

UniFlash Tower for Flash Chromatography

- **Better performance – Improved chromatographic bed**
- **Rapid and simple cartridge changing**
- **Accommodation of different commercial cartridges**
- **Improved reliability – Elimination of cartridge voids**
- **Direct loading of solid samples**
- **Cartridges from 10 to 800 grams**



The new UniFlash system from Hologent Technologies, Inc. is a modular, powerful and cost-effective approach to modern Flash Chromatography. The modular design ensures maximum flexibility and upgradeability from a basic entry level system to a highly automated, full-featured system including gradient capability and detector-based peak collection.

The heart of the UniFlash system is the UniFlash Tower. This innovative module uses pneumatic axial

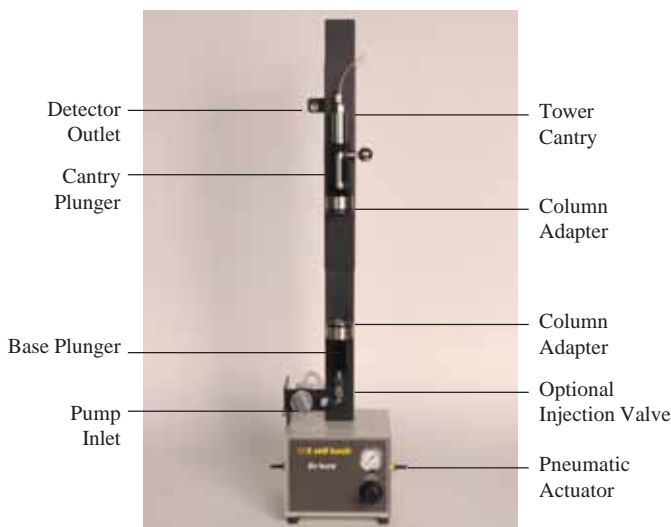
compression technology on the primary flash cartridge. Axial compression is a well-known approach to improving performance in chromatographic columns, and has been employed for many years in preparative chromatography. The effect of axial compression is to increase the packed density of the chromatographic bed in the column, thus reducing or eliminating channels, voids, and wall effect. The net result of this action is increased chromatographic efficiency, which leads to the commensurate benefit of improved loadability at faster flow rates (less breakthrough). This is particularly important in Flash chromatography, where chromatographic beds are often loaded to maximum capacity, and high throughput is essential.

The UniFlash Tower design makes changing chromatographic columns swift and efficient. The flip of a switch, the movement of a lever, and the column is released for removal and replacement. There are no screw threads to strip, no fittings to change. In addition, the Tower design allows full visibility of the cartridge at all times.

Easily-changed cartridge adapters and adjustable plunger heights allow the Tower to accept not only high-performance UniFlash cartridges, but also most Biotage, ISCO and Argonaut cartridge formats, in sizes from 10 grams to 150 grams (the UniFlash Prep Tower accepts cartridges from 10 grams to 800 grams). The axial compression feature of the Tower improves the chromatographic performance of any cartridge with a movable frit (ISCO cartridges have fixed end frits and may be used in the Tower, without improvement of bed performance).

Due to dry packing of the sorbent beds, most Flash columns are subject to voids, especially larger mass columns. Regardless of the quality of the original dry-packed bed, during shipping the best of packed columns may settle, creating voids and channels, which significantly impair proper chromatographic performance. The axial compression action of the UniFlash Tower in most cases eliminates these voids immediately as the cartridge is compressed.

An additional benefit of the axial compression approach is easy loading of solid samples directly on the column. In most Flash systems, if a solid sample is loaded directly on the head of the column, a void is created as the sample dissolves. In the UniFlash Tower, axial compression continuously fills the space created by the dissolving sample, preventing void formation.



Operation

The UniFlash Tower is easy and friendly to operate. Installation involves a press-fit connection to a laboratory air or nitrogen supply, followed by a fluid connection to the UniFlash Iso or Quad pumping systems (other commercial pumps may be used if desired). The Tower outlet may also be connected to a UniFlash Star if detector-based peak collection is necessary. The proper adapters for the column to be processed are fitted, and the Tower gantry is adjusted to the height setting recommended for the column. The user then places the column on the base plunger, lowers the gantry plunger into the top of the column, and actuates the Tower pneumatics, raising the base plunger and axially compressing the column. A Flash separation may then be carried out on the column, after which the user may release the pneumatics, thus lowering the base plunger, and allowing column removal. The column changing operation may literally be accomplished in a few seconds.

Tower Options

The Tower is available with an attached injection valve to facilitate liquid sample injection, and a flow reversal valve to allow simple selection of upward or downward solvent flow through the cartridge.

UniFlash Cartridges

Chrom Tech provides a complete line of high-performance UniFlash cartridges in 25, 50, 100, 150 and 800 gram sizes (800 gram cartridges require the UniFlash Prep Tower). UniFlash cartridges are available in a selection of popular silica and bonded phase sorbents.

UniFlash Tower Ordering Information:

Cat. No.	Description
352-1001	UniFlash Tower™ - Standard
352-1005	UniFlash Tower™ - Prep

Tower Accessories

352-1010	Sample injector (manual)
352-1013	Flow reversal valve
352-1006	Large volume sample injector
352-1125	UniFlash column fixtures, 25g/50g
352-1128	UniFlash column fixtures, 100g/150g
352-1124	Biotage column fixtures, 40g/90g/120g
352-1121	Argonaut column fixtures, 10g/20g
352-1123	Argonaut column fixtures, 25g/50g/70g
81620	Injection syringe, luer lock, 10mL
82520	Injection syringe, luer lock, 25mL

UniFlash Pumps for Flash Chromatography



The Iso and Quad pumps are capable of flow rates as high as 150mL/min. This allows the processing of large Flash columns for multi-gram samples (ie: UniFlash 150 gram cartridges) without sacrificing rapid run times or target compound resolution. The Iso and Quad pumps can also deliver mobile phase at pressures up to 100 psi, allowing the use of higher efficiency chromatographic sorbents in the Flash cartridge.

Unlike other commercial Flash systems, the Quad offers four concurrent solvents to be run in any combination. This provides convenience in gradient formation, and also allows for isocratic compositional mixtures of the four solvents to be easily programmed.

When maximum flow accuracy is desired, an optional flow feedback capability is available on the Iso and Quad pumps. The flow feedback both measures and controls the mobile phase flow.

The UniFlash Pad is a simple, intuitive, handheld controller for operation of the Iso and Quad pumps. The four-line LCD display has large characters and is easy to read. For the Iso pump, the Pad offers flow control capability, and for the Quad pump the Pad allows programming of complex segmented gradients. Another standard capability is storage of multiple programmed methods.

Together with the UniFlash Tower, a UniFlash Iso or Quad pump plus a UniFlash Pad creates a highly capable, entry-level Flash chromatography system for the user on a limited budget. For additional capability, the user may upgrade the system at any time to full detector-based automation by adding a UniFlash Star and a suitable fraction collector.

UniFlash Pump Specifications:

Suction shoe gear pump technology

Magnetically-coupled motor drive

Power requirement: 110 VAC

Maximum differential pressure: 75 psi (90 psi to column)

Flow range with flow control: 20 -150 mL/min

Weight: Quad - 11 lbs; Iso - 8 lbs

Dimensions: 12" (L) x 7" (W) x 6" (H)

Wetted parts: SS, Rytan gears, PTFE seals

UniFlash Pumps, Ordering Information:

Cat. No.	Description
352-1015	Iso™ Isocratic pump
352-1016	Quad™ Gradient pump
352-1019	Pad™ Pump controller
352-1017	Flowmeter upgrade (flow feedback)
352-1018	Gradient upgrade with flowmeter



Flash column shown in tower

UniFlash Pumping System Options:

The Iso and Quad pumps are based on well-tested gear pump technology. This technology offers:

- **No check valves - enhanced reliability**
- **Magnetically-coupled drive – trouble-free operation**
- **High flow rate capability – faster separations on larger cartridges**
- **Four simultaneous solvents with the Quad**
- **Optional flow feedback control – maximum flow accuracy**
- **Compact, handheld controller – simple, intuitive programming**

Mobile phase flow within the UniFlash system is provided by one of two available pumping systems. The UniFlash Iso is a low-cost, isocratic pump, and the UniFlash Quad is a quaternary gradient pump, providing maximum convenience and flexibility. Both pumping systems are controlled via the handheld UniFlash Pad controller. Further, the Iso may be readily upgraded by the user to the Quad with an easily-installed upgrade kit.

Gear pumps are widely used in many industrial applications for their durability, flexibility, and simplicity of design. These same characteristics make gear pumps ideal for use in Flash chromatography. Lack of check valves (one of the most common causes of failure in chromatographic pumping systems) dramatically reduces necessary service and maintenance. In addition, the UniFlash pumps use a magnetically-coupled drive, which effectively “disconnects” the drive motor from the pumping mechanism in the event of excessive system overpressure due to highly viscous samples or fluid system blockages. Other commercial Flash systems use direct-drive motors, which can easily burn out under these problem conditions.

UniFlash System Accessories for Flash Chromatography



UniFlash Star

- **UV Monitoring at 254nm**

Sample fractions are often collected in Flash chromatography on a time or volume basis. Using this approach, time-consuming TLC of all tube fractions, as well as excessive disposable glassware use is required. UV detection-based fraction collection obviates this, by collecting only relevant peaks in the chromatogram, and sending baseline solvent to a separate waste container.

The UniFlash Star is a simple, cost-effective and utilitarian UV detector, built specifically for Flash chromatography. The Star monitors the column output at 254nm, and sends the signal to any collection device capable of accepting a UV signal, including most commercial fraction collectors. The flow cell in the Star is designed with a short path length to accommodate the high sample concentrations typical in Flash chromatography, without the troublesome bubble formation common in other commercial detectors.

UniFlash Boss

- **Quaternary gradient control including method storage**
- **Data system-based peak detection, tracking and fraction collection**

The UniFlash Boss is a sophisticated module offering system management, built-in data processing to accept signals from the Star detector, and outputs appropriate for controlling fraction collection devices. The user interface of the Boss is a handheld, touchscreen unit that controls the UniFlash pumps (Iso or Quad), the Star detector and the UniFlash Target fraction collector. The Boss also provides contact-closure outputs for control of third-party tube-based fraction collectors.

For UniFlash pump control, the Boss generates quaternary gradients in multi-segmented profiles, to accommodate virtually any separation requirement, and also offers flow programming (Figure 1). Together with the flow feedback control in the UniFlash pumps, actual solvent flow from time of injection is monitored, allowing for accurate and reproducible chromatography. In addition, flow monitoring ensures effective fraction collection in a variety of vessels, without requiring

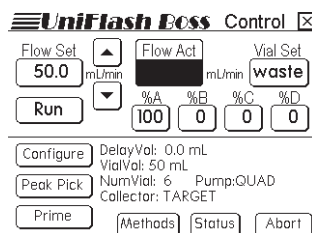


Figure 1.
UniFlash Boss Control Panel

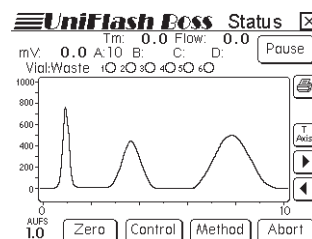


Figure 2.
UniFlash Boss Chromatogram

separate monitoring capabilities on the fraction collector. Flow monitoring also protects against collection vessel overflow.

The data system within the Boss employs powerful peak detection algorithms to assure effective peak discrimination and intelligent control of the fraction collector, even for complex chromatograms with shouldered and unresolved peaks (Figure 2). Chromatograms are annotated with numbers for ready identification of relevant product peaks, and may be printed on the integral printer. An RS232 port on the Boss allows output of methods and chromatograms for archival to a PC.

Controls Third-party Fraction Collectors

Many laboratories performing Flash chromatography already have available an assortment of fraction collectors. Any of these collectors that accepts a contact closure to advance collection to the next tube, may be readily controlled by the UniFlash Boss. The user simply inputs the volume of the collection vessels in use, and selects “Other” as the collector option in the Boss. By monitoring the actual flow during the course of the run, the Boss can determine when to advance fractions, and the built-in Waste/Collect valve allows collection of only those fractions containing relevant peaks.

UniFlash Target

- **Large vessel collection of peaks**

The UniFlash Target is a novel, unique module for intelligent fraction collection. Unlike many commercial collectors, the Target was designed specifically with the needs of the Flash chromatographer in mind.

In place of an x-y gantry with cables and many moving parts, the Peak selects fractions with the most reliable of chromatographic components – simple valves. The compact architecture allows for large volume collection in a very small footprint. Different Target models can collect either 6 x 500 ml or 24 x 50 ml fractions in 24/40 neck round bottom flasks (for use with rotary evaporators); other options for collection vessels are also available. Via control by the UniFlash Boss, solvent fractions not containing peaks are routed to a separate waste container, or may even be sent to a separate fraction collector, also controlled by the Boss. Multiple Target collectors may easily be “daisy-chained” together for expanded collection capabilities.

UniFlash Star, Boss, and Target Ordering Information:

Cat. No.	Description
352-1020	Star™ 254nm UV detector
352-1035	Boss™ System controller
352-1030	Target™ Peak collector, 6 position
352-1040	Target™ Peak collector, 24 position

UniFlash Cartridges and UniFlash Planar Station



Flash Cartridges

UniFlash Format

Cat. No.	Description	Qty.
623-0259F	UniFlash Silica, 60Å, 40µm, 25g	20
623-0509F	UniFlash Silica, 60Å, 40µm, 50g	20
623-1000F	UniFlash Silica, 60Å, 40µm, 100g	20
623-1500F	UniFlash Silica, 60Å, 40µm, 150g	20
623-0200P*	UniFlash Silica, 60Å, 40µm, 200g	2
623-0400P*	UniFlash Silica, 60Å, 40µm, 400g	2
623-0800P*	UniFlash Silica, 60Å, 40µm, 800g	2
625-0259F	Merck 60 Silica, 40µm, 25g	20
625-0509F	Merck 60 Silica, 40µm, 50g	20
625-1000F	Merck 60 Silica, 40µm, 100g	20
625-1500F	Merck 60 Silica, 40µm, 150g	20
624-0259F	UniFlash spherical Silica, 50µm, 25g	20
624-0509F	UniFlash spherical Silica, 50µm, 50g	20
624-1000F	UniFlash spherical Silica, 50µm, 100g	20
624-1500F	UniFlash spherical Silica, 50µm, 150g	20

Argonaut Format

623-0109F	UniFlash Silica, 60Å, 40µm, 10g, 70cc	20
623-0209F	UniFlash Silica, 60Å, 40µm, 20g, 70cc	20
625-0109F	Merck 60 Silica, 40µm, 10g, 70cc	20
625-0209F	Merck 60 Silica, 40µm, 20g, 70cc	20

Biotage Format

623-0401F	UniFlash Silica, 60Å, 40µm, 40g	20
623-0902F	UniFlash Silica, 60Å, 40µm, 90g	20
623-1203F	UniFlash Silica, 60Å, 40µm, 120g	20
625-0401F	Merck 60 Silica, 40µm, 40g	20
625-0902F	Merck 60 Silica, 40µm, 90g	20
625-1203F	Merck 60 Silica, 40µm, 120g	20

* Call for pricing on other phases, ie: C18, aminopropyl

UniFlash Planar Station

- Rapid approach to method development using parallel, horizontal thin-layer (“Planar”) separations

The **NEW** UniFlash Planar Station™ provides the Flash chromatography user with a cost effective, rapid approach to method development for Flash chromatography, using parallel, horizontal thin-layer (“Planar”) separations. The unique design of the Planar Station allows the user to run four different chromatographic runs simultaneously, each employing discrete development solvents. Standard microscope size plates (2.5 x 7.5cm), readily available commercially, are used in the Planar Station. Chromatographic development of the separations typically occurs in less than 2 minutes, allowing quick identification of optimum mobile phase conditions for the Flash chromatographic separation. Chrom Tech offers microscope size thin-layer plates in both Merck 60 and UniFlash silicas. For Flash separations employing these silica chemistries, the results from the Planar Station are directly translatable to the Flash chromatography separation.

Usage of UniFlash Planar Station

The ability to evaluate four separate solvent conditions simultaneously within a single device shortens method development time for Flash chromatography considerably. The most common approaches taken are 1) evaluation of development solvent selectivity using four separate combinations of different solvents (for example, hexane/methylene chloride, hexane/ethyl acetate, hexane/THF, and hexane/isopropanol), or 2) evaluation of solvent strength with different relative compositions of a single solvent pair (for example, hexane/ethyl acetate at four different percentage mixtures). A similar evaluation using conventional thin-layer chromatography requires four separate development jars, consuming more time and substantially more solvent, with poorer quality chromatography.

UniFlash Planar Station Ordering Information

Cat. No.	Description	Qty.
352-1050	UniFlash Planar Station	1
352-1055	Replacement wicks	100
623-0037	UniFlash TLC plates, 2.5 x 7.5cm	100
625-0037	Merck TLC plates, 2.5 x 7.5cm	100

Flash Purification Columns

- Clean, pre-packed, disposable polypropylene or high density polyethylene cartridges
- Leak free
- Faster separations with improved band definition
- Safe – no glass handling or washing, no breakage
- Excellent pricing!

Our flash chromatography products offer high levels of performance and reproducibility. The flash media has consistently tight particle size distributions with lower fines.



Sample Preparation

Open Top Flash Cartridges

- Compatible with Jones/Argonaut Flash Systems

The open top flash cartridges are syringe barrels packed with silica gel. They can be used for SPE for extracting samples such as food or soil which require more sorbent capacity due to either a high concentration of analyte or large quantities of extractable interferences in the sample.

These cartridges are able to hold up to 150 mL of sample and their larger diameter allows the sample to flow through more rapidly.

Silica Open Top Flash Cartridges

Cat. No.	Sorbent		Qty.
	Mass	Volume	
OC-550070	70gm	150mL	25
OC-550040	40gm	150mL	25
OC-600035	35gm	60mL	50
OC-600020	20gm	60mL	50

Other phases available: C8, C18, SCX, SAX, NH₂, CN, Florisil

Flash Columns

- Sizes: FLO 12, FLO 40, FLO75, FLO150
- Compatible with Biotage Flash Systems

Silica Flash Columns

Cat. No.	Device	Dimensions	Sorbent	Qty.
		L x W (mm)	(g)	
OC-4000	12S	75 x 12	4	20
OC-4100	12M	150 x 12	8	20
OC-4200	40S	70 x 40	40	20
OC-4300	40M	150 x 40	90	20
OC-4400	40L	200 x 40	120	20
OC-6500	65I	240 x 65	330	5
OC-4500	75S	90 x 75	200	20
OC-4600	75M	150 x 75	400	20
OC-4700	75L	350 x 75	800	20
OC-4800	150M	300 x 150	2,500	2
OC-4900	150L	600 x 150	5,000	2

Other phases available: C8, C18, NH₂, CN, Alumina Acidic, Alumina Neutral, Alumina Basic, Decolorization Alumina, Graphitized Carbon