

# JORDI FLP

## Our Mission

It is the goal of Jordi FLP to provide the highest quality products and services to the polymer, pharmaceutical, nanotechnology, and biotechnology industries. Quality is central to who we are as a company. Our highly trained staff of Ph.D.s, Chemists and Technicians provide specialized analytical testing going beyond the simple reporting of data to reach the more important goal of solving our customers problems. Strict quality control in both our manufacturing and service divisions is insisted upon to guarantee that every job is done right every time. The health and well-being of people who may never hear the name Jordi FLP depend upon it.

## The Products

Jordi specializes in the production of polymer-based chromatography media, solid phase extraction (SPE) cartridges, and HPLC columns. Our DVB gels were designed by founder and President Dr. Howard C. Jordi. It was his desire to prepare a longer-lasting and more versatile column media. Out of this were born the Jordi divinylbenzene (DVB) resins. These materials eliminated many of the problems of conventional gel permeation chromatography (GPC) columns including frequent voiding, limited solvent range, and short column life. Since that time, Jordi FLP has expanded into the production of a wide range of polymer based products for reverse phase (RP), normal phase (NP) and ion exchange chromatography. New and innovative GPC products remain central to our development efforts.

## Analytical Services

Jordi FLP provides contract analytical services with a special emphasis on chemical identification. We have de formulated hundreds of materials, providing a list of all chemical components and their relative concentrations. Typical projects include product failure analysis, HPLC method development, polymer filler and additive quantitation, and unknown identification. Our team of Ph.D. biological and polymer chemists have extensive expertise in a broad range of today's most advanced analytical techniques including mass spectroscopy, gas and liquid chromatography, elemental analysis, and spectroscopy. Our goal is to provide the best customer service in the industry, backed by our more than 25 years of technical expertise.

*...solving your problem is our focus!*

## Payment Options:

We accept Purchase Orders with terms of Net 30 days, MasterCard, Visa, American Express and Discover. When using a credit card, you must inform us of any transaction limits on your card. Failure to do so may affect processing of your payment and delay your shipment.



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# Core Values

## Integrity -

The guiding principle that  
overrides all other  
concerns.

We do what we say we will do.

To see the next Jordi core value turn to page 12.



# Columns



## Introduction to Jordi Columns

Jordi FLP manufactures a complete line of polymer-based high pressure liquid chromatography (HPLC) columns for normal and reverse phase chromatography, size exclusion chromatography, and ion exchange chromatography. All Jordi columns are made from our proprietary chemistries to maximize column life. Each Jordi column is put through a rigorous quality control process and shipped with a quality assurance chromatogram. We back up our quality pledge with a 90 day warranty.

Jordi columns represent over 25 years of continuous development effort and are in use in many of today's premier analytical laboratories. We combine these great products with the industry's best technical support and free access to our extensive application database. Our knowledgeable technical support staff can be quickly reached by phone or email to aid you in selecting the Jordi product which is best for you.

### Jordi Polymeric Packing Media

Every great column starts with the packing media. Jordi gels are made using our proprietary process which provides a maximum amount of cross-linking and as a result:

- There is more strength to the gel, increasing column life.
- Jordi columns offer unparalleled resistance to shrinking and swelling. The same Jordi GPC column can be used with solvents as different as hexane and hexafluoroisopropanol and still maintain their high efficiency. Some Jordi packings have no solvent limitations at all.
- Packings are available with pore sizes ranging from 100Å for the separation of low MW compounds (50-5000), to mixed bed packings capable of separating a very broad range of molecular weights (100>10,000,000).
- Jordi provides the widest range of polymer surface chemistries available.
- Since the gel has a higher strength, brittleness of the very large pore size gels (those able to separate 10,000,000 MW polystyrene) is reduced and the gel doesn't fragment. The figure below shows the pressure ratings and pore size specifications for all Jordi packings.

PRESSURE LIMITS FOR JORDI MEDIA	
<i>Pore Size</i>	<i>Pressure Limit</i>
<b>Solid Bead</b>	30,000psig
<b>100Å</b>	30,000psig
<b>500Å</b>	30,000psig
<b>10<sup>3</sup>Å</b>	30,000psig
<b>10<sup>4</sup>Å</b>	2,000psig
<b>10<sup>5</sup>Å</b>	2,000psig
<b>Mixed Bed</b>	2,000psig

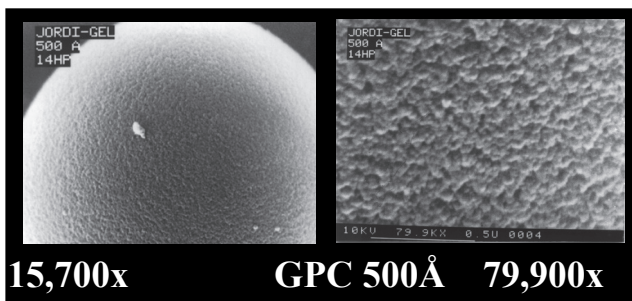
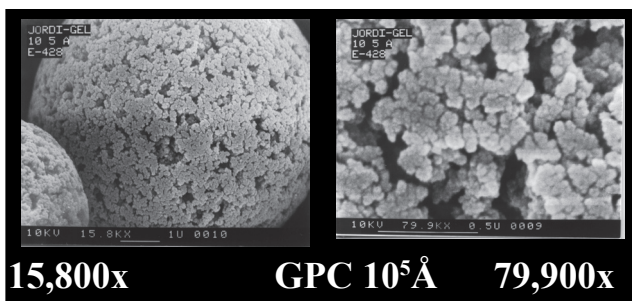
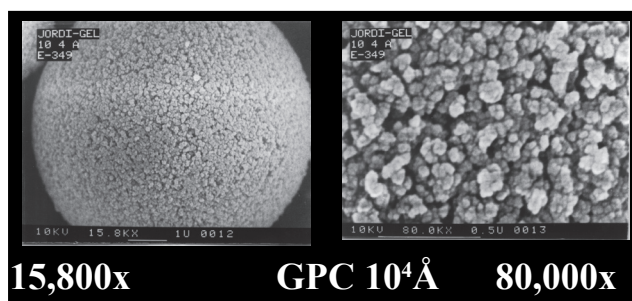
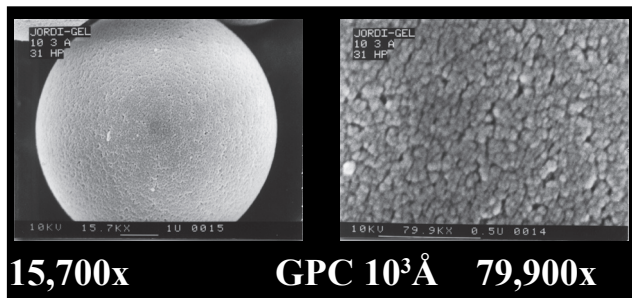
JORDI PORE SIZE SPECIFICATIONS	
<i>Description</i>	<i>MW Range</i>
<b>GPC Solid Bead</b>	2,000-400,000,000
<b>GPC 100Å</b>	<100-5,000
<b>GPC 500Å</b>	<100-10,000
<b>GPC 10<sup>3</sup>Å</b>	<100-50,000
<b>GPC 10<sup>4</sup>Å</b>	100-100,000
<b>GPC 10<sup>5</sup>Å</b>	10,000->10,000,000
<b>GPC Mixed Bed</b>	100->10,000,000

# Columns

## *Advantages of Jordi Polymer Columns*

- **Rugged** - Divinylbenzene packing can be run at high temperatures and with nearly all solvents. Change solvents without damaging the column. Most Jordi packings can be used at temperatures of up to 150°C and pressures up to 30,000psig.
- **pH Resistant** - Usable over the entire pH range. Jordi columns can support mobile phase & pH values from 0 to 14.
- **Powerful** - High pore-volume for greater resolution with fewer columns. Jordi GPC columns come with a larger standard column dimension (10mm) as compared to competitors' columns (7.8mm) without increased cost.
- **Efficient** - High plate counts for sharp, symmetrical peaks.
- **Versatile** - Multiple surface chemistries for organic and water-soluble polymers. Jordi provides the widest range of polymeric surface chemistries available. This provides the greatest opportunity to achieve a successful separation.
- **Economical** - Compare and save. Jordi columns cost up to a third less than competitors' columns and contain up to 30% more gel.

*These photomicrographs show the surface and pore-size uniformity that is characteristic of Jordi column packings.*



# Core Values

## Excellence -

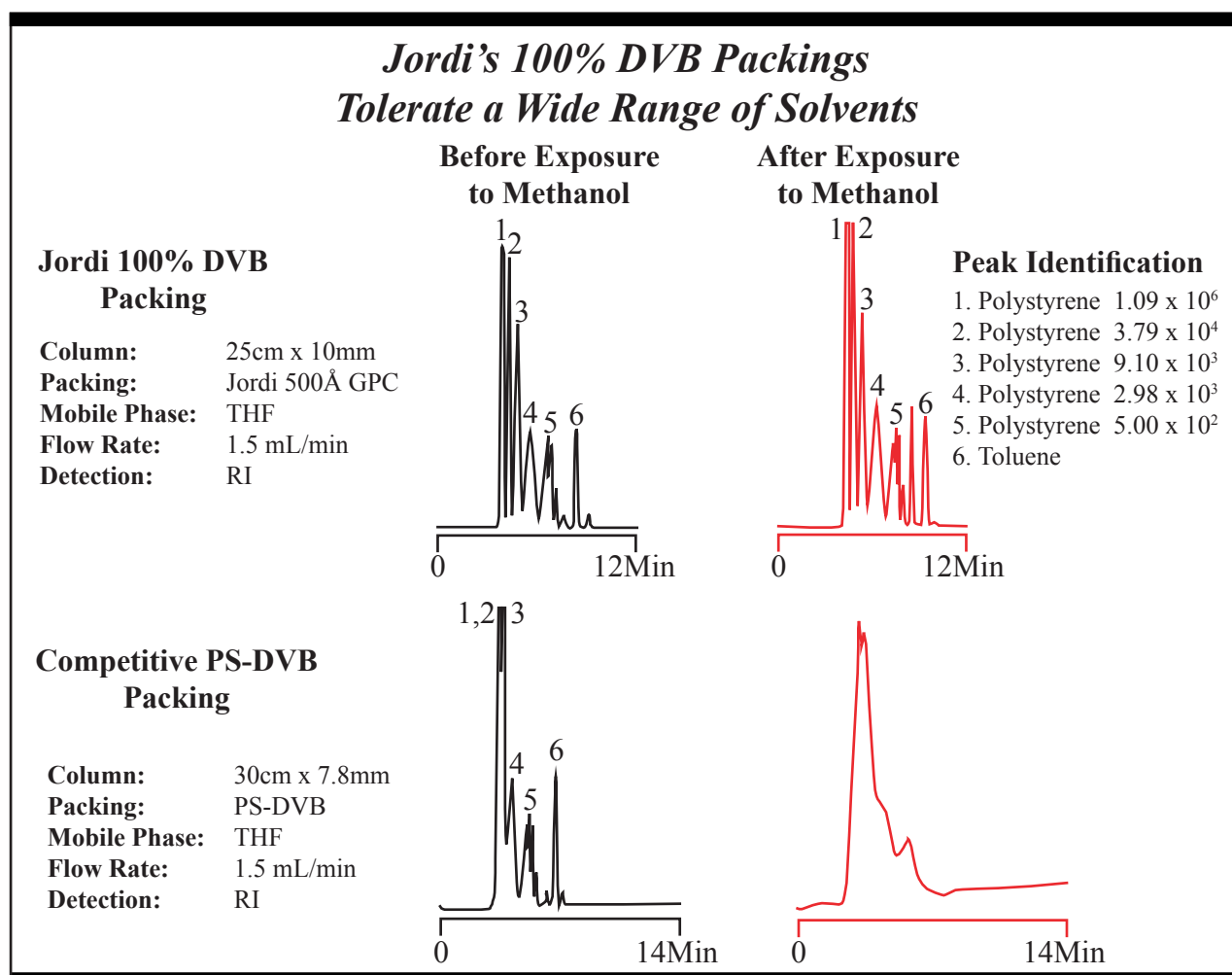
We strive to be the very best at what we do and choose to exit from business which we cannot perform at a high level of quality.

To see the next Jordi core value turn to page 38.

## Introduction to Jordi GPC Columns

Jordi is the only company that makes 100% divinylbenzene (DVB) packings for compatibility with high temperatures, high pressures and the widest range of solvents. Competitors make their packings from fragile polystyrene-divinylbenzene copolymers, (PS-DVB). Changes in solvent, temperature and pressure in our competitors' columns cause shrinkage and swelling and a shortened column life.

A single Jordi GPC column can be used in many solvents including toluene, THF, methanol, hexane, HFIP, acetone, DMF, DMAC, 5% water in THF, or acetic acid. The figure below shows the degradation on a competitor's fragile PS-DVB column following exposure to methanol. The Jordi DVB column performs flawlessly under identical conditions. Use Jordi columns at temperatures up to 150°C and with samples containing salts, acids, or bases. Jordi packings tolerate pressures far higher than conventional PS-DVB materials and are pH 0-14 stable.

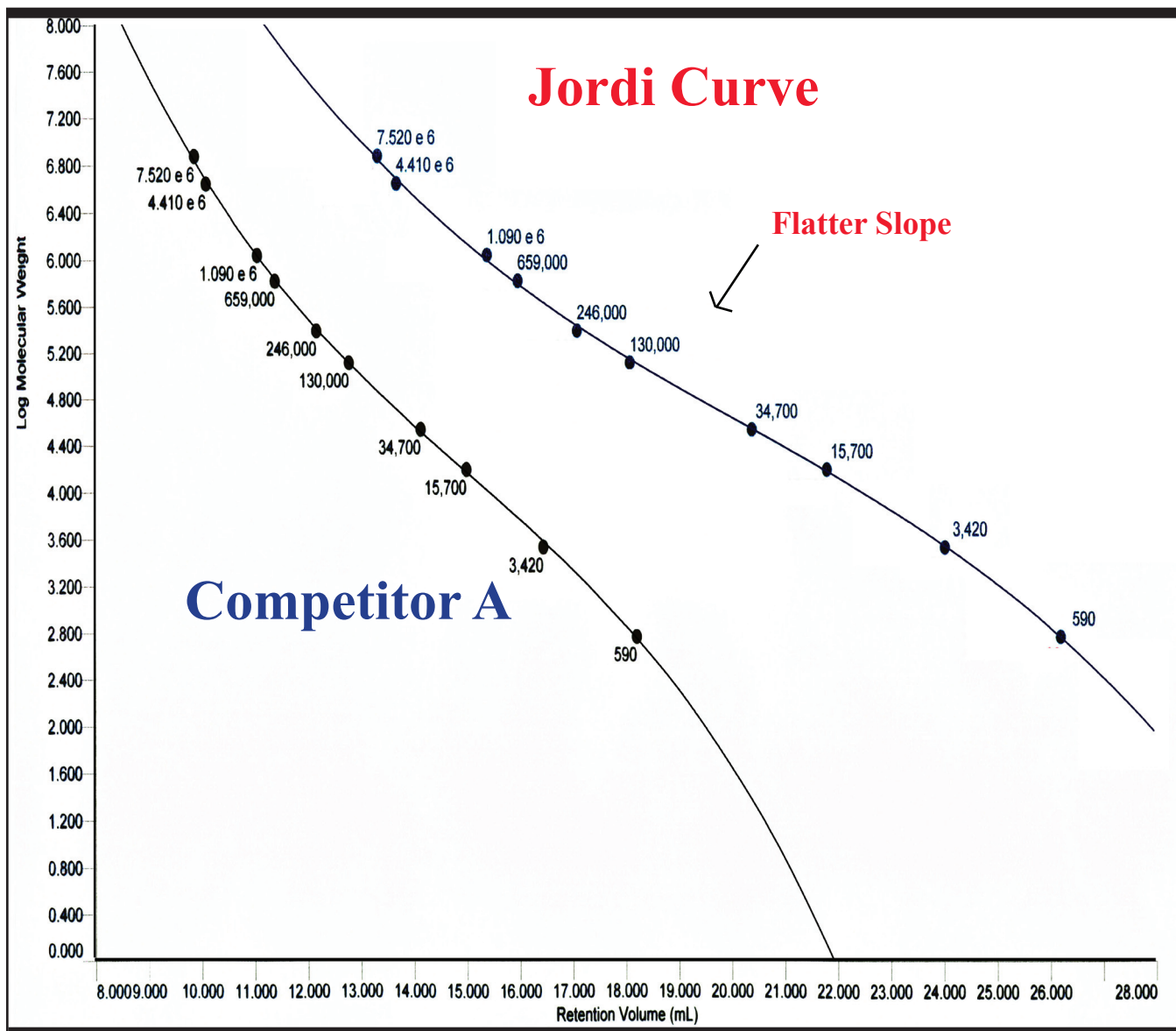


**GPC Durability Test** — Here is a dramatic example of Jordi GPC column durability. Initial chromatograms were obtained using THF as mobile phase. Each column was then stressed by a sudden change of mobile phase from THF to Methanol. Methanol was run through each column for approximately 16 hours, at which time the mobile phase was changed back to THF.

# Columns

## Jordi Calibration Linearity

The porosity of Jordi media has been carefully designed to produce extremely linear calibration curves. Linearity of the calibration is an important factor in determining the accuracy of molecular weight calculations based on narrow standards. The slope of the calibration curve is also important as a flatter slope indicates greater resolving power. The figure below compares the calibration curves obtained from two Jordi Mixed Bed columns 25cm x 10mm versus two similar 30cm x 7.8mm columns, from one of our competitors.



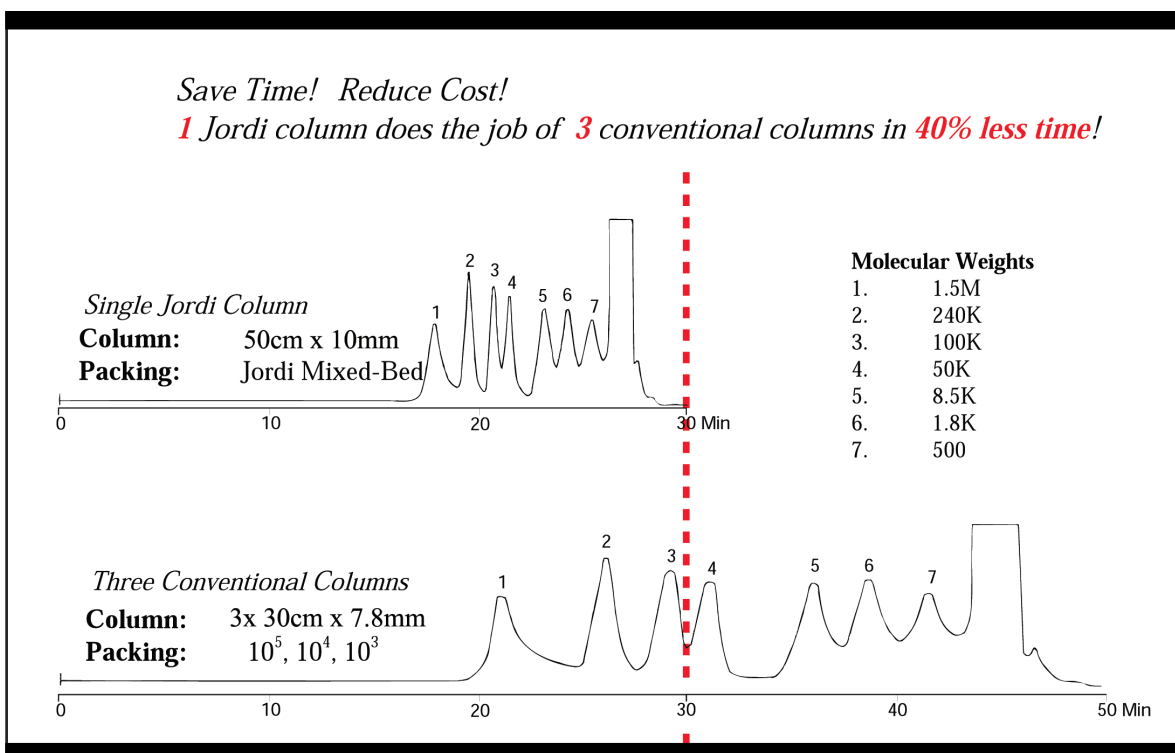
# Columns

## GPC Column Dimensions - Increased Resolving Power

Jordi offers all of our GPC columns with a standard 10mm ID. This means:

- Sample resolution is increased without increased cost.
- You can run larger injection volumes in a preparative mode with less concern about overload.

In GPC, columns with larger total pore volume provide increased resolving power. Column dimensions, therefore, are an important consideration. **Jordi's 10mm ID columns provide the best value currently available.** Jordi GPC packings have higher pore volume than PS-DVB packings for more separating power per column. One 50cm x 10mm Jordi Mixed Bed column replaces three 30cm x 7.8mm PS-DVB columns and separates the same sample in 40% less time. The sample passes through fewer frits reducing shearing, adsorption, and frit clogging. Jordi columns with an average particle size of 5-microns provide very high efficiencies, *i.e.* 60,000+ plates/meter. The figure below shows the separation of a series of narrow standards on one Jordi Mixed Bed DVB 50cm x 10mm column as compared to three competitor Mixed Bed 30cm x 7.8mm columns.



## Fewer Frits

With one Jordi 50cm x 10mm GPC Column, instead of three 30cm x 7.8mm columns, there are fewer frits which means:

- Lower back pressure
- Less chance of column plugging
- Less possibility of degradation by shearing as the polymer passes through the frits
- Less tailing of polar components due to less contact with the high surface area of the frits' steel
- Less adsorption
- Less reaction with solvents requiring salts, acids, or bases
- Reduced reactivity because the high-surface area frit material is Hastaloy C™

## Less Remixing of Sample Components

With one Jordi 50cm x 10mm GPC Column, instead of three 30cm x 7.8mm columns, there is less remixing of sample components as the sample goes through the frit because of:

- Even flow distribution
- No change in and out of small tube diameters in column joining hardware
- Fewer end fittings and less connecting tubing, and hence, less dead volume

## Less Temperature Variation

With a single column there is less variation of temperature since there is less steel to conduct heat. There is much better column bed stability and quicker detector equilibration particularly at elevated column temperatures.

## Economical

Jordi DVB GPC Columns cost less. One Jordi Mixed Bed DVB 50cm x 10mm column costs \$1,795 versus approximately \$3,200 for the 3 columns required from other suppliers. That's a savings of over 40% !



## *Jordi GPC Column Selection*

Selecting the correct Jordi column for your application is easy. Our extensive application database contains hundreds of methods for the analysis of nearly all commercially available polymers and hundreds of other compounds. You can search by sample name through the complete methods database at:

<http://www.jordiflp.com/Applications.php>

Alternatively, our staff chemists are available at any time by phone or email to aid you in selecting the Jordi product which is right for you. Call or write us today to receive your free copy of the Jordi method database on CD or in print.

The following factors should be considered when designing your separation:

1. Mobile Phase (sample-column interaction, solubility of sample)
2. Resolution (separating power)
3. Pore Size (applicable size range of the separation)
4. Column Chemistry (sample-column interaction)

### **Mobile Phase**

The first question to answer when designing a GPC separation is which mobile phase will be used. The most important factor is sample solubility. If the sample is not soluble then no separation can be achieved. The second concern is the ability of the solvent to prevent column-sample interactions. In general, organic solvents do a better job of preventing sample-column interactions than do aqueous mobile phases on most GPC phases. A careful consideration of sample chemistry will often suggest possible solvents. Sample column interactions are reduced by choosing a mobile phase which interacts so strongly with the sample that it disrupts sample-column attraction. Under these conditions, a purely size-based separation will result. The *Jordi application database* or our technical support line are of great help in determining which solvent system to use with your Jordi column. The table below is based on our experience from hundreds of applications and shows the general solvent strength for preventing column sample interactions.

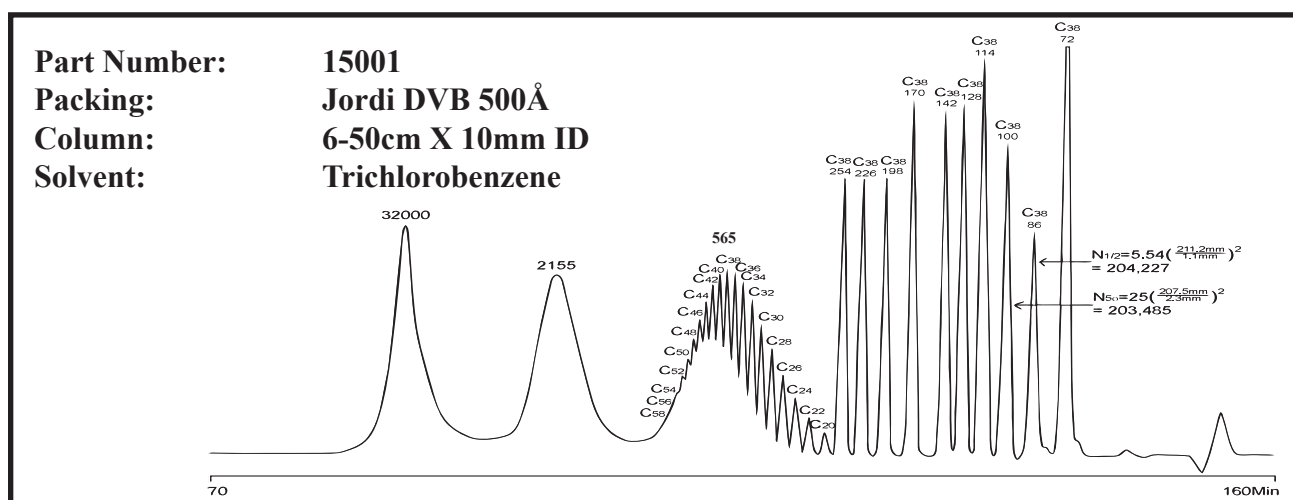
SOLVENT STRENGTH		
Strong	Moderate	Weak
tetrahydrofuran (THF), chloroform, acetic acid, hexafluoroisopropanol (HFIP), dichloromethane (DCM), trichlorobenzene (TCB), n-methylpyrrolidinone (NMP), dimethylformamide (DMF), dimethylacetamide (DMAC)	dimethylsulfoxide (DMSO), methanol, isopropyl alcohol (IPA)	water

# Columns

## Resolution

The second factor to consider when designing your separation is the amount of resolution required. The most commonly used Jordi column configuration consists of two 25cm x 10mm columns or one 50cm x 10mm. Routine polymer molecular weight analysis can be performed very well with a column set of this type. As a general rule, narrow polymeric materials which differ in molecular weight by 100% can be base line separated on a set with this configuration. Small molecules can often be resolved to an even greater extent.

It is sometimes desirable to use larger column sets for applications which are designed to distinguish subtle differences in sample molecular weight or when running unknown materials. An example of this is the determination of the oligomer distribution in wax samples. The figure below shows baseline separation of the oligomers of a polyethylene wax differing by only a single carbon! This was accomplished by running six Jordi 500Å 50cm x 10mm columns in series.



## Pore Sizes Selection

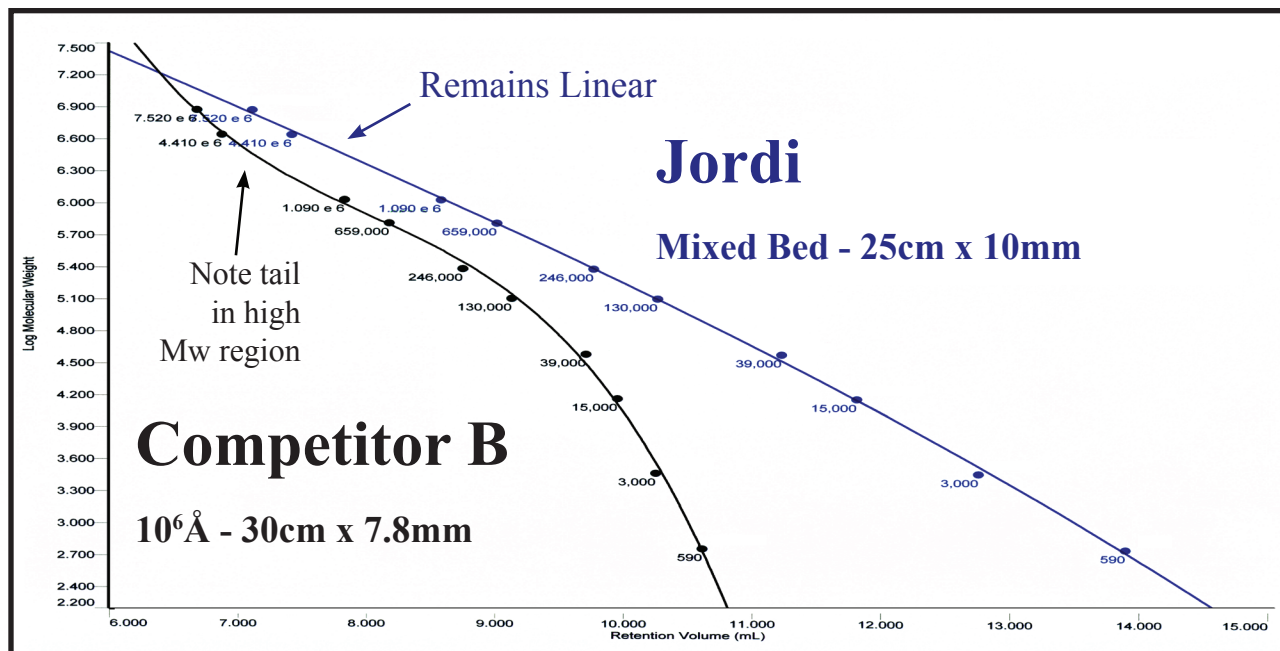
Jordi offers porosities to cover the complete molecular weight range. Packings are available for the separation of ultrahigh molecular weight samples (>20 million) down to 50. See our pore size specifications table for correlations between pore size and molecular weight.

Jordi Mixed Bed Columns separate an extremely broad molecular weight range covering from 10,000,000 - 100 and are strongly recommended for routine sample analysis or when analyzing unknowns.

Competitors offer a 10<sup>6</sup>Å column for ultra-high molecular weight samples but don't actually check the molecular weight limit since standards aren't available or are extremely shear sensitive. Our Mixed Bed and 10<sup>5</sup>Å columns contain pores as large as other suppliers' columns labeled 10<sup>6</sup>Å and we don't sacrifice low end resolution. See the figure on the following page for an example of the excellent high-end resolution on a Jordi Mixed Bed column in comparison to a competitors 10<sup>6</sup>Å column.

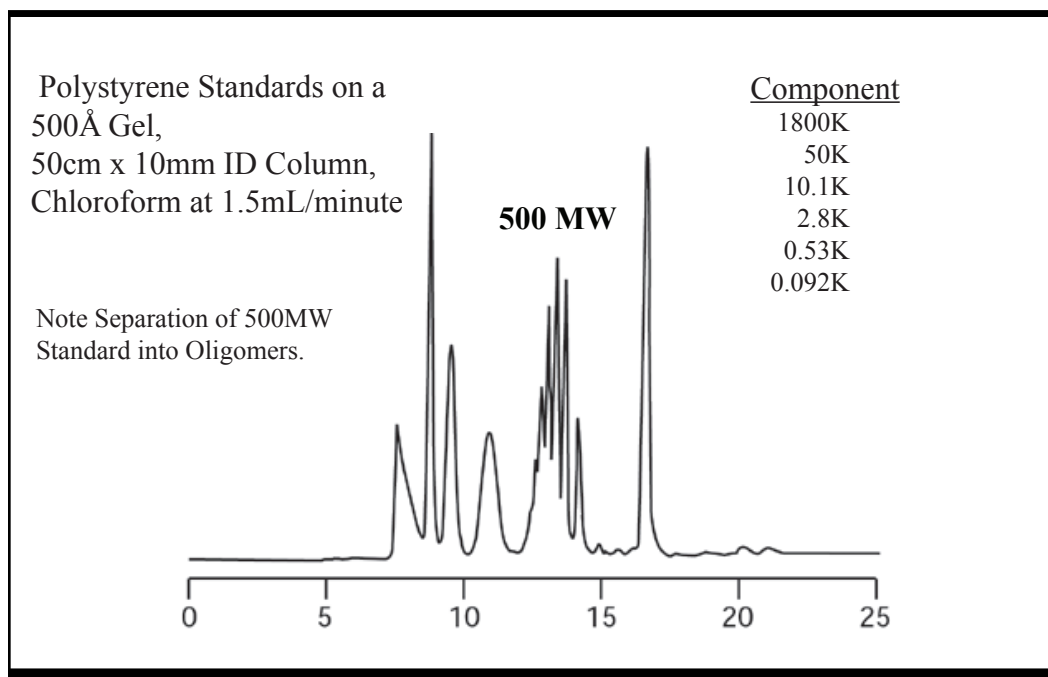
JORDI PORE SIZE SPECIFICATIONS	
Description	MW Range
GPC Solid Bead	2,000-400,000,000
GPC 100Å	<50-5,000
GPC 500Å	<50-10,000
GPC 10 <sup>3</sup> Å	<100-50,000
GPC 10 <sup>4</sup> Å	100-100,000
GPC 10 <sup>5</sup> Å	10,000->10,000,000
GPC Mixed Bed	100->10,000,000

# Columns



Small pore columns include the 100Å and 500Å columns. Jordi recommends 500Å columns for routine oligomer work. Our 500Å column will start to exclude at 20K and has a pore size distribution that allows the oligomers in the 500MW polystyrene standard to be separated into 7 peaks from 728MW down to 92MW! The excellent resolution of Jordi 500Å columns is illustrated in the figure below.

Individual pore size columns including 100Å, 500Å, 10<sup>3</sup>Å, 10<sup>4</sup>Å, 10<sup>5</sup>Å, and solid bead (SB) columns are available for accurate sample matching. These columns are sometimes preferred for the analysis of well-defined samples or when very high resolution is needed in a narrow molecular weight range.



# Columns

PACKING POLARITY		
Hydrophobic	Mid-Polar	Hydrophilic
DVB	Hydroxylated DVB	Sulfonated DVB
Fluorinated DVB	Polar Pack Wax	Glucose DVB

## Guidelines for Selecting Surface Chemistry

Jordi offers the widest selection of surface chemistries to address all of your GPC separation needs. The first goal in any GPC separation is to prevent column-sample interactions. The two crucial parameters to accomplish this are the mobile phase and the chemistry of the stationary phase. **The general rule for GPC separations is that hydrophilic samples are best analyzed on polar phases while hydrophobic polymers should be analyzed on non-polar phases.** Jordi offers the broadest

selection of polymer chemistries available from any single SEC column manufacturer. This provides you with the widest possible range of tools for optimizing your separation. Column chemistry has been poorly explored by other column manufacturers taking away one of the most convenient methods to optimize a size-based separation.

A complete list of approved methods for each Jordi column is available on our website. These methods can be accessed by clicking on the links at the bottom of each column page. All of Jordi's SEC columns can be found at:

<http://www.jordiflp.com/products.php>.

## Jordi GPC – Organic Solvent Columns

Jordi offers three column chemistries for analyses in organic mobile phases:

### Jordi Gel DVB

GPC separations have traditionally been performed using poly(styrene-co-divinylbenzene) (PS-DVB) packings. This media provides a generally non-interacting surface for many organic polymers when analyzed in common organic solvents such as tetrahydrofuran (THF). Jordi packings for GPC are based on 100% divinylbenzene (DVB) providing very similar separation characteristics with the added advantage of improved column life and increased solvent compatibility.

Jordi DVB Columns are our best selling GPC product with literally hundreds of published applications. This superb GPC column is trusted the world over for providing high resolution, excellent plate counts, and industry-leading durability. Product reproducibility has been established with over twenty years of continuous sales. These factors combine to make Jordi DVB columns one of the very best GPC columns on the market.

JORDI GPC COLUMNS
<i>Organic Phases</i>
Jordi Gel DVB
Hydroxylated DVB
Fluorinated DVB
<i>Aqueous Phases</i>
Glucose DVB
Sulfonated DVB
Polar Pack Wax DVB

## Fluorinated DVB

Jordi Fluorinated gels represent one of the most exciting breakthroughs in GPC technology. This patent-pending technology provides a non-stick surface chemistry for significantly reduced sample-column interactions for a variety of polar polymers. Example applications include the analysis of phenolic resins, polyacrylamides, and novel drug delivery polymers in polar solvents such as hexafluoroisopropanol (HFIP). This gel has also been applied when sample column interaction prevents the use of PS-DVB columns in convenient mobile phases such as THF. Column back pressure is greatly reduced on Jordi Fluorinated columns allowing high flow rates for decreased analysis time. This unique property can also be applied for the preparation of ultra-high resolution GPC column sets containing over 250,000 plates or at high flow rates for rapid GPC analysis.

## Hydroxylated DVB

Jordi Hydroxylated and Glucose columns bridge the gap between aqueous and organic SEC columns. Hydroxylated DVB columns have been applied for the analysis of hydroxypropylmethylcellulose (HPMC) and its derivatives. Jordi Glucose columns are more polar and are typically used in water/polar organic mixtures. Both columns are compatible with 100% organic mobile phases. Jordi Glucose columns can also be applied in 100% aqueous solution but are more commonly used in polar organic solvents such as dimethylsulfoxide (DMSO), dimethylacetamide (DMAC), dimethylformamide (DMF). Some organic is required to obtain pure size-based separations on either of these phases. Typical applications for these packings include the analysis of polysaccharides and other polar polymers.

## Jordi GPC – Aqueous Solvent Columns

Jordi offers three column chemistries for analyses in aqueous mobile phases. Aqueous applications represent some of the most challenging size-based separations. This is a result of the difficulty in preventing sample-column interactions. Jordi Glucose DVB allows the separation of a wide range of samples in mixed aqueous/organic mobile phases. Negatively and positively charged samples can be separated using charge-charge repulsion on Jordi Sulfonated and Polar Pack WAX columns without the need for high salt concentrations.

## Glucose DVB

Jordi Glucose DVB columns have been used for a wide range of neutral polar synthetic polymers and polysaccharides in mixed mobile phases such as DMSO/H<sub>2</sub>O 20/80. The incredible inertness of these packings has allowed their application in strongly basic mobile phases such as 1M NaOH and they can tolerate transitions from 100% aqueous to 100% organic mobile phases. Typical applications include separations of polysaccharides, polyvinylpyrrolidone (PVP), and other water soluble polymers. They can also be applied for the analysis of charge polymers in salt solutions.

## **Sulfonated and Polar Pack DVB**

Jordi Sulfonated and Polar Pack DVB columns are for the analysis of charged polymers without the need for high salt concentrations. Sulfonated columns have a negatively charged surface allowing the separation of negatively charged polymers such as poly(styrene sulfonate). Typical mobile phases include aqueous/organic mixtures such as water/methanol. Jordi Polar Pack WAX columns have a tertiary amine group which is converted to the positively charged quaternary amine in weakly acidic mobile phases. This allows the separations of amine polymers such poly(ethyleneimine) or other positively charged samples in mobile phases such as water/acetic acid mixtures. These columns are an excellent choice for light scattering analyses in which high salt concentrations are a hindrance to system performance.



## Jordi Gel DVB Columns

Our most popular GPC column, Jordi Gel DVB columns are prepared from 100% divinylbenzene as compared to the more common polystyrene divinylbenzene copolymer used by other manufacturers. This unique chemistry imparts greater strength and rigidity to the gels due to their highly crosslinked structure.

Jordi DVB columns have undergone over 25 years of refinement and represent one of the very best GPC columns on the market today. They are unique in their ability to be used in virtually any solvent. Jordi DVB columns have highly linear calibration curves and are available in a wide range of porosities. Routine or difficult solvents alike, Jordi DVB columns represent the pinnacle of GPC column excellence.

### Advantages of Jordi DVB columns:

**Rugged** - high temperature stable (150°C), nearly all organic solvents

**Linear Calibrations** - maximize precision of molecular weight calculations

**Range of Porosities** - 100Å to 10<sup>5</sup>Å & Mixed Bed & SB

**Solvents** - can be changed without damaging the column

**Wide pH Range** - mobile phase & pH values from 0 to 14

**Efficient** - High plate counts for sharp, symmetrical peaks

**Powerful** - High pore-volume for greater resolution

**Long column life** - 3 month warranty standard

**Quality** - DVB columns have been in continuous production for over 25 years and are subjected to rigorous quality checks

### Jordi Gel DVB Applications and Solvents

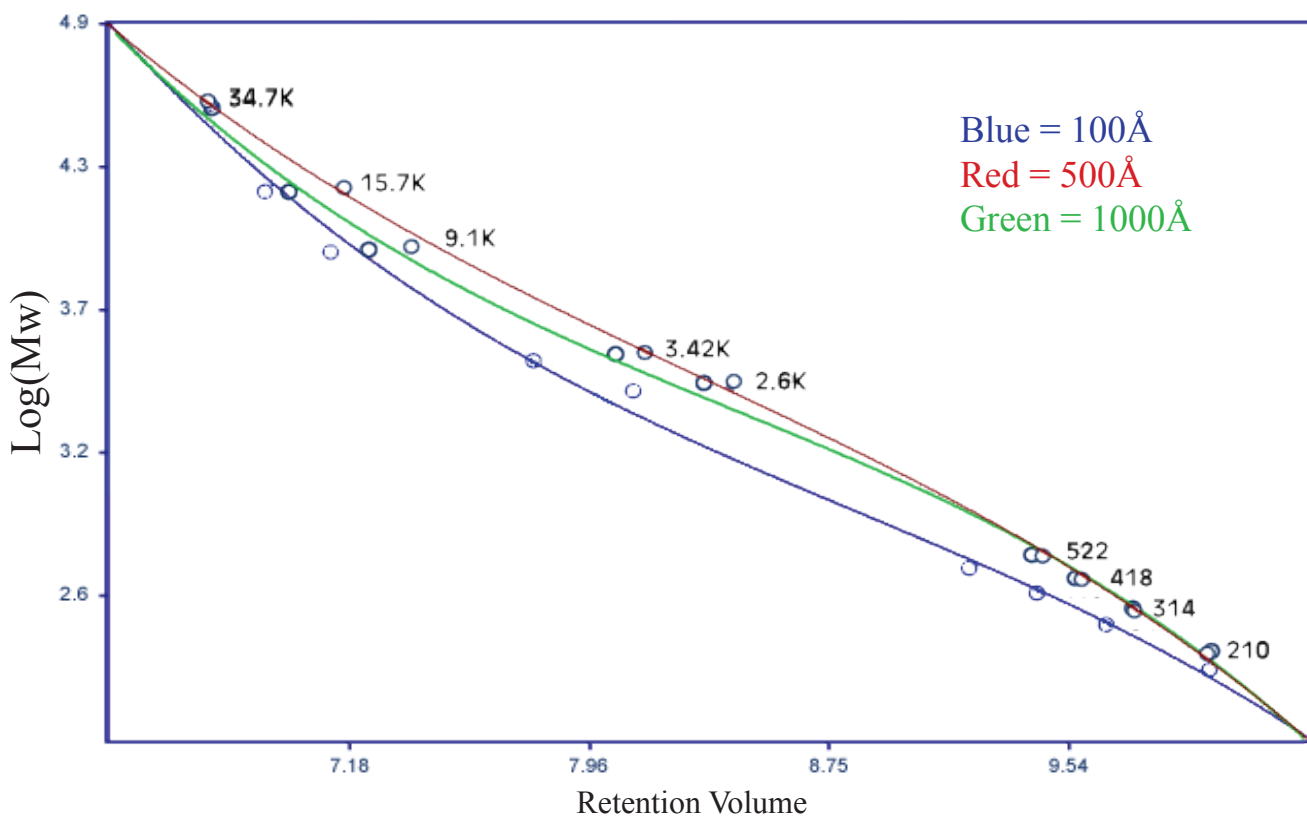
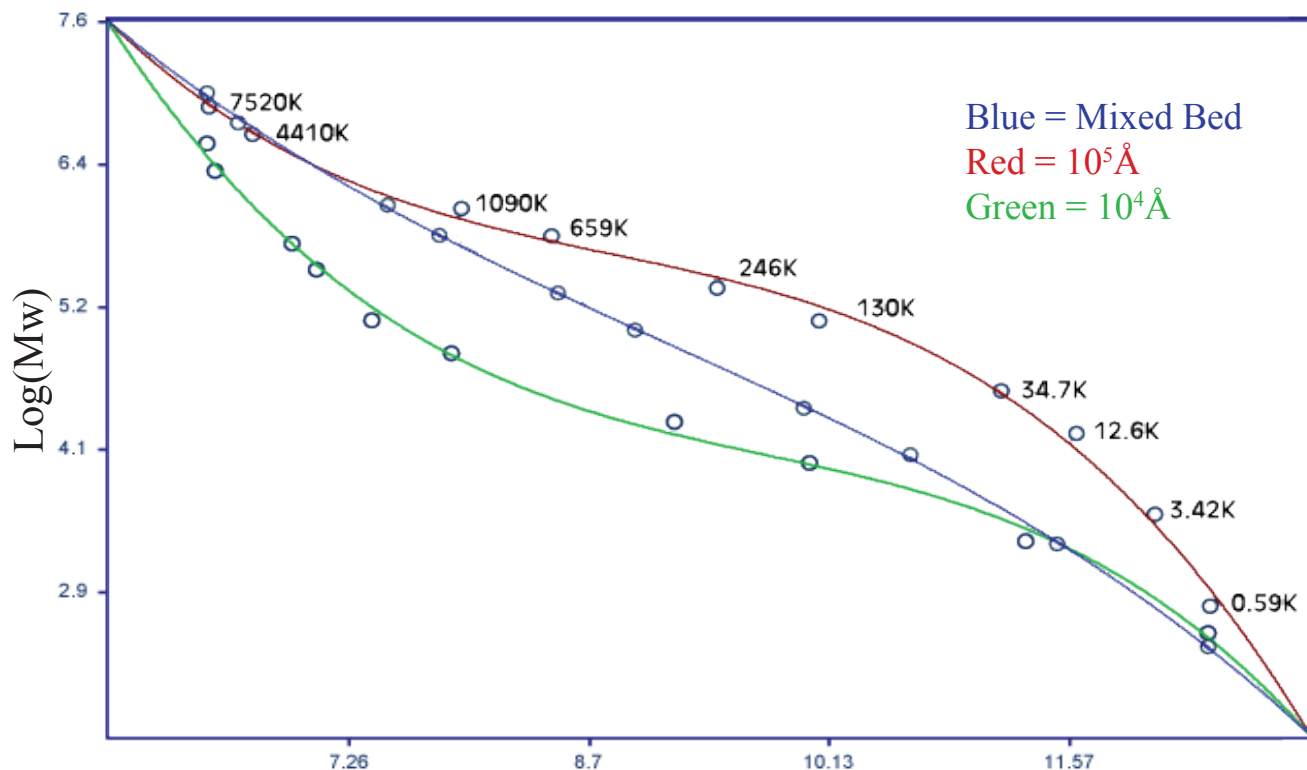
#### *Typical Applications:*

Poly(ethylene Terephthalate)	Nylons
Poly(vinylidene Fluoride)	Polycarbonate
Polybutadiene	Polystyrene
Poly(lactide)	Polyethylene
Polypropylene	Polycarbonate

#### *Typical Solvent Systems:*

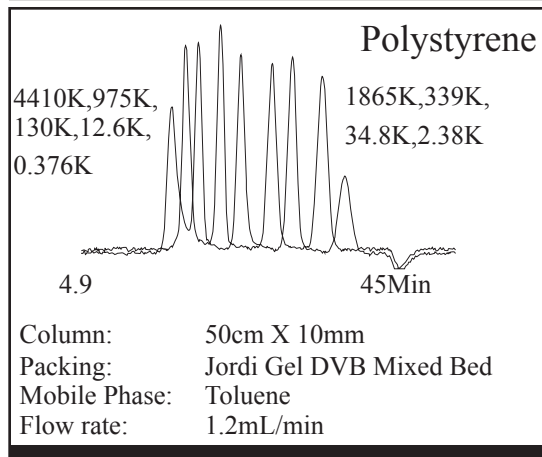
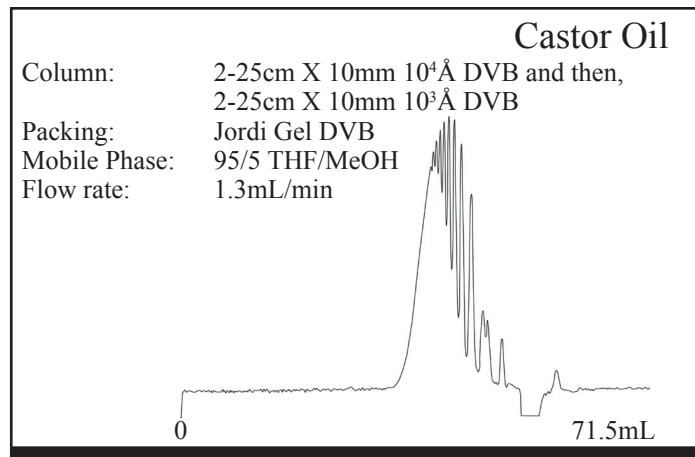
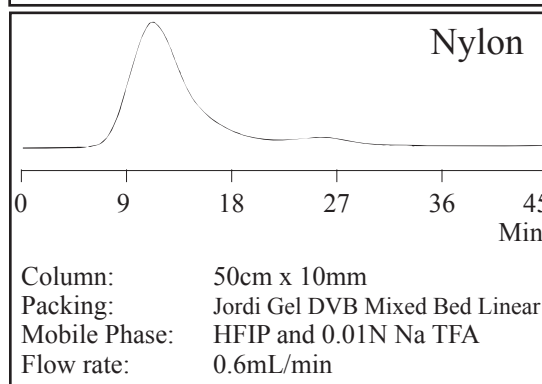
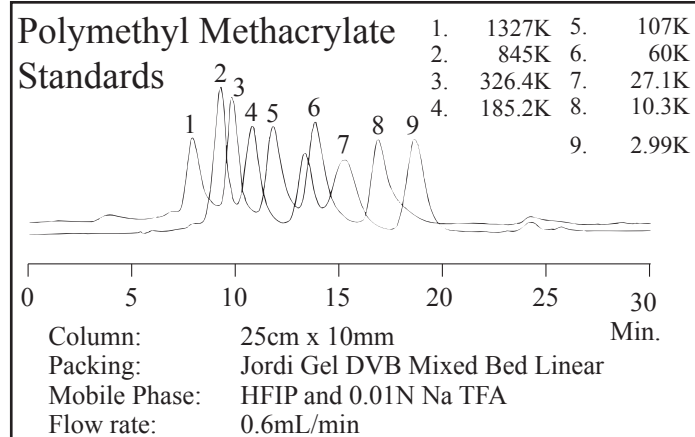
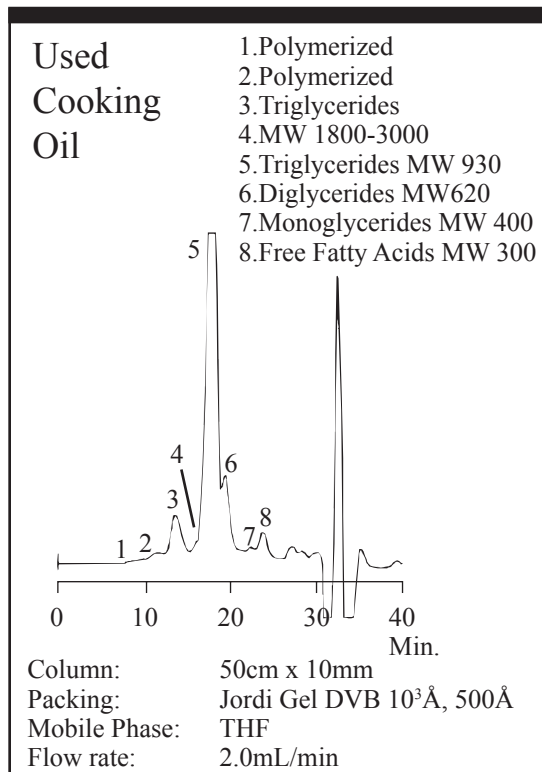
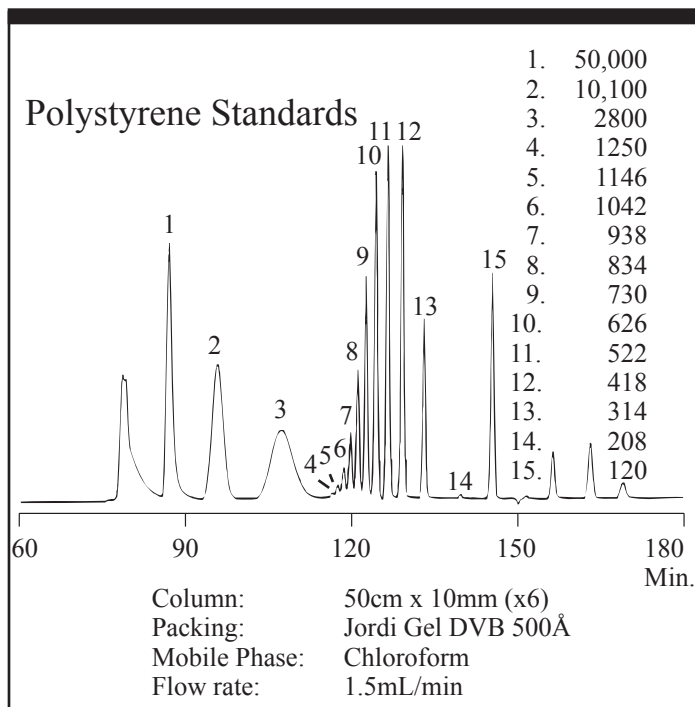
Tetrahydrofuran (THF)	Trichlorobenzene (TCB)
N-methylpyrrolidone (NMP)	Dimethylacetamide (DMAC)
Hexafluoroisopropanol (HFIP)	Chloroform
Dimethylformamide (DMF)	Toluene

## Jordi Gel DVB Calibration Curves





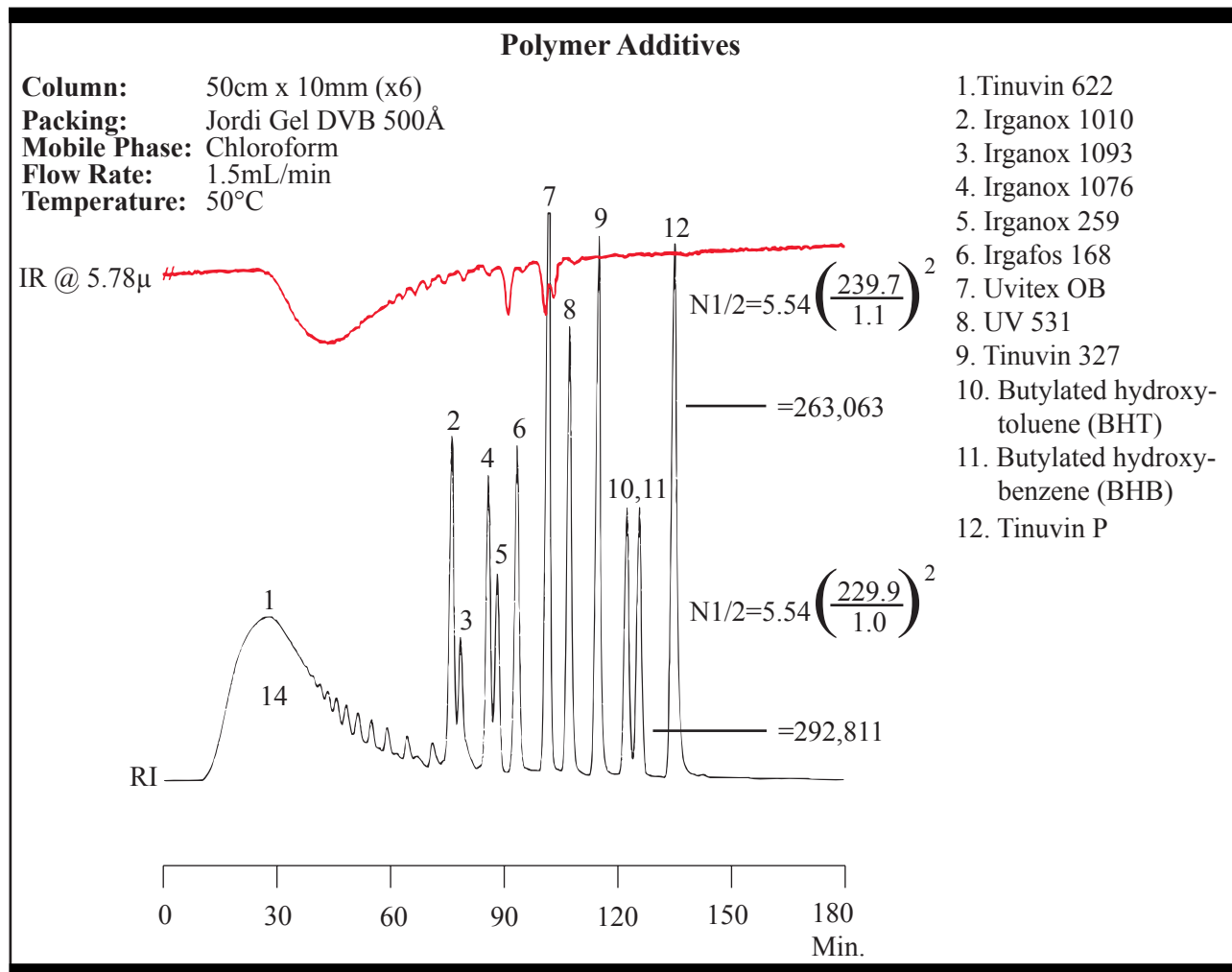
## Select Jordi Gel DVB Applications



## Select Jordi Gel DVB Applications

### Ultrahigh Resolution GPC Method for Additives Analysis

Jordi FLP has now developed GPC/SEC columns capable of resolving and quantitating up to several dozen additives simultaneously. The figure below demonstrates this ability. Standards 10 and 11 differ by only one methyl group and are baseline separated while the column set simultaneously separates Tinuvin 622 with a MW of several thousand.



<b>Jordi Gel DVB Columns — Organic Solvent</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15070	100Å	5μ	30cm	7.8mm
15020	100Å	5μ	25cm	10mm
15000	100Å	5μ	50cm	10mm
15071	500Å	5μ	30cm	7.8mm
15021	500Å	5μ	25cm	10mm
15001	500Å	5μ	50cm	10mm
15072	10 <sup>3</sup> Å	5μ	30cm	7.8mm
15022	10 <sup>3</sup> Å	5μ	25cm	10mm
15002	10 <sup>3</sup> Å	5μ	50cm	10mm
15073	10 <sup>4</sup> Å	5μ	30cm	7.8mm
15023	10 <sup>4</sup> Å	5μ	25cm	10mm
15003	10 <sup>4</sup> Å	5μ	50cm	10mm
15074	10 <sup>5</sup> Å	5μ	30cm	7.8mm
15024	10 <sup>5</sup> Å	5μ	25cm	10mm
15004	10 <sup>5</sup> Å	5μ	50cm	10mm
15075	Mixed Bed	5μ	30cm	7.8mm
15025	Mixed Bed	5μ	25cm	10mm
15005	Mixed Bed	5μ	50cm	10mm
15076	Solid Bead	5μ	30cm	7.8mm
15026	Solid Bead	5μ	25cm	10mm
15006	Solid Bead	5μ	50cm	10mm
	<b><i>Light Scattering</i></b>			
15077	Mixed Bed	5μ	30cm	7.8mm
15027	Mixed Bed	5μ	25cm	10mm
15007	Mixed Bed	5μ	50cm	10mm

<b>Jordi Gel DVB Organic - Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15307	100Å	5μ	15cm	4.6mm
15306	100Å	5μ	25cm	4.6mm
15309	500Å	5μ	15cm	4.6mm
15308	500Å	5μ	25cm	4.6mm
15311	10 <sup>3</sup> Å	5μ	15cm	4.6mm
15310	10 <sup>3</sup> Å	5μ	25cm	4.6mm
15313	10 <sup>4</sup> Å	5μ	15cm	4.6mm
15312	10 <sup>4</sup> Å	5μ	25cm	4.6mm
15315	10 <sup>5</sup> Å	5μ	15cm	4.6mm
15314	10 <sup>5</sup> Å	5μ	25cm	4.6mm
15317	Mixed Bed	5μ	15cm	4.6mm
15316	Mixed Bed	5μ	25cm	4.6mm
15319	Solid Bead	5μ	15cm	4.6mm
15318	Solid Bead	5μ	25cm	4.6mm

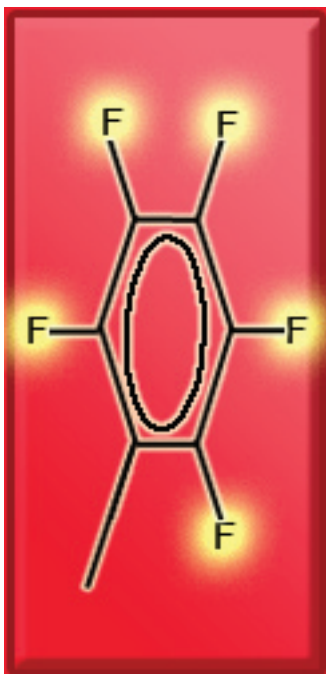
<b>Jordi Gel DVB Organic Solvent - Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15120	100Å	5μ	25cm	22mm
15100	100Å	5μ	50cm	22mm
15121	500Å	5μ	25cm	22mm
15101	500Å	5μ	50cm	22mm
15122	10 <sup>3</sup> Å	5μ	25cm	22mm
15102	10 <sup>3</sup> Å	5μ	50cm	22mm
15123	10 <sup>4</sup> Å	5μ	25cm	22mm
15103	10 <sup>4</sup> Å	5μ	50cm	22mm
15124	10 <sup>5</sup> Å	5μ	25cm	22mm
15104	10 <sup>5</sup> Å	5μ	50cm	22mm
15125	Mixed Bed	5μ	25cm	22mm
15105	Mixed Bed	5μ	50cm	22mm
15126	Solid Bead	5μ	25cm	22mm
15127	Solid Bead	5μ	50cm	22mm

<b>Jordi Gel DVB Organic Solvent - Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15320	100Å	10μ	25cm	50mm
15300	100Å	10μ	50cm	50mm
15321	500Å	10μ	25cm	50mm
15301	500Å	10μ	50cm	50mm
15322	10 <sup>3</sup> Å	10μ	25cm	50mm
15302	10 <sup>3</sup> Å	10μ	50cm	50mm
15323	10 <sup>4</sup> Å	10μ	25cm	50mm
15303	10 <sup>4</sup> Å	10μ	50cm	50mm
15324	10 <sup>5</sup> Å	10μ	25cm	50mm
15304	10 <sup>5</sup> Å	10μ	50cm	50mm
15325	Mixed Bed	10μ	25cm	50mm
15305	Mixed Bed	10μ	50cm	50mm
15326	Solid Bead	10μ	25cm	50mm
15327	Solid Bead	10μ	50cm	50mm

# Fluorinated DVB Columns

## Jordi *Fl.A.S.H.* Fluorinated DVB Columns

Jordi non-stick Fluorinated GPC columns provide reduced sample-column interactions as compared to PS-DVB or 100% DVB columns. This allows the analysis of many polymers which have previously been impossible to analyze in convenient GPC solvents. The broad solvent compatibility of our Fluorinated columns allows the analysis of many sample types.



This one of a kind, patent pending technology also greatly reduces column back pressure, allowing its application at high speeds, while maintaining high resolution. The secret is the reduced resistance to mass transfer for the fluorinated surface. It is no longer necessary to sacrifice the quality of your molecular weight data to obtain short analysis times. Fluorinated columns run at normal flow rates save wear and tear on pump seals, extending pump lifetimes.

The reduced back pressure for Jordi Fluorinated columns can be applied for ultra-high resolution applications by using up to 6 - 50cm x 10mm columns in series. This provides up to a quarter million plates of separating power!

### Advantages of Jordi Fluorinated GPC columns:

- **Non-stick surface** - for reduced sample-column interaction
- **Reduced back pressure** - due to low column solvent interaction
- **Solvent Saver** - no increase in solvent consumption per analysis
- **High Speed** - GPC analysis in seven minutes or less
- **Linear Calibrations** - maximize precision of MW calculations
- **Wide range of porosities** - 100Å to 10<sup>5</sup>Å, Mixed Bed & SB
- **Rugged** - long column life - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

### Fluorinated DVB Applications and Solvents

#### *Typical Applications:*

Phenolics  
Poly(propylacrylamide) (PAM)  
Polybutadiene  
Polycarbonate  
Phenolic Resins  
Poly(glycolic acid) (PGA)

#### *Typical Solvent Systems:*

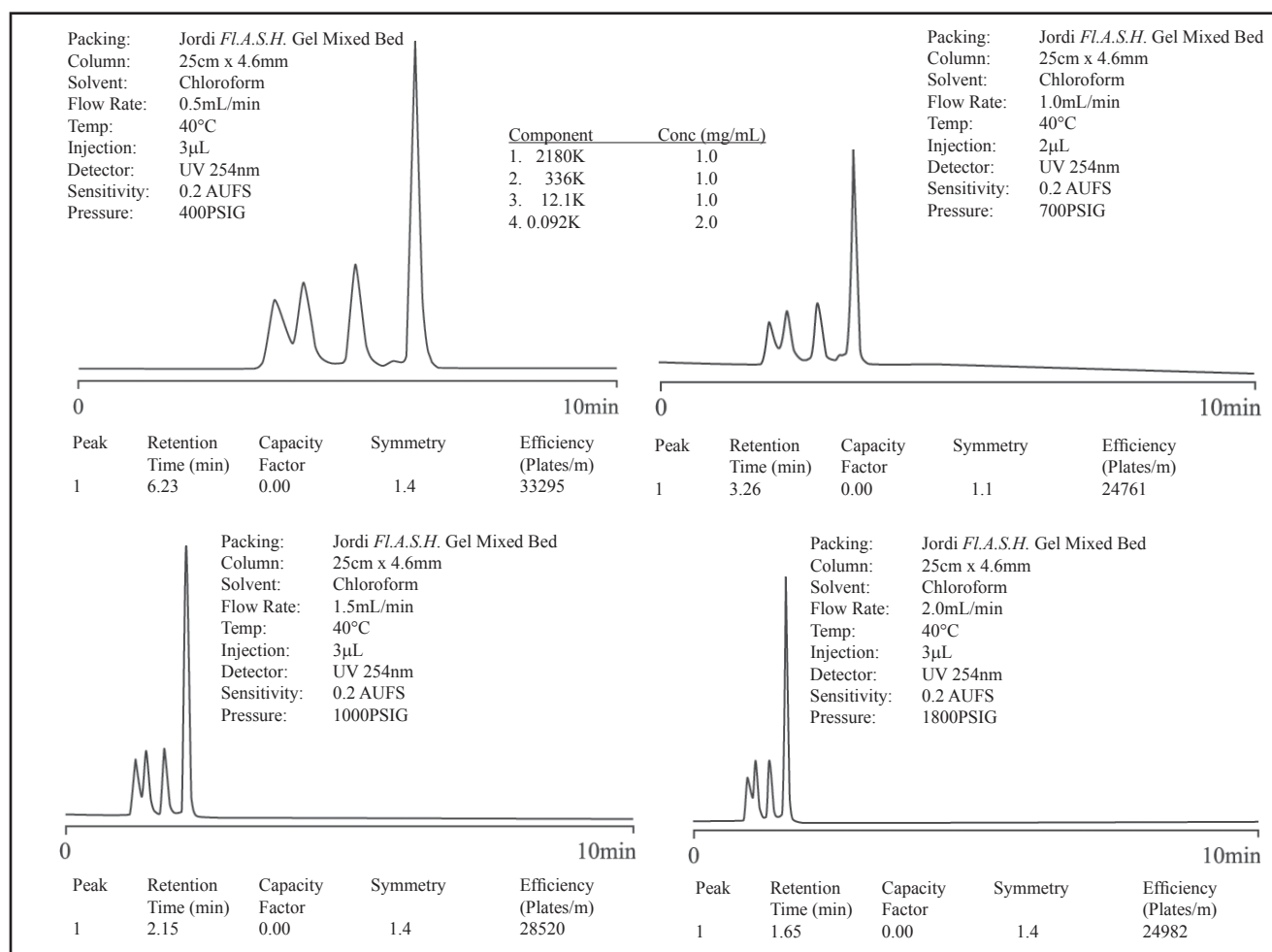
Tetrahydrofuran (THF)  
Chloroform  
Trichlorobenzene  
Hexane  
Hexafluoroisopropanol (HFIP)

# Fluorinated DVB Columns

## Select Jordi Fluorinated DVB Applications

### LIGHTNING FAST ANALYSIS USING A JORDI FLUORINATED DVB COLUMN

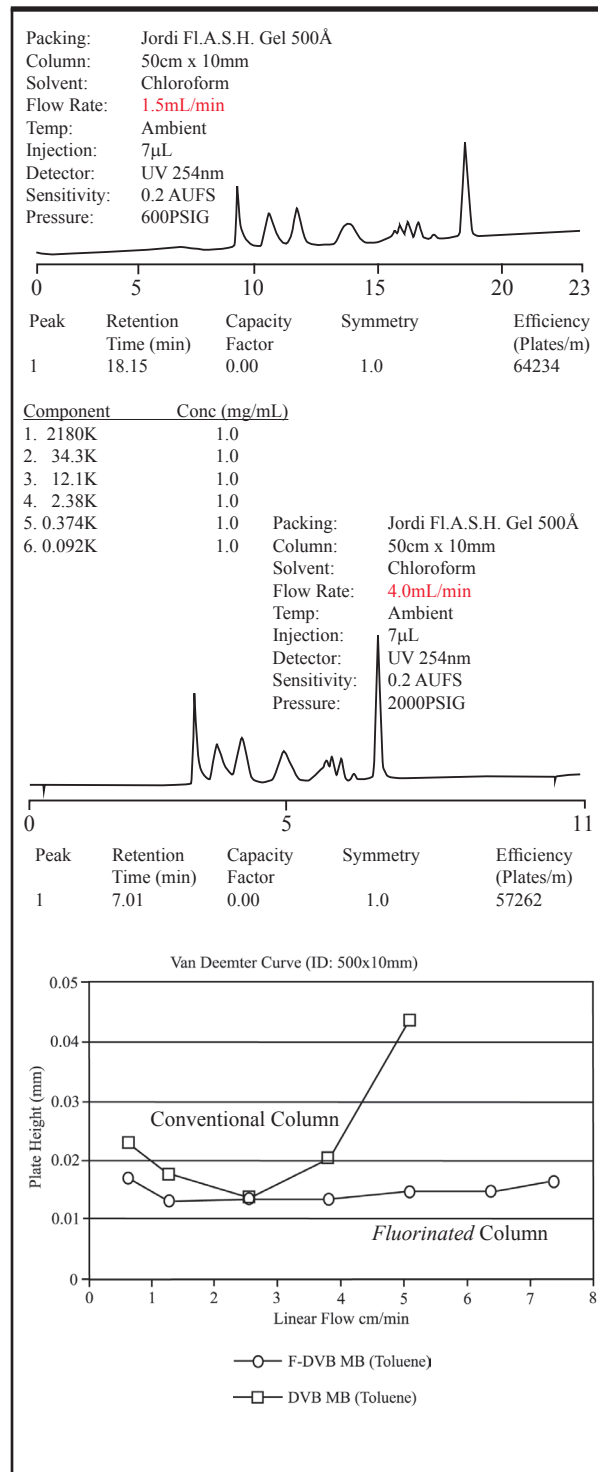
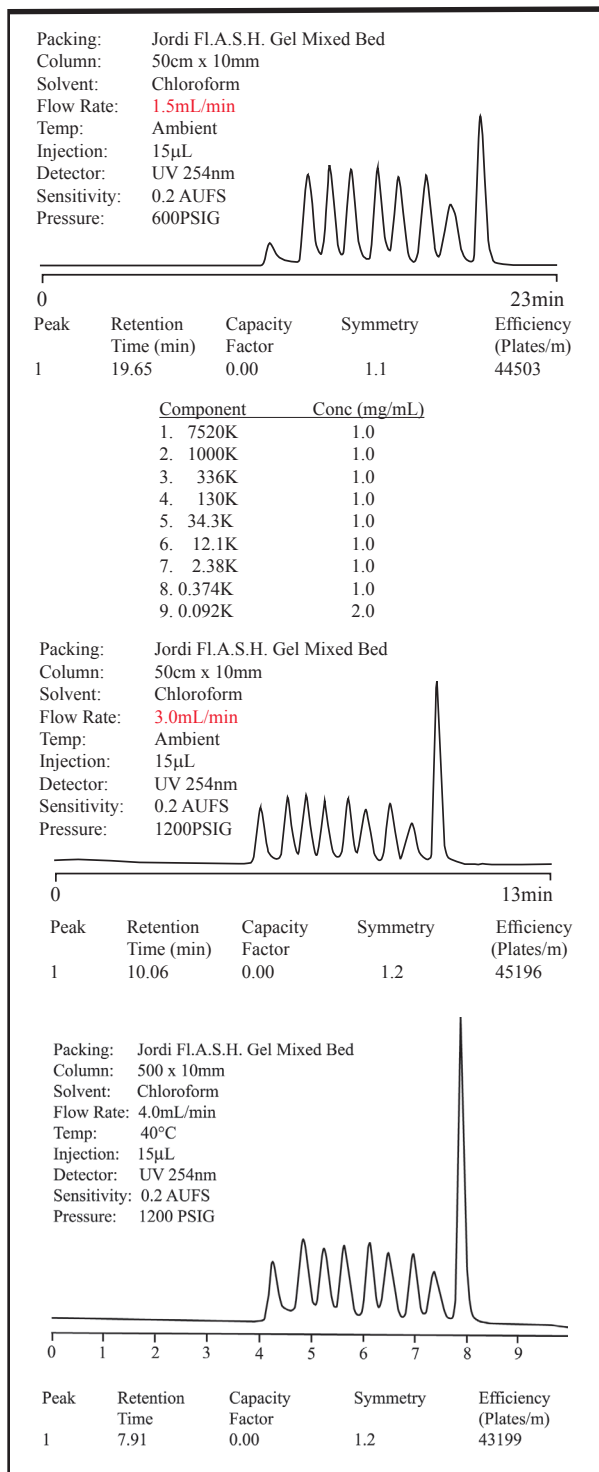
Decrease analysis time with new Jordi Fluorinated columns. This patent pending separations media is created using a fluorinated version of our reliable 100% DVB packings. The result is a large decrease in column back pressure enabling the use of high flow rates for rapid analysis without a significant loss of resolution. The secret is the large reduction in the interaction between the stationary phase and the mobile phase. A typical GPC run can take 20-40 minutes but with Jordi Fluorinated columns this analysis can be performed without significant loss of resolution in as little as 7 minutes! Columns of identical dimensions packed with our Fluorinated gel display a factor of four reduction in back pressure allowing their application at flow rates four times faster than standard GPC columns. Experience the difference for yourself.



# Fluorinated DVB Columns

## Fluorinated GPC Column

Our latest innovation in GPC column packings. Fluorinated DVB media allows a decrease in analysis time from 30 minutes to 7 minutes using a 50cm column without sacrificing significant resolution. Operational pressures are reduced by a factor of four or more!



# Fluorinated DVB Columns

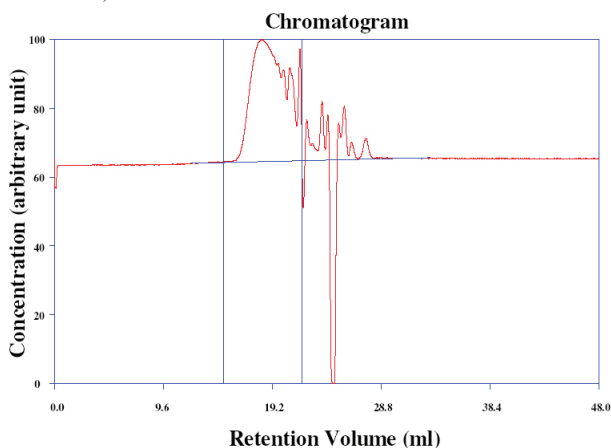
## Select Jordi Fluorinated DVB Applications

### REDUCED ADSORPTION OF PHENOLIC RESINS ON FLUORINATED DVB

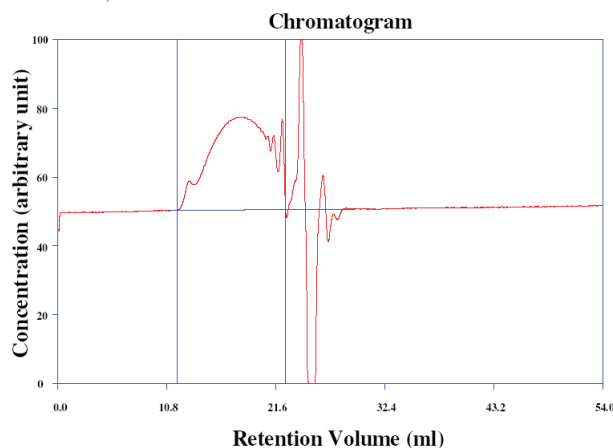
**Part Number:** 15001  
**Packing:** Jordi DVB 500Å  
**Column:** 50cm X 10mm ID  
**Solvent:** 95/5 THF/MeOH  
**Flow Rate:** 1.2mL/min.  
**Concentration:** 2.5mg/mL  
**Injection:** 200µL  
**Det. Temperature:** 35°C  
**Detector:** Waters 410 RI, 8X, SF 20

**Part Number:** 90002  
**Packing:** Jordi *FL.A.S.H.* 10<sup>3</sup>Å  
**Column:** 50cm X 10mm ID  
**Solvent:** 95/5 THF/MeOH  
**Flow Rate:** 1.2mL/min.  
**Concentration:** 2.5mg/mL  
**Injection:** 200µL  
**Det. Temperature:** 35°C  
**Detector:** Waters 410 RI, 8X, SF 20

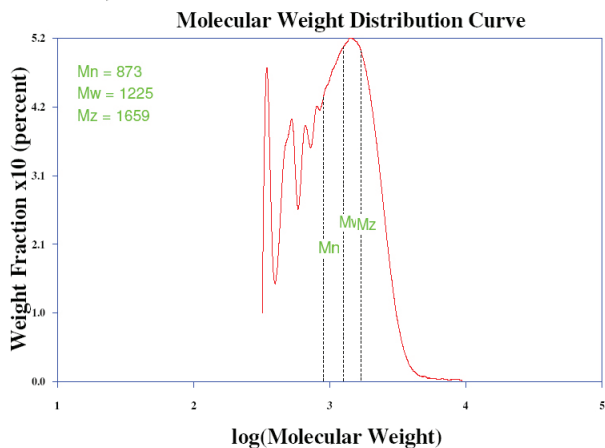
1A.DAT,



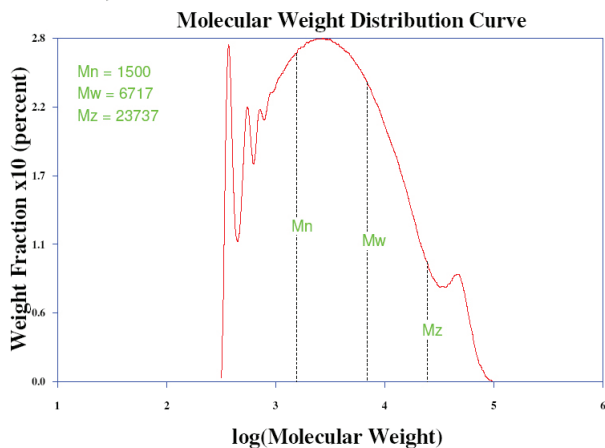
1A.DAT,



1A.DAT,



1A.DAT,





# Fluorinated DVB Columns

<b>Jordi Gel DVB Fluorinated Columns — Organic Solvent</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90060	100Å	5μ	30cm	7.8mm
90010	100Å	5μ	25cm	10mm
90000	100Å	5μ	50cm	10mm
90061	500Å	5μ	30cm	7.8mm
90011	500Å	5μ	25cm	10mm
90001	500Å	5μ	50cm	10mm
90062	10 <sup>3</sup> Å	5μ	30cm	7.8mm
90012	10 <sup>3</sup> Å	5μ	25cm	10mm
90002	10 <sup>3</sup> Å	5μ	50cm	10mm
90063	10 <sup>4</sup> Å	5μ	30cm	7.8mm
90013	10 <sup>4</sup> Å	5μ	25cm	10mm
90003	10 <sup>4</sup> Å	5μ	50cm	10mm
90064	10 <sup>5</sup> Å	5μ	30cm	7.8mm
90014	10 <sup>5</sup> Å	5μ	25cm	10mm
90004	10 <sup>5</sup> Å	5μ	50cm	10mm
90065	Mixed Bed	5μ	30cm	7.8mm
90015	Mixed Bed	5μ	25cm	10mm
90005	Mixed Bed	5μ	50cm	10mm
90066	Solid Bead	5μ	30cm	7.8mm
90016	Solid Bead	5μ	25cm	10mm
90006	Solid Bead	5μ	50cm	10mm
<b><i>Light Scattering</i></b>				
90067	Mixed Bed	5μ	30cm	7.8mm
90017	Mixed Bed	5μ	25cm	10mm
90007	Mixed Bed	5μ	50cm	10mm

<b>Jordi Gel DVB Fluorinated Columns — Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90070	100Å	5μ	15cm	4.6mm
90080	100Å	5μ	25cm	4.6mm
90071	500Å	5μ	15cm	4.6mm
90081	500Å	5μ	25cm	4.6mm
90072	10 <sup>3</sup> Å	5μ	15cm	4.6mm
90082	10 <sup>3</sup> Å	5μ	25cm	4.6mm
90073	10 <sup>4</sup> Å	5μ	15cm	4.6mm
90083	10 <sup>4</sup> Å	5μ	25cm	4.6mm
90074	10 <sup>5</sup> Å	5μ	15cm	4.6mm
90084	10 <sup>5</sup> Å	5μ	25cm	4.6mm
90075	Mixed Bed	5μ	15cm	4.6mm
90085	Mixed Bed	5μ	25cm	4.6mm
90076	Solid Bead	5μ	15cm	4.6mm
90086	Solid Bead	5μ	25cm	4.6mm

# Fluorinated DVB Columns

<b>Jordi Gel DVB Fluorinated Columns — 1" OD — Organic Solvent</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90020	100Å	5μ	25cm	22mm
90030	100Å	5μ	50cm	22mm
90021	500Å	5μ	25cm	22mm
90031	500Å	5μ	50cm	22mm
90022	10 <sup>3</sup> Å	5μ	25cm	22mm
90032	10 <sup>3</sup> Å	5μ	50cm	22mm
90023	10 <sup>4</sup> Å	5μ	25cm	22mm
90033	10 <sup>4</sup> Å	5μ	50cm	22mm
90024	10 <sup>5</sup> Å	5μ	25cm	22mm
90034	10 <sup>5</sup> Å	5μ	50cm	22mm
90025	Mixed Bed	5μ	25cm	22mm
90035	Mixed Bed	5μ	50cm	22mm
90026	Solid Bead	5μ	25cm	22mm
90036	Solid Bead	5μ	50cm	22mm

<b>Jordi DVB Fluorinated Prep Columns — 2" OD — Organic Solvent</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90040	100Å	10μ	25cm	50mm
90050	100Å	10μ	50cm	50mm
90041	500Å	10μ	25cm	50mm
90051	500Å	10μ	50cm	50mm
90042	10 <sup>3</sup> Å	10μ	25cm	50mm
90052	10 <sup>3</sup> Å	10μ	50cm	50mm
90043	10 <sup>4</sup> Å	10μ	25cm	50mm
90053	10 <sup>4</sup> Å	10μ	50cm	50mm
90044	10 <sup>5</sup> Å	10μ	25cm	50mm
90054	10 <sup>5</sup> Å	10μ	50cm	50mm
90045	Mixed Bed	10μ	25cm	50mm
90055	Mixed Bed	10μ	50cm	50mm
90046	Solid Bead	10μ	25cm	50mm
90056	Solid Bead	10μ	50cm	50mm

# Hydroxylated DVB Columns

## Jordi Hydroxylated DVB Columns

Hydroxylated DVB columns provide increased hydrophilicity as compared to 100% divinylbenzene or polystyrene divinylbenzene columns. This has the advantage of preventing column voiding in highly aqueous mobile phases. Column-sample interactions are also eliminated for samples which interact strongly with residual double bonds present in pure DVB gels.



Jordi hydroxylated Gel contains a diol surface chemistry. This tends to improve peak shapes for polar polymers and allows for the use of increased percentages of water. Unlike Polystyrene-DVB columns, Jordi hydroxylated columns have no known solvent limitations.

### Advantages of Hydroxylated DVB columns:

- **Rugged** - applicable in both aqueous and organic solvents
- **Solvents** - can be changed without damaging the column
- **Wide pH Range** - pH values from 0 to 14
- **Efficient** - High plate counts for sharp, symmetrical peaks
- **Powerful** - High pore-volume for greater resolution
- **Long column life** - 100% DVB increases life
- **Wide range of porosities** - 100Å to 10<sup>5</sup>Å, Mixed Beds & SB
- **Quality** - subjected to rigorous quality checks

### Jordi Gel Hydroxylated DVB Applications and Solvents

#### *Typical Applications:*

Hydroxypropylmethylcellulose (HPMC)

#### *Typical Solvent Systems:*

Tetrahydrofuran (THF)/Acetic Acid 90/10

*Jordi FLP supplies a full line of porosities for all our GPC products. We recommend using our 500Å columns for small molecules. Our Mixed Bed Linear Columns are the most versatile choice for polymers.*

# Hydroxylated DVB Columns

<b>Jordi Gel DVB Hydroxylated Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
20010	100Å	5μ	30cm	7.8mm
20000	100Å	5μ	25cm	10mm
19000	100Å	5μ	50cm	10mm
20011	500Å	5μ	30cm	7.8mm
20001	500Å	5μ	25cm	10mm
19001	500Å	5μ	50cm	10mm
20012	10 <sup>3</sup> Å	5μ	30cm	7.8mm
20002	10 <sup>3</sup> Å	5μ	25cm	10mm
19002	10 <sup>3</sup> Å	5μ	50cm	10mm
20013	10 <sup>4</sup> Å	5μ	30cm	7.8mm
20003	10 <sup>4</sup> Å	5μ	25cm	10mm
19003	10 <sup>4</sup> Å	5μ	50cm	10mm
20014	10 <sup>5</sup> Å	5μ	30cm	7.8mm
20004	10 <sup>5</sup> Å	5μ	25cm	10mm
19004	10 <sup>5</sup> Å	5μ	50cm	10mm
20015	Mixed Bed	5μ	30cm	7.8mm
20005	Mixed Bed	5μ	25cm	10mm
19005	Mixed Bed	5μ	50cm	10mm
20016	Solid Bead	5μ	30cm	7.8mm
20006	Solid Bead	5μ	25cm	10mm
19006	Solid Bead	5μ	50cm	10mm
<i>Light Scattering</i>				
20017	Mixed Bed	5μ	30cm	7.8mm
20007	Mixed Bed	5μ	25cm	10mm
19007	Mixed Bed	5μ	50cm	10mm

<b>Jordi Gel DVB Hydroxylated - Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
20261	100Å	5μ	15cm	4.6mm
20260	100Å	5μ	25cm	4.6mm
20263	500Å	5μ	15cm	4.6mm
20262	500Å	5μ	25cm	4.6mm
20265	10 <sup>3</sup> Å	5μ	15cm	4.6mm
20264	10 <sup>3</sup> Å	5μ	25cm	4.6mm
20267	10 <sup>4</sup> Å	5μ	15cm	4.6mm
20266	10 <sup>4</sup> Å	5μ	25cm	4.6mm
20269	10 <sup>5</sup> Å	5μ	15cm	4.6mm
20268	10 <sup>5</sup> Å	5μ	25cm	4.6mm
20271	Mixed Bed	5μ	15cm	4.6mm
20270	Mixed Bed	5μ	25cm	4.6mm
20273	Solid Bead	5μ	15cm	4.6mm
20272	Solid Bead	5μ	25cm	4.6mm

# Hydroxylated DVB Columns

<b>Jordi Gel DVB Hydroxylated - Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
20050	100Å	5μ	25cm	22mm
19050	100Å	5μ	50cm	22mm
20051	500Å	5μ	25cm	22mm
19051	500Å	5μ	50cm	22mm
20052	10 <sup>3</sup> Å	5μ	25cm	22mm
19052	10 <sup>3</sup> Å	5μ	50cm	22mm
20053	10 <sup>4</sup> Å	5μ	25cm	22mm
19053	10 <sup>4</sup> Å	5μ	50cm	22mm
20054	10 <sup>5</sup> Å	5μ	25cm	22mm
19054	10 <sup>5</sup> Å	5μ	50cm	22mm
20055	Mixed Bed	5μ	25cm	22mm
19055	Mixed Bed	5μ	50cm	22mm
20056	Solid Bead	5μ	25cm	22mm
19056	Solid Bead	5μ	50cm	22mm

<b>Jordi Gel DVB Hydroxylated - Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
20250	100Å	10μ	25cm	50mm
19250	100Å	10μ	50cm	50mm
20251	500Å	10μ	25cm	50mm
19251	500Å	10μ	50cm	50mm
20252	10 <sup>3</sup> Å	10μ	25cm	50mm
19252	10 <sup>3</sup> Å	10μ	50cm	50mm
20253	10 <sup>4</sup> Å	10μ	25cm	50mm
19253	10 <sup>4</sup> Å	10μ	50cm	50mm
20254	10 <sup>5</sup> Å	10μ	25cm	50mm
19254	10 <sup>5</sup> Å	10μ	50cm	50mm
20255	Mixed Bed	10μ	25cm	50mm
19255	Mixed Bed	10μ	50cm	50mm
20256	Solid Bead	10μ	25cm	50mm
19256	Solid Bead	10μ	50cm	50mm

## Core Values

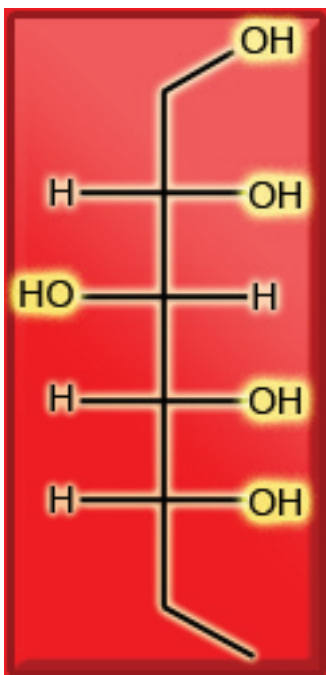
Servant-hood, Christ Likeness -

Considering the needs of our customers and exceeding their expectations.

To see the next Jordi core value turn to page 58.

## Jordi Glucose DVB Columns

Glucose columns provide a polar surface chemistry for GPC analyses in aqueous buffer solutions or organic solvents. The 100% divinylbenzene core imparts higher strength and rigidity as compared to methacrylate gels and will not dissolve at extremes of pH. Glucose columns are applicable for a wide range of polar polymers including polysaccharides and many polar synthetic materials.



**Jordi Glucose columns are for use with aqueous solvents modified with buffers, salts, and strong or weak acids, providing:**

- **Improved Resolution** - 10mm column dimensions standard
- **Solvent Compatibility** - 100% organic to 100% aqueous buffers
- **Powerful** - high pore-volume for greater resolution
- **Long column life** - extended column life reduces cost
- **Linear Calibrations** - maximize precision of MW calculations
- **Wide range of porosities** - 100Å to 10<sup>5</sup>Å, Mixed Bed & SB
- **Wide pH Range** - pH values from 0 to 14
- **Quality** - glucose columns have been in continuous production for over 15 years and are subjected to rigorous quality checks

Jordi uses a unique approach in the production of Glucose DVB packing materials. Production begins with a highly cross-linked divinylbenzene gel to which glucose is attached. The DVB base material provides strength, resilience, and chemical stability. The glucose groups cause the packing to be compatible with both polar samples and polar solvents. Jordi Glucose DVB columns are available in a broad range of porosities for all your aqueous separations. As an example, 5 million MW polyacrylic acid standards are not excluded from 10<sup>5</sup>Å glucose DVB columns. The small

pore sizes provide sharp symmetrical peaks for the separation of corn syrups into their oligomers. Highly efficient 5 micron particles are used for all our glucose packings providing the efficiency you have come to expect from Jordi. The small pore-sized materials will withstand pressures up to 30,000psig; The large pore sized packings will withstand pressures up to 2,000psig.

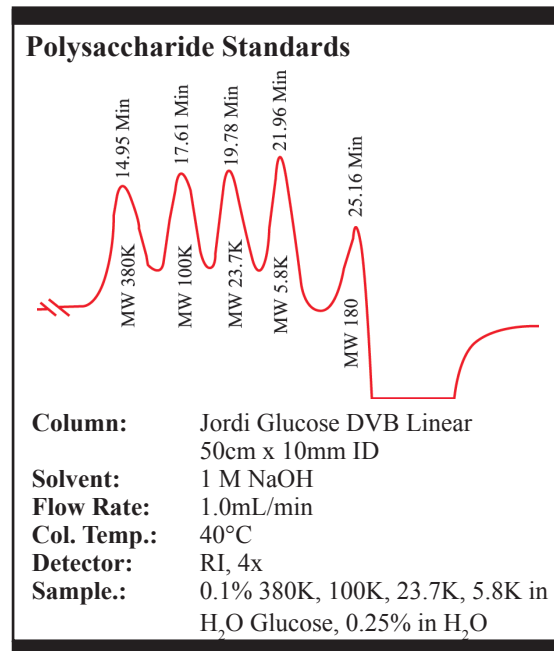
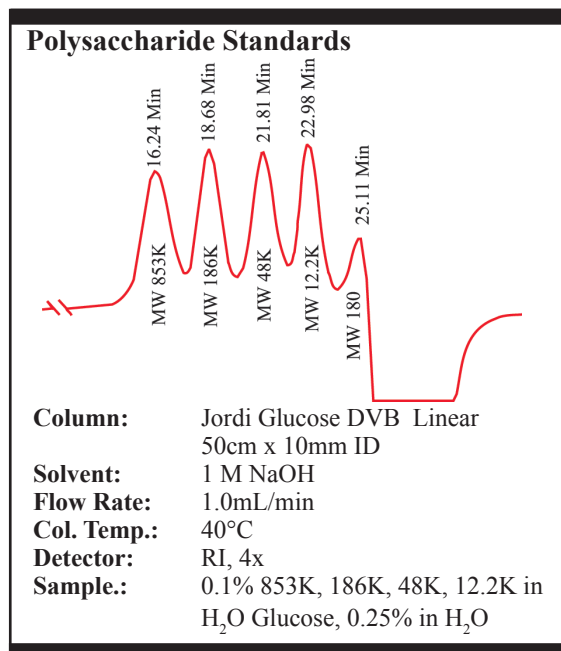
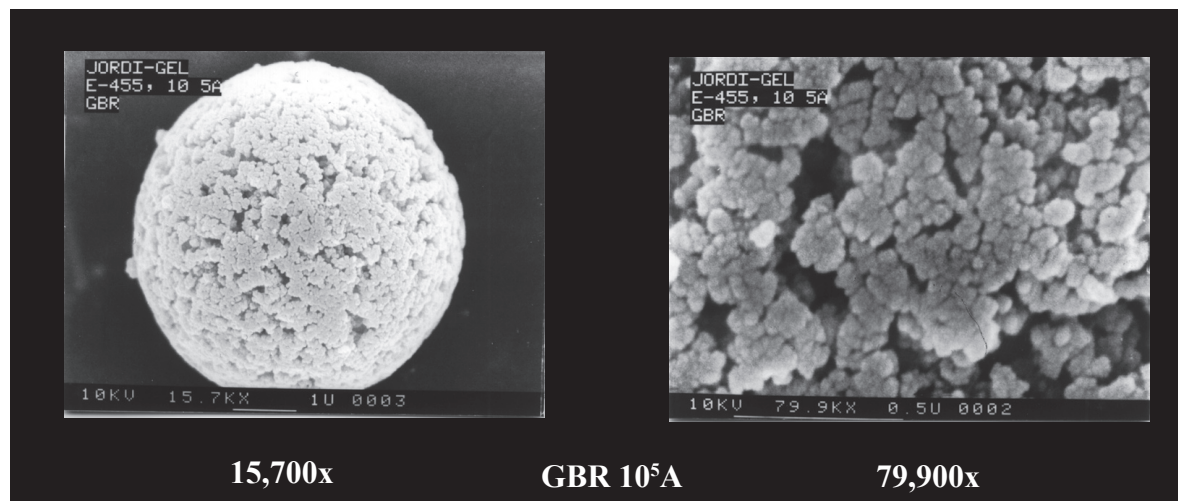
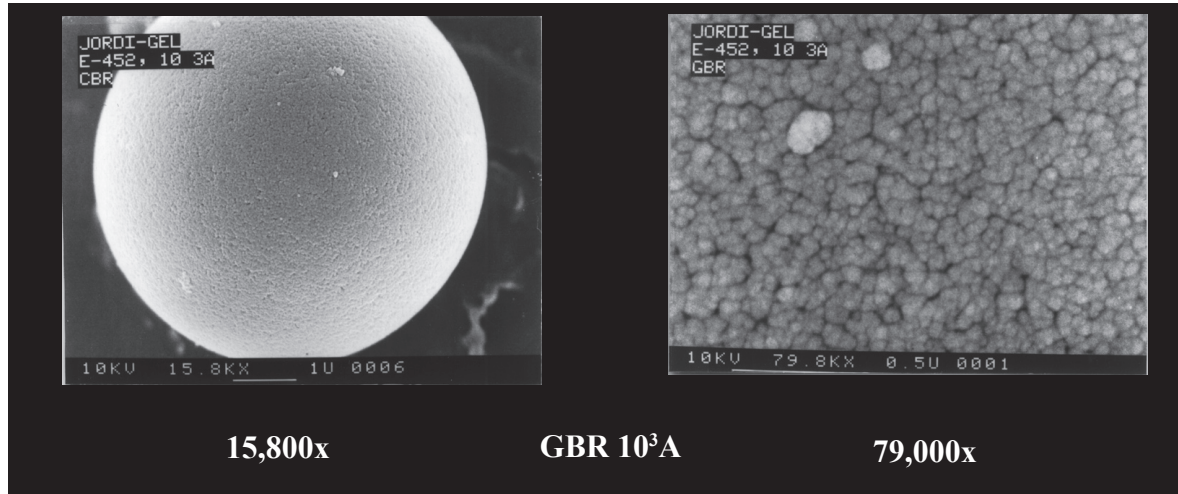
### Glucose DVB Applications and Solvents

#### *Typical Applications:*

Peptides  
Polysaccharides  
Carboxymethyl Cellulose  
Polyacrylamides  
Polyacrylic Acids

#### *Typical Solvent Systems:*

0.1M HNO<sub>3</sub>  
DMSO  
NMP  
Chloroform  
1M NaOH



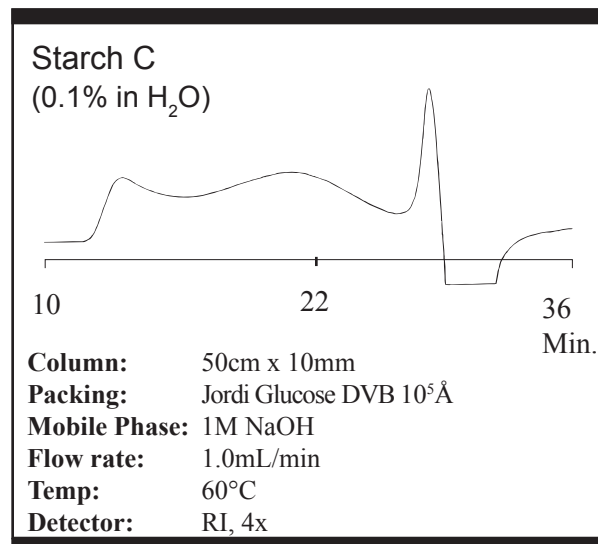
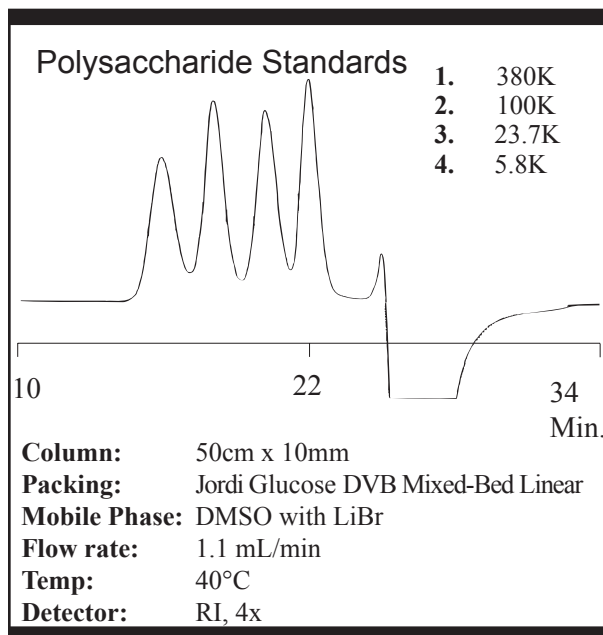
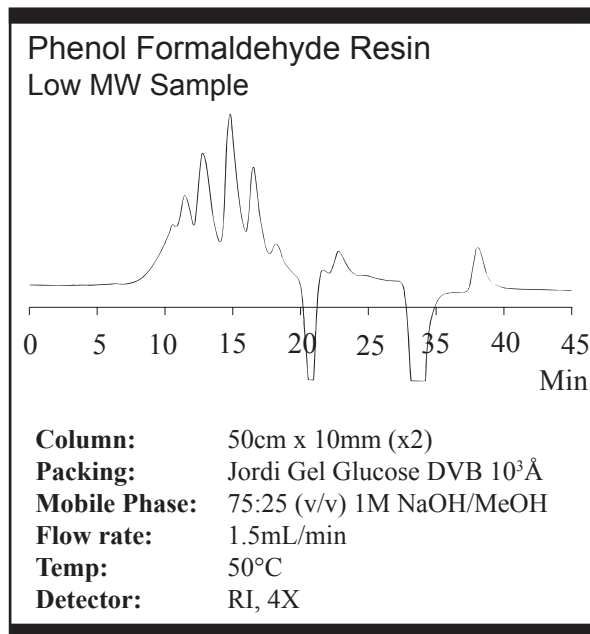


## Select Jordi Glucose DVB Applications

### Glucose DVB Columns Can Improve Your Separation

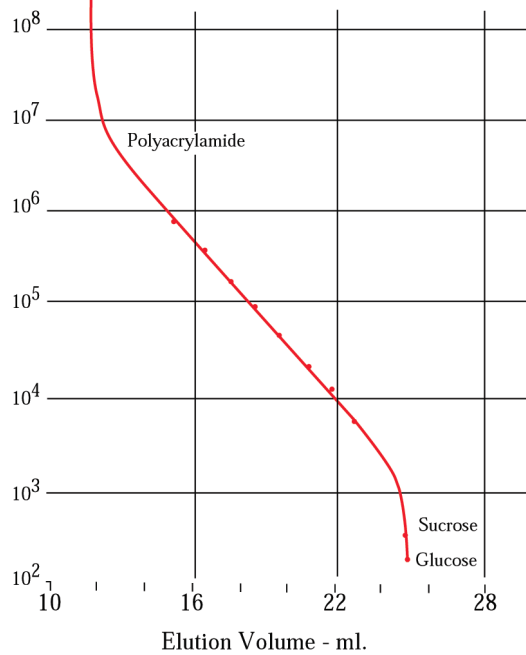
Typical samples include polysaccharides, polyacrylic acids, carboxymethyl cellulose, polyacrylamides, carrageenans, starches, hyaluronic acid and lignins. Use buffer salts, strong or weak acids, or organic solvents as mobile phase modifiers to improve peak shape.

Glucose units are attached to both the DVB polymer backbone and the aromatic ring. The glucose groups make the packing compatible with both polar samples and polar solvents, while the base DVB provides strength, resiliency and chemical stability. Aqueous buffers, 1M NaOH, 0.1N HNO<sub>3</sub>, and water with organic modifiers such as an alcohol, acetonitrile, THF or DMSO have been used successfully.



## Polysaccharide Standards Calibration Curve

**Column:** Jordi Glucose Linear Column  
50cm x 10mm ID  
**Solvent:** 1 Molar NaOH  
**Flow Rate:** 1mL/min  
**Col. Temp.:** 40°C  
**Sample.:** Polysaccharide Standards and Polyacrylamide

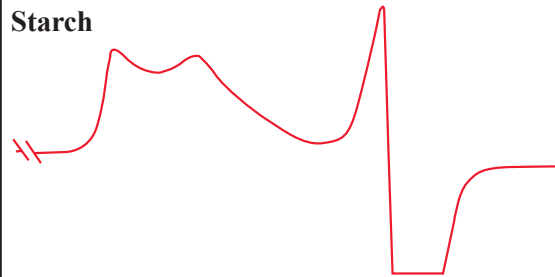


## Polyacrylamide Standard

**Column:** Jordi Glucose Linear  
50cm x 10mm ID  
**Solvent:** 1 M NaOH  
**Flow Rate:** 1.0mL/min  
**Col. Temp.:** 40°C  
**Detector:** RI, 4x  
**Sample.:** MW 5.5 Million/13.37 Min.

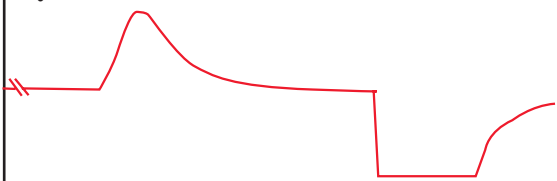


## Starch



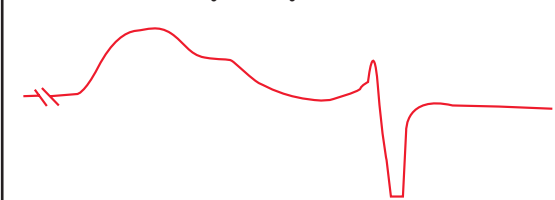
**Column:** Jordi Glucose Linear  
50cm x 10mm ID  
**Solvent:** 1M NaOH  
**Flow Rate:** 1.0mL/min  
**Col. Temp.:** 40°C  
**Detector:** RI, 2x  
**Sample.:** 0.1% in 1M NaOH

## Hyaluronic Acid

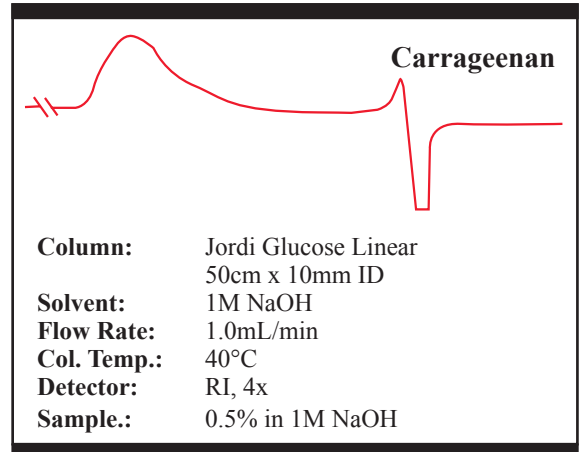
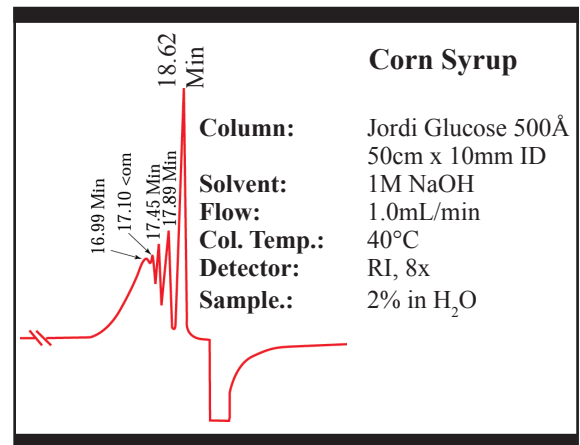
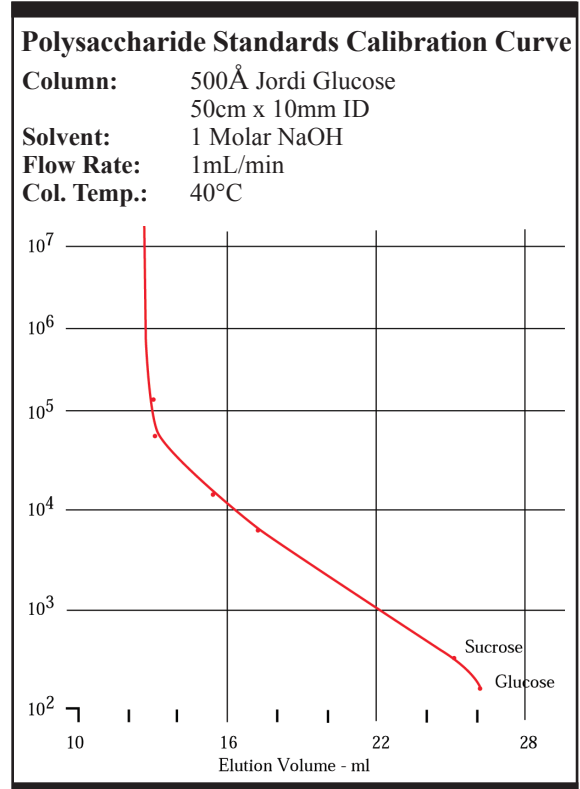
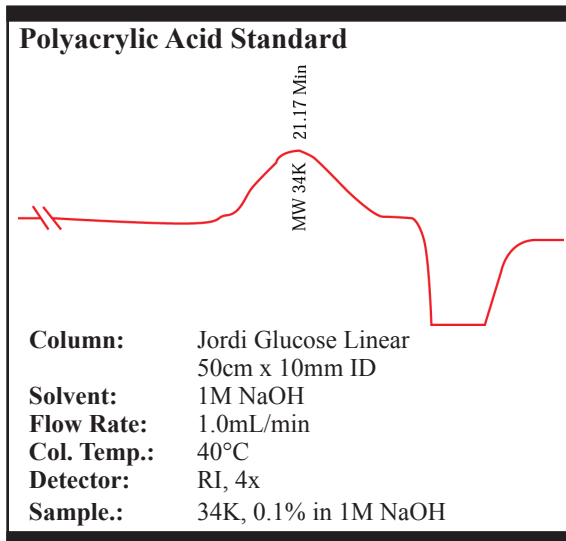
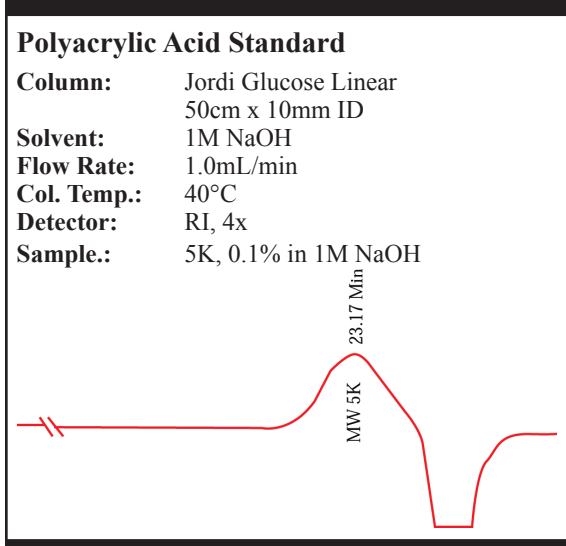
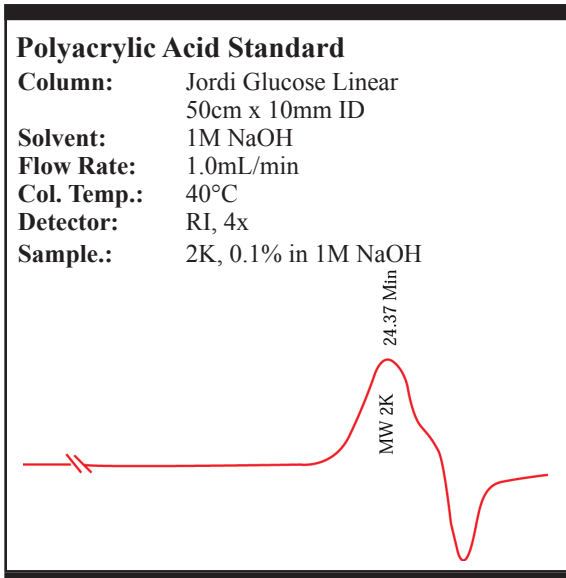


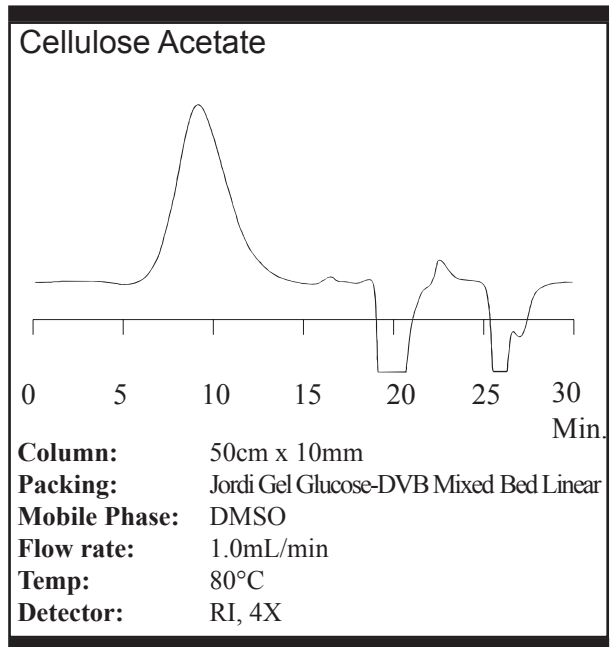
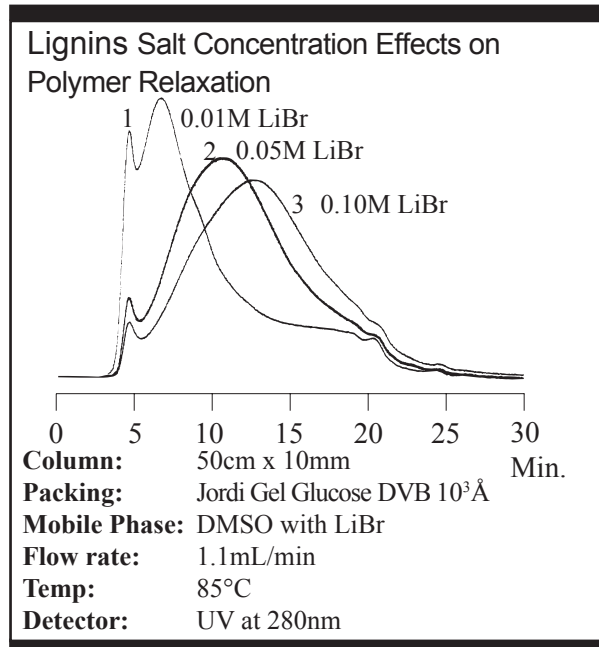
**Column:** Jordi Glucose  $10^5 \text{ \AA}$   
50cm x 10mm ID  
**Solvent:** 1 M NaOH  
**Flow Rate:** 1.0mL/min  
**Col. Temp.:** 60°C  
**Detector:** RI, 4x  
**Sample.:** 0.05% in  $\text{H}_2\text{O}$

## Sodium Carboxymethyl Cellulose



**Column:** Jordi Glucose Linear  
50cm x 10mm ID  
**Solvent:** 1M NaOH  
**Flow Rate:** 1.0mL/min  
**Col. Temp.:** 40°C  
**Detector:** RI, 4x  
**Sample.:** 0.25% in 1M NaOH





<b>Jordi Gel DVB Glucose Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>30060</b>	100Å	5µ	30cm	7.8mm
<b>15060</b>	100Å	5µ	25cm	10mm
<b>15050</b>	100Å	5µ	50cm	10mm
<b>30061</b>	500Å	5µ	30cm	7.8mm
<b>15061</b>	500Å	5µ	25cm	10mm
<b>15051</b>	500Å	5µ	50cm	10mm
<b>30062</b>	10 <sup>3</sup> Å	5µ	30cm	7.8mm
<b>15062</b>	10 <sup>3</sup> Å	5µ	25cm	10mm
<b>15052</b>	10 <sup>3</sup> Å	5µ	50cm	10mm
<b>30063</b>	10 <sup>4</sup> Å	5µ	30cm	7.8mm
<b>15063</b>	10 <sup>4</sup> Å	5µ	25cm	10mm
<b>15053</b>	10 <sup>4</sup> Å	5µ	50cm	10mm
<b>30064</b>	10 <sup>5</sup> Å	5µ	30cm	7.8mm
<b>15064</b>	10 <sup>5</sup> Å	5µ	25cm	10mm
<b>15054</b>	10 <sup>5</sup> Å	5µ	50cm	10mm
<b>30065</b>	Mixed Bed	5µ	30cm	7.8mm
<b>15065</b>	Mixed Bed	5µ	25cm	10mm
<b>15055</b>	Mixed Bed	5µ	50cm	10mm
<b>30066</b>	Solid Bead	5µ	30cm	7.8mm
<b>15066</b>	Solid Bead	5µ	25cm	10mm
<b>15056</b>	Solid Bead	5µ	50cm	10mm
<b>Light Scattering</b>				
<b>30067</b>	Mixed Bed	5µ	30cm	7.8mm
<b>15067</b>	Mixed Bed	5µ	25cm	10mm
<b>15057</b>	Mixed Bed	5µ	50cm	10mm

<b>Jordi Gel DVB Glucose Columns — Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15371	100Å	5μ	15cm	4.6mm
15370	100Å	5μ	25cm	4.6mm
15373	500Å	5μ	15cm	4.6mm
15372	500Å	5μ	25cm	4.6mm
15375	10 <sup>3</sup> Å	5μ	15cm	4.6mm
15374	10 <sup>3</sup> Å	5μ	25cm	4.6mm
15377	10 <sup>4</sup> Å	5μ	15cm	4.6mm
15376	10 <sup>4</sup> Å	5μ	25cm	4.6mm
15379	10 <sup>5</sup> Å	5μ	15cm	4.6mm
15378	10 <sup>5</sup> Å	5μ	25cm	4.6mm
15381	Mixed Bed	5μ	15cm	4.6mm
15380	Mixed Bed	5μ	25cm	4.6mm
15383	Solid Bead	5μ	15cm	4.6mm
15382	Solid Bead	5μ	25cm	4.6mm

<b>JORDI GPC SPECIFICATIONS</b>	
<i>Description</i>	<i>MW Range</i>
<b>GPC Solid Bead</b>	2,000-400,000,000
<b>GPC 100Å</b>	<50-5,000
<b>GPC 500Å</b>	<50-10,000
<b>GPC 10<sup>3</sup>Å</b>	<100-50,000
<b>GPC 10<sup>4</sup>Å</b>	100-100,000
<b>GPC 10<sup>5</sup>Å</b>	10,000->10,000,000
<b>GPC Mixed Bed</b>	100->10,000,000

<b>Jordi Gel DVB Glucose Columns — Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15160	100Å	5μ	25cm	22mm
15150	100Å	5μ	50cm	22mm
15161	500Å	5μ	25cm	22mm
15151	500Å	5μ	50cm	22mm
15162	10 <sup>3</sup> Å	5μ	25cm	22mm
15152	10 <sup>3</sup> Å	5μ	50cm	22mm
15163	10 <sup>4</sup> Å	5μ	25cm	22mm
15153	10 <sup>4</sup> Å	5μ	50cm	22mm
15164	10 <sup>5</sup> Å	5μ	25cm	22mm
15154	10 <sup>5</sup> Å	5μ	50cm	22mm
15165	Mixed Bed	5μ	25cm	22mm
15155	Mixed Bed	5μ	50cm	22mm
15390	Solid Bead	5μ	25cm	22mm
15391	Solid Bead	5μ	50cm	22mm

<b>Jordi Gel Glucose Columns — Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15360	100Å	10μ	25cm	50mm
15350	100Å	10μ	50cm	50mm
15361	500Å	10μ	25cm	50mm
15351	500Å	10μ	50cm	50mm
15362	10 <sup>3</sup> Å	10μ	25cm	50mm
15352	10 <sup>3</sup> Å	10μ	50cm	50mm
15363	10 <sup>4</sup> Å	10μ	25cm	50mm
15353	10 <sup>4</sup> Å	10μ	50cm	50mm
15364	10 <sup>5</sup> Å	10μ	25cm	50mm
15354	10 <sup>5</sup> Å	10μ	50cm	50mm
15365	Mixed Bed	10μ	25cm	50mm
15355	Mixed Bed	10μ	50cm	50mm
15396	Solid Bead	10μ	25cm	50mm
15397	Solid Bead	10μ	50cm	50mm

# Sulfonated DVB Columns

## Jordi Sulfonated DVB Columns

Sulfonated DVB columns are an excellent choice for the analysis of anionic polymers in aqueous buffer solutions. Sulfonated groups are attached to the surface of core DVB particles imparting a strong negative charge to the surface. Ionic repulsion prevents column sample interactions without the need for high salt concentrations. The 100% divinylbenzene core particles increase column life and allow for wide solvent compatibility.



### Advantages of Sulfonated DVB columns:

- **Rugged** - solvent changes will not damage columns
- **Solvent Compatibility** - 100% organic to 100% aqueous buffers
- **Wide pH Range** - pH values from 0 to 14
- **Powerful** - High pore-volume for greater resolution
- **Range of Porosities** - 100Å to 10<sup>5</sup>Å, Mixed Bed & SB
- **Long Column Life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

*Jordi FLP supplies a full line of porosities for all our GPC products. We recommend using our 500Å columns for small molecules. Our Mixed-Bed Linear Columns are the most versatile choice for polymers.*

### Sulfonated DVB Applications and Solvents

#### *Typical Applications:*

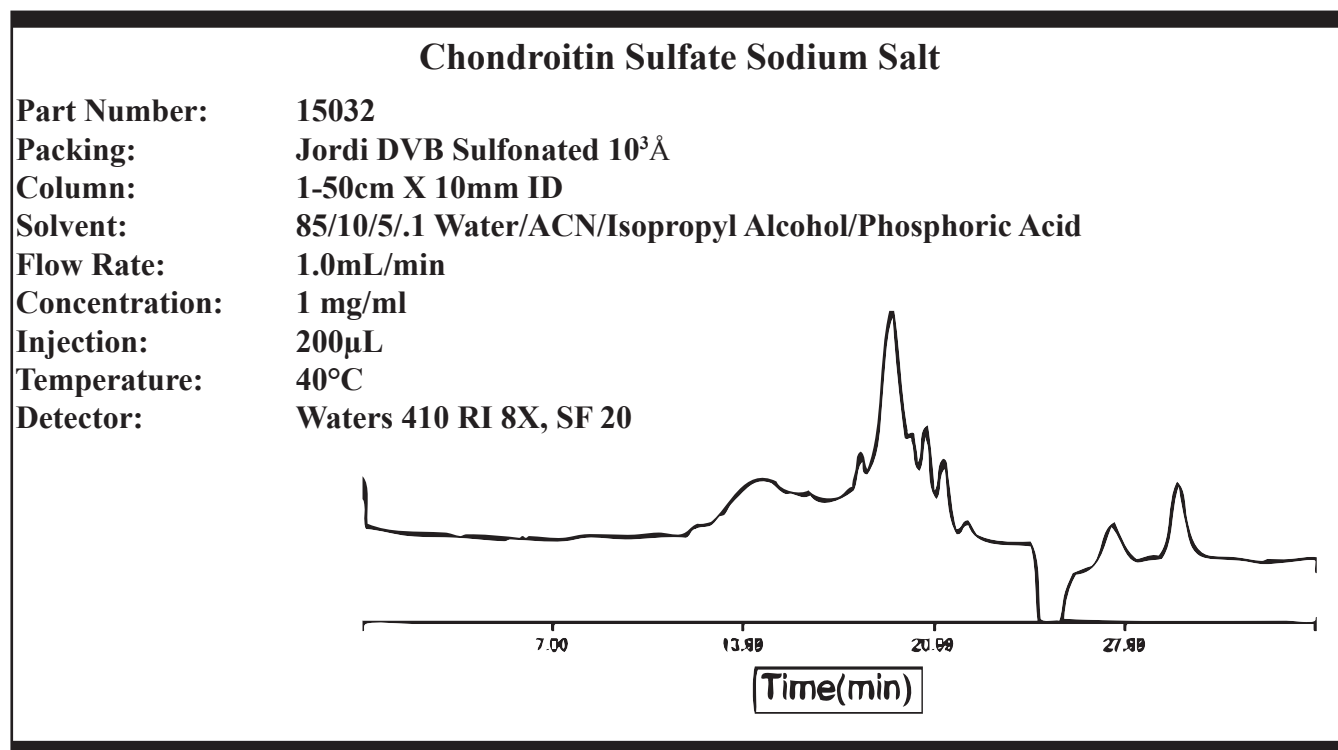
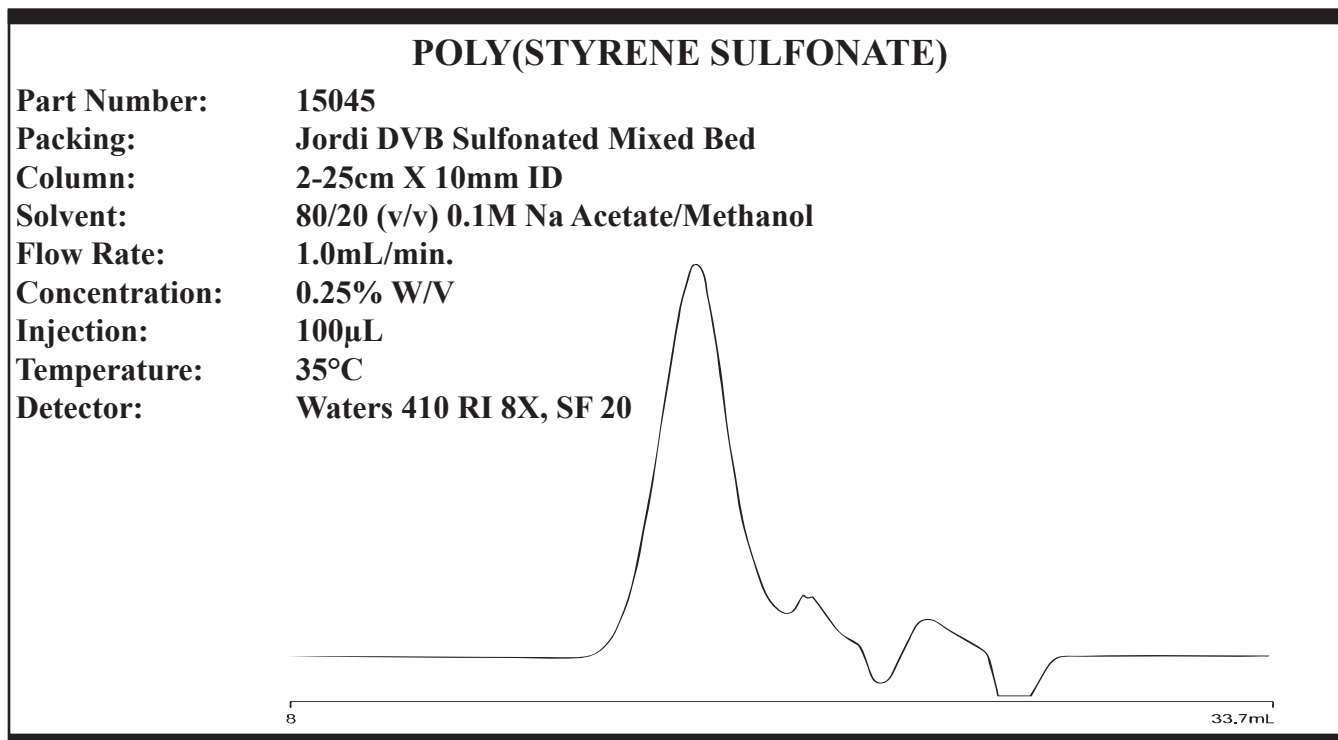
Poly(styrene sulfonate)  
Phosphoric compounds  
Lignin sulfonate  
Organic acids  
Carboxylated polymers

#### *Typical Solvent Systems:*

1M NaOH  
90/10 – H<sub>2</sub>O/Acetic Acid  
.01M Phosphoric Acid  
80/20 - .1M  
Na Acetate/Methanol

# Sulfonated DVB Columns

## Select Jordi Sulfonated DVB Applications





<b>Jordi Gel DVB Sulfonated Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15720	100Å	5µ	30cm	7.8mm
15040	100Å	5µ	25cm	10mm
15030	100Å	5µ	50cm	10mm
15721	500Å	5µ	30cm	7.8mm
15041	500Å	5µ	25cm	10mm
15031	500Å	5µ	50cm	10mm
15722	10 <sup>3</sup> Å	5µ	30cm	7.8mm
15042	10 <sup>3</sup> Å	5µ	25cm	10mm
15032	10 <sup>3</sup> Å	5µ	50cm	10mm
15723	10 <sup>4</sup> Å	5µ	30cm	7.8mm
15043	10 <sup>4</sup> Å	5µ	25cm	10mm
15033	10 <sup>4</sup> Å	5µ	50cm	10mm
15724	10 <sup>5</sup> Å	5µ	30cm	7.8mm
15044	10 <sup>5</sup> Å	5µ	25cm	10mm
15034	10 <sup>5</sup> Å	5µ	50cm	10mm
15725	Mixed Bed	5µ	30cm	7.8mm
15045	Mixed Bed	5µ	25cm	10mm
15035	Mixed Bed	5µ	50cm	10mm
15726	Solid Bead	5µ	30cm	7.8mm
15046	Solid Bead	5µ	25cm	10mm
15036	Solid Bead	5µ	50cm	10mm
<b><i>Light Scattering</i></b>				
15727	Mixed Bed	5µ	30cm	7.8mm
15047	Mixed Bed	5µ	25cm	10mm
15037	Mixed Bed	5µ	50cm	10mm

<b>Jordi Gel DVB Sulfonated - Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15251	100Å	5µ	15cm	4.6mm
15250	100Å	5µ	25cm	4.6mm
15253	500Å	5µ	15cm	4.6mm
15252	500Å	5µ	25cm	4.6mm
15255	10 <sup>3</sup> Å	5µ	15cm	4.6mm
15254	10 <sup>3</sup> Å	5µ	25cm	4.6mm
15257	10 <sup>4</sup> Å	5µ	15cm	4.6mm
15256	10 <sup>4</sup> Å	5µ	25cm	4.6mm
15259	10 <sup>5</sup> Å	5µ	15cm	4.6mm
15258	10 <sup>5</sup> Å	5µ	25cm	4.6mm
15261	Mixed Bed	5µ	15cm	4.6mm
15260	Mixed Bed	5µ	25cm	4.6mm
15263	Solid Bead	5µ	15cm	4.6mm
15262	Solid Bead	5µ	25cm	4.6mm

<b>Jordi Gel DVB Sulfonated - Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15140	100Å	5μ	25cm	22mm
15130	100Å	5μ	50cm	22mm
15141	500Å	5μ	25cm	22mm
15131	500Å	5μ	50cm	22mm
15142	10 <sup>3</sup> Å	5μ	25cm	22mm
15132	10 <sup>3</sup> Å	5μ	50cm	22mm
15143	10 <sup>4</sup> Å	5μ	25cm	22mm
15133	10 <sup>4</sup> Å	5μ	50cm	22mm
15144	10 <sup>5</sup> Å	5μ	25cm	22mm
15134	10 <sup>5</sup> Å	5μ	50cm	22mm
15145	Mixed Bed	5μ	25cm	22mm
15135	Mixed Bed	5μ	50cm	22mm
15146	Solid Bead	5μ	25cm	22mm
15136	Solid Bead	5μ	50cm	22mm

<b>Jordi Gel DVB Sulfonated - Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15240	100Å	10μ	25cm	50mm
15230	100Å	10μ	50cm	50mm
15241	500Å	10μ	25cm	50mm
15231	500Å	10μ	50cm	50mm
15242	10 <sup>3</sup> Å	10μ	25cm	50mm
15232	10 <sup>3</sup> Å	10μ	50cm	50mm
15243	10 <sup>4</sup> Å	10μ	25cm	50mm
15233	10 <sup>4</sup> Å	10μ	50cm	50mm
15244	10 <sup>5</sup> Å	10μ	25cm	50mm
15234	10 <sup>5</sup> Å	10μ	50cm	50mm
15245	Mixed Bed	10μ	25cm	50mm
15235	Mixed Bed	10μ	50cm	50mm
15246	Solid Bead	10μ	25cm	50mm
15236	Solid Bead	10μ	50cm	50mm

## Jordi Polar Pack Wax Columns

Polar Pack WAX columns are an excellent choice for the analysis of cationic polymers in aqueous buffer solutions. Polar Pack WAX columns have a poly(amino) surface chemistry which becomes positively charged in acidic mobile phases. Ionic repulsion prevents column sample interactions without the need for high salt concentrations. The 100% divinylbenzene core particles increase column lifetime and allow for wide solvent compatibility.



### Advantages of Polar Pack WAX columns:

- **Rugged** - solvent changes will not damage columns
- **Solvent Compatibility** - 100% polar organics to 100% aqueous buffers
- **Wide pH Range** - pH values from 0 to 14
- **Powerful** - High pore-volume for greater resolution with fewer columns
- **Range of Porosities** - 100Å to 10<sup>5</sup>Å, Mixed Beds & SB
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

Use Jordi Polar Pack WAX DVB columns for the analysis of polysaccharides, starches, celluloses and other cationic water soluble polymers.

Polar Pack WAX columns combine our base DVB polymer bonded with polyethyleneimine (PEI) to provide an ionizable surface. This allows complete control over the degree of positive charge. The bonded functional group is a secondary amine. At pH values below 8, the column becomes positively charged. Above pH 8, it becomes neutral.

### Polar Pack WAX DVB Applications and Solvents

#### *Typical Applications:*

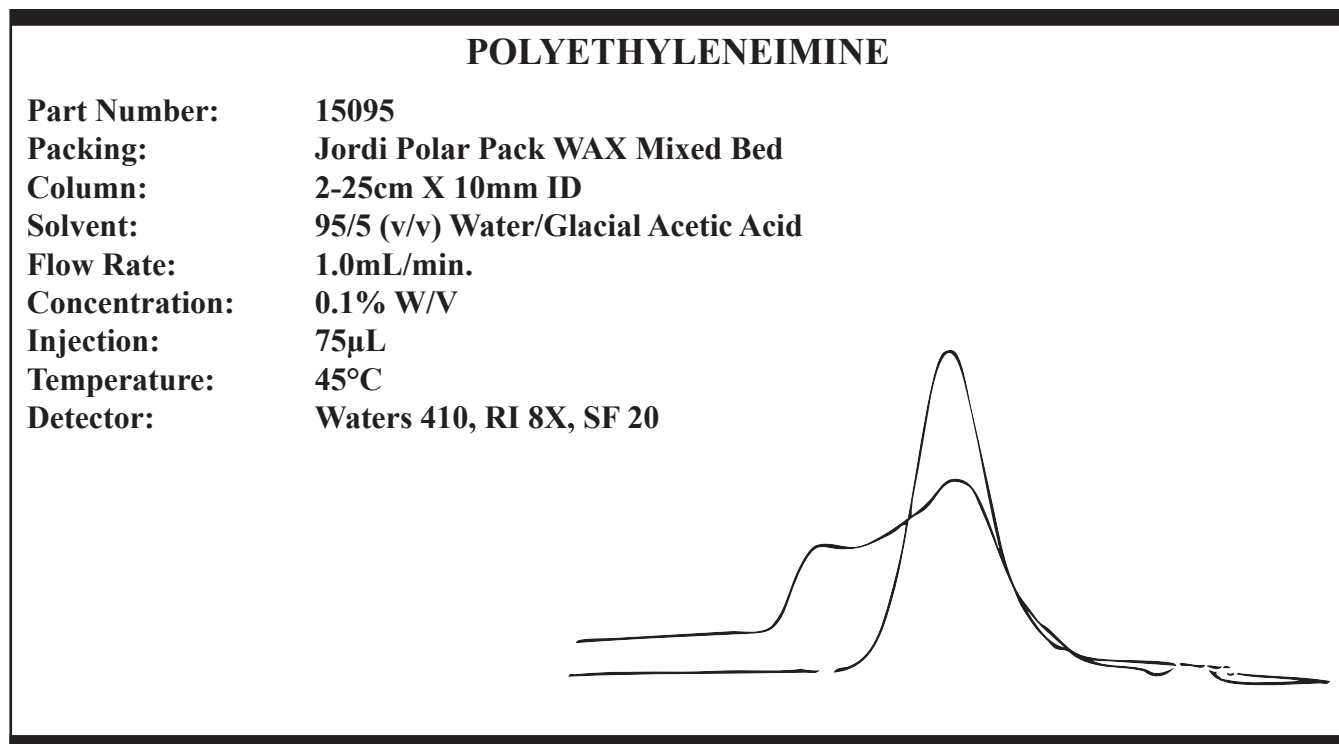
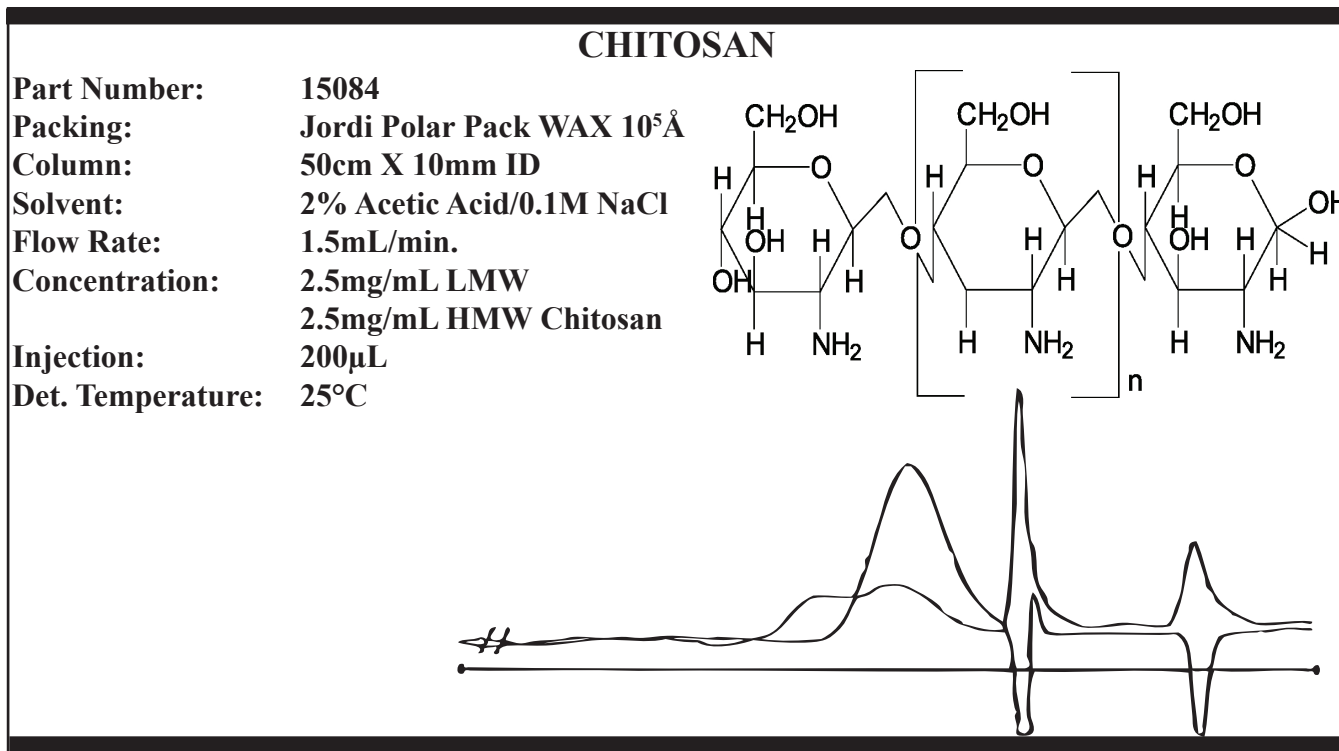
Chitosan  
Polysaccharides  
Polyethyleneimine  
Phospholipids  
Quaternized polymers

#### *Typical Solvent Systems:*

90/10 - H<sub>2</sub>O/Acetic Acid

# Polar Pack WAX Columns

## Select Polar Pack WAX Applications



# Polar Pack WAX Columns

<b>Jordi Gel DVB Polar Pack WAX Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15700	100Å	5μ	30cm	7.8mm
15090	100Å	5μ	25cm	10mm
15080	100Å	5μ	50cm	10mm
15701	500Å	5μ	30cm	7.8mm
15091	500Å	5μ	25cm	10mm
15081	500Å	5μ	50cm	10mm
15702	10 <sup>3</sup> Å	5μ	30cm	7.8mm
15092	10 <sup>3</sup> Å	5μ	25cm	10mm
15082	10 <sup>3</sup> Å	5μ	50cm	10mm
15703	10 <sup>4</sup> Å	5μ	30cm	7.8mm
15093	10 <sup>4</sup> Å	5μ	25cm	10mm
15083	10 <sup>4</sup> Å	5μ	50cm	10mm
15704	10 <sup>5</sup> Å	5μ	30cm	7.8mm
15094	10 <sup>5</sup> Å	5μ	25cm	10mm
15084	10 <sup>5</sup> Å	5μ	50cm	10mm
15705	Mixed Bed	5μ	30cm	7.8mm
15095	Mixed Bed	5μ	25cm	10mm
15085	Mixed Bed	5μ	50cm	10mm
15706	Solid Bead	5μ	30cm	7.8mm
15096	Solid Bead	5μ	25cm	10mm
15086	Solid Bead	5μ	50cm	10mm
<b><i>Light Scattering</i></b>				
15707	Mixed Bed	5μ	30cm	7.8mm
15097	Mixed Bed	5μ	25cm	10mm
15087	Mixed Bed	5μ	50cm	10mm

<b>Jordi Gel DVB Polar Pack WAX - Solvent Saver</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15167	100Å	5μ	15cm	4.6mm
15166	100Å	5μ	25cm	4.6mm
15169	500Å	5μ	15cm	4.6mm
15168	500Å	5μ	25cm	4.6mm
15171	10 <sup>3</sup> Å	5μ	15cm	4.6mm
15170	10 <sup>3</sup> Å	5μ	25cm	4.6mm
15173	10 <sup>4</sup> Å	5μ	15cm	4.6mm
15172	10 <sup>4</sup> Å	5μ	25cm	4.6mm
15175	10 <sup>5</sup> Å	5μ	15cm	4.6mm
15174	10 <sup>5</sup> Å	5μ	25cm	4.6mm
15177	Mixed Bed	5μ	15cm	4.6mm
15176	Mixed Bed	5μ	25cm	4.6mm
15179	Solid Bead	5μ	15cm	4.6mm
15178	Solid Bead	5μ	25cm	4.6mm

<b>Jordi Gel DVB Polar Pack WAX - Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15190	100Å	5μ	25cm	22mm
15180	100Å	5μ	50cm	22mm
15191	500Å	5μ	25cm	22mm
15181	500Å	5μ	50cm	22mm
15192	10 <sup>3</sup> Å	5μ	25cm	22mm
15182	10 <sup>3</sup> Å	5μ	50cm	22mm
15193	10 <sup>4</sup> Å	5μ	25cm	22mm
15183	10 <sup>4</sup> Å	5μ	50cm	22mm
15194	10 <sup>5</sup> Å	5μ	25cm	22mm
15184	10 <sup>5</sup> Å	5μ	50cm	22mm
15195	Mixed Bed	5μ	25cm	22mm
15185	Mixed Bed	5μ	50cm	22mm
15196	Solid Bead	5μ	25cm	22mm
15186	Solid Bead	5μ	50cm	22mm

<b>Jordi Gel DVB Polar Pack WAX - Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
15290	100Å	10μ	25cm	50mm
15280	100Å	10μ	50cm	50mm
15291	500Å	10μ	25cm	50mm
15281	500Å	10μ	50cm	50mm
15292	10 <sup>3</sup> Å	10μ	25cm	50mm
15282	10 <sup>3</sup> Å	10μ	50cm	50mm
15293	10 <sup>4</sup> Å	10μ	25cm	50mm
15283	10 <sup>4</sup> Å	10μ	50cm	50mm
15294	10 <sup>5</sup> Å	10μ	25cm	50mm
15284	10 <sup>5</sup> Å	10μ	50cm	50mm
15295	Mixed Bed	10μ	25cm	50mm
15285	Mixed Bed	10μ	50cm	50mm
15296	Solid Bead	10μ	25cm	50mm
15286	Solid Bead	10μ	50cm	50mm

## Jordi Reverse Phase and Normal Phase Columns

Jordi RP and NP columns represent over 25 years of continuous development effort and are some of the finest polymeric columns on the market today. Our extensive application database can, in many cases, provide an already established method for the analysis of your compound. Jordi polymeric columns offer significant advantages over silica phases for the analysis of:

- **Polar compounds which are poorly retained by silica phases (carbohydrates, PEG)**
- **Very hydrophobic samples which have poor solubility in aqueous mobile phases**
- **Complex samples which require selectivity significantly different from silica phases**
- **Ionizable compounds for which extremes of pH allow ion suppression**
- **Separations in which retention is desirable at higher organic content**

Jordi RP and NP columns offer significant advantages including:

- **Wider range of surface chemistries than other polymer manufacturers**
- **Long column lifetimes**
- **pH 0-14 stable**
- **Compatible with nearly all solvents**
- **Multiple pore sizes (300Å, 500Å, and 10<sup>3</sup>Å)**
- **Highly retentive polymer phases**
- **100% Carbon Loading**

### *Jordi Reverse Phase*

Jordi polymer-based DVB resins are similar to phenyl silica phases but provide greater retention. Compared with C<sub>18</sub> silica phases, they show increased retention and different selectivity for many compounds. Our resins serve as a highly retentive phase allowing retention for compounds which elute in the void volume on most silica phases. Jordi Fluorinated RP DVB columns are the exception to this rule, offering significantly lower retention resulting in elution of sample components at higher water concentrations. All Jordi RP columns are completely pH stable from 0-14 and compatible with nearly all solvents.

Because of the high surface area of the packing material, the addition of an organic solvent is required to elute most materials from the column. The highly cross-linked packing material does not restrict the choice of solvent; Acetic Acid, Formic Acid, Pyridine, Dimethyl Sulfoxide, Tetrahydrofuran and Acetone have all been used successfully. Jordi RP & NP columns are 100% carbon loaded, as opposed to silica columns, providing greatly increased sample loading capacity. Surface areas of up to 750 m<sup>2</sup>/g are available on Jordi resins.

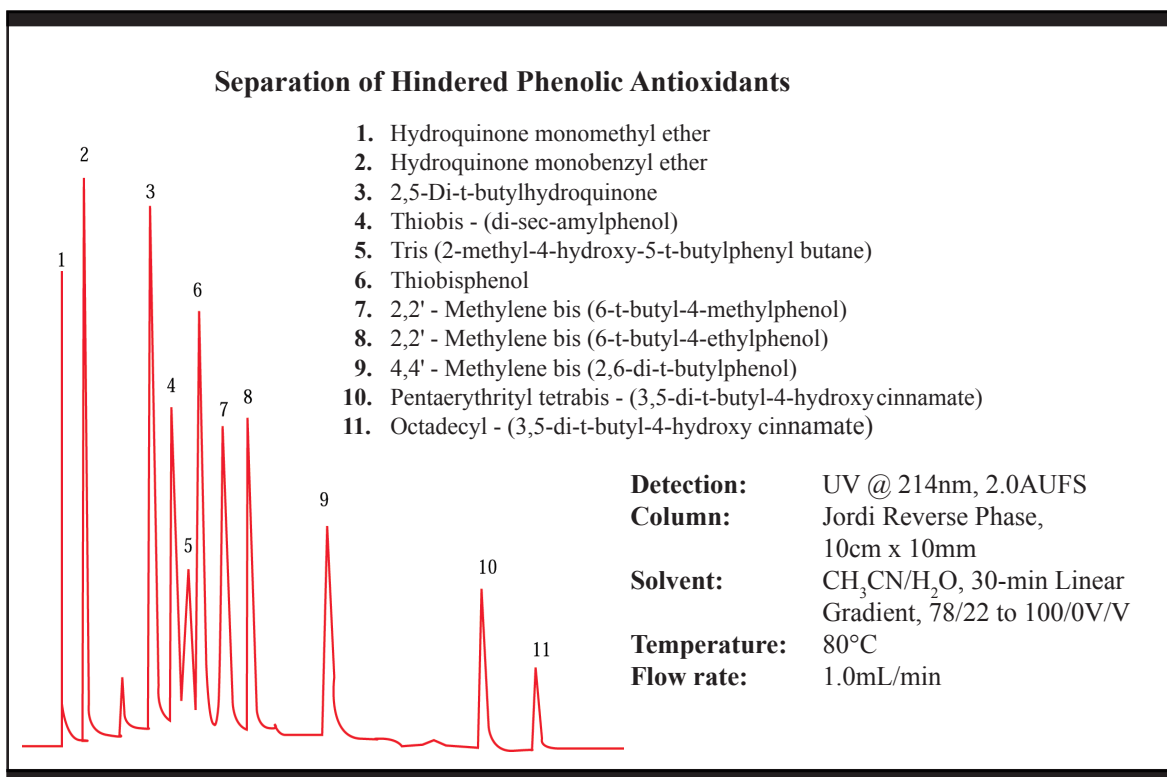
Jordi Reverse Phase Columns work extremely well with paired-ion techniques used to separate both organic and inorganic ions based on hydrophobicity of the packing material.

Jordi recommends a 10cm x 10mm ID column format for our RP columns. This size minimizes the shrinking and swelling effects of the packing when changing solvent polarities allowing a gradient run from a 100% aqueous buffer to 100% THF. Columns with standard 4.6mm ID are also available. Jordi RP columns with lengths of 10cm or greater require a small amount (5%) of an organic solvent to be used at all times to ensure against loss of efficiency due to bed shrinkage.

## Featured Applications

### Separation of Hindered Phenolic Antioxidants

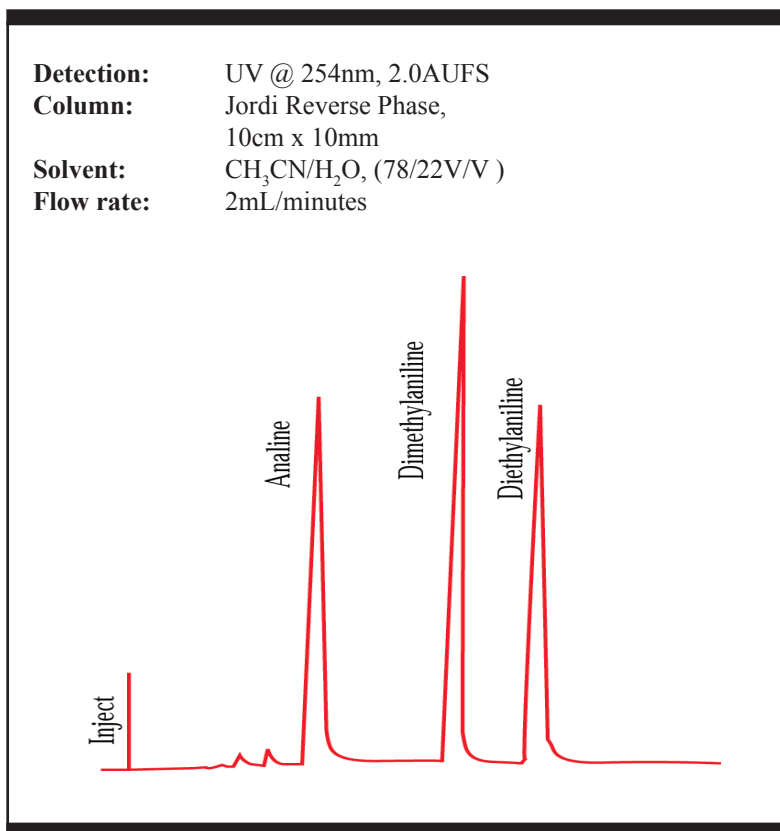
The separation of hindered phenolic antioxidants utilizes a linear gradient of acetonitrile from 78% to 100%. The column temperature was maintained at 80°C to ensure reasonable retention time and to enhance the selectivity of the column, as well as the solubility of the sample. The divinylbenzene polymer packing is highly cross-linked and is actually very stable at operating temperatures up to 150°C. The columns can be run for months at 150°C in Ethylene Glycol or Trichlorobenzene (TCB).





## Separation of Aniline, Dimethylaniline and Diethylaniline

Most samples with basic characteristics elute well from the Jordi Reverse Phase columns as shown by the separation of aniline, dimethylaniline and diethylaniline. This separation displays good peak symmetry with almost no trace of tailing. If present, non-symmetric peak shapes can usually be corrected by the addition of a small amount of Triethylamine to the eluent.



## Jordi RP & NP Method Development Kit

The Jordi method development kit includes five different stationary phases in an optimum size for rapid screening. All phases are based on our 100% divinylbenzene packings imparting higher strength and rigidity to the gels.

The Jordi RP & NP method development kit includes one each of the following 10cm x 4.6mm columns:

Jordi Method Development Kit				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
76000	500Å	5μ	10cm	4.6mm
Packing Media				
DVB RP • DVB C <sub>18</sub> RP • DVB Glucose NP DVB Hydroxylated RP • DVB Fluorinated RP				

# Core Values

## Innovation -

A company which brings new technology into the marketplace and which embraces change.

To see the next Jordi core value turn to page 66.

## Jordi DVB RP Columns

DVB RP columns are prepared from 100% divinylbenzene as opposed to the more common polystyrene divinylbenzene copolymers used by other column manufacturers. This unique chemistry imparts higher strength and rigidity to the gels due to the highly cross-linked structure. Jordi DVB RP columns are 100% carbon loaded as opposed to silica columns providing higher retention and greatly increased sample loading capacity.



### Advantages of Jordi DVB RP Columns:

- **Rugged** - high temperature stable and virtually all organic solvents
- **Solvents** - can be changed without damaging the column
- **Wide pH range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Powerful** - high pore-volume for greater resolution
- **Long column life** - 3 month warranty standard
- **Range of Porosities** - 300Å, 500Å, and 10<sup>3</sup>Å
- **Easy Scale Up** - 1" - 4" preparative columns available
- **Quality** - DVB RP columns have been in continuous production for over 25 years and are subjected to rigorous quality checks

### Jordi DVB RP Applications and Solvents

#### *Typical Applications:*

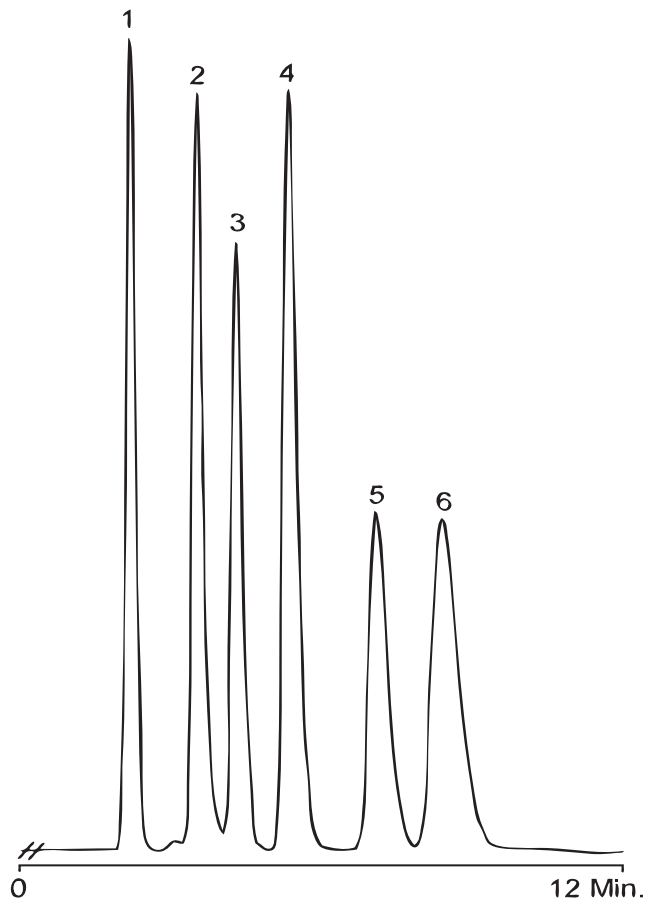
Alkaloid drugs  
 Caffeine in Coffee  
 PEG and PPG  
 Slip agents  
 Glycerol monoesters  
 Hindered Phenolic Antioxidants

#### *Typical Solvent Systems:*

10/20/30/40 MeOH/THF/ACN/H<sub>2</sub>O  
 2-propanol  
 H<sub>2</sub>O/ACN/MeOH with 0.1% TFA

## Select Jordi DVB RP Applications

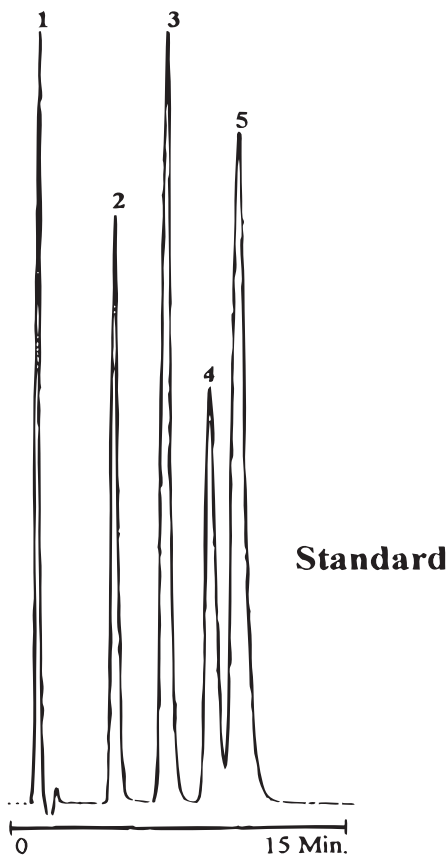
### ASPIRIN and RELATED COMPOUNDS



1. 4-Hydroxy Benzoic Acid
2. Acetylsalicylic Acid (Asprin)
3. Phenacetin (p-Acetophenetidine)
4. Salicylic Acid
5. 5-Methyl Salicylic Acid
6. 3-Methyl Salicylic Acid

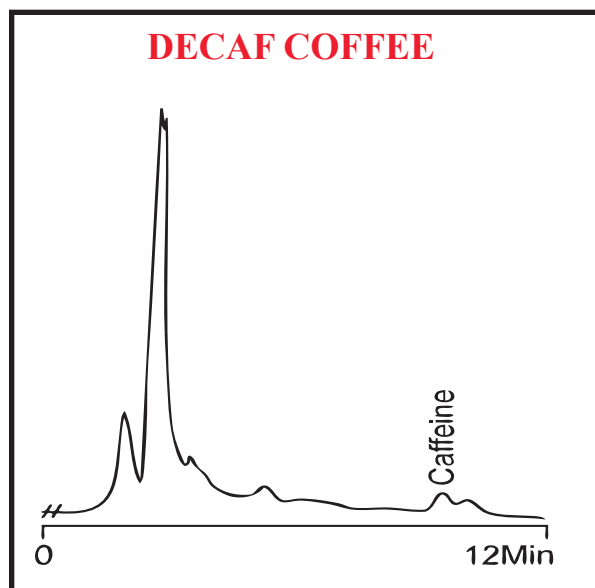
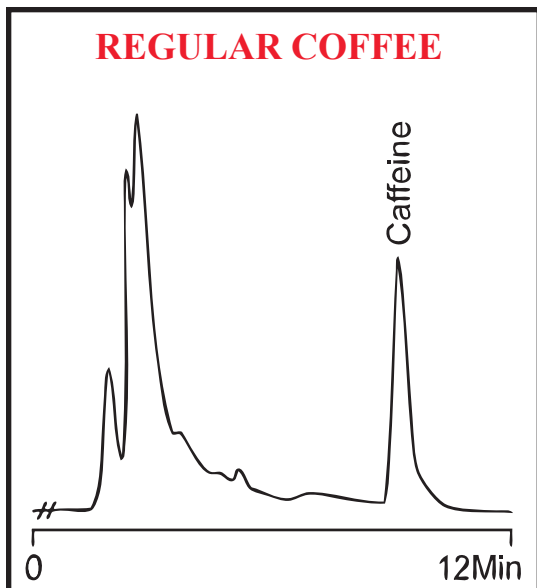
### VASOCONSTRICTORS

1. Phenylephrine Hydrochloride
2. Norephedrine Hydrochloride
3. Procainamide Hydrochloride
4. Ephedrine Hydrochloride
5. Pseudoephedrine Hydrochloride



**Part Number:** 16002  
**Packing:** Jordi DVB RP 500Å  
**Column:** 10cm X 10mm ID  
**Solvent:** 50/50 ACN/H<sub>2</sub>O w/0.05% TFA  
**Flow Rate:** 3.0mL/min  
**Injection:** 100µL  
**Det. Temperature:** 25°C  
**Detector:** UV @254nm

**16002**  
**Jordi DVB RP 500Å**  
**10cm X 10mm ID**  
**24/74/2 ACN/0.2M NaOH/Butylamine**  
**3.0mL/min**  
**100µL**  
**25°C**  
**UV @254nm**



**Part Number:** 16502  
**Packing:** Jordi DVB Reverse Phase 500Å  
**Column:** 15cm X 4.6mm ID  
**Solvent:** 50/15/35 0.01M LiNO<sub>3</sub>/ACN/MeOH  
**Flow Rate:** 0.5mL/min.  
**Injection:** 50µL  
**Det. Temperature:** 25°C  
**Detector:** UV @254nm

Jordi Gel DVB RP Columns				
Cat. #	Pore Size	Particle Size	Length	ID
16526	300Å	5µ	10cm	4.6mm
16501	300Å	5µ	15cm	4.6mm
16506	300Å	5µ	25cm	4.6mm
16001	300Å	5µ	10cm	10mm
16527	500Å	5µ	10cm	4.6mm
16502	500Å	5µ	15cm	4.6mm
16507	500Å	5µ	25cm	4.6mm
16002	500Å	5µ	10cm	10mm
16528	10 <sup>3</sup> Å	5µ	10cm	4.6mm
16503	10 <sup>3</sup> Å	5µ	15cm	4.6mm
16508	10 <sup>3</sup> Å	5µ	25cm	4.6mm
16003	10 <sup>3</sup> Å	5µ	10cm	10mm

<b>Jordi Gel DVB RP Columns - Micro &amp; Minibore</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
16516	300Å	5μ	5cm	2.1mm
16522	300Å	5μ	10cm	2.1mm
16517	500Å	5μ	5cm	2.1mm
16523	500Å	5μ	10cm	2.1mm
16518	10 <sup>3</sup> Å	5μ	5cm	2.1mm
16524	10 <sup>3</sup> Å	5μ	15cm	2.1mm

<b>Jordi Gel DVB RP Columns - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
16016	300Å	5μ	30cm	7.8mm
16010	300Å	5μ	25cm	10mm
16017	500Å	5μ	30cm	7.8mm
16011	500Å	5μ	25cm	10mm
16018	10 <sup>3</sup> Å	5μ	30cm	7.8mm
16012	10 <sup>3</sup> Å	5μ	25cm	10mm

<b>Jordi Gel DVB RP Columns - Prep 1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
16021	300Å	5μ	10cm	22mm
16121	300Å	5μ	25cm	22mm
16131	300Å	5μ	50cm	22mm
16022	500Å	5μ	10cm	22mm
16122	500Å	5μ	25cm	22mm
16132	500Å	5μ	50cm	22mm
16023	10 <sup>3</sup> Å	5μ	10cm	22mm
16123	10 <sup>3</sup> Å	5μ	25cm	22mm
16133	10 <sup>3</sup> Å	5μ	50cm	22mm

<b>Jordi Gel DVB RP Columns - Prep 2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
16301	300Å	10μ	10cm	50mm
16321	300Å	10μ	25cm	50mm
16331	300Å	10μ	50cm	50mm
16302	500Å	10μ	10cm	50mm
16322	500Å	10μ	25cm	50mm
16332	500Å	10μ	50cm	50mm
16303	10 <sup>3</sup> Å	10μ	10cm	50mm
16323	10 <sup>3</sup> Å	10μ	25cm	50mm
16333	10 <sup>3</sup> Å	10μ	50cm	50mm

## Jordi DVB C<sub>18</sub> RP Columns

DVB C<sub>18</sub> columns are prepared by bonding octadecylamine to our 100% divinylbenzene polymer phase. This unique chemistry imparts higher strength and rigidity to the gels due to the highly cross-linked structure. Jordi DVB C<sub>18</sub> RP columns are 100% carbon loaded as opposed to silica columns providing greatly increased sample loading capacity. Selectivity is similar to C<sub>18</sub> silica-based columns with slightly weaker retention as compared to Jordi DVB columns. Mixed-mode separations can be accomplished in acidic solutions by forming a positive charge on the amine group.



### Advantages of Jordi DVB C<sub>18</sub> RP Columns:

- **Rugged** - high temperature stable and nearly all organic solvents
- **Solvents** - can be changed without damaging the column
- **Wide pH range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Powerful** - high pore-volume for greater resolution
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

### Jordi Gel DVB C<sub>18</sub> Applications and Solvents

#### *Typical Applications:*

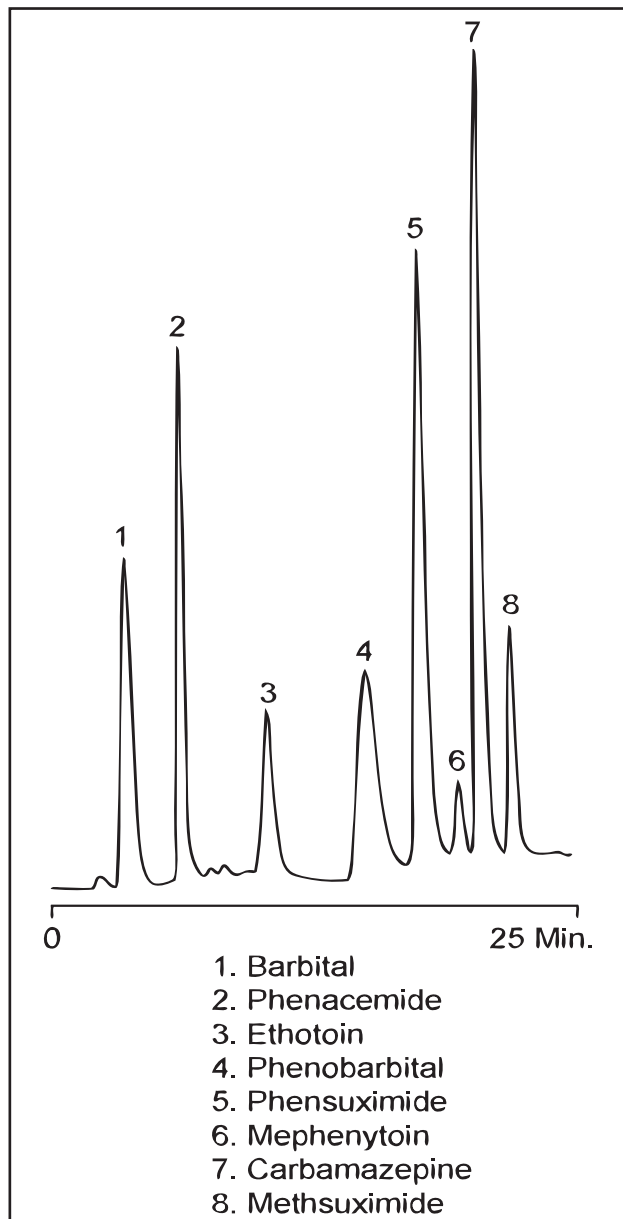
Monophosphate nucleotides  
 Fat Soluble Vitamins  
 Choline compounds  
 Anticonvulsants  
 Fatty Acids  
 Aspirin

#### *Typical Solvent Systems:*

ACN & .1% TFA  
 50/25/25 - H<sub>2</sub>O/MeOH/ACN  
 NaH<sub>2</sub>PO<sub>4</sub>/ACN/Butylamine

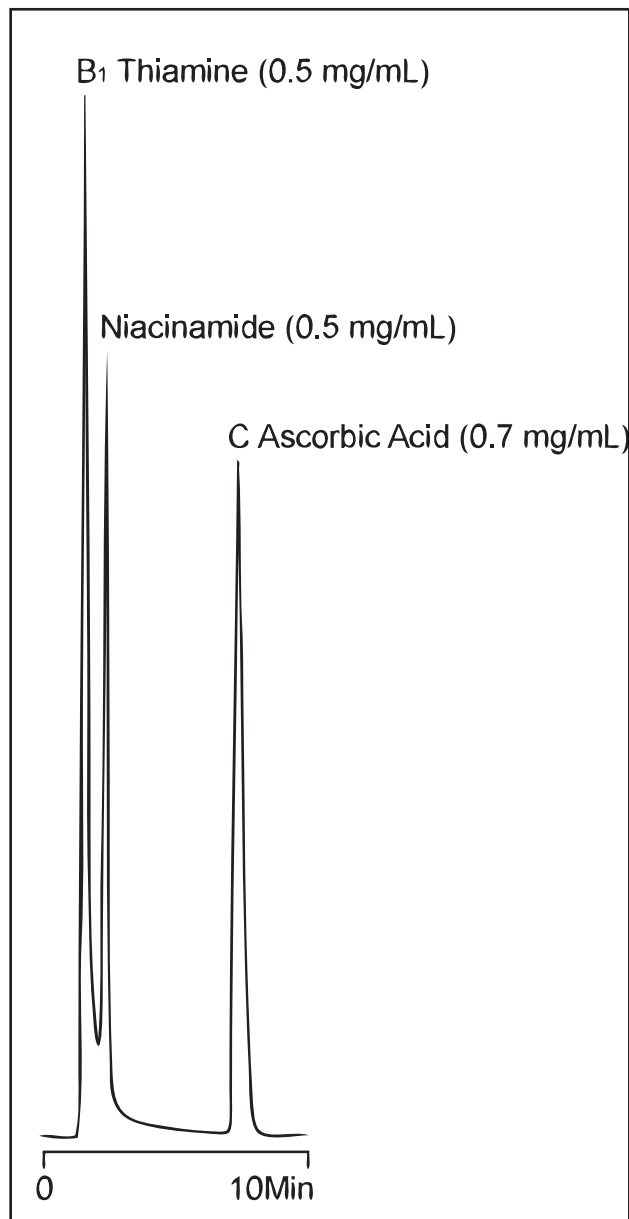
## Select Jordi DVB C<sub>18</sub> RP Applications

### ANTICONVULSANTS



**Part Number:** 18500  
**Packing:** DVB C<sub>18</sub> 500Å  
**Column:** 15cm X 4.6mm ID  
**Solvent A:** H<sub>2</sub>O  
**Solvent B:** 87.5/12.5 ACN/MeOH  
**Flow Rate:** 0.7mL/min.  
**Injection:** 20µL  
**Det. Temperature:** 25°C  
**Detector:** UV @215nm

### WATER SOLUBLE VITAMINS



**18500**  
**Jordi DVB C<sub>18</sub> 500Å**  
**15cm X 4.6mm ID**  
**50/40/10 H<sub>2</sub>O/ACN/MeOH**  
**pH 4.0 w/ CH<sub>3</sub>COOH**  
**0.7mL/min.**  
**15µL**  
**25°C**  
**UV @246nm**



<b>Jordi Gel DVB C<sub>18</sub> RP Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>18503</b>	500Å	5μ	10cm	4.6mm
<b>18500</b>	500Å	5μ	15cm	4.6mm
<b>18501</b>	500Å	5μ	25cm	4.6mm
<b>18502</b>	500Å	5μ	10cm	10mm

<b>Jordi Gel DVB C<sub>18</sub> RP Columns - Mini &amp; Microbore</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>18530</b>	500Å	5μ	5cm	2.1mm
<b>18531</b>	500Å	5μ	10cm	2.1mm

<b>Jordi Gel DVB C<sub>18</sub> RP Columns - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>18016</b>	500Å	5μ	30cm	7.8mm
<b>18010</b>	500Å	5μ	25cm	10mm

<b>Jordi Gel DVB C<sub>18</sub> RP Columns - Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>18020</b>	500Å	5μ	10cm	22mm
<b>18021</b>	500Å	5μ	25cm	22mm

*Specialty columns and packings are available on request. Please contact us for pricing.*

# Core Values

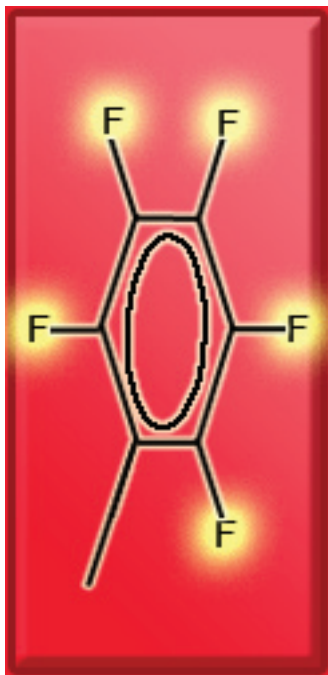
## Teamwork -

We succeed when we work as a group. We grow when we share what we learn with one another.

To see the next Jordi core value turn to page 74.

## Jordi DVB Fluorinated RP columns

The patent pending DVB Fluorinated RP columns have a pentafluorophenyl group attached to the surface of our 100% divinylbenzene packing. They are 100% carbon loaded as opposed to silica columns providing greatly increased sample loading capacity. The Fluorinated phase is much less retentive than standard Jordi DVB RP packings requiring less organic in the mobile phase for elution.



### Advantages of Jordi DVB Fluorinated RP columns:

- **Selective** - fluorinated surface for fluorine interactions
- **Solvents** - can be changed without damaging the column
- **Wide pH Range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Powerful** - high pore-volume for greater resolution
- **Long column life** - 3 month standard warranty
- **Quality** - subjected to rigorous quality checks

Jordi Gel DVB Fluorinated RP Columns				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90360	300Å	5μ	10cm	4.6mm
90350	300Å	5μ	15cm	4.6mm
90340	300Å	5μ	25cm	4.6mm
90370	300Å	5μ	10cm	10mm
90361	500Å	5μ	10cm	4.6mm
90351	500Å	5μ	15cm	4.6mm
90341	500Å	5μ	25cm	4.6mm
90371	500Å	5μ	10cm	10mm
90362	10 <sup>3</sup> Å	5μ	10cm	4.6mm
90352	10 <sup>3</sup> Å	5μ	15cm	4.6mm
90342	10 <sup>3</sup> Å	5μ	25cm	4.6mm
90372	10 <sup>3</sup> Å	5μ	10cm	10mm

<b>Jordi Gel DVB Fluorinated RP Columns - Micro &amp; Minibore</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90306	300Å	5μ	5cm	2.1mm
90059	300Å	5μ	10cm	2.1mm
90307	500Å	5μ	5cm	2.1mm
90068	500Å	5μ	10cm	2.1mm
90308	10 <sup>3</sup> Å	5μ	5cm	2.1mm
90069	10 <sup>3</sup> Å	5μ	10cm	2.1mm

<b>Jordi Gel DVB Fluorinated RP Columns - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90316	300Å	5μ	30cm	7.8mm
90311	300Å	5μ	25cm	10mm
90317	500Å	5μ	30cm	7.8mm
90312	500Å	5μ	25cm	10mm
90318	10 <sup>3</sup> Å	5μ	30cm	7.8mm
90313	10 <sup>3</sup> Å	5μ	25cm	10mm

<b>Jordi Gel DVB Fluorinated RP Columns - Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
90321	300Å	5μ	10cm	22mm
90326	300Å	5μ	25cm	22mm
90322	500Å	5μ	10cm	22mm
90327	500Å	5μ	25cm	22mm
90323	10 <sup>3</sup> Å	5μ	10cm	22mm
90328	10 <sup>3</sup> Å	5μ	25cm	22mm

*Specialty columns and packings are available on request. Please tcontact us for pricing.*

## Jordi DVB Hydroxylated RP Columns

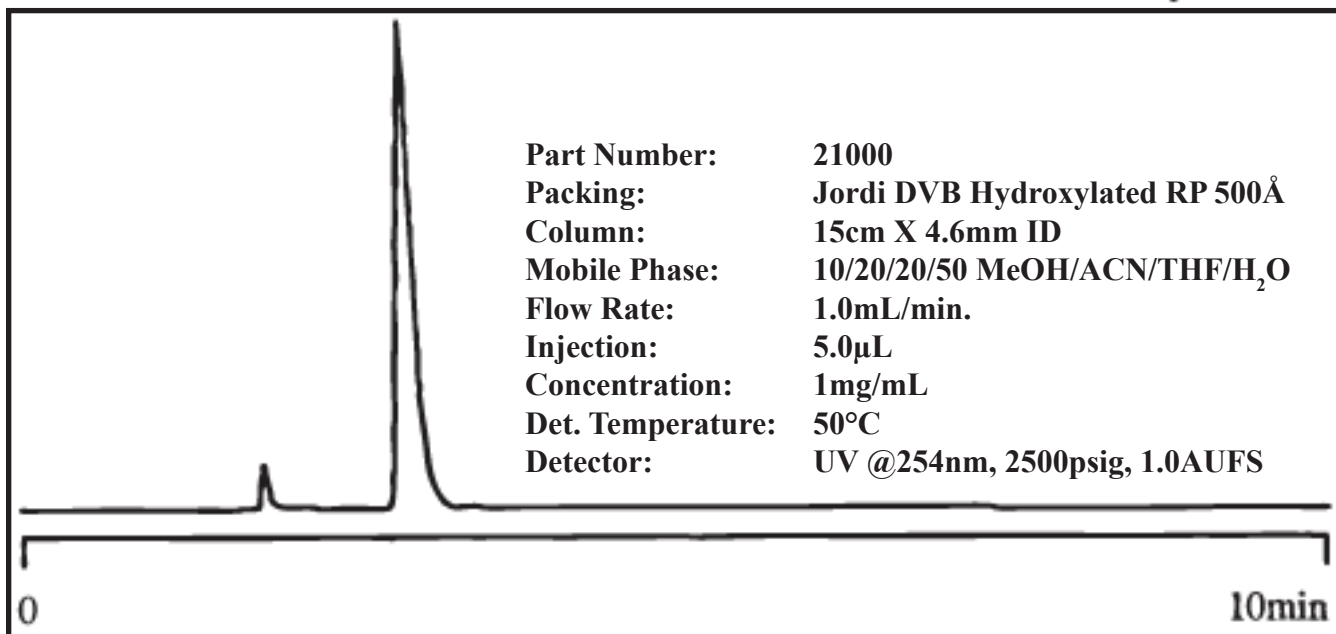
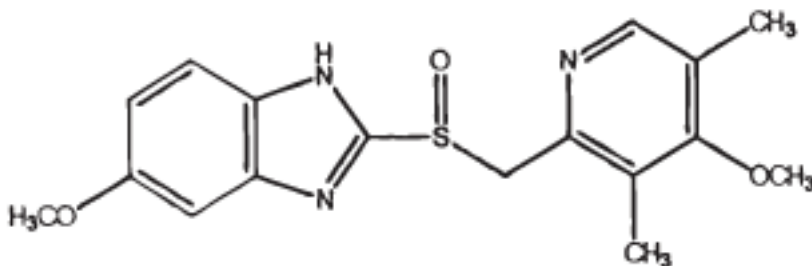
Jordi DVB Hydroxylated RP columns are formed from our 100% divinylbenzene-based polymer functionalized with diol groups. Jordi DVB Hydroxylated RP columns are 100% carbon loaded as opposed to silica columns providing greatly increased sample loading capacity. Diol functionality allows for hydrogen bond formation and different selectivity from our hydrophobic phases.



### Advantages of Jordi DVB Hydroxylated RP Columns:

- **Solvents** - can be changed without damaging the column
- **Wide pH Range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Powerful** - high pore-volume for greater resolution
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

### ANTIULCERATIVE OMEPRAZOLE



<b>Jordi Gel DVB Hydroxylated RP Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
21007	500Å	5μ	10cm	4.6mm
21000	500Å	5μ	15cm	4.6mm
21001	500Å	5μ	25cm	4.6mm
21002	500Å	5μ	10cm	10mm

<b>Jordi Gel DVB Hydroxylated RP Columns - Micro &amp; Minibore</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
21016	500Å	5μ	5cm	2.1mm
21017	500Å	5μ	10cm	2.1mm

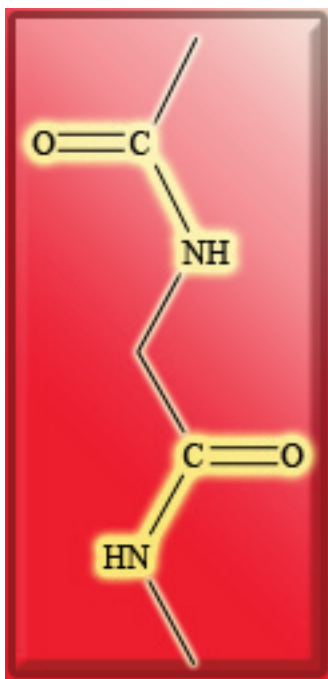
<b>Jordi Gel DVB Hydroxylated RP Columns - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
21006	500Å	5μ	30cm	7.8mm
21003	500Å	5μ	25cm	10mm

<b>Jordi Gel DVB Fluorinated RP Columns - Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
21004	500Å	5μ	10cm	22mm
21005	500Å	5μ	25cm	22mm

*Specialty columns and packings are available on request. Please telephone us for pricing.*

## Jordi Peptide Protein Columns

Peptide Protein columns are a polyamide-based gel for the reverse phase analysis of peptides, proteins and other polar molecules. Peak shapes for many basic organic materials are improved as compared to results on hydrophobic phases. Peptide protein columns are currently being used by major pharmaceutical companies as well as government health organizations for protein analysis.



### Advantages of Jordi Peptide Protein Columns:

- **Rugged** - useful at high temperatures (150°C) and with nearly any solvent
- **Solvents** - can be changed without damaging the column
- **Wide pH Range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

Polyamide gel can be used with virtually any organic and/or buffer system including:

- **TRIS**
- **Phosphate**
- **Acetic acid**
- **Trifluoroacetic acid**
- **Methanol, Acetonitrile, THF**

Acetic or Formic Acids serve as an excellent replacement for TFA for MS analysis of proteins and peptides used in gradients of water to acetonitrile.

### Jordi Peptide Protein Applications and Solvents

#### *Example Applications:*

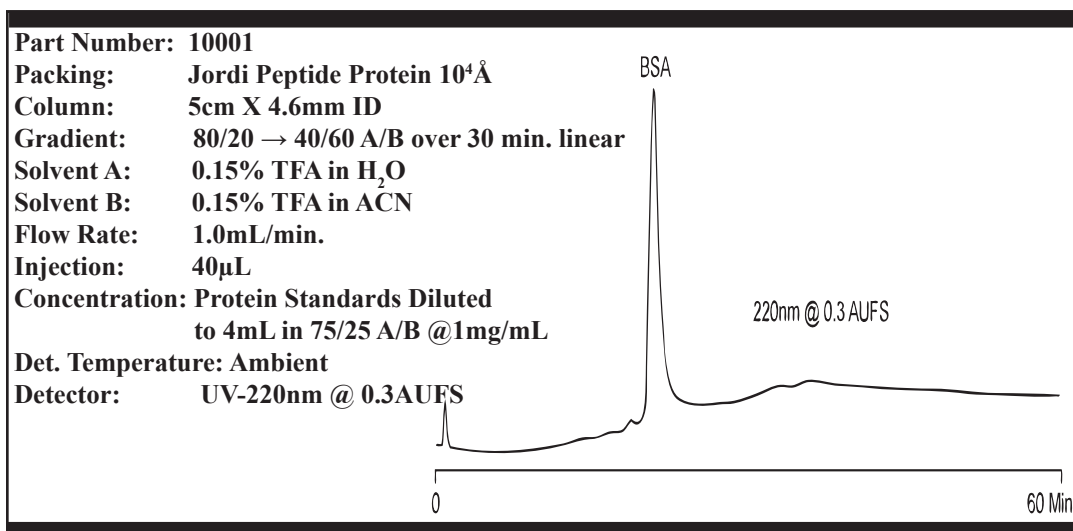
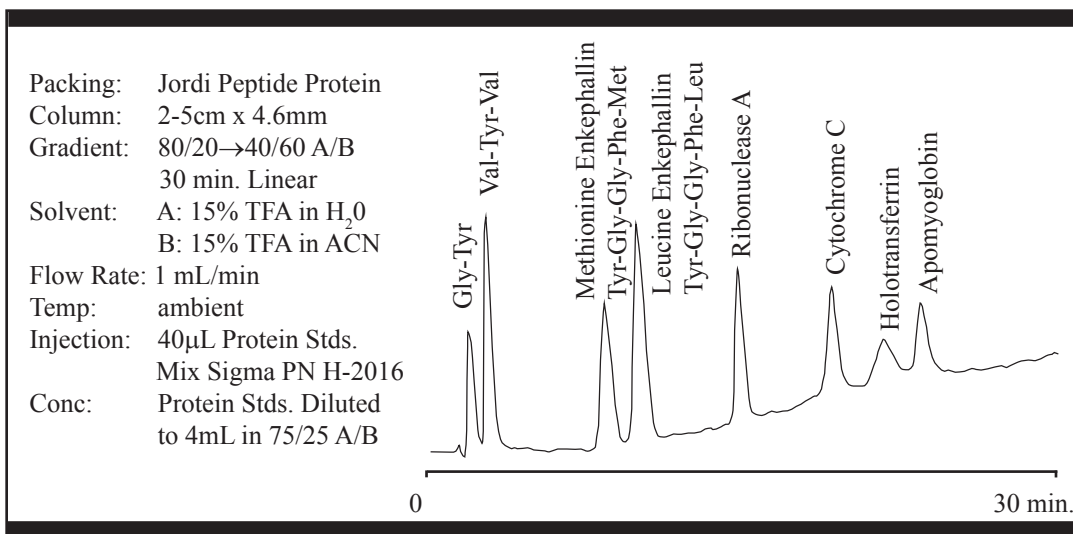
BSA  
 Holotransferrin  
 Cytochrome C  
 Apomyoglobin  
 Peptides

#### *Typical Solvent Systems:*

ACN & .1% TFA  
 ACN/Acetic Acid 98/2  
 H<sub>2</sub>O/Acetic Acid 98/2

## Select Jordi Peptide Protein Applications

Peptide Protein columns maintain virtually all the benefits of our DVB resins such as wide pH range stability, high temp stability and high pressure stability. In addition, the polyamide backbone adds hydrophilicity which in turn allows complex molecules such as proteins and peptides to elute easily. This can be contrasted with DVB resins which tend to strongly and irreversibly adsorb proteins and many peptides. Peptide Protein columns are an excellent choice for reverse phase analysis.





<b>Jordi Peptide Protein for RP</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10001</b>	10 <sup>4</sup> Å	5μ	5cm	4.6mm
<b>10002</b>	10 <sup>4</sup> Å	5μ	10cm	4.6mm
<b>10003</b>	10 <sup>4</sup> Å	5μ	15cm	4.6mm
<b>10004</b>	10 <sup>4</sup> Å	5μ	25cm	4.6mm

<b>Jordi Peptide Protein for RP -Mini &amp; Micro</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10106</b>	10 <sup>4</sup> Å	5μ	5cm	2.1mm
<b>10108</b>	10 <sup>4</sup> Å	5μ	10cm	2.1mm

<b>Jordi Peptide Protein for RP - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10201</b>	10 <sup>4</sup> Å	5μ	5cm	10mm
<b>10202</b>	10 <sup>4</sup> Å	5μ	10cm	10mm
<b>10204</b>	10 <sup>4</sup> Å	5μ	25cm	10mm
<b>10104</b>	10 <sup>4</sup> Å	5μ	30cm	7.8mm

<b>Jordi Peptide Protein for RP - Prep-1" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10301</b>	10 <sup>4</sup> Å	5μ	5cm	22mm
<b>10302</b>	10 <sup>4</sup> Å	5μ	10cm	22mm
<b>10304</b>	10 <sup>4</sup> Å	5μ	25cm	22mm

<b>Jordi Peptide Protein for RP - Prep-2" OD</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10502</b>	10 <sup>4</sup> Å	5μ	10cm	50mm
<b>10504</b>	10 <sup>4</sup> Å	5μ	25cm	50mm

<b>Jordi Peptide Protein for RP - PEEK Hardware</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>10150</b>	10 <sup>4</sup> Å	5μ	15cm	4.6mm
<b>10151</b>	10 <sup>4</sup> Å	5μ	25cm	4.6mm
<b>10156</b>	10 <sup>4</sup> Å	5μ	25cm	10mm

# Core Values

## Integrity -

The guiding principle that  
overrides all other  
concerns.

We do what we say we will do.

To see the next Jordi core value turn to page 78.

## Jordi Gel DVB Fast Protein Analysis Non-Porous Resin

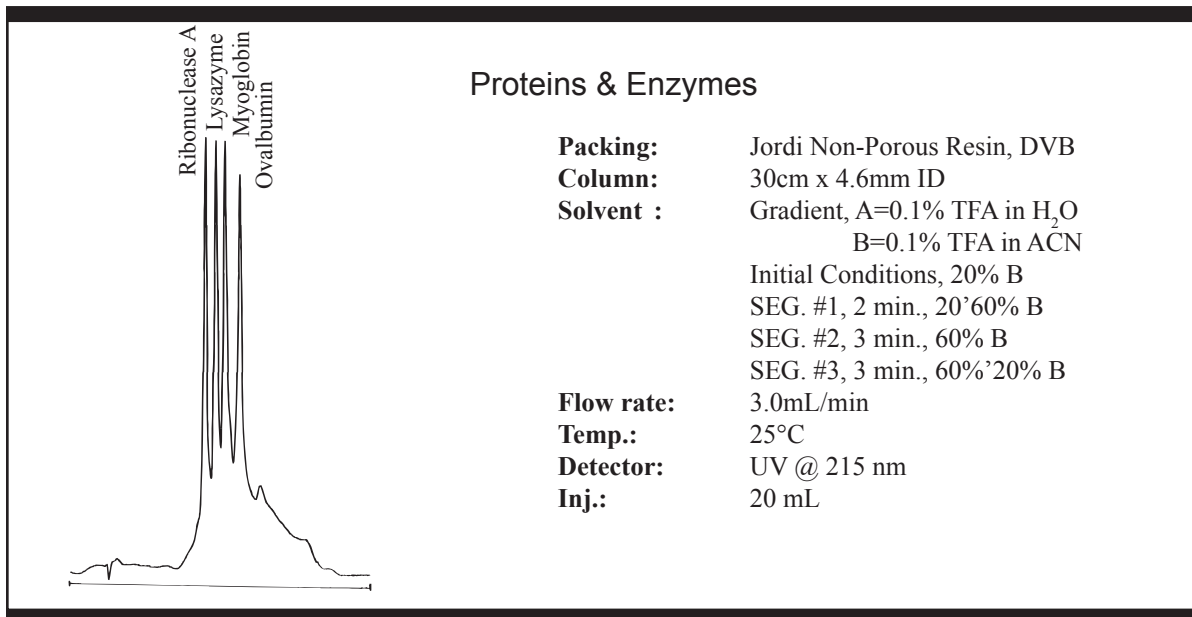
Non-porous resin columns allow the rapid analysis of peptides and proteins using gradients of water to acetonitrile containing .1% TFA. Columns are prepared from 100% divinylbenzene imparting greater strength and rigidity to the gels. This allows the use of nearly any solvent for column conditioning including 1M NaOH. Jordi DVB columns have undergone over 25 years of refinement. They are unique in their ability to be used in virtually any solvent and remain extremely durable.



### Advantages of Jordi DVB Columns:

- **Rugged** - high temperature stable and virtually all organic solvents
- **Solvents** - can be changed without damaging the column
- **Wide pH range** - pH values from 0 to 14
- **Long column life** - 3 month warranty standard
- **Quality** - DVB RP columns have been in continuous production for over 25 years and are subjected to rigorous quality check

Jordi Fast Protein Analysis Non Porous Columns				
Cat. #	Pore Size	Particle Size	Length X	ID
17020	Solid Bead	5 $\mu$	3.0cm	4.6mm



### Proteins & Enzymes

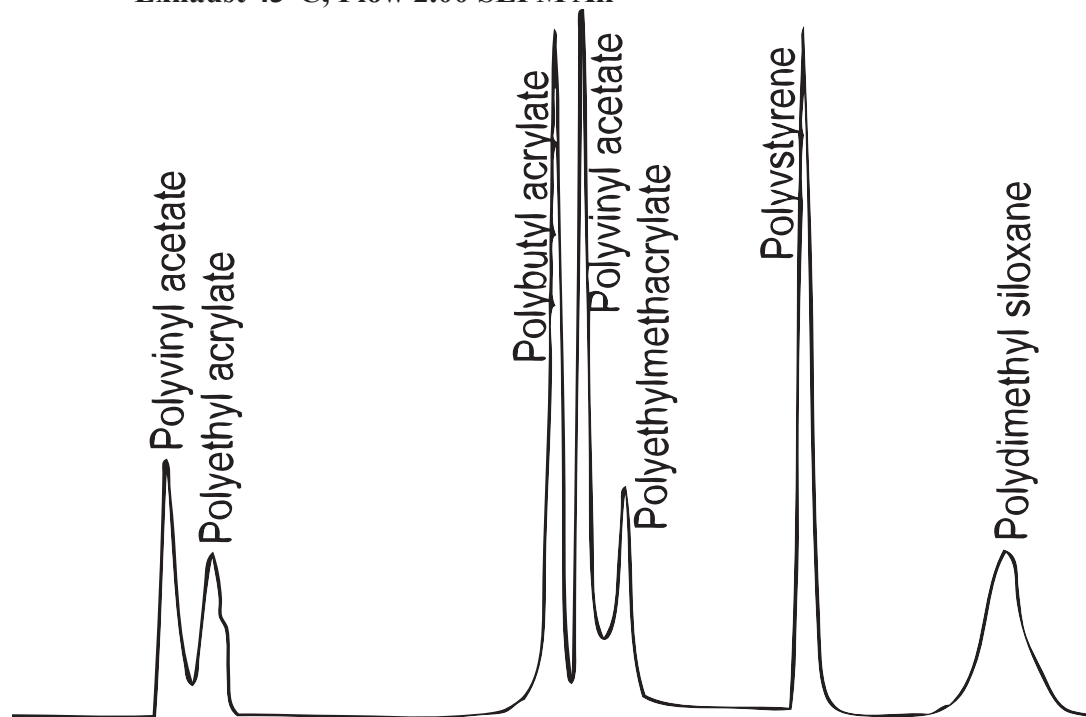
**Packing:** Jordi Non-Porous Resin, DVB  
**Column:** 30cm x 4.6mm ID  
**Solvent :** Gradient, A=0.1% TFA in H<sub>2</sub>O  
 B=0.1% TFA in ACN  
 Initial Conditions, 20% B  
 SEG. #1, 2 min., 20'60% B  
 SEG. #2, 3 min., 60% B  
 SEG. #3, 3 min., 60'20% B  
**Flow rate:** 3.0mL/min  
**Temp.:** 25°C  
**Detector:** UV @ 215 nm  
**Inj.:** 20 mL

## Jordi Normal Phase

Jordi Normal Phase (NP) columns allow separations based on compound polarity as opposed to hydrophobicity. The development of NP was limited historically by poor run-to-run reproducibility due to long equilibration times on polar stationary phases. Jordi NP columns overcome this limitation due to our robust polymeric packing materials. This enables more rapid equilibration rates without damaging the column. NP columns can be used for the separation of complex mixtures by functional group class. All Jordi NP columns are completely pH stable from 0-14 and have no known solvent limitations.

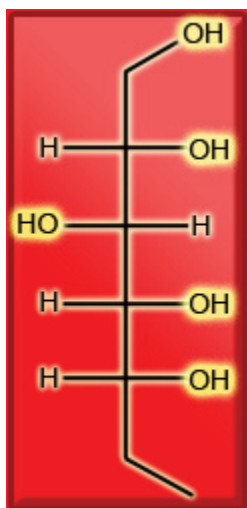
### POLYMER CLASS SEPARATION USING RP/NP CHROMATOGRAPHY

**Part Number:** 16508  
**Packing:** Jordi DVB Reverse Phase 10<sup>3</sup>Å  
**Column:** 25cm X 4.6mm ID  
**Gradient:** 100/0 → 0/100 ACN/CHCl<sub>3</sub> linear over 30 min.  
**Flow Rate:** 1.0mL/min.  
**Injection:** 20µL  
**Conc.:** 5mg/mL  
**Det. Temperature:** 65°C  
**Detector:** Alltech 500 ELSD: ATTN 16, Heater 65°C  
Exhaust 43°C, Flow 2.00 SLPM Air



## Jordi NP DVB Glucose Columns

NP DVB glucose columns enable the normal phase separation of a wide range of compounds based on their polarity. Weakly polar compounds are found to elute first followed by more polar components. This can be used to fractionate a sample based on the functional groups present in each molecule. Gradients are the opposite of those typically used for RP chromatography and thus a gradient from a non-polar solvent to a more polar solvent is used.



### Advantages of Jordi Gel Glucose Columns:

- **Class based separations**
- **Efficiency** - High column plate counts
- **Ease of Use** - Rapid recovery of the phase following gradient analysis
- **Rugged** - solvent changes will not damage columns
- **Solvent compatibility** - 100% organic to 100% aqueous buffers
- **Wide pH range** - pH values from 0 to 14.
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

Jordi NP DVB Glucose Columns				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
18603	500Å	5μ	10cm	4.6mm
18600	500Å	5μ	15cm	4.6mm
18601	500Å	5μ	25cm	4.6mm
18602	500Å	5μ	10cm	10mm

Jordi NP DVB Glucose Columns - Mini & Microbore				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
18640	500Å	5μ	5cm	2.1mm
18641	500Å	5μ	10cm	2.1mm

Jordi NP DVB Glucose Columns - Semi Prep				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
18611	500Å	5μ	30cm	7.8mm
18610	500Å	5μ	25cm	10mm

Jordi NP DVB Glucose Columns - Prep				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
18620	500Å	5μ	10cm	22mm
18621	500Å	5μ	25cm	22mm

## Core Values

### Excellence -

We strive to be the very best at what we do and choose to exit from business, which we cannot perform at a high level of quality.

To see the next Jordi core value turn to page 80.

## Jordi NP DVB Polyamino Columns

NP DVB Polyamino columns contain secondary amino groups which quaternize in acidic solutions, allowing mixed-mode ion exchange and normal phase separations. Normal Phase separations are used to separate molecules based on their polarity as opposed to their hydrophobicity as in RP. Weakly polar compounds are found to elute first followed by more polar components. This can be used to fractionate a sample based on the functional groups present in each molecule. Gradients are the opposite of those typically used for RP chromatography and thus a gradient from a non-polar solvent to a more polar solvent is used.



### Advantages of Jordi NP DVB Polyamino Columns:

- **Class based separations**
- **Efficiency** - high column plate counts
- **Mixed-mode separations** - combining ion exchange and normal phase
- **Ease of Use** - rapid recovery of the phase following gradient analysis
- **Rugged** - solvent changes will not damage columns
- **Solvent compatibility** - 100% organic to 100% aqueous buffers
- **Wide pH range** - pH values from 0 to 14.
- **Long column life** - 3 month warranty standard
- **Quality** - subjected to rigorous quality checks

Jordi NP DVB Polyamino Columns				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
17053	500Å	5μ	10cm	4.6mm
17050	500Å	5μ	15cm	4.6mm
17051	500Å	5μ	25cm	4.6mm
17052	500Å	5μ	10cm	10mm

Jordi NP DVB Polyamino Columns - Minibore				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
17062	500Å	5μ	10cm	2.1mm

Jordi NP DVB Polyamino Columns - Semi Prep				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
17077	500Å	5μ	30cm	7.8mm
17076	500Å	5μ	25cm	10mm

Jordi NP DVB Polyamino Columns - Prep				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
17081	500Å	5μ	10cm	22mm
17082	500Å	5μ	25cm	22mm

## Core Values

Servant-hood, Christ Likeness -

Considering the needs of our customers and exceeding their expectations.

To see the next Jordi core value turn to page 84.

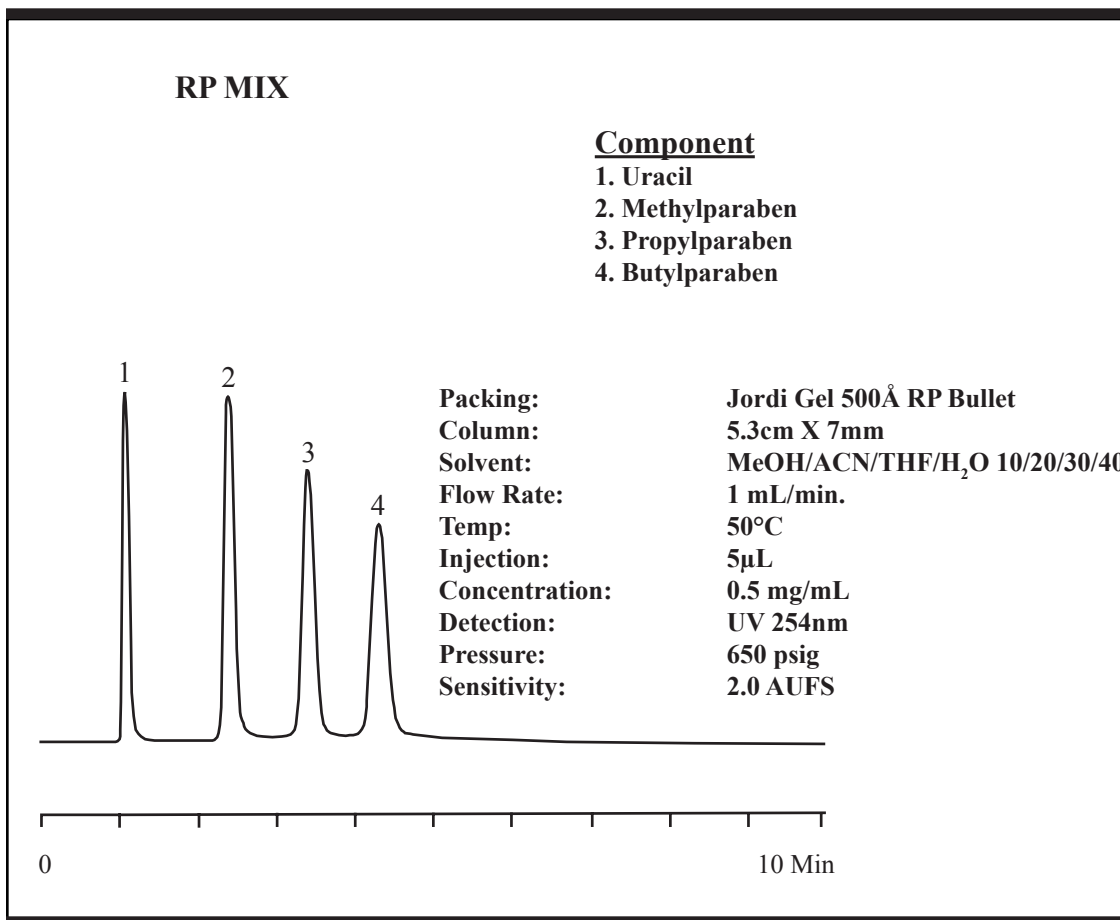


## Jordi RP & NP Bullet Columns

Decrease your analysis time for RP and NP separations using Jordi bullet columns. These columns are packed with the same quality gels found in our other normal phase and reverse phase products. The bullet hardware allows for decreased analysis times by optimizing the column size and flow characteristics.

### Advantages of Jordi RP & NP Bullet Columns:

- **Broad Application** - wide selection of surface chemistries
- **Time Savings** - decreased analysis times, five minutes or less
- **Solvent** - no increase in solvent consumption per analysis



<b>Jordi Gel DVB RP Bullet Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60025</b>	300Å	5μ	5.3cm	7mm
<b>60026</b>	500Å	5μ	5.3cm	7mm
<b>60027</b>	10 <sup>3</sup> Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB Fluorinated RP Bullet Columns</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60020</b>	300Å	5μ	5.3cm	7mm
<b>60021</b>	500Å	5μ	5.3cm	7mm
<b>60022</b>	10 <sup>3</sup> Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB C18 RP Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60040</b>	500Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB Hydroxylated RP Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60035</b>	500Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB Glucose NP Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60046</b>	500Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB Polyamino Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60055</b>	500Å	5μ	5.3cm	7mm

<b>Jordi Gel DVB Sulfonated Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60001</b>	500Å	5μ	5.3cm	7mm

<b>Jordi Peptide Protein Bullet Column</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>60060</b>	10 <sup>4</sup> Å	5μ	5.3cm	7mm

## Jordi Ion Chromatography Columns

Jordi offers three different resins for ion exchange chromatography including a SAX, WAX, and SCX. Jordi SAX Quat columns contain a quaternated amino group covalently bound to our 100% DVB media. Sulfonated resins for strong cation exchange and secondary amino columns for weak anion exchange are also available upon request.

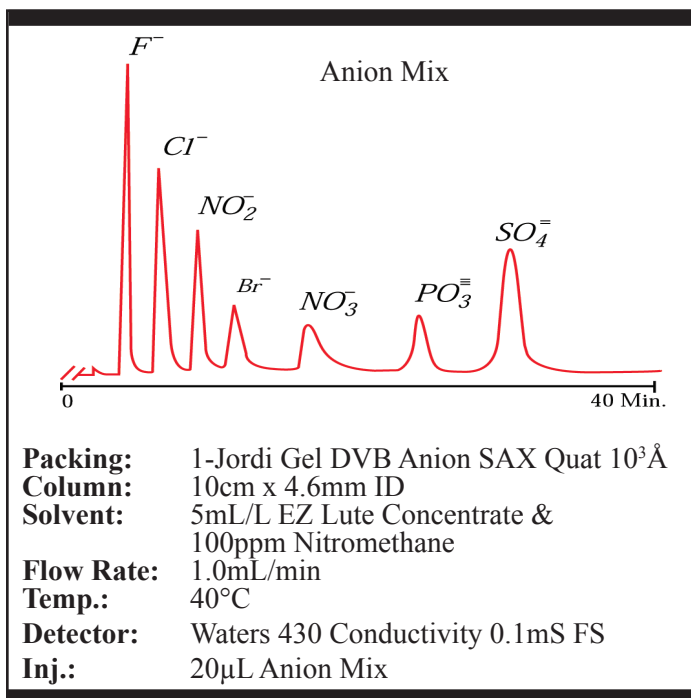


### Jordi DVB SAX Quat Columns

Separation of a wide range of inorganic anions can be accomplished using Jordi DVB SAX Quat columns. These columns contain a quaternary amine functional group covalently bound to a 100% DVB resin. Fluoride, chloride, nitrate, nitrite, sulfate, and phosphate can be analyzed in a single analysis.

#### Advantages of Jordi DVB SAX Quat Columns:

- **Rugged** - high column stability compatible with nearly any solvent
- **Solvents** - can be changed without damaging the column
- **Wide pH range** - pH values from 0 to 14
- **Efficient** - high plate counts for sharp, symmetrical peaks
- **Long column life** - 3 month warranty standard



Jordi SAX Quat DVB Application and Solvent	
<b>Typical Application:</b>	Inorganic Ions
<b>Typical Solvent System:</b>	5mL/L EZ Lute Concentrate and 25ppm Nitromethane

Jordi SAX Quat DVB				
Cat. #	Pore Size	Particle Size	Length	ID
18701	$10^3 \text{ \AA}$	5µ	10cm	4.6mm

## Core Values

Innovation -

A company which brings new technology into the marketplace and which embraces change.

To see the next Jordi core value turn to page 86.

## Jordi DVB Organic Acid Columns

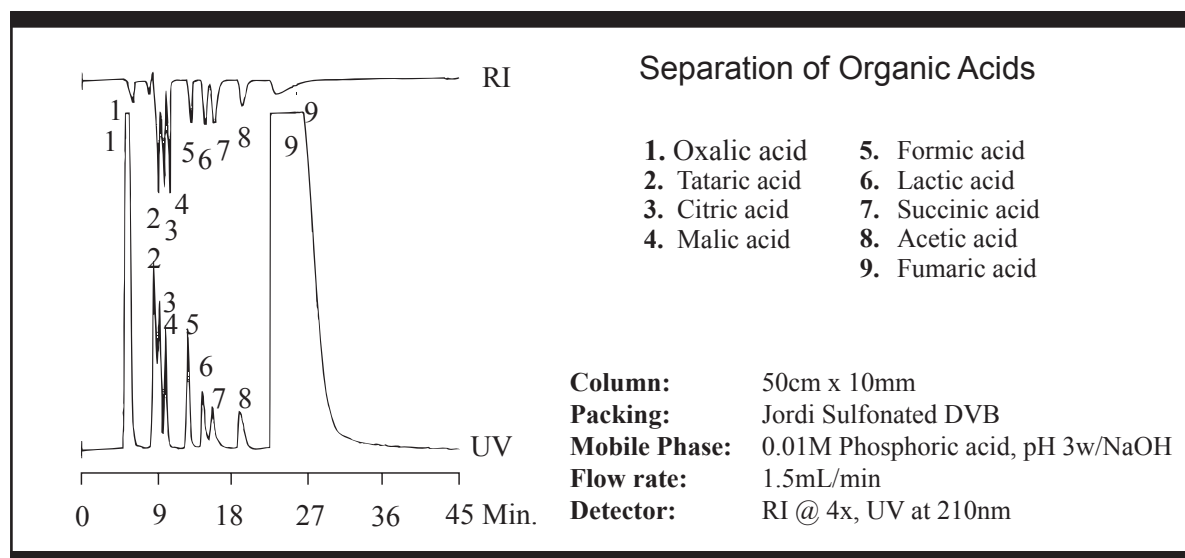
Organic acid columns contain a 500Å sulfonated resin enabling the size-based separation of organic acids. Sample-column interaction is prevented by charge-charge repulsion. Other types of acidic compounds can also be separated by size.



The following acids can be separated:

- Oxalic Acid
- Tartaric Acid
- Citric Acid
- Malic Acid
- Formic Acid
- Lactic Acid
- Succinic Acid
- Acetic Acid
- Fumaric Acid

The ruggedness of the packing allows column clean-up with solvents which other packings cannot tolerate. Strong bases, acids or organic solvents can be used to remove contamination without damaging the packing material.



Jordi DVB Organic Acid Columns				
Cat. #	Pore Size	Particle Size	Length	ID
17001	500Å	5µ	25cm	10mm
17000	500Å	5µ	50cm	10mm

## Core Values

**T**eamwork -

We succeed when we work as a group. We grow when we share what we learn with one another.

## Jordi NP DVB Polyamino Columns

Polyamino columns are designed for the separation of a broad range of sugars and higher molecular weight oligomers. Polyamino packings contain a high concentration of (NH and NH<sub>2</sub>) functional groups bonded to a 500Å porosity, highly crosslinked, DVB bead. 5µ particle size is used to obtain high efficiency separations.

The strong amine bonding chemistry allows their application under highly acidic or basic conditions and in a wide range of solvents. They are also temperature stable up to 100°C with no adverse effects.



### Advantages of Jordi NP DVB Polyamino Columns:

- **Efficient** - high column plate counts
- **Mixed-mode separations** - combining ion exchange and normal phase
- **Ease of Use** - rapid recovery of the phase following gradient analysis
- **Rugged** – solvent changes will not damage columns
- **Solvent compatibility** - 100% organic to 100% aqueous buffers
- **Wide pH range** - pH values from 0 to 14
- **Long column life** – 3 month warranty standard

#### Jordi NP DVB Polyamino Applications and Solvents

##### *Typical Application:*

Sugar Separations

##### *Typical Solvent System:*

ACN

H<sub>2</sub>O

Methanol

# Polyamino Sugar Columns

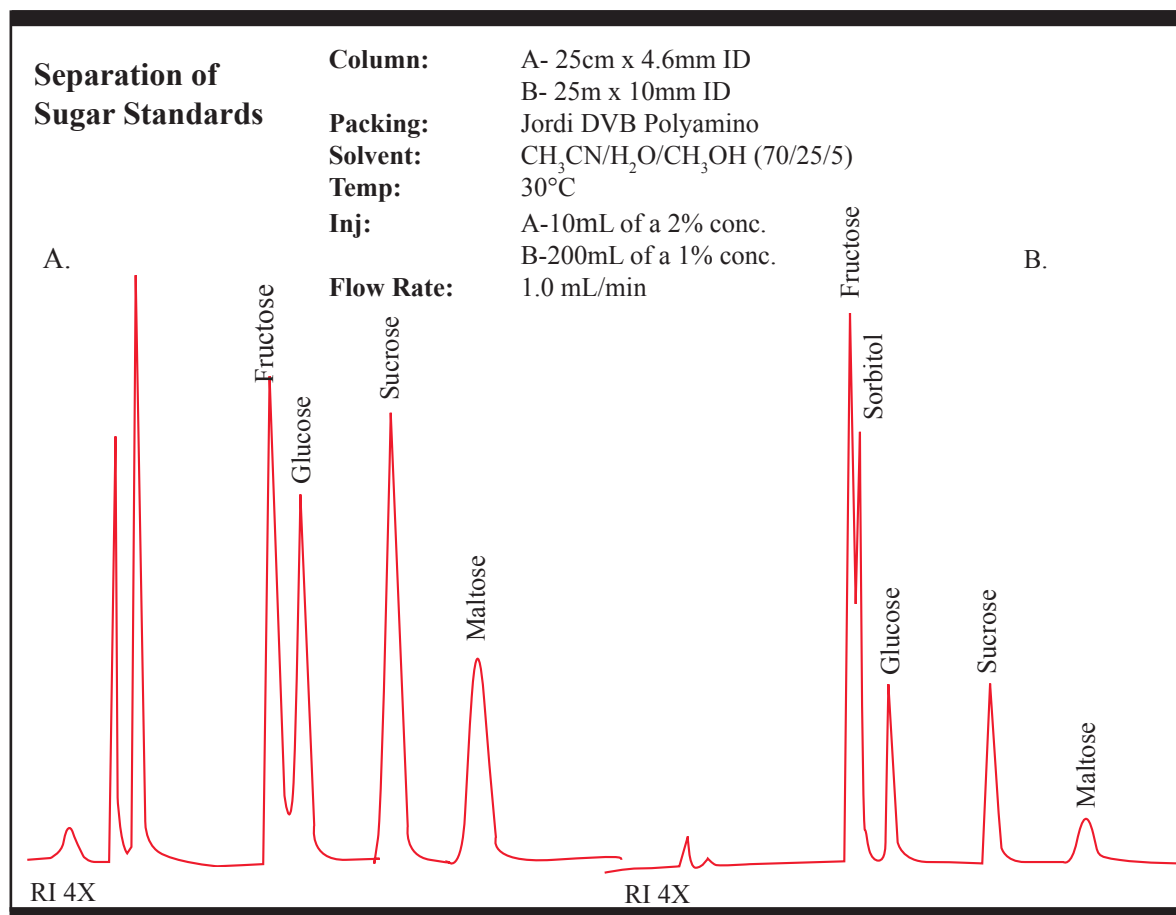
## Select Jordi NP DVB Polyamino Applications

Jordi NP DVB Polyamino columns for the analysis of sugars utilizes a polyamine (NH and NH<sub>2</sub>) bonded to the surface of a 500Å porosity, highly cross-linked, divinylbenzene polymer.

This unique combination of the polyamine surface functionality bonded to the extremely rugged base material provides the ability to separate a wide range of sugars. Higher molecular weight oligomers can be analyzed on the same column.

The particle size of the packing material averages 5 microns. This small particle size provides high efficiencies for modern HPLC. Because of the strength of the highly cross-linked DVB base material, the columns can be operated at pressures up to 30,000psig with no adverse effects.

The NH<sub>2</sub> functionality is chemically bonded to the surface of DVB; it remains on the surface, and the column retains the original separation characteristics for long periods of use. The column can also be cleaned and rejuvenated using strong acids, bases, or organic solvents to remove any adsorbed contaminants.





# Polyamino Sugar Columns

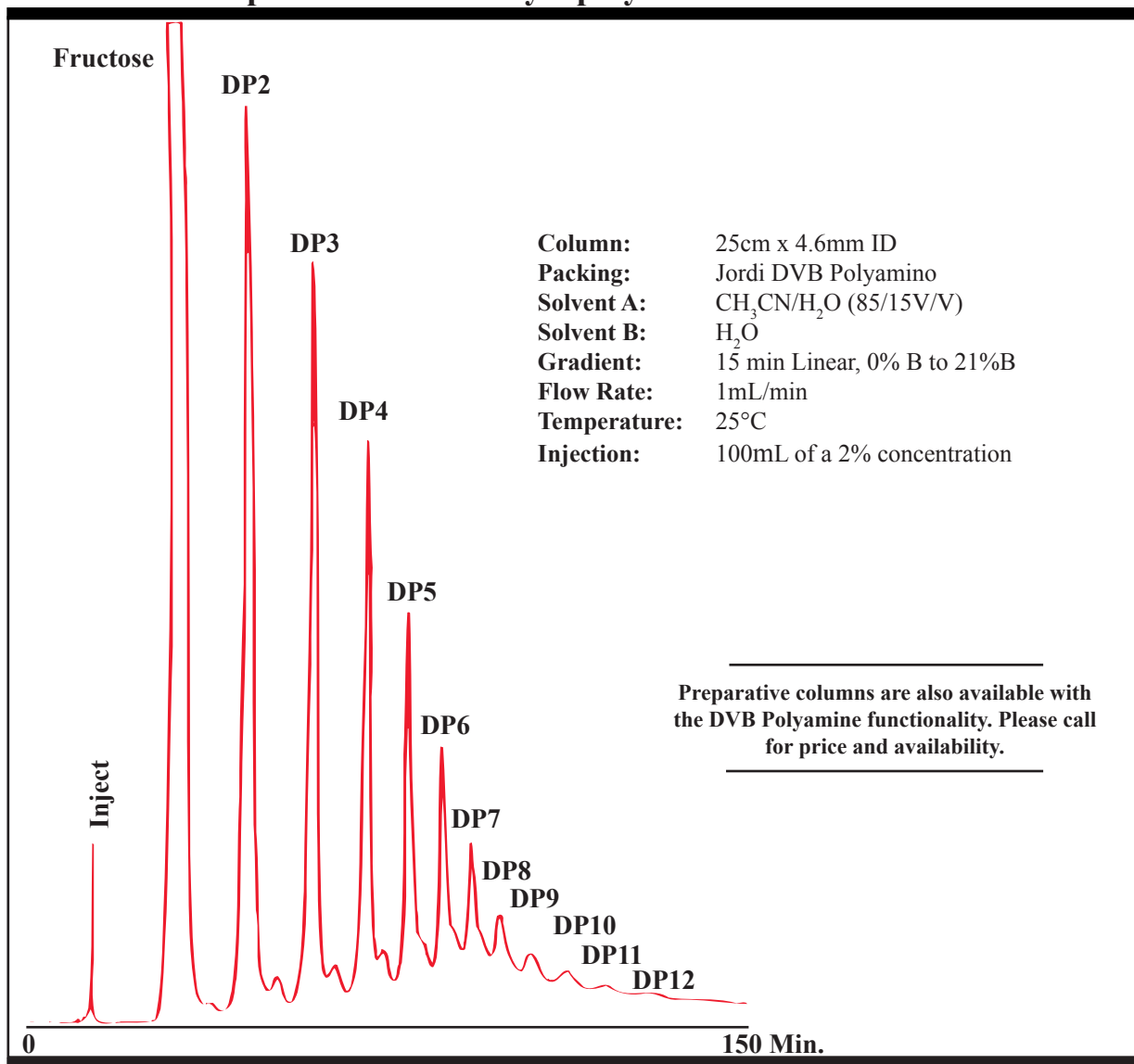
## Separation of Corn Syrup by Gradient Elution

Gradient elution provides increased separation capability for higher molecular weight sugars. The example below shows good resolution up to DP 12, although higher molecular weights could also be separated.

Temperature stability is excellent with the Jordi DVB polyamino columns and they can be readily operated up to 100°C with no adverse effects.

Jordi NP DVB Polyamino columns are available in two standard sizes, 25cm x 4.6mm ID and 25cm x 10mm ID. The 25cm x 10mm column provides greater resolving power with four times the sample loading capacity while the 25cm x 4.6mm column reduces analysis time.

### Separation of Corn Syrup by Gradient Elution



# Polyamino Sugar Columns

<b>Jordi Polyamino Sugar</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>17013</b>	500Å	5μ	15cm	4.6mm
<b>17010</b>	500Å	5μ	25cm	4.6mm

<b>Jordi Polyamino - Microbore</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>17016</b>	500Å	5μ	5cm	2.1mm

<b>Jordi Polyamino - Semi Prep</b>				
<i>Cat. #</i>	<i>Pore Size</i>	<i>Particle Size</i>	<i>Length</i>	<i>ID</i>
<b>17012</b>	500Å	5μ	30cm	7.8mm
<b>17011</b>	500Å	5μ	25cm	10mm

## Jordi Guard Columns

Guard columns are an excellent way to protect the investment you have made in your analytical columns. This is especially true when working with unknown samples which may contain reactive or adsorbable materials. A guard column is a shorter version of the analytical column which is sacrificed in order to protect your main column.

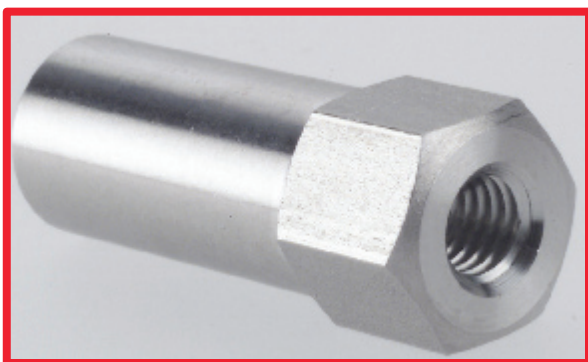
Jordi Guard columns are available for all GPC columns and most RP and NP columns. In all cases, your Guard column(s) will be packed with the same high quality gels used in your analytical column.

Jordi Guard Columns come in two porosities. Jordi 500Å guard columns protect porosities of 100Å, 500Å, and 10<sup>3</sup>Å. Our mixed bed guard columns protect porosities of 10<sup>4</sup>Å, 10<sup>5</sup>Å, and Mixed Bed. For example, if you are purchasing P/N 15001 Jordi 500Å DVB Column, you can protect it with P/N 15001G5 Jordi 500Å DVB Guard Column. If you are purchasing P/N 15063 Jordi 10<sup>4</sup>Å Glucose Column, you can protect it with P/N 15065G5 Jordi MB Glucose Guard Column. Jordi guard columns come in 10mm x 50mm and 7.8mm x 40mm sizes. Customized solutions are available if larger sizes are desired.

See our easy-to-use guide on the next page for the appropriate guard column. If you need additional assistance selecting the correct guard column, please contact customer service or use our Guard Column Finder at <http://www.jordiflp.com/guard.php>.



Jordi Guard Columns				
<i>Gel Type</i>	<i>Cat. #</i>	<i>Main Column</i>	<i>Porosity Guarded</i>	<i>Sizes Guarded</i>
DVB	15001G5	15000, 15001, 15002, 15020, 15021, 15022	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	15071G4	15070, 15071, 15072		7.8mm x 300mm
	15005G5	15003, 15004, 15005, 15023, 15024, 15025	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	15075G4	15073, 15074, 15075		7.8mm x 300mm
Fluorinated	90011G5	90000, 90001, 90002, 90010, 90011, 90012	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	90061G4	90060, 90061, 90062		7.8mm x 300mm
	90015G5	90003, 90004, 90005, 90013, 90014, 90015	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	90065G4	90063, 90064, 90065,		7.8mm x 300mm
Glucose	15061G5	15050, 15051, 15052, 15060, 15061, 15062	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	30061G4	30060, 30061, 30062		7.8mm x 300mm
	15065G5	15053, 15054, 15055, 15063, 15064, 15065	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	30065G4	30063, 30064, 30065		7.8mm x 300mm
Hydroxylated	20001G5	19000, 19001, 19002, 20000, 20001, 20002	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	20011G4	20010, 20011, 20012		7.8mm x 300mm
	20005G5	19003, 19004, 19005, 20003, 20004, 20005	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	20015G4	20013, 20014, 20015		7.8mm x 300mm
Sulfonated	15041G5	15030, 15031, 15032, 15040, 15041, 15042	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	15721G4	15720, 15721, 15722		7.8mm x 300mm
	15045G5	15033, 15034, 15035, 15043, 15044, 15045	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	15725G4	15723, 15724, 15725		7.8mm x 300mm
Polar Pack WAX	15091G5	15080, 15081, 15082, 15090, 15091, 15092	100Å, 500Å, 10 <sup>3</sup> Å	10mm x 250mm
	15701G4	15700, 15701, 15702		7.8mm x 300mm
	15095G5	15083, 15084, 15085, 15093, 15094, 15095	10 <sup>4</sup> Å, 10 <sup>5</sup> Å, Mixed Bed	10mm x 250mm
	15705G4	15703, 15704, 15705		7.8mm x 300mm



Thank you for purchasing a Jordi column. We strive to provide the highest quality HPLC columns on the market. Our goal is to make you successful. If you experience any problems or need any technical advice, please call or email us; we are here to help you. All Jordi columns are warranted for 90 days from the date received.

For technical support, Jordi customer service is available at:

Email: [techsupport@jordiflp.com](mailto:techsupport@jordiflp.com)

Phone: 508-966-1301

## Installation

Jordi recommends the use of stainless steel tubing of 1/16" OD and 0.010" ID for column connections of analytical columns. Preparative columns 22mm and greater require 0.020" ID tubing. Excessive tubing volume should be avoided by minimizing the tubing length between the column, detector and injector. The use of Jordi Column Connectors is recommended when connecting multiple columns in series. These connectors come preassembled and ready to use. For more information, see the Jordi Column Accessories on page 115.

## General Guidelines for All Jordi Columns

In an effort to maximize column life expectancy and performance, steps should be taken to prepare each sample before injection. This should include sample filtration to remove particulates, and possibly, solid phase extraction (SPE) to remove highly retained sample components. Jordi offers a complete line of SPE products for sample cleanup.

Jordi recommends using a guard column to protect your analytical column. The guard column will help protect your analytical column from particulate matter and highly retained sample components. The guard column should be changed when performance measures decline, such as plate count, pressure, or resolution. A list of Jordi guard columns is found on page 92.

Optimum sample injection volumes and concentrations are best determined for each type of analysis and are dependent on sample MW. Broad distribution polymers can generally be injected at higher concentrations than lower polydispersity samples. Overloading will not damage the Jordi column, but distorted peaks and questionable results may occur.

## Tips For Best Results with GPC Columns

1. Run your column at 0.5-2.0mL/min for maximum life and best results. Our recommended flow rates for organic GPC columns are 1.5mL/min for 10mm sizes and 1.0mL/min for 7.8mm columns. Aqueous phases should be run at .6ml/min for 10mm sizes.
2. For use in TCB at 140-150°C, we recommend purging the columns at 0.2mL/min for 10-12hr with TCB at 40°C and then ramping up to your desired temperature over 6 hours.
3. If you notice a calibration change after significant use, you may need a clean frit(s) particularly on the column inlet. If the original inlet frit clogs, it will contribute to shearing of high MW polymer and thus, must be changed.
4. For special solvents, i.e. DMSO/H<sub>2</sub>O, MeOH, Acetone, please call a Jordi technician.
5. For any solvent changeover involving miscible solvents, it is best to purge with the new solvent at 0.2mL/min for 10-12hr. Immiscible solvents require an intermediary solvent that both the initial and final solvent are miscible with.
6. The Jordi Mixed-Bed, 10<sup>4</sup>Å and 10<sup>5</sup>Å materials should never exceed 2000psig as this will crush the gel. For solid bead, 100Å, 300Å, 500Å and 10<sup>3</sup>Å gels you may run pressures up to 8000psig without damaging the column.
7. If you have any specific questions, please contact us. We are here to serve you.

JORDI GPC SPECIFICATIONS	
<i>Description</i>	<i>MW Range</i>
<b>GPC Solid Bead</b>	2,000-400,000,000
<b>GPC 100Å</b>	<50-5,000
<b>GPC 500Å</b>	<50-10,000
<b>GPC 10<sup>3</sup>Å</b>	<100-50,000
<b>GPC 10<sup>4</sup>Å</b>	100-100,000
<b>GPC 10<sup>5</sup>Å</b>	10,000->10,000,000
<b>GPC Mixed Bed</b>	100->10,000,000

## Tips for Best Results with Reverse Phase Columns

1. The flow rate ranges for various reverse phase columns are shown in the table to the right:
2. Do not worry about high back pressures. Jordi columns are packed at 8,000psig and can run for months at pressures in the 3,000-5,000psig range without damage.
3. If you notice a change in plate count or resolution after significant use, you may need a clean frit(s), particularly on the column inlet.
4. Try to keep at least 5% organic in your solvent when using Jordi DVB and Fluorinated DVB columns. Jordi gel is very hydrophobic and will not wet in water. A premature loss in column efficiency can occur when 100% water or buffer solutions are used.

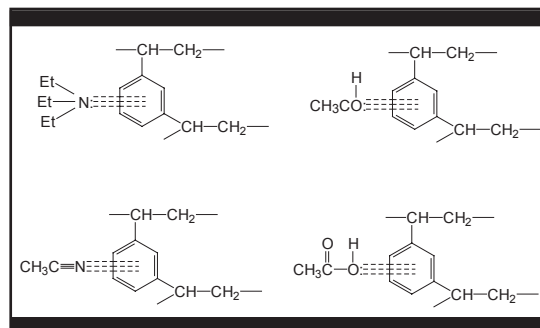
JORDI RP FLOW RATE RANGE	
<i>Column ID</i>	<i>Flow Rate Range</i>
<b>4.6mm</b>	<b>0.5-1.5mL/min.</b>
<b>10mm</b>	<b>1.0-2.0mL/min.</b>
<b>22mm</b>	<b>3.0-6.0mL/min.</b>

## Avoiding Tailing and/or Adsorption Phenomena

Because of the large number of aromatic rings inherent in the packing's structure, Jordi Gel columns based on divinylbenzene will give unique responses to certain types of samples.

If your samples contain aromatic rings or atoms such as O or N with unshared electron pairs, they have the potential to be strongly retained and/or tail on the Jordi Gel columns. To avoid this we recommend the use of a competing electron-rich solvent in the mobile phase.

Solvents which are commonly used for this purpose include acetonitrile, triethylamine (TEA), or n-butylamine as they coordinate with the aromatic rings on the packing material creating a less electron-dense surface chemistry.



For certain separations, it is also possible to use sodium acetate to modify peak shape and retention. In like manner, using low percentages of glycerol, 2-propanol, or other similarly hydrophilic hydroxylated solvents reduces the net effective surface hydrophobicity. The diagram above indicates several possible interactions of the mobile phase modifiers with the aromatic rings of the DVB gel.

In our experience, it is best to use quantities of 0.5-2.0% of TEA or ethylene glycol, or 0.01M Na Acetate, and anywhere from 2.0-100% of solvents such as  $\text{CH}_3\text{CN}$ ,  $\text{CH}_3\text{OH}$ , or 2-propanol. We have also found that a 50/50 V/V  $\text{CH}_3\text{CN}/\text{CH}_3\text{OH}$  mixture as strong solvent is better than either used alone.

For samples containing the piperazine group, such as hindered amine light stabilizers, we have found that 98/2 V/V  $\text{CHCl}_3$  /TEA or 75/25 V/V THF/ MeOH with 0.01 M NaAc are excellent mobile phases and yield high quality GPC results on the Jordi Gel DVB columns.

## Solvent Changeover

Jordi columns are some of the most durable in the industry tolerating a very wide range of solvents. When purging your column into a new solvent, it is important to keep in mind the following facts:

SOLVENT PURGE VOLUME	
Column Size	Volume
10mm x 25cm	40ml
7.8mm x 30cm	40ml
10mm x 50cm	80ml
4.6mm x 15cm	15ml
4.6mm x 25cm	25ml

1. Before changing solvents, please confirm that your column is compatible with your new mobile phase. The solvent compatibility of Jordi columns is so broad that it is easier to list which solvents should not be used. Jordi DVB and Jordi Fluorinated DVB columns should not be used in 100% water or buffer solutions. At least 5% organic solvent should be maintained at all times. All other columns have no known solvent limitations.
2. Always purge your column into a new solvent at 0.2ml/min until two full column volumes have passed through the column.



## Frit Replacement

Changing column frits is simple and can be accomplished using the Jordi Frit Removal Tool, see pg 116 for ordering information.

To change a column frit, please follow these steps:

1. Clamp the column, with outlet and inlet plugs in place, in a ring stand or a bench vice with the column inlet pointing up.
2. Allow the column to equilibrate to room temperature before removing the column end fitting.
3. Carefully loosen and remove the column end fitting. Hold the column end fitting steady with one wrench while loosening the column nut with another wrench until it drops away from the end fitting.
4. Remove the column distributor frit using a frit removal tool or by pulling up on the plastic housing. Be careful when removing the frit to prevent the loss of significant gel from the tube end.
5. Clean the top surface of the column by gently scraping a flat spatula or a razor blade across the gel surface. Be sure to avoid disturbing the packing material in the column. To get the surface even, you may have to wet the packing with the solvent that the column is conditioned in or another miscible solvent.
6. Place a new distributor frit cap on top of the cleaned surface of the column. Press the frit firmly down onto the column end.
7. Rinse all residual packing material from the column end fitting and frit. Failure to remove packing material from threads and sealing surfaces, e.g. frit, may result in leaks or clogging.
8. Replace the column end fitting. Use wrenches to tighten the end fitting nut approximately 1/4 turn past finger tight. Do not over tighten.
9. Connect the column to the HPLC system and check for leaks.
10. If the column leaks, turn the pump flow off; allow the pressure to bleed off, and then tighten the end-fitting nut slightly more, approximately 1/8 of a turn.

## Quality Assurance

Jordi has a strict quality assurance program designed to provide our customers with a product they can trust every time.

All Jordi columns come with a Quality Assurance Certificate to ensure customer satisfaction. This certificate provides the customer with performance information for the specific column received. Performance measures included are plate count, back pressure, resolution and symmetry. Since instrumentation, tubing, and other elements can alter performance, your results may vary slightly from the results shown on the Jordi certificate. Taking care to follow the instructions outlined in this guide will help ensure the highest product performance.

## Storage

Jordi end plugs should be used to cap the column when not in use. Jordi columns should be stored at room temperature; preferably in the box they were originally shipped in for safekeeping. Jordi columns can be stored in many solvents without concern. However, reactive solvents such as unstabilized tetrahydrofuran (THF) should not be used to store columns for extended periods. If you have any questions regarding a specific solvent, please contact a Jordi representative for technical advice.

## Warranty

Jordi columns come with a 90 day warranty from the date of delivery. This warranty does not cover: installation or service of product, conditions resulting from consumer mishandling such as improper maintenance or misuse, abuse, accident, or alteration.

## Return Policy

Jordi products can be returned within 30 days of delivery. There is a 15% restocking fee on list price for all orders. All returned products must be accompanied by a Return Merchandise Authorization (RMA) number. To obtain an RMA number, please contact the Jordi representative from which the items were originally purchased. You may also contact Jordi customer service directly at:

Email: [info@jordiflp.com](mailto:info@jordiflp.com)

Phone: 508-966-1301



## *Introduction to Jordi Solid Phase Extraction (SPE)*

Solid phase extraction (SPE) is an essential tool for the analysis of a broad range of sample types. This stems from the importance of removing interferences, concentrating the analyte of interest, and preventing damage to valuable analytical columns and instrumentation. SPE replaces more time consuming methods such as liquid-liquid extraction, centrifugation, and precipitation.

The benefits of polymer based SPE has only recently become apparent and has lead to its broad adoption for many important analyses including drug recovery. A list of just a few of the benefits of polymeric SPE as compared to silica includes:

### **Advantages of Polymeric SPE**

- Outstanding recovery due to the highly retentive nature of polymeric phases
- Absence of leachables from the polymeric media since there is no bonded phase
- Lack of residual silanol groups
- Incredible ruggedness of polymeric supports allows wide pH and solvent compatibility
- Improved batch to batch reproducibility
- Higher capacity for improved detection limits and reduced resin volumes

Jordi FLP manufactures a complete line of polymer-based solid phase extraction (SPE) cartridges. All Jordi SPE products are made using our high quality 100% divinylbenzene packing materials which have been in continuous production for over 25 years. Jordi uses only the highest quality resins in all of our SPE products. These products are thoroughly tested to ensure consistency from batch to batch. Testing includes verification of all of the following parameters:

### **Resin Quality Control**

- **Particle Size** - Electrozone sensing analysis of particle size distribution
- **Particle Shape** - Light microscopy analysis of particle shape and size
- **Surface area and Porosity** - Nitrogen adsorption
- **Chromatographic performance** - Column chromatography
- **Purity** - Mass spectroscopy (MS)

Jordi offers the broadest range of polymer-based surface chemistries on the market addressing aqueous, organic, and ion exchange sample preparation. Jordi resins are made from 100% divinylbenzene making them more retentive than standard PS-DVB packings. This makes J-Clean SPE one of the most retentive phases available, providing increased analyte recoveries.

## Jordi Hydroclean RP

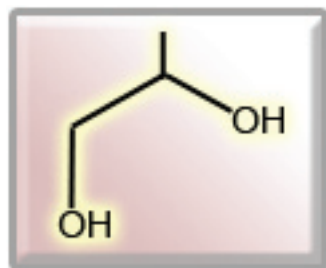
The latest innovation from Jordi, Hydroclean RP is a *hydrophilic/lipophilic polymeric media* for *clinical* reverse phase SPE applications. The presence of hydroxyl groups on the polymer surface provides increased retention for polar compounds and improves water wettability. This prevents rapid drying of cartridges and ensures high recovery. The hydrophobic divinylbenzene backbone provides excellent retention and chemical inertness.

Jordi has optimized the particle size of Hydroclean RP to maximize sample loadability and recovery while maintaining excellent flow characteristics for higher viscosity solutions. The extremely high surface area of Jordi polymeric sorbents allows the use of smaller bed weights, reducing cost per analysis. Hydroclean RP cartridges are stable at extremes of pH (0-14) and are compatible with essentially any eluting solvent.

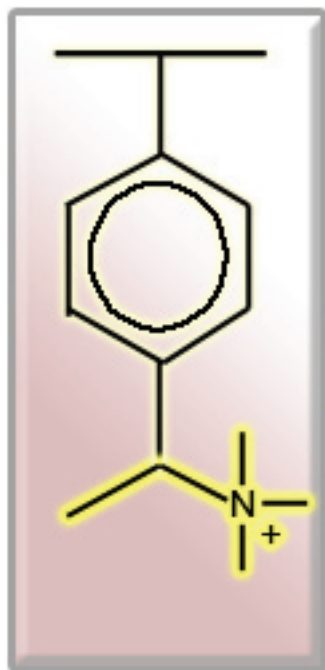
All Hydroclean RP cartridges are packaged in pure polyethylene cartridges to prevent sample contamination. A rigorous quality control process ensures the consistency of each batch of Hydroclean resin and includes the following:

### Quality Control

- **Particle Size** - Electrozone sensing analysis of particle size distribution
- **Particle Shape** - Light microscopy analysis of particle shape and size
- **Surface Area and Porosity** - Nitrogen adsorption
- **Chromatographic Performance** - Column chromatography
- **Purity** - Mass Spectroscopy (MS)



Jordi Hydroclean RP			
Cat. #	Tube size	Bed weight	Qty.
531SPE	1.0cc	30mg	100
532SPE	3.0cc	60mg	100
535SPE	6.0cc	200mg	30



## Jordi Hydroclean SAX

Hydroclean SAX cartridges are made using a *hydrophilic/lipophilic polymeric media containing quaternary amino groups* covalently bound to the polymer surface. They are designed for *clinical anion exchange reverse phase* SPE applications. The presence of quaternary amino groups allows retention of negatively charged analytes and provides increased retention for polar compounds and improves water wettability. This prevents rapid drying of cartridges and ensures high recovery. The DVB backbone provides reverse phase retention allowing separation by two mechanisms. The hydrophobic divinylbenzene backbone provides excellent retention and chemical inertness.

Jordi has optimized the particle size of Hydroclean SAX to maximize sample loadability and recovery while maintaining excellent flow characteristics for higher viscosity solutions. The extremely high surface area of Jordi polymeric sorbents allows the use of smaller bed weights, reducing cost per analysis. Hydroclean SAX cartridges are stable at extremes of pH (0-14) and are compatible with essentially any eluting solvent.

All Hydroclean RP cartridges are packaged in pure polyethylene cartridges to prevent sample contamination. A rigorous quality control process ensures the consistency of each batch of Hydroclean resin and includes the following:

### Quality Control

- **Particle Size** - Electrozone sensing analysis of particle size distribution
- **Particle Shape** - Light microscopy analysis of particle shape and size
- **Surface Area and Porosity** - Nitrogen adsorption
- **Chromatographic Performance** - Column chromatography
- **Purity** - Mass Spectroscopy (MS)

Jordi Hydroclean SAX			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
581SPE	1.0cc	30mg	100
582SPE	3.0cc	60mg	100
585SPE	6.0cc	200mg	30



## Jordi Hydroclean SCX

Hydroclean SCX cartridges are made using a *hydrophilic/lipophilic polymeric media containing sulfonated groups* covalently bound to the polymer surface. They are designed for *clinical cation exchange reverse phase* SPE applications. The presence of sulfonated groups allows retention of positively charge analytes and provides increased retention for polar compounds and improves water wetability. This prevents rapid drying of cartridges and ensures high recovery. The DVB backbone provides reverse phase retention allowing separation by two mechanisms. The hydrophobic divinylbenzene backbone provides excellent retention and chemical inertness.

Jordi has optimized the particle size of Hydroclean SCX to maximize sample loadability and recovery while maintaining excellent flow characteristics for higher viscosity solutions. The extremely high surface area of Jordi polymeric sorbents allows the use of smaller bed weights, reducing cost per analysis. Hydroclean SCX cartridges are stable at extremes of pH (0-14) and are compatible with essentially any eluting solvent.

All Hydroclean RP cartridges are packaged in pure polyethylene cartridges to prevent sample contamination. A rigorous quality control process ensures the consistency of each batch of Hydroclean resin and includes the following:

### Quality Control

- **Particle Size** - Electrozone sensing analysis of particle size distribution
- **Particle Shape** - Light microscopy analysis of particle shape and size
- **Surface Area and Porosity** - Nitrogen adsorption
- **Chromatographic Performance** - Column chromatography
- **Purity** - Mass Spectroscopy (MS)

Jordi Hydroclean SCX			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
501SPE	1.0cc	30mg	100
502SPE	3.0cc	60mg	100
505SPE	6.0cc	200mg	30

## Jordi DVB J-Clean™ SPE Cartridges

J-Clean™ DVB SPE tubes contain high purity, 100% divinylbenzene resin in a clean polyethylene syringe barrel format with 0.5 micron frits. The resin has a reduced average particle size compared to other manufacturers resulting in significantly increased surface area for greater analyte recovery. 100% DVB virtually eliminates swelling and shrinking preventing bed channeling and loss of the target analyte.

J-Clean™ DVB is excellent for applications such as pesticide clean-up from environmental samples. It is also used for the recovery of nucleic acids, polar drug metabolites and irreversibly binds peptides and proteins.

### Advantages of J-Clean™ DVB:

- Greater sample capacity than regular C<sub>18</sub> silica and other PS-DVB resins
- Hydrophobic phase for stronger binding of non-polar analytes
- Increased hydrophobicity as compared to Jordi Hydroclean RP
- Lack of residual silanol groups
- Incredible ruggedness of polymeric supports allows wide pH range and solvent compatibility
- Higher capacity for improved detection limits and reduced resin volumes

### Quality Control

- **Particle Size** - Electrozone sensing analysis of particle size distribution
- **Particle Shape** - Light microscopy analysis of particle shape and size
- **Surface Area and Porosity** - nitrogen adsorption
- **Chromatographic Performance** - column chromatography
- **Purity** - Mass Spectroscopy (MS)

DVB J-Clean™			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>114SPE</b>	3.0cc	100mg	30
<b>110SPE</b>	6.0cc	200mg	30
<b>111SPE</b>	60.0cc	2g	10
<b>112SPE</b>	60.0cc	5g	10
<b>113SPE</b>	60.0cc	10g	10



## J-Clean™ Peptide Protein SPE Cartridges

Jordi Peptide Protein Cartridges are excellent for cleanup of protein and peptide samples. Analytes are purified using a reverse phase mechanism. Typical applications include de-salting of protein solutions followed by elution in an organic solvent.

<b>J-Clean™ Peptide Protein</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>154SPE</b>	3.0cc	100mg	30
<b>150SPE</b>	6.0cc	200mg	30
<b>151SPE</b>	60.0cc	2g	10
<b>152SPE</b>	60.0cc	5g	10
<b>153SPE</b>	60.0cc	10g	10

## J-Clean™ Fluorinated SPE Cartridges

Jordi Fluorinated Cartridges provide reduced interaction with sample components as compared to J-Clean DVB. Strong retention is observed for samples containing fluorinated groups. Analytes are purified using a reverse phase mechanism.

<b>J-Clean™ DVB Fluorinated</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>144SPE</b>	3.0cc	100mg	30
<b>140SPE</b>	6.0cc	200mg	30
<b>141SPE</b>	60.0cc	2g	10
<b>142SPE</b>	60.0cc	5g	10
<b>143SPE</b>	60.0cc	10g	10

## J-Clean™ Glucose SPE Cartridges

Jordi Glucose Cartridges are packed with our very hydrophilic glucose coated DVB resin. Strong retention is observed for samples containing very polar groups. Analytes can be purified using a reverse phase or normal phase mechanism.

<b>J-Clean™ DVB Glucose</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>164SPE</b>	3.0cc	100mg	30
<b>160SPE</b>	6.0cc	200mg	30
<b>161SPE</b>	60.0cc	2g	10
<b>162SPE</b>	60.0cc	5g	10
<b>163SPE</b>	60.0cc	10g	10

## Jordi Ion Exchange Cartridges

Analytes which contain ionic groups can be easily purified away from non-ionic contaminants using Jordi ion exchange resins. Jordi offers three products based on our 100% DVB resins for the analysis of ionic samples. These include:

### Ion Exchange Resins

- J-Clean™ **Polar Pack WAX** - Secondary amino resin for cation purification
- J-Clean™ **SAX Quat DVB** - Quaternated amino resin for anion purification
- J-Clean™ **Sulfonated DVB** - SCX resin for cation purification

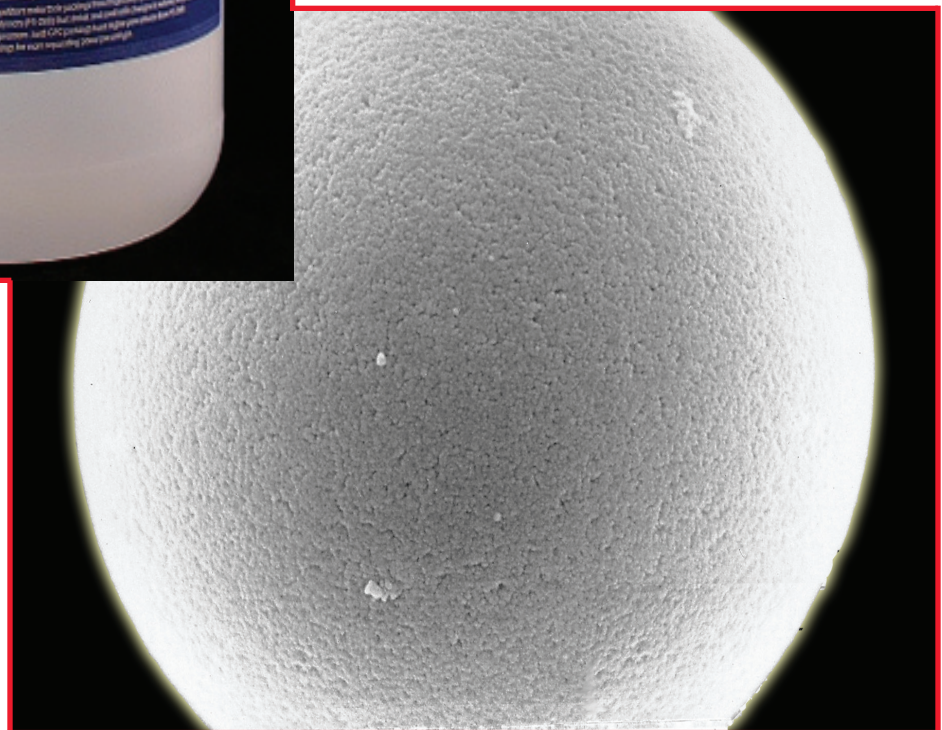
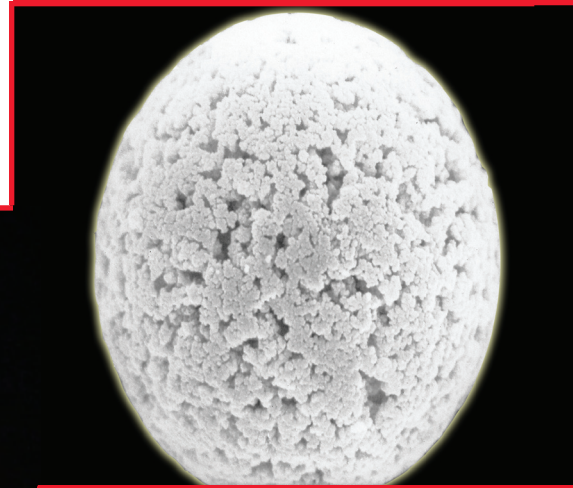
Jordi SAX Quat DVB and Sulfonated DVB cartridges contain fixed positively and negatively charged groups respectively. J-Clean Polar Pack WAX cartridges contain secondary amino groups which become positively charged below pH 8.

<b>J-Clean™ Polar Pack WAX DVB</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>174SPE</b>	3.0cc	100mg	30
<b>170SPE</b>	6.0cc	200mg	30
<b>171SPE</b>	60.0cc	2g	10
<b>172SPE</b>	60.0cc	5g	10
<b>173SPE</b>	60.0cc	10g	10

<b>J-Clean™ SAX Quat DVB</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>184SPE</b>	3.0cc	100mg	30
<b>180SPE</b>	6.0cc	200mg	30
<b>181SPE</b>	60.0cc	2g	10
<b>182SPE</b>	60.0cc	5g	10
<b>183SPE</b>	60.0cc	10g	10

<b>J-Clean™ Sulfonated DVB</b>			
<i>Cat. #</i>	<i>Tube size</i>	<i>Bed weight</i>	<i>Qty.</i>
<b>194SPE</b>	3.0cc	100mg	30
<b>190SPE</b>	6.0cc	200mg	30
<b>191SPE</b>	60.0cc	2g	10
<b>192SPE</b>	60.0cc	5g	10
<b>193SPE</b>	60.0cc	10g	10

# Bulk Media



## Jordi Gel™ DVB

### Durability and Performance

**Jordi FLP is the only company that makes packings from 100% divinylbenzene (DVB) for compatibility with high temperatures, pressures and the widest range of solvents.**

Jordi gels have the highest extent of crosslinking and are made using our proprietary processes which provide:

- More strength to the gel
- Unparalleled resistance to shrinking and swelling
- Pore sizes to cover the entire Mw range
- Widest range of polymeric surface chemistries (ion exchange, hydrophobic, hydrophilic)
- Particle sizes ranging from 1-200 $\mu$
- High temperature stability (150°C)
- Stability at high pressures (30,000 psig)
- High pore volume (up to 750m<sup>3</sup>/g!)
- Economical pricing

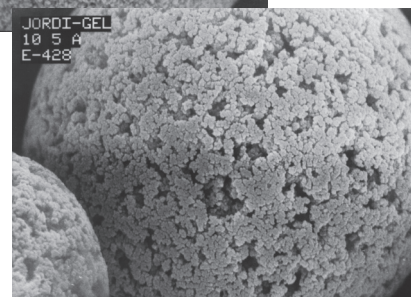
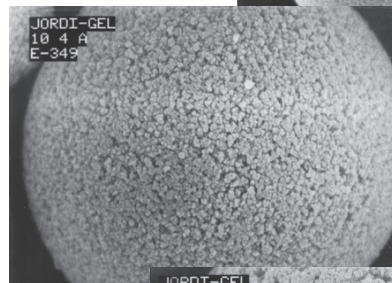
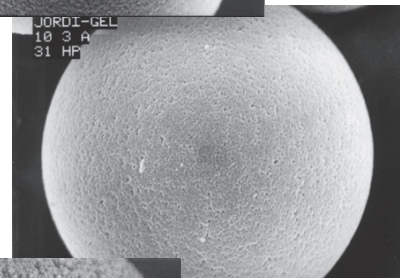
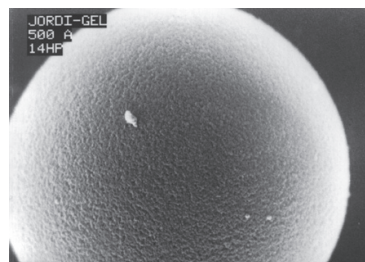
Jordi polymeric media is prepared in our state of the art manufacturing facility in batch sizes as large as 15kg. We take great pride in the production of all Jordi resins and submit our products to a demanding quality control process.

Please call or email us for information on selecting the right gel for your application. Custom gel synthesis is available upon request.

### QC - Quality and Consistency

- **Particle Size** - Electrozone sensing particle size analysis
- **Particle Shape** - Light microscopy for particle shape determination
- **Surface Area and Porosity** - nitrogen adsorption
- **Chromatographic Performance** - HPLC column chromatography
- **Purity** - Mass Spectroscopy (MS)

Jord Gel™ Specifications		
Pore Size	Pressure Limit	MW Range
100Å	8,000psig	<50-5,000
500Å	8,000psig	<50-10,000
10 <sup>3</sup> Å	8,000psig	<100-25,000
10 <sup>4</sup> Å	2,000psig	100-2,000,000
10 <sup>5</sup> Å	2,000psig	100-10,000,000
Mixed Bed	2,000psig	100->10,000,000



## Organic Resins

<b>Jordi Gel DVB Resin for Organic Solvent GPC/SEC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
40000	100Å	40010	100Å
40001	500Å	40011	500Å
40002	10 <sup>3</sup> Å	40012	10 <sup>3</sup> Å
40003	10 <sup>4</sup> Å	40013	10 <sup>4</sup> Å
40004	10 <sup>5</sup> Å	40014	10 <sup>5</sup> Å
40006	Solid Bead	40016	Solid Bead

<b>Jordi Gel DVB Fluorinated Resin for Organic Solvent GPC/SEC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat #</i>	<i>Porosity</i>	<i>Cat #</i>	<i>Porosity</i>
44000	100Å	44010	100Å
44001	500Å	44011	500Å
44002	10 <sup>3</sup> Å	44012	10 <sup>3</sup> Å
44003	10 <sup>4</sup> Å	44013	10 <sup>4</sup> Å
44004	10 <sup>5</sup> Å	44014	10 <sup>5</sup> Å
44006	Solid Bead	44016	Solid Bead

<b>Jordi Gel DVB Hydroxylated Resin for Organic Solvent GPC/SEC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat #</i>	<i>Porosity</i>	<i>Cat #</i>	<i>Porosity</i>
42000	100Å	42010	100Å
42001	500Å	42011	500Å
42002	10 <sup>3</sup> Å	42012	10 <sup>3</sup> Å
42003	10 <sup>4</sup> Å	42013	10 <sup>4</sup> Å
42004	10 <sup>5</sup> Å	42014	10 <sup>5</sup> Å
42006	Solid Bead	42016	Solid Bead

## Aqueous Resins

Jordi Gel DVB Sulfonated Resin for Aqueous Solvent GPC/SEC			
Average 5 Micron Particles		5-20 Micron Particles	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
40100	100Å	40110	100Å
40101	500Å	40111	500Å
40102	10 <sup>3</sup> Å	40112	10 <sup>3</sup> Å
40103	10 <sup>4</sup> Å	40113	10 <sup>4</sup> Å
40104	10 <sup>5</sup> Å	40114	10 <sup>5</sup> Å
40106	Solid Bead	40116	Solid Bead

Jordi Gel DVB Polar Pack WAX Resin for Aqueous Solvent GPC/SEC			
Average 5 Micron Particle		5-20 Micron Particles	
<i>Cat #</i>	<i>Porosity</i>	<i>Cat #</i>	<i>Porosity</i>
41000	100Å	41010	100Å
41001	500Å	41011	500Å
41002	10 <sup>3</sup> Å	41012	10 <sup>3</sup> Å
41003	10 <sup>4</sup> Å	41013	10 <sup>4</sup> Å
41004	10 <sup>5</sup> Å	41014	10 <sup>5</sup> Å
41006	Solid Bead	41016	Solid Bead

Jordi Gel DVB Glucose Resin for Aqueous Solvent GPC/SEC			
Average 5 Micron Particles		5-20 Micron Particles	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
40200	100Å	40210	100Å
40201	500Å	40211	500Å
40202	10 <sup>3</sup> Å	40212	10 <sup>3</sup> Å
40203	10 <sup>4</sup> Å	40213	10 <sup>4</sup> Å
40204	10 <sup>5</sup> Å	40214	10 <sup>5</sup> Å
40206	Solid Bead	40216	Solid Bead

<b>Jordi Gel DVB Resin for Reverse Phase LC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
40300	300Å	40310	300Å
40301	500Å	40311	500Å
40302	10 <sup>3</sup> Å	40312	10 <sup>3</sup> Å

<b>Jordi Gel DVB C<sub>18</sub> Resin for Reverse Phase LC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
40500	300Å	40510	300Å
40501	500Å	40511	500Å
40502	10 <sup>3</sup> Å	40512	10 <sup>3</sup> Å

<b>Jordi Gel DVB Fluorinated Resin for Reverse Phase LC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
44300	100Å	44310	300Å
44301	500Å	44311	500Å
44302	10 <sup>3</sup> Å	44312	10 <sup>3</sup> Å

<b>Jordi Gel DVB Hydroxylated Resin for Reverse Phase LC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
42300	100Å	42310	300Å
42301	500Å	42311	500Å
42302	10 <sup>3</sup> Å	42312	10 <sup>3</sup> Å

<b>Peptide/Protein Resin for Reverse Phase LC</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
41303	10 <sup>4</sup> Å	41313	10 <sup>4</sup> Å

<b>Jordi Gel DVB Glucose Resin for Normal Phase</b>			
<b>Average 5 Micron Particles</b>		<b>5-20 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>	<i>Cat. #</i>	<i>Porosity</i>
<b>46000</b>	300Å	<b>46010</b>	300Å
<b>46001</b>	500Å	<b>46011</b>	500Å
<b>46002</b>	10 <sup>3</sup> Å	<b>46012</b>	10 <sup>3</sup> Å

<b>Jordi Gel DVB Polyamino Resin for Normal Phase LC</b>	
<b>Average 5 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>
<b>40402</b>	10 <sup>3</sup> Å

<b>Jordi Gel DVB SAX Quat Resin for Anion Analysis</b>	
<b>Average 5 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>
<b>40602</b>	10 <sup>3</sup> Å

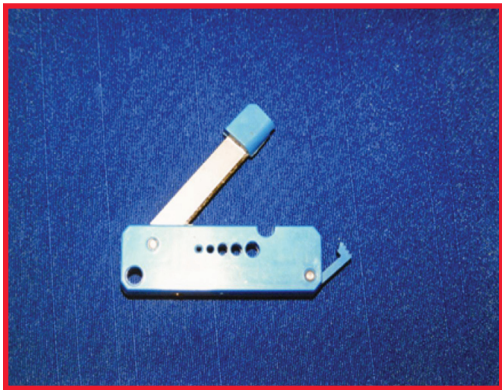
<b>Jordi Gel DVB Sulfonated Resin for Cation Analysis</b>	
<b>Average 5 Micron Particles</b>	
<i>Cat. #</i>	<i>Porosity</i>
<b>48001</b>	500Å
<b>48002</b>	10 <sup>3</sup> Å



# Accessories



GPC Standards



Chromatography Supplies



Lab Equipment

## Flange Kits and Accessories

**Stay organized with these convenient kits!**

Jordi currently offers the Flanged Finger-tight Fittings Kit, the Easy-Flange Kit, and Easy-Flange Combi Kit. Each Flange Kit comes with various sized pins, tubing cutter and Teflon tubing. The Flanged Finger-tight Fittings Kit comes with polypropylene o-rings/bushings, Clean Cut Tubing Cutter and a Union.

A list of the contents of each kit is shown in the table on the following page. The components of each kit are also available for purchase separately.



**Easy Flange Kit**



**Easy Flange Combi Kit**

<b>Flange Kit</b>	
<i>Cat. #</i>	<i>Description</i>
<b>JR201540</b>	Easy-Flange Kit Contains the following:
<b>JR201540L</b>	1 Plastic Box
<b>JR202235</b>	1 Disc with 0.50mm Pin
<b>JR201541</b>	1 Disc with 0.80mm Pin
<b>JR201554</b>	1 Disc with 0.80mm Pin, Titan
<b>JR201536</b>	1 Disc with 1.30mm Pin
<b>JR201537</b>	1 Disc with 1.30mm Pin, Titan
<b>JR797</b>	1 Clean-Cut Tubing Cutter
<b>JR4036</b>	6ft Teflon Tubing 1/16" X 0.75mm ID
<b>JR201539</b>	Easy-Flange Combi Kit Contains all the above plus:
<b>JR201094B</b>	10 Black Flanged Nuts 1/16"
<b>JR201926</b>	10 1/16" polypropylene o-ring
<b>JR201580W</b>	10 White Flanged Nuts 1/8"
<b>JR201928</b>	10 1/8" polypropylene o-ring
<b>JR4036</b>	4ft Teflon tubing 1/16" x 0.75mm ID
<b>JR6800</b>	10ft Teflon tubing 1/8" x 1.58mm ID

<b>Flanged Finger-tight Fittings Kit</b>	
<i>Cat. #</i>	<i>Description</i>
<b>JR201529</b>	Flanged Finger-tight Fittings Kit Contains:
<b>JR201094B</b>	10 Black Flanged Nuts 1/16"
<b>JR201094W</b>	10 White Flanged Nuts 1/16"
<b>JR201580B</b>	10 Black Flanged Nuts 1/8"
<b>JR201580W</b>	10 White Flanged Nuts 1/8"
<b>JR201928</b>	20 Bushings 1/8" Polypropylene
<b>JR201926</b>	20 Bushings 1/16" Polypropylene
<b>JR797</b>	1 Clean-Cut Tubing Cutter
<b>JR4011</b>	3 m Teflon tubing 1/16" x 0.25mm ID
<b>JR4183</b>	3 m Teflon tubing 1/16" x 0.50mm ID
<b>JR4036</b>	3 m Teflon tubing 1/16" x 0.75mm ID
<b>JR6800</b>	3 m Teflon tubing 1/8" x 1.59mm ID
<b>JR060</b>	5 Unions

## Lab Tools & Cutters

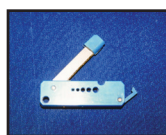
The Jordi line of lab tools was created to simplify common chromatography repairs.



Jordi ValvTool – is designed to be used in those hard to reach areas. This unique slotted wrench can be used to tighten nuts where a loop or capillary may otherwise make this simple task a chore! The Jordi Valvtool fits most of your 1/4” HPLC Stainless steel and PEEK fittings.



Jordi Frit Pullers - make frit removal a simple task. Designed to easily remove the frit without damaging the column, our Frit Puller is available in two sizes, small and large. The small Frit Puller will fit all Jordi columns with either a 2.1mm ID or a 4.6mm ID, while the large Frit Puller fits all Jordi columns with a 7.8mm ID or a 10mm ID.



The Clean-cut™ Tubing Cutter will put an end to the problem of distorted cut tubing. This tubing cutter gives you a clean, straight cut every time! The plastic tubing cutter features a slotted housing which holds all sizes of our plastic tubing, perpendicular to the blade, giving you a clean usable piece of tubing every time.



Jordi Stainless Steel Capillary Pliers – the ideal tool for cutting 1/16” stainless steel tubing without damaging the tube where cut.

Jordi Torque Wrench – is designed to provide just the right amount of torque when tightening column end fittings. This prevents deforming column frits which could damage and possibly destroy your valuable analytical columns. Wrenches are available for the complete Jordi column line, 10mm, 7.8mm, 4.6mm and 2.1mm.

Lab Tools	
<i>Cat. #</i>	<i>Description</i>
<b>JR800</b>	Jordi Valv Tool
<b>SHTW2146</b>	Small Torque Wrench
<b>SHTW7810</b>	Large Torque Wrench
<b>SHFP2146</b>	Small Frit Puller
<b>SHFP7810</b>	Large Frit Puller

Cutters	
<i>Cat. #</i>	<i>Description</i>
<b>JR797</b>	Clean-Cut Tubing Cutter
<b>JR798</b>	Clean-Cut Tubing Cutter Replacement Blade
<b>JR796</b>	Stainless Steel Capillary Tubing Pliers

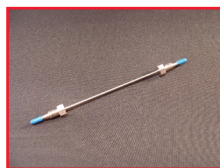
## Vacuum Manifolds



Jordi offers two Vacuum Manifolds, a 12-port and a 24-port. Vacuum manifolds allow you to process multiple samples simultaneously, saving time and effort. Manifold systems come complete with the components listed. Each component is also available for purchase as needed.

Vacuum Manifolds & Accessories	
<i>Cat. #</i>	<i>Description</i>
<b>JS210112</b>	12 Port Vacuum Manifold: includes the following:
<b>JS212001</b>	Lid, Gaskets and 12 Stopcocks
<b>JS213212</b>	Glass Chamber
<b>JS212304</b>	Vacuum Gauge, Valve & Glass Chamber
<b>JS212518</b>	12 Port-size Collection Rack
<b>JS5619</b>	2 12 Port-size Gaskets
<b>JS5623</b>	12 One-way Stopcocks
<b>JS5660</b>	2 Waste Containers
<b>JS210114</b>	24 Port Vacuum Manifold includes the following:
<b>JS211224</b>	Lid, Gaskets and 24 Stopcocks
<b>JS210124</b>	Glass Chamber
<b>JS210324</b>	Vacuum Gauge, Valve & Glass Chamber
<b>JS210424</b>	1 24 Port-size Collection Rack
<b>JS5621</b>	2 24 Port-size Gaskets

## Column Connectors



Jordi Column Connectors provide a quick and easy way to connect multiple columns. These connectors, available in a variety of lengths and IDs, come assembled and ready to use. Simply remove the protective end caps and attach.

Column Connectors	
<i>Cat. #</i>	<i>Description</i>
<b>BCC0105</b>	5.0cm 0.01"
<b>BCC0110</b>	10cm 0.01"
<b>BCC0120</b>	20cm 0.01"
<b>GCC0205</b>	5.0cm 0.02"
<b>GCC0210</b>	10cm 0.02"
<b>GCC0220</b>	20cm 0.02"

**Jordi columns boast some of the longest column lifetimes in the industry. To help extend the life of your column we offer a full line of replacement parts.**

### **Column Care Kit**

The Column Care Kit provides all the items you will need when replacing column frits. The kits come with 2 inlet frits, 2 outlet frits and a Frit Puller. The Frit Puller tool allows you to remove blocked frits without damaging the column. The items in these kits are also sold separately.

### **End Fittings**

If an end fitting becomes damaged during frit removal you can order a replacement by selecting the item from the chart on the next page. It's been our experience that if the end fitting has been damaged, so has the frit. Therefore all replacement end fittings come with the appropriate frit.

### **Torque Wrench**

To tighten end fittings, Jordi offers a specialized Torque Wrench to prevent over tightening. The Torque Wrench is available in two sizes, small which will fit our 2.1mm & 4.6mm ID columns, and large which will fit our 7.8mm & 10mm ID columns.

### **Column Connectors**

Jordi Column Connectors allow you to run multiple columns in series. Our column connectors come in three convenient lengths, 5cm, 10cm and 20cm, and two ID's, 0.01" and 0.02". These connectors come assembled and ready to use.

### **Column End Plugs**

Replacement column end plugs are available. Jordi end plugs are made from PEEK and are sold in pairs.

Column Care Kits	
<i>Cat. #</i>	<i>Description</i>
<b>CCK21</b>	2.1mm ID Column Care Kit includes the following:
<b>SHIF21</b>	2 2.1mm Inlet Frits
<b>SHOF21</b>	2 2.1mm Outlet Frits
<b>SHFP2146</b>	Small Frit Puller
<b>CCK46</b>	4.6mm ID Column Care Kit includes the following:
<b>SHIF46</b>	2 4.6mm Inlet Frits
<b>SHOF46</b>	2 4.6mm Outlet frits
<b>SHFP2146</b>	Small Frit Puller
<b>CCK78</b>	7.8mm ID Column Care Kit includes the following:
<b>SHIF78</b>	2 7.8mm Inlet Frits
<b>SHOF78</b>	2 7.8mm Outlet Frits
<b>SHFP7810</b>	Large Frit Puller
<b>CCK10</b>	10mm ID Column Care Kit includes the following:
<b>SHIF10</b>	2 10mm Inlet Frits
<b>SHOF10</b>	2 10mm Outlet Frits
<b>SHFP7810</b>	Large Frit Puller

Column End Fittings	
<i>Cat. #</i>	<i>Description</i>
<b>SHEF21</b>	2.1mm End Fitting with frit
<b>SHEF46</b>	4.6mm End Fitting with frit
<b>SHEF78</b>	7.8mm End Fitting with frit
<b>SHEF10</b>	10mm End Fitting with frit
<b>SHEF22</b>	22mm End Fitting with frit

Column Connectors	
<i>Cat. #</i>	<i>Description</i>
<b>BCC0105</b>	5.0cm 0.01"
<b>BCC0110</b>	10cm 0.01"
<b>BCC0120</b>	20cm 0.01"
<b>GCC0205</b>	5.0cm 0.02"
<b>GCC0210</b>	10cm 0.02"
<b>GCC0220</b>	20cm 0.02"

Lab Tools	
<i>Cat. #</i>	<i>Description</i>
<b>SHTW2146</b>	Small Torque Wrench
<b>SHTW7810</b>	Large Torque Wrench

Column End Plugs	
<i>Cat. #</i>	<i>Description</i>
<b>PCEP2</b>	2 PEEK Column End Plugs

## GPC Standards Kits

Jordi offers a broad range of standards for GPC analysis. Each kit includes a set of 10 standards, 1 gram of each, as well as quality assurance chromatograms for each standard. GPC MW values are confirmed using methods such as viscometry, light scattering and NMR. For help selecting the standard which is best for your application contact us at [techsupport@jordiflp.com](mailto:techsupport@jordiflp.com) and we will be happy to assist you.



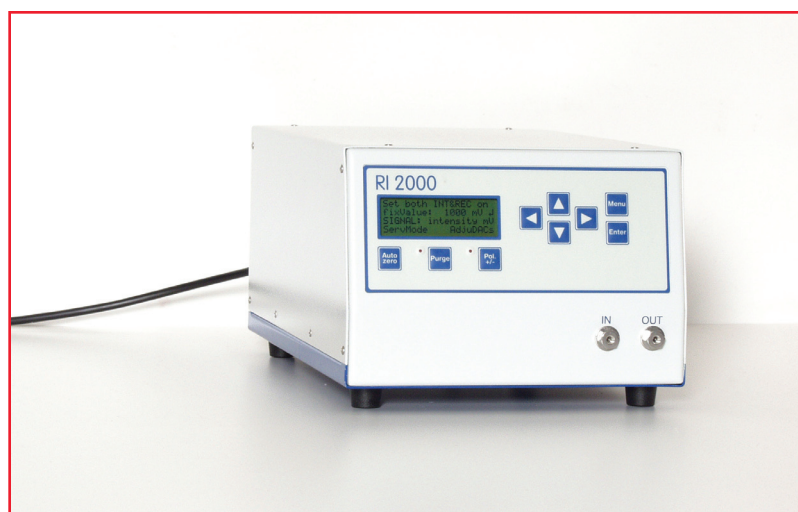
Standards Kits	
<i>Cat. #</i>	<i>Description</i>
<b>2000</b>	Polystyrene Standards Kit
<b>2001</b>	Polystyrene Sulfonate Kit
<b>2002</b>	PMMA Kit
<b>2004</b>	Dextran Standards Kit
<b>2005</b>	Pullulan Standards Kit (Polysaccharide)



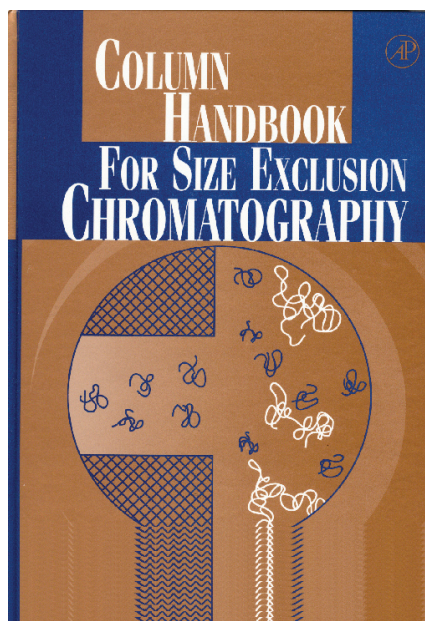
# Lab Equipment Accessories

## RI 2000 Differential Refractive Index Detector

The RI 2000 Differential Refractive Index series offers the sensitivity, stability and reproducibility required for optimal RI detection. The thermally shielded optics, with a counter current heat exchanger and with its user programmable temperature control, produce an extremely stable baseline and an optimal Signal/Noise ratio. The RI 2000 series provides autopurge and autozero capabilities as well as RS232 communication to acquire data directly without using any external signal interface. The RI 2000 detector is available for analytical, micro, preparative and analytical/preparative modes.



Refractive Index Detector	
<i>Cat. #</i>	<i>Description</i>
<b>RI 2000</b>	RI 2000 Series Detector



The Column Handbook for Size Exclusion Chromatography is the combined effort of every major column manufacturer and many experienced column users. It includes information regarding the technology, characterization, and evaluation of analytical and preparative columns for SEC, GFC, and other popular techniques. Experts discuss various applications in organic and aqueous mobile phases for synthetic and biopolymers, high-temperature SEC and much more. The Jordi Gel line of GPC columns is covered in detail in Chapter 13, which has been authored by Dr. Howard Jordi, President and founder of Jordi FLP.

Reference Material	
<i>Cat. #</i>	<i>Description</i>
<b>REF13</b>	Column Handbook for SEC

# Services

**Jordi FLP** has been providing contract analytical services for over 25 years. We operate one of the largest and best equipped GPC laboratories in the country. It is our goal to provide the highest quality analytical services while meeting our customer's need for rapid turnaround times.

## *Problems We Solve:*

- Product Deformulation
- Product Formulation
- Contract Analysis
- Good vs. Bad Comparisons
- Expert Witness Services
- HPLC Training and Installation Services
- HPLC Method Development
- Polymer Analysis
- Polymer Filler & Additives Quantitation
- Preparative HPLC
- Quantitative Analysis
- Unknown Materials Identification

## *Techniques We Offer:*

- Chemical Methods (titrimetry, extractions, etc.)
- Fourier Transform Infrared Spectroscopy (FTIR)
- Elemental Analysis (PIXE, INAA)
- Gas Chromatography (GC)
- Gel Permeation Chromatography (GPC)
- Light Microscopy
- Nuclear Magnetic Resonance (NMR)
- High Performance Liquid Chromatography (HPLC)
- Mass Spectroscopy (MS)
- Particle Analysis
- Thermal Methods (DSC, TGA, TMA)
- Supplemental Testing

## ***Product Deformulation***

Jordi FLP specializes in complete material deformulations. We have successfully deformulated hundreds of products including polymer composites, car waxes, inks, nail polishes, adhesives, sunscreens, and drug products.

Deformulations typically involve the following steps:

- |                                   |                       |                         |
|-----------------------------------|-----------------------|-------------------------|
| 1. Initial Consultation           | 3. Receipt of samples | 5. Delivery of Results  |
| 2. Preparation of a written quote | 4. Analysis           | 6. Closing Consultation |

Deformulation is a complex process in which your results are only as good as the people analyzing your material. At Jordi, we solve your problem by combining a wide range of today's most advanced analytical techniques with the 25 years of experience of our Ph.D. staff.

Call today for your free consultation with the deformulation experts at Jordi.

## ***Product Formulation***

A natural outgrowth of our product deformulation services has been the reformulation of products. This is generally a service we provide after deformulating a material. A recent example of this was the formulation of a car wax product following the discontinuation of a formerly commercially available product.

Product formulation generally consists of the following steps:

- |                                    |  |
|------------------------------------|--|
| 1. Product Deformulation           | 5. Product scale up                          |
| 2. Formulation - small scale       | 6. Delivery of final formula                 |
| 3. Sample submission to the client | 7. Training services at <i>your</i> facility |
| 4. Product refinement              |  |

Product formulation involves more than the mixing of chemicals. Let our experienced chemists speed the process of product formulation and then help transfer that technology back into your facility.

## ***Contract Analysis***

Today's changing business environment has led many companies to reduce the size and capacity of their R&D departments. Jordi offers contract analysis services for those customers who need repeat analysis performed on an ongoing basis. This provides a cost effective solution and the equivalent expertise of having your own analytical department.

## *Good vs. Bad Comparisons*

Do you have a product which is inconsistent from batch to batch or which is no longer performing as it used to? Jordi's Ph.D. chemists bring 25 years of experience in the investigation of material failures. We use the latest analytical techniques to determine if any chemical differences exist between the good and bad samples. We then summarize our findings into an easy to read final report. You receive a listing of the observed differences as well as any recommendations for a solution.

Good vs. Bad comparisons typically involve the following steps:

1. Initial Consultation
2. Preparation of a written quote
3. Receipt of samples
4. Analysis
5. Delivery of Results
6. Closing Consultation

## *Expert Witness Services*

Jordi's Ph.D. chemists are available to provide testimony as an expert witness regarding the chemical identity of a material. Our scientists have 25 years of experience in interpreting and presenting scientific data. We have the credentials as well as the English skills required to provide an easy to understand representation of the scientific data. We are available to testify for depositions as well as trials.

Jordi can offer analysis and expert testimony in cases such as:

- Product failure
- Patent infringement
- Personal injury
- Product liability

## *HPLC Training and Installation Services*

Are you new to high performance liquid chromatography (HPLC)? We can provide both phone and on-site support to get you started in the right direction.

We have 25 years experience in chromatography and would be happy to help you. Our services include introductory presentations on the various HPLC techniques as well as installation and training on any of your Jordi HPLC products.

## *HPLC Method Development*

The process of method development is research focused on the discovery of a suitable set of conditions for the analysis of your sample. Jordi FLP is uniquely qualified to aid you in this process. We have both the analytical knowledge as well as our own complete line of LC products. The discovery and application of these products has provided us with a depth of knowledge few others possess in HPLC separations.

We start your project with a clear discussion of the goals of the analysis. Possible goals for the analytical method include quantitation, molecular weight calculation, impurity analysis, etc. We then provide our services on a per method tried basis using our significant experience to guide and shorten the method development process.

HPLC Method Development typically involves the following steps:

1. Initial Consultation
2. Preparation of a written quote
3. Receipt of samples
4. Analysis
5. Delivery of Results
6. Closing Consultation
7. Transfer of the method to your facility
8. Ongoing support as needed

You have complete control over the process through selection of the methods you deem worth trying.

## *Polymer Analysis*

For more than 25 years, Jordi has successfully reformulated hundreds of polymer products including polymer composites, adhesives, thermosets, rubbers, and latexes. We understand the complexities of polymer systems and can analyze your polymer to determine any of the following:

- Monomer composition
- Antioxidant analysis
- Residual monomer concentration
- Pigment determination
- Copolymer analysis
- Absolute or relative molecular weight
- Additives quantitation
- Crosslink density
- Weight Percent below 500 and 1000Mw
- Percent or type of filler (SiO<sub>2</sub>, Carbon Black, etc.)
- Mold release - slip agents composition

We have previously analyzed essentially every major class of commercially available polymer including but not limited to:

- Polyolefins
- Polyesters
- Polyurethanes and Ureas
- Butadiene based rubbers
- Nylons
- Methacrylates and Acrylates
- Polysiloxanes
- Polysaccharides
- Cationic and Anionic polymers
- Resins (melamine, phenol formaldehyde, etc.)

## *Polymer Filler & Additives Identification and Quantitation*

Jordi FLP has been providing expert polymer analysis services for over 25 years. We have successfully quantitated and previously analyzed many of the commercially available polymer additives and fillers. Our extensive polymer additive library and established methodology allow us to easily recognize many current and former polymer additives. Quantitation down to the low parts per million for most additives is routine.

We understand the complexities of polymer systems and can analyze your polymer to determine any of the following:

- Residual Monomer concentration
- Antioxidant analysis
- Pigment determination
- Mold release - slip agents composition
- Percent or type of filler (SiO<sub>2</sub>, Carbon Black, etc.)
- Weight Percent below 500 and 1000 Mw

We have previously analyzed essentially every major class of commercially available polymer including but not limited to:

- Polyolefins
- Polyesters
- Polyurethanes and Ureas
- Nylons
- Polysiloxanes
- Resins (melamine, phenol formaldehyde, etc.)
- Cationic and Anionic polymers
- Butadiene based rubbers
- Methacrylates and Acrylates
- Polysaccharides

## *Preparative HPLC*

Do you need to purify a product but don't have the facilities needed for preparative chromatography? Let Jordi provide the preparative chromatography services you need to obtain 100mg, 1g, or even greater quantities of a finished product. We have the experience and instrumentation needed to perform your preparative chromatography separations.

*We've built our  
reputation for excellence  
analyzing polymer systems.*

## *Quantitative Analysis*

Do you need to quantitate a contaminant or other component in your product or sample? Do you need to know it will be done right? Jordi FLP has extensive experience in the quantitation of a wide range of components. Organic compounds can be quantitated using gas or liquid chromatography. We offer both FID and MS detection for quantitation by gas chromatography. Liquid chromatography detection methods include:

- Evaporative Light Scattering (ELSD)
- Ultra Violet (UV)
- Refractive Index (RI)
- Conductivity
- Fluorescence
- Photodiode array (PDA)
- Mass spectroscopy (MS)

Need an inorganic element quantitated? We have the capability to quantitate over 75 different inorganic elements. Many can be done simultaneously!

## *Unknown Identification*

Do you need to identify a contaminant or other component in your product or sample? Jordi FLP has extensive experience in the identification of impurities. We solve your problem by combining a wide range of today's most advanced analytical techniques with the 25 years of experience of our Ph.D. staff.

We offer five different mass spectral techniques to analyze almost any sample type providing an exact chemical structure for your contaminant in most cases. We can couple these methods with our light microscopy facilities to analyze even very small samples.

Unknown Identification typically involves the following steps:

1. Initial Consultation
2. Preparation of a written quote
3. Receipt of samples
4. Analysis
5. Delivery of Results
6. Closing Consultation



# Techniques We Offer **Services**

## ***Chemical Methods***

**Jordi FLP provides a wide range of chemical analysis. Please feel free to call us to discuss your chemical analysis needs.**

### ***Titrimetry***

The sample is placed into a suitable solvent and titrated using the appropriate titrant. The volume of titrant is used to determine the concentration of the titrated species in the solution. Samples are run in duplicate to demonstrate reproducibility of the method.

### ***Extractables Testing***

The sample is placed into a suitable solvent in a metal wire cage and extracted for a specified period of time. Alternatively, the sample is subjected to soxhlet extraction for a specified period of time. Gravimetric analysis of the residual sample is used to determine the percent extractables. This technique can be coupled with mass spectroscopy to determine the chemical structures of the extracted species.

### ***Karl Fischer Titration***

The sample is dissolved in a suitable solvent. The volume of water is then determined by titration using Karl Fischer reagent.

### ***Gravimetric Analysis***

The sample is prepared for analysis by extraction, precipitation, or ashing depending on the quantitation desired. The residual weight is then measured on an analytical balance. Duplicate samples are analyzed to demonstrate the reproducibility of the method.

*To learn more about these analyses contact us...*

*We are the Chemical Testing experts!*

# Techniques We Offer **Services**

## ***Fourier Transform Infrared Spectroscopy (FTIR)***

Jordi FLP can provide FTIR services using our diamond ATR FTIR system. This instrument allows the analysis of very small samples. The resulting spectra is then compared against our spectral database of thousands of known compounds allowing for positive identification. This technique is best for major sample component identification (>5%).

## ***Elemental Analysis***

**Jordi FLP can provide elemental analysis for a range of inorganic components. Please feel free to call us for help with your inorganic quantitation needs.**

## ***Proton Induced X-ray Emission (PIXE)***

This is a non-destructive technique in which the simultaneous determination of the elemental composition from Sodium through Uranium can be determined. Samples which are appropriate for PIXE analysis include solids, liquids, thin films, and aerosol filter samples. PIXE is sensitive to the elemental composition of the sample and not the arrangement of the atoms. Samples are analyzed by bombardment with a proton beam. The protons interact with the electrons in the atoms of the sample forming inner shell vacancies. The energy of the X-rays emitted when the vacancies are refilled are characteristic of the element from which they originate. The relative intensities of the X-rays then serve as a means to quantitate the individual elements.

## ***Neutron Activation Analysis (INAA)***

INAA is one of the most sensitive analytical techniques used for multi-element analysis available today. The INAA procedure is capable of providing both quantitative and qualitative results for individual elements, with sensitivities that are superior to those possible by any other analytical technique. This technique can be used to analyze some 75 individual elements (including certain organic elements) at trace levels.

*Jordi FLP has more than 25 years of experience finding the answers our clients need. Call today and learn how our experienced chemists can help you!*

## ***Gas Chromatography (GC)***

Jordi FLP can provide gas chromatography analysis of your samples using any of the following methods:

### ***Gas Chromatography Mass Spectroscopy (GC-MS)***

A liquid sample is injected into the GC-MS using an auto-injector and then transferred in the gas phase into a gas chromatography column. Components are then separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. The resulting characteristic fragmentation patterns are used for component identification. Comparison of the sample spectra to reference spectra for over one hundred thousand known compounds often allows for positive component identification. Creation of a calibration curve for known amounts of a reference material can be used for quantitation. A three point calibration is standard. This technique only provides information on volatile sample components.

### ***Head Space Gas Chromatography Mass Spectroscopy (Headspace GCMS)***

A portion of the sample is placed into a headspace sampling unit at a specified temperature. The gas above the sample is then injected onto a gas chromatography column. Components are separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. The resulting characteristic fragmentation patterns are used for component identification. Comparison of the sample spectra to reference spectra for over one hundred thousand known compounds often allows for positive component identification. Comparison with a calibration curve for known amounts of the reference material can then be used for quantitation. This technique only provides information on volatile sample components.

### ***Desorption Mass Spectroscopy (DMS)***

The sample is placed into a quartz tube and dropped into a heating chamber at 300°C. Volatile components of the sample are desorbed and then transferred in the gas phase into a gas chromatography column. Components are then separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. This results in a characteristic fragmentation pattern for each component. Comparison of the sample spectra to reference spectra for over one hundred thousand known compounds often allows for positive component identification. This technique provides information on volatile sample components.

## ***Gel Permeation Chromatography (GPC)***

GPC is a technique which is used to determine the molecular weight of sample components. Jordi FLP operates one of the most extensive GPC facilities in the country. We currently have 42 GPC systems allowing us to provide for all your GPC testing needs. We are capable of running in nearly any solvent and can provide rapid turn-around for most analyses.

Jordi FLP produces a complete line of GPC columns providing us with unique expertise and access to a wide selection of column stationary phases. We can solve the GPC problems which others cannot.

Detection methods available for GPC analysis include:

- Ultra Violet (UV)
- Refractive Index (RI)
- Viscometry
- Fourier Transform Infrared Spectroscopy (FTIR)
- Evaporative Light Scattering (ELSD)
- Right Angle Light Scattering (RALS)
- Low Angle Light Scattering (LALLS)

We offer the following GPC test methods:

## ***Gel Permeation Chromatography***

Standardized (GPC) – The sample is placed into a suitable solvent and passed through a GPC column. Sample components are separated based on molecular size and monitored by refractive index detection. Comparison with standards of known value allows the determination of the relative molecular weights of sample components.

## ***High Temperature Gel Permeation Chromatography (GPC-H)***

This method is most often applied for the analysis of polyethylene and polypropylenes. The sample is placed into trichlorobenzene in the presence of an antioxidant and passed through a GPC column at 145°C. Sample components are separated based on molecular size. Comparison with standards of known value allows the determination of relative molecular weights of sample components.

## ***Gel Permeation Chromatography Tetra Detection (GPC-T)***

The sample is placed into a suitable solvent and passed through a GPC column. Sample components are separated based on molecular size. Right angle light scattering, low angle light scattering, Viscometry, UV, and refractive index detection are conducted on the sample as it exits from the column enabling the determination of the absolute molecular weight and intrinsic viscosity. This technique can be used to examine polymer branching, determine polymer intrinsic viscosity, calculate polymer  $dn/dc$ , and find the percent recovery.

## ***Gel Permeation Chromatography Fourier Transform Infrared Spectroscopy (GPC-FTIR)***

The sample is placed into a suitable solvent and passed through a GPC column. Sample components are separated based on molecular size and simultaneously submitted to online FTIR analysis. Comparison with standards of known value allows the determination of relative molecular weights of sample components. Chemical identification of each sample component is attempted using comparison with reference spectrum. Changes in the chemistry of polymeric materials can be observed across the molecular weight distribution providing information otherwise unobtainable by any other method. Jordi FLP is the first analytical laboratory in the country with online GPC-FTIR capability.

## ***Light Microscopy***

**Jordi FLP can provide light microscopy analysis of your samples using any of the following methods:**

### ***Transmission Light Microscopy***

Sample images are obtained by placing the sample on a glass slide and observing the light transmitted through the sample. This technique is best for samples which are partially transparent or for the observation of fine powders. Digital images of the sample are captured allowing the determination of object size. This technique is useful for the observation of particulates as small as 1 $\mu$ m in diameter.

### ***Stereo Microscopy***

Sample images are captured by placing the sample on a glass slide and observing the light reflected off the sample. This method is useful for non-transparent specimens. Magnifications ranging from 35-90X can be obtained. Images are digitally captured and can then be analyzed to determine object size.

# Techniques We Offer **Services**

## ***High Performance Liquid Chromatography (HPLC)***

HPLC is a technique which is used for the separation of sample components based on their molecular interactions. This method is useful for the quantitation and purification of a wide range of compounds.

Jordi FLP produces a complete line of reverse phase, normal phase, and ion exchange columns providing us with unique expertise and access to a wide selection of column stationary phases. We are capable of running in nearly any solvent and offer a wide range of detection methods. We can solve the HPLC problems which others can not.

Detection methods available for HPLC analysis include:

- Ultra Violet (UV)
- Refractive Index (RI)
- Conductivity
- Mass Spectroscopy (MS)
- Photodiode Array (PDA)
- Fluorescence
- Evaporative Light Scattering (ELSD)
- Fourier Transform Infrared Spectroscopy (FTIR)

We offer the following HPLC test methods:

## ***High Performance Liquid Chromatography for Additives Quantitation (HPLC-A)***

This technique can be used to quantify the presence of organic additives in polymer samples. The polymer matrix is first extracted with a suitable organic solvent to release the additives. The extract is then injected into the HPLC system and components are separated using reverse phase, size exclusion, or normal phase chromatography. Components are then analyzed using evaporative light scattering, multi-wavelength UV, or fluorescence detection. Comparison with standards of known concentration allows for quantitation of the desired sample components.

## ***Reverse Phase Chromatography (RP)***

This technique can be used to separate, identify, and/or quantitate components in mixtures of soluble organic compounds based on their hydrophobicity. Samples are dissolved in a suitable solvent and separated based on their interaction with the column stationary phase.

## ***Normal Phase Chromatography (RP)***

This technique can be used to separate mixtures of soluble organic components based on their functional group class. Samples are dissolved in a suitable solvent and separated based on their interaction with the column stationary phase.

## ***Ion Exchange Chromatography (RP)***

This technique can be used to separate mixtures of soluble components based on their charge. Samples are dissolved in a suitable solvent and separated based on their interaction with the column stationary phase. A conductivity detector is used for this method.

## ***Mass Spectroscopy (MS)***

Mass spectroscopy is one of the most important analytical tools available today. Jordi FLP offers five different MS methods to allow the analysis of any sample type including solids, liquids, or gases.

Jordi FLP has extensive expertise in the analysis and interpretation of mass spectral data. Methods available for MS analysis include:

- **Gas Chromatography Mass Spectroscopy (GCMS)**
- **Head Space Gas Chromatography Mass Spectroscopy (Headspace GCMS)**
- **Desorption Gas Chromatography Mass Spectroscopy (DMS)**
- **Pyrolysis Mass Spectroscopy (PYMS)**
- **Liquid Chromatography Mass Spectroscopy (LCMS)**

### **Method Descriptions:**

#### ***Gas Chromatography Mass Spectroscopy (GC-MS)***

A liquid sample is injected into the GC-MS using an auto-injector and then volatilized and passed into a gas chromatography column. Components are separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. The resulting characteristic fragmentation patterns are used for component identification. Comparison of the sample spectra to reference spectra for thousands of known compounds often allows for positive component identification. Quantitation is possible by comparison with a calibration curve for known amounts of a reference material.

#### ***Head Space Gas Chromatography Mass Spectroscopy (Headspace GCMS)***

A portion of the sample is placed into a headspace sampling unit at a specified temperature. The gas above the sample is then injected onto a gas chromatography column. Components are separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. The resulting characteristic fragmentation patterns are used for component identification. Comparison of the sample spectra to reference spectra for thousands of known compounds often allows for positive component identification. Quantitation is possible by comparison with a calibration curve for known amounts of a reference material.

## *Mass Spectroscopy (MS) (continued)*

### *Desorption Mass Spectroscopy (DMS)*

The sample is placed into a quartz tube and dropped into a heated chamber at a selected temperature between 50-315°C. Volatile components of the sample are desorbed and transferred in the gas phase onto a gas chromatography column. Components are separated as a function of temperature and interaction with the column stationary phase. They are then subjected to an electron impact (EI) mass spectrometry source. The resulting characteristic fragmentation patterns are compared to reference spectra for thousands of known compounds often allowing component identification. This technique provides information on volatile sample components. Samples with the same matrix will desorb sample components with an equal efficiency allowing good vs bad comparisons.

### *Pyrolysis Mass Spectroscopy (PYMS)*

The sample is placed into a heated probe and is then pyrolyzed by ramping the temperature to 540°C. This temperature ramp causes separation of sample components based on their thermal stability. The resulting materials are then analyzed by mass spectroscopy using an EI ionization source and compared to reference spectra for thousands of known compounds. Positive component identification is possible in many cases. This technique provides information on pyrolyzable sample components.

### *Liquid Chromatography Mass Spectroscopy (LCMS)*

The sample is dissolved in a suitable solvent and then separated by liquid chromatography. Sample components are passed into an electrospray ionization source for analysis by mass spectrometry. Four detection methods are possible including ESI+, ESI-, APCI+, and APCI-. This technique provides the molecular weight of each component without fragmentation patterns. Comparison of the retention times and molecular weight values often allows for positive sample component identification. This technique can be applied successfully in some cases in which low volatility of sample components prevents their detection by other methods. This technique also has greater sensitivity than other MS methods. Quantitation is possible by comparison with a calibration curve for known amounts of a reference material.



## ***Particle Analysis***

**Jordi FLP provides particle analysis for a range of materials. Please call or email us to discuss your analysis needs.**

### ***Partical Size and Shape Analysis by Light Microscopy***

Sample images are obtained by placing the sample on a glass slide and observing the light transmitted through the sample. This technique is best for samples which are partially transparent or for the observation of fine powders (1-20 $\mu$ m). Digital images of the sample are captured allowing the determination of object size. This technique is useful for the observation of particulates as small as 1 $\mu$ m in diameter.

### ***Electrozone Sensing Particle Size Analysis (L-Zone)***

Particle size information is obtained using the L- Zone through the measurement of the conductivity of the solution as the particles pass through a sensing zone. The presence of the particle within the sensing zone displaces a volume of liquid and thus reduces the measured conductivity. The momentary decrease in current, results in an electric pulse whose amplitude is proportional to the volume of electrolyte solution displaced. This allows the determination of the particle size. The instrument then sums the number of particles of a particular size passing through the sensing zone over a specific period of time. A plot of the particle size distribution is then obtained. The volume is measured directly but the size is reported as the equivalent spherical size and equals the size of a sphere that displaces the same volume of liquid. Particle sizes ranging from .4-1200 $\mu$  can be analyzed by this method. Samples must be dispersable in a salt solution to be analyzed by L-zone.

## ***Thermal Methods***

**Jordi FLP offers three different thermal analysis techniques to solve all of your materials characterization needs.**

### ***Differential Scanning Calorimetry (DSC)***

The sample is placed into an aluminum pan and heated at a constant rate. Differences in the amount of energy required to increase the sample temperature provide insight into the material structure including both chemistry and crystallinity. Parameters which are accessible by DSC include the melt point, glass transition, and extent of curing.

### ***Thermogravimetric Analysis (TGA)***

The sample is weighed into a platinum weigh boat. It is then heated while measuring the weight loss as a function of temperature. Residual weight following heating to 1000°C is indicative of inorganic filler. The percent carbon black can also be determined through the comparison of weight loss while using different purge gases.

## *Thermal Methods (continued)*

### *Melt Flow*

The sample is extruded through a tube of a specific length and diameter while being subjected to a fixed amount of weight at a fixed temperature. The time for extrusion is measured to calculate the melt flow index. This method is a low cost technique commonly used in quality control applications for polymer samples.

## *Nuclear Magnetic Resonance (NMR)*

**Jordi FLP provides both  $^1\text{H}$  and  $^{13}\text{C}$  NMR analysis and has extensive expertise in the interpretation of NMR data. Please feel free to call us to discuss your NMR analysis needs.**

### *NMR*

The sample is dissolved in a suitable solvent and then placed into a high magnetic field and subjected to a radio frequency pulse. A specific nuclei is chosen for analysis such as  $^1\text{H}$  or  $^{13}\text{C}$ . Adsorption of radiation is dependent on the chemical environment surrounding the nuclei being analyzed. The resulting signal is useful for elucidating the chemical structure of sample molecules and signals are also quantitative in nature.

## *Supplemental Testing*

Didn't find the testing you need? Call or email our scientists today to discuss your analysis. We offer many services which are not shown in this catalog. If we can't provide the testing you require, we will use our extensive knowledge of the industry to help you find a laboratory that can.

*Demand the best*

*for all your chemical tests*

*Contact the Experts at **Jordi***

## Sample Submission Form

Jordi, FLP invites you to submit your samples for analysis. Use our facilities to augment your capabilities for all of your analytical needs. Please make copies of this form for other work as needed.

### Sample Analysis Request Form

Please use this form to provide information to us about your analytical needs.

Name: \_\_\_\_\_ Organization: \_\_\_\_\_  
Department: \_\_\_\_\_ Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Purchase Order # \_\_\_\_\_

### Samples to be Analyzed

Identification: \_\_\_\_\_

Name of Material and a Brief Description of the Problem you want to solve:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Sample Size** — We prefer to receive one gram or more of sample. Please consult us for special circumstances.

In what solvents is your sample soluble?

\_\_\_\_\_

Do your samples contain ionic components? Explain

\_\_\_\_\_

Are there any hazards in handling them? Explain

\_\_\_\_\_

Are they temperature or light sensitive?

\_\_\_\_\_

For GPC analyses, estimate the Molecular Weight, if possible.

\_\_\_\_\_