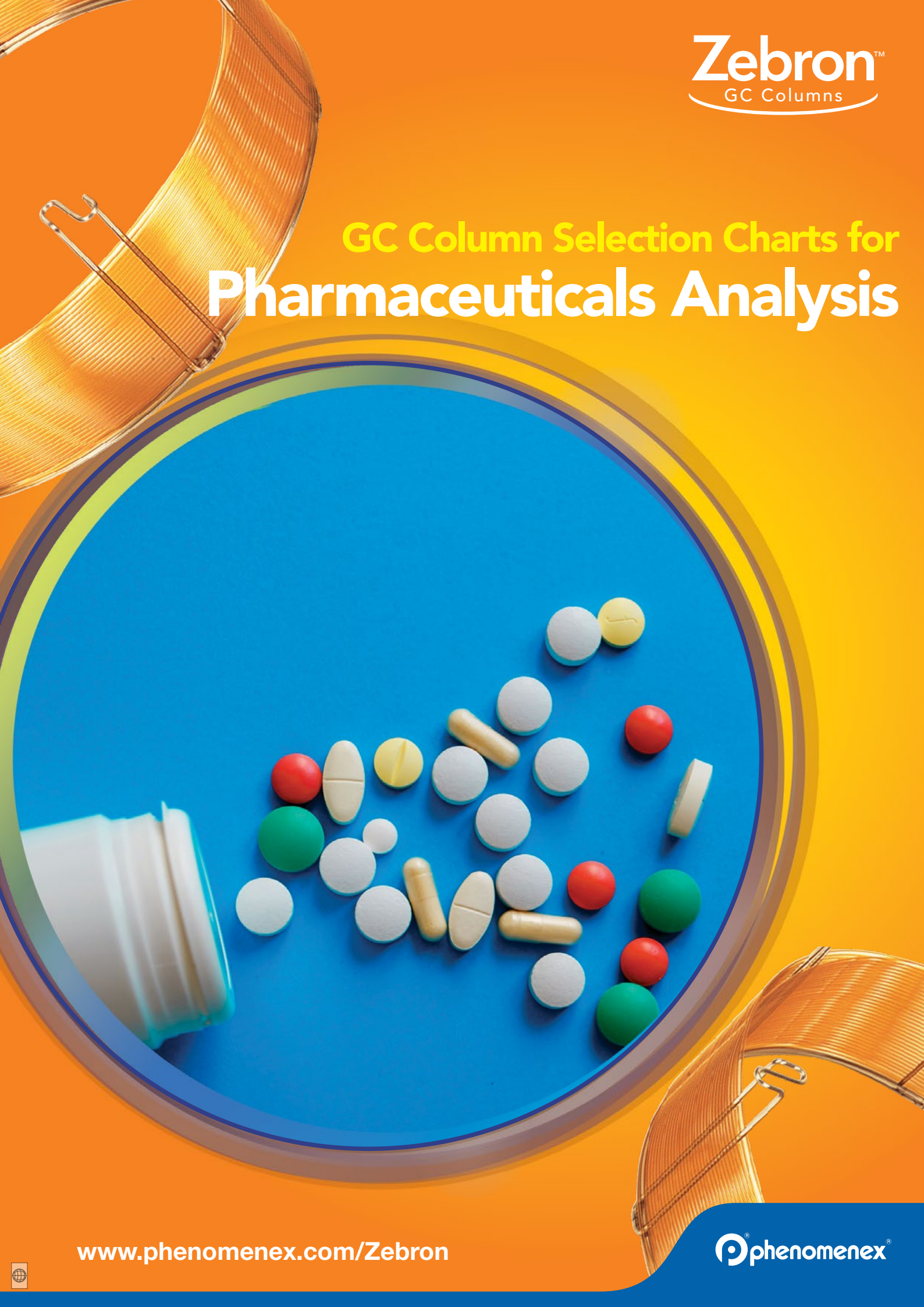



# GC Column Selection Charts for Pharmaceuticals Analysis



# Pharmaceutical Selection Chart – USP

Listed below are recommended Zebron columns for USP and pharmaceutical methods. Other columns may also be used for these analyses — please contact Phenomenex for your specific GC column needs.

USP	Phase	Composition	Recommended Columns
	G1	Dimethylpolysiloxane Oil	ZB-1, ZB-1 <sup>PLUS</sup> ™, ZB-1HT Inferno™
	G2	Dimethylpolysiloxane Gum	ZB-1, ZB-1 <sup>PLUS</sup> , ZB-1HT Inferno
	G3	50 % Phenyl 50 % Methylpolysiloxane	ZB-50
	G5	≥ 70 % of 3-Cyanopropylpolysiloxane	ZB-FAME
	G8	80 % Bis (3-Cyanopropyl-20 % 3-Cyanopropylphenylpolysiloxane)	ZB-FAME
	G9	Methylvinylpolysiloxane	ZB-1 <sup>PLUS</sup> , ZB-1HT Inferno, ZB-1
	G14	Polyethylene Glycol (Average MW 950-1,050)	ZB-WAX, ZB-WAX <sup>PLUS</sup> ™
	G15	Polyethylene Glycol (Average MW 3,000-3,700)	ZB-WAX, ZB-WAX <sup>PLUS</sup>
	G16	Polyethylene Glycol (Average MW 15,000)	ZB-WAX, ZB-WAX <sup>PLUS</sup>
	G17	75 % Phenyl 25 % Methylpolysiloxane	ZB-50
	G20	Polyethylene Glycol (Average MW of 380-420)	ZB-WAX, ZB-WAX <sup>PLUS</sup>
	G25	Polyethylene Glycol TPA (Carbowax 20M Terephthalic Acid)	ZB-FFAP
	G27	5 % Phenyl 95 % Methylpolysiloxane	ZB-5, ZB-5 <sup>PLUS</sup> ™, ZB-5HT Inferno
		5 % Phenyl-Arylene 95 % Methylpolysiloxane	ZB-5ms, ZB-5MS <sup>PLUS</sup> ™, ZB-SemiVolatiles
	G28	25 % Phenyl 75 % Methylpolysiloxane	ZB-35, ZB-35HT Inferno
	G32	20 % Phenylmethyl 80 % Dimethylpolysiloxane	ZB-35, ZB-35HT Inferno
	G35	Polyethylene Glycol & Diepoxide Esterified with Nitroterephthalic Acid	ZB-FFAP
	G36	1 % Vinyl 5 % Phenylmethylpolysiloxane	ZB-5, ZB-5 <sup>PLUS</sup> , ZB-5HT Inferno
	G38	Phase G1 Plus A Tailing Inhibitor	ZB-1, ZB-1 <sup>PLUS</sup> , ZB-1HT Inferno
	G39	Polyethylene Glycol (Average MW 1,500)	ZB-WAX, ZB-WAX <sup>PLUS</sup> ™
	G41	Phenylmethyldimethylsilicone (10% Phenyl Substituted)	ZB-5, ZB-5 <sup>PLUS</sup> , ZB-5HT Inferno
	G42	35 % Phenyl 65 % Dimethylpolysiloxane	ZB-35, ZB-35HT Inferno
	G43	6 % Cyanopropylphenyl 94 % Dimethylpolysiloxane	ZB-624, ZB-624 <sup>PLUS</sup> ™
	G46	14 % Cyanopropylphenyl 86 % Methylpolysiloxane	ZB-1701, ZB-1701P
	G47	Polyethylene glycol (Average MW 8,000)	ZB-WAX <sup>PLUS</sup> , ZB-WAX
	G48	Highly polar, partially cross-linked cyanopolysiloxane	ZB-FAME
	G51	50% Phenyl - 50% Dimethylpolysiloxane phase which is modified with an aromatic selector for optimized separation of polycyclic aromatic hydrocarbons (PAH)	ZB-PAH-CT, ZB-PAH-EU

Residual Solvents	USP <467> Procedure	USP Phase for Residual Solvents	Recommended Columns
	Procedure A	G43 (6% Cyanopropyl 94% Dimethylpolysiloxane)	ZB-624, ZB-624 <sup>PLUS</sup>
	Procedure B	G16 (Polyethylene Glycol)	ZB-WAX <sup>PLUS</sup>
	Procedure C	G43 or G16	ZB-624 <sup>PLUS</sup> or ZB-WAX <sup>PLUS</sup>


Doing Headspace Testing?

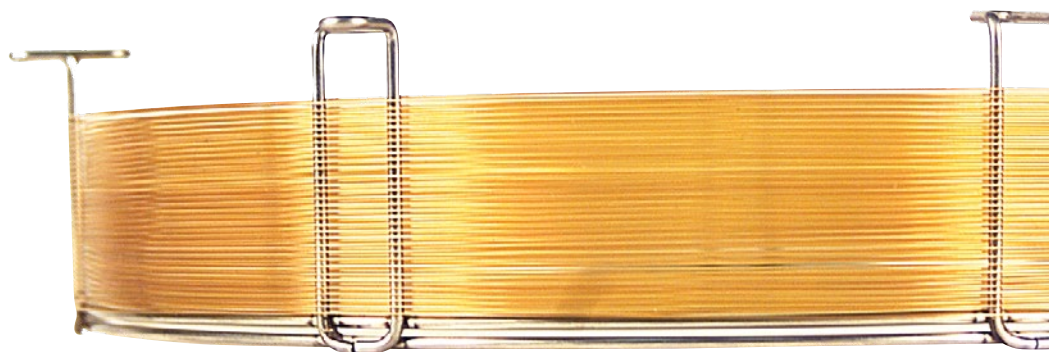
Find the right headspace vial for your analysis and learn more about Verex™ Certified Vial Products with our interactive web tool.

[www.phenomenex.com/verex](http://www.phenomenex.com/verex)

# Pharmaceutical Selection Chart – Ph.Eur

Listed below are recommended Zebron columns for Ph. Eur. and pharmaceutical methods. Other columns may also be used for these analyses – please contact Phenomenex for your specific GC column needs.

Ph.Eur	Phase	Composition	Details	Recommended Columns
	1114800	3 % Cyanopropyl 3 % Phenyl 94 % methylpolysiloxane	Polysiloxane substituted with 3 % cyanopropyl groups, 3 % phenyl groups, and 94 % methyl groups	ZB-624, ZB-624 <sup>PLUS</sup>
	1109200	7 % Cyanopropyl 7 % Phenyl 86 % methylpolysiloxane	Polysiloxane substituted with 7 % cyanopropyl groups, 7 % phenyl groups, and 86 % methyl groups	ZB-1701, ZB-1701P
	1066700	Cyanopropylpolysiloxane	Polysiloxane substituted with 100 % cyanopropyl groups	ZB-FAME, ZB-Fast FAME
	1066800	Methylpolysiloxane	Polysiloxane substituted with 100 % methyl groups	ZB-1, ZB-1 <sup>PLUS</sup> , ZB-1HT Inferno; ZB-Bioethanol, ZB-1XT SimDist
	1066900	5 % Phenyl 95 % methylpolysiloxane	Polysiloxane substituted with 5 % phenyl groups and 95 % methyl groups	ZB-5, ZB-5HT
	1176600	5 % Phenyl 95 % methylpolysiloxane base deactivated	Base-deactivated Polysiloxane substituted with 5 % phenyl groups and 95 % methyl groups	ZB-5 <sup>PLUS</sup> , ZB-5MS <sup>PLUS</sup>
	1067900	50 % Phenyl 50 % methylpolysiloxane	Polysiloxane substituted with 50 % phenyl groups and 50 % methyl groups	ZB-50
	1100000	1 % Vinyl 5 % Phenyl 94 % methylpolysiloxane	Polysiloxane substituted with 1 % vinyl groups, 5 % phenyl groups, and 94 % methyl groups	ZB-5MS, ZB-5MS <sup>PLUS</sup>
	106700	Macrogol 20000	Polyethyleneglycol 20000	ZB-WAX, ZB-WAX <sup>PLUS</sup>
	106701	Macrogol 20000 2-nitroterephthate	Polyethyleneglycol 20000 with embeded 2-nitroterephthate groups	ZB-FFAP



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# Cross-Reference by Manufacturer

## Upgrade to Zebron!

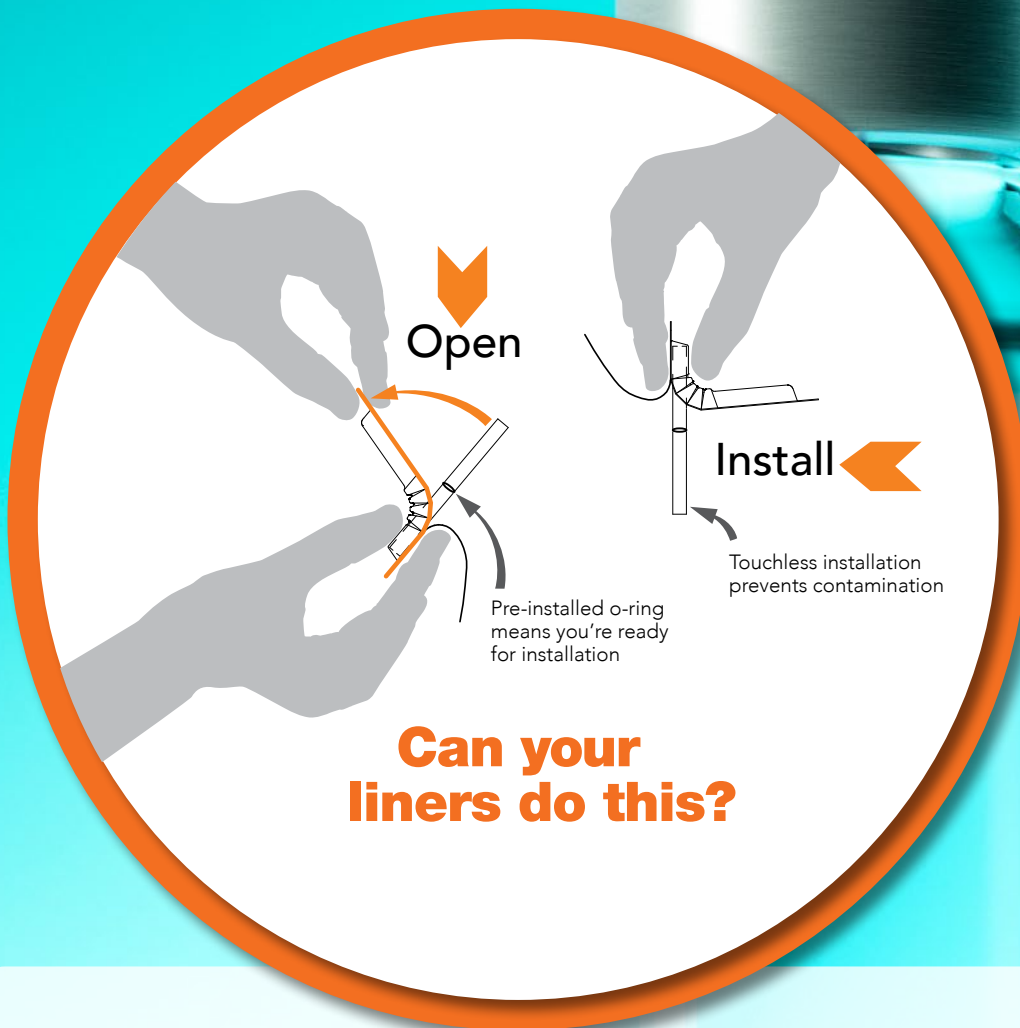
Our commitment to quality and innovation is what makes Zebron GC columns well-suited for any application. Performance is guaranteed!.

Zebron Phase	Zebron Composition	Restek®	Agilent®	Supelco®	SGE®	OV
ZB-1	100% Dimethylpolysiloxane	Rtx®-1, Rtx-1PONA, Rtx-1 F&F	DB®-1, DB-2887, DB-1 EVDX, HP-1, HP-101, HP-PONA, Ultra 1, CP-Sil 5 CB	SPB®-1, SPB-1 TG, SE-30, MET-1, SPB-1 Sulfur, SPB-HAP	BP1, BP1-PONA, BPX1-SimD	OV-1
ZB-1 PLUS™	100% Dimethylpolysiloxane	Rtx-1ms, Rxi®-1ms	DB-1ms, DB-1ms Ultra Inert, HP-1ms, HP-1ms Ultra Inert, CP-Sil 5 CB MS, VF-1ms	MDN-1, Equity®-1	SolGel-1ms™	
ZB-1HT Inferno™	100% Dimethylpolysiloxane	Rxi-1HT	DB-1ht, CP-SimDist	Petrocol 2887		
ZB-1XT SimDist	100% Dimethylpolysiloxane	MXT®-1HT SimDist, MXT-1, MXT-1 SimDist, MXT-2887	CP-SimDist UltiMetal, CP-Sil 8 CB UltiMetal, BPX1-SimD, DB-PS1, DB-HT SimDis, DB-PS2887			
ZB-5	5% Phenyl 95% Dimethylpolysiloxane	Rtx-5	DB-5, HP-5, Ultra 2, HP-PAS-5, CP-Sil 8 CB, HP-5ms Ultra Inert	MDN-5, SPB-5, PTE-5, SE-54, PTA-5, Equity-5, Sac-5	BP5, BPX5	OV-5
ZB-5 PLUS™	5% Phenyl 95% Dimethylpolysiloxane	Rtx-5ms, Rxi-5ms, Rtx-5Amine	DB-5, HP-5ms, HP-5msi	MDN-5S		
ZB-5HT Inferno	5% Phenyl 95% Dimethylpolysiloxane	Rxi-5HT, Rtx-5HT Sbx®-5HT, XTl®-5HT	DB-5ht, VF-5ht	HT-5		
ZB-5ms	5% Phenyl-Arylene 95% Dimethylpolysiloxane	Rtx-5Sil MS, Rxi-5Sil MS	DB-5ms, DB-5.625, VF-5ms, DB-5ms EVDX, CP-Sil 8 CB MS			
ZB-5MS PLUS™	5% Phenyl-Arylene 95% Dimethylpolysiloxane	Rxi-5Sil MS	DB-5ms Ultra Inert, HP-5ms Ultra Inert, DB-5ms, VF-5ms	SLB®-5ms		
ZB-SemiVolatiles	5% Phenyl-Arylene 95% Dimethylpolysiloxane	Rxi-5Sil MS, Rxi-5ms	DB-5ms Ultra Inert	SLB-5ms		
ZB-35	35% Phenyl 65% Dimethylpolysiloxane	Rtx-35, Rtx-35ms	DB-35, DB-35ms, HP-35, HP-35ms	MDN-35, SPB-35, SPB-608	BPX35, BPX608	OV-11
ZB-35HT Inferno	35% Phenyl 65% Dimethylpolysiloxane		Phenomenex Exclusive			
ZB-50	50% Phenyl 50% Dimethylpolysiloxane	Rtx-50	DB-17, DB-17HT, DB-17ms, HP-50+, DB-17 EVDX, CP-Sil 24 CB	SP-2250, SPB-17, SPB-50	BPX50	OV-17
ZB-624	6% Cyanopropylphenyl 94% Dimethylpolysiloxane	Rtx-1301, Rtx-624	DB-1301, DB-624, DB-VRX, HP-VOC, CP-1301, CP-Select 624 CB	SPB-1301, SPB-624	BP624	OV-624
ZB-624 PLUS™	Proprietary	Rxi-624Sil MS	CP-Select 624 CB, DB-624UI Ultra Inert			
ZB-1701	14% Cyanopropylphenyl 86% Dimethylpolysiloxane	Rtx-1701	DB-1701, CP-Sil 19 CB	SPB-1701, Equity-1701	BP10	OV-1701
ZB-1701P	14% Cyanopropylphenyl 86% Dimethylpolysiloxane		DB-1701P			
ZB-FAME	High Cyanopropyl		CP-Sil 88, HP-88, DB-23	SP®-2560, SP-2380		
ZB-WAX	Polyethylene Glycol	Rtx-WAX, Famewax, Stabilwax-DB	DB-WAXetr, HP-INNOWax, CP-Wax 57 CB	MET-Wax, Omegawax	SolGel-WAX™	
ZB-WAX PLUS™	Polyethylene Glycol	Stabilwax®	DB-WAX, CAM, HP-20M, Carbowax 20M, CP-Wax 52 CB	SUPELCO WAX® 10	BP20	Carbowax 20M
ZB-FFAP	Nitroterephthalic Acid Modified Polyethylene Glycol	Stabilwax-DA	DB-FFAP, HP-FFAP, CP-FFAP CB CP-Wax 58 FFAP CB	Nukol, SPB-1000	BP21	OV-351
ZB-Drug-1	Proprietary		Phenomenex Exclusive			
ZB-BAC-1	Proprietary	Rtx-BAC1	DB-ALC1			
ZB-BAC-2	Proprietary	Rtx-BAC2	DB-ALC2			
ZB-Bioethanol	Proprietary		Phenomenex Exclusive			
ZB-PAH-EU	Proprietary	Rxi-PAH	DB-PAH-EU			
ZB-PAH-CT	Proprietary		PAH-Select			

This section is, neither in terms of manufacturers nor in terms of their products, a complete list, and the accuracy of the data is not guaranteed. Small differences in dimensions or performance might be possible and slight adjustments to your application may be necessary.

Pair your GC column with a Zebron Inlet Liner for better GC results!

- Remarkably Inert
- Ridiculously Easy to Install



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### Search by:

- Application
- System Manufacturer
- Injection Type
- Part Number

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## Your GC instrument will thank you for the ultimate protection that Zebtron Gas Management offers!

### Zebtron Gas Management Filters

Part No.	Description	Unit
<a href="#">AG6-1040</a>	Gas Filter Universal	ea
<a href="#">AG6-1070</a>	Gas Filter Universal (Helium)	ea
<a href="#">AG6-1010</a>	Gas Filter Oxygen	ea
<a href="#">AG6-1020</a>	Gas Filter Moisture	ea
<a href="#">AG6-1030</a>	Gas Filter Hydrocarbon	ea
<a href="#">AG6-1050</a>	Gas Filter Hydrocarbon/Moisture for LC-MS	2/pk
<a href="#">AG6-1060</a>	Ring Nut for Gas Filter	ea



### Zebtron Gas Management Traps

Part No.	Description	Unit
<a href="#">AG6-3140</a>	Click-on Universal Trap	ea
<a href="#">AG6-3110</a>	Click-on Oxygen Trap	ea
<a href="#">AG6-3120</a>	Click-on Moisture Trap	ea
<a href="#">AG6-3130</a>	Click-on Hydrocarbon Trap	ea
<a href="#">AG6-3150</a>	Click-on Carbon Dioxide Trap	ea



### Zebtron Connecting Units

Part No.	Description	Unit
<a href="#">AG6-2101</a>	1-position Connecting Unit 1/4 in. Brass	ea
<a href="#">AG6-2102</a>	2-position Connecting Unit 1/4 in. Brass	ea
<a href="#">AG6-2103</a>	4-position Connecting Unit 1/4 in. Brass	ea
<a href="#">AG6-2201</a>	1-position Connecting Unit 1/8 in. Brass	ea
<a href="#">AG6-2202</a>	2-position Connecting Unit 1/8 in. Brass	ea
<a href="#">AG6-2203</a>	4-position Connecting Unit 1/8 in. Brass	ea
<a href="#">AG6-2204</a>	High flow 2-position Connecting Unit for LC-MS	ea
<a href="#">AG6-2205</a>	Particle Filter for LC-MS	ea
<a href="#">AG6-2206</a>	O-ring Replacement for Gas Filter Baseplate	20/pk

Part No.	Description	Unit
<a href="#">AG6-2301</a>	1-position Connecting Unit 1/4 in. Stainless Steel	ea
<a href="#">AG6-2302</a>	2-position Connecting Unit 1/4 in. Stainless Steel	ea
<a href="#">AG6-2303</a>	4-position Connecting Unit 1/4 in. Stainless Steel	ea
<a href="#">AG6-2304</a>	1-position Connecting Unit 1/8 in. Stainless Steel	ea
<a href="#">AG6-2305</a>	2-position Connecting Unit 1/8 in. Stainless Steel	ea
<a href="#">AG6-2306</a>	4-position Connecting Unit 1/8 in. Stainless Steel	ea

### Zebtron Base Electronic Indicator and Other Accessories

Part No.	Description	Unit
<a href="#">AG6-3160</a>	1/8 in. Brass Click-on Connector Set	2/pk
<a href="#">AG6-3170</a>	1/4 in. Brass Click-on Connector Set	2/pk
<a href="#">AG6-3180</a>	Wall-mounting Clamp Set for Gas Traps	2/pk
<a href="#">AG6-4150</a>	1/8 in. Stainless Steel Click-on Connector Set	2/pk
<a href="#">AG6-4160</a>	1/4 in. Stainless Steel Click-on Connector Set	2/pk
<a href="#">AG6-3190</a>	O-ring Replacement Set for Gas Trap	20/pk
<a href="#">AG6-4110</a>	Electronic Indicator for Gas Trap	ea
<a href="#">AG6-4120</a>	Electronic Indicator for Gas Filter	ea
<a href="#">AG6-4130</a>	Electronic Indicator for LC-MS Filter	ea



### First time ordering Zebtron Click-on Gas Traps?

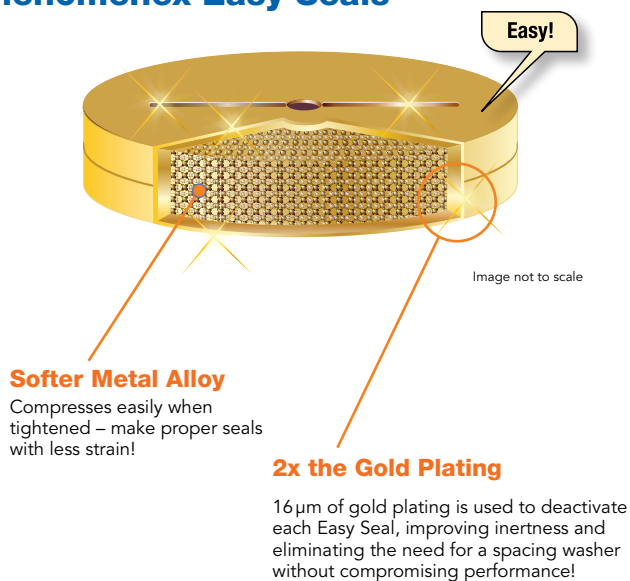
Be sure to order the **brass or stainless steel connector** with your first trap.



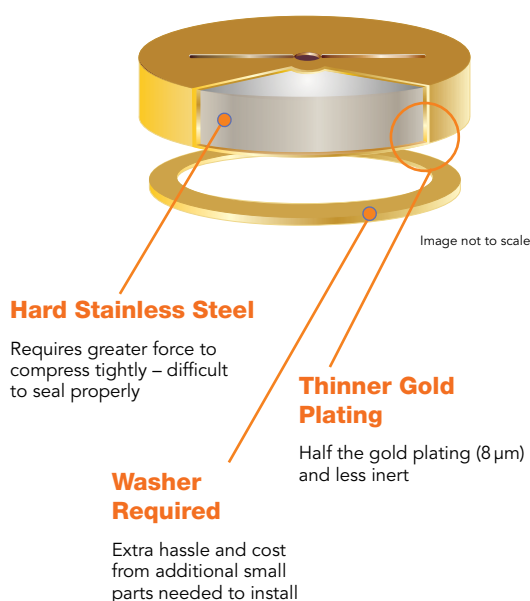
## Inlet Base Seals

### Easy Seals™ for Agilent® GCs

#### Phenomenex Easy Seals



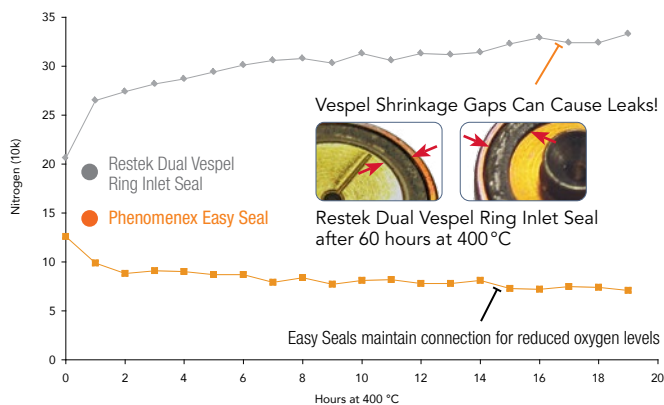
#### Traditional Gold Plated Seals



#### The Oxygen Test: 20 Hours at 400 °C

Easy Seals are designed to create leak-tight connections that reduce the amount of oxygen entering the GC system, even up to 400 °C! Our testing showed that the Easy Seal maintained a good connection while the Restek® Dual Vespel® Ring Inlet Seal showed increasing levels of oxygen in the system — increased potential for contamination!

Test Conditions: Both inlet base seals were new and unused prior to testing. Seals were installed in an Agilent 6890 Series instrument with a 5973 MS with a Zebron ZB-5ms GC column (15 meter x 0.25 mm x 0.25 µm). An initial air and water check was performed upon installation to ensure there was no error in installation. The inlet temperature was set to 400 °C and counts of oxygen were measured over time.



#### Ordering Information

Easy Seals Inlet Base Seals				2/pk	10/pk
Description	Injection Type	Groove Style	Inlet Hole Diameter (mm)	Part No.	Part No.
Easy Seals Gold Inlet Seal	Splitless	Single	0.8	AG0-8619	AG0-8620



# Pharmaceuticals Analysis



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