HPLC

Varian
Dynamax Preparative HPLC Columns

VARIAN

Preparative HPLC
Simple, successful and economical

Linear scale-up—move from analytical separation to preparative purification quickly and simply.

Dynamic Axial Compression—ensure top column performance injection after injection.

Dynamax modular column technology—replace only the spent cartridge.

Preparative chromatography typically involves large injections of very precious material. Flawless purification with good recovery is critical. The key to simple and successful preparative HPLC is linear scale-up coupled with Dynamax preparative HPLC columns.

Dynamic Axial Compression removes voids before they form with a simple twist of the wrist. Dynamax columns save you money by recycling expensive end fittings. Varian offers cartridges with internal diameters of 10, 21.4, and 41.4 mm and packing materials to meet all your preparative applications.

Extend column life. *Dynamax 21.4 mm ID preparative HPLC column with integrated guard module.*

Integrated Guard Module Extends Column Life

- Protect preparative columns
- Maintain column selectivity
- Lower operating costs

The Dynamax design provides an optional integrated guard module packed with the same phase as that of your preparative column. Permanently retained contaminates are captured on the guard module protecting the preparative column. Guard modules extend column life and lower your operating costs even further.

Dynamic Axial Compression really works!
The proof is in the performance

- Eliminate voids and maintain bed structure
- No tools required
- Reuse end fittings

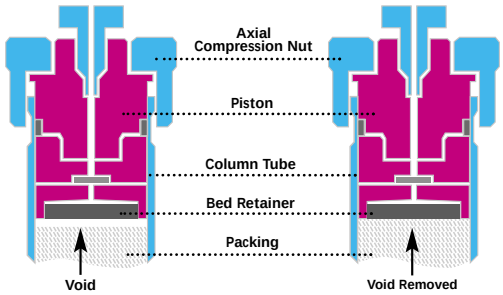
The Dynamax end-fitting is a major innovation in preparative HPLC design that extends column life. A movable piston and bed retainer exert force against the top of the packed bed. A dynamic sealing ring between the piston and the column wall forms a high-pressure seal. The seal derives force from the solvent pressure inside the column, yet slides freely along the interior wall when pressure is absent. A leak-free seal is formed at any position.

Dynamic Axial Compression essentially repacks the column when you tighten the end-fitting. A highly uniform bed structure is maintained and voids formed at the top of the column are eliminated. Moderate force, just a twist of the wrist, on the end-fitting removes voids.

In addition to recovery from severe voiding, very subtle chromatographic changes can be reversed by Dynamic Axial Compression. For example, columns that have lost efficiency but do not yet exhibit peak splitting can be restored to original levels of efficiency and peak symmetry using Dynamic Axial Compression.

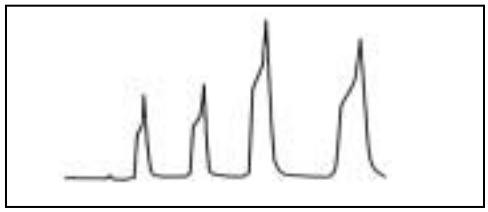
Dynamax preparative HPLC columns provide exceptional performance for reasonable prices. Value becomes even more pronounced as column diameter increases. Dynamax 21.4 mm ID and 41.4 mm ID preparative columns offer the highest throughput to price ratios of any commercially available high resolution HPLC columns.

Dynamax Column Inlet End-Fitting

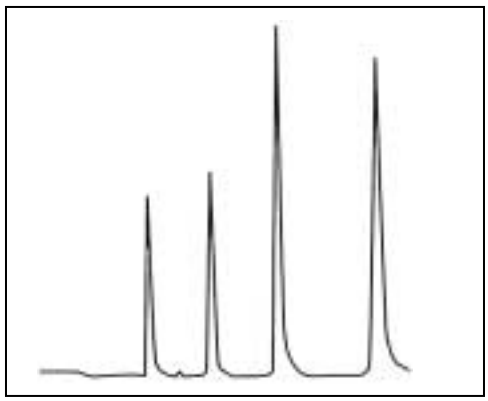


Void removal. *A twist of the Axial Compression Nut presses the bed retainer down and removes the void.*

Restore Performance



Voided column. *A 21.4 mm ID Dynamax column was exposed to severe pressure shocks to create an inlet void. Severe peak splitting is evident.*



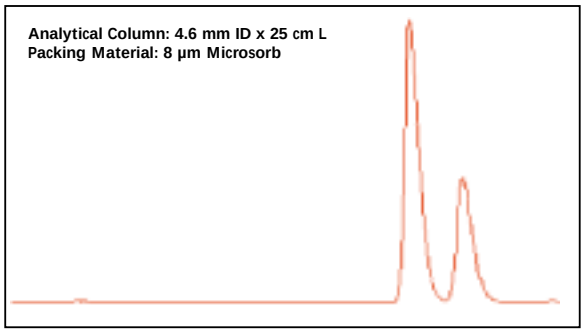
Performance restored. *The inlet end fitting was hand-tightened at atmospheric pressure to create Dynamic Axial Compression force. Injecting the same sample yielded highly resolved sharp peaks.*

Linear Scale-Up
In four easy steps

Linear scale-up is based on having both analytical and preparative columns packed with material that is the same phase and particle size. With linear scale-up, you can move from an analytical injection to purification in four easy steps.

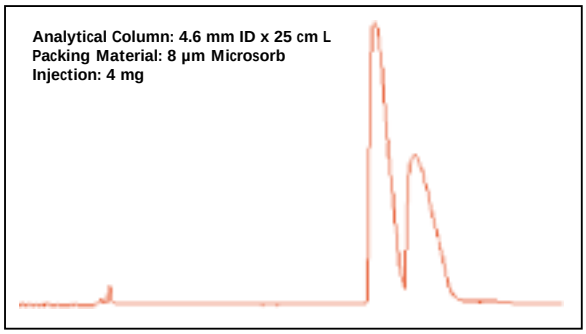
Step 1: Refine Analytical Conditions

Develop your analytical separation on a stationary phase that is also available in preparative HPLC column dimensions.



Analytical separation. *Typical sample loading for analysis and quantification.*

Step 2: Maximize Sample Loading



Determining maximum sample loading. *Using the same column as in Step 1 and maintaining an acceptable separation, a 10-fold increase of injected sample was achieved.*

Determine the sample loading on your analytical column by increasing the amount of sample injected on the column until the separation is at a minimum acceptable level. At this stage, flow rate and gradient conditions are also determined.

Quick and Easy Transition From Analytical to Prep

Step 3: Apply Scale-Up Factor

Apply the corresponding scale-up factor as you transition from an analytical column to a preparative column. The scale-up factor determines flow rate, sample volume, tubing ID, and dead volume.

The adjacent table provides the scale-up factor for a range of ID columns based on using a 4.6 mm ID column for your analytical development column.

Scale-Up Factors	
Column ID (mm)	**Scale-Up Factor (Ratio to 4.6 mm ID)**
2.1	0.21
4.6	1.00
10.0	4.70
21.4	21.60
41.4	81.00
77.0	280.00
100.0	472.00
150.0	1060.00

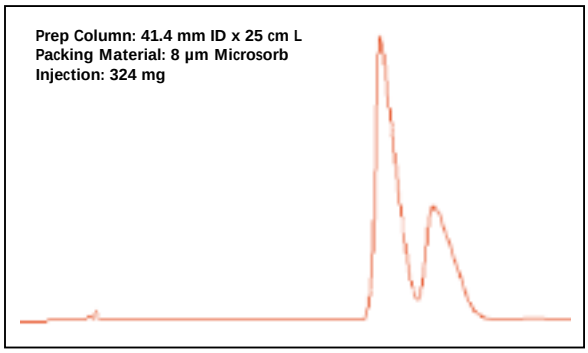
Simple scale-up. *Values used when scaling up from 4.6 mm ID analytical column.*

The values determined in Step 2 are multiplied by the scale-up factor appropriate to the preparative column. When this is done, the analytical and preparative chromatogram will look identical provided that the same packing material is used in both columns.

Sample concentration and gradient profile must remain identical for both the analytical and preparative separations. Inject only the amount of material determined by the scale-up factor to assure preparative results that match the analytical separation.

Step 4: Purifying Your Sample

Make your preparative injection. Whether you are purifying milligrams or kilograms of material in a single injection, applying the correct scale-up factor makes your work simple.



Scale-up factor at work. *Using the scale-up factor of 81.8 for a 4.6 mm analytical column, the same chromatographic results were generated on a 41.4 mm preparative column.*

OmniSpher™ and Microsorb™
Silicas for any application

Varian manufactures two lines of preparative columns, OmniSpher and Microsorb, individually tested to meet our standards for quality and performance.

OmniSpher C18

- High-purity silica
- Symmetrical peak shape
- Excellent stability and reproducibility

OmniSpher is our most recent development in stationary phase technology and is available in 5 µm and 10 µm spherical particles for preparative HPLC. OmniSpher was designed specifically for the analysis and purification of mixtures containing either acidic or basic compounds that normally tail on more traditional bonded material.

OmniSpher's superior peak shape is due to the use of ultra-high purity silica with extremely low concentrations of metals and salts. Higher concentrations of metals lead to most of the secondary interactions that cause peak tailing. OmniSpher is truly a universal column!

Replace traditional phases with OmniSpher. *OmniSpher columns are universal and can be applied to samples regardless of polarity.*

Microsorb

- Economical
- Choice of particle and pore sizes
- Broad range of phases

The Microsorb column line is made up of 8 phases: Silica, C4, C8, C18, Phenyl, Cyano, and Amino. These materials are offered in 5, 8, and 10 µm particles with pore sizes of either 100 or 300 Å to address all your application needs. Pore size choices make Microsorb applicable to both small and large molecule separations.

Choose pre-packed columns or bulk materials. *Microsorb is available in pre-packed analytical, semi-prep, and preparative columns as well as in bulk from100 g to 1 kg.*

Ordering Information

Phase	Pore Å	Size µm	Length	Analytical Column 4.6 mm ID	Dynamax Prep Cartridges without End-Fittings 10.0 mm ID	21.4 mm ID	41.4 mm ID
OmniSpher C18	110	5	50 mm	CP27845	CP28169	CP28170	
			100 mm	CP27801	CP28171	CP28172	
			250 mm	CP27803	CP28173	CP28174	
			Guard Module		CP28178	CP28179	
OmniSpher C18	110	10	250 mm	CP28281	CP28175	CP28176	CP28177
			Guard Module		CP28180	CP28181	CP28182
Microsorb C18	100	5	250 mm	CP30713	R0080210C5	R0080220C5	
			Guard Module		R0080210G5	R0080220G5	
Microsorb C18	300	5	250 mm	CP30716	R0083213C5	R0083223C5	
			Guard Module		R0083213G5	R0083223G5	
Microsorb C18	60	8	250 mm	CP30719	R00083211C	R00083221C	R00083241C
			Guard Module		R00083211G	R00083221G	R00083241G
Microsorb C18	100	8	250 mm	CP30840	R0080240C8		
			Guard Module		R0080220G8	R0080240G8	
Microsorb C18	300	10	250 mm	CP30843	R083213C10	R083223C10	R083243C10
			Guard Module		R083213G10	R083223G10	R083243G10
Microsorb BDS	100	5	250 mm	CP30686	R0080910C5	R0080920C5	
			Guard Module		R0080910G5	R0080920G5	
Microsorb BDS	100	10	250 mm	R089900C10	R080920C10	R080940C10	
			Guard Module		R080920G10	R080940G10	
Microsorb C4	300	5	250 mm	CP30746	R0083523C5		
			Guard Module		R0083523G5		
Microsorb C4	300	8	250 mm	R0086503C8	R0083523C8	R0083543C8	
			Guard Module		R0083523G8	R0083543G8	
Microsorb C4	300	10	250 mm	CP30846	R083513C10	R083523C10	R083543C10
			Guard Module		R083513G10	R083523G10	R083543G10
Microsorb C8	100	5	250 mm	CP30734	R0080310C5	R0080320C5	
			Guard Module		R0080310G5	R0080320G5	
Microsorb C8	300	5	250 mm	CP30737	R0080313C5	R0080323C5	
			Guard Module		R0080313G5	R0080323G5	
Microsorb C8	60	8	250 mm	CP30740	R00083311C	R00083321C	R00083341C
			Guard Module		R00083311G	R00083321G	R00083341G
Microsorb C8	100	8	250 mm	R0086300C8	R0080320C8	R0080340C8	
			Guard Module		R0080320G8	R0080340G8	
Microsorb C8	300	8	250 mm	R0086303C8	R0083323C8	R0083343C8	
			Guard Module		R0083323G8	R0083343G8	
Microsorb Si	100	5	250 mm	CP30803	R0080110C5	R0080120C5	
			Guard Module		R0080110G5	R0080120G5	
Microsorb Si	60	8	250 mm	CP30806	R00083111C	R00083221C	
			Guard Module		R00083111G	R00083221G	
Microsorb Si	100	8	250 mm	R0086100C8	R0080120C8	R0080140C8	
			Guard Module		R0080120G8	R0080140G8	
Microsorb Phenyl	100	5	250 mm	CP30758	R0080D10C5	R0080D20C5	
			Guard Module		R0080D10G5	R0080D20G5	
Microsorb Phenyl	60	8	250 mm	CP30849	R00083D11C	R00083D21C	R00083D41C
			Guard Module		R00083D11G	R00083D21G	R00083D41G
Microsorb CN	100	5	250 mm	CP30773	R0080810C5	R0080820C5	
			Guard Module		R0080810G5	R0080820G5	
Microsorb CN	60	8	250 mm	CP30776	R00083811C	R00083821C	R00083841C
			Guard Module		R00083811G	R00083821G	R00083841G
Microsorb CN	100	8	250 mm	R0086800C8	R0080820C8	R0080840C8	
			Guard Module		R0080820G8	R0080840G8	
Microsorb Amino	100	5	250 mm	CP30788	R0080710C5	R0080720C5	
			Guard Module		R0080710G5	R0080720G5	
Microsorb Amino	60	8	250 mm	CP30791	R00083721C	R00083741C	
			Guard Module		R00083721G	R00083741G	
Microsorb Amino	100	8	250 mm	R0086700C8	R0080720C8	R0080740C8	
			Guard Module		R0080720G8	R0080740G8	

Please refer to the Varian Chromatography and Spectroscopy Supplies Catalog for details on other available column and packing options.

Dynamax Preparative HPLC Column Hardware

Dynamax cartridges are delivered without end-fittings. The first time you purchase a Dynamax cartridge you will need the appropriate end-fittings. There are three options for configuring Dynamax columns. End-Fittings Kits are available for each configuration.

Kit 1. End-fittings for operating Dynamax preparative columns without a guard module. Match the Kit to the ID of the Dynamax preparative cartridge.

Part No.	Description
R000083810	10.0 mm ID Dynamax End-Fitting Kit #1
R000083820	21.4 mm ID Dynamax End-Fitting Kit #1
R000083840	41.4 mm ID Dynamax End-Fitting Kit #1

Kit 2. All the connectors needed to operate a Dynamax preparative cartridge fitted with a protective guard module.

Part No.	Description
R000083812	10.0 mm ID Dynamax End-Fitting Kit #2
R000083822	21.4 mm ID Dynamax End-Fitting Kit #2
R000083842	41.4 mm ID Dynamax End-Fitting Kit #2

Kit 3. Use the guard module as the preparative column. Match the the Dynamax Guard Holder to the ID of the guard module.

Part No.	Description
R000083814	10.0 mm ID Dynamax Guard Holder
R000083824	21.4 mm ID Dynamax Guard Holder
R000083844	41.4 mm ID Dynamax Guard Holder

Help Desk

For responsive customer support, you can rely on our Technical Help Desks in the USA and Europe. Varian's Help Desk team is available to address our customers' toughest application questions.

Call the US Help Desk toll-free at 800-926-3000, send a fax to 310-539-1449, or e-mail us at helpdesk.us@varianinc.com. For the European Help Desk contact your local Varian office, or e-mail us at helpdesk.eu@varianinc.com.

New CP-SCANVIEW CD-ROM

CP-SCANVIEW is an easily searchable CD applications database that contains 1,600 of the latest analytical GC and HPLC applications and 1,400 solid phase extraction applications. Contact your Varian office today for your free copy.

Varian Preparative Components and Systems Performance, Selection, and Value

When you routinely need to purify large quantities of material, it is more economical to pack your own preparative columns. Varian offers multiple options to address this need. Our options extend well beyond commercially available pre-packed columns.

Load & Lock™ columns. *Designed to make packing columns with variable bed lengths quick and easy. Bed lengths range between 10 and 50 cm. Simply pour the slurry into the column, attach the end cap, and compress with the hydraulic piston.*

RamPak™ column packing stations. *RamPak 41/77 ID and 100/150 ID Stations are offered. The RamPak Station applies Dynamic Axial Compression with a hydraulic cylinder, pressing the bed during packing. Pressure continuously applied during operation assures a tightly packed bed and eliminates voids as soon as they form.*

Preparative HPLC pumps and detectors. *Varian offers a total HPLC solution with a range of components specifically designed for preparative applications. Whether your application requires flows of 25 mL/min or over 3 L/min, Varian has the system.*

SepTech® skid systems. *For purification requirements extending into the manufacturing area, skid systems are custom designed for bench-top, pilot-plant, and process applications.*

Varian Analytical Instruments serving worldwide markets in:

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Biotechnology
Clinical
Electronics
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Photonics
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Pharmaceutical
Food and Beverage
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Petroleum and Petrochemical

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Varian is committed to a process of continuous improvement which demands that we understand and then meet or exceed the needs and expectations of our customers — both inside and outside the company — in everything we do.

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