375 °C

1. Hexane	10. Octadecane
2. Heptane	11. Eicosane
3. Octane	12. Tetracosane
4. Nonane	13. Octacosane
5. Decane	14. n-Dotriacontane
6. Undecane	15. n-Hexatriacontane
7. Dodecane	16. Tetracontane
8. Tetradecane	17. Tetraoctacontane
9. Hexadecane	

Free and Total Glycerin in Biodiesel

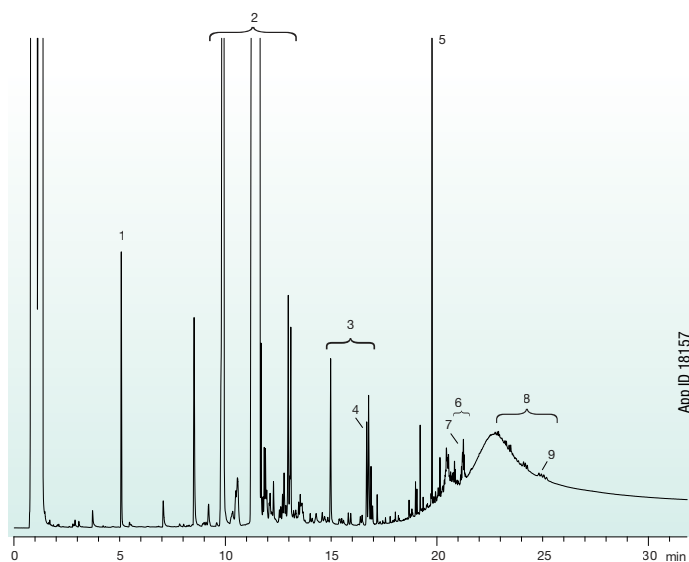
The Zebron™ ZB-1HT Inferno™ column is ideal for biodiesel analysis because it is stable at the elevated temperatures needed to resolve and remove high boiling triglycerides. While standard polyimide resin degrades at temperatures above 380 °C, the Inferno columns utilize a polyimide resin material that shows minimal thermal breakdown, even at programmed temperatures up to 430 °C– the highest thermal stability of any non-metal GC column!

ASTM Method D6584: Free and Total Glycerin in B-100 Biodiesel Methyl Esters



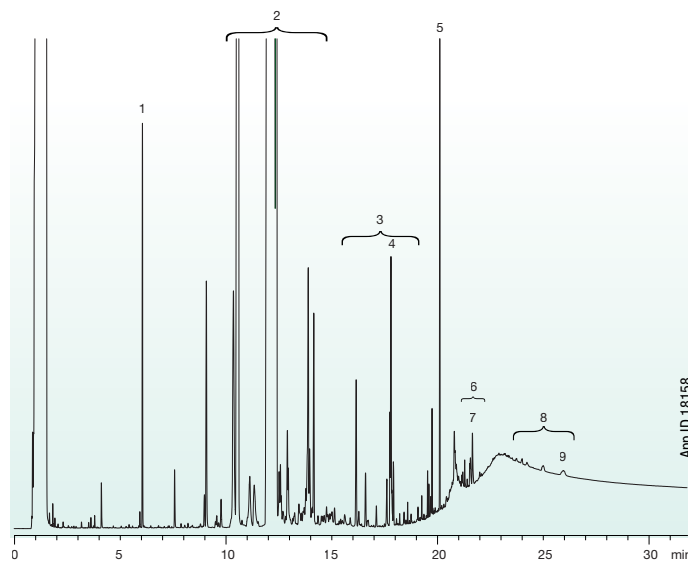
Column: Zebron ZB-5HT Inferno™
Dimensions: 15 meter x 0.32 mm x 0.10 µm + 2 meter x 0.53 mm Z-Guard
Part No.: 7EM-G015-02
Injection: On-Column @ 53 °C, 1 µL
Carrier Gas: Helium @ 3.0 mL/min (constant flow)
Oven Program: 50 °C for 1 min to 180 °C @ 15 °C/min to 230 °C @ 7 °C/min to 380 °C @ 30 °C/min for 10 min
Detector: FID @ 380 °C
 Note: A 2.0 m x 0.53 mm Guard Column was connected to the analytical column per ASTM method requirements.
Sample:

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



Column: Zebron ZB-35HT Inferno™
Dimensions: 15 meter x 0.25 mm x 0.10 µm
Part No.: 7EG-G025-02
Injection: On-Column @ 53 °C, 0.1 µL
Carrier Gas: Helium @ 1.3 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 30 cm x 0.5 mm ID guard column was connected to the analytical column per ASTM method requirements
Sample:

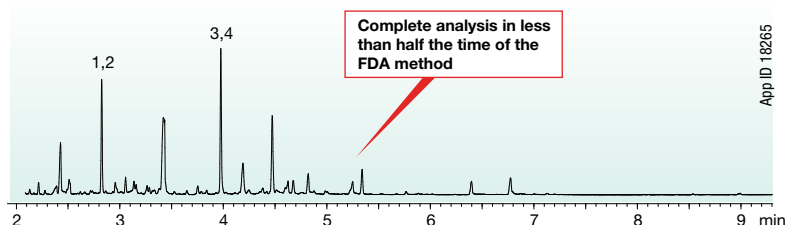
1. Butanetriol (ISTD1)
2. Ester
3. Monoglycerides
4. 1-Monooleoyl-rac-glycerol
5. Tricarpin (ISTD2)
6. Diglycerides
7. 1,3-Diolein
8. Triglycerides
9. Triolein



Column: Zebron ZB-XLB-HT Inferno™
Dimensions: 15 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G024-11
Injection: On-Column @ 53 °C, 0.10 µL
Carrier Gas: Helium @ 1.3 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 30 cm x 0.5 mm ID guard column was connected to the analytical column per ASTM method requirements
Sample:

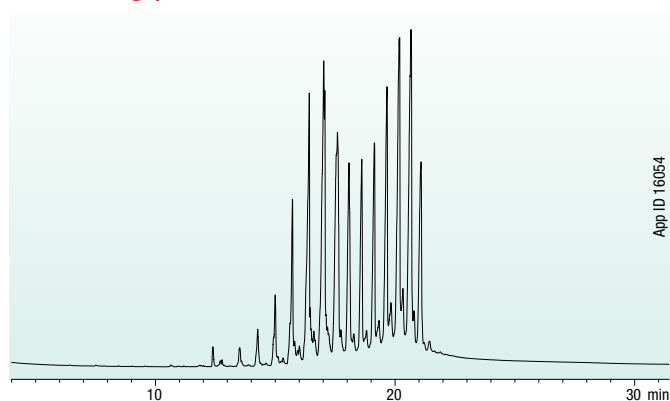
1. Butanetriol (ISTD1)
2. Ester
3. Monoglycerides
4. 1-Monooleoyl-rac-glycerol
5. Tricarpin (ISTD2)
6. Diglycerides
7. 1,3-Diolein
8. Triglycerides
9. Triolein

Melamine in Baby Formula



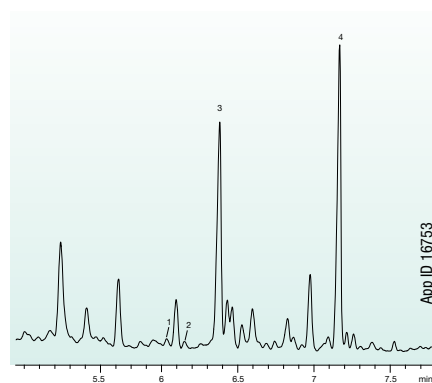
Column: Zebron ZB-XLB-HT Inferno™
Dimensions: 15 meter x 0.25 mm x 0.25 µm
Part No.: 7EG-G024-11
Injection: On-Column @ 103 °C, 1 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 100 °C for 0.5 min to 320 °C @ 25 °C/min
Detector: Mass Selective (MSD) @ 325 °C
Sample: Analytes are 200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

Butter Triglycerides



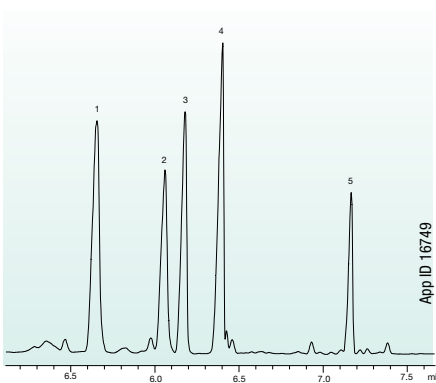
Column: Zebron ZB-5HT Inferno™
Dimensions: 15 meter x 0.32 mm x 0.10 µm
Part No.: 7EM-G015-02
Injection: On-Column @ 103 °C, 2 µL
Carrier Gas: Helium @ 1.8 mL/min (constant flow)
Oven Program: 100 °C to 400 °C @ 14 °C/min for 10 min
Detector: FID @ 400 °C
Sample: Butter

Sterols from Olive Oil: Underivatized



Column: Zebron ZB-5HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G015-02
Injection: Splitless @ 350 °C, 0.5 µL
Carrier Gas: Helium @ 2 mL/min (constant flow)
Oven Program: 220 °C to 350 °C @ 15 °C/min
Detector: FID @ 350 °C
Sample:
 1. Campesterol
 2. Stigmasterol
 3. β-Sitosterol
 4. Betulin (IS)

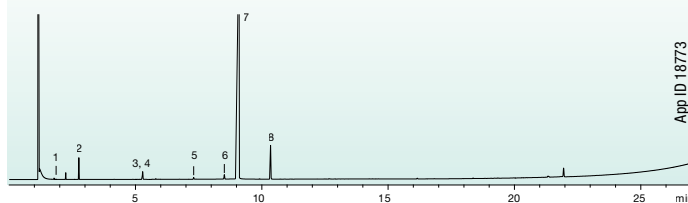
Sterols from Olive Oil: Derivatized



Column: Zebron ZB-5HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G015-02
Injection: Splitless @ 350 °C, 0.5 µL
Carrier Gas: Helium @ 2 mL/min (constant flow)
Oven Program: 220 °C to 350 °C @ 15 °C/min.
Detector: FID @ 350 °C
Note: Sterols derivatized via BSTFA:TMCS; 99:1 in pyridine
Sample:
 1. Cholesterol
 2. Campesterol
 3. Stigmasterol
 4. β-Sitosterol
 5. Betulin (IS)

Chemical Applications

Amine and Nitrosamine

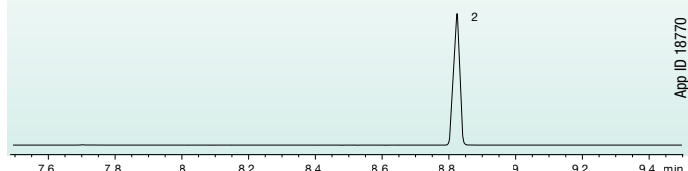


Column: Zebron ZB-35HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G025-11
Injection: Split 50:1 @ 350 °C, 1 µL
Carrier Gas: Helium @ 2.1 mL/min (constant flow)
Oven Program: 140 °C to 400 °C @ 10 °C/min
Detector: FID @ 410 °C

Note: Application courtesy of Northeastern Chemical Company

Sample: 1. MW 135 Amine
 2. MW 163 Amine
 3. MW 178 Amine
 4. MW 208 Amine
 5. MW 164 Nitrosamine
 6. MW 178 Nitrosamine
 7. MW 192 Nitrosamine
 8. MW 208 Nitrosamine

Diethylene Glycol Divinyl Ether



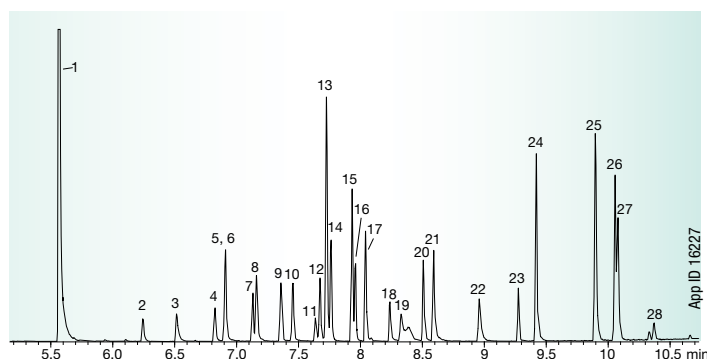
Column: Zebron ZB-35HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.25 µm
Part No.: 7HG-G025-11
Injection: Split 40:1 @ 250 °C, 1 µL
Carrier Gas: Helium @ 1.4 mL/min (constant flow)
Oven Program: 40 °C for 0.5 min to 150 °C @ 10 °C/min
 to 310 °C @ 25 °C/min for 2 min
Detector: FID @ 320 °C

Note: Application courtesy of Northeastern Chemical Company

Sample: 1. Isopar C
 2. Diethylene glycol divinyl ether
 3. Isobornyl acrylate

Pharmaceutical/Drugs

Drug Screen



Column: Zebron ZB-1HT Inferno™
Dimensions: 30 meter x 0.25 mm x 0.10 µm
Part No.: 7HG-G014-02
Injection: Split 15:1 @ 250 °C, 1 µL
Carrier Gas: Helium 1.1 mL/min (constant flow)
Oven Program: 50 °C for 1 min to 320 °C @ 25 °C/min for 3 min
Detector: MSD @ 310 °C; 45-450 amu

Note: Analytes were 25 ppm

Sample: 1. Nicotine
 2. Contaminant
 3. Acetaminophen
 4. Allobarbitol
 5. Aprobital
 6. Ibuprofen
 7. Butabarbital
 8. Phenacetin
 9. Amobarbital
 10. Pentobarbital
 11. Meprobamate
 12. Secobarbital
 13. Caffeine
 14. Methyl Benzilate
 15. Benzphetamine
 16. Hexobarbital
 17. Dimenhydrinate
 18. Doxylamine
 19. Phenobarbital
 20. Methapyrilene
 21. Chlorpheniramine
 22. Brompheniramine
 23. Cocaine
 24. Chlorcyclizine
 25. Codeine
 26. Diazepam
 27. Hydrocodone
 28. Oxymorphone

Cool-Lock™ Nut

Capillary GC Installation with the Cool-Lock™ Nut

- Avoid burning your fingers again – cools with the oven
- No Wite-Out® or Tipp-Ex® needed
- Achieve the proper installation depth each and every time
- No need for wrench with hand-tightened connections



- 1** Insert column through column nut and ferrule. Insert the end of the column and column nut into the bottom of the Cool-Lock Nut Installation Gauge.

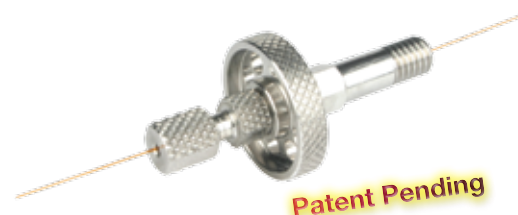


- 2** Hand-tighten the column nut into the gauge until the ferrule starts to compress. Adjust the length of the column to the desired length.



- 3** Unscrew the installation gauge and install the nut and column into the instrument.

- 4** Make sure Cool-Lock nut is in the full extension position to achieve the correct pre-measured position, and allow for proper leak checking.



Ordering Information

Cool-Lock GC Capillary Nut For Agilent GC Systems*

Part No.	Description	Unit	Price
AGO-8319	Cool-Lock GC Capillary Nut For Use With Short-Style Ferrules	ea	
AGO-8320	Cool-Lock GC Capillary Nut For Use With Long-Style Ferrules	ea	
AGO-8349	Cool-Lock Nut Installation Gauge	ea	

Replacement Ferrules

AGO-4701	GC Capillary Ferrules Graphite 1/16 in. to 0.5 mm ID	10/pk	
AGO-4704	GC Capillary Ferrules Graphite 1/16 in. to 0.8 mm ID	10/pk	

*Guaranteed fit for Agilent 5850, 5890, 6850, 6890 GC systems



Cool-Lock GC Capillary Nut For Shimadzu Systems**

Part No.	Description	Unit	Price
AGO-8419	Cool-Lock GC Capillary Nut For Use With Short-Style Ferrules	ea	
AGO-8420	Cool-Lock Nut Installation Gauge	ea	

**Guaranteed fit for Shimadzu 2010 and 2014 GC systems

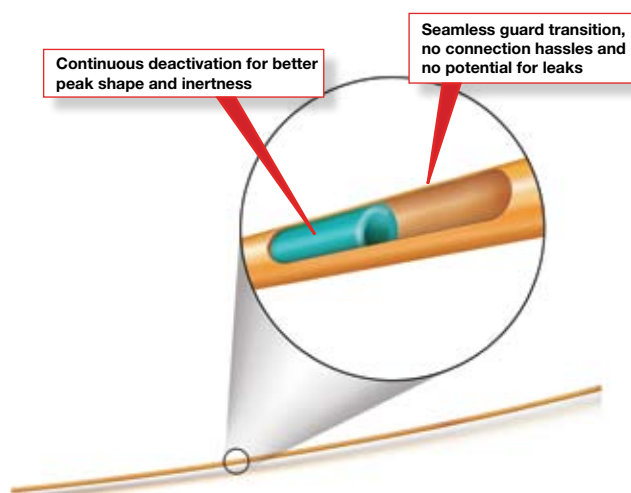
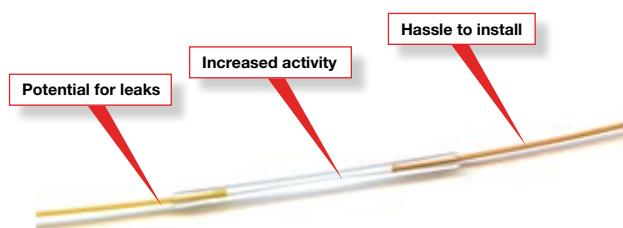
Guardian™: Integrated Guard Columns

- Eliminates the potential for leaks
- Extends column life
- Improves analyte focusing for low boiling compounds
- Aggressively tested to ensure deactivation

Traditional Union Connected Guard Column

vs.

Guardian Integrated Guard Column



Ordering Information

Guardian: Integrated Guard Column

GC Phase	Dimensions	5 m Guardian Part No.	Price
Zebron ZB-1HT	30 meter x 0.25 mm x 0.10 df (µm)	7HG-G014-02-GGA	
Zebron ZB-5HT	30 meter x 0.25 mm x 0.10 df (µm)	7HG-G015-02-GGA	
Zebron ZB-5HT	30 meter x 0.25 mm x 0.25 df (µm)	7HG-G015-11-GGA	

Inlet Base Seals

- Prevents analyte adsorption
- Improves detection sensitivity
- Improves method reproducibility
- Fits all Agilent 5890/6890 split/splitless injection ports



Ordering Information

Gold Inlet Base Seals

Part No.	Description	Similar to Mfr. No.*	Unit	Price
Standard, single groove for splitless applications, 0.8 mm dia. inlet hole				
AG0-7518	Gold Inlet Base Seal, splitless (single groove), 0.8 mm	18740-20885	2/pk	
AG0-7519	Gold Inlet Base Seal, splitless (single groove), 0.8 mm	18740-20885	10/pk	
High Split Flow, cross groove for split applications, 0.8 mm dia. inlet hole				
AG0-7520	Gold Inlet Base Seal, split (double groove/cross), 0.8 mm	5182-9652	2/pk	
AG0-7521	Gold Inlet Base Seal, split (double groove/cross), 0.8 mm	5182-9652	10/pk	
Replacement Inlet Seal Washers				
AG0-8397	Inlet Seal Washers, Gold plated, for Agilent GC injection port	-	12/pk	

Stainless Steel Base Seals

Part No.	Description	Similar to Mfr. No.*	Unit	Price
Standard, single groove for splitless applications, 0.8 mm dia. inlet hole				
AG0-8393	Stainless Steel Inlet Base Seal, splitless (single groove), 0.8 mm	18740-20880	2/pk	
AG0-8394	Stainless Steel Inlet Base Seal, splitless (single groove), 0.8 mm	18740-20880	10/pk	
High Split Flow, cross groove for split applications, 0.8 mm dia. inlet hole				
AG0-8395	Stainless Steel Inlet Base Seal, split (double groove/cross), 0.8 mm	-	2/pk	
AG0-8396	Stainless Steel Inlet Base Seal, split (double groove/cross), 0.8 mm	-	10/pk	
Replacement Inlet Seal Washers				
AG0-7522	Inlet Seal Washers, Stainless Steel, for Agilent GC injection port	5061-5869	12/pk	



Injection Port Inlet Liners

- Fit standard instrument manufacturers' inlets
- Popular designs at excellent prices
- Reduce analyte discrimination
- Improve reproducibility and results
- Clean, non-adsorptive/non-reactive surface



Ordering Information

Description	GC Model No.	Dimensions ID x L x OD (mm)	Material* (deactivated)	Quartz Wool (Y/N)	Similar to Manufacturer Number**	Part No.	Unit	Price
Agilent Technologies (HP)								
Single Taper Direct Connect with Side Hole (top)	5880/5980/6890	4 x 78.5 x 6.3	B (y)	N	21055	AG0-7850	5/pk	
Single Taper Direct Connect with Side Hole (bottom)	5880/5980/6890	4 x 78.5 x 6.3	B (y)	N	G1544-80730 20771	AG0-7851	5/pk	
Split / Splitless Focus Liner with wool	5880/5890/6890	4 x 78.5 x 6.3	B (y)	Y	210-4004	AG0-7515	5/pk	
Shimadzu								
Splitless Liner	9A/15A/16A	3.4 x 139 x 5.0	B (y)	N	20749	AG0-4669	5/pk	
Thermo Scientific (Finnigan)								
Splitless / Single Taper Liner /Trace	8000 series	5 x 105 x 8.0	B (y)	N	45350033	AG0-7852	5/pk	

* B= Borosilicate; Deactivated = Yes (y) or No (n). ** Similar to but not always an exact equivalent to the original manufacturer's product.



Additional GC accessories are available.
For more information contact our GC Specialists at GCspecialist@phenomenex.com.

Septa

Silicone Rubber Inlet Septa

- Advanced silicone formulations reduce coring and increase septum lifetime
- Enhanced durability and re-sealing capabilities
- Precision formed and cut to exacting specifications
- Reduced needle damage
- General purpose and specialty low bleed, high-temperature septa available

PhenoRed™-400

Fire brick red, with a 50 durometer rating, this specially formulated high-temperature, low-bleed silicone rubber septum is designed and conditioned for high sensitivity analysis where the demands for low bleed and heat stability are critical. Say goodbye to ghost peaks! Temperature-rated to 400 °C.

PhenoGreen™-400

Long life, high-temperature green septum, rated to 400 °C. GuideRight™ through-hole to guide the needle during injection.

GuideRight™ Injection Hole Septa

The GuideRight™ through-hole guides the needle during injection. Septum performance and lifetime increase while downtime due to bent needles or dirty injection ports decreases. Choose from either high-temperature PhenoGreen™ or PhenoRed™, both rated to 400 °C.

Long Ferrules

Graphite Ferrules

- High-purity graphite significantly reduces ferrule bleed
- Special construction minimizes "flaking"
- Stable to 450 °C - excellent for high temperature use
- Not for use with GC/MS transfer lines



Ordering Information Silicone Rubber Septa

Part No.	Description	Unit	Price
PhenoRed 3/16 in. (9.5 mm) Diameter			
AGO-4690	PhenoRed-400 Injector Septa	50/pk	
AGO-4691	PhenoRed-400 Injector Septa	100/pk	
PhenoRed 7/16 in. (11 mm)			
AGO-4696	PhenoRed-400 Injector Septa	50/pk	
AGO-4697	PhenoRed-400 Injector Septa	100/pk	

Ordering Information GuideRight Injection Hole Septa

Part No.	Description	Unit	Price
PhenoGreen 3/16 in. (9.5 mm) Diameter 400 °C			
AGO-7874	PhenoGreen™ 400 Injector Septa	50/pk	
PhenoGreen 7/16 in. (11 mm) Diameter 400 °C			
AGO-7875	PhenoGreen™ 400 Injector Septa	50/pk	
PhenoRed 3/16 in. (9.5 mm) Diameter 400 °C			
AGO-7916	PhenoRed™ 400 Injector Septa	50/pk	
PhenoRed 7/16 in. (11 mm) Diameter 400 °C			
AGO-7917	PhenoRed™ 400 Injector Septa	50/pk	

Ordering Information Graphite Ferrules, Rated to 450 °C

Part No.	Description	Unit	Price
0.4 mm Ferrule ID			
AGO-4698	Graphite Ferrule 1/16 in. to 0.4 mm	10/pk	
AGO-4699	Graphite Ferrule 1/16 in. to 0.4 mm	50/pk	
0.5 mm Ferrule ID			
AGO-4701	Graphite Ferrule 1/16 in. to 0.5 mm	10/pk	
AGO-4702	Graphite Ferrule 1/16 in. to 0.5 mm	50/pk	
0.8 mm Ferrule ID			
AGO-4704	Graphite Ferrule 1/16 in. to 0.8 mm	10/pk	
AGO-4705	Graphite Ferrule 1/16 in. to 0.8 mm	50/pk	



Additional GC accessories are available.
For more information contact our GC Specialists at GCspecialist@phenomenex.com.

Terms and Conditions

Subject to Phenomenex Standard Terms & Conditions, which may be viewed at www.phenomenex.com/TermsAndConditions.

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Disclaimer

Comparative separations may not be representative of all applications.

Cool-Lock Nut is U.S. patent pending by Phenomenex, Inc.

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guarantee

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

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