Agilent InfinityLab

Purify Your Way

Agilent Load & Lock Columns

Agilent

Trusted Answers

Flexible 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 InfinityLab LC Purification Solutions, these columns offer maximum purification performance at higher flow rates and delivery pressures, meeting the high-throughput demands of pilot-scale purification.

An overview of the benefits

- **Easy setup**
  Pack or unpack your column with any commercially available sorbent within minutes.
- **Straightforward transport**
  The column and packing station can be moved anywhere within your facility.
- **High-performance purification**
  Load & Lock Columns offer both dynamic axial compression (DAC) and static axial compression (SAC).
- **High bed stability**
  Unique fluid and sample distribution plates ensure maximized plate count, increased sample loading, and extended column life.
- **Temperature control**
  Columns are equipped as standard with stainless steel water jackets, providing accurate temperature management when connected to a water source.

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

Columns Fitted to Your Purification Needs

Agilent Load & Lock Columns are designed to flexibly accommodate your application requirements, whatever the sample amount, sorbent, and location within your lab. Following a quick setup, these columns enable high performance, productivity, and reproducibility.

Easy to setup and easy to use

When you need to purify large quantities of material using your own choice of sorbent, 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 sorbent—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.

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.

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

Temperature control for highest reproducibility

Load & Lock Columns are equipped 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.

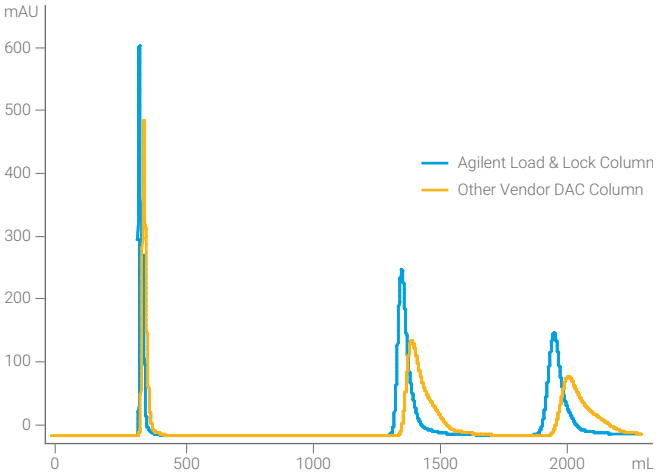
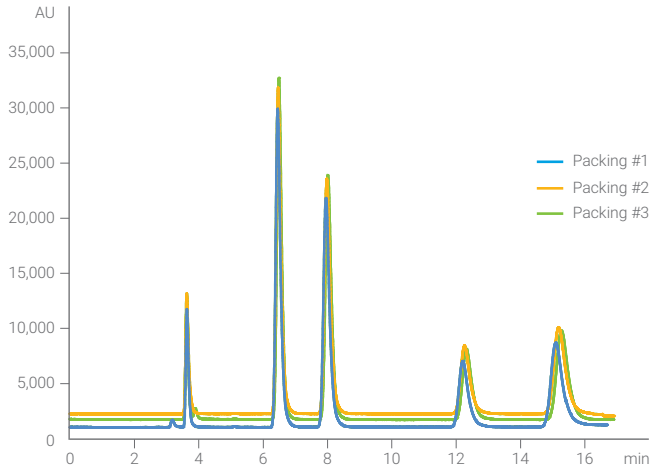


Figure 1. The outstanding efficiency of Agilent Load & Lock Columns (used in DAC mode) is apparent in this comparison with a DAC column from another vendor.

Figure 2. 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.



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

Figure 3. A packing study using a 2 in id Load & Lock Column demonstrates excellent reproducibility.

Two Compression Modes for Full Versatility

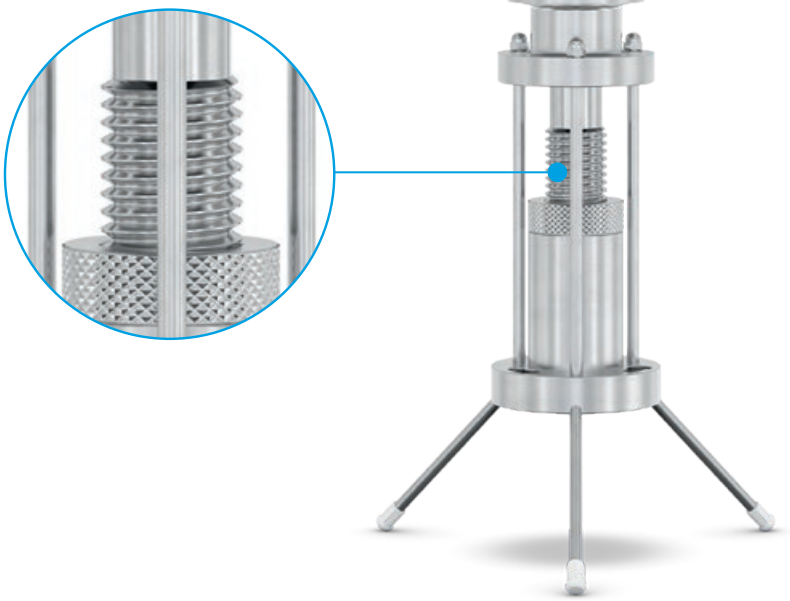
Agilent Load & Lock Columns are unique in that they offer both dynamic axial compression (DAC) and static axial compression (SAC), giving you the flexibility to choose a compression mode that best suits your application.

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: DAC and 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.

Compress with confidence

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

DAC is the traditional approach to packing columns and has been used extensively for over 30 years. Sorbents with spherical particles in the 8 to 15 µm 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, SAC offers an alternative technique that prevents damage to the particles. Use SAC for sorbents with particle sizes of 10 µm or larger, for irregular-shaped particles, or for easily damaged or sensitive sorbents such as the 300 Å particles or polymeric sorbents 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.

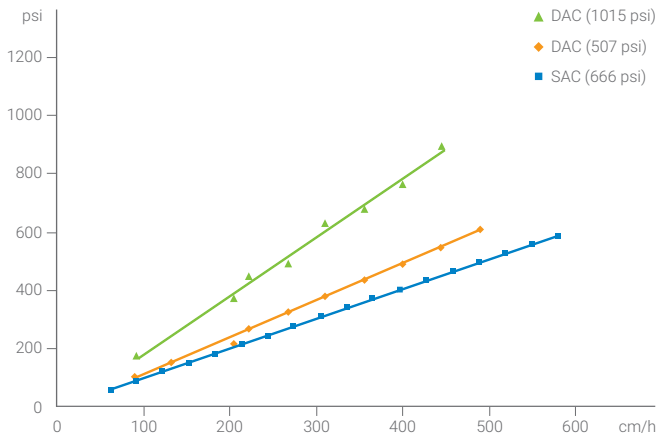


Figure 4. This plot of pressure against linear velocity demonstrates the improved permeability and wider linear velocity range of Load & Lock Columns. In this example, the column was packed with PLRP-S 100 Å, 10–15 µm sorbent, at a pressure of 666 psi (46 bar) in DAC mode, and operated in SAC mode with 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.

Safe, Intuitive Packing Stations Anywhere Within Your Facility

Agilent Mobile 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 Mobile 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.

Figure 5. The Agilent Mobile Packing Station for convenient and safe packing of 1, 2 and 3 in id Load & Lock Columns.

Column packing where you want

The Agilent Mobile 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 in 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.

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 sorbent. 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 SAC operation. The entire packing procedure requires only minutes, is residue-free, and utilizes the entire quantity of sorbent.

The right separation media for your analytes

Whether your application requires prepacked columns or multi-kilo batches of prep and process chromatography sorbents for packing your own DAC/SAC columns, Agilent can help. Sorbent selection is key to maximum purification productivity, and Agilent has one of the most complete ranges of prepacked columns and bulk sorbents for HPLC separations.

Agilent InfinityLab ZORBAX and Pursuit XRs silica offer the performance you need in a variety of chemistries for high-quality small molecule separations. PLRP-S, PL-SAX, and PL-SCX are the polymeric sorbents of choice for demanding separations such as oligonucleotide purification, where their thermal and chemical stability can be used to maximum benefit.

Figure 6. Agilent provides a range of bulk sorbents to meet your purification needs.

Purify Your Samples with Maximum Flexibility

Alongside columns and packing stations, Agilent provides everything you need to purify a range of analytes. Our LC purification portfolio enables separations from analytical to preparative scale, together with prepacked columns and sorbents for the purification of either small molecules or larger biologics.

Purification solutions for every scale

Agilent 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.

Portfolio overview

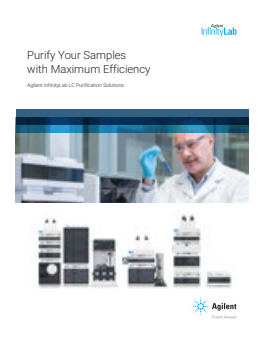
Figure 6. A comprehensive and scalable portfolio based on a single platform gives you the choice to tailor a system to meet your laboratory's current and future needs.

	Analytical		Semipreparative		Preparative
Productivity Range	Micrograms		Milligrams		Grams
Agilent 1290 Infinity II Preparative LC Systems			1 – 50 mL/min		4 – 200 mL/min
Agilent 1260 Infinity II Preparative LC Systems			1 – 50 mL/min		
Agilent 1220/1260/1290 Infinity II Analytical-Scale LC Purification Systems	0.01 – 10 mL/min				
Column Inner Diameter	4.6 mm	10 mm (½ inch)	20–25 mm (1 inch)	30 mm	50 mm (2 inch)
Typical Flow Rate (mL/min)	1	4.7	20–25	42	118

Flow range extensions made possible by exchangeable pump heads

Portfolio brochure

Learn more about the systems, modules, software, and services featured in the InfinityLab LC Purification Solutions by reading our comprehensive brochure.



Download brochure at
www.agilent.com/chem/lc-purification-brochure

Selection guide

Compare the features, physical specifications, and performance characteristics of InfinityLab LC purification systems, modules, columns, and media.

Download Selection Guide at
www.agilent.com/chem/lc-purification-selection-guide

Reliable, efficient, always innovating for your best result

You can rely on Agilent InfinityLab LC instruments, columns, and supplies to deliver rugged quality and robust analytical results. But our promise to you does not stop there. Every component of the Agilent InfinityLab family is designed to work together to help you improve your workflow, increasing efficiency and reducing operational costs.

Learn more about InfinityLab at **www.agilent.com/chem/infinitylab**

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U.S. and Canada
1-800-227-9770
agilent_inquiries@agilent.com

Europe
info_agilent@agilent.com

Asia Pacific
inquiry_lsca@agilent.com

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