

Dynamic Axial Compression Liquid Chromatography Columns

Proven, scalable technology for classic purification techniques



AsahiKASEI
BIOPROCESS

FLASH | MPLC | HPLC | UHPLC

Expand the Boundaries of Liquid Chromatography

Liquid chromatography (LC) remains an integral component of downstream processing and the most powerful means of purifying active pharmaceutical ingredients (API). In response to the increasing popularity of lean manufacturing and continuous processing, Asahi Kasei Bioprocess America, Inc. designs a range of LC columns using dynamic axial compression (DAC) technology to drive packing, unpacking and purification of gram to kilogram quantities of small molecules, peptides, oligonucleotides and microbial-derived proteins.

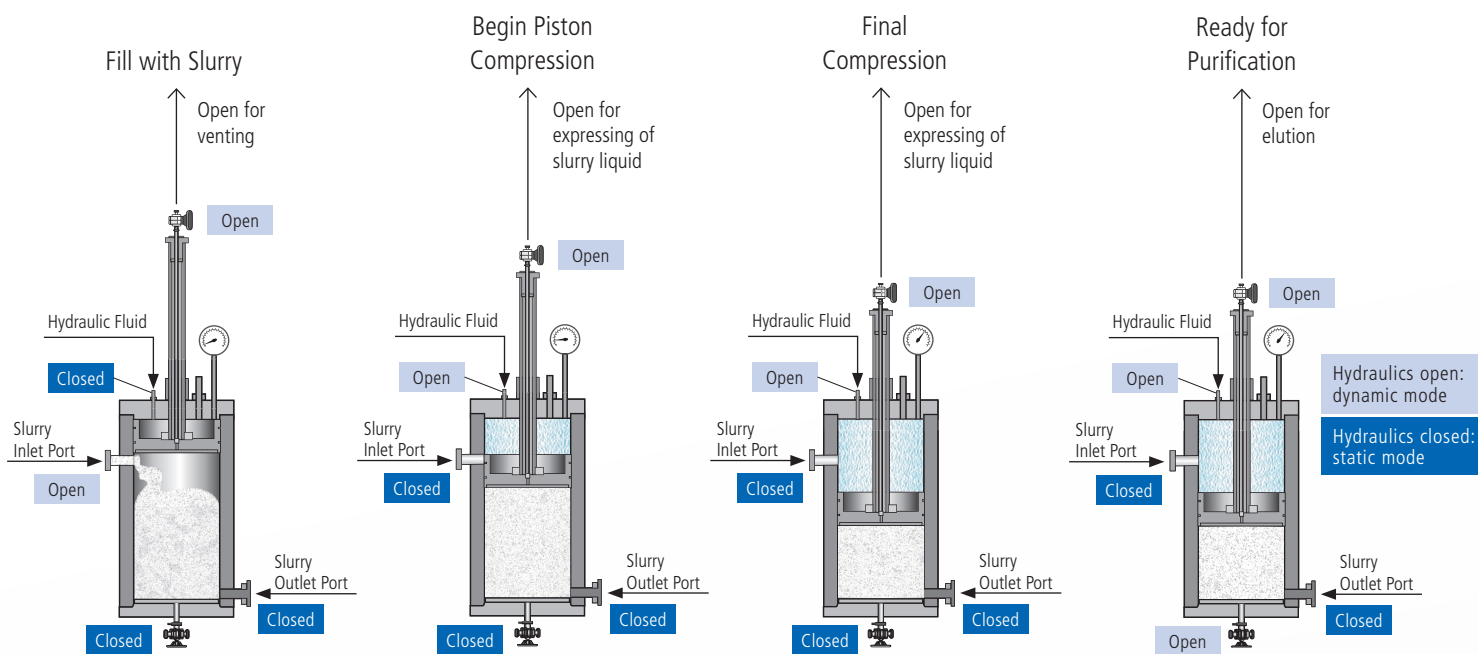


Figure 1. Packing DAC LC columns

Pack Your Column in Minutes

Transfer slurry through the slurry inlet port, and a hydraulic cart drives reproducible packing using a “set it and forget it” air pressure regulator. Compartmentalized hydraulics enable our DAC LC columns to have the lowest height requirement of any comparable DAC LC column, making them ideal for laboratories, pilot plants or manufacturing suites.

Instead of hydraulic oil, clean solvents such as alcohol or the eluent can be used to pressurize the column, thereby reducing the risk of contamination in an environmentally-friendly manner.

Accelerate Unpacking

To unpack the depressurized column, remove the bottom plate and eject the bed out of the tube with the same hydraulic cart. The novel scraper seal retains the frit and glides along the column tube bore, wiping the column walls as the piston head rapidly unpacks the bed.

Our hoist-free feature enables the piston frit to be changed from the bottom of the column, so routine frit maintenance* can be performed without the use of an overhead hoist.

*Available for columns with i.d. > 15 cm.

Take Advantage of Increased Stability

Instead of legacy “flanged tubes”, our DAC LC columns are engineered as hydraulic cylinders. Both the thicker wall of the column tube and reinforcement of the piston contribute to a mechanically robust design. This permits smooth, consistent strokes to maintain the integrity of the packed bed and reduce the risk of piston malfunction. And with our internal leak detection system, you can be assured that the seal integrity will always be known.

Putting the “High” Back into High Performance

Central to the performance of any chromatography column is the flow distributor. Asahi Kasei Bioprocess uses CAD-modeled “active” flow distribution to maximize yield by increasing the number of theoretical plates (N) and reducing the height equivalent to a theoretical plate (HETP). Both product and eluent streams uniformly access the full extent of the packed bed surface area through a proprietary network of radial and concentric channels. This translates to sharper product peaks and higher yields and recoveries than with other distribution designs.



With hundreds of chromatography columns and systems installed worldwide, Asahi Kasei Bioprocess is a trusted leader in small molecule purification.

Capitalize on Greater Flexibility

Asahi Kasei Bioprocess offers stainless steel DAC LC columns with a broad range of internal diameters – from as small as 6 cm to as large as 160 cm – with the capability to tolerate pressures from 10 bar up to 200 bar. Our DAC LC columns can also be customized to other diameters and lengths in order to better fit your unique purification process.

Our DAC LC columns are available with fully separated hydraulics. Columns with similar pressure ratings and internal diameters can be operated with a single hydraulic cart when the columns are not in use simultaneously. This unique feature reduces capital costs and maximizes resource allocation.

Column Applications Guide

Our columns support typical rigid or small particle process LC media to facilitate purification of a wide range of active pharmaceutical ingredients.



One hydraulic cart is compatible with different DAC LC columns

Table 1. Column recommendations based on the type of molecule being purified.

End Product	Suggested Media	Particle Size (µm)	LC Column Type
Oligonucleotides	Small bead agarose or polymeric gel	15 - 40	MPLC HPLC
Peptides	Reverse-phase spherical silica	5 - 30	HPLC UHPLC
Microbial-derived proteins	Reverse-phase spherical silica or polymeric gel	10 - 30	MPLC HPLC
Enantiomers	Chiral	10 - 20	HPLC
Small molecules	Normal-phase spherical silica	10 - 30	HPLC
Small molecules (rapid cleanup)	Normal-phase irregular silica	40 - 63	Flash

Comply with Industry Standards

Each DAC LC column features 316L stainless steel construction with highly fluorinated, FDA-compliant seals that are compatible with typical organic and aqueous mobile phases. Full material traceability is provided for all stainless steel product contact parts. The following options are available:

- » Electropolishing
- » Jacketing and/or insulation for column temperature control
- » ASME code stamps
- » CE Pressure Equipment Directive compliance
- » Certified USP Class VI and non-animal-derived seals

Pressure Ratings for Your Application

HPLC

Since high pressure columns are commonly utilized during peptide purifications, 70 and 100 bar ratings are designed to be compatible with 10 to 15 μm spherical silica gels.

UHPLC

When greater resolution is required, our ultra high performance liquid chromatography (UHPLC) columns tolerate pressures of up to 200 bar, enabling the use of silica gels as small as 5 μm . UHPLC columns are especially attractive for challenging peptide purifications and can be made with internal diameters from 6 to 60 cm.

MPLC

Many oligonucleotide or small protein purifications generate back pressure less than 20 bar. When a 20 bar column will be sufficient, MPLC columns provide the benefits associated with DAC combined with a lower pressure rating and lower up-front cost.

Flash

For cleanup of small molecules using irregular or large particle silica gels, 10 bar column designs for flash chromatography can be engineered with higher bed heights than traditional HPLC columns.



Improve Ease-of-Use

Since both column frits can be replaced without an overhead lift, our DAC LC columns are ideal for clean rooms or facilities with limited overhead clearance. The unique woven mesh frit design is less susceptible to clogging and can be replaced in minutes without the use of liquid nitrogen chilling. The slurry inlet port permits smooth slurry loading without needing to remove the column top plate or the piston.

Related Products and Services

To augment DAC LC columns, Asahi Kasei Bioprocess offers equipment and services related to purification and oligosynthesis.

Purification Equipment

- » Flash, MPLC, HPLC and UHPLC Systems

Oligosynthesis Equipment

- » Synthesis Columns
- » Asahi Oligosynthesizer™



Ordering Information

DAC HPLC Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
HP6x50	6 cm i.d. x 50 cm L	100 bar
HP6x70	6 cm i.d. x 70 cm L	100 bar
HP7.5x50	7.5 cm i.d. x 50 cm L	100 bar
HP7.5x70	7.5 cm i.d. x 70 cm L	100 bar
HP10x50	10 cm i.d. x 50 cm L	100 bar
HP10x70	10 cm i.d. x 70 cm L	100 bar
HP15x50	15 cm i.d. x 50 cm L	70 bar
HP15x70	15 cm i.d. x 70 cm L	70 bar
HP17x50	17 cm i.d. x 50 cm L	70 bar
HP17x70	17 cm i.d. x 70 cm L	70 bar
HP20x50	20 cm i.d. x 50 cm L	70 bar
HP20x70	20 cm i.d. x 70 cm L	70 bar
HP30x50	30 cm i.d. x 50 cm L	70 bar
HP30x70	30 cm i.d. x 70 cm L	70 bar
HP40x50	40 cm i.d. x 50 cm L	70 bar
HP40x70	40 cm i.d. x 70 cm L	70 bar
HP45x50	45 cm i.d. x 50 cm L	70 bar
HP45x70	45 cm i.d. x 70 cm L	70 bar
HP50x50	50 cm i.d. x 50 cm L	70 bar
HP50x70	50 cm i.d. x 70 cm L	70 bar
HP60x50	60 cm i.d. x 50 cm L	70 bar
HP60x70	60 cm i.d. x 70 cm L	70 bar
HP80x50	80 cm i.d. x 50 cm L	70 bar
HP80x70	80 cm i.d. x 70 cm L	70 bar
HP100x50	100 cm i.d. x 50 cm L	70 bar
HP100x70	100 cm i.d. x 70 cm L	70 bar

DAC HPLC Column Hydraulic Carts

Catalog No.	Description	Pressure Rating
HP-Cart-10	Benchtop hydraulic cart for 6 - 10 cm i.d. DAC HPLC columns	100 bar
HP-Cart-17	Benchtop hydraulic cart for 15 - 17 cm i.d. DAC HPLC columns	70 bar
HP-Cart-30	Hydraulic cart for 20 - 30 cm i.d. DAC HPLC columns	70 bar
HP-Cart-60	Hydraulic cart for 40 - 60 cm i.d. DAC HPLC columns	70 bar
HP-Cart-100	Hydraulic cart for 80 - 100 cm i.d. DAC HPLC columns	70 bar

DAC MPLC Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
MP15x50	15 cm i.d. x 50 cm L	20 bar
MP15x70	15 cm i.d. x 70 cm L	20 bar
MP17x50	17 cm i.d. x 50 cm L	20 bar
MP17x70	17 cm i.d. x 70 cm L	20 bar
MP20x50	20 cm i.d. x 50 cm L	20 bar
MP20x70	20 cm i.d. x 70 cm L	20 bar
MP30x50	30 cm i.d. x 50 cm L	20 bar
MP30x70	30 cm i.d. x 70 cm L	20 bar
MP40x50	40 cm i.d. x 50 cm L	20 bar
MP40x70	40 cm i.d. x 70 cm L	20 bar
MP45x50	45 cm i.d. x 50 cm L	20 bar
MP45x70	45 cm i.d. x 70 cm L	20 bar
MP50x50	50 cm i.d. x 50 cm L	20 bar
MP50x70	50 cm i.d. x 70 cm L	20 bar
MP60x50	60 cm i.d. x 50 cm L	20 bar
MP60x70	60 cm i.d. x 70 cm L	20 bar
MP80x50	80 cm i.d. x 50 cm L	20 bar
MP80x70	80 cm i.d. x 70 cm L	20 bar
MP100x50	100 cm i.d. x 50 cm L	20 bar
MP100x70	100 cm i.d. x 70 cm L	20 bar
MP120x50	120 cm i.d. x 50 cm L	20 bar
MP120x70	120 cm i.d. x 70 cm L	20 bar

DAC MPLC Column Hydraulic Carts

Catalog No.	Description	Pressure Rating
MP-Cart-17	Benchtop hydraulic cart for 15 - 17 cm i.d. DAC MPLC columns	20 bar
MP-Cart-30	Hydraulic cart for 20 - 30 cm i.d. DAC MPLC columns	20 bar
MP-Cart-60	Hydraulic cart for 40 - 60 cm i.d. DAC MPLC columns	20 bar
MP-Cart-100	Hydraulic cart for 80 - 100 cm i.d. DAC MPLC columns	20 bar

DAC UHPLC Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
UP6x50	6 cm i.d. x 50 cm L	200 bar
UP7.5x50	7.5 cm i.d. x 50 cm L	200 bar
UP10x50	10 cm i.d. x 50 cm L	200 bar
UP15x50	15 cm i.d. x 50 cm L	200 bar
UP17x50	17 cm i.d. x 50 cm L	200 bar
UP20x50	20 cm i.d. x 50 cm L	200 bar
UP30x50	30 cm i.d. x 50 cm L	200 bar
UP40x50	40 cm i.d. x 50 cm L	200 bar
UP45x50	45 cm i.d. x 50 cm L	200 bar
UP50x50	50 cm i.d. x 50 cm L	200 bar
UP60x50	60 cm i.d. x 50 cm L	200 bar

DAC UHPLC Column Hydraulic Carts

Catalog No.	Description	Pressure Rating
UP-Cart-10	Benchtopy hydraulic cart for 6- 10 cm i.d. DAC UHPLC columns	200 bar
UP-Cart-17	Hydraulic cart for 15- 17 cm i.d. DAC UHPLC columns	200 bar
UP-Cart-30	Hydraulic cart for 20 - 30 cm i.d. DAC UHPLC columns	200 bar
UP-Cart-60	Hydraulic cart for 40 - 60 cm i.d. DAC UHPLC columns	200 bar

Note: Custom diameters, lengths and pressure ratings are also available.

DAC Flash Chromatography Columns

Catalog No.	Column Dimensions	Pressure Rating
LP30x50	30 cm i.d. x 50 cm L	10 bar
LP30x100	30 cm i.d. x 100 cm L	10 bar
LP40x50	40 cm i.d. x 50 cm L	10 bar
LP40x100	40 cm i.d. x 100 cm L	10 bar
LP45x50	45 cm i.d. x 50 cm L	10 bar
LP45x100	45 cm i.d. x 100 cm L	10 bar
LP50x50	50 cm i.d. x 50 cm L	10 bar
LP50x100	50 cm i.d. x 100 cm L	10 bar
LP60x50	60 cm i.d. x 50 cm L	10 bar
LP60x100	60 cm i.d. x 100 cm L	10 bar
LP80x50	80 cm i.d. x 50 cm L	10 bar
LP80x100	80 cm i.d. x 100 cm L	10 bar
LP100x50	100 cm i.d. x 50 cm L	10 bar
LP100x100	100 cm i.d. x 100 cm L	10 bar
LP120x50	120 cm i.d. x 50 cm L	10 bar
LP120x100	120 cm i.d. x 100 cm L	10 bar

DAC Flash Column Hydraulic Carts

Catalog No.	Description	Pressure Rating
LP-Cart-30	Hydraulic cart for 30 cm i.d. DAC Flash columns	10 bar
LP-Cart-60	Hydraulic cart for 40 - 60 cm i.d. DAC Flash columns	10 bar
LP-Cart-120	Hydraulic cart for 80 - 120 cm i.d. DAC Flash columns	10 bar

Note: DAC Flash columns can be pressurized pneumatically for operations < 6 bar.

Standard Column Options

Catalog No.	Description
OPT012	Electropolished wetted parts for 6 – 10 cm i.d. columns
OPT212	Electropolished wetted parts for 15 – 20 cm i.d. columns
OPT412	Electropolished wetted parts for 30 – 45 cm i.d. columns
OPT612	Electropolished wetted parts for 50 – 60 cm i.d. columns
OPT712	Electropolished wetted parts for 70 – 80 cm i.d. columns
OPT812	Electropolished wetted parts for 100 – 120 cm i.d. columns

OPT014	ASME Code Stamp for 15 – 35 cm i.d. columns
OPT214	ASME Code Stamp for 40 – 60 cm i.d. columns
OPT414	ASME Code Stamp for 70 – 80 cm i.d. columns
OPT614	ASME Code Stamp for 100 cm i.d. columns or larger

OPT015	Heating jacket for 6 – 10 cm i.d. columns
OPT215	Heating jacket for 15 – 20 cm i.d. columns
OPT415	Heating jacket for 30 – 45 cm i.d. columns
OPT615	Heating jacket for 50 – 60 cm i.d. columns
OPT715	Heating jacket for 70 – 80 cm i.d. columns
OPT815	Heating jacket for 100 – 120 cm i.d. columns

OPT016	Heating jacket w/ insulation/sheathing for 6 – 10 cm i.d. columns
OPT216	Heating jacket w/ insulation/sheathing for 15 – 20 cm i.d. columns
OPT416	Heating jacket w/ insulation/sheathing for 30 – 45 cm i.d. columns
OPT616	Heating jacket w/ insulation/sheathing for 50 – 60 cm i.d. columns
OPT716	Heating jacket w/ insulation/sheathing for 70 – 80 cm i.d. columns
OPT816	Heating jacket w/ insulation/sheathing for 100 – 120 cm i.d. columns

SRV-112	IQ/OQ documentation and execution service for one column
SRV-303	Standard column documentation package
SRV-304	GMP column documentation package
SRV-307	GMP column documentation package (PED Cat I)
SRV-308	GMP column documentation package (PED CAT II)

Note: Please inquire about options available for columns with i.d. > 60 cm.

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Technical Support and Warranty Information

A reliable technical support network is available throughout the United States, Europe and Asia.

We offer an extendable 1-year warranty, service contracts and a personalized level of service for peace of mind and timely support when you need it.

For more information, please visit:

www.ak-bio.com