

# VersaFlash™

High Throughput Flash Purification



VersaFlash Station

VersaPak™ Cartridges

Sample Loading

VersaVac™ Manifold

Cartridge Stacking and  
Rev-Elution

Pump

Kits & Accessories

**Pure...and Simple**

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# VersaFlash™

## High Throughput Flash Purification

The VersaFlash high throughput flash purification (HTFP) system is a patent pending, truly unique flash chromatography system. Besides being the only system to utilize spherical silica in the pre-packed cartridges, it is one of the most simple and cost-effective disposable cartridge flash chromatography systems, yet it has capabilities that most other systems don't have.

Most flash chromatography systems work with a very narrow range of column and sample sizes, requiring researchers to purchase additional systems or costly and burdensome compression barrels in order to work with larger cartridges and samples. The VersaFlash system allows you to work with the entire range of VersaPak cartridges on the same hardware by making simple adjustments to the station hardware without the need for additional equipment and accessories. VersaFlash is simple since it only requires basic manipulations of the sealing platens to change between similar sized cartridges. By adjusting the upper platen you can quickly change between the full range of different sized cartridges.





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Introduction

# VersaFlash Station

## The most versatile flash purification system.

The new, patent pending Supelco VersaFlash High Throughput Flash Purification (HTFP) system is the first system to offer all of the capabilities required for flash separations and the versatility to perform unique purification tasks that conventional flash systems do not allow. These capabilities permit researchers to expand beyond the limitations of contemporary flash chromatography, saving time and money while improving their separations.

### Built-In Versatility

The unique design of the VersaFlash station makes it possible to:

- Scale up from 23 x 53 mm (11 g) cartridges to 110 x 300 mm (1340 g) cartridges in seconds on the same system hardware.
- Extend cartridge length by stacking two cartridges together.
- Achieve bimodal separations by stacking different phase chemistries.
- Elute strongly retained substances quickly by using the Rev-Elution technique.

### Versatility Plus

The VersaFlash station can easily be connected to existing flash system hardware with either a pressurized reservoir or a pump. The outlet can also be connected to a fraction collector, detector or optional fractioning valve.

### VersaFlash Makes Cartridge Change-Out Fast and Easy

The unique, patent pending VersaPak pre-compression design eliminates the need for compression barrels making cartridge change-out fast and easy.

Installing, removing, and changing out VersaPak cartridges in the VersaFlash station is fast and easy. With the handle in the idle position and pulled out, the bottom platen is lowered, allowing ample room to move cartridges in and out. Once you have installed a cartridge, simply push the handle in, raising the lower platen, securing the cartridge in place. Then simply turn the handle toward the operate position to fully engage the cartridge and to create a leak-proof seal.

### Compact and Portable

The VersaFlash station is compact and portable so it can easily be moved from one fume hood to another. It can also be placed on a laboratory cart so that it can be easily transported between labs and not take up valuable hood space.

Figure 1. Fast and Easy Cartridge Change-Out

You can see the previously used cartridge sealed into the VersaFlash station with the handle in the **operate** position.



Turn the handle to the **idle** position and pull it out to remove the cartridge.



Insert a new cartridge, push the handle in and turn it toward the **operate** position to seal the new cartridge.



## VersaFlash Efficiently Handles a Wide Range of Sample Sizes

Most flash chromatography systems typically limit users to a narrow sample range requiring additional hardware purchase and laborious change-out in order to work with larger sample sizes. The robust VersaPak cartridge design eliminates the need for compression barrels making cartridge change-out fast and easy. The VersaFlash station offers you the versatility to work with discovery scale cartridges (23 x 53 mm) and only requires a simple adjustment of the upper platen to work with development scale cartridges (110 x 300 mm). In a matter of seconds you can change from the smallest cartridge to the largest cartridge giving you the flexibility you need to handle a wide range of sample sizes.

## Common Sense Technology

The VersaFlash HTFP system incorporates several simple scientific principles allowing for the best separations possible, the highest cartridge capacity, and the greatest cost-effectiveness.

### The VersaFlash employs:

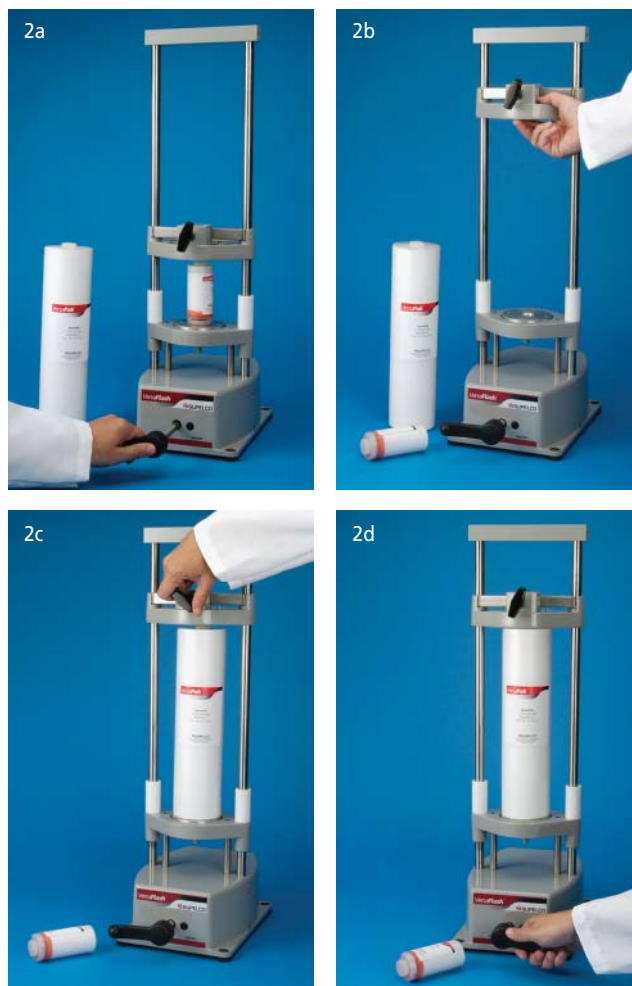
- Spherical particles to optimize cartridge bed uniformity creating more narrow bands and preventing bed shifting due to irregular particle abrasion and fines.
- The use of vacuum to permit loading and partial separation in multiple cartridges.
- Secure end fittings with no threaded luer connections to leak or fracture.
- Precompression to eliminate the need for a compressed gas source, expensive and clumsy compression barrels, and cartridges stuck in compression barrels.
- Capped, flat-ended cartridges to allow for cartridge stacking and Rev-Elution.

The VersaFlash HTFP system was designed for total versatility. The VersaFlash station can even be installed to operate with existing flash apparatus. It can be used with a pump (see page 11) or a pressurized reservoir. Simply replace the cartridge apparatus with a VersaFlash station to gain all of the benefits of the VersaFlash system. A detector and fraction collector of choice also may be connected to the VersaFlash stand to further expand your capabilities.

Only Supelco offers the versatility of a fully integrated HTFP system and the cartridge technology to add versatility to an existing flash system.

Figure 2. VersaFlash is Scalable Across the Entire Range of Cartridge Sizes Using the Exact Same Hardware

- To switch to a larger cartridge, turn the handle to the **idle** position and pull it out lowering the bottom sealing platen.
- Once the cartridge is removed, push the handle in and loosen the securing knob on the upper platen to raise it to the proper height to insert the 300 mm cartridge.
- With the upper platen resting on the cartridge, tighten the securing knob.
- Turn the handle toward the **operate** position sealing it in the VersaFlash station.



The VersaFlash station is available in two different sizes. The standard VersaFlash station (97732-U) can accommodate cartridges up to a total length of 300 mm while the Extended VersaFlash station (97719-U) can handle cartridges up to a total length of 400 mm. This can allow you to stack up to an 80 x 100 mm solid sample cartridge (see page 10) with a 300 mm cartridge.

### VersaFlash Station Specifications

	97732-U	97719-U
Height:	70 cm (27.5 in.)	82 cm (32.3 in.)
Length:	28 cm (11 in.)	28 cm (11 in.)
Width:	21 cm (8 in.)	21 cm (8 in.)
Weight:	12 kg (27 lbs)	12.4 kg (28 lbs)

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VersaFlash Station

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# VersaPak Cartridges

The patented and innovative design of the VersaPak cartridges with the symmetric end-cap design and the robust housing construction leads to the unique features of scalability, quick cartridge change-out and cartridge stacking. The robust cartridge design eliminates the need for compression barrels and other additional cumbersome hardware and allows the VersaFlash station to work with the full range of cartridge sizes. VersaPak cartridges are available in 7 different cartridge sizes in two different particle sizes of spherical silica and C18 bonded silica.

## Spherical Silica Increases Efficiency & Capacity

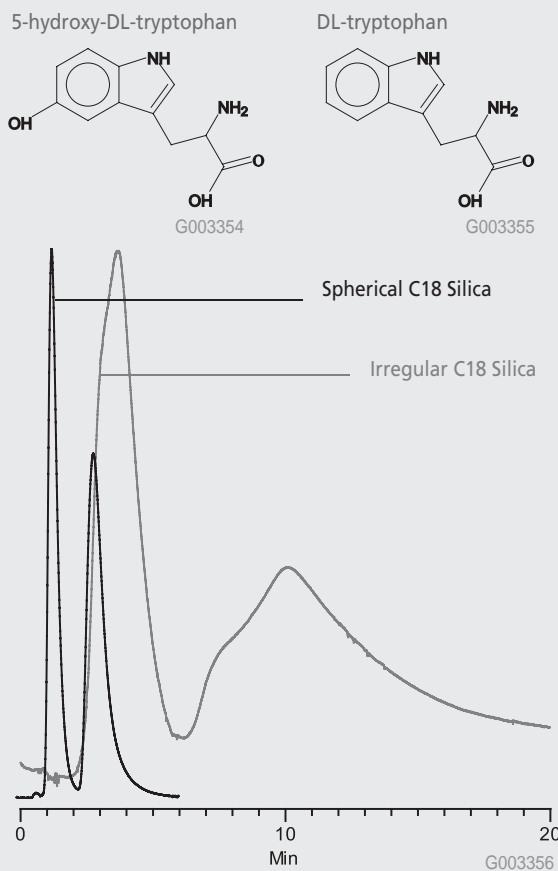
The VersaPak cartridges are the first pre-packed flash cartridges to utilize high efficiency spherical silica leading to higher sample loading capacity and better separation efficiency. The same size flash column can be packed with 30% more spherical silica resulting in approximately 25% higher adsorption capacity in the same size column. The higher adsorption capacity of spherical silica is also derived from the lower pore volume. The spherical particle shape and resulting homogeneous packing characteristics result in a sharper adsorption and elution curve. Spherical silica has a sharper end curve during elution, which means that

the target compound will be eluted in a narrower band with less solvent that requires long re-concentration (eg. rotovaporation) times.

The application below shows the separation of two forms of DL-tryptophan to compare the efficiency and resolution of spherical versus irregular C18 bonded silica. The efficiency (plates/meter) of the spherical media was 2-10 times greater than the irregular media while the resolution of the spherical media was also significantly higher than the irregular

Figure 3. Spherical vs. Irregular C18 Bonded Silica Efficiency

samples: 5-hydroxy-DL-tryptophan and DL-tryptophan  
mobile phase/detector: Methanol:Water = 90:10 (v/v), UV  
flow rate: 20 mL/min.



## VersaPak Cartridge Characteristics and Loading Guidelines

- VersaPak cartridges are packed with 20-45 or 45-75  $\mu\text{m}$  spherical, silica based porous (70  $\text{\AA}$ ) particles.
- They are pre-packed and compressed for optimum loading capacity, flow performance, and mass transfer.
- Optimum loading per cartridge depends on separation conditions, length and diameter, flow rate, and temperature.
- VersaPak cartridges are designed to be used at pressures less than 60 psi.

The table below is useful to determine the general operating conditions and loading limits.

VersaPak Cartridge Characteristics and Sample Loading Guidelines

Cartridge	Particle Size ( $\mu\text{m}$ )	Packing Weight (g)	Column Volume (mL)	Separation Mechanism	Maximum Loading Capacity <sup>▲</sup>
<b>Silica</b>					
23 x 53 mm	20-45	11	15	Normal Phase	1.1
23 x 110 mm	20-45	23	30	Normal Phase	2.3
40 x 75 mm	45-75	51	60	Normal Phase	5.0
40 x 150 mm	45-75	102	120	Normal Phase	10.0
80 x 150 mm	45-75	410	480	Normal Phase	34.0
80 x 300 mm	45-75	820	960	Normal Phase	70.0
110 x 300 mm	45-75	1320	1850	Normal Phase	130.0
<b>C18</b>					
23 x 53 mm	20-45	15	11	Reversed Phase	1.5
23 x 110 mm	20-45	30	20	Reversed Phase	3.0
40 x 75 mm	45-75	70	30	Reversed Phase	7.0
40 x 150 mm	45-75	140	60	Reversed Phase	14.0
80 x 150 mm	45-75	515	240	Reversed Phase	51.0
80 x 300 mm	45-75	1050	480	Reversed Phase	105.0
110 x 300 mm	45-75	1920	910	Reversed Phase	190.0

<sup>▲</sup> Several factors influence the maximum loading capacity of the column including: similarity of compounds, sample matrix, concentration of reaction products and the elution solvent used.

## Elution Volume Determination

One column volume (CV) is defined as the interstitial volume of the sorbent bed or the void volume in the packed cartridge. In normal phase flash chromatography, TLC can be used to estimate the column elution behavior using the following guidelines:

$$CV = 1/R_f$$

$$R_f = \frac{\text{distance between origin and component}}{\text{distance between origin and solvent front}}$$

Therefore fast eluting compounds that are weakly retained can be eluted in just over one column volume while a more slowly eluting compound, which is tightly retained may require up to 10 column volumes to elute.

For tightly and fully retained substances, perform Rev-Elution, possibly requiring a stronger mobile phase for complete elution.

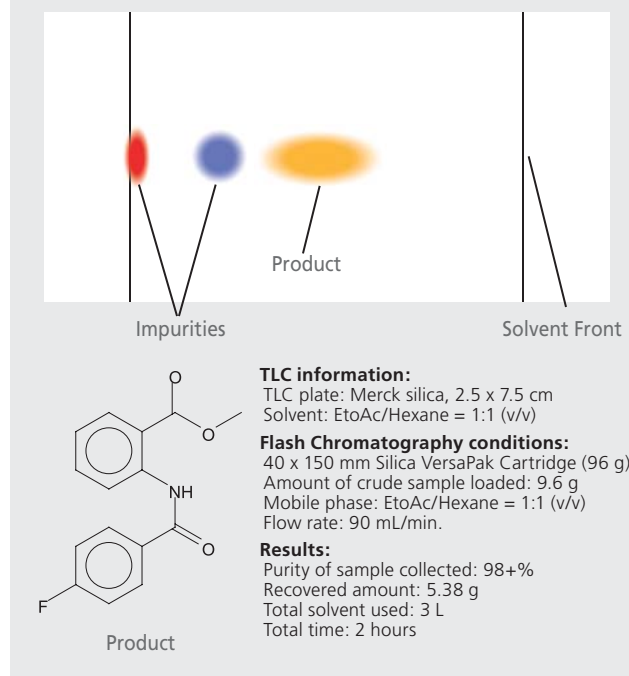
Step or continuous gradient application generally will reduce solvent volume.

## Safer and More Consistent than Glass Columns

Pre-packed VersaPak cartridges are safer than glass columns, with no risk of shattering or exposure to hazardous silica fines. They also give more consistent results since they are manufactured using a reproducible process and there is less concern for risk of sample to sample cross-contamination.

TLC is commonly used to scout for suitable mobile phase conditions to achieve separation between the target compound and any impurities. In the application shown below, approximately a 10% sample load was effectively purified on the VersaPak cartridge resulting in over 5 grams of pure product.

Figure 4. VersaFlash Application



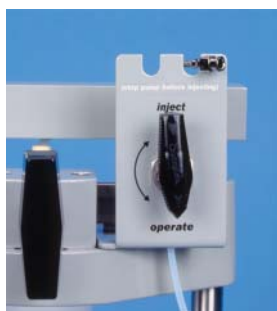
# Sample Loading

The VersaPak cartridge provides you with a variety of ways to load samples. There are at least six ways to load a sample onto a VersaPak cartridge.

- Direct sample in-line loading using the sample injector assembly.
- Direct sample injection onto the cartridge (off-line).
- Vacuum aspiration onto the cartridge using the VersaVac manifold (off-line).
- Using a solid sample cartridge prior to the primary cartridge (on-line).
- Using a valve and loop injector for repetitive volume sample loading (on-line).
- Through the pump loading for large volume dilute samples (on-line).

## Sample Injector Assembly (97725-U)

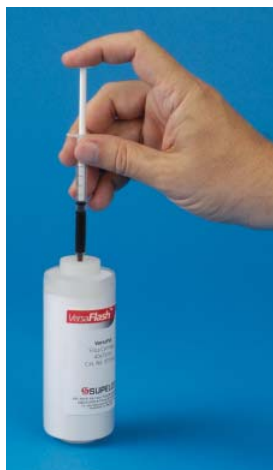
The easiest and most common way to load samples onto VersaPak cartridges is using the sample injector assembly.



The 3-way valve sample injector allows you to quickly inject a sample directly onto the cartridge using a syringe.

## Direct Sample Application

VersaPak cartridges can be loaded with sample material prior to insertion in the VersaFlash station. There are no valves or tubing to carry over residual material or clog with



precipitated sample. Even viscous fluids and substances of low solubility with the mobile phase can be loaded directly onto the cartridge without cartridge inserts or in-line sample devices. This makes it possible to load the samples in a different location from the VersaFlash station where the purification will be performed. Cartridges can even be loaded hours before the separation takes place.

## VersaVac Sample Loading Station (97750-U)

The VersaVac sample loading station allows you to pre-load and partially separate multiple samples off-line.

Cartridges can be placed on top of the vacuum manifold, a vacuum applied and samples added to the top of the cartridge, thereby being drawn by vacuum onto the top of the cartridge. The



VersaVac gives you the flexibility to pre-load from one to six cartridges off-line while other samples are being purified, allowing you to work more efficiently.

The kit includes the VersaVac manifold, with vacuum gauge and female Luer plugs. The VersaVac can also be used to empty solvents from cartridges for easier/safer disposal.

## Multiple Sample Loading

The VersaVac loading station permits as many as six cartridges to be simultaneously loaded with sample

material. Simply place the cartridges onto the VersaVac, pour the sample material into the funnel, and turn on the vacuum. Samples are immediately applied to the head of the cartridge and are ready for purification.



The VersaVac also allows for partial separations to take place. By following the sample with a solvent, the sample components will begin to separate in the VersaPak cartridge. This time-saving method can be done with as many as six different samples simultaneously, including pre-purification using an SPE tube.



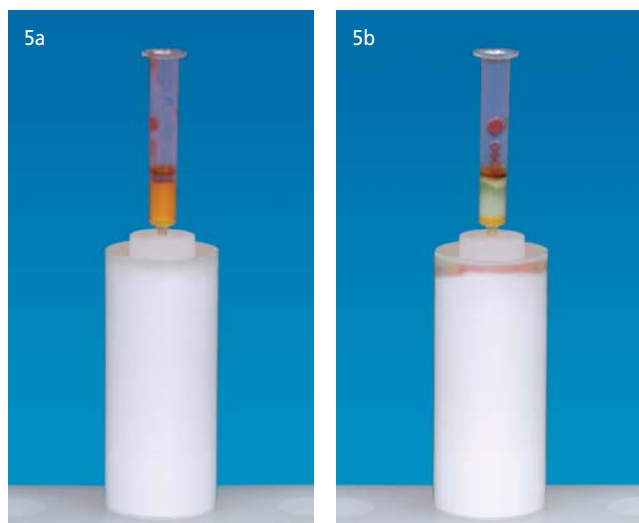
## One-Step Pre-Purification

Samples often contain impurities that will not be retained by the packing media in the VersaPak. Impurities such as dissolved salts, colored material, and reaction by-products can be removed easily before the sample reaches the VersaPak. Supelco SPE tubes, in tandem with a VersaPak cartridge, will retain the contaminants while allowing the remaining components to be loaded onto the VersaPak cartridge. The VersaVac serves as a convenient device to pull the mixture through the SPE / VersaPak combo. As many as six samples can be pre-purified and loaded simultaneously.

**Figure 5. Separation of a Chlorophyll/Carotenoid Mixture Using One-Step Pre-Purification**

5a. Load sample on C18 cartridge using silica SPE tube for pre-purification

5b. Carotenoids were eluted into the VersaPak with methanol/dichloromethane, chlorophyll sticks on the silica (green band)



## Solid Sample Cartridges

For certain low solubility samples, drying the sample onto a sorbent and then loading it into a cartridge is the only way to effectively load the sample onto the purification cartridge. Therefore empty VersaFlash solid sample cartridges are available in 4 different sizes to accommodate a wide range of sample types and sizes. Solid sample cartridges are available from 40 x 37.5 mm cartridges (~20 g Si) up to 80 x 100 mm (~230 g Si) with two intermediate sizes. Simply load the sample dried onto silica, celite or another adsorbent and then stack the solid sample cartridge in front of the purification cartridge to elute the sample directly on to the separation cartridge.

The solid sample cartridges can also be used for packing novel separation materials into them in order to use them as a purification cartridge. If you find a material that works well and are interested in using it on a routine basis, we can potentially manufacture prepacked cartridges for you on a custom basis.



## Resins and Media for Flash Chromatography

Sigma Aldrich offers a full range of media and resins ideal for purification techniques such as flash chromatography. Many of these materials may be packed in the VersaFlash solid sample cartridges to develop new purification solutions. Certain materials such as resins may swell upon exposure to solvents and therefore special care should be taken when packing these materials into disposable cartridges. We highly recommend that any resins be pre-swelled and packed into cartridges as a slurry to avoid over-packing. Below is a partial list of resins and media that are available:

- Spherical silica
- Spherical C18 bonded silica
- Irregular Silica (Merck®, Davisil®)
- Celite®
- Diaion Resins

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Sample Loading

# Cartridge Stacking and Rev-Elution

The VersaFlash Station and VersaPak cartridges allow you to manipulate the separation cartridges in very unique ways that give you a high degree of versatility in designing your purification scheme.

## Cartridge Stacking

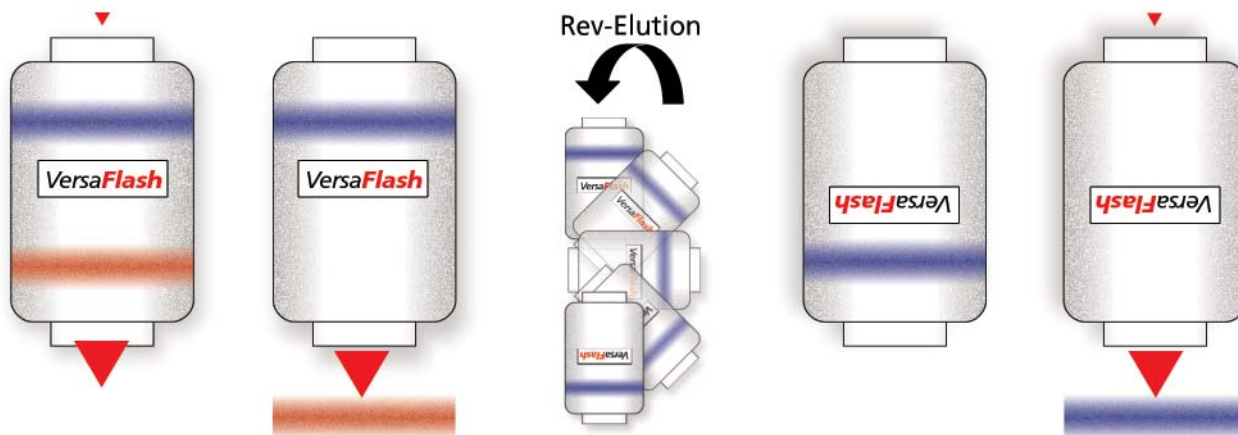
Cartridge stacking is an easy way to extend the separation efficiency of a cartridge, effectively giving you the ability to create longer more efficient cartridge lengths. While most commercially available pre-packed flash cartridges come in a limited range of length and diameter options, the stacking capability of the VersaFlash system allows you to create almost any length cartridge. For example, you can stack two 40 x 150 mm cartridges to create the equivalent of a 40 x 300 mm cartridge for extremely difficult separations. Or you can combine different media such as silica and C18 to perform simultaneous multi-modal separations.



## Rev-Elution

When desired compounds are fully retained on the cartridge, they must be eluted using a stronger mobile phase. Normally this spreads the band as it passes through the entire media bed. Also, if there are traces of sample material remaining on the cartridge, contamination of the retained component is likely to occur. Finally, excess solvent

is required to move the band entirely through the cartridge. These problems are solved by Rev-Elution, or the technique of reversing the cartridge 180 degrees. Consequently the retained substance can be quicker and cleanly eluted using only a slightly stronger mobile phase without the need to travel through the entire cartridge bed.



# VersaFlash Pump

Many flash chromatography systems utilize a pressurized stainless steel solvent reservoir to contain the solvent and force it through the flash cartridges. The VersaFlash system uses a pump, which eliminates the need for a stainless steel reservoir, thereby eliminating the following limitations:



- The level of solvent cannot be seen, often times causing incomplete separations and unknown solvent flush volumes.
- The reservoir is difficult to empty and refill any time solvent change is required.
- Solvent volume is limited by the tank capacity.
- An external gas supply is required to pressurize the tank.

## Specifications

**Flow Rate:** 5-170 mL/min (97723-U, 97734-U)  
10-340 mL/min (97724-U, 97737-U)

**Pressure:** 0 to 7.8 bar (100 psi)

**Fluid Contact Parts:** Tefzel®, Ceramic

**Fluid Viscosity Range:** Up to 2000 cps without feed pressure

**Fluid Connections:** 1/4"- 28 HPLC fittings  
1/4" ID compression

**Pump Type:** Piston

**Motor Type:** 3400 rpm DC, Optically Encoded,  
Servo Controlled

## Controls

**Manual Input:** Buttons on front panel

**Analog Input:** 4-20 mA, or 0-5 VDC

**Analog Output:** Pulsed output proportional to motor speed

**Operating Temp. Range:** 4 °C to 40 °C

**Operating Humidity Range:** Up to 100% humidity

**Electrical Input:** 110/220 VAC, 50/60 Hz,  
75 Watts, Double fused

**Physical Size:** 5.75" W x 6.25" H x 11" D  
14.6 cm W x 15.9 cm H x 28 cm D

**Weight:** 5 kg (11 lb.)

**Agency Certifications:** CE

**Supplied Accessories:** Power Cord, Teflon® tubing and fittings

**Warranty:** Limited Warranty – See operation manual or ask your dealer for a copy of the warranty. Misuse, misapplication, neglect and abuse are specifically excluded. No warranty on the pump head.

## Advantages of the VersaFlash Piston Pump Include:

- Variable speed for flow rate adjustment.
- Compact pump design conserves valuable fume hood space.
- Unlimited solvent volume for uninterrupted flow.
- No external gas source required.
- Solvent changeover is fast and easy.
- Digital flow adjustment provides an easy means of repeating flow settings.

## Connecting the VersaFlash Station to a Pump or Other Solvent Delivery Systems

The VersaFlash system is a modular system, which means that it can be purchased as a complete system including a pump or you can purchase the VersaFlash station separately and connect it to existing hardware. The VersaFlash station is supplied with 1/8" tubing for connection to a pump or solvent delivery system as well as upstream fraction collectors or detectors.

## In-line Pressure Gauge (97726-U)

An in-line pressure gauge is also available to monitor the system pressure to insure the system is being used under safe operating conditions. The stainless steel pressure gauge should be placed in-line between the pump and the VersaFlash station to help monitor the system pressure and insure that the pressure limitations of the cartridges and system are not exceeded.



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VersaFlash Pump

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# VersaFlash Kits and Accessories



## VersaFlash Starter Kit (97739-U)

The starter kit provides you with everything you need to get you started in using the broad capabilities of the VersaFlash system for purification. From flushing solvents out of the system using the solvent flush adapter to stacking multiple cartridges using the cartridge stacking connector, the starter kit allows you to utilize the broad capabilities of the VersaFlash system.

The kit includes a 40 x 40 mm cartridge stacking connector, a solvent flush connector, 1/8 in. tubing (10 ft.) and 40 mm solid sample cartridges (3 large and 3 small) with a reusable stainless steel cap.



## Solid Sample Cartridge Kit (97738-U)

The solid sample cartridge kit allows you to adsorb samples onto silica or other packing materials and pack the dried sample into a solid sample cartridge and link it to the

### Contents of Solid Sample Cartridge Kits

	40 mm SSC Kit	80 mm SSC Kit
	<b>97738-U</b>	
Small Solid Sample Cartridges▼	(6) 40 x 37.5 mm	(3) 80 x 50 mm
Large Solid Sample Cartridges▼	(6) 40 x 75 mm	(3) 30 x 100 mm
Stainless Steel Cap	(1) w/O-ring	(1) w/O-ring
Frit Insertion Tools	40 mm Plunger/Sleeve	80 mm Plunger/Sleeve
Polyethylene Frits	(12) 40 mm	(6) 80 mm
Replacement O-Ring	(1) 40 mm	(1) 80 mm
▼ 1 endcap pre-assembled		

separation cartridge, allowing for direct desorption by the mobile phase. Samples that have low solubility in the mobile phase can be transferred to the head of the cartridge with no tubing or fittings to restrict or clog due to precipitation.

## 23 mm Cartridge Starter Kit (97761-U)

The 23 mm cartridges require an adapter to work with the VersaFlash station. With this in mind, a starter kit is available that includes 5 each of the 23 x 53 mm and 23 x 110 mm silica cartridges with two 23 mm adapters. This will allow you to get started using the smaller 23 mm cartridges.



Adapters for 23 mm cartridges are also available separately if you prefer to order a larger quantity of cartridges or need additional adapters.

## Accessories

### Cartridge Stacking Assemblies

The cartridge stacking assemblies allow you to connect two cartridges in series to expand the sorbent capacity and/or to mix different cartridge phase chemistries to conduct bimodal separations. The connector consists of a stacking connector to connect the fluid flow paths of the two cartridges as well as a sleeve to hold the two cartridges in alignment during operation. Cartridge stacking assemblies are available in four sizes: 40 mm x 40 mm, 40 mm x 80 mm, 80 mm x 80 mm, and 80 mm x 110 mm; to stack in different diameter cartridges.



### Solvent Flush Connector (97743-U)

The solvent flush connector is used to flush solvents out of the VersaFlash system or when changing from one solvent to another without a VersaPak cartridge in the station. It easily connects to the outlets of the two platens.



# Sigma-Aldrich Has Everything You Need for Flash Chromatography.

If you're not ready to switch to the VersaFlash system and disposable cartridges, Sigma-Aldrich has a wide range of glass columns, bulk media, TLC plates, and solvents ideal for flash chromatography. Or as an alternative to flash chromatography, pre-packed Büchner funnels and SPE products are ideal for small sample purification and/or cleanup. Below is an overview of some of the products that are available, for more information visit our website at [sigma-aldrich.com/supelco](http://sigma-aldrich.com/supelco).

## Glass Flash Chromatography Columns

With glass columns and accessories available in a wide range of configurations including both threaded and ball joint designs from 100 mL to 2 L capacity, you are sure to find the glass columns and accessories to meet all your requirements. For a complete list of available products visit [sigma-aldrich.com/equipment](http://sigma-aldrich.com/equipment).



## Bulk Flash Chromatography Media

Sigma-Aldrich also offers a comprehensive range of silica gels, including Davisil and E. Merck products. These materials are useful for all types of low pressure, medium pressure, and flash chromatography. They can be applied to the cleanup and purification of a wide range of synthetic and natural compounds.

## TLC Plates

Thin Layer Chromatography (TLC) plates for adsorption, partition and ion exchange method development are also available. Six different media choices with glass, polyester, and aluminum backings insure a wide range of capabilities are available.



- Silica gel – for weakly to strongly polar separations
- High purity silica gel – acid washed for separation of aflatoxins
- Cellulose – for partition chromatography
- Cellulose/PEI – for separation of weak anions (amino acids, peptides).
- Chiral silica – for separation of optically active isomers

## VersaPure™ Pre-Packed Büchner Funnels

Supelco offers a range of sizes of Büchner funnels pre-packed with a variety of media types including silica, charcoal, magnesium sulfate, celite, florisil and alumina ideal for sample cleanup. The pre-packed funnel design means they are ready-to-use, saving time in packing, cleaning and disposal of reusable funnels. It also eliminates potential hazards related to exposure to inhalable particulates and performance variation related to channeling that may occur with self-packed funnels. With funnel packing weights from 12.5 g to 100 g, the funnels can handle many different samples.



For smaller scale purification or sample preparation, Supelco has a wide range of SPE products such as SPE tubes, vacuum manifolds and accessories. Please see the Supelco catalog or go on-line at [sigma-aldrich.com/supelco](http://sigma-aldrich.com/supelco) for more information.

## Solvents

Sigma-Aldrich is a leading supplier of solvents for a broad range of scientific research needs. From high purity CHROMASOLV solvents specifically developed for MS applications to solvents for general laboratory research, Sigma-Aldrich can meet all your solvent needs.

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VersaFlash Station

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### On-Time Delivery

Still waiting for HPLC or capillary GC columns that you ordered last week or last month? Not getting responsive customer service? Get the service you deserve today with products that meet your performance demands and are delivered when you need them.

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# Ordering Information

Description	Qty.	Cat. No.	Description	Qty.	Cat. No.
<b>VersaFlash Systems</b>			<b>Sample Loading Equipment &amp; Accessories</b>		
System I (station assembly, 220 V pump*, starter kit, VersaVac sample loading station)		97720-U	VersaFlash Starter Kit	1/pk	97739-U
System I (station assembly, 110 V pump*, starter kit, VersaVac sample loading station)		97730-U	Sample Injector Assembly	1/pk	97725-U
System II (station assembly, starter kit, sample loading kit)		97731-U	VersaVac Sample Loading Station	1/pk	97750-U
* 5-170 mL/min pump 'Standard VersaFlash stand' 97732-U			Solvent Flush Connector	1/pk	97743-U
<b>Station Assembly</b>			In-line Pressure Gauge	1/pk	97726-U
VersaFlash Station (Max. stacked cartridge length 300 mm)		97732-U	Threaded Male Luer, 1/4-28	6/pk	97744-U
VersaFlash XL Station (Max. stacked cartridge length 400 mm)		97719-U	<b>Media and Reagents</b>		
<i>Replacement Parts - Station</i>			<b>Bulk Media</b>		
PEEK seal assembly	2/pk	97748-U	VersaFlash spherical silica, dried 100 g		97728-U
Teflon Tubing 10' x 1/8" OD x 1.5 mm ID	1/pk	58703	VersaFlash spherical silica, dried 1 Kg		97729-U
Teflon Tubing 50' x 1/8" OD x 1.5 mm ID	1/pk	58699	VersaFlash spherical C18 silica 100 g		97727-U
Flangeless Fittings, 1/8"	5/pk	58686	<b>TLC Plates</b>		
<b>Pumps</b>			Glass silica TLC plate w/ fluorescent indicator		Z12,269-6
10-340 mL/min., 110 V		97723-U	C18 silica TLC plate w/ fluorescent indicator		Z26,548-9
10-340 mL/min., 220 V		97724-U	<b>Solvents</b>		
5-170 mL/min., 110 V		97734-U	Acetonitrile 99.5+% ACS Reagent, Ph. Eur. (GC)		33019
5-170 mL/min., 220 V		97737-U	Acetonitrile 99.5+% ACS Reagent 4 x 4L		43,755-7
<i>Replacement Parts - Pumps</i>			Chloroform 99.0 - 99.4% Reagent, Ph. Eur. ISO, (GC)		32211
Pump Head, 5-170 mL/min.		97735-U	Chloroform 99.8% ACS Reagent 4 x 4L		47,247-6
110 V Pump Drive		97736-U	Dichloromethane > 99.9% ACS Reagent, ISO, (GC)		32222
<b>VersaPak Cartridges</b>			Dichloromethane 99.9% ACS HPLC 4 x 4L		27,056-3
<i>Silica</i>			Ethyl Acetate >99.5+% ACS Reagent, Ph. Eur. ISO, (GC)		33211
23 mm Cartridge Starter Kit		97761-U	Ethyl Acetate 99.5+% ACS Reagent 4 x 4L		44,350-6
23 mm x 53 mm, 11 g, 20 - 45 µm	20/pk	97757-U	Hexane >99% ACS Reagent, Ph. Eur. (GC)		32293
23 mm x 110 mm, 23 g, 20 - 45 µm	20/pk	97758-U	Hexane 95+% spectrophotometric grade 4 x 4L		27,050-4
40 mm x 75 mm, 51 g, 45-75 µm	12/pk	97704-U	Methanol >99.8% ACS Reagent, Ph. Eur. ISO, (GC)		32213
40 mm x 75 mm, 51 g, 45-75 µm	96/pk	97705-U	Methanol 99.8% ACS Reagent 4 x 4L		17,933-7
40 mm x 150 mm, 102 g, 45-75 µm	6/pk	97706-U	Petroleum ether bp 60-80 °C		32248
40 mm x 150 mm, 102 g, 45-75 µm	48/pk	97707-U	Petroleum ether low bp hydrogen treated naphtha bp 30-50 °C		32246
80 mm x 150 mm, 410 g, 45-75 µm	2/pk	97708-U	Petroleum ether Ph Eur. High bp 50-70 °C		32247
80 mm x 150 mm, 410 g, 45-75 µm	12/pk	97709-U	Petroleum ether ACS Reagent 4 x 4L		18,451-9
80 mm x 300 mm, 820 g, 45-75 µm	1/pk	97710-U	Toluene >99.7% ACS Reagent, Ph. Eur. ISO, (GC)		32249
80 mm x 300 mm, 820 g, 45-75 µm	6/pk	97711-U	Toluene 99.5+% ACS Reagent 4 x 4L		17,941-8
110 mm x 300 mm, 1.35 Kg, 45-75 µm	1/pk	97712-U	<b>Trademarks</b>		
<i>C18</i>			Celite — Celite Corp.		
23 mm x 53 mm, 15 g, 20 - 45 µm	2/pk	97759-U	CHROMASOLV, Supelco, VersaFlash, VersaPak, VersaVac —		
23 mm x 110 mm, 30 g, 20 - 45 µm	2/pk	97760-U	Sigma-Aldrich Co.		
40 mm x 75 mm, 70 g, 45-75 µm	2/pk	97700-U	Davisil — W.R. Grace & Co.		
40 mm x 150 mm, 140 g, 45-75 µm	1/pk	97701-U	Merck — Merck & Co. Inc.		
80 mm x 150 mm, 515 g, 45-75 µm	1/pk	97702-U	Teflon, Tefzel — E.I. duPont de Nemours & Co. Inc.		
80 mm x 300 mm, 1050 g, 45-75 µm	1/pk	97703-U			
110 mm x 300 mm, 1.9 Kg, 45-75 µm	1/pk	97713-U			
<b>Solid Sample Cartridges</b>					
<i>40mm ID</i>					
40 mm Solid Sample Cartridge Kit	1/pk	97738-U			
40 mm x 37.5 mm Solid Sample Cartridges	12/pk	97746-U			
40 mm x 75 mm Solid Sample Cartridges	12/pk	97747-U			
40 mm Solid Sample Module Cap with O-rings	1/pk	97722-U			
40 mm Solid Sample Module O-ring	3/pk	97721-U			
<i>80mm ID</i>					
80 mm Solid Sample Cartridge Kit	1/pk	97753-U			
80 mm x 50 mm Solid Sample Cartridges	6/pk	97751-U			
80 mm x 100 mm Solid Sample Cartridges	6/pk	97752-U			
80 mm Solid Sample Module Cap with O-rings	1/pk	97754-U			
80 mm Solid Sample Module O-ring	1/pk	97755-U			
<b>Cartridge Accessories</b>					
23 mm Cartridge Adapters	2/pk	97762-U			
Cartridge Stacking Assembly (40 x 40 mm)	1/pk	97740-U			
Cartridge Stacking Assembly (40 x 80 mm)	1/pk	97741-U			
Cartridge Stacking Assembly (80 x 80 mm)	1/pk	97742-U			
Cartridge Stacking Assembly (80 x 110 mm)	1/pk	97756-U			
Replacement O-rings for stacking connector	6/pk	97745-U			

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