



Agilent Load & Lock Columns

Purify your way



Agilent Technologies

## PURIFY YOUR WAY WITH VERSATILE COLUMN SOLUTIONS FOR HIGH-THROUGHPUT AND HIGH-YIELD PURIFICATION

Ideal for routine purification of large quantities of material, Agilent Load & Lock columns exhibit excellent packed bed stability and enhanced flow distribution to deliver the highest productivity. Combined with Agilent purification systems, these columns offer maximum purification efficiency at higher flow rates and delivery pressures, meeting the high-throughput demands of pilot-scale purification.

### Easy to Setup and Easy to Use

When you need to purify large quantities of material using your own choice of separation media, Agilent Load & Lock columns can help you get your purification facility up-and-running quickly and with ease. Within a few minutes you can pack or unpack your column with any commercially-available material – even in hazardous environments. Combined in one easy-to-move stand, the column and packing station can be moved wherever it's needed within your facility for maximum mobility and greater convenience.

### High Performance on a Large Scale

Agilent Load & Lock columns are available with inside diameters from 1 to 3 inches (27 to 75 mm) and are unique in that they offer both dynamic axial compression (DAC) and static axial compression (SAC). Axial compression is used in the column packing process to compress the sorbent particles into a tightly packed, void-free bed for high performance purifications. With DAC the packed bed is constantly compressed while being used, whereas with SAC the column is first compressed by a plunger, which is subsequently held in position with a locking mechanism.

With just one mobile station you can pack any number of 1, 2 and 3 inch id columns. The undocking feature allows you to deploy the packed columns anywhere in your facility.



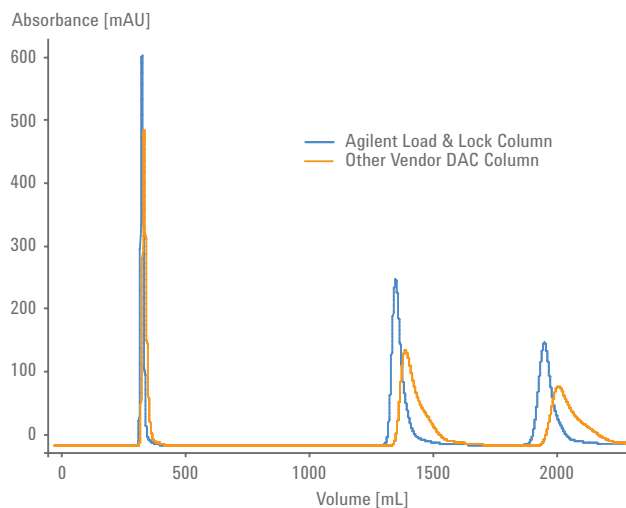
## Highest Bed Stability for Maximum Sample Loading

The distribution of fluid and sample within the column is the key parameter to achieve effective separations. Agilent's unique fluid and sample distribution plates improve column performance by diffusing the sample more evenly across the entire surface of the packed bed, providing for exceptional separation efficiency.

- Maximized plate count
- Minimized peak broadening
- Increased sample loading
- Reduced back pressure
- Extended column life



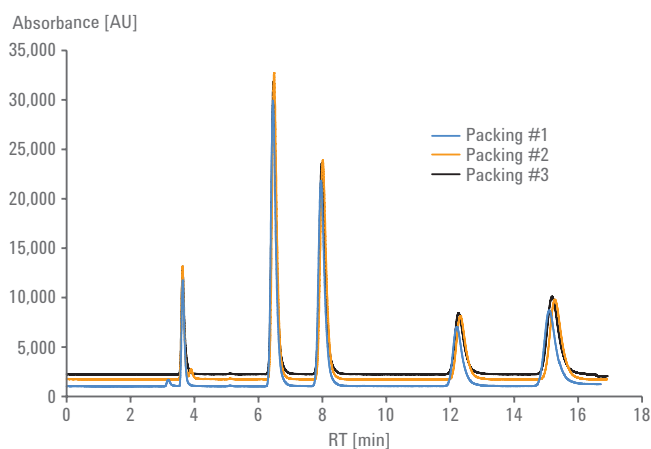
A proprietary fluid and sample distribution plate diffuses the sample more efficiently – the resulting 20 % increase in sample loading allows you to produce more purified material per unit time and thereby reduce production costs.



The outstanding efficiency of Agilent Load & Lock columns (used in DAC mode) is apparent in this comparison with a DAC column from another vendor.

## Temperature Control for Highest Reproducibility

Load & Lock columns are available with stainless steel water jackets welded directly to the column. Connected to a hot or cold water source such as a circulating bath facilitates accurate and inexpensive temperature control when processing thermally-labile or temperature-dependent samples. Constant column temperatures up to 60 °C can be maintained, delivering excellent column-to-column reproducibility.



Packing #	Nth/meter	As	RT [min]
1	40,606	1.27	15.18
2	41,522	1.22	15.28
3	41,164	1.30	15.26

A packing study using a 2 inch id Load & Lock column demonstrates excellent reproducibility.

# PURIFY YOUR WAY WITH DYNAMIC AXIAL COMPRESSION OR STATIC AXIAL COMPRESSION FOR FULL FLEXIBILITY

Agilent Load & Lock columns are unique in that they offer both dynamic axial compression and static axial compression, giving you the flexibility to choose a compression mode that best suits your application.

## Choose the Best Mode for Your Application

Axial compression is used during the column packing process to compress the sorbent particles into a tightly-packed, void-free bed – essential to achieve high performance separation. There are two methods of maintaining axial compression; dynamic axial compression (DAC) and static axial compression (SAC). With DAC, the packed bed in the column is compressed constantly and dynamically while being used. With SAC, the column is first compressed by a plunger, which is subsequently held in position with a locking mechanism. Agilent Load & Lock columns are the only commercially available columns that allow you to use both DAC and SAC.



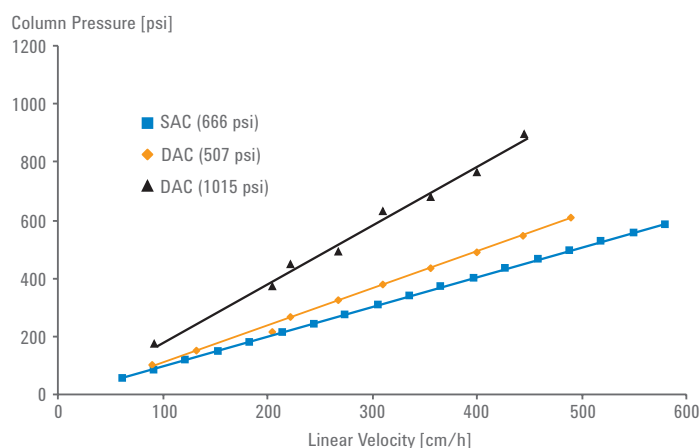
In SAC mode the column is first compressed by a plunger, which is subsequently held in position with a locking mechanism, protecting fragile sorbents from being crushed and thereby maintaining separation integrity.

## DAC – The Traditional Approach

Dynamic axial compression is the traditional approach to packing columns and has been used extensively for over 30 years. Packing materials with spherical particles in the 8 – 15  $\mu\text{m}$  range are typically used, which can withstand the substantial hydraulic forces applied.

## SAC – For Better Results

With the advent of packing materials less resistant to hydraulic forces, static axial compression offers an alternative technique that prevents damage to the particles. Use SAC for packing materials with particle sizes of 10  $\mu\text{m}$  or larger, for irregular-shaped particles, or for easily-damaged or sensitive materials such as the 300  $\text{\AA}$  particles or polymeric materials deployed for biological applications. The flexibility to perform either mode ensures that Load & Lock columns consistently deliver high quality separation results. The stable packed beds exhibit excellent permeability for extended column life.



This plot of pressure against linear velocity demonstrates the improved permeability and wider linear velocity range of Load & Lock columns. In this example the column was packed with PLRP-S 100  $\text{\AA}$ , 10–15  $\mu\text{m}$  material, at a pressure of 666 psi (46 bar) in DAC mode, and operated in SAC mode with an eluent of 80 % acetonitrile and 20 % water. For comparison the plots of conventional DAC columns packed at pressures of 507 and 1015 psi (35 and 70 bar) are shown.

## PURIFY YOUR WAY WITH SAFE, EASY-TO-USE PACKING STATIONS ANYWHERE WITHIN YOUR PURIFICATION FACILITY

Agilent packing stations for Load & Lock columns are easily maneuverable and require only compressed air for operation, making them safe to use with any type of solvent anywhere within your purification facility – even in hazardous environments.

### Safe, Convenient and Easy to Use

Requiring only compressed air at a pressure of 6 bar (90 psi), the Load & Lock packing stations do not need electrical power, making them safe to use with any solvent and the solution of choice for hazardous environments. An air-driven, constant pressure hydraulic pump controls the packing stations' hydraulic cylinder, which can be operated in either dynamic or static axial compression mode.

### Column Packing How You Want

Load & Lock columns can be packed using different techniques depending on the desired physical length of the bed or quantity of packing material. The slurry or rapid pack method is the most common technique used to pack high performance material in this type of column. This technique utilizes 60 % or less of the available column tube length. No reservoir is required for packing; the slurry is poured into the column, the end cap attached and the slurry solvent removed by hydraulic compression. When the compression pressure is reached, the compression piston can be locked in place for static axial compression operation. The entire packing procedure requires only minutes, is residue-free and utilizes the entire quantity of material.

### Column Packing Where You Want

The Agilent packing stations can be used to pack columns of different inside diameters, reducing the total cost of ownership as you need only one packing station for 1, 2 and 3 inch id columns. That means you can pack a column, lock it and then remove from the packing station. This unique feature facilitates the setup of a central packing zone, which can be located away from the sample preparation and purification areas. Further, it frees up the packing station and gives you the flexibility to pack an unlimited number of columns.



The Agilent 123 MultiPacker Station for convenient and safe packing of 1, 2 and 3 inch id Load & Lock columns.

## PURIFY YOUR WAY WITH PURELY BETTER SOLUTIONS FOR COMPOUND ISOLATION

Agilent offers the most comprehensive portfolio of flexible and reliable solutions for purification by liquid chromatography. No matter what scale you are working at, Agilent has high-performance instrumentation, columns, software and services that ensure highest purity and maximum recovery.



 Flow range extensions made possible by exchangeable pump heads

\*Optional software available for automated analytical-to-preparative scale-up



### Agilent LC and LC/MS Purification Solutions

Agilent Technologies offers the most comprehensive portfolio of flexible and reliable solutions for sample purification by liquid chromatography. No matter what scale of LC purification you are working at, Agilent has high-performance instrumentation, columns, software and services that ensure highest purity and maximum recovery. And because it's from Agilent, you get everything you expect from a chromatography leader with over 40 years of innovative contributions to LC technology.



Download brochure  
[www.agilent.com/chem/PREPbro](http://www.agilent.com/chem/PREPbro)

### Agilent 1260 Infinity Purification Systems

Agilent 1260 Infinity LC and LC/MS purification systems offer flexible and easy-to-use solutions for purification of microgram to gram quantities of samples – with maximum levels of recovery and purity. Choose from a wide range of separation and detection modules to tailor a system that meets your needs. Raise your laboratory's productivity with workflow-based software for automated transfer of methodologies from analytical to preparative scale.



Download brochure  
[www.agilent.com/chem/1260bro](http://www.agilent.com/chem/1260bro)

### Agilent 218 Purification Systems

The Agilent 218 Purification System has the flexibility to adapt to your purification needs as they change over time. Delivering isocratic flow or gradients at up to 200 mL/min with excellent precision and reproducibility, this system is a true workhorse for routine LC purification work.



Download brochure  
[www.agilent.com/chem/218bro](http://www.agilent.com/chem/218bro)

### Agilent SD-1 Purification Systems

The Agilent SD-1 Purification System achieves better gradient accuracy over a larger flow rate range than any other preparative LC system today. Exchangeable pumps heads enable the system to deliver flow rates of 200 and 500 mL/min. One system runs routine analyses and scales-up to multiple gram levels of sample.



Download brochure  
[www.agilent.com/chem/SD1bro](http://www.agilent.com/chem/SD1bro)

Learn more

**[www.agilent.com/chem/purification](http://www.agilent.com/chem/purification)**

Find an Agilent customer center

**[www.agilent.com/chem/contactus](http://www.agilent.com/chem/contactus)**

USA and Canada

**1-800-227-9770**

**[agilent\\_inquiries@agilent.com](mailto:agilent_inquiries@agilent.com)**

Europe

**[info\\_agilent@agilent.com](mailto:info_agilent@agilent.com)**

Asia Pacific

**[inquiry\\_lsca@agilent.com](mailto:inquiry_lsca@agilent.com)**

This information is subject to change without notice.

© Agilent Technologies, Inc. 2013-2014

Published in the USA, March 1, 2014

5991-1396EN



**Agilent Technologies**