

Enhance Resolution

FOR POLYMER ANALYSIS, Guaranteed*

- Remarkable Reproducibility
- Exceptional Efficiency
- Long Lifetimes
- Economically Priced



Phenogel™ Non-Aqueous GPC/SEC Columns

Phenomenex Phenogel Price

5 µm, 300 x 7.8 mm

**Guaranteed
Lower Price
Alternative**

**COMPARE
AND SAVE!**

Agilent® PLgel™ Price

5 µm, 300 x 7.5 mm

EXPENSIVE

Phenogel Columns are a Recommended Alternative to:

Company	Column
Jordi Associates	Jordi GPC-DVB
Agilent Technologies®	PLgel™
Waters®	Styragel®
	µStyragel™
	Ultrastaygel™
	Styragel® HT
	Styragel® HR
Shodex®	GPC KF-800 series
PSS	SDV
Tosoh Bioscience®	TSKgel® H-type

*

guarantee

If Phenogel analytical columns do not provide at least equivalent separation as compared to a competing column of the similar particle size, phase, and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

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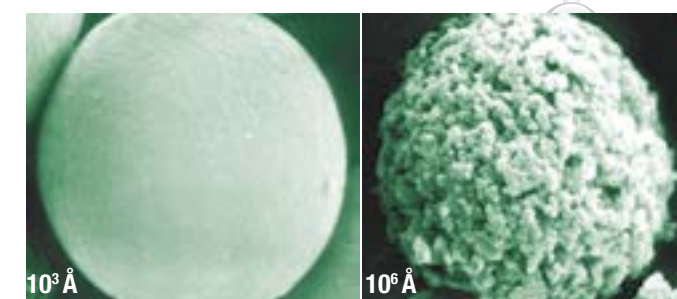
Phenogel™ Non-Aqueous GPC/SEC Columns

- 5 and 10 µm particle sizes
- Narrow bore (4.6 mm ID) solvent-saver columns available
- Highly cross-linked for mechanical and chemical stability
- Temperature stable to 140 °C

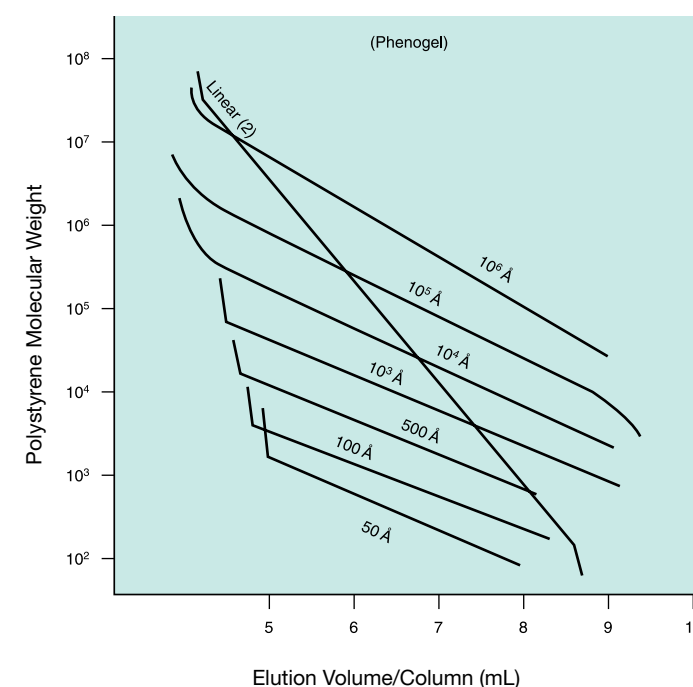
Phenogel packing materials are made from styrene-divinylbenzene by emulsion polymerization under conditions to optimize pore size, total pore volume, particle size, and degree of cross-linking. The results yield Gel Permeation Chromatography (GPC) materials that provide very high resolution, rugged durability, and wide solvent compatibility.

Phenogel is available in seven different pore sizes ranging from 50 Å to 10⁶ Å, and a unique Linear(2) configuration. Pore size distribution and pore volume are closely controlled parameters in the manufacturing process; attention to these details accounts for the high resolution and tight linear calibration curves associated with Phenogel, as well as the excellent column-to-column reproducibility.

SEM Photos of Phenogel Polymer Beads



Column Molecular Weight Calibration Curves



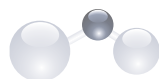
Column Selection by Molecular Weight

Sample Type	Molecular Weight	Phenogel Column
Small Organics	100 - 3 K 500 - 6 K 1 K - 15 K	50 Å 100 Å 500 Å
Resins	1 K - 75 K 5 K - 500 K 10 K - 1,000 K	10 ³ Å 10 ⁴ Å 10 ⁵ Å
High MW Polymers	60 K - 10,000 K 100 - 10,000 K	10 ⁶ Å Linear(2)

Technical Specifications

Material:	SDVB
Particle Size:	5, 10 µm
Porosities:	50 Å to 10 ⁶ Å, and mixed beds
Maximum Pressure:	1500 psi
Maximum Temperature:	140 °C
Minimum Efficiency*:	5 µm: 45,000 p/m** 10 µm: 35,000 p/m**
Typical Flow Rates:	4.6 mm ID: 0.35 mL/min 7.8 mm ID: 1.0 mL/min 21.2 mm ID: 7.0 mL/min
End Fittings:	Valco® Compatible

* Tested in THF ** For 300 x 7.8 mm ID columns



Solvent and Temperature Compatibility

- Phenogel™ columns are packed in tetrahydrofuran (THF)
- Columns can also be shipped in solvents such as DMF, Methylene Chloride, NMP, and Methanol to help minimize equilibration time

Phenogel columns maintain excellent solvent compatibility and high efficiency during sequential solvent switches from:
THF → DMF → Toluene → CHCl₃ → DMF (ambient temp) → DMF (50 °C) → THF → NMP → DMSO → THF → DMSO → Methanol

Although styrene-divinylbenzene materials are exceptionally inert, interaction between the column packing and sample materials (especially very polar solutes) occasionally occurs and the mobile phase must be modified to eliminate this effect. Phenogel columns can tolerate up to 0.1 % low MW amines, 0.5 % glacial acetic acid, or up to 1 % water in the mobile phase as modifiers.

Phenogel columns are temperature stable to 140 °C which is important for applications involving solutes with limited solubility at

ambient temperatures, or where solubility considerations demand the use of viscous solvents such as DMF or DMSO. At higher temperatures, eluent viscosity is decreased and mass transfer is enhanced, with the effect of increasing sample resolution. This temperature stability is particularly useful when analyzing polymers such as polyethylene and polypropylene which require higher temperatures.

Solvent Selection Table

Recommended GPC Solvent	Sample	Suggested Temp.
THF	Polystyrenes	Ambient
	Polybutadienes	50 °C
HFIP**	Polyethylene Oxide	Ambient
	Epoxy Resins	
Dichloromethane	Phenolic Resins	
	Polymethacrylates	
Toluene	Polyamides (Nylon)	30 °C
	PETP (polyethyleneterephthalate)	
DMF	Naphthalene	Ambient
	Diethylhexyl Phthalate	
DMF	Polyisobutylene	Ambient
	Polyisoprene	
DMF	Silicone Oils	
	Chlorinated Rubber	

**HFIP (hexafluoroisopropanol) allows polymers such as polyamides and PET that are analyzed at a temperature of 135 °C and higher to be analyzed at temperatures below 100 °C. The narrow particle distribution of Phenogel columns eliminates the problem of overlapping peaks and band broadening that is typically associated with using this solvent with traditional GPC columns.

Solvent Compatibility Table

Mobile Phase Solvent	Phenogel Pore Size:							Linear & Mixed	Suggested Operating Temp.
	50 Å	100 Å	500 Å	10 ³ Å	10 ⁴ Å	10 ⁵ Å	10 ⁶ Å		
Acetone	Y	Y	Y	Y	Y	Y	Y	Y	
Benzene	Y	Y	Y	Y	Y	Y	Y	Y	
Carbon Tetrachloride	Y	Y	Y	Y	Y	Y	Y	Y	
Chloroform	Y	Y	Y	Y	Y	Y	Y	Y	
30 % HFIP/Chloroform	Y	Y	Y	Y	Y	Y	Y	Y	
Diethyl Ether	Y	Y	Y	Y	Y	Y	Y	Y	
Dimethylacetamide (DMAC)	Y*	Y	Y	Y	Y	Y	Y	Y	60 °C
Dimethylformamide (DMF)	Y*	Y	Y	Y	Y	Y	Y	Y	60 °C
Dioxane	Y	Y	Y	Y	Y	Y	Y	Y	
DMSO	Y*	Y	Y	Y	Y	Y	Y	Y	60 °C
Ethyl Acetate	Y	Y	Y	Y	Y	Y	Y	Y	
Hexafluoroisopropanol (HFIP)	Y	Y	Y	Y	Y	Y	Y	Y	
Hexane	Y	Y	Y	Y	Y	Y	Y	Y	
M-Cresol	Y*	Y	Y	Y	Y	Y	Y	Y	100 °C
Methyl Ethyl Ketone	Y	Y	Y	Y	Y	Y	Y	Y	
Methylene Chloride	Y	Y	Y	Y	Y	Y	Y	Y	
O-Chlorophenol	Y*	Y	Y	Y	Y	Y	Y	Y	100 °C
O-Dichlorobenzene	Y*	Y	Y	Y	Y	Y	Y	Y	135 °C
Quinolin	Y*	Y	Y	Y	Y	Y	Y	Y	60 °C
Tetrahydrofuran	Y	Y	Y	Y	Y	Y	Y	Y	
Toluene	Y	Y	Y	Y	Y	Y	Y	Y	
Trichlorobenzene	Y*	Y	Y	Y	Y	Y	Y	Y	135 °C
Water	N	N	N	N	N	N	N	N	
Xylene	Y	Y	Y	Y	Y	Y	Y	Y	

*Not recommended on 5 µm 50 Å columns.

N = Not Compatible
Y = Compatible

Solvent Switching

Solvent Switching Considerations

Although Phenogel™ columns are rugged and can withstand strong solvent changes, care should be exercised when switching from high-swell solvents (A) to low-swell solvents (B, C, and D), see diagram below right. Improper solvent switches can result in a void. Best results are attained when an intermediate-swell solvent

is used, and column lifetime is improved. Contact Phenomenex regarding solvents not listed below.

Column life can be maximized by dedicating certain columns to certain solvents. This will also minimize solvent switches. If care is not taken, a void may occur.

- Reduce flow rate to 0.2 mL/min
- Backpressure must NEVER exceed 1500 psi
- Always check solvent miscibility in a beaker or follow the solvent miscibility table below before proceeding with ANY solvent switch
- Compare the swell characteristics of solvent 1 (old solvent) to solvent 2 (new solvent) and follow the guidelines below

❑ If solvent 1 and solvent 2 belong to the same swell category (see table below right), check the solvent miscibility and proceed with the switch

❑ If solvent 1 and solvent 2 belong to successive swell categories as indicated by the arrows in the table below right, check the miscibility and proceed with the switch

❑ If solvent 1 and solvent 2 DO NOT belong to the same OR successive swell categories, switch to an intermediate solvent FIRST, as indicated by the arrows in the table below

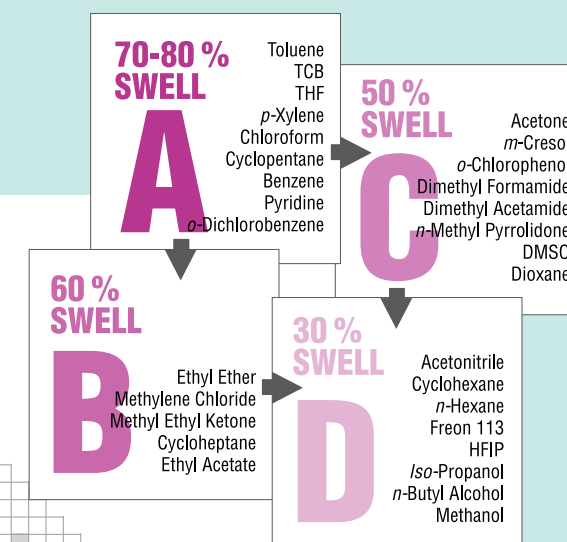
Solvent Miscibility Table

Solvent	Polarity Index	Refractive Index @ 20 °C	UV(nm) Cutoff @ 1 AU	Boiling Point (°C)	Viscosity (cP)	Solubility in water (% w/w)
Acetic Acid	6.2	1.372	230	118	1.26	100
Acetone	5.1	1.359	330	56	0.32	100
Acetonitrile	5.8	1.344	190	82	0.37	100
Benzene	2.7	1.501	280	80	0.65	0.18
n-Butanol	4.0	1.394	254	125	0.73	0.43
Butyl Acetate	3.9	1.399	215	118	2.98	7.81
Carbon Tetrachloride	1.6	1.466	263	77	0.97	0.08
Chloroform	4.1	1.446	245	61	0.57	0.815
Cyclohexane	0.2	1.426	200	81	1.00	0.01
1,2-Dichloroethane ¹	3.5	1.444	225	84	0.79	0.81
Dichloromethane ²	3.1	1.424	235	41	0.44	1.6
Dimethylformamide	6.4	1.431	268	155	0.92	100
Dimethyl Sulfoxide ³	7.2	1.478	268	189	2.00	100
Dioxane	4.8	1.422	215	101	1.54	100
Ethanol	5.2	1.360	210	78	1.20	100
Ethyl Acetate	4.4	1.372	260	77	0.45	8.7
Di-Ethyl Ether	2.8	1.353	220	35	0.32	6.89
Heptane	0.0	1.387	200	98	0.39	0.0003
Hexane	0.0	1.375	200	69	0.33	0.001
Methanol	5.1	1.329	205	65	0.60	100
Methyl-H-Butyl Ether ⁴	2.5	1.369	210	55	0.27	4.8
Methyl Ethyl Ketone ⁵	4.7	1.379	329	80	0.45	24
Pentane	0.0	1.358	200	36	0.23	0.004
n-Propanol	4.0	1.384	210	97	2.27	100
Iso-Propanol ⁶	3.9	1.377	210	82	2.30	100
Di-Iso-Propyl Ether	2.2	1.368	220	68	0.37	
Tetrahydrofuran	4.0	1.407	215	65	0.55	100
Toluene	2.4	1.496	285	111	0.59	0.051
Tichloroethylene	1.0	1.477	273	87	0.57	0.11
Water	9.0	1.333	200	100	1.00	100
Xylene	2.5	1.500	290	139	0.61	0.018

Synonym Table

¹ Ethylene Chloride
² Methylene Chloride
³ Methyl Sulfoxide
⁴ tert-Butyl Methyl Ether
⁵ 2-Butanone
⁶ 2-Propanol

Acetic Acid	Acetone	Acetonitrile	Benzene	n-Butanol	Butyl Acetate	Carbon Tetrachloride	Chloroform	Cyclohexane	1,2-Dichloroethane	Dichloromethane	Dimethylformamide	Dimethyl Sulfoxide	Ethanol	Ethyl Acetate	Di-Ethyl Ether	Heptane	Hexane	Methanol	Methyl-H-Butyl Ether	Methyl Ethyl Ketone	Pentane	n-Propanol	Iso-Propanol	Di-Iso-Propyl Ether	Tetrahydrofuran	Toluene	Tichloroethylene	Water	Xylene
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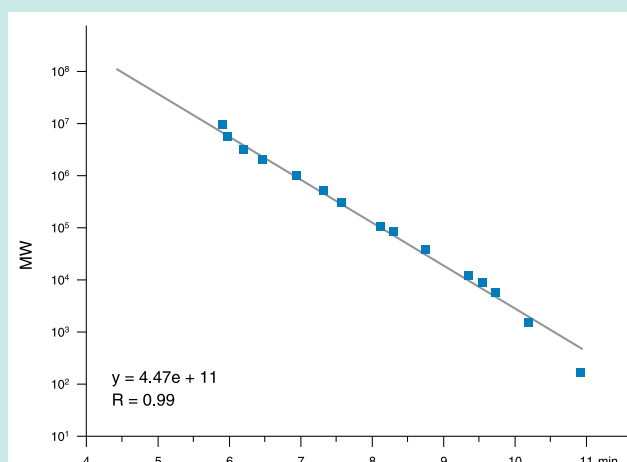


Applications on Phenogel™ Linear Non-Aqueous GPC/SEC Columns

Linear Columns

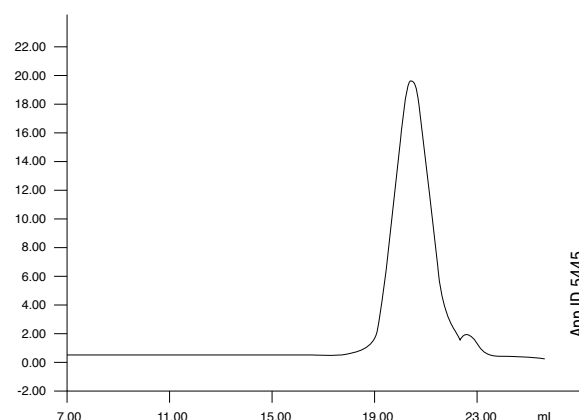
- Linear calibration to 10 million daltons
- Long column lifetime
- Excellent mechanical stability
- Excellent for analyzing a wide range of molecular weights

Calibration Curve: Linear(2)
Phenogel 5 µm 300 x 7.8 mm



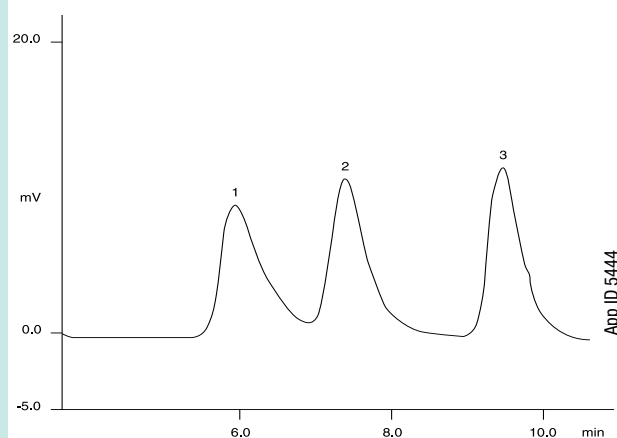
Nylon 6 in HFIP

Column: Phenogel 10 µm Linear(2) x 2
Dimensions: 300 x 7.8 mm
Part No.: 00H-3260-K0
Mobile Phase: HFIP (0.01 M NATFAT)
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.025 % w/v
Temperature: 30 °C
Sample: 14,500 MW



Mixed Polystyrene Standard on Linear(2) Column

Column: Phenogel 5 µm Linear(2)
Dimensions: 300 x 7.8 mm
Part No.: 00H-3259-K0
Mobile Phase: THF
Flow Rate: 1.0 mL/min
Detection: RI
Injection Volume: 50 µL
Temperature: 35 °C
Sample: Polystyrene standards injected
1. 2,860,000 MW
2. 277,000 MW
3. 9,350 MW



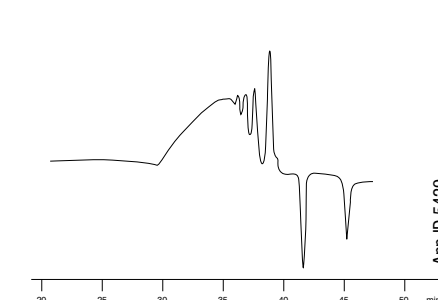
Applications on Phenogel™ Fixed Pore Non-Aqueous GPC/SEC Columns

50 Å - 10⁶ Å Fixed Pore Columns

- High resolution at low cost
- Customize your analysis by coupling different pore-size columns
- Wide range of solvent compatibility

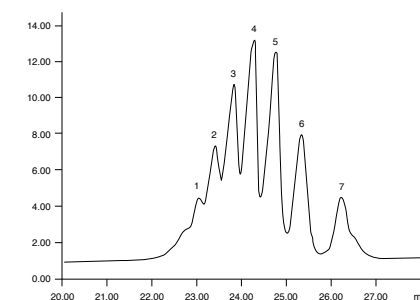
Phenolic Resins

Column: Phenogel 5 µm 500 Å x 2, 10³ Å, 10⁴ Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0443-K0 (500 Å)
00H-0444-K0 (10³ Å)
00H-0445-K0 (10⁴ Å)
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: RI
Injection Volume: 5 µL
Temperature: 25 °C
Sample: Phenolic Aldehyde Resin, MW 500 to 470 K



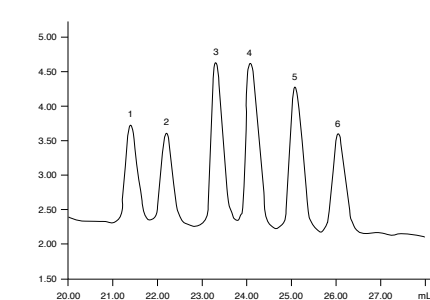
Polyethylene Glycol 330

Column: Phenogel 5 µm 50 Å, 100 Å, 500 Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0441-K0 (50 Å)
00H-0442-K0 (100 Å)
00H-0443-K0 (500 Å)
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Temperature: Ambient
Sample: 1. dp7 546 MW 5. dp3 194 MW
2. dp6 458 MW 6. dp2 106 MW
3. dp5 370 MW 7. dp1 62 MW
4. dp4 282 MW



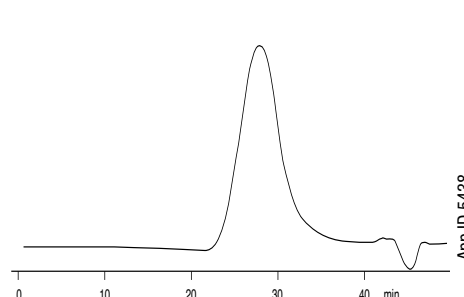
Closely Related Hydrocarbons

Column: Phenogel 5 µm 50 Å, 100 Å, 500 Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0441-K0 (50 Å)
00H-0442-K0 (100 Å)
00H-0443-K0 (500 Å)
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Temperature: Ambient
Sample: 1. C40 562 MW 4. C20 282 MW
2. C32 450 MW 5. C16 226 MW
3. C24 338 MW 6. C13 184 MW



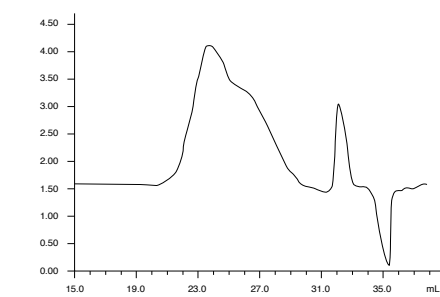
Polyvinyl Butyral

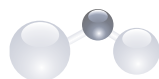
Column: Phenogel 5 µm 500 Å, 10³ Å, 10⁴ Å, 10⁵ Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0443-K0 (500 Å)
00H-0444-K0 (10³ Å)
00H-0445-K0 (10⁴ Å)
00H-0446-K0 (10⁵ Å)
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Temperature: 25 °C
Sample: 300,000 MW



Polyethylene Oxide (PEO)

Column: Phenogel 10 µm 10⁵ Å, 10⁴ Å, 10³ Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0446-K0 (10⁵ Å)
00H-0445-K0 (10⁴ Å)
00H-0444-K0 (10³ Å)
Mobile Phase: DMF (0.1M LiBr)
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.125 % w/v
Temperature: 50 °C
Sample: 400,000 MW





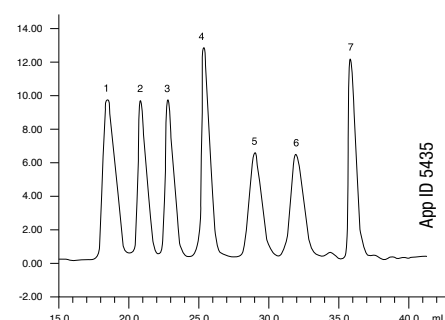
Applications on Phenogel™ Fixed Pore Non-Aqueous GPC/SEC Columns

50 Å - 10⁶ Å Fixed Pore Columns (continued)

Polystyrenes (Wide MW Range)

Column: Phenogel 10 µm 10⁵ Å, 10⁴ Å, 10³ Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0446-KO (10⁵ Å)
00H-0445-KO (10⁴ Å)
00H-0444-KO (10³ Å)

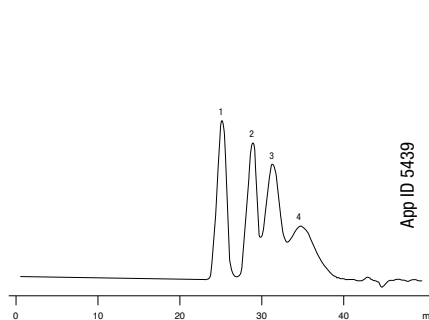
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Temperature: Ambient
Sample: 1. 1,560,000 MW 5. 6,100 MW
2. 260,000 MW 6. 854 MW
3. 94,000 MW 7. 146 MW
4. 30,000 MW



Poly - (α-Methyl Styrene) (Wide MW Range)

Column: Phenogel 5 µm 10⁵ Å, 10⁴ Å, 10³ Å, 500 Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0446-KO (10⁵ Å)
00H-0445-KO (10⁴ Å)
00H-0444-KO (10³ Å)
00H-0443-KO (500 Å)

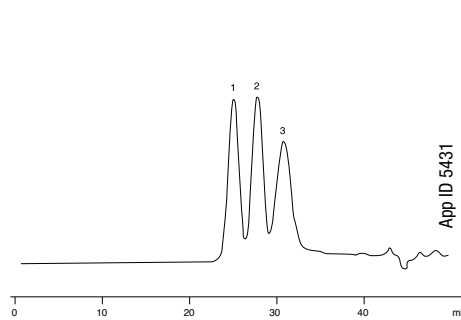
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Sample: 1. 680,000 MW
2. 90,000 MW
3. 30,000 MW
4. 6,000 MW



Polymethyl Methacrylates (Wide MW Range)

Column: Phenogel 5 µm 10⁵ Å, 10⁴ Å, 10³ Å, 500 Å
Dimensions: 300 x 7.8 mm
Part No.: 00H-0446-KO (10⁵ Å)
00H-0445-KO (10⁴ Å)
00H-0444-KO (10³ Å)
00H-0443-KO (500 Å)

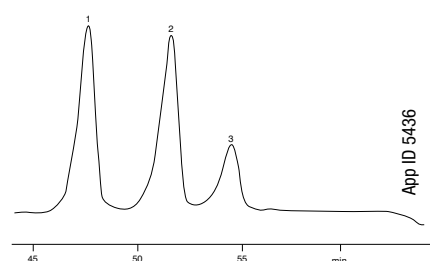
Solvent: THF
Flow Rate: 1.0 mL/min
Detection: Differential Refractometer
Injection Volume: 100 µL 0.25 % w/v
Sample: 1. 700,000 MW
2. 107,000 MW
3. 27,000 MW



Isoprenes from In Vitro Translation on Products

Column: Phenogel 5 µm 50 Å, 100 Å in series
Dimensions: 300 x 7.8 mm
Part No.: 00H-0441-KO (50 Å)
00H-0442-KO (100 Å)

Mobile Phase: THF
Flow Rate: 0.25 mL/min
Detection: Differential Refractometer
Sample: 1. Squalene C30
(2, 6, 10, 15, 19, 23-Hexamethyltetracosane)
2. Phytane C20
(2, 6, 10, 14-Tetramethylhexadane)
3. Farnesne C15
(2, 6, 10-Trimethyldodecane)



The columns were used in tandem to characterize isoprene chain lengths removed from labeled in vitro translation products or cell proteins. The isoprenoids were removed by treatment with Raney nickel and extracted into pentane. The pentane extractable material was hydrogenated over platinum catalyst and injected onto the column. Fractions were collected at 0.5 minute intervals and radioactivity was monitored by liquid scintillation. These saturated hydrocarbon chains were characterized by comparing radioactive peaks to standard retention times.

Chromatogram courtesy of W. Maltese and R. Erdman, Weis Center for Research, Geisinger Clinic.

Reduced Solvent Consumption

Phenogel-Narrow Bore Columns: An Improved Dimension in GPC Analysis

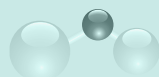
- Decrease solvent consumption
- Retain same elution profile
- Reduce solvent disposal costs

Phenogel-NB (Narrow Bore) columns are optimized to reduce solvent consumption. The Phenogel-NB columns have a 4.6 mm column ID and run at 0.35 mL/minute, **reducing solvent consumption and disposal costs up to 65 %!**

Loading

With narrow bore GPC/SEC columns, the volume in which the sample elutes is significantly decreased, thus increasing the effective concentration of the sample. This increase in sensitivity is exploited in HPLC, but in GPC it leads to overloading effects and proportionally lower sample loadings must be used.





Polymer Calibration Standards Kits

- Low, medium and high molecular weights available
- Narrow molecular weight distribution

Organic SEC (GPC) Calibration Kits

All calibration kits contain standards that are uniformly separated logarithmically to give equally distributed data points on a calibration curve over the Mp (peak molecular weight) range stated.

Ordering Information

Part No.	MW	Kit Description	Mp Range	Unit	Price
AL0-2761	Low MW Narrow MWD Kit	8 Standards	100-10,000	250 mg/standard	
AL0-2762	Medium MW Narrow MWD Kit	6 Standards	10,000-100,000	250 mg/standard	
AL0-2763	High MW Narrow MWD Kit	6 Standards	120,000-1,850,000	250 mg/standard	

Phenex™ Syringe Filters

For Sample and Solvent Filtration Prior to Chromatography!

- Consistent, reproducible results
- Increased column lifetime



Ordering Information

4 mm Diameter for ≤ 2 mL sample volumes				15 mm Diameter for 2 – 10 mL sample volumes			25 - 28 mm Diameter for 10 – 100 mL sample volumes		
Membrane Type/Size	Part No.	Unit	Price	Part No.	Unit	Price	Part No.	Unit	Price
0.20 µm									
Phenex-RC (Regenerated Cellulose)	AF0-3203-12	100/pk		AF0-2203-12	100/pk		AF0-8203-12 ⁴	100/pk	
	AF0-3203-52	500/pk		AF0-2203-52	500/pk		AF0-8203-52 ⁴	500/pk	
Phenex-PTFE ³ (Polytetrafluoroethylene)	AF0-3202-12	100/pk		AF0-2202-12	100/pk		AF0-1202-12	100/pk	
	AF0-3202-52	500/pk		AF0-2202-52	500/pk		AF0-1202-52	500/pk	
0.45 µm									
Phenex-RC (Regenerated Cellulose)	AF0-3103-12	100/pk		AF0-2103-12	100/pk		AF0-8103-12 ⁴	100/pk	
	AF0-3103-52	500/pk		AF0-2103-52	500/pk		AF0-8103-52 ⁴	500/pk	
Phenex-PTFE ³ (Polytetrafluoroethylene)	AF0-3102-12	100/pk		AF0-2102-12	100/pk		AF0-1102-12	100/pk	
	AF0-3102-52	500/pk		AF0-2102-52	500/pk		AF0-1102-52	500/pk	
1.20 µm									
Phenex-GF ^{1,2} (Glass Fiber)	Prefiltration of heavily contaminated or highly viscous samples. When used in-series preceding a membrane filter, clogging of the membrane filter is prevented and sample clean up is optimized. Outlet connection is luer lock.						AF0-8515-12 ¹	100/pk	
							AF0-8515-52 ¹	500/pk	

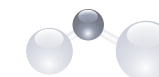
Above syringe filters are non-sterile.
Housing is made of medical-grade polypropylene (PP), and offer luer lock inlet/slip outlet connections, unless otherwise indicated.
1. Glass fiber filters are 28 mm diameter and made of borosilicate. They will remove 90 % of all particles >1.2 µm.
2. Housing material is methacrylate butadiene styrene (MBS) polymerisate. Also known as Cryolite®.
3. Hydrophobic membrane. Can be made hydrophilic by pre-wetting with IPA.
4. 26 mm diameter.
5. Larger quantity purchases at significant savings are available. Additional dimensions and membrane types are available. Please contact your local Phenomenex technical consultant or distributor for availability or assistance.

Tip: Try a Sample Pack!

Request yours today by phone or visit
www.phenomenex.com/sample

guarantee

If Phenex Syringe Filters do not perform as well or better than your current syringe filter product of similar membrane, diameter and pore size, send in your comparative data within 45 days and return the product for a FULL REFUND.



Ordering Information



Please specify shipping solvent when ordering

Other column dimensions available. Phenogel columns are routinely shipped in THF. However, columns are also available in commonly used solvents such as Toluene and Chloroform as well as DMF, NMP, and other solvents.

Ordering Information

5 µm Columns (mm)			Guards
300 x 7.8			50 x 7.8
Pore Size	MW Range		
50 Å	100-3 K	00H-0441-K0	03B-2088-K0
100 Å	500-6 K	00H-0442-K0	03B-2088-K0
500 Å	1 K-15 K	00H-0443-K0	03B-2088-K0
10 ³ Å	1 K-75 K	00H-0444-K0	03B-2088-K0
10 ⁴ Å	5 K-500 K	00H-0445-K0	03B-2088-K0
10 ⁵ Å	10 K-1,000 K	00H-0446-K0	03B-2088-K0
10 ⁶ Å	60 K-10,000 K	00H-0447-K0	03B-2088-K0
300 x 7.8			50 x 7.8
Mixed Beds			
Linear(2)	100-10,000 K	00H-3259-K0	03B-2088-K0



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www.phenomenex.com/Phenogel

5 µm Narrow Bore (NB) Columns (mm)			Guards
300 x 4.6			30 x 4.6
Pore Size	MW Range		
50 Å	100-3 K	00H-0441-E0	03A-2088-E0
100 Å	500-6 K	00H-0442-E0	03A-2088-E0
500 Å	1 K-15 K	00H-0443-E0	03A-2088-E0
10 ³ Å	1 K-75 K	00H-0444-E0	03A-2088-E0
10 ⁴ Å	5 K-500 K	00H-0445-E0	03A-2088-E0
300 x 4.6			30 x 4.6
Mixed Beds			
Linear(2)	100-10,000 K	00H-3259-E0	03A-2088-E0

Other Shipping Solvents:	
Methanol, Methylene Chloride, Cyclohexane, Ethyl Acetate, NMP, DMAC, DMF	
Size (mm)	Price
30 x 4.6	
50 x 7.8	
300 x 4.6	
300 x 7.8	
NOTE: Phenogel columns are routinely shipped in THF. Columns can be shipped in Toluene and Chloroform upon request at no additional charge.	

Phenogel Columns are a Recommended Alternative to:

Company	Column
Jordi Associates	Jordi GPC-DVB
Agilent Technologies®	PLgel™
Waters®	Styragel® µStyragel™ UltraStyragel™ Styragel® HT Styragel® HR
Shodex®	GPC KF-800 series
PSS	SDV
Tosoh Bioscience®	TSKgel® H-type

guarantee

If Phenogel analytical columns do not provide at least equivalent separation as compared to a competing column of the similar particle size, phase, and dimensions, return the column with comparative data within 45 days for a FULL REFUND.

Australia

t: 02-9428-6444
f: 02-9428-6445
auinfo@phenomenex.com

Austria

t: 01-319-1301
f: 01-319-1300
anfrage@phenomenex.com

Belgium

t: 02 503 4015 (French)
f: 02 511 8666 (Dutch)
+31 (0)30-2383749
beinfo@phenomenex.com

Canada

t: (800) 543-3681
f: (310) 328-7768
info@phenomenex.com

Denmark

t: 4824 8048
f: +45 4810 6265
nordicinfo@phenomenex.com

Finland

t: 09 4789 0063
f: +45 4810 6265
nordicinfo@phenomenex.com

France

t: 01 30 09 21 10
f: 01 30 09 21 11
franceinfo@phenomenex.com

Germany

t: 06021-58830-0
f: 06021-58830-11
anfrage@phenomenex.com

India

t: 040-3012 2400
f: 040-3012 2411
indiainfo@phenomenex.com

Ireland

t: 01 247 5405
f: +44 1625-501796
eireinfo@phenomenex.com

Italy

t: 051 6327511
f: 051 6327555
italiainfo@phenomenex.com

Luxembourg

t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

Mexico

t: 001-800-844-5226
f: 001-310-328-7768
tecnicomx@phenomenex.com

The Netherlands

t: 030-2418700
f: 030-2383749
nlinfo@phenomenex.com

New Zealand

t: 09-4780951
f: 09-4780952
nzinfo@phenomenex.com

Norway

t: 810 02 005
f: +45 4810 6265
nordicinfo@phenomenex.com

Puerto Rico

t: (800) 541-HPLC
f: (310) 328-7768
info@phenomenex.com

Sweden

t: 08 611 6950
f: +45 4810 6265
nordicinfo@phenomenex.com

United Kingdom

t: 01625-501367
f: 01625-501796
ukinfo@phenomenex.com

United States

(310) 212-0555
(310) 328-7768
info@phenomenex.com

All other countries: Corporate Office USA

t: (310) 212-0555
f: (310) 328-7768
info@phenomenex.com

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