



Carbohydrate and Organic Acid Separations

*Long column lifetimes.
Accurate, reproducible analysis.*



Food and Beverages • Bioethanol • Drug Formulation • Quality Control • Excipient Analysis

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



www.phenomenex.com/rezex

Trust Rezex™ For Excellent Resolution and Reproducibility

Phenomenex Rezex HPLC columns are guaranteed to give you the performance you need. From drug formulation and excipient analysis to quality control testing of finished food products, Rezex columns consistently provide accurate and reproducible results.



“I have been using Phenomenex Rezex ... for sugar quantitation in the last few years, we are very happy with the resolution of this column, plus a short running time.”

- Global Leader, Food & Beverage Ingredient Production

Try Rezex Risk Free! Rezex is a guaranteed alternative to:

- Bio-Rad® Aminex®
- Waters® Sugar-Pak™
- Supelco® SUPELCOGEL™
- Transgenomic® CARBOSep™
- Sepax® Carbomix®

guarantee

If you are not completely satisfied with the performance of any Rezex column, as compared to a competing product of the same size and phase, simply return the Rezex column with your comparative data within 45 days for a FULL REFUND.

Experience the Rezex™ Performance Advantage

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Broad Range Of Phases To Perfectly Suit Your Application Needs

Rezex™ columns achieve separations based on multiple modes of interaction including ion-exchange, ion-exclusion, size exclusion, reversed phase, and partition. In many cases, this allows for separation of multiple compound classes with one column. The 8 % cross-linked materials exhibit excellent strength and durability while maintaining low system backpressures not typical with highly cross-linked resins. The 4 % cross-linked silver and sodium phases have a larger effective pore volume and are ideal for larger starches, such as oligosaccharides.

Table 1

Cross Referencing Guide

Rezex	Description	Applications	Bio-Rad® Aminex®	Supelco® SUPELCOGEL™	Waters® Sugar-Pak™	Transgenomic® CARBOsep™	Sepax® Carbomix®
RCM-Monosaccharide (L19 packing)*	8% cross-linked CALCIUM	- Monosaccharides and sugar alcohols, including sorbitol and mannitol from sweeteners and corn and cane sugars - Class separation of di-, tri-, and tetra- saccharides	HPX-87C 125-0095	SUPELCOGEL Ca	Sugar-Pak 1	CARBOsep CHO-820	Carbomix Ca
RHM-Monosaccharide (L17 packing)*	8% cross-linked HYDROGEN	Monosaccharides in combination with organic acids, fatty acids, alcohols, ketones, neutral compounds, or inorganic salts	HPX-87H 125-0140	SUPELCOGEL C-610H & H	N/A	ICSep ION-300	Carbomix H
RAM-Carbohydrate	8% cross-linked SILVER	Selectivity complementary to toher Rezex column types	N/A	N/A	N/A	N/A	N/A
RSO-Oligosaccharide	4% cross-linked SILVER	High resolution of oligosaccharides up to 18 degrees of polymerization (Dp)	HPX-42A 125-0097	SUPELCOGEL AG1 & AG2	N/A	N/A	N/A
RNO-Oligosaccharide	4% cross-linked SODIUM	High resolution of oligosaccharides	N/A	N/A	N/A	CARBOsep COREGEL-87N	N/A
RPM-Monosaccharide (L34 packing)*	8% cross-linked LEAD	100 x 7.8 mm dimensions available for sugar alcohol analysis according to the USP procedure - Monosaccharides and sugar alcohol analysis - Cellobiose, glucose, xylose, arabinose, and mannose and other cellulose products	HPX-87P 125-0098	SUPELCOGEL Pb	N/A	CARBOsep COREGEL-87P	Carbomix Pb
RNM-Carbohydrate (L58 packing)*	8% cross-linked SODIUM	- Analysis of mono-, di-, and tri- saccharides - For matrices which contain high concentration of inorganic sodium (i.e. molasses)	HPX-87N 125-0143	N/A	N/A	N/A	Carbomix Na
ROA-Organic Acid (L22 packing)*	8% cross-linked HYDROGEN	- Organic acids alone - Organic acids in combination with carbohydrates, alcohols, fatty acids, or neutral compounds - Ethanol, acetic acid, glycerol, and standard alcohol mixtures - Amino sugars	HPX-87H 125-0140	SUPELCOGEL C-610H & H	N/A	N/A	N/A
RFQ-Fast Acid	8% cross-linked HYDROGEN	- Rapid screening of fruit quality - Ethanol, acetic acid, glycerol and standard alcohol mixtures	Fast Acid 125-0100	N/A	N/A	N/A	N/A
RKP-Potassium	8% cross-linked POTASSIUM	Analysis of glyphosate	HPX-87K 125-0142	SUPELCOGEL K	N/A	CARBOsep COREGEL-87K	Carbomix K
RCU-USP Sugar Alcohols (L19 packing)*	8% cross-linked CALCIUM	Sugar analysis according to the USP procedures on a 250 x 4.0 mm dimension	Sugar Alcohols 125-0094	N/A	N/A	N/A	N/A

* United States Pharmacopeia (USP)



Column Selection – Variety Gives You The Power Of Optimization

Rezex™ columns utilize different ligands. Selecting the right column will allow you to achieve the best resolution for your peaks of interest.

Column Selection Guidelines:

1. Application examples (Table 1)
2. Cross referencing guide (Table 1)
3. Retention time chart (Table 2)
4. Our support staff – Knowledgeable consultants who can provide excellent recommendations on applications
5. Application library available at www.phenomenex.com/rezex

Retention Times For Some Carbohydrates And Sugar Alcohols

Still not sure what phase to choose? It is important to ensure that you get adequate resolution between your peaks of interest. The retention time chart below gives the retention times for common carbohydrates and sugar alcohols on the most popular Rezex phases.

Table 2

Counter Ion Analyte	RAM Ag ⁺	RCM Ca ⁺²	RNM Na ⁺	RHM H ⁺	RPM Pb ²⁺
Adonitol (Ribitol)	11.54	14.93	11.10	11.11	20.15
D-Altrose	11.95	12.71	11.45	10.21	15.82
D-(-)-Arabinose	13.01	13.56	12.65	11.24	16.47
D-(+)-Cellobiose	8.86	8.60	8.49	8.02	11.00
D-(+)-Digitoxose	11.90	13.82	11.39	12.59	15.32
Dulcitol	11.64	21.61	11.10	10.71	33.25
Meso-Erythritol	12.31	15.49	11.78	12.14	19.82
D-(-)-Fructose	12.05	13.65	11.76	10.31	17.71
L-(-)-Fucose	12.75	13.19	12.30	11.65	16.19
D-(+)-Galactose	11.87	11.73	11.47	10.19	14.94
Gentiobiose	8.70	8.40	8.40	7.87	10.53
D-(+)-Glucose	11.04	10.37	10.71	9.62	12.92
Inositol	12.59	13.35	12.14	9.98	18.87
Isomaltose	9.11	8.74	8.76	8.02	11.28
Lactose	9.27	9.03	8.78	8.32	11.89
Lactulose	9.75	10.32	9.23	8.57	13.95
D- Lyxose	12.41	14.06	11.98	10.68	16.66
D- Maltose	9.16	8.81	8.75	8.18	11.59
Maltotriose	8.27	8.10	7.94	7.51	11.02
Maltulose	9.25	9.47	8.82	8.27	12.40

Counter Ion Analyte	RAM Ag ⁺	RCM Ca ⁺²	RNM Na ⁺	RHM H ⁺	RPM Pb ²⁺
D- Mannitol	11.36	17.82	10.80	10.59	24.90
D-(+)-Mannose	12.04	12.04	11.54	10.16	16.39
Melibiose	9.26	9.04	8.82	8.14	11.97
D-(+)-Melezitose	8.00	7.93	7.66	7.54*	9.94
D-(+)-Raffinose	8.10	8.16	7.76	7.88*	10.28
L-(+)-Rhamnose	11.50	12.18	11.00	10.90	14.47
D-(-)-Ribose	14.59	23.38	14.34	11.42	33.48
Salicin	18.51	18.58	17.36	14.98	26.81
D-Sorbitol	11.91	22.45	11.39	10.83	35.97
Stachyose	7.60	7.59	7.30	7.27	9.72
Sucrose	9.03	8.71	8.65	9.24*	11.00
Trehalose	8.91	8.72	8.49	8.32	11.01
Xylitol	12.69	22.01	12.16	11.78	32.38
D-(+)-Xylose	12.06	11.62	11.68	10.24	13.84

* Partial hydrolysis results.

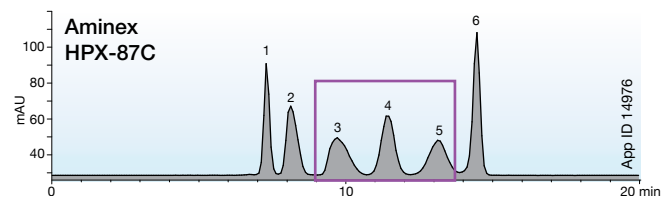
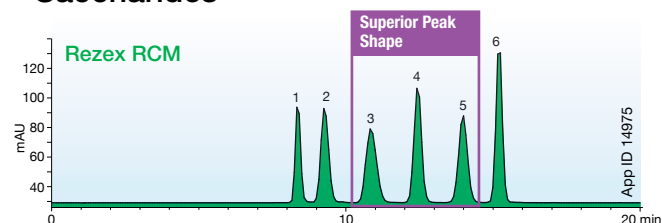
Conditions

Dimensions: 300 x 7.8 mm
Mobile Phase: Water (degassed)
Flow Rate: 0.6 mL/min
Temperature: 80 °C
Detection: RI @ 40 °C

Phenomenex® Rezex™ vs. Bio-Rad® Aminex®

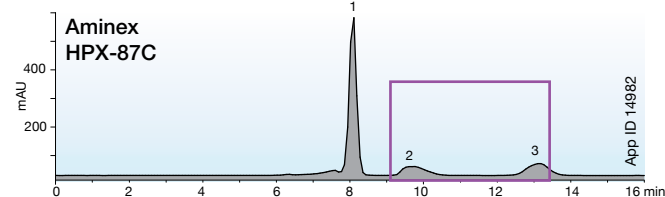
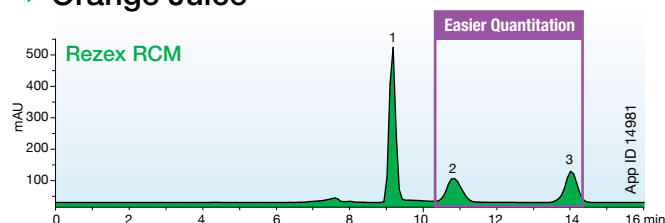
Sharper Peak Shape = Easy & Accurate Quantitation

► Saccharides



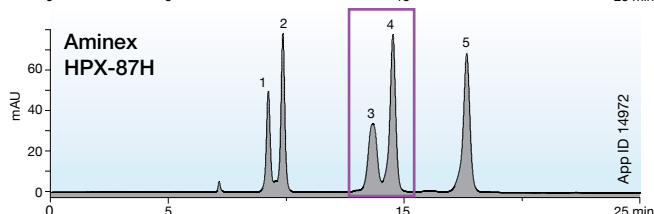
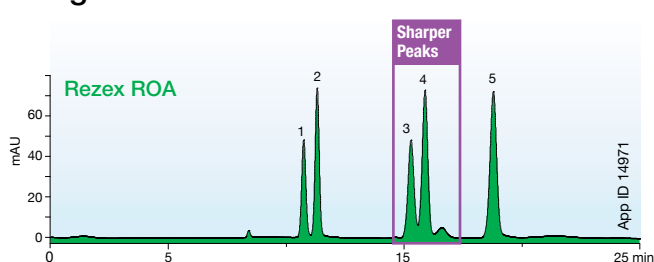
Columns: Rezex RCM-Monosaccharide
Aminex HPX-87C
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: 1. Melezitose 4. Mannose
2. Maltose 5. Fructose
3. Glucose 6. Ribitol

► Orange Juice



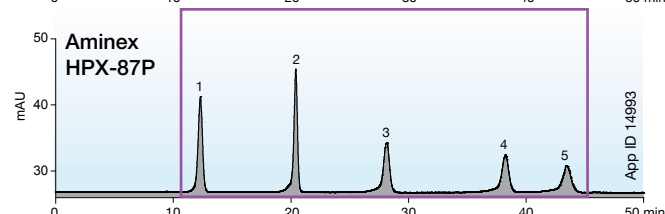
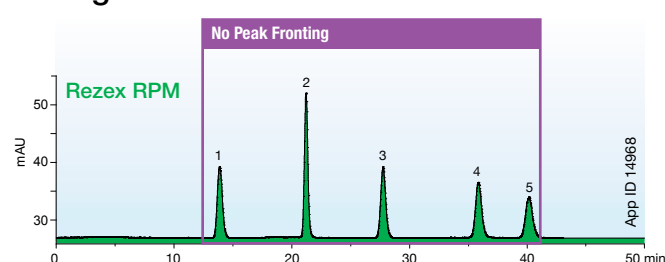
Columns: Rezex RCM-Monosaccharide
Aminex HPX-87C
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: 1. Sucrose
2. Glucose
3. Fructose

► Organic Acids in Wine



Columns: Rezex ROA-Organic Acid
Aminex HPX-87H
Dimensions: 300 x 7.8 mm
Mobile Phase: 0.005 N H₂SO₄
Flow Rate: 0.5 mL/min
Detection: UV @ 210 nm
Temperature: 40 °C
Sample: 1. Citric acid 4. Lactic acid
2. Tartaric acid 5. Acetic acid
3. Succinic acid

► Sugar Alcohols



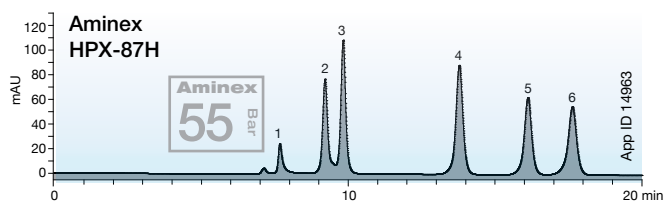
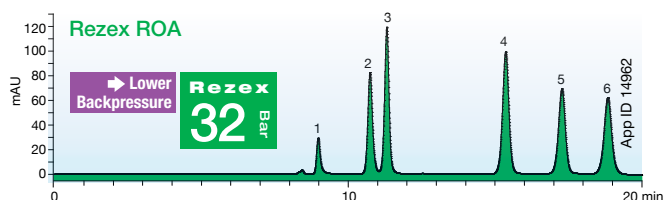
Columns: Rezex RPM-Monosaccharide
Aminex HPX-87P
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: 1. Glucose 4. Xylitol
2. Erythritol 5. Sorbitol
3. Mannitol

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Phenomenex® Rezex™ vs. Bio-Rad® Aminex®

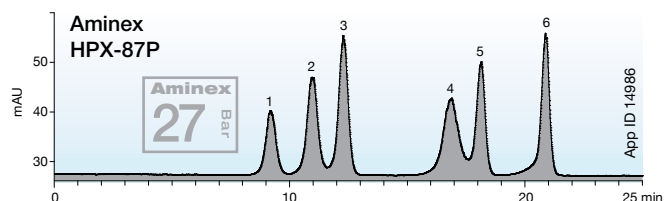
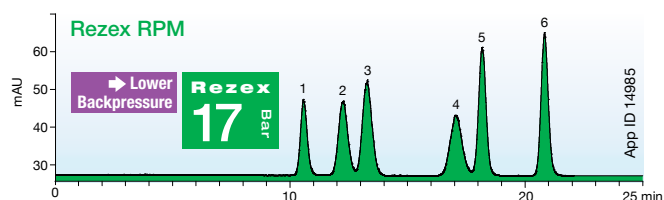
Lower Backpressure = Longer Column Lifetimes and Faster Run Time Capability

► Aliphatic Acids



Columns: Rezex ROA-Organic Acid
Aminex HPX-87H
Dimensions: 300 x 7.8 mm
Mobile Phase: 0.005 N H₂SO₄
Flow Rate: 0.5 mL/min
Detection: UV @ 210 nm
Temperature: 40 °C
Sample: 1. Oxalic acid 4. Succinic acid
2. Citric acid 5. Formic acid
3. Tartaric acid 6. Acetic acid

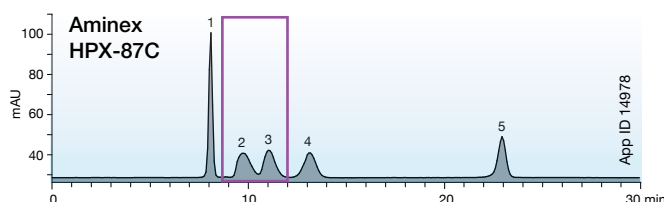
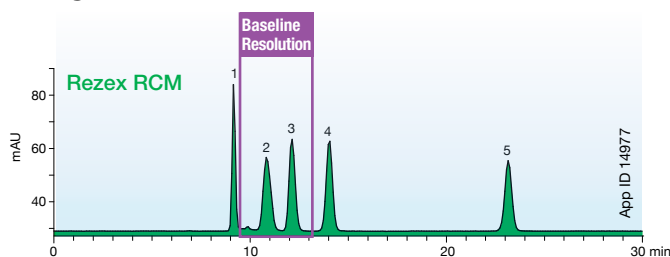
► Saccharides



Columns: Rezex RPM-Monosaccharide
Aminex HPX-87P
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 75 °C
Sample: 1. Melezitose 4. Mannose
2. Maltose 5. Fructose
3. Glucose 6. Ribitol

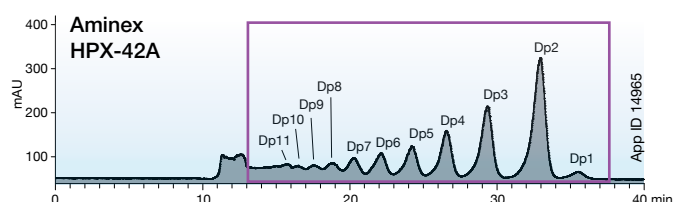
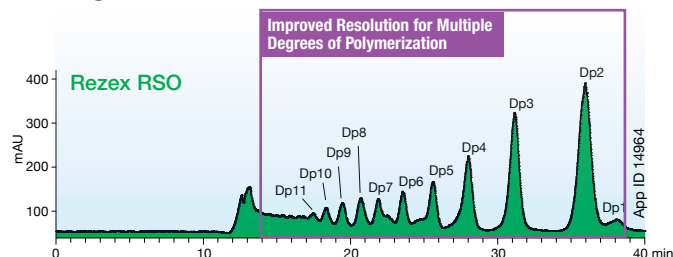
Higher Efficiency = Baseline Separation of Critical Sample Components

► Sugars



Columns: Rezex RCM-Monosaccharide
Aminex HPX-87C
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: 1. Sucrose 4. Fructose
2. Glucose 5. Sorbitol
3. Galactose

► Oligosaccharides



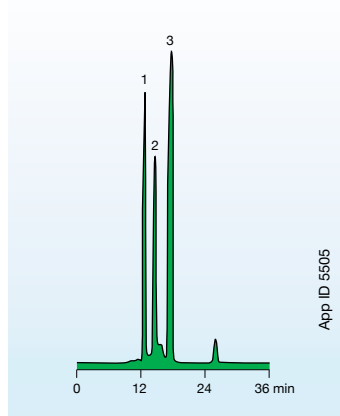
Columns: Rezex RSO-Oligosaccharide
Aminex HPX-42A
Dimensions: 200 x 10.0 mm
Mobile Phase: Water
Flow Rate: 0.3 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: Malto-Oligosaccharides (Dp1-Dp14)
(Dp refers to degree of polymerization)

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Select Applications On Rezex™ HPLC Columns

Food and Beverage

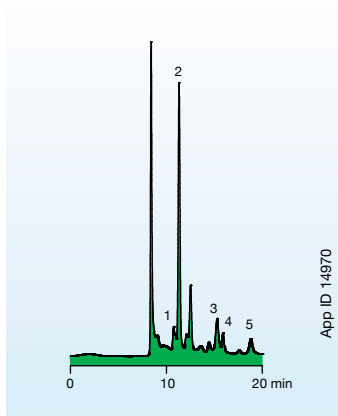
► Apple Juice



App ID 5505

Column: Rezex RCM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0130-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 75 °C
Sample:
 1. Sucrose
 2. Glucose
 3. Fructose

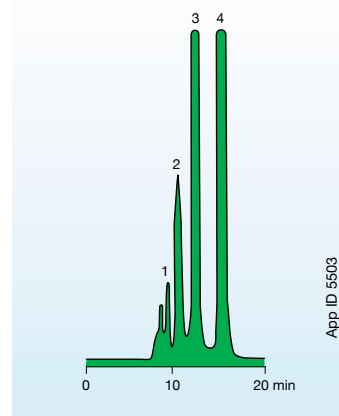
► White Wine



App ID 14970

Column: Rezex ROA-Organic Acid
Dimensions: 300 x 7.8 mm
Part No.: 00H-0138-K0
Mobile Phase: 0.005 N H₂SO₄
Flow Rate: 0.5 mL/min
Detection: UV @ 210 nm
Temperature: 40 °C
Sample:
 1. Citric acid
 2. Tartaric acid
 3. Succinic acid
 4. Lactic acid
 5. Acetic acid

► Honey

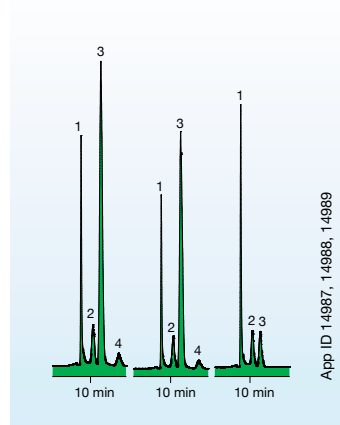


App ID 5503

Column: Rezex RCM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0130-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 75 °C
Sample:
 1. Dp 3
 2. Dp 2
 3. Glucose
 4. Fructose

Fermentation and Bioethanol

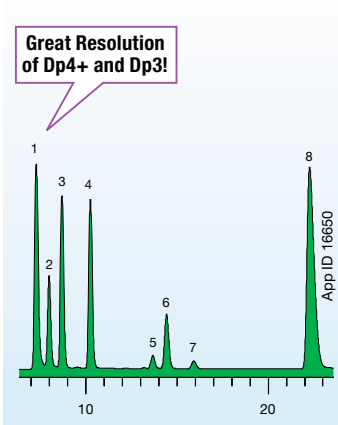
► Fermentation Broth



App ID 14987, 14988, 14989

Column: Rezex RCM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0130-K0
Mobile Phase: Water
Flow Rate: 0.5 mL/min
Detection: ELSD
Temperature: 80 °C
Sample:
 1. Sucrose
 2. Glucose
 3. Galactose
 4. Fructose

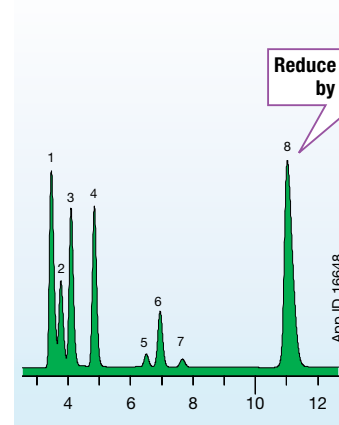
► Bioethanol



App ID 16650

Column: Rezex ROA-Organic Acid
Dimensions: 300 x 7.8 mm
Part No.: 00H-0138-K0
Mobile Phase: 0.005 N Sulfuric Acid
Flow Rate: 0.6 mL/min
Detection: RI @ 40 °C
Temperature: 60 °C
System: Shimadzu® Prominence® LC-20A System
Sample:
 1. Dp4+
 2. Dp3
 3. Maltose
 4. Glucose
 5. Lactic Acid
 6. Glycerol
 7. Acetic Acid
 8. Ethanol

► Bioethanol



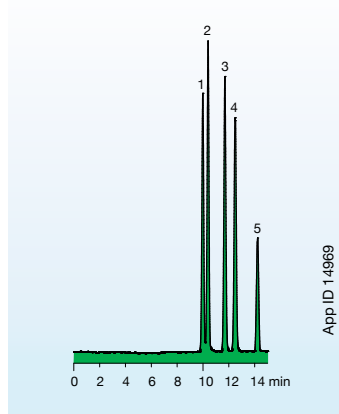
App ID 16648

Column: Rezex ROA-Organic Acid
Dimensions: 150 x 7.8 mm
Part No.: 00F-0138-K0
Mobile Phase: 0.005 N Sulfuric Acid
Flow Rate: 0.6 mL/min
Detection: RI @ 40 °C
Temperature: 60 °C
System: Shimadzu Prominence LC-20A System
Sample:
 1. Dp4+
 2. Dp3
 3. Maltose
 4. Glucose
 5. Lactic Acid
 6. Glycerol
 7. Acetic Acid
 8. Ethanol

Select Applications On Rezex™ HPLC Columns

Saccharides

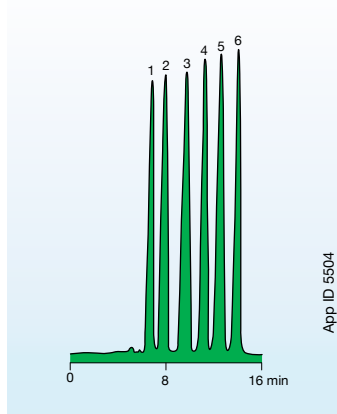
► Monosaccharides with Organic Acids



App ID 14969

Column: Rezex RQA-Organic Acid
Dimensions: 300 x 7.8 mm
Part No.: 00H-0138-K0
Mobile Phase: 0.1 % formic acid
Flow Rate: 0.5 mL/min
Detection: ELSD
Temperature: 75 °C
Sample:
 1. Citric acid
 2. Tartaric acid
 3. Glucose
 4. Fructose
 5. Succinic acid

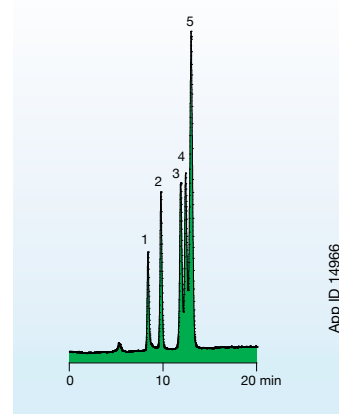
► Saccharides



App ID 5504

Column: Rezex RCM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0130-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 85 °C
Sample:
 1. Melezitose
 2. Maltose
 3. Glucose
 4. Mannose
 5. Fructose
 6. Ribitol

► Saccharides

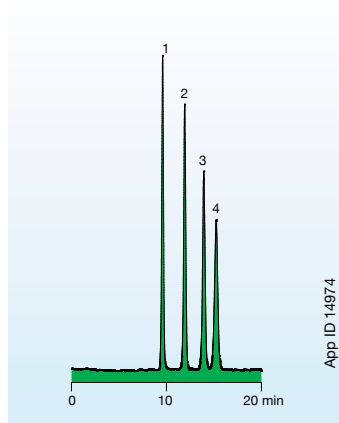


App ID 14966

Column: Rezex RAM-Carbohydrate
Dimensions: 300 x 7.8 mm
Part No.: 00H-0131-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 75 °C
Sample:
 1. Melezitose
 2. Mannose
 3. Maltose
 4. Fructose
 5. Glucose

Carbohydrates

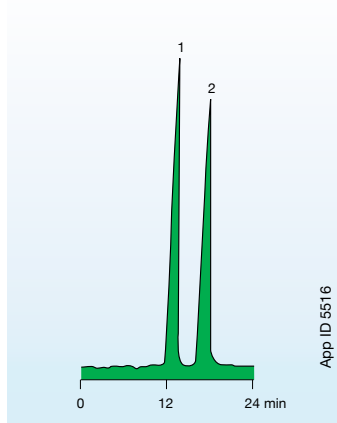
► Carbohydrates



App ID 14974

Column: Rezex RAM-Carbohydrate
Dimensions: 300 x 7.8 mm
Part No.: 00H-0131-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample:
 1. Sucrose
 2. Glucose
 3. Arabinose
 4. Ribose

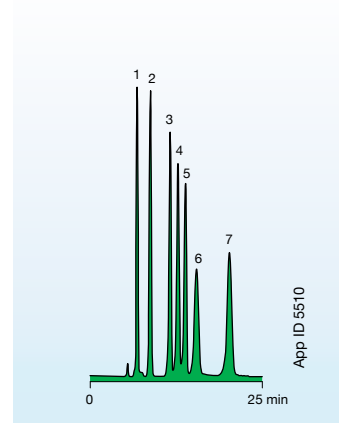
► Carbohydrates



App ID 5516

Column: Rezex RCU-USP Sugar Alcohols
Dimensions: 250 x 4.0 mm
Part No.: 00G-0130-D0
Mobile Phase: Water
Flow Rate: 0.2 mL/min
Detection: RI
Temperature: 30 °C
Sample:
 1. Mannitol
 2. Sorbitol

► Carbohydrates



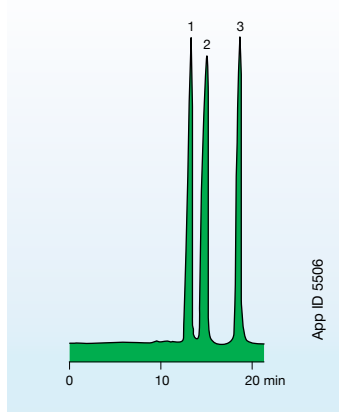
App ID 5510

Column: Rezex RNM-Carbohydrate
Dimensions: 300 x 7.8 mm
Part No.: 00H-0136-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 75 °C
Sample:
 1. Stachyose
 2. Cellobiose
 3. Glucose
 4. Fructose
 5. Arabinose
 6. Ribose
 7. Salicin
 (1 % solution of each)

Select Applications On Rezex™ HPLC Columns

Carbohydrates / Saccharides (Cont'd)

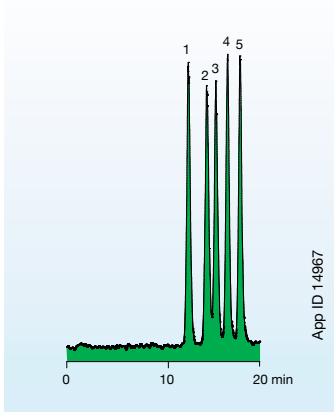
► Carbohydrates



Column: Rezex RKP-Potassium
Dimensions: 300 x 7.8 mm
Part No.: 00H-3252-K0
Mobile Phase: Water
Flow Rate: 0.4 mL/min
Detection: RI
Temperature: 85 °C
Sample: 1. Maltotriose
 2. Maltose
 3. Glucose

App ID 5506

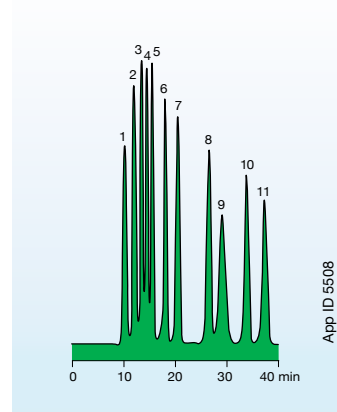
► Wood Saccharides



Column: Rezex RPM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0135-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 85 °C
Sample: 1. D-Cellobiose
 2. α-D-glucose
 3. D-(+)-Xylose
 4. D-(+)-Galactose
 5. D-(-)-Arabinose

App ID 14967

► Saccharides and Alcohols

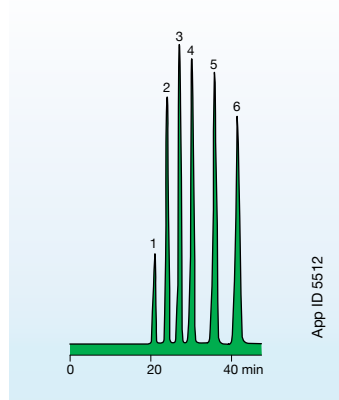


Column: Rezex RPM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0135-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 75 °C
Sample: 1. Stachyose 8. Mannitol
 2. Maltose 9. Salicin
 3. Glucose 10. Xylitol
 4. Xylose 11. Sorbitol
 5. Galactose
 6. Fructose
 7. meso-Erythritol

App ID 5508

Alcohols

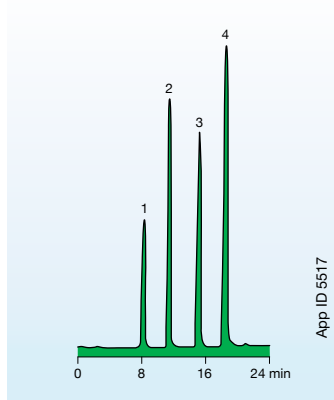
► Alcohols



Column: Rezex RHM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0132-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 60 °C
Sample: 1. Methanol
 2. Ethanol
 3. Isopropanol
 4. n-Propanol
 5. sec-Butanol
 6. n-Butanol

App ID 5512

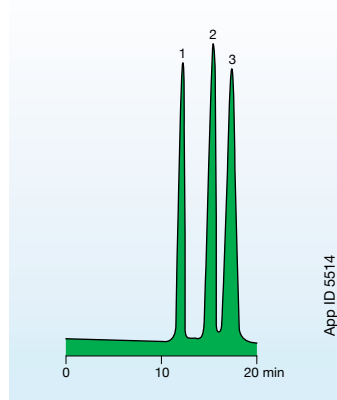
► Carboxylic Acids



Column: Rezex ROA-Organic Acid
Dimensions: 300 x 7.8 mm
Part No.: 00H-0138-K0
Mobile Phase: Water + 0.5 % Trifluoroacetic Acid
Flow Rate: 1.0 mL/min
Detection: RI
Temperature: 40 °C
Sample: 1. Acetylene Carboxylic Acid
 2. Maleic Acid
 3. Succinic Acid
 4. Fumaric Acid

App ID 5517

► Amino Sugars



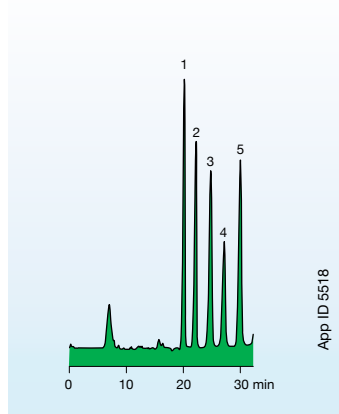
Column: Rezex ROA-Organic Acid
Dimensions: 300 x 7.8 mm
Part No.: 00H-0138-K0
Mobile Phase: 1 % Phosphoric Acid
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: Ambient
Sample: 1. Glucose
 2. N-Acetylglucose
 3. N-Acetylgalactosamine

App ID 5514

Select Applications On Rezex™ HPLC Columns

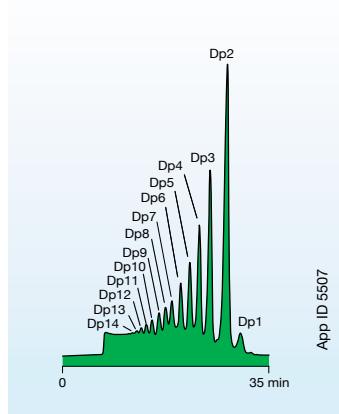
Other Applications

► Food Softeners



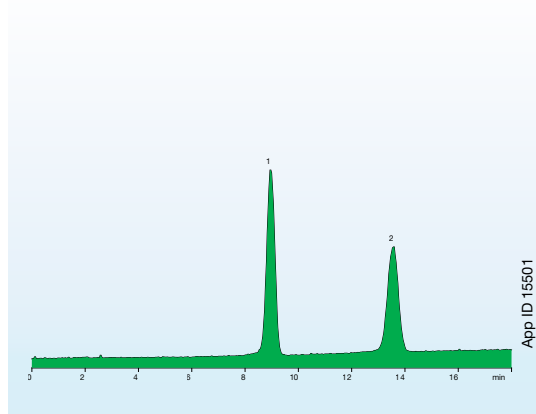
Column: Rezex RCM-Monosaccharide
Dimensions: 300 x 7.8 mm
Part No.: 00H-0130-K0
Mobile Phase: Water
Flow Rate: 0.5 mL/min
Detection: RI
Temperature: 60 °C
Sample: 1. Glycerol
 2. Methoxypolyethylene Glycol
 3. Triethylene Glycol
 4. Sorbitol
 5. Urea

► Oligosaccharides



Column: Rezex RSO-Oligosaccharide
Dimensions: 200 x 10 mm
Part No.: 00P-0133-N0
Mobile Phase: Water
Flow Rate: 0.3 mL/min
Detection: RI
Temperature: 75 °C
Sample: Malto-Oligosaccharides as shown

► Oligosaccharides



Column: Rezex RPM-Monosaccharide
Dimensions: 100 x 7.8 mm
Part No.: 00D-0135-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD (Ambient)
Column Temperature: 80 °C
Sample: 1. Mannitol
 2. Sorbitol

Applications (partial list)

Call us for assistance in selecting the right column for your needs

Compound	Rezex Phase	App ID No.
Acetic acid	ROA	5515
	RHM	14962
Acetylene carboxylic acid	ROA	5517
Arabinose	RNM	5510
	RAM	14974
Citric acid	ROA	5515
	RHM	14970
D-Cellobiose	RNM	5510
	RPM	14967
D-(+)-Galactose	RPM	14967
D-(+)-Xylose	RPM	14967
D-(-)-Arabinose	RPM	14967
Erythritol	RPM	14968
Ethanol	ROA	5512
	ROA	5515
Formic acid	RHM	14962
	RCM	5504, 5505, 14975, 14981, 14977, 14987
Fructose	RPM	5508, 14985
	RNM	5510
	RAM	14966
	ROA	5517
Fumaric acid	RPM	5508
Galactose	RCM	14977, 14987
Glucose	RCM	5504, 5505, 14975, 14977, 14979, 14981, 14987, 14983
	RPM	5508, 14985
	RKP	5506
	ROA	5514
	RNM	5510
	RAM	14966, 14974
	RCM	5518
Glycerol	ROA	5512
Isopropanol	RHM	14970, 14971
Lactic acid	ROA	5517
Maleic acid	RSO	5507
Malto-Oligosaccharides	RCM	5504, 14975
	RPM	5508, 14985
	RKP	5506
	RAM	14966
Maltose	RKP	5506
Maltotriose	RPM	5508, 14968
Mannitol	RCU	5516

Compound	Rezex Phase	App ID No.
Mannose	RCM	5504, 14975
	RPM	14985
	RAM	14966
Melezitose	RCM	5504, 14975
	RPM	14985
	RAM	14966
meso-Erythritol	RPM	5508
Methanol	ROA	5512
Methoxypolyethylene Glycol	RCM	5518
n-Butanol	ROA	5512
n-Propanol	ROA	5512
N-Acetylgalactosamine	ROA	5514
N-Acetylglucose	ROA	5514
Oxalic acid	ROA	5515
	RHM	14962
Ribose	RNM	5510
	RAM	14974
	RCM	5504, 14975
Ribitol	RAM	14966
	RHM	14991
	RPM	14985
	RPM	5508
Salicin	RNM	5510
sec-Butanol	ROA	5512
Sorbitol	RPM	5508, 14968
	RCM	5518, 14977
	RCU	5516
Stachyose	RPM	5508
	RNM	5510
Succinic acid	ROA	5515
	RHM	14962
Sucrose	RCM	5505, 14981, 14977, 14987
	RAM	14974
Tartaric acid	RCM	5504
	RHM	14970
Triethylene glycol	RCM	5518
Urea	RCM	5518
Xylitol	RPM	5508, 14968
Xylose	RPM	5508

* For applications not in this brochure, copies are available through Phenomenex or your local Phenomenex distributor.

Specifications And Operating Recommendations

	RCM Monosaccharide	RSO Oligosaccharide	RNO Oligosaccharide	RNM Carbohydrate	RAM Carbohydrate
Part No.	00H-0130-K0	00P-0133-N0	00P-0137-N0	00H-0136-K0	00H-0131-K0
Ionic Form	Calcium	Silver	Sodium	Sodium	Silver
Standard Dimensions	300 x 7.8 mm	200 x 10 mm	200 x 10 mm	300 x 7.8 mm	300 x 7.8 mm
Matrix	Sulfonated Styrene Divinyl Benzene				
Cross Linking	8 %	4 %	4 %	8 %	8 %
Particle Size (µm)	8	12	12	8	8
Min. Efficiency (p/m) based on last peak	35,000	N/A	N/A	30,000	35,000
Typical Pressure (psi @ Testing Flow Rate)	260	115	130	170	285
Max. Pressure (psi @ Max Flow Rate)	1,000	300	300	1,000	1,000
Max. Flow Rate (mL/min)	1.0	0.3	0.3	1.0	1.0
Max. Temperature (°C)	85	85	85	85	85
Typical Mobile Phase	Water	Water	Water	Water	Water
pH Range	Neutral	Neutral	Neutral	Neutral	Neutral
Guard Column Part No.	03B-0130-K0	03R-0133-N0	03R-0137-N0	03B-0136-K0	03B-0131-K0
Cleaning, Regeneration and Storage					
Organic Modifiers (Max)	5 % Methanol, IPA, EtOH				
Inorganic Modifiers	5 % CaSO ₄ , Ca(NO ₃) ₂ , CaCl ₂	5 % Silver Nitrate	5 % Sodium Salts	5 % Sodium Salts	2 % Silver Nitrate
Avoid	Acids, Bases, Non-Calcium Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases Non-Silver Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases, Non-Sodium Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases, Non-Sodium Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases, Non-Silver Salts or Metal Ions, > 30 % Acetonitrile
					
Cleaning Solvent	100 % Water	100 % Water	100 % Water	100 % Water	100 % Water
Flow Rate (mL/min)	0.4	0.1	0.1	0.4	0.4
Temperature (°C)	85	85	85	85	85
Duration (hrs)	12	12	12	12	12
Regeneration Solvent	0.1 M Ca(NO ₃) ₂	0.1 M AgNO ₃	0.1 M NaNO ₃	0.1 M NaNO ₃	0.1 M AgNO ₃
Flow Rate (mL/min)	0.2	0.1	0.2	0.2	0.2
Temperature (°C)	85	85	85	85	85
Duration (hrs)	4-16	4-16	4-16	4-16	4-16
Ship/Storage Solvent	Water	Water	Water	Water	Water

	RPM Monosaccharide	RHM Monosaccharide	ROA Organic Acid	RFQ Fast Acid	RCU Sugar Alcohols
Part No.	00H-0135-K0	00H-0132-K0	00H-0138-K0	00D-0223-K0	00G-0130-D0
Ionic Form	Lead	Hydrogen	Hydrogen	Hydrogen	Calcium
Standard Dimensions	300 x 7.8 mm	300 x 7.8 mm	300 x 7.8 mm	100 x 7.8 mm	250 x 4.0 mm
Matrix	Sulfonated Styrene Divinyl Benzene				
Cross Linking	8 %	8 %	8 %	8 %	8 %
Particle Size (µm)	8	8	8	8	8
Min. Efficiency (p/m) based on last peak	35,000	35,000	50,000 (Acetic Acid)	30,000	12,000
Typical Pressure (psi @ Testing Flow Rate)	190	275	580	365	90
Max. Pressure (psi @ Max Flow Rate)	1,000	1,000	1,000	1,000	1,000
Max. Flow Rate (mL/min)	1.0	1.0	1.0	1.0	0.5
Max. Temperature (°C)	85	85	85	85	85
Typical Mobile Phase	Water	Water	0.005 N H ₂ SO ₄	0.005 N H ₂ SO ₄	Water
pH Range	Neutral	1-8	1-8	1-8	Neutral
Guard Column Part No.	03B-0135-K0	03B-0132-K0	03B-0138-K0	03B-0223-K0	03A-0130-D0
Cleaning, Regeneration and Storage					
Organic Modifiers (Max)	5 % Methanol, IPA, EtOH				
Inorganic Modifiers	5 % Lead Nitrate	5 % HNO ₃ , H ₃ PO ₄	5 % HNO ₃ , H ₃ PO ₄	5 % HNO ₃ , H ₃ PO ₄	5 % CaSO ₄ , Ca(NO ₃) ₂ , CaCl ₂
Avoid	Acids, Bases, Non-Lead Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases, Salts or Metal Ions, > 30 % Acetonitrile	Acids, Bases, Salts or Metal Ions, pH > 3, > 30 % Acetonitrile	Acids, Bases, Salts or Metal Ions, pH > 3, > 30 % Acetonitrile	Acids, Bases, Non-Calcium Salts or Metal Ions, > 30 % Acetonitrile
					
Cleaning Solvent	100 % Water	100 % Water	100 % Water	100 % Water	100 % Water
Flow Rate (mL/min)	0.4	0.4	0.4	0.4	0.1
Temperature (°C)	85	85	85	85	85
Duration (hrs)	12	12	12	12	12
Regeneration Solvent	0.1 M Pb(NO ₃) ₂	0.025 M H ₂ SO ₄	0.025 M H ₂ SO ₄	0.025 M H ₂ SO ₄	0.1 M Ca(NO ₃) ₂
Flow Rate (mL/min)	0.2	0.2	0.2	0.2	0.1
Temperature (°C)	85	85	85	85	85
Duration (hrs)	4-16	4-16	4-16	4-16	4-16
Ship/Storage Solvent	Water	Water	0.005 N H ₂ SO ₄	0.005 N H ₂ SO ₄	Water

Phenex™ Syringe Filters

For Sample and Solvent Filtration Prior to Chromatography!

- Less system downtime
- More consistent, reproducible results
- Increased column lifetime



Ordering Information¹

Ordering Information ¹		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	Part No.	Unit	Part No.	Unit	
0.20 µm							
Phenex-RC (Regenerated Cellulose)	AF0-3203-12	100/pk	AF0-2203-12	100/pk	AF0-8203-12 ⁵	100/pk	
	AF0-3203-52	500/pk	AF0-2203-52	500/pk	AF0-8203-52 ⁵	500/pk	
Phenex-PES ³ (Polyethersulfone)	—	—	—	—	AF0-8208-12 ⁷	100/pk	
	—	—	—	—	AF0-8208-52 ⁷	500/pk	
Phenex-PTFE ⁶ (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	
Phenex-NY (Nylon)	AF3-3207-12	100/pk	AF0-2207-12	100/pk	AF0-1207-12	100/pk	
	AF3-3207-52	500/pk	AF0-2207-52	500/pk	AF0-1207-52	500/pk	
Phenex-GF/NY ² (Glass Fiber/Nylon)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a Nylon (NY) membrane. Excellent for filtration of particle-laden samples, such as foods and beverages, environmental, biofuels, and dissolution samples. Use less hand pressure to filter even the most difficult samples. Outlet connection is luer lock.				AF0-1A47-12 ⁷	100/pk	
					AF0-1A47-52 ⁷	500/pk	
Phenex-PVDF (Polyvinylidene Fluoride)	—	—	AF6-5206-12 ⁸	100/pk	AF6-6206-12	100/pk	
	—	—	AF6-5206-52 ⁸	500/pk	AF6-6206-52	500/pk	
Phenex-GF/PVDF (Glass Fiber/Polyvinylidene Fluoride)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a PVDF membrane. The hydrophilic PVDF membrane provides high flow rates and throughput, low extractables and broad chemical compatibility. This membrane binds less protein than nylon or PTFE membranes.				AF6-6C06-12	100/pk	
					AF6-6C06-52	500/pk	
Phenex-CA ⁴ (Cellulose Acetate)	—	—	—	—	AF0-8204-12 ⁷	100/pk	
	—	—	—	—	AF0-8204-52 ⁷	500/pk	
Phenex-GF/CA ^{2,3,4} (Glass Fiber/Cellulose Acetate)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a CA membrane. Excellent for filtration of tissue culture media, general biological sample filtration and clarification. Outlet connection is luer lock.				AF0-8A09-12 ⁷	100/pk	
					AF0-8A09-52 ⁷	500/pk	
0.45 µm							
Phenex-RC (Regenerated Cellulose)	AF0-3103-12	100/pk	AF0-2103-12	100/pk	AF0-8103-12 ⁵	100/pk	
	AF0-3103-52	500/pk	AF0-2103-52	500/pk	AF0-8103-52 ⁵	500/pk	
Phenex-PES ³ (Polyethersulfone)	—	—	—	—	AF0-8108-12 ⁷	100/pk	
	—	—	—	—	AF0-8108-52 ⁷	500/pk	
Phenex-PTFE ⁶ (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	
Phenex-NY (Nylon)	AF3-3107-12	100/pk	AF0-2107-12	100/pk	AF0-1107-12	100/pk	
	AF3-3107-52	500/pk	AF0-2107-52	500/pk	AF0-1107-52	500/pk	
Phenex-GF/NY ² (Glass Fiber/Nylon)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a Nylon (NY) membrane. Excellent for filtration of particle-laden samples, such as foods and beverages, environmental, biofuels, and dissolution samples. Use less hand pressure to filter even the most difficult samples. Outlet connection is luer lock.				AF0-1B47-12 ⁷	100/pk	
					AF0-1B47-52 ⁷	500/pk	
Phenex-PVDF (Polyvinylidene Fluoride)	—	—	AF6-5106-12 ⁸	100/pk	AF6-6106-12	100/pk	
	—	—	AF6-5106-52 ⁸	500/pk	AF6-6106-52	500/pk	
Phenex-GF/PVDF (Glass Fiber/Polyvinylidene Fluoride)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a PVDF membrane. The hydrophilic PVDF membrane provides high flow rates and throughput, low extractables and broad chemical compatibility. This membrane binds less protein than nylon or PTFE membranes.				AF6-6D06-12	100/pk	
					AF6-6D06-52	500/pk	
Phenex-GF/CA ^{2,3,4} (Glass Fiber/Cellulose Acetate)	An integrated syringe filter unit containing an inert borosilicate glass fiber prefilter and a CA membrane. Excellent for filtration of tissue culture media, general biological sample filtration and clarification. Outlet connection is luer lock.				AF0-8B09-12 ⁷	100/pk	
					AF0-8B09-52 ⁷	500/pk	
1.20 µm							
Phenex-GF ^{2,3} (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 ⁷	100/pk	
					AF0-8515-52 ⁷	500/pk	

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. Larger quantity purchases at significant savings are available.
2. Glass fiber filters are 28 mm diameter and made of borosilicate. They will remove 90 % of all particles >1.2 µm.
3. Housing material is methacrylate butadiene styrene (MBS) polymerisate. Also known as Cyrolite®.
4. Cellulose acetate is surfactant-free.
5. 26 mm diameter.
6. Hydrophobic membrane. Can be made hydrophilic by pre-wetting with IPA.
7. 28 mm diameter.
8. 17 mm diameter.

Additional dimensions and membrane types are available.

Please contact your local Phenomenex technical consultant or distributor for availability or assistance.



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



Find More Online!

To find the perfect Phenex syringe filter for any application go to www.phenomenex.com/syringefilterfinder

You Need Constant Temperature, Use A **ThermaSphere™ TS-130** Column Heater!



BENEFITS

- Improves chromatographic reproducibility
- Improves ruggedness of separation
- Improves peak efficiency and analyte quantification
- Improves baseline and overall detector performance

ESSENTIAL FOR

- Monosaccharides and sugar alcohol analysis
- Organic acid analysis
- Oligosaccharide analysis
- Rapid Fruit Sugar Analysis

FEATURES

- Compact and lightweight unit
- Transparent compartment cover
- Micro-fan provides rapid thermal equilibration

Ordering Information

Specifications

Column Size Accommodated: Fits up to one 30 cm length column, or 25 cm column with guard column. Multiple inlet and outlet slots allow the shortest length of tubing to be used with any length column.

Temperature Range: From 25 to 90 °C in 0.1 °C increments.

Temperature Stability: ±0.1 °C Calibration two-point, electronic, factory set.

Accuracy: 0.5 °C over the entire range.

Power: 12 volt DC universal power supply takes voltage inputs from 95 VAC to 265 VAC, 50/60 Hz. CE approved.

Over-temperature Alarm: Audible with automatic heater shutoff if column temperature exceeds 10 °C of target temperature.

Auto-Off Timer: Count down timer with audible alarm turns off heater, settable to 30 days in days, hours, minutes and seconds.

Injection Counter: Trigger on external switch closure.

ThermaSphere TS-130 Column Heater

Part No.	Description
EH0-7057	ThermaSphere TS-130 HPLC Column Heater 25-90 °C, 95 to 265 VAC, 50/60 Hz

1. The ThermaSphere TS-130 is warranted for one year parts and labor. Each unit is individually calibrated and comes with a Certificate of Performance. No adjustment or re-calibration is ever necessary. CE approved, UL and CSA approved power supplies.
2. Please specify Line Cord if other than North America (Australia, Germany, Italy and U.K. are available)

guarantee

If the TS-130 column heater does not provide at least an equivalent performance as compared to a competing column heater of similar specifications, return the TS-130 with comparative data within 45 days for a FULL REFUND.

Ordering Information

Columns					Guards		SecurityGuard™ Cartridges (mm)
Description	Part No.	Cross Linkage	Ionic Form	Size (mm)	Part No.	Size (mm)	4 x 3.0* /10pk
RCM-Monosaccharide	00F-0130-K0	8 %	Calcium	150 x 7.8	03B-0130-K0	50 x 7.8	AJ0-4493
RCM-Monosaccharide	00H-0130-K0	8 %	Calcium	300 x 7.8	03B-0130-K0	50 x 7.8	AJ0-4493
RHM-Monosaccharide	00H-0132-K0	8 %	Hydrogen	300 x 7.8	03B-0132-K0	50 x 7.8	AJ0-4490
RAM-Carbohydrate	00H-0131-K0	8 %	Silver	300 x 7.8	—	—	AJ0-4491
RSO-Oligosaccharide	00P-0133-N0	4 %	Silver	200 x 10.0	03R-0133-N0	60 x 10.0	—
RNO-Oligosaccharide	00P-0137-N0	4 %	Sodium	200 x 10.0	03R-0137-N0	60 x 10.0	—
RPM-Monosaccharide (for USP procedure)	00H-0135-K0	8 %	Lead	300 x 7.8	03B-0135-K0	50 x 7.8	AJ0-4492
	00D-0135-K0	8 %	Lead	100 x 7.8	03B-0135-K0	50 x 7.8	AJ0-4492
RNM-Carbohydrate	00H-0136-K0	8 %	Sodium	300 x 7.8	03B-0136-K0	50 x 7.8	—
ROA-Organic Acid	00F-0138-E0	8 %	Hydrogen	150 x 4.6	—	—	AJ0-4490
ROA-Organic Acid	00G-0138-E0	8 %	Hydrogen	250 x 4.6	—	—	AJ0-4490
ROA-Organic Acid	00F-0138-K0	8 %	Hydrogen	150 x 7.8	03B-0138-K0	50 x 7.8	AJ0-4490
ROA-Organic Acid	00H-0138-K0	8 %	Hydrogen	300 x 7.8	03B-0138-K0	50 x 7.8	AJ0-4490
RKP-Potassium	00H-3252-K0	8 %	Potassium	300 x 7.8	—	—	—
RFQ-Fast Acid	00D-0223-K0	8 %	Hydrogen	100 x 7.8	03B-0223-K0	50 x 7.8	AJ0-4490
RCU-USP Sugar Alcohols	00G-0130-D0	8 %	Calcium	250 x 4.0	—	—	AJ0-4493

for ID: 3.2-8.0 mm

* SecurityGuard Analytical Cartridges require universal holder Part No.: KJ0-4282



If you are not completely satisfied with the performance of any Rezex™ column, as compared to a competing product of the same size and phase, simply return the Rezex column with your comparative data within 45 days for a FULL REFUND.



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