SepaFlash™ Sapphire Series

Simplify your purification, maximize your efficiency!

Product Overview

The SepaFlash™ Sapphire Series is designed for reliable, high-purity purification with exceptional ease and efficiency. Whether handling milligrams or scaling up to a kilogram, it provides a fast, straightforward solution. Luer-Lok® end fittings ensure seamless compatibility with any flash system, enabling smooth workflows and consistent performance.

With superior resolution, solvent savings, and up to 30 % higher sample loading capacity, the Sapphire Series strikes the perfect balance of performance and versatility for all chromatography applications.

SepaFlash™ Sapphire Series -
Excellent Efficiency at a Competitive Price.
Try it, love it.

Key Features

Precision Packing and Reliable Reproducibility

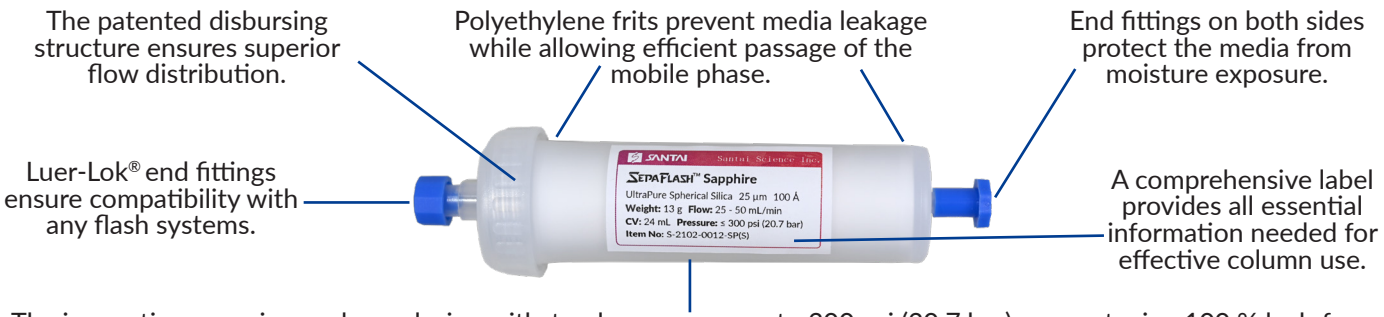
Since 2004, SepaFlash™ columns have delivered consistent performance through advanced semi-automated packing technology, ensuring precision, efficiency, and robust lot-to-lot reproducibility. With low fines, these columns create a stable separation environment, minimizing contamination risks and maintaining reliability.

Versatile

The SepaFlash™ Sapphire Series offers sizes from 4 g to 10 kg, accommodating sample purification from 10 mg to 3 kg. Packed with high-efficiency 25 µm, 100 Å spherical silica gel (specifications detailed in the table), this series delivers exceptional performance and cost-effectiveness, making it ideal for diverse purification applications.

Parameters	Sapphire Column
Particle Shape	Spherical
Particle Size	25 µm
Pore Diameter	100 Å
Typical Surface Area	500 m^2/g
pH	5.0 - 8.0
Loading Capacity	0.1 - 30 %

Column Design



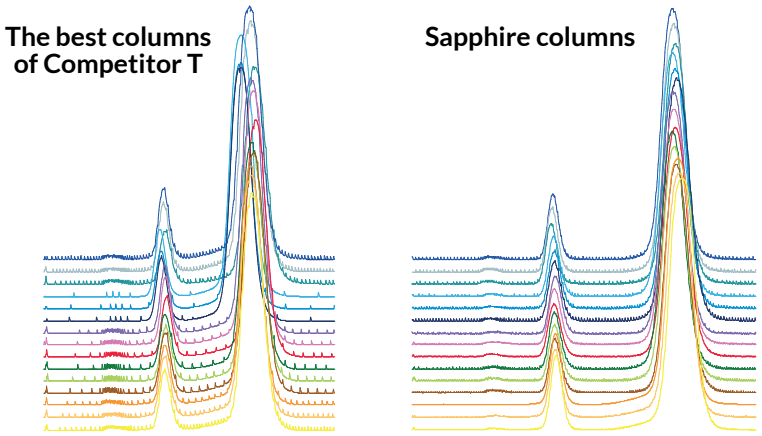
The innovative one-piece column design withstands pressures up to 300 psi (20.7 bar), guaranteeing 100 % leak-free performance. It is available with a range of irregular and spherical silica gels, aluminas, and other media, all packed with precision using advanced semi-automated dry packing technology for versatile application across various needs.

Greater Performance with SepaFlash™ Sapphire Compared to a Competitor

This experiment compares the performance of the Sapphire series with the best column from Competitor T. The results demonstrate that the Sapphire columns outperformed competitive products, delivering a better resolution and higher column efficiency (≥ 50 %), as measured by the average number of effective plates (N_{eff}).

Experimental Conditions

Experiment using SepaFlash™ Sapphire Spherical Silica Columns	
Column Size	12 g
Sample	Acetophenone & p-methoxyacetophenone
Mobile Phase	80 % hexane and 20 % ethyl acetate
Flow Rate	20 mL/min
Sample Size	0.2 mL
Wavelength	254 nm

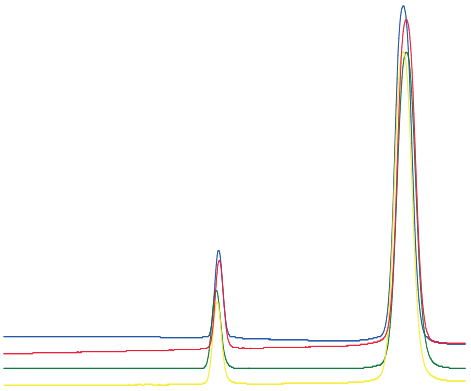


Average Observed Chromatographic Parameters

Parameters	Competitor	Sapphire	Sapphire Performance Conclusion
Resolution (Rs)	2.79	3.47	Much better separation
Effective Plates (N_{eff})	73	114	Significantly more efficient
Tailing Factor (T)	1.06	1.05	Slightly better peak shape

Seamless Scale-Up with SepaFlash™ Sapphire 330 g

The SepaFlash™ Sapphire 330 g column enables effortless scale-up while maintaining resolution and efficiency. The superposition of chromatograms confirms excellent reproducibility, ensuring consistent retention times and peak shapes. This allows users to scale-up with confidence, achieving high-purity compounds with minimal optimization.



SepaFlash™ Sapphire Typical Column Characteristics

The table below presents the characteristics of the SepaFlash™ Sapphire Series.

Product Number	Typical Silica Weight	Column ID x Length (mm)	Typical Column Volume (mL)	Typical Loading Capacity	Recommended Flow Rate (mL/min)	Maximum Pressure (psi / bar)
S-2102-0004-SP(S)	4 g	12.3 x 97.5	6	4 mg - 1.2 g	15 - 30	300 / 20.7
S-2102-0012-SP(S)	13 g	21.2 x 113.3	24	12 mg - 3.6 g	25 - 50	
S-2102-0025-SP(S)	21 g	21.2 x 163.1	40	25 mg - 7.5 g		
S-2102-0040-SP(S)	32 g	26.7 x 165.9	58	40 mg - 12 g	30 - 60	
S-2102-0080-SP(S)	70 g	30.9 x 242.5	127	80 mg - 24 g	40 - 80	250 / 17.2
S-2102-0120-SP(S)	108 g	37.4 x 254.3	186	120 mg - 36 g	45 - 90	
S-2102-0220-SP(S)	202 g	59.8 x 209.3	358	220 mg - 66 g	60 - 120	200 / 13.8
S-2102-0330-SP(S)	282 g	59.8 x 270.3	501	330 mg - 99 g		
S-2102-0800-SP(S)	708 g	78.2 x 382.9	1,235	800 mg - 240 g	200 - 300	100 / 6.9
S-2102-1600-SP(S)	1.4 kg	103.8 x 432.4	2,468	1.6 g - 480 g		
S-2102-3000-SP(S)	2.6 kg	127.5 x 509.5	4,626	3.0 g - 900 g	300 - 400	
S-2102-5000-SP(S)	4.4 kg	127.5 x 770.0	7,709	5.0 g - 1.5 kg	350 - 450	
S-2102-010K-SP(S)	8.8 kg	172.5 x 850.0	15,415	10.0 g - 3.0 kg	400 - 500	

Using the SepaFlash™ Sapphire Series: A Step-by-Step Guide

Cartridge Installation

The SepaFlash™ Standard Series columns are designed with universal connectors, ensuring full compatibility with all flash chromatography systems available on the market including but not limited to:

- Advion-Interchim® puriFlash®
- Biotage® Isolera® & Selekt®
- Buchi® Pure® & Sepacore®
- Gilson® PLC®
- Grace® Reveleris®
- Teledyne Isco® CombiFlash®

Securely attach the cartridge to your flash chromatography system, ensuring a proper fit with the connectors. Once the cartridge is installed, refer to the system's user guide for detailed setup and operation instructions.

Alternatively, you can consult this quick reference guide to assist with your purification process.

Note: Always store unused columns in a dry place at room temperature with the end caps securely in place. Remove the end caps only when installing the column.

Sample Loading

The solubility of the compound determines whether to use liquid or dry loading when introducing the sample onto the SepaFlash™ column.

- **Liquid loading** involves dissolving the sample in the minimum amount of the weakest possible solvent. The dissolved sample is then added to the top of the SepaFlash™ column or introduced via the sample injector using a syringe.

- **Dry loading** is recommended when the sample has limited solubility in weak solvents. In this case, a stronger solvent is used to fully dissolve the sample, which is then pre-adsorbed onto a small quantity of sorbent. After evaporating the solvent using a rotary evaporator, the sample-sorbent mixture is loaded into an empty SepaFlash™ iLOK™ empty solid-load cartridge (see procedure below), which is placed on top of the flash column or directly on the 15 % free space of the SepaFlash™ iLOK™-SL openable column.

How to Use the SepaFlash™ iLOK™ Cartridges

Step 1:
Unscrew and remove the cap from the iLOK™ empty column tube, remove the frit, and place the column tube on a support stand.

Step 2:
Fill the column tube with silica gel mixed with the sample (for solid-load), the adsorbent (for chromatographic column) or with 85 % of silica (for combined application as shown on the picture). Tap gently to settle and avoid overfilling.

Step 3:
Place the frit on the top of the column tube.

Step 4:
Use the insertion tool to press the frit into the column tube, ensuring the frit is as straight as possible.

Complete the next two steps only for the combined application. For solid-load use, proceed directly to Step 7.

Step 5:
Add the silica gel mixed with the sample to the top of the column (blue section), gently tap to settle and place the second frit on the column tube.

Step 6:
Use the insertion tool to press the frit into the column tube, ensuring the frit is as straight as possible.

Step 7:
Finally, securely fasten the column by fully tightening it with the cap screwing closing tool.

Ensure the cap is fully tightened before use!

Step 8:
Your SepaFlash™ iLOK™ cartridge is now ready for use. It is recommended toperform a pre-equilibration step with 3 - 5 column volumes before loading your sample.

Typical Recommended Column Conditions

The conditions outlined in this table serve as a general starting point for column use and maintenance. However, specific applications may require adjustments based on factors such as sample properties, solvent compatibility, and system requirements. It is recommended to optimize these parameters as needed to achieve the best chromatographic performance and column longevity.

Steps	Normal Phase Mode	Reversed Phase Mode	HILIC Phase Mode
Pre-conditionling	Flush the column with at least 3 CV using hexanes or the initial mobile phase conditions.	Flush the column with at least 3 CV of ≥ 90 % organic solvent (typically methanol or acetonitrile) to activate the phase.	Flush the column with at least 5 CV of ≥ 90 % organic solvent.
Equilibration	Flush the column with at least 3 CV using the initial mobile phase conditions. **Typical solvent:** hexane & ethyl acetate mixture.	Flush the column with at least 2 CV using the initial mobile phase conditions. **Typical solvent:** organic solvent (typically methanol or acetonitrile) in water.	Flush the column with at least 10 CV using the initial mobile phase conditions. **Typical solvent:** 60 - 95 % acetonitrile with aqueous buffers like ammonium acetate or formate.
Disclamer	**SepaFlash™ columns are single-use, but customers may validate an FDA-compliant cleaning process at their own risk. Santai Science provides no warranty for reuse, as it may affect separation efficiency and fraction purity.**		
General Guidelines for Cleaning	1. **Prevent drying:** after the first use, do not allow the column to dry out and ensure the air purge on the instrument is turned off. 2. **Use intermediate solvents when necessary:** if the run solvents are immiscible with the storage solvents, rinse the column with an intermediate solvent. 3. **Remove organic solvents:** flush the column with at least 3 CV of the solutions listed under "Cleaning" to remove organic modifiers or strong organic solvents.		
Cleaning	Rinse the column with at least 3 CV of 100 % of the most polar solvent in the elution mixture, optionally in reverse flow. If needed, rinse with 5 CV of 100 % isopropanol. Do not use 100 % methanol; instead, use a dichloromethane:methanol mixture (≤ 25 % of methanol).	If buffers or additives were used, rinse the column with 5 CV of 95:5 water:organic solvent (skip this cleaning step if not required), followed by 5 CV of 95:5 organic solvent:water (typically methanol or acetonitrile in water).	Rinse the column with 10 CV of 95:5 water:organic solvent, then 10 CV of 95:5 organic solvent:water (e.g., methanol or acetonitrile). If needed, clean with 10 CV of 50 mM ammonium formate or acetate (50:50 aqueous:acetonitrile).
General Guidelines for Storage	**To ensure proper storage, fill the column with the recommended solvents listed under "Storage Conditions" and keep it in a dry place at room temperature with the end caps securely in place.**		
Storage Conditions	Store the column in 100 % isopropanol.	Store the column in ≥ 70 % organic solvent (typically methanol or acetonitrile in water).	Store the column in 80 % acetonitrile in water or 100 % isopropanol.

Notes: CV stands for "Column Volume," which refers to the total internal volume of the column. Before reusing the column, ensure proper re-equilibration by running it in normal flow mode with the initial solvent conditions before the next injection.

Optimizing Column Conditions

If the typical recommended conditions do not provide optimal performance, consider one of these adjustments:

- **For difficult separations,** use gradient elution, starting with a solvent where Rf ≤ 0.2 and gradually increasing polarity. If resolution remains poor, consider a two-step purification, using a second column for finer separation.
- **For acid-sensitive compounds,** to prevent degradation, use neutral or amine-modified silica. Alternatively, deactivate silica by flushing the column with 5 - 10 CV of a solvent containing 1 - 3 % triethylamine (TEA) before running the separation.
- **Consider column stacking** by connecting two identical pre-packed columns in series to improve resolution and loading capacity. Adjust flow rate to manage back pressure.
- **During pre-conditioning step,** increase equilibration time if retention is inconsistent. Ensure solvent compatibility and adjust buffer pH for better peak shape.

Feel free to contact our technical support team at support@santaisci.com if you need help or advice.