

Simulated Distillation


Metal GC Columns



Zebron

Zebron™ ZB-1XT SimDist
with Glass Infusion™ Technology

*Consistent and Reliable
Results, Guaranteed.*

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



5 Reasons

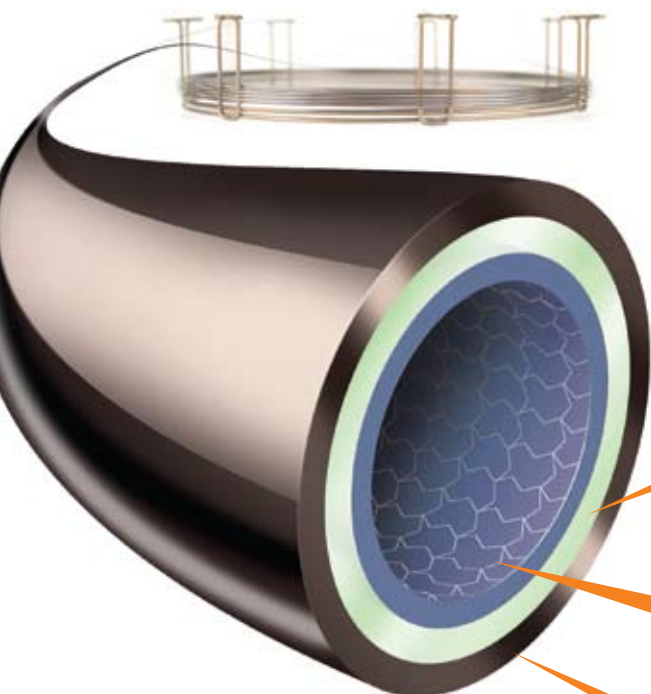
to Switch to Zebron™ ZB-1XT SimDist GC Columns

- 1. New Glass Infusion™ Technology** p. 3
Uniform Coating for Sharper Peaks and Higher Efficiency
- 2. Consistency and Reliability** p. 4
Zebron Columns are INDIVIDUALLY Tested for Better Reproducibility and Overall Performance
- 3. Higher Efficiency** p. 6
45-70 % Higher Column Efficiency
- 4. Long Lifetime** p. 7
Improved Resolution of C50/C52 Hour after Hour
- 5. 100 % Risk-Free Guarantee** p. 11



guarantee

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



New Glass Infusion™ Technology for Improved Performance

Multi-layer Glass Infusion™

ensures a thick uniform surface that is consistent throughout the length of the column.

Due to the Glass Infusion, we achieve complete surface coverage with our **advanced high temperature polymer**.

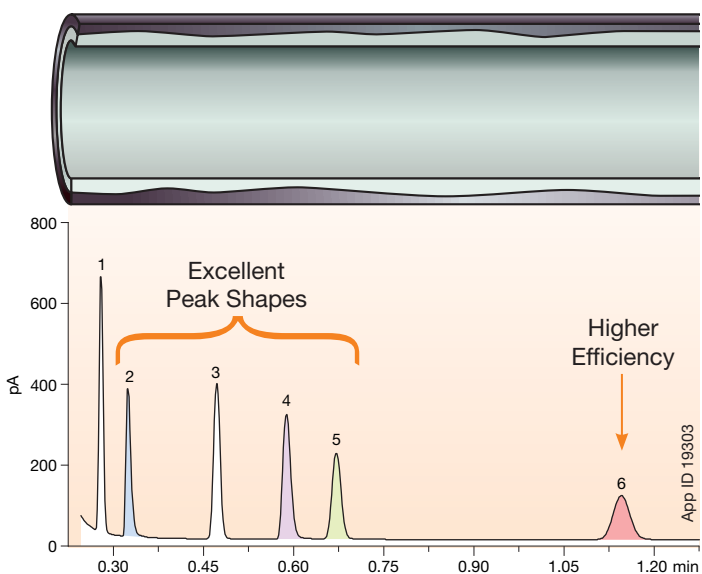
Rugged Metal Tubing allows you to run methods up to 450 °C without becoming brittle or breaking.

Why It's Good

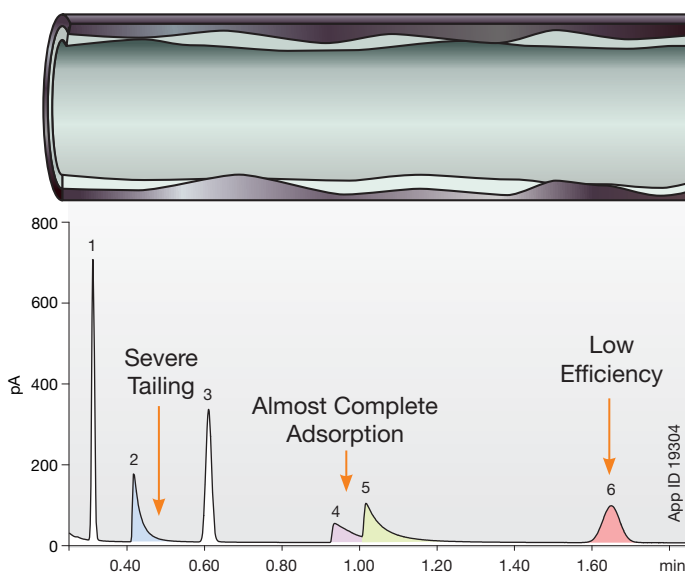
The Glass Infusion process results in a thick and uniform glass layer that completely covers the internal metal surface of the column. This uniform glass surface allows for thorough stationary phase coverage which improves efficiency. Since neutral hydrocarbon test mixes do not detect uneven glass deposition, we use a test mix of acids, bases and

neutrals to monitor our manufacturing process and ensure complete glass infusion and stationary phase coverage. As a result, Zebron ZB-1XT columns achieve high efficiencies and perform reliably and consistently from run-to-run and column-to-column.

Glass Infused ZB-1XT



Not Glass Infused



Conditions for both columns:

Injection: Split 100:1 @ 250 °C, 1.0 µL
Carrier Gas: Hydrogen @ 1.93 mL/min (constant pressure)
Oven Program: 130 °C (Isothermal)
Detector: FID @ 325 °C

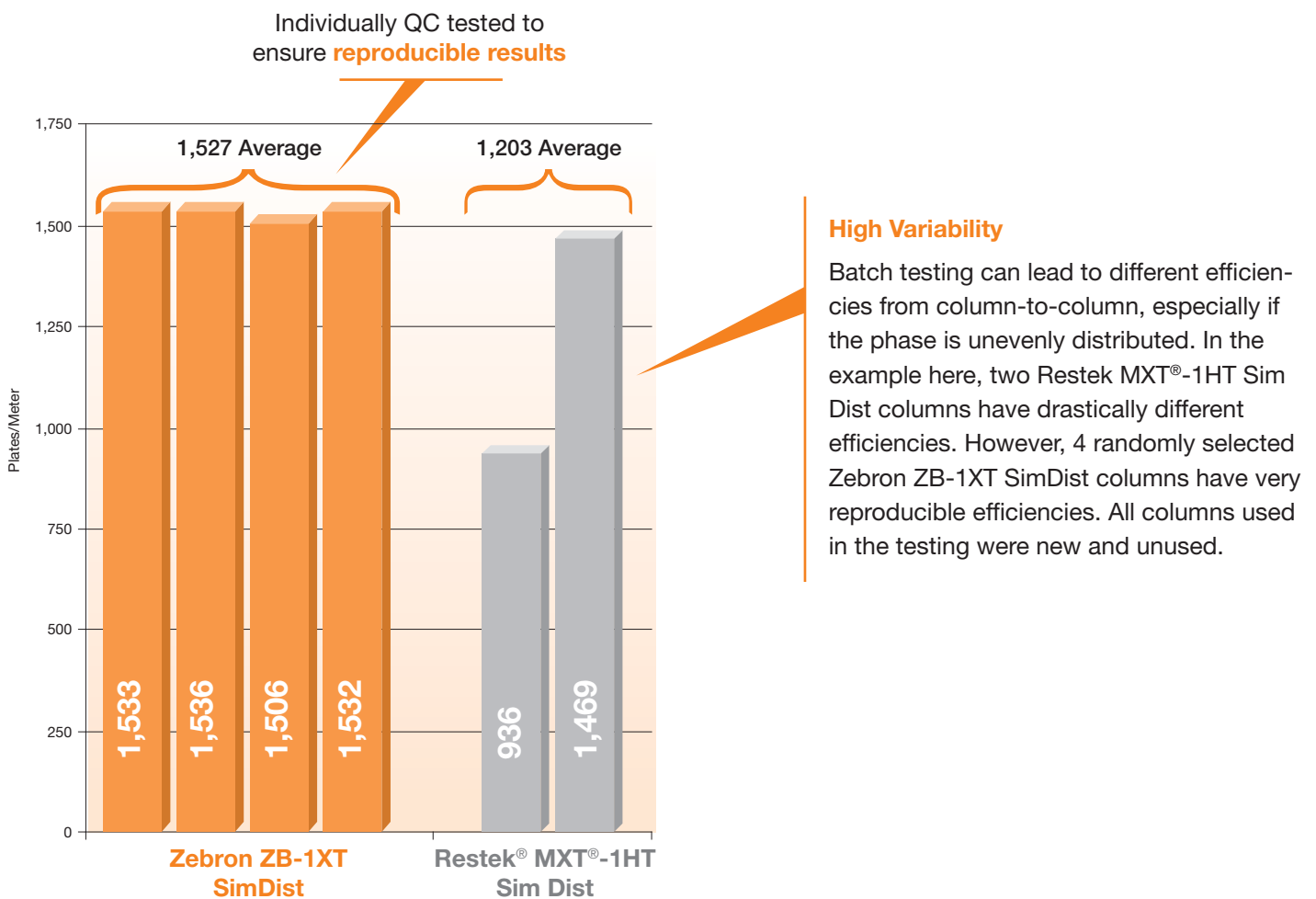
Sample: 1. Undecane
 2. 4-Chlorophenol
 3. Tridecane
 4. 1-Undecanol
 5. Dicyclohexylamine
 6. Pentadecane

Note: Sample at 250 µg/mL each in hexane

Individually Tested for Better Reproducibility and Performance

In addition to employing Glass Infusion™ Technology for consistency, each Zebtron ZB-1XT SimDist column is individually tested to eliminate column-to-column variability.

Column Reproducibility Comparison Between Restek® and Zebtron



Tip:

For quick and accurate GC column installation, use the Cool-Lock™ Nut. (See page 11).



We Recommend Against Using Batch Tested Columns

Some metal GC columns for simulated distillation are batch QC tested. This process introduces the possibility for poor column-to-column reproducibility.

The Batch Testing Process – How Others Do It



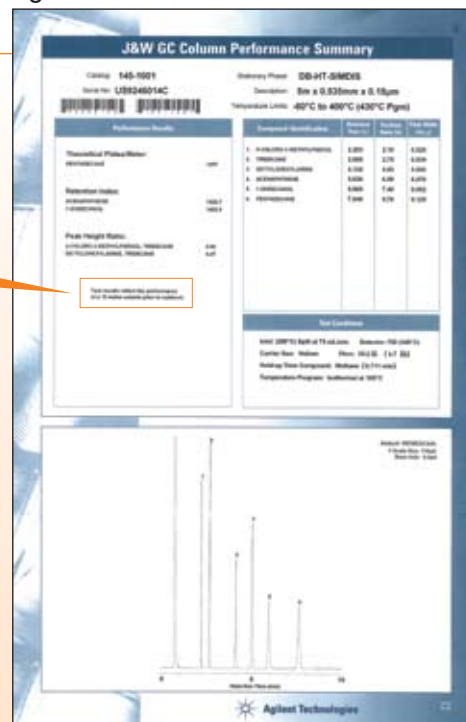
Restek® and Agilent®'s Actual QC Sheets

Restek® GC Column

“Test results reflect the performance of a 15 meter column prior to cutdown”

“This column was originally tested and evaluated as a 15 meter column and cut into 3 x 5 meter columns”

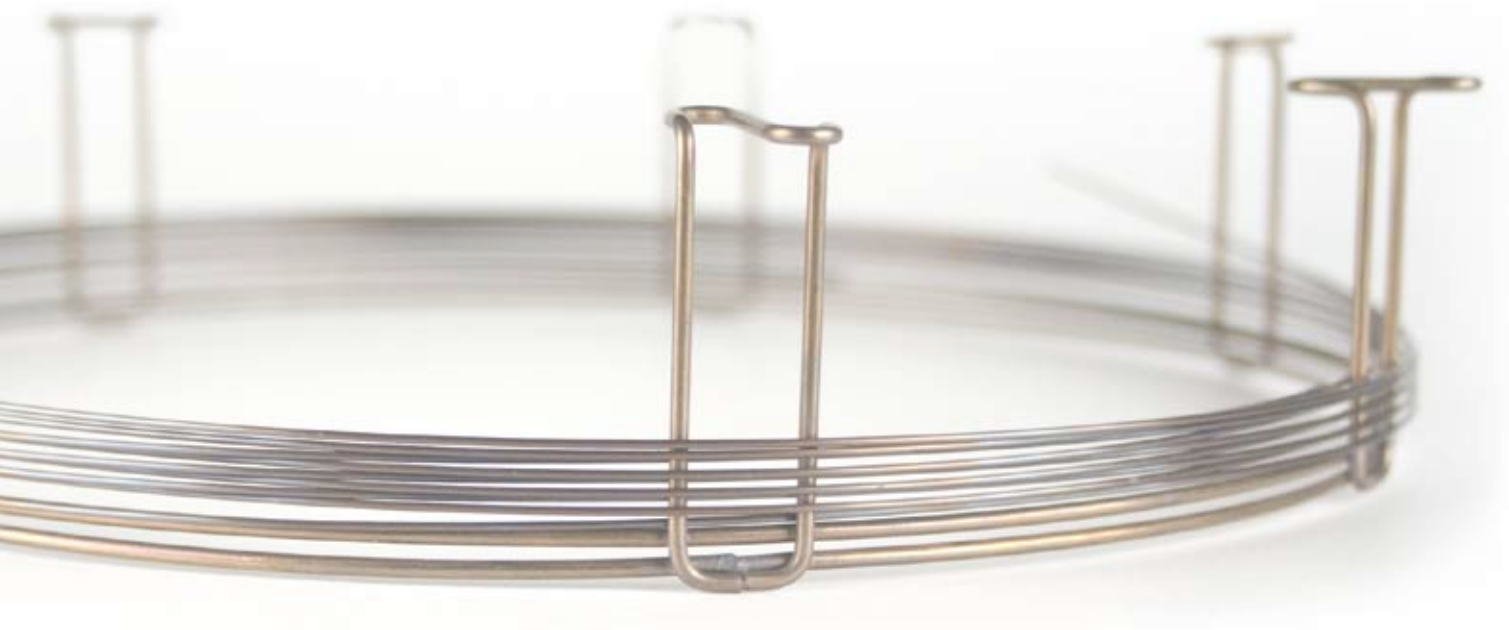
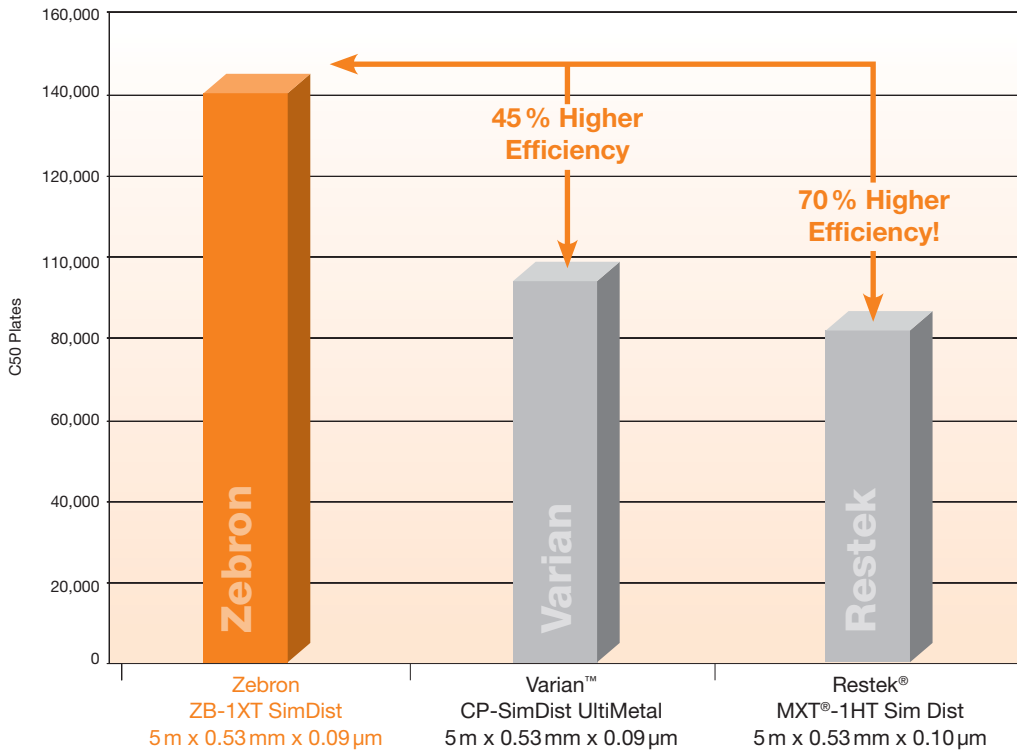
Agilent® J&W GC Column



45-70 % Higher Column Efficiency

Glass Infusion™ Technology provides improved efficiency, allowing sharper peaks and improved signal-to-noise for late eluting and low level compounds.

Higher C50 Efficiency with Zebtron ZB-1XT SimDist Columns

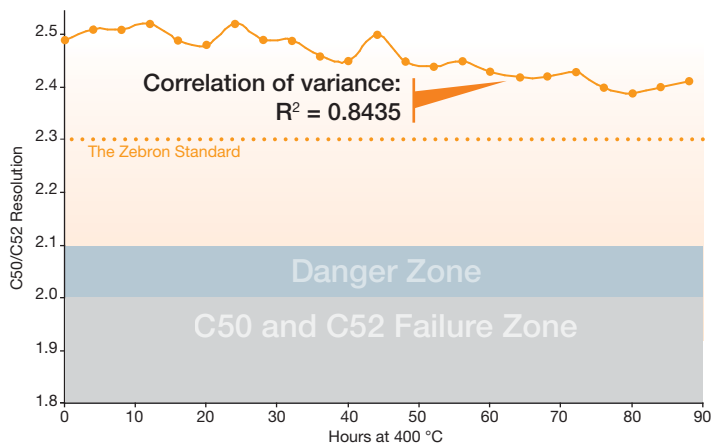


Improved Resolution of C50/C52 Hour After Hour

In order for a GC column to be used for high temperature simulated distillation analysis ASTM D6352, it needs to provide a resolution greater than 2.0 for C50 and C52. In this example, Zebtron™ ZB-1XT SimDist columns start with better resolution and maintain it day in and day out.

Zebtron ZB-1XT SimDist

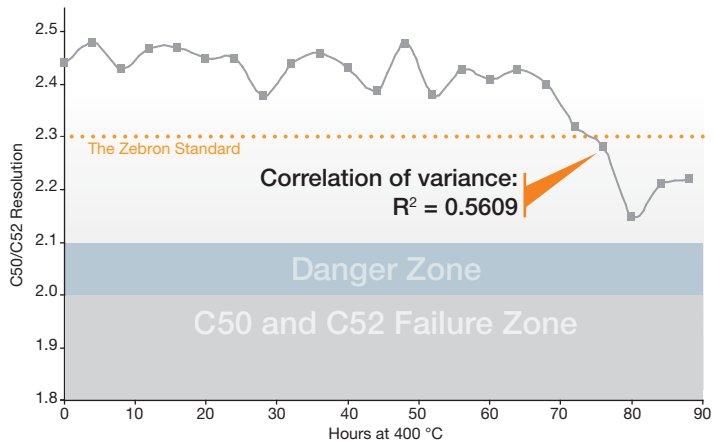
5 m x 0.53 mm x 0.09 μm



- High resolution
- Long lifetime
- Consistent and reliable performance

Varian™ CP-SimDist UltiMetal

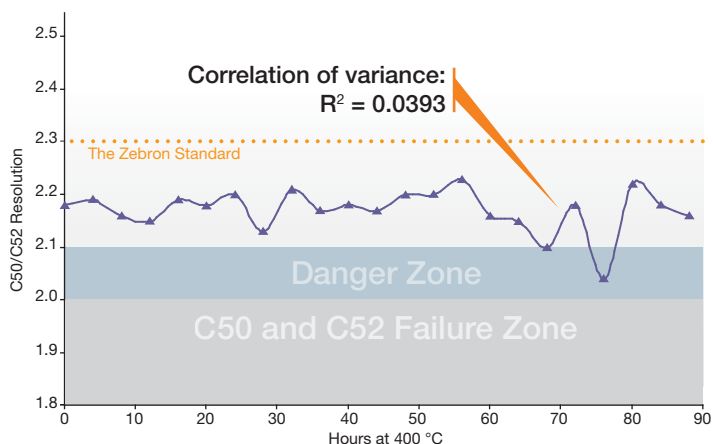
5 m x 0.53 mm x 0.09 μm



- High variability
- Lower C50/52 resolution

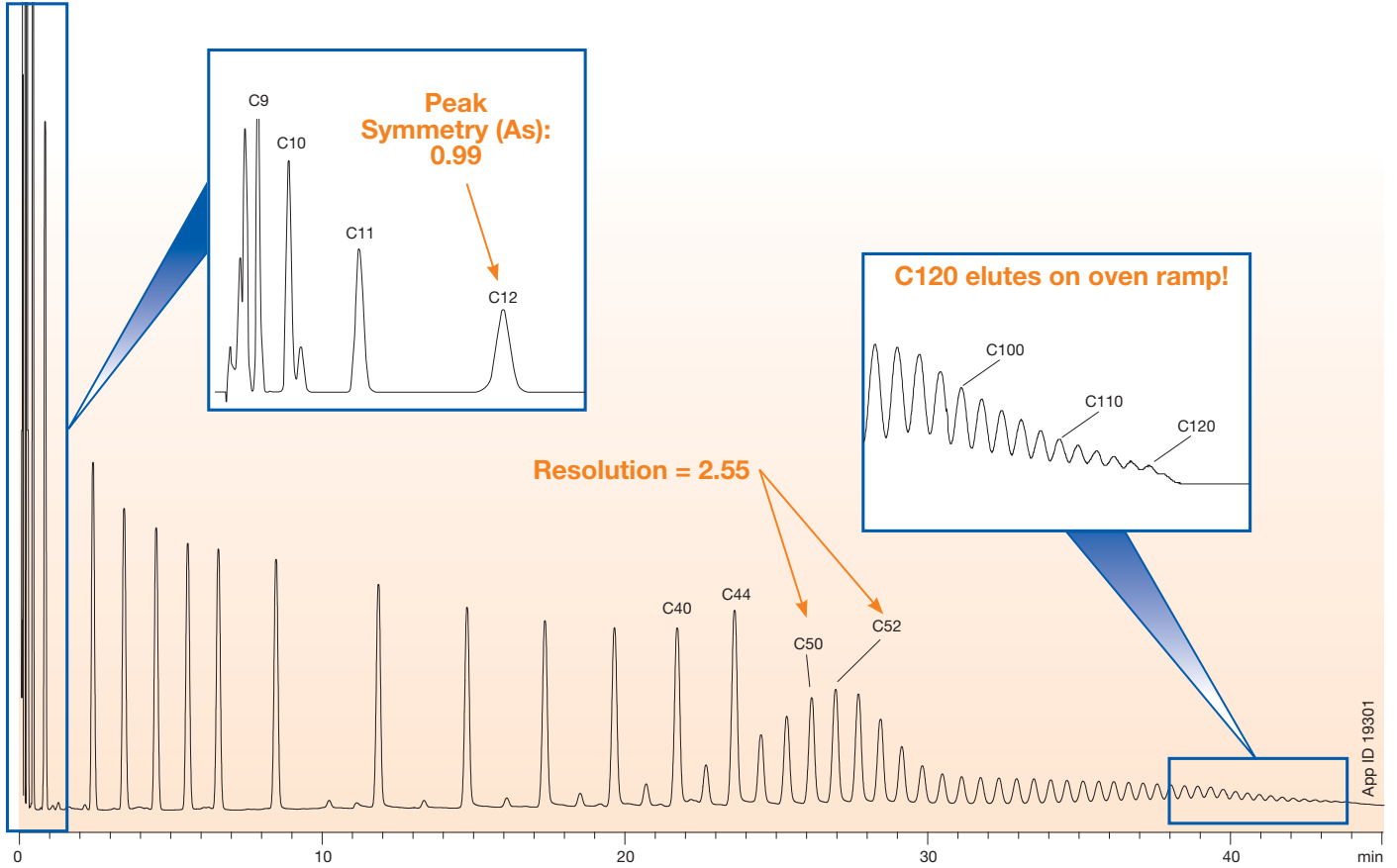
Restek® MXT®-1HT Sim Dist

5 m x 0.53 mm x 0.10 μm



- High risk of failing method criteria
- Lower C50/52 resolution
- High variability

Better Results for High Temperature SimDist Analysis (ASTM D7169)

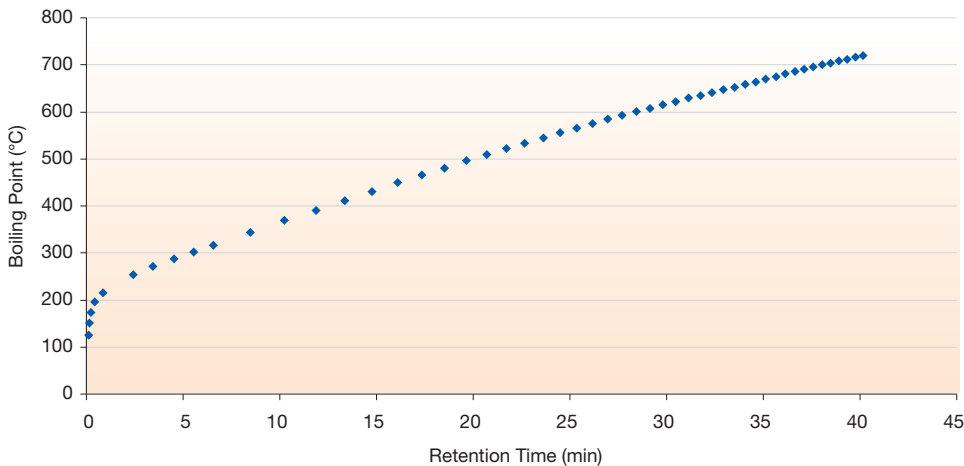


App ID 19301

Column: Zebtron™ ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.09 µm
Part No.: 7AK-G026-55
Injection: On-Column @ 53 °C, 1 µL
Carrier Gas: Helium @ 34 mL/min (constant flow)
Oven Program: 35 °C to 430 °C @ 9 °C/min for 10 min
Detector: FID @ 450 °C
Sample: D2887 calibration mix with POLYWAX® 1000 in CS2
 Note: This chromatogram has been baseline subtracted.

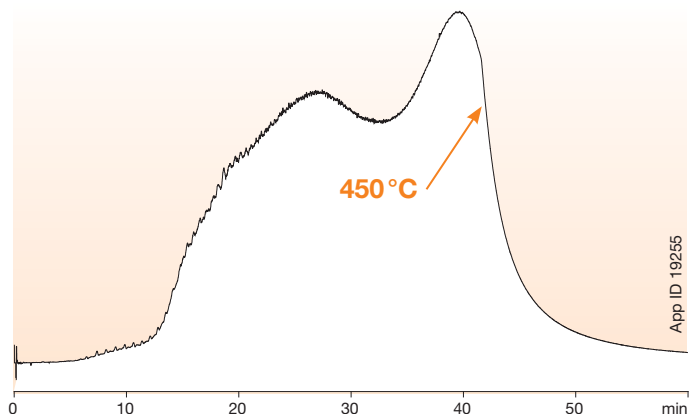
Method Requirement	ZB-1XT SimDist Value	Pass
Resolution of C50 / C52 is between 1.8 and 4.0	2.55	✓
Peak skew for any peak from C12-C24 is between 0.8 and 1.2	C12 Skew = 0.99	✓
C100 elutes on temperature ramp	Up to C120 elutes on ramp	✓

Boiling Point Calibration Graph



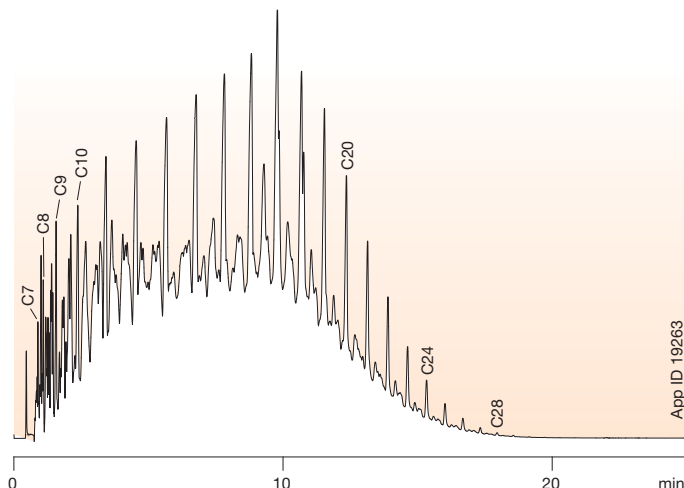
Representative Applications

Vacuum Bottom Distillate (ASTM D7169)



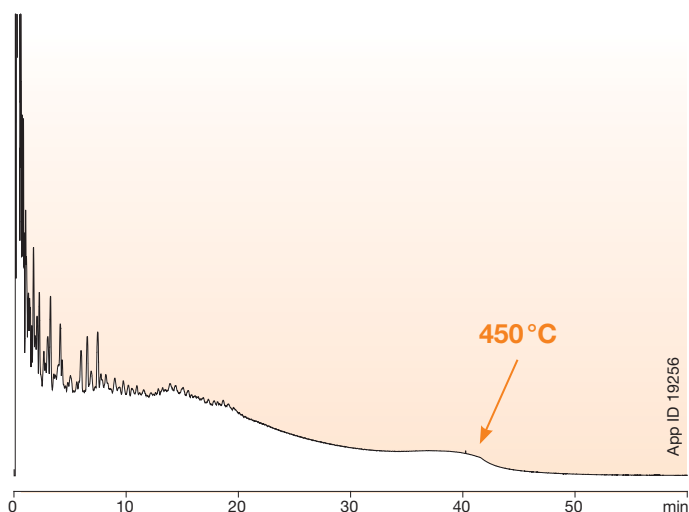
Column: Zebtron™ ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.09 μm
Part No.: 7AK-G026-55
Injection: On-Column @ 38 °C, 1 μL
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 450 °C @ 10 °C/min for 20 min
Detector: FID @ 450 °C
Sample: Vacuum bottom distillate
 Note: Sample is 1% in CS2 and baseline subtracted.

Diesel Fuel



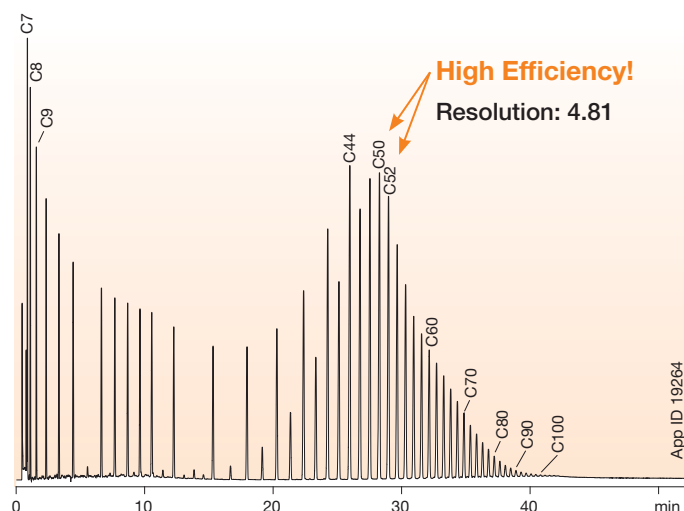
Column: Zebtron ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.15 μm
Part No.: 7AK-G026-05
Injection: On-Column @ 33 °C, 1 μL
Carrier Gas: Helium @ 7 mL/min (constant flow)
Oven Program: 30 °C to 450 °C @ 10 °C/min for 10 min
Detector: FID @ 450 °C
Sample: Diesel Fuel
 Note: Sample is 1% in CS2 and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

Yeates Crude Oil (ASTM D7169)



Column: Zebtron ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.09 μm
Part No.: 7AK-G026-55
Injection: On-Column @ 38 °C, 1 μL
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 450 °C @ 10 °C/min for 20 min
Detector: FID @ 450 °C
Sample: Yeates Crude Oil
 Note: Sample is 1% in CS2 and baseline subtracted.

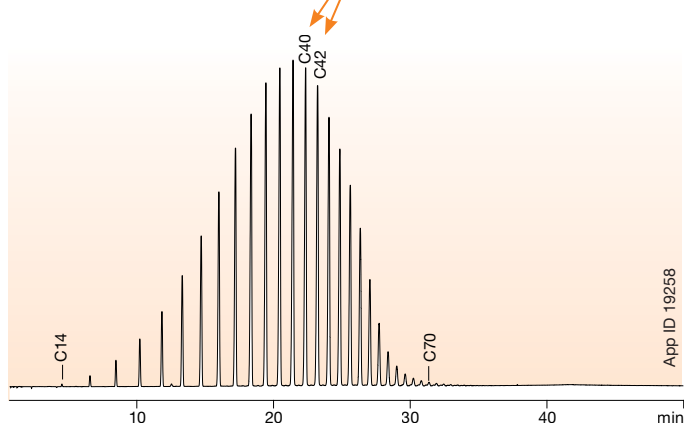
Hydrocarbons C7–C100+ (ASTM D7169)



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

POLYWAX® 500

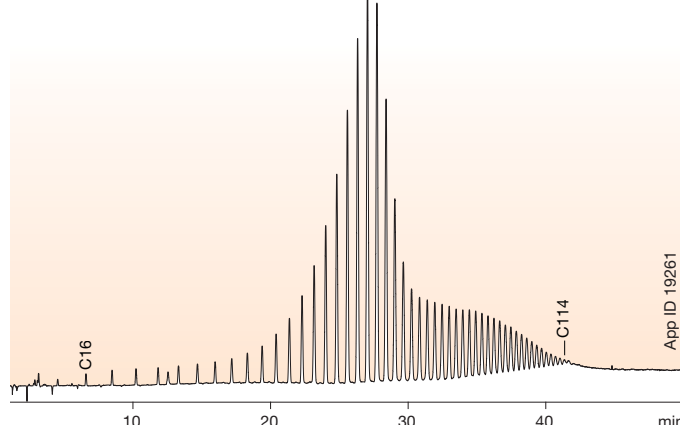
High Efficiency!
Resolution: 4.65



Column: Zebtron ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.15 μ m
Part No.: 7AK-G026-05
Injection: On-Column @ 38 °C, 1 μ L
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 450 °C @ 15 °C/min for 10 min
Detector: FID @ 450 °C
Sample: POLYWAX 500

Note: Sample is 0.1 % in CS₂ and baseline subtracted.

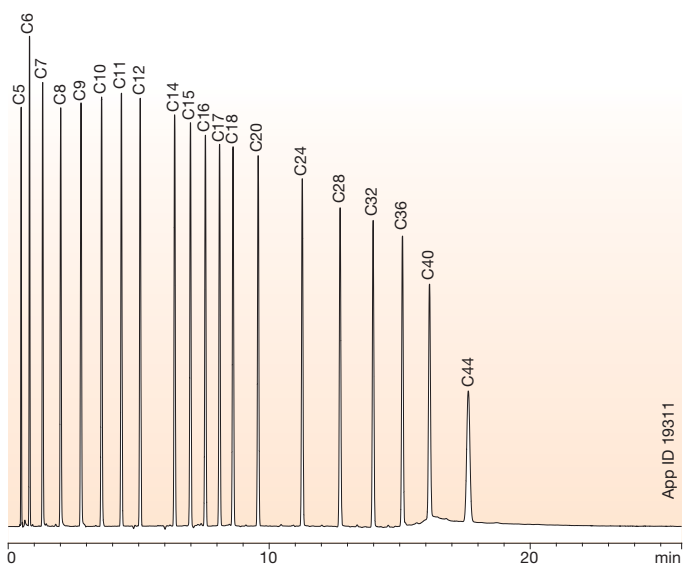
POLYWAX 1000



Column: Zebtron ZB-1XT SimDist
Dimensions: 5 meter x 0.53 mm x 0.15 μ m
Part No.: 7AK-G026-05
Injection: On-Column @ 38 °C, 1 μ L
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 450 °C @ 15 °C/min for 10 min
Detector: FID @ 450 °C
Sample: POLYWAX 1000

Note: Sample is 0.1 % in CS₂ and baseline subtracted.

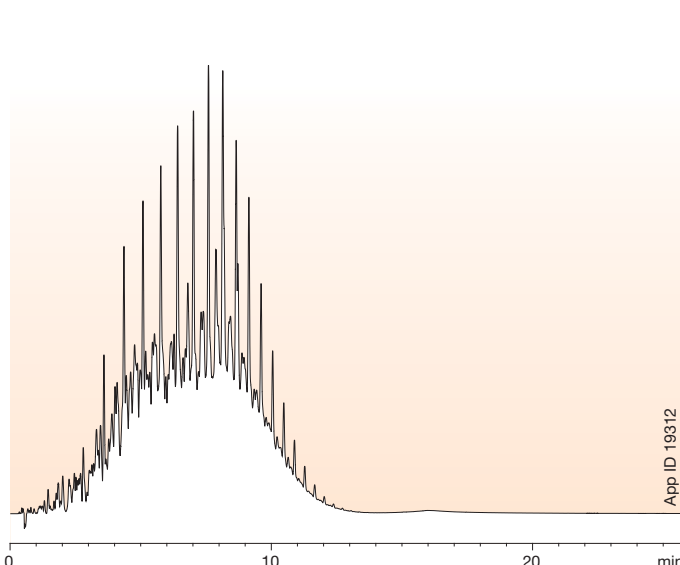
C5-C44 (ASTM D2887)



Column: Zebtron ZB-1XT SimDist
Dimensions: 10 meter x 0.53 mm x 2.65 μ m
Part No.: 7CK-G026-35
Injection: On-Column @ 38 °C, 1 μ L
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 350 °C @ 20 °C/min for 10 min
Detector: FID @ 370 °C
Sample: Hydrocarbons standard

Note: Sample is 0.01 % in CS₂ and baseline subtracted.

Diesel Fuel



Column: Zebtron ZB-1XT SimDist
Dimensions: 10 meter x 0.53 mm x 2.65 μ m
Part No.: 7CK-G026-35
Injection: On-Column @ 38 °C, 0.1 μ L
Carrier Gas: Helium @ 15 mL/min (constant flow)
Oven Program: 35 °C to 350 °C @ 20 °C/min for 10 min
Detector: FID @ 370 °C
Sample: Diesel fuel

Note: Sample is neat and baseline subtracted.

Zebron™ ZB-1XT SimDist Column Selection

ASTM Method	Ranges	Analytes	Recommended Column	Description	Price
D7169	C9-C100	Crude Oil	7AK-G026-05	ZB-1XT SimDist, 5 m x 0.53 mm x 0.15 µm	
D7169	C9-C100	Vacuum Distillates	7AK-G026-55	ZB-1XT SimDist, 5 m x 0.53 mm x 0.09 µm	
D6352	C10-C90	Petroleum Distillates	7AK-G026-05	ZB-1XT SimDist, 5 m x 0.53 mm x 0.15 µm	
D2887X	C10-C60	Petroleum Fractions	7AK-G026-05	ZB-1XT SimDist, 5 m x 0.53 mm x 0.15 µm	
D2887	C5-C44	Petroleum Fractions	7CK-G026-35	ZB-1XT SimDist, 10 m x 0.53 mm x 2.65 µm	
D3710	C4-C15	Gasoline Fractions	7CK-G026-35	ZB-1XT SimDist, 10 m x 0.53 mm x 2.65 µm	

Ordering Information

Zebron ZB-1XT SimDist Metal GC Columns will replace:

- Varian™ CP-SimDist UltiMetal
- Agilent® J&W DB-HT Sim Dis
- Restek® MXT®-1HT Sim Dist

100 % Risk-Free guarantee

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

ID(mm)	df(µm)	Temp. Limits °C	Part No.	Price
5-Meter				
0.53	0.09	-60 to 450	7AK-G026-55	
0.53	0.15	-60 to 450	7AK-G026-05	
10-Meter				
0.53	0.15	-60 to 450	7CK-G026-05	
0.53	2.65	-60 to 400	7CK-G026-35	



Cool-Lock GC Capillary Nut For Agilent GC Systems*



Part No.	Description	Unit	Price
AG0-8319	Cool-Lock GC Capillary Nut For Use With Short-Style Ferrules	ea	
AG0-8320	Cool-Lock GC Capillary Nut For Use With Long-Style Ferrules	ea	
AG0-8349	Cool-Lock Nut Installation Gauge	ea	

Replacement Ferrules

AG0-4701	GC Capillary Ferrules Graphite 1/16 in. to 0.5 mm ID	10/pk	
AG0-4704	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 GC Systems**




Part No.	Description	Unit	Price
AG0-8419	Cool-Lock GC Capillary Nut For Use With Short-Style Ferrules	ea	
AG0-8420	Cool-Lock Nut Installation Gauge	ea	

** Guaranteed fit for Shimadzu 2010 and 2014 GC systems

Test Mix	Part No.	Price
ZB-1XT SimDist Test Mix	AG0-8645	



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

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