Rezex™

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.

Carbohydrate and Organic Acid Analysis

- **Excellent resolution and column-to-column reproducibility**
- **Easy, accurate quantitation from sharper peak shapes**
- **Longer column lifetimes and faster run time capability from lower backpressures**
- **Baseline separation of critical sample components due to higher efficiencies**

Rezex ion-exclusion HPLC columns achieve reproducible, accurate separations based on multiple modes of interaction. Available in 4 % and 8 % cross-linked sulfonated styrene-divinylbenzene (SDVB) and multiple ionic forms (calcium, sodium, hydrogen, potassium, lead, and silver) for a wide range of selectivities. USP L17, L19, L22, L34, and L58 packings available.

REZEX™

Use Rezex for carbohydrate, oligosaccharide, and organic acid separations:

- Drug formulation and excipient analysis
- Food and beverage quality control testing
- Fermentation reaction monitoring and recovery testing for biofuels

Recommended alternative to Bio-Rad® Aminex®, Supelco® SUPELCOGEL™, and Waters® Sugar-Pak™ (see p. 250)

Find the Column For Your Application

Phases Available	Description	Applications	Additional Notes
RCM-Monosaccharide (L19 packing)*	8 % cross-linked resin **CALCIUM** ionic form	Monosaccharides and sugar alcohols from sweeteners and corn and cane sugars Di, tri, and tetra saccharides	– Our most commonly used column type – Easy regeneration with calcium nitrate solutions
RHM-Monosaccharide (L17 packing)*	8 % cross-linked resin **HYDROGEN** ionic form	Monosaccharides in combination with organic acids, fatty acids, alcohols, ketones, neutral compounds, or inorganic salts	– Versatile column, generally run with a mobile phase of deionized water
RAM-Carbohydrate	8 % cross-linked resin **SILVER** ionic form	Selectivity complementary to other Rezex column types	
RSO-Oligosaccharide	4 % cross-linked resin **SILVER** ionic form	High resolution of oligosaccharides up to 18 degrees of polymerization (Dp)	– Guard column is recommended to protect the ionic integrity of the matrix
RNO-Oligosaccharide	4 % cross-linked resin **SODIUM** ionic form	High resolution of oligosaccharides	
RPM-Monosaccharide (L34 packing)*	8 % cross-linked resin **LEAD** ionic form	Monosaccharides and sugar alcohol analysis. Cellobiose, glucose, xylose, arabinose, mannose and other cellulose products	
RNM-Carbohydrate (L58 packing)*	8 % cross-linked resin **SODIUM** ionic form	For matrices which contain high concentration of inorganic sodium, i.e. molasses	– Easily regenerated to the original ionic strength
ROA-Organic Acid (L22 packing)*	8 % cross-linked resin **HYDROGEN** ionic form	Organic acids alone or in combination with carbohydrates, alcohols, fatty acids, or neutral compounds; Amino sugars; ethanol, acetic acid, glycerol, and standard alcohol mixtures	– Selectivity can be altered by changing the pH as well as the type of dilute mineral acid used as the mobile phase
RFQ-Fast Acid	8 % cross-linked resin **HYDROGEN** ionic form	Rapid screening of fruit quality; ethanol, acetic acid, glycerol, and standard alcohol mixtures	– Analytes are routinely chromatographed under 5 minutes
RKP-Potassium	8 % cross-linked resin **POTASSIUM** ionic form	Analysis of glyphosate	
RCU-USP Sugar Alcohols (L19 packing)*	8 % cross-linked resin **CALCIUM** ionic form	For sugar analysis according to the USP procedures	– Sorbitol and mannitol can be resolved using simple isocratic conditions

* United States Pharmacopeia (USP)

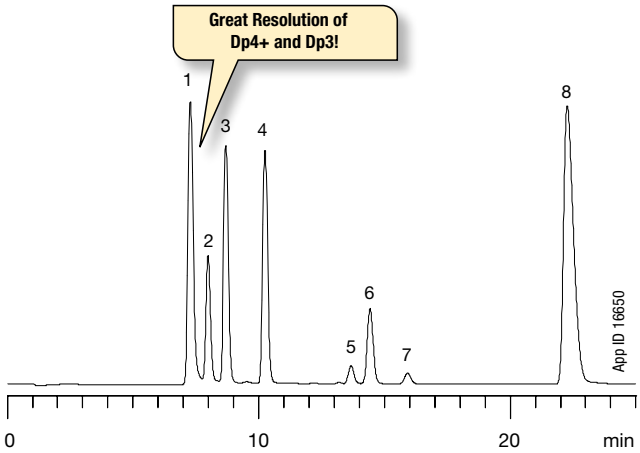
Rezex™

Bioethanol Fermentation Monitoring

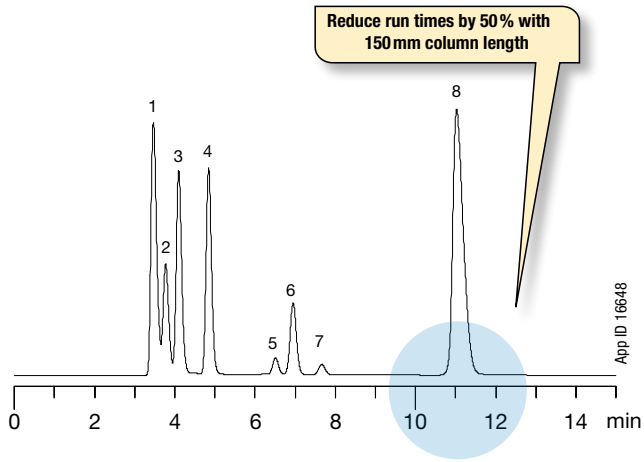
- **Easy quantitation of ethanol fermentation broth components**
- **Monitor starches, sugars, organic acids, and ethanol in one run**
- **Reliable lactic acid and acetic acid monitoring**
- **Increase throughput by reducing run times 50 % with 150 mm column length**

Monitoring the key reaction components throughout the fermentation process is crucial for maximizing ethanol recovery. Rezex ROA is uniquely suited for the separation and analysis of simple and complex sugars, organic acids, and ethanol within a fermentation broth sample. With results easily obtained through an isocratic run, Rezex ROA is instrumental in helping you to accurately determine what critical steps need to be taken to ensure the maximum yield is achieved during your fermentation run.

Rezex ROA has the ability to achieve excellent baseline separation between Dp3 and Dp4+, which have proven to be a challenge within the bioethanol industry. It is this great baseline separation that affords scientists the opportunity to utilize a shorter column dimension. By using the 150 x 7.8 mm Rezex ROA column, you are able to decrease the run time by 50 % when compared to the average run time on a 300 x 7.8 mm column.



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



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

Shorten GC Fuel Quality Testing

Zebron™ ZB-Bioethanol GC column can shorten your quality test down to 5 minutes! (See p. 99).

Extend Column Lifetime

Protect the Rezex column from the intrusion of the metal ions by using Phenex™ Syringe Filters and SecurityGuard™. The filters and SecurityGuard guard cartridge system work by trapping metal ions, such as calcium, magnesium, and iron, which can damage the column and cause it to lose or change separation efficiency. (See pp. 12 and 251).

Rezex™ vs. Bio-Rad Aminex®

Phenomenex guarantees satisfaction when using Rezex HPLC columns. As illustrated below, Rezex offers advantages that enhance chromatographic results, increase throughput, and simplify quantitation.

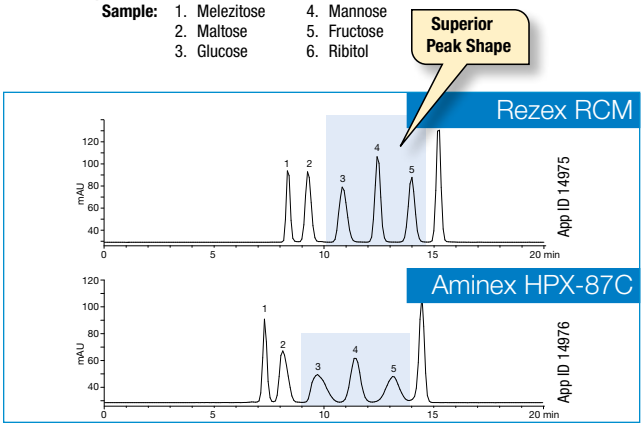
Easier, Accurate Quantitation

Due to improved peak shape

Saccharides

Conditions for both columns:

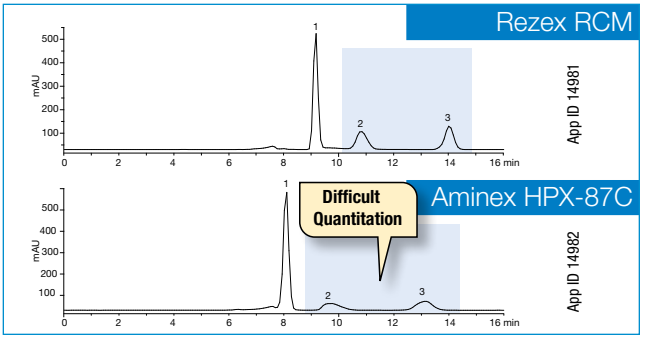
Column: Rezex RCM-Monosaccharide
Aminex HPX-87C
Dimensions: 300 x 7.8 mm
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample: 1. Melezitose 2. Maltose 3. Glucose 4. Mannose 5. Fructose 6. Ribitol



Orange Juice

Conditions for both columns:

Column: 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



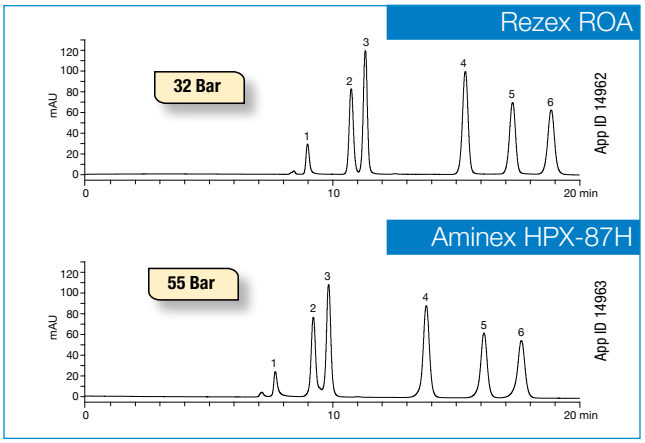
Longer Column Lifetime

Due to lower backpressures

Aliphatic Acids

Conditions for both columns:

Column: Rezex ROA-Organic Acid
Aminex HPX-87H
Dimensions: 300 x 7.8 mm
Mobile Phase: 0.005 N H_2SO_4
Flow Rate: 0.5 mL/min
Detection: UV @ 210 nm
Temperature: 40 °C
Sample: 1. Oxalic Acid 2. Citric Acid 3. Tartaric Acid 4. Succinic Acid 5. Formic Acid 6. Acetic Acid



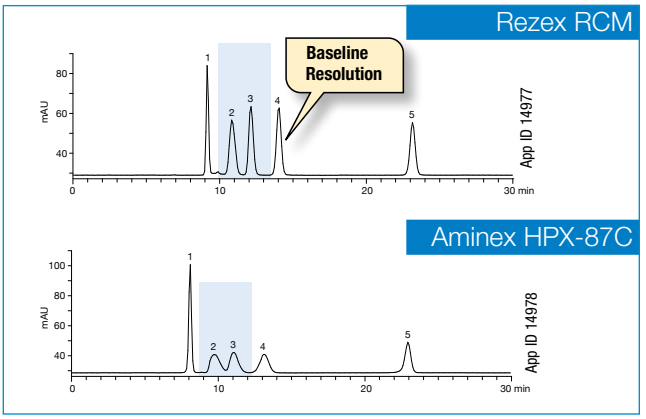
Baseline Separation of Critical Sample Components

Due to improved resolution

Sugars

Conditions for both columns:

Column: 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. Galactose 4. Fructose 5. Sorbitol



Comparative separations may not be representative of all applications.

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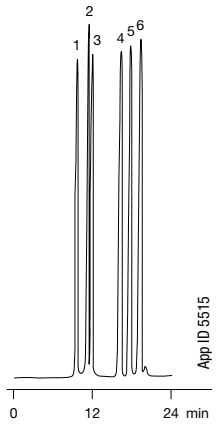
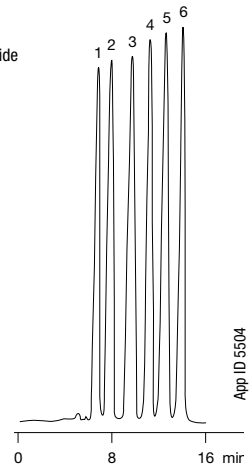
Organic Acids

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: 0.5 mL/min
Detection: UV @ 210 nm
Temperature: 55 °C
Sample:
1. Oxalic
2. Citric
3. Tartaric
4. Succinic
5. Formic
6. Acetic



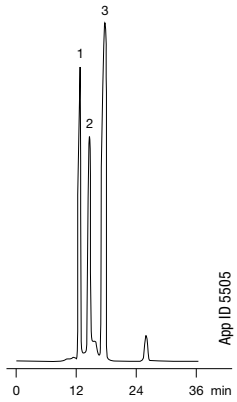
Saccharides

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



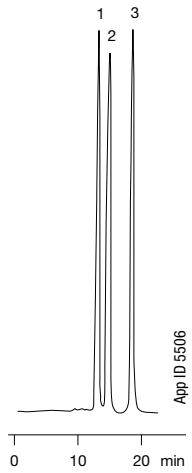
Apple Juice

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



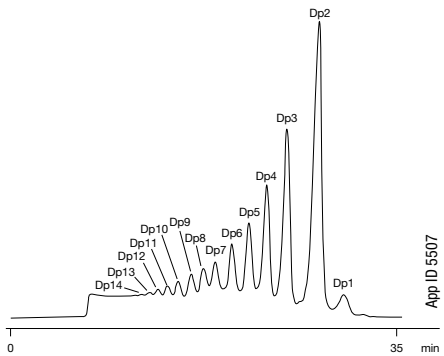
Carbohydrates

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



Oligosaccharides

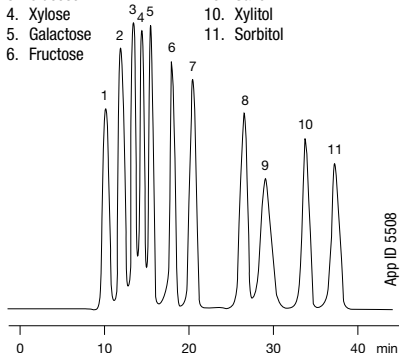
Column: Rezex RSO-Oligosaccharide
Dimensions: 200 x 10 mm
Part No.: 00P-0133-N0
Mobile Phase: Water
Flow Rate: 0.3 mL/min
Detection: RI
Temperature: 75 °C
Sample: Malto-Oligosaccharides as shown



Dp refers to Degree of polymerization

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: RI
Temperature: 75 °C
Sample:
1. Stachyose
2. Maltose
3. Glucose
4. Xylose
5. Galactose
6. Fructose
7. Meso-Erythritol
8. Mannitol
9. Salicin
10. Xylitol
11. Sorbitol



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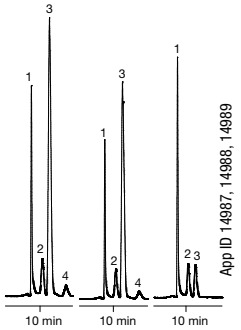
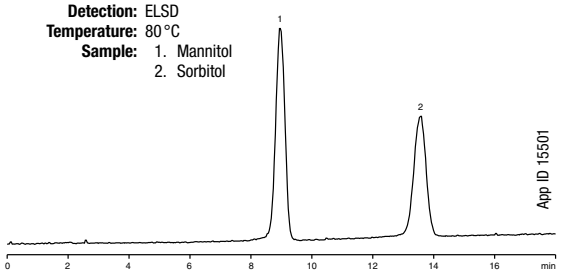
Fermentation Broth

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



Mannitol and Sorbitol: USP Method (L19 Column)

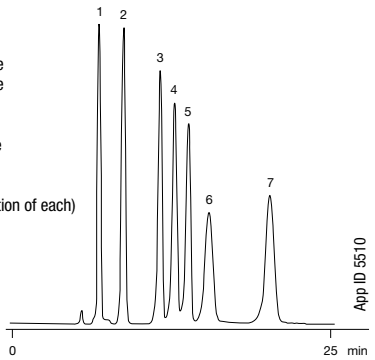
Column: Rezex RPM-Monosaccharide
Dimensions: 100 x 7.8 mm
Part No.: 00D-0135-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: ELSD
Temperature: 80 °C
Sample:
1. Mannitol
2. Sorbitol



Carbohydrates

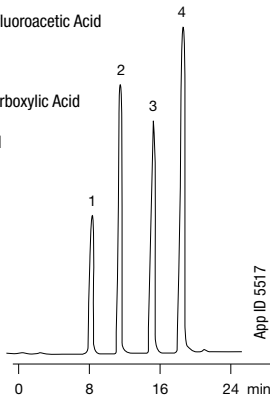
Column: Rezex RNM-Carbohydrate
Dimensions: 300 x 7.8 mm
Part No.: 00H-0136-K0
Mobile Phase: Water
Flow Rate: 0.6 mL/min
Detection: RI
Temperature: 75 °C
Sample:
1. Stachyose
2. Cellobiose
3. Glucose
4. Fructose
5. Arabinose
6. Ribose
7. Salicin

(1 % solution of each)



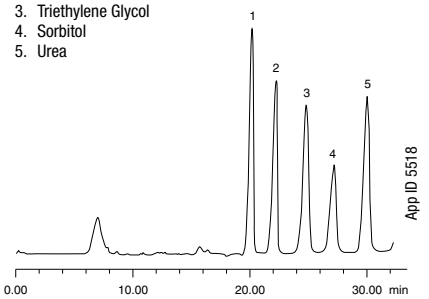
Carboxylic Acids

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



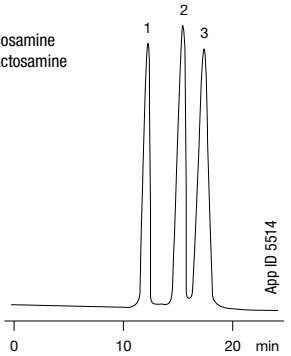
Food Softeners

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



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-Acetylglucosamine
3. N-Acetylgalactosamine



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Specifications and Operating Recommendations

	RCM-Monosaccharide	RSO-Oligosaccharide	RNO-Oligosaccharide	RNM-Carbohydrate	RAM-Carbohydrate
Part Number	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-divinylbenzene				
Cross Linking	8 %	4 %	4 %	8 %	8 %
Particle Size	8 µm	12 µm	12 µm	8 µm	8 µm
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 (see pressure)	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/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Non-Silver Salts/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Non-Sodium Salts/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Non-Sodium Salts/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Non-Silver Salts/ 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 Number	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-divinylbenzene				
Cross Linking	8 %	8 %	8 %	8 %	8 %
Particle Size	8 µm	8 µm	8 µm	8 µm	8 µm
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_2SO_4	0.005 N H_2SO_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_3PO_4	5 % HNO_3, H_3PO_4	5 % HNO_3, H_3PO_4	5 % $CaSO_4$, $Ca(NO_3)_2$, $CaCl_2$
Avoid	Acids, Bases, Non-Lead Salts/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Salts/ Metal Ions, >30 % Acetonitrile	Acids, Bases, Salts, Metal Ions, pH > 3, >30 % Acetonitrile	Acids, Bases, Salts, 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_2SO_4	0.025 M H_2SO_4	0.025 M H_2SO_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_2SO_4	0.005 N H_2SO_4	Water

Rezex™

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.

Retention Times for Some Carbohydrates and Sugar Alcohols

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
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

Column Cross Reference Chart

Phenomenex Rezex™	Bio-Rad® Aminex®	Supelco® SUPELCOGEL™	Waters® Sugar-Pak™
RCM-Monosaccharide	HPX-87C 125-0095	Supelcogel Ca	Sugar-Pak 1
RHM-Monosaccharide	HPX-87H 125-0140	Supelcogel C-610H & H	N/A
RPM-Monosaccharide	HPX-87P 125-0098	Supelcogel Pb	N/A
RNM-Carbohydrate	HPX-87N 125-0143	N/A	N/A
RSO-Oligosaccharide	HPX-42A 125-0097	Supelcogel Ag1 & Ag2	N/A
ROA-Organic Acid	HPX-87H 125-0140	Supelcogel C-610H & H	N/A
RFQ-Fast Acid	Fast Acid 125-0100	N/A	N/A
RKP-Potassium	HPX-87K 125-0142	Supelcogel K	N/A
RCU-USP Sugar Alcohols	Sugar Alcohols 125-0094	N/A	N/A

Ordering Information

Columns						Guards			SecurityGuard™ Cartridges (mm)
									4 x 3.0*
Description	Part No.	Cross Linkage	Ionic Form	Size (mm)	Price	Part No.	Size (mm)	Price	/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		03A-0130-D0	30 x 4.0		AJ0-4493

for ID: 3.2-8.0 mm

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

For Column Heaters, see p. 366

For our full line of Column Performance Check Standards, see pp. 372-373