

Zebron™ GC Columns

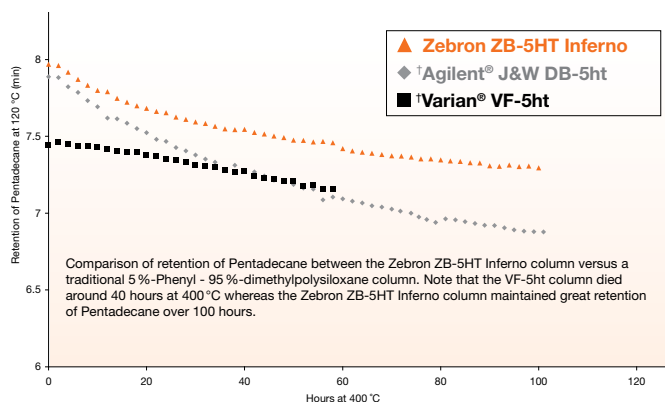
ZB-5HT Inferno™

- First non-metal columns stable to 430 °C
- Robust column for high temperature bake outs and analysis, such as biodiesel, long-chain hydrocarbons, polymers, and high molecular weight compounds
- Provides true boiling point separation for hydrocarbon distillation methods
- Longer lifetime with rugged high temperature, polyimide coated, fused silica tubing
- Low activity, provides good peak shape for acidic and basic samples
- Individually tested for low bleed, MS certified
- Temperature Limits: -60 to 400/430 °C (Isothermal/TPGC)*

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

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

Zebron Inferno Columns Win In The Lifetime Test



Conditions for all columns**:

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

How does the lifetime test work?

Hydrocarbons are a good way to measure the stability and lifetime of a non-polar column. Because their 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 Zebron 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 ZB-5HT had the same retention for Pentadecane at 100 hours as the Agilent® J&W DB-5ht column at 40 hours—over 2X the lifetime!

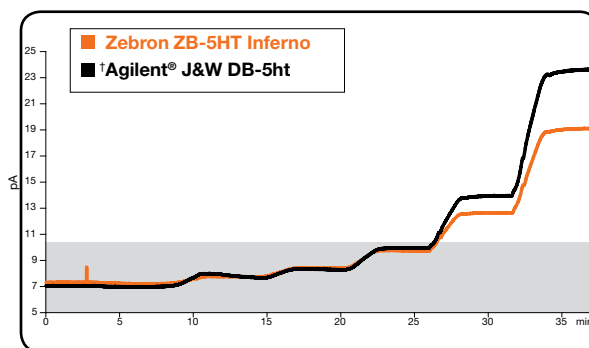
Column Profile



Applications

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

Lower Bleed!*



Conditions for both columns**:

- Dimensions:** 30 meter x 0.25 mm x 0.10 µm
- Injection:** Null Injection @ 250 °C
- Carrier Gas:** Hydrogen @ 11 psi (Constant Pressure)
- Oven Program:** 120 °C for 3 min to 320 °C @ 30 °C/min (hold 5 min) to 340 °C @ 30 °C/min (hold 5 min) to 360 °C @ 30 °C/min (hold 5 min) to 380 °C @ 30 °C/min (hold 5 min) to 400 °C @ 30 °C/min (hold 5 min)
- Detector:** FID @ 405 °C

*The shaded area depicts the bleed criteria for MS certified columns on a MS detector. MS bleed certification values are typically read at 320 °C. This demonstrates the low bleed capabilities of the ZB-5HT. It meets MS certification limits even at 360 °C!

**All columns used for above tests were new/never used, prior to this testing and 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 may not be representative of every application.

*Agilent is a registered trademark of Agilent Technologies, Inc.
Varian is a registered trademark of Varian Medical Systems Technologies, Inc.



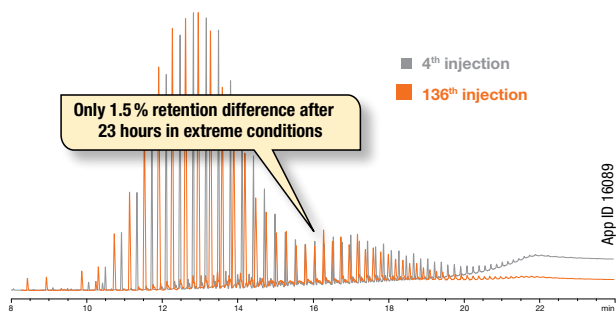
2007 R&D 100 Award Recipient



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, send in your comparative data within 45 days and keep the column for FREE!

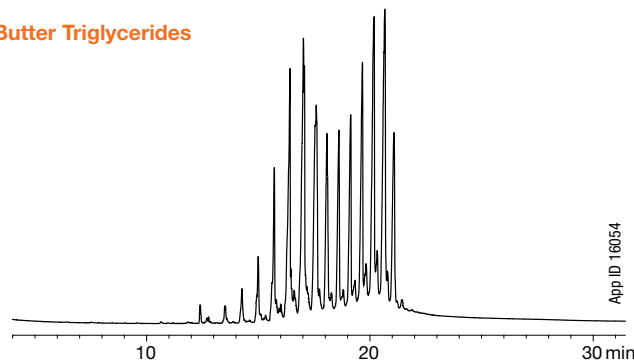
ZB-5HT Inferno™ (cont'd)

Paraffin Wax



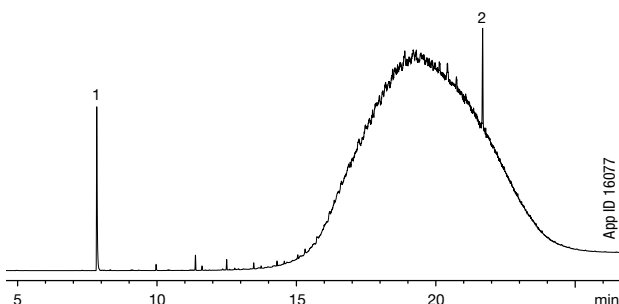
Column: Zebron ZB-5HT Inferno
Dimensions: 15 meter x 0.32 mm x 0.10 µm
Part No.: 7EM-G015-02
Injection: Direct on column @ 43 °C, 0.1 µL
Carrier Gas: Helium @ 1.9 mL/min (35 cm/sec) (constant flow)
Oven Program: 40 °C for 2 min to 430 °C @ 20 °C for 10 min
Detector: FID @ 430 °C
Sample: Paraffin Wax

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

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
Oven Program: 50 °C for 6 min to 400 °C @ 20 °C/min for 15 min
Carrier Gas: Helium @ 1.3 mL/min (constant flow)
Detector: FID @ 415 °C
Sample: Fuel was 10 mg/mL in dichloromethane with 50 ppm markers
 1. Decane (C10)
 2. Tetracontane (C40)

Ordering Information

Zebron ZB-5HT Inferno GC Columns

ID(mm)	df(µm)	Temp. Limits °C	Part No.	Price
10-Meter with 2-Meter Spliced Guard (0.53 mm ID)				
0.32	0.10	-60 to 400/430	7CM-G015-02-GST	
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	
60-Meter				
0.25	0.25	-60 to 400/430	7KG-G015-11	

Note: 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. Agilent 6850 and some SRI and process GC systems use only 5 in. cages. See p. 86.



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



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



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