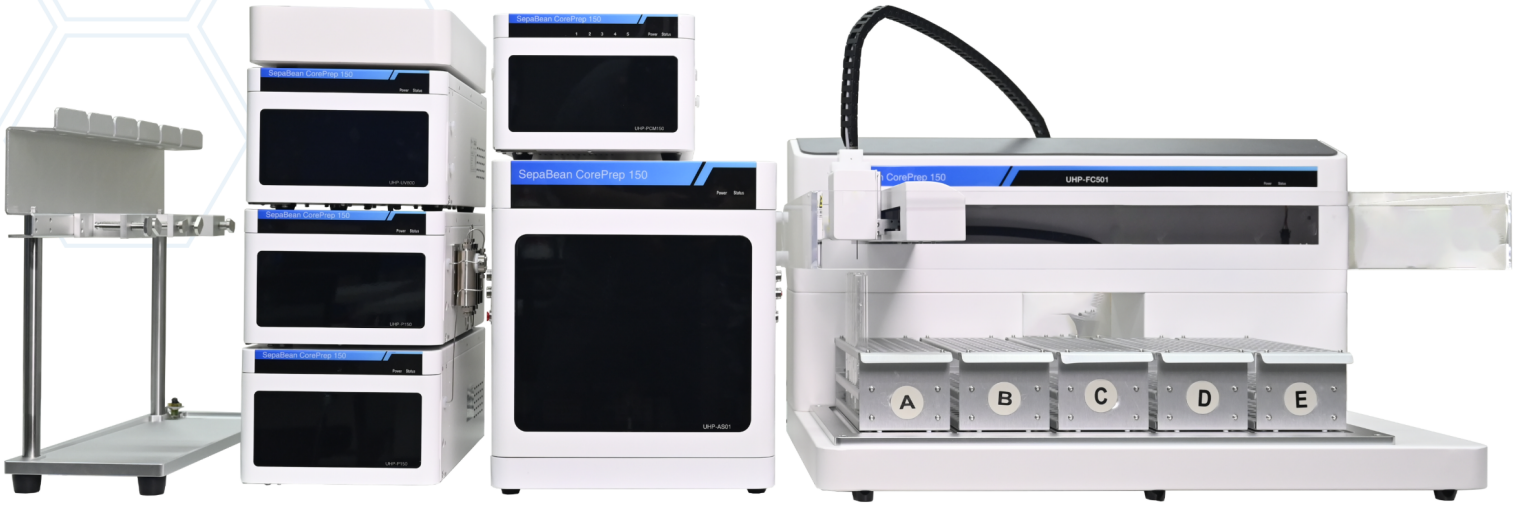
SANTAI

SepaBean™ CorePrep 150

High Pressure Preparative Liquid Chromatography System



Simplify your purification, maximize your efficiency!

Santai Science Inc.

Introduction

Introduction

Welcome to the SepaBean™ CorePrep 150 system Brochure, your complete guide to Santai Science's next-generation preparative liquid chromatography solutions. The SepaBean™ CorePrep 150 is an advanced high pressure preparative chromatography system engineered to deliver unmatched purification performance. Designed for efficiency, reliability, and ease of use, it integrates cutting-edge technologies that simplify workflows, reduce maintenance, and maximize productivity in both research and production environments. preparative liquid chromatography technologies.

Complementing the CorePrep 150 system, Santai Science offers a comprehensive portfolio of SepaPrep™ HPLC columns specifically developed for preparative and semi-preparative applications. Available in multiple stationary phases, particle sizes, and column dimensions, SepaPrep™ columns are optimized to deliver high loading capacity, excellent resolution, and robust reproducibility across a wide range of purification challenges.

Together, the SepaBean™ CorePrep 150 system and SepaPrep™ HPLC columns form a fully integrated purification platform, enabling seamless method development, efficient scale-up, and consistent performance from early-stage research to routine purification.

This brochure highlights our high-pressure preparative chromatography solutions, showcasing how the combined system and column design enhance purification efficiency, reliability, and operational simplicity.

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Explore the Santai Science Portfolio

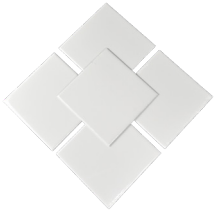
Explore the Santai Science Portfolio

At Santai Science, we take pride in offering a diverse portfolio of advanced separation and purification solutions tailored to meet the evolving needs of scientists and professionals worldwide. From innovative chromatography systems to high-performance consumables, our products are designed to deliver precision, efficiency, and reliability. Browse below to discover how our cutting-edge technologies can empower your research and applications.

SepaBean™ Chromatography machines & SepaFlash™ Columns

Product Line	SepaBean™ machines	SepaFlash™ FP LT-ELSD	SepaFlash™ Columns
Picture			
Description	SepaBean™ machines deliver efficient and user-friendly flash chromatography solutions for diverse applications. Available Models: • SepaBean™ machine U • SepaBean™ machine T • SepaBean™ machine • SepaBean™ machine 2 • SepaBean™ machine L	The SepaFlash™ FP LT-ELSD is a low-temperature evaporative light scattering detector, ideal for non-chromophoric analytes like carbohydrates, lipids, and polymers. It ensures high sensitivity, low noise, and optimal detection of thermally unstable compounds, compatible with all SepaBean™ models.	SepaFlash™ columns deliver precise, durable, and efficient purification for diverse chromatography applications. Available Series: • SepaFlash™ Standard • SepaFlash™ Large Size • SepaFlash™ HP, Bio & Bonded • SepaFlash™ iLOK™ & iLOK™-SL • SepaFlash™ iLOK™ Large-Size

Other SepaFlash™ Products

Product Line	SepaFlash™ Ultra-Pure Bare Silica Gels	SepaFlash™ Ultra-Pure Bonded Silica Gels	SepaFlash™ TLC Plates
Picture			
Description	SepaFlash™ Ultra-Pure bare silica gels in bulk provide high-quality phases for chromatography, available in both irregular and spherical shapes. With particle sizes ranging from 10 µm to 200 µm and pore diameters from 50 Å to 300 Å, these silicas meet diverse application needs. They are offered in convenient 1 kg, and 25 kg containers.	SepaFlash™ Ultra-Pure bonded silica gels offer versatile chromatography solutions in irregular or spherical shapes, with particle sizes from 10 µm to 40 - 75 µm and pore diameters of 50 Å to 300 Å. Available in reversed phase, normal phase, ion-exchange, HILIC, and alumina phases.	SepaFlash™ TLC plates are manufactured with high-quality media to match the sorbents in SepaFlash™ flash columns. This alignment ensures greater reproducibility in method development. Available with aluminum and glass backings, these plates come in a wide range of sizes from 2.5 x 7.5 cm to 20 x 20 cm, supporting both analytical and preparative chromatography needs.

About Santai

Discover Santai Technologies

Founded in 2004, Santai Technologies is a leading technology company dedicated to advancing separation and purification tools. With over 20 years of expertise, we have become a trusted partner for professionals and scientists across the pharmaceutical, biotechnology, fine chemicals, natural products, and petrochemical industries.

Santai is renowned worldwide for its outstanding flash chromatography instruments and consumables, setting new benchmarks for efficiency, precision, and reliability in the global market.

Santai: Over 20 Years of Innovation in Chromatography

For two decades, Santai has been a leader in chromatography innovation, providing
for scientists worldwide. With our advanced SepaBean™ machines and SepaFlash™
innovation and quality, continually empowering researchers with more effective pu

2004

Santai Technologies was founded to develop separation and chromatography solutions.

2005

The SepaFlash™ Standard Series was launched, leveraging proprietary packing technology for enhanced performance.

2009

The SepaFlash™ HP Series has been launched, offering enhanced pressure resistance.

2013

The SepaFlash™ iLOK™ has been launched, providing the convenience of manual assembly and flexible sample loading options.

2015

The SepaFlash™
and SepaFlash™
have been launc

Santai was recognized as "High-tech Enterpr

The SepaBe
launched
chromatogr
networking capab

About Santai Science

Established in 2018 as a sister company of Santai Technologies, Santai Science is headquartered in Montreal, Canada. Its core mission centers on the commercialization of cutting-edge separation and purification tools, including product demonstrations and specialized services.

Santai Science also plays a vital role in providing customer training, delivering technical support, and managing order processing and shipment directly from its Montreal office.

Our Extensive Global Reach

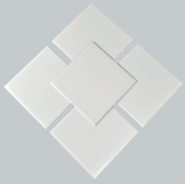
Santai operates and maintains warehousing services across America, Asia, India, and Europe. This strategic global presence ensures that our products and services are readily accessible and efficiently delivered to clients around the world.

cutting-edge solutions that streamline purification processes
columns enhancing efficiency, we remain committed to
rification technologies.

Standard Size 3 kg
Bonded Series
hed.

Santai Science was founded in Canada, alongside the iLOK™-SL flash column with 15 % free space for solid loading.

The iLOK™ Large Size empty columns (800 g to 7 kg) were launched, together with new product lines like bulk silica gels and TLC plates.



2016

rise”

an™ machine was
as a unique flash
aphy system with
ilities and built-in
intelligence.

2018

The SepaBean™ machine L was launched, featuring large 5 kg and 10 kg flash columns designed for the pilot-scale market.

2021

2022

2024-2025

Launch of the 2nd generation SepaBean™ machines, SepaBean™ CorePrep 150, and Rotary Evaporator Product Line

SepaBean™ CorePrep 150

Simplify your purification, maximize your efficiency!

Product Overview

The SepaBean™ CorePrep 150 is a high-pressure preparative LC system built for reliable, accurate, and cost-effective purification. With flexible flow rates, multiple detector options, and smart Internet of Things (IoT) features, it simplifies method development and boosts efficiency across research and production labs.

Key Features

- **High Pressure and Performance System**
  Achieves up to 40 MPa (5,800 psi / 400 bar) with precise flow rates up to 150 mL/min. This capability supports rapid method development using a broad range of preparative columns, including smaller particle sizes and series configurations. It also enables higher flow rates, offering greater flexibility in method optimization.

- **Flexible and Adaptable**
  Equipped with multiple detector options (UV-Vis dual wavelength, optional ELSD), an autosampler with expandable injection volumes, and an optional column selector supporting up to 5 preparative columns. This modular design provides unmatched adaptability to fit diverse purification workflows.

- **Accurate Collection**
  A high-precision automated fraction collector minimizes dead volume and sample diffusion, ensuring accurate recovery and reproducibility. Compatible with a wide range of test tube racks, it provides reliability and flexibility in sample collection.

- **Smart and Connected**
  Featuring intuitive control software integrated with Internet of Things (IoT) connectivity, the system offers real-time remote monitoring, automatic safety interventions, and instant mobile alerts. This guarantees secure operation, peace of mind, and maximized uptime.

Innovation You Can Trust

Backed by over 20 years of expertise in chromatography, Santai Science brings cutting-edge technology to the SepaBean™ CorePrep 150. Engineered for high-pressure performance, reliability, and ease of use, it empowers researchers to achieve superior purification results while reducing time, effort, and maintenance costs.

HPLC Columns Compatibility

To fully leverage the performance of the SepaBean™ CorePrep 150, a wide range of compatible HPLC columns is available. Designed to deliver high efficiency, reproducibility, and robustness, these columns support reliable method development and scalable purification across diverse applications.

Overview of the Complete Set Design

The SepaBean™ CorePrep 150 combines high-pressure pumping, precise detection, automated injection, and accurate fraction collection. With an optional column selector and Internet of Things (IoT) connectivity, its modules work seamlessly to deliver reliable and efficient purification.

Column Selector (Optional)

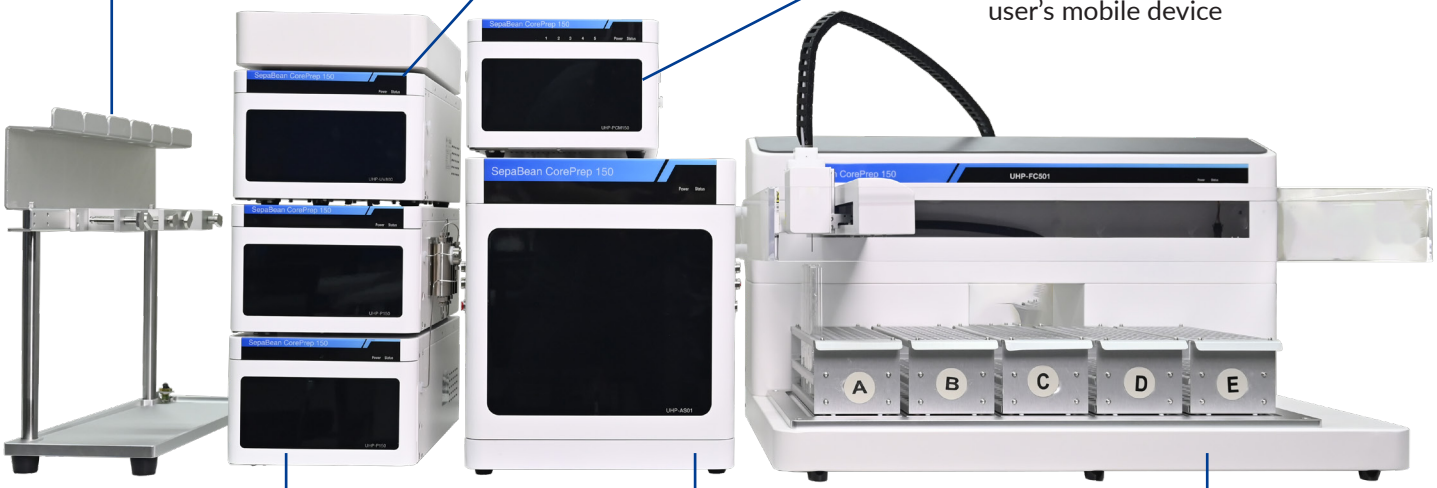
- Supports up to 5 columns with diameters up to 50 mm and lenghts up to 250 mm

Detector

- UV-Vis 200 - 800 nm dual wavelength detector
- Optional ELSD detector

Integrated Power Supply

- Equipped with an Internet of Things (IoT) module, the system automatically performs safety interventions and sends instant notifications to the user's mobile device



Pumping System

- Flow Rate: 1 - 150 mL/min
- Operating Pressure: up to 40 MPa (5,800 psi / 400 bar)
- Optional sample pump available

Autosampler

- Compatible with 2 test tube racks, adaptable to various test tube sizes
- Equipped with a standard 5 mL injection loop, expandable to 20 mL
- Built-in cleaning function for both inner and outer needle walls

Fraction Collector

- Split-type 2D automatic fraction collector: automatically selects and sets the coordinates of test tube racks or collection bottles
- Supports up to 5 racks, compatible which test tubes of various sizes

SepaBean™ CorePrep 150 - Complete Set Specifications

Characteristics	Specifications
Part Number	SPBUHP150
Description	SepaBean™ CorePrep 150 - Ultra-high Pressure Liquid Chromatography System, Complete Set. Maximum flow rate: 150 mL/min. Compatible with 200 - 800 nm UV dual-wavelength detector. Maximum pressure resistance: 40 MPa (5,800 psi / 400 bar).
Included in the Complete Set	The SepaBean™ CorePrep 150 - Complete Set comes with two pumping systems, a UV-Vis detector, an autosampler, a fraction collector, and an integrated power supply with communication module. **Available Options:** for greater flexibility, the system can be extended with a column selector (up to 5 preparative columns) and an ELSD detector.
Control Device	External PC with intuitive control software
Dimensions (H x W x D)	580 x 1,750 x 660 mm (excluding Column Selector Module)
Flow Rate Range	0 - 150 mL/min
Power Supply	220 V AC, total power 1,000 W
Operating Pressure	≤ 40 MPa (≤ 5,800 psi / ≤ 400 bar) (316 L Pump Head)
Tubing Connection	1/16" standard pipe connection
Weight	155 kg (342 lbs), excluding Column Selector Module

Module Features and Specifications

Introduction

The SepaBean™ CorePrep 150 is built from modular components that work seamlessly together to deliver high-performance preparative chromatography. Each module plays a key role in system operation. The following section highlights the main features and specifications of each module.

Fraction Collector

- **Compact and Independent Design:** Supports up to 5 test tube racks without interference, ensuring efficient use of space.
- **Flexible Compatibility:** Accommodates 13 mm, 16 mm, and 18 mm test tubes, easily selectable to fit different application needs.
- **Accurate Flow Control:** Optimized pipeline design minimizes delay and dead volumes, reducing sample diffusion and ensuring precise collection.
- **High-Precision Switching:** Equipped with a robust three-way valve, the system enables reliable position switching while keeping waste and collection channels independent, ensuring leak-free operation and high recovery rates.

Fraction Collector Specifications

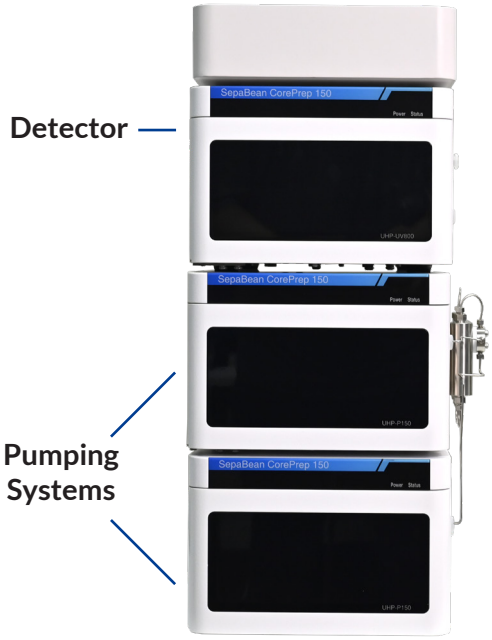
Characteristics	Specifications
Part Number	UHP-FC501
Description	High Pressure Fraction Collector Module
Dimensions (H x W x D)	680 x 837 x 658 mm
Flow Rate Range	0 - 150 mL/min
Power Supply	100 - 240 V AC, power 75 W
Sample Rack Capacity	• 13 x 100 mm, 9 mL, 96 wells • 16 x 100 mm, 15 mL, 75 wells • 18 x 150 mm, 25 mL, 70 wells *(The maximum test tube height supported is 180 mm)*
Supported Racks	Supports up to 5 test tube racks
Switching Speed	Switching speed reaches a maximum of 0.1 seconds
Weight	45 kg (99 lbs)

Detector

- **Dual Optical System:** Enables simultaneous dual-wavelength detection for enhanced analytical flexibility.
- **High-Precision Monochromator:** Advanced optical control ensures superior wavelength accuracy and stability.
- **Independent Optical Path Design:** Proprietary development of the optical path and detachable circulation flow cell enables quick maintenance and reliable operation.

Detector Specifications

Characteristics	Specifications
Part Number	UHP-UV800
Description	200 - 800 nm UV Variable Wavelength Detector
Baseline Drift	± 2 x 10^{-4} AU
Baseline Noise	± 0.5 x 10^{-5} AU
Detection Range	0 - 2 AU
Dimensions (H x W x D)	172 x 240 x 450 mm
Flow Cell Optical Path	2.1 mm path length
Flow Cell Volume	10 µL
Power Supply	100 - 240 V AC, power 75 W
Wavelength Accuracy	1 nm
Wavelength Precision	± 0.1 nm
Weight	18 kg (40 lbs)



Pumping System

- **Dual Floating Plunger Design:** Parallel, floating plungers ensure high accuracy and extend the service life of the sealing ring.
- **Easy Maintenance:** Built-in plunger cleaning channel removes salt residues without disassembling the pump head; the embedded design allows quick disassembly and reset.
- **High-Stability Motor:** Servo motor with secondary transmission delivers higher torque at reduced speed, improving pump gradient stability and consistent flow rates.
- **Durable Linear Bearings:** Ball-type linear bearings reduce tangential forces under pressure, enhancing stability and extending sealing ring lifetime, unlike traditional plastic bearings that struggle with high-pressure stability.
- **Precision Machining:** Pump heads are engineered for concentricity, while floating high-pressure sealing sleeves provide superior sealing strength and long-term stability compared to conventional machined pump heads.

Pumping System Specifications

Characteristics	Specifications
Part Number	UHP-P150
Description	High Pressure Pumping System, 150 mL
Dimensions (H x W x D)	172 x 278 x 450 mm (including mixer)
Flow Accuracy	± 1 %
Flow Rate Range	0.01 ~ 150 mL/min, increment 0.01 mL/min
Flow Repeatability RSD	≤ 1 %
Gradient Accuracy	≤ 1.5 %
Operating Pressure	≤ 40 MPa (≤ 5,800 psi / ≤ 400 bar) (316 L pump head)
Power Supply	100 - 240 V AC, power 300 W (single pump)
Pressure Pulsation	≤ 0.5 MPa (≤ 72.5 psi / ≤ 5 bar)
Tubing Connection	1/16” standard pipe connection
Weight	18.5 kg (41 lbs), including mixer

Pumping System Overview

Integrated Power Supply

- **Compact Integration:** Combines power distribution and communication control in a single, streamlined unit.
- **Smart Connectivity:** Internet of Things (IoT) enabled for real-time monitoring, safety interventions, and instant mobile notifications.
- **Stable and Reliable:** Ensures consistent system performance with reduced wiring and simplified setup.

Integrated Power Supply Specifications

Characteristics	Specifications
Part Number	UHP-PCM150
Description	High Pressure Integrated Power Supply and Communication Module
Dimensions (H x W x D)	172 x 240 x 461 mm
Internet of Things (IoT) Module	Support China Mobile / China Unicom / China Telecom SIM cards
Power Supply	110 - 220 V AC, power 100 W (200 W with column switching module)
Weight	10 kg (22 lbs)

Column Selector

- **Flexible Column Switching:** Supports up to 5 columns with reliable, automated switching.
- **Streamlined Workflows:** Eliminates manual reconnections, saving time and reducing the risk of errors.
- **Seamless Integration:** Works directly with the control software for quick method changes and improved efficiency.
- **Versatile Column Compatibility:** Accommodates column diameters from 4.6 to 50 mm and lengths of 100, 150, or 250 mm for a wide range of applications.

Column Selector Specifications

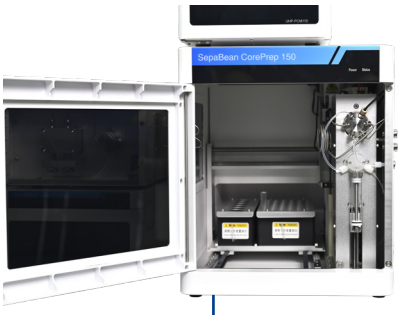
Characteristics	Specifications
Part Number	UHP-ACSC501
Description	Automatic Preparative Column Selector Module
Dimensions (H x W x D)	460 × 520 × 190 mm
Number of Channels	Supports up to 5 channels
Power Supply	110 - 220 V AC, power 100 W (200 W with integrated power box)
Weight	5 kg (11 lbs)

Autosampler (Injector)

- **Flexible Tube Rack Design:** Compatible with 5 mL, 9 mL, and 15 mL sample tubes, offering versatile combinations.
- **Independent Injection Module:** Operates separately from the collection process, enabling both single injections and repeated stacking without delays.
- **Wide Injection Range:** Adjustable volumes from 100 µL to 10 mL (± 1 µL) with precise control; injection speed can scale from small to large volumes within 30 seconds.
- **High Reproducibility:** Residual injection rate below 0.01 % ensures accurate performance even with complex samples.
- **Expandable Capacity:** Reserved switching port supports larger sample injections, extending the range up to 100 µL - 20 mL.

Autosampler Specifications

Characteristics	Specifications
Part Number	UHP-AS01
Description	High Pressure Autosampler
Carryover Effect	≤ 0.01 %
3-Dimensional	XYZ Axis
Dimensions (H x W x D)	400 x 340 x 525 mm
Injection Accuracy	± 2 %
Injection Dead Volume	310 µL
Injection Precision	RSD ≤ 1 %
Injection Time	The injection cycle time is 32 seconds for a standard 5 mL injection and 50 seconds for a standard 10 mL injection
Injection Volume	100 µL to 5 mL with a standard 5 mL quantitative loop, minimum increment of 1 µL, and can be expanded up to 20 mL
Needle Wash	Thorough cleaning of inner and outer walls of the injection needle
Sample Rack Options	• 10 x 75 mm, 5 mL, 112 wells • 16 x 100 mm, 15 mL, 50 wells • 13 x 100 mm, 9 mL, 72 wells • 30 x 100 mm, 40 mL, 6 wells
Power Supply	100 - 240 V AC, power 75 W
Weight	35 kg (77 lbs)



Autosampler Overview

Ordering Information

Available SepaBean™ CorePrep 150 Components

The table below lists all components available for the high pressure preparative LC system.

Item Number	Description
SPBUHP150	SepaBean™ CorePrep 150 - Ultra-high Pressure Liquid Chromatography System, Complete Set. Maximum flow rate: 150 mL/min. Compatible with 200 - 800 nm UV dual-wavelength detector. Maximum pressure resistance: 40 MPa (5,800 psi / 400 bar).
UHP-FC501	SepaBean™ CorePrep 150 - High Pressure Fraction Collector Module
UHP-ACSC501	SepaBean™ CorePrep 150 - Automatic Preparative Column Selector Module
UHP-PCM150	SepaBean™ CorePrep 150 - High Pressure Integrated Power Supply and Communication Module
UHP-UV800	SepaBean™ CorePrep 150 - 200 - 800 nm UV Variable Wavelength Detector
UHP-P150	SepaBean™ CorePrep 150 - High Pressure Pumping System, 150 mL
UHP-AS01	SepaBean™ CorePrep 150 - High Pressure Autosampler

Intelligent and Intuitive Software Control

The SepaBean™ CorePrep 150 is powered by a next-generation control platform designed for precision, flexibility, and ease of use. From method setup and gradient programming to fraction collection and data processing, every function is accessible through a clear, unified interface.

This intelligent software environment ensures complete system control and data integrity while optimizing performance for both routine and complex preparative workflows.

Key Features

- **Unified System Control**
  Centralized management of pumps, detectors, columns, and fraction collectors ensures seamless coordination and consistent operation throughout each run.

- **Real-Time Monitoring**
  Live visualization of pressure, flow rate, and detector response provides clear insight into every stage of the purification process.

- **Flexible Method Configuration**
  Injection, collection, and gradient parameters can be easily customized to meet specific application needs and optimize performance.

- **Automatic Data Logging**
  All run parameters, chromatograms, and collection results are automatically recorded and securely stored, ensuring complete traceability and simplifying both data review and method validation.

- **User-Friendly Interface**
  The intuitive layout and logical workflow minimize setup time and training, enhancing productivity and reducing operational errors.

Hardware Parameter Setting

The hardware settings interface provides full visibility and configuration of each module within the SepaBean™ CorePrep 150 system. Users can monitor pump performance, define detector channels, set column parameters, and manage rack configurations for both the autosampler and fraction collector, all from a single screen. The modular design ensures that every connected component communicates seamlessly with the control software, allowing smooth method setup and real-time status tracking.

Main Advantages

- Clear overview of all modules and operating parameters
- Quick setup of pump flow rates, detector wavelengths, and column types
- Flexible tray and rack selection for sample and fraction collection
- Customizable naming and parameter fields for easy documentation

Gradient Method Editing

The gradient editor is engineered for simplicity and precision, enabling effortless creation and optimization of multi-step gradient programs. Users can insert, delete, or adjust gradient points through a drag-and-drop interface while visualizing the solvent composition curve in real time. The form-based structure supports rapid method development and ensures reproducibility, even for complex multi-solvent gradients.

Features

- One-click insertion and graphical editing of gradient steps
- Adjustable parameters for flow, time, and solvent ratio
- Preset and manual collection triggers selectable within the same interface
- Copy, modify, and reuse saved methods to reduce setup time
- Step-specific injection and repeat functions for advanced applications

Multiple Collection Modes

To accommodate a wide range of purification strategies, the SepaBean™ CorePrep 150 offers flexible collection options, from full-range recovery to precise, peak-based fractionation. Automatic algorithms detect peak start and end points using slope recognition and threshold settings, ensuring accurate and efficient fraction collection. These automated strategies minimize solvent waste, reduce human intervention, and enhance reproducibility across runs.

Available Modes

- **Full Collection:** Captures all eluted material for complete sample recovery.
- **Peak Collection:** Isolates compounds at defined peaks for targeted purification.
- **Threshold Collection:** Uses customizable signal thresholds for selective capture.
- **Slope or M-Shape Cutting:** Optimizes fraction boundaries for high-purity results.

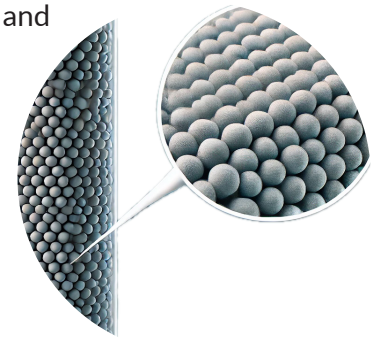
Overlay and Stacking Injections Functions

The SepaBean™ CorePrep 150 supports advanced injection modes for continuous or large-volume preparations. Through intelligent scheduling, the system can perform repeated sample injections without interruption, maximizing throughput and reducing downtime. By combining automation with precise flow control, these modes minimize solvent consumption, improve productivity, and maintain chromatographic precision across extended operations.

- **Overlay Injection:** Repeats small-volume injections sequentially to process large samples continuously.
- **Stacking Injection:** Overlaps successive injections to merge non-target impurities and shorten total runtime, particularly effective under isocratic conditions such as chiral separations.

SepaPrep™ HPLC Columns

The SepaPrep™ HPLC column portfolio is engineered to deliver predictable, scalable, and reproducible chromatographic performance across analytical, semi-preparative, and preparative applications.



Manufactured using high-purity spherical silica gels and tightly controlled surface-bonding and packing processes, SepaPrep™ columns ensure consistent chromatographic behavior from early method development through full-scale purification.

Each stationary phase is designed with a clear separation objective, allowing users to select the most appropriate chemistry based on analyte polarity, mobile phase constraints, and downstream purification requirements.

Lot-to-lot Reproducibility and Manufacturing Consistency

Reproducibility is essential for reliable method development, validation, and transfer. SepaPrep™ HPLC columns are manufactured using carefully controlled silica selection, surface modification, and column packing procedures to ensure consistent performance from batch to batch.

Santai applies rigorous quality controls throughout the entire production process, including raw material qualification and chromatographic performance testing. This approach minimizes variability in retention, efficiency, and peak symmetry, enabling confident method transfer between columns and across different scales.

Scalable Performance From Analytical to Preparative Columns

SepaPrep™ columns are available in analytical, semi-preparative, and preparative formats, enabling straightforward scalability of chromatographic methods. Consistent stationary phase chemistry, pore structure, and surface properties across column dimensions support predictable retention behavior and loading capacity when transitioning from analytical screening to preparative purification.

This scalability reduces redevelopment time, improves process efficiency, and supports reliable compound isolation in research, development, and production environments.

A Structured Portfolio

The SepaPrep HPLC portfolio includes a comprehensive range of reversed-phase, polar, and specialty stationary phases, aligned where applicable with established USP classifications. This structured offering simplifies column selection and facilitates method development, troubleshooting, and regulatory documentation.

Available chemistries include:

- Universal reversed-phase columns for routine applications
- Aqueous-compatible phases for polar analytes
- High-density bonded phases for non-polar compounds
- Low-pH and high-pH resistant columns for challenging conditions
- HILIC and specialty phases for highly polar compounds

This portfolio-based approach enables efficient method optimization while maintaining consistent selectivity principles.

Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
SepaPrep™ UNI Series - Universal Reversed-Phase Performance for Routine and Method-Development Workflows							
C18	L1	3 & 5	120	340	Double	14	1.5 - 9.0
SepaPrep™ AQT Series - Reversed-Phase Columns Optimized for Highly Aqueous and Polar Separations							
C18	L1	3, 5 & 10	100	380	Single	18	1.5 - 9.0
C8	L7	5				13	
SepaPrep™ LPS Series - Low-pH Stable Reversed-Phase Columns for Acidic and LC-MS Applications							
C18	L1	3, 5 & 10	150	200	Non-endcapped	12	0.8 - 7.5
C18 (WP)	L1	5	300	80	Non-endcapped	5	0.8 - 7.5
C8	L7	5	150	200	Non-endcapped	7	1.0 - 7.5
SepaPrep™ STR Series - Robust Reversed-Phase Columns Designed for Stable Performance and Contamination Resistance							
C18	L1	5	150	200	Double	15	1.5 - 9.0
C8	L7	5			Single	8	1.5 - 8.5
SepaPrep™ CSH Series - Hybrid-Surface Reversed-Phase Columns for High-pH and Basic Compound Separations							
C18 (H)	L1	5 & 10	100	380	Double	21	1.5 - 12.0
C18 (L)	L1	3, 5 & 10	150	200	Double	14	
C8 (H)	L7	5	100	380	Single	14	
C8 (L)	L7	3 & 5	150	200	Double	10	
SepaPrep™ XDB Series - High-Density Bonded Phases for Strong Hydrophobic Retention and Robust Performance							
C18	L1	5 & 10	100	380	Double	18	1.5 - 9.0
C18 (H)	L1	5 & 10			Double	22	1.5 - 10.0
C8	L7	5			Single	14	1.5 - 8.5
Amino (NH_2)	L8	5			Non-endcapped	6	2.0 - 8.5
Cyano (CN)	L10	5			Single	5	2.0 - 9.0
Phenyl	L11	5			Single	12	1.5 - 9.0
Silica	L3	5			Non-endcapped	-	1.0 - 7.0
SepaPrep™ HILIC - Hydrophilic Interaction Chromatography for Highly Polar and Water-Soluble Compounds							
HILIC	-	5 & 10	100	380	Non-endcapped	8	2.0 - 8.0

Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.

SepaPrep™ UNI Series

Universal Reversed-Phase Performance for Routine and Method-Development Workflows

Series Overview

The SepaPrep™ UNI Series, where UNI stands for Universal, is designed as a robust, general-purpose reversed-phase solution for a wide range of analytical and preparative HPLC applications. Built on high-purity silica and optimized C18 surface bonding, SepaPrep™ UNI columns deliver stable retention, excellent peak shape, and reliable reproducibility, making them an ideal choice for routine analysis and method development.

The balanced surface chemistry of the SepaPrep™ UNI Series provides predictable selectivity for non-polar to moderately polar compounds, while advanced end-capping minimizes secondary interactions. This design ensures consistent performance across repeated injections, between column batches, and during scale-up from analytical to preparative formats.

Key Features

- **Optimized Endcapping for Improved Peak Shape**
  Minimizes residual silanol activity, delivering sharp, symmetrical peaks, including for basic analytes.
- **Enhanced Lot-to-Lot Reproducibility**
  Controlled silica selection and packing procedures ensure consistent performance and reliable method transfer.
- **Versatile Reversed-Phase Selectivity**
  Balanced retention suitable for pharmaceuticals, natural products, and synthetic intermediates.

Silica Characteristics

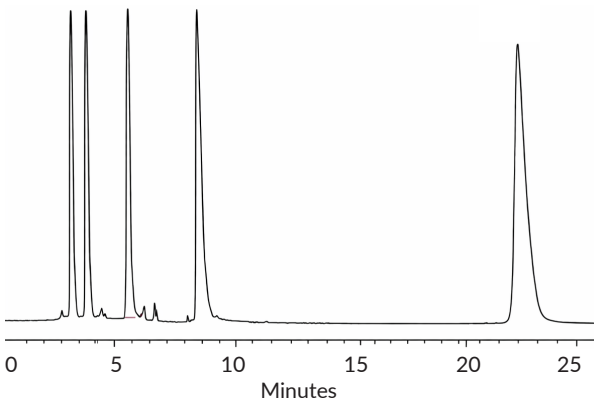
Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range*
C18	L1	3 & 5	120	340	Double	14	1.5 - 9.0

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ UNI C18 within its optimal pH range of 2.0 to 6.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

Reversed-Phase Selectivity and Peak Shape Evaluation

Experimental Conditions

Experiment using SepaPrep™ UNI C18 HPLC Column	
HPLC Column	SepaPrep™ UNI C18, 5 µm, 120 Å, 4.6 × 150 mm (PN: SH-200503-004X150)
Sample	1) Uracil, (2) Dimethyl Phthalate, (3) Butylparaben (Butyl 4-Hydroxybenzoate), (4) Naphthalene, (5) Amitriptyline
Mobile Phase	0.02 mol/L potassium dihydrogen phosphate, pH 7.0 (adjusted with potassium hydroxide (KOH)) / methanol, 28:72 (v/v)
Flow Rate	1 mL/min
Injection Volume	0.2 mL
Column Temp.	30°C
Wavelength	254 nm



SepaPrep™ AQT Series

Reversed-Phase Columns Optimized for Highly Aqueous and Polar Separations

Series Overview

The SepaPrep™ AQT Series is engineered to deliver stable, reproducible reversed-phase performance under highly aqueous mobile phase conditions. The AQT designation refers to Aqueous Treatment and reflects the column's enhanced stability in highly aqueous mobile phases, where conventional C18 phases often suffer from loss of retention or phase collapse. An advanced dual-layer surface treatment creates a hydrophilic interface on the silica substrate, preserving retention while maintaining excellent chromatographic efficiency.

By reducing residual surface acidity and improving silica purity, the SepaPrep™ AQT Series provides clean peak shapes and robust performance for polar and moderately polar analytes, even under 100 % aqueous conditions. This makes SepaPrep™ AQT columns a practical and reliable alternative to ion-pair chromatography in many applications.

Key Features

- **Fully Compatible with 100 % Aqueous Mobile Phases**
  Maintains stable retention and efficiency under highly aqueous conditions without phase collapse, expanding method flexibility for polar compounds.
- **Dual-Layer Surface Treatment to Reduce Tailing**
  The engineered hydrophilic interface reduces secondary interactions and minimizes peak tailing, particularly for polar and basic analytes.
- **Reliable Alternative to Ion-Pair Chromatography**
  Enables efficient separation of polar compounds while simplifying method development and MS compatibility.

Silica Characteristics

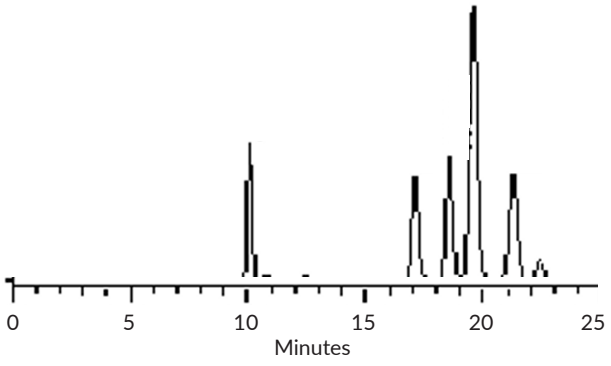
Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
C18	L1	3, 5 & 10	100	380	Single	18	1.5 - 9.0
C8	L7	5				13	

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ AQT within its optimal pH range of 2.0 to 6.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

Troxerutin Content Determination

Experimental Conditions

Experiment using SepaPrep™ AQT C18 HPLC Column	
HPLC Column	SepaPrep™ AQT C18, 5 µm, 100 Å, 4.6 × 250 mm (PN: SH-180502-004X250)
Sample	Troxerutin
Mobile Phase	0.1 mol/L sodium dihydrogen phosphate, pH 4.4 (adjusted with phosphoric acid) / acetonitrile (ACN), 80:20 (v/v)
Flow Rate	0.5 mL/min
Injection Volume	10 µL
Column Temp.	30°C
Wavelength	254 nm



SepaPrep™ LPS Series

Low-pH Stable Reversed-Phase Columns for Acidic and LC-MS Applications

Series Overview

The SepaPrep™ LPS Series is specifically engineered to deliver exceptional stability and reproducible performance under strongly acidic conditions, with LP referring to Low pH and S indicating enhanced stability, while remaining fully compatible with highly aqueous mobile phases. The stationary phase is intentionally non-endcapped and built on a sterically protected bonding architecture that shields critical siloxane linkages from acid-driven degradation.

This design enables reliable operation at pH values as low as 0.8, with very low phase bleed and excellent chromatographic stability. As a result, SepaPrep™ LPS columns are particularly well suited for LC-MS workflows, impurity profiling, and the separation of highly polar analytes under acidic conditions.

Key Features

- **Exceptional Stability Under Strongly Acidic Conditions**
  Sterically protected, non-endcapped bonding architecture enables reliable operation at pH values as low as 0.8 while maintaining long-term chromatographic stability.
- **Fully Compatible With 100 % Aqueous Mobile Phases**
  Maintains retention and efficiency under fully aqueous or high-water conditions without loss of performance.
- **Low Phase Bleed for LC-MS Workflows**
  Optimized stationary-phase chemistry ensures stable baselines and excellent compatibility with mass spectrometry.

Silica Characteristics

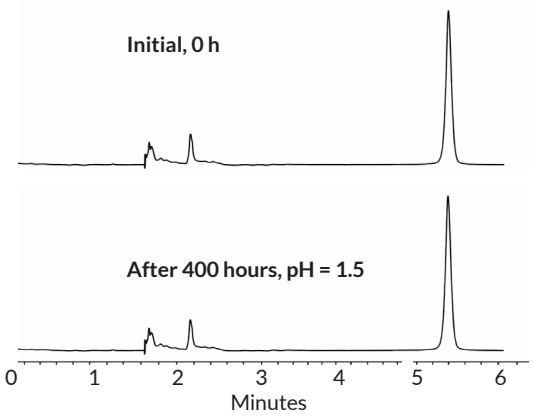
Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
C18	L1	3, 5 & 10	150	200	Non-endcapped	12	0.8 - 7.5
C18 (WP)	L1	5	300	80		5	
C8	L7	5	150	200		7	1.0 - 7.5

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ LPS within its optimal pH range of 1.0 to 4.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

Superior Stability Under Low-pH Conditions

Experimental Conditions

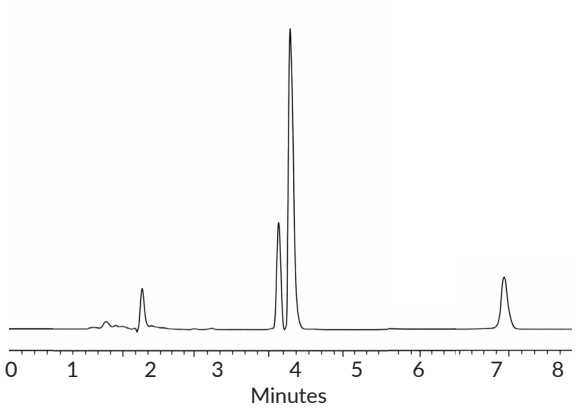
Experiment using SepaPrep™ LPS C18 HPLC Column	
HPLC Column	SepaPrep™ LPS C18, 5 µm, 100 Å, 4.6 × 150 mm (PN: SH-220505-004X150)
Sample	Naphthol
Mobile Phase	Trifluoroacetic acid (TFA) in 80% methanol, pH 1.5 (adjusted with TFA)
Flow Rate	1 mL/min
Injection Volume	5 µL
Column Temp.	30°C
Wavelength	254 nm



Separation of Organic Acids

Experimental Conditions

Experiment using SepaPrep™ LPS C18 HPLC Column	
HPLC Column	SepaPrep™ LPS C18, 5 µm, 100 Å, 4.6 × 150 mm (PN: SH-220505-004X150)
Sample	Vitamin C (Vc), Malonic Acid, Lactic Acid, Citric Acid
Mobile Phase	20 mM phosphate buffer (PBS), pH 2.0
Flow Rate	1 mL/min
Injection Volume	5 µL
Column Temp.	30°C
Wavelength	210 nm



SepaPrep™ STR Series

Robust Reversed-Phase Columns Designed for Stable Performance and Contamination Resistance

Series Overview

The SepaPrep™ STR Series is engineered by carefully balancing pore size, surface area, and carbon loading to deliver robust retention, reliable resolution, and enhanced resistance to contamination, with STR referring to Stable and Robust performance. This design makes SepaPrep™ STR columns particularly well suited for routine analytical workflows involving complex or challenging sample matrices.

By employing a lower surface area silica compared to conventional reversed-phase columns, the SepaPrep™ STR Series reduces the number of active adsorption sites. This contributes to improved stability, cleaner separations, and extended operational lifetime, especially in applications where column fouling is a concern.

Key Features

- **Improved Resistance to Contamination**
  Reduced surface area limits non-specific adsorption, helping maintain stable performance with complex or poorly characterized samples.
- **Extended Column Lifetime**
  Designed to maintain performance over prolonged use, reducing downtime and replacement frequency.
- **Reliable Reversed-Phase Retention**
  Balanced hydrophobic interactions deliver predictable retention and resolution for routine analytical separations.

Silica Characteristics

Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
C18	L1	5	150	200	Double	15	1.5 - 9.0
C8	L7	5			Single	8	1.5 - 8.5

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ STR within its optimal pH range of 2.0 to 6.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

SepaPrep™ CSH Series

Hybrid-Surface Reversed-Phase Columns for High-pH and Basic Compound Separations

Series Overview

The SepaPrep™ CSH Series is built on advanced hybrid-silica surface technology, with CS referring to CoreShell and H indicating a hybrid architecture, combining a silica core with a protective hydrophobic layer. This architecture shields the silica matrix from alkaline degradation, enabling reliable operation under elevated pH conditions while maintaining high chromatographic efficiency.

By moderating excessive hydrophobic interactions and preserving fast mass transfer, the SepaPrep™ CSH Series delivers sharp peak shapes, high loading capacity, and excellent durability, making it particularly well suited for basic analytes, preparative separations, and demanding high-pH workflows.

Key Features

- **Hybrid-Silica Surface for Enhanced High-pH Stability**
  The protective hydrophobic layer limits alkaline attack on the silica surface, supporting stable operation at pH values up to 12.
- **Optimized Peak Shape for Basic Compounds**
  The hybrid surface chemistry reduces secondary interactions, improving peak symmetry and reproducibility for basic and ionizable analytes.
- **High Loading Capacity and Scalable Performance**
  Designed to support preparative-scale separations, enabling efficient scale-up from analytical to preparative formats without loss of selectivity.

Silica Characteristics

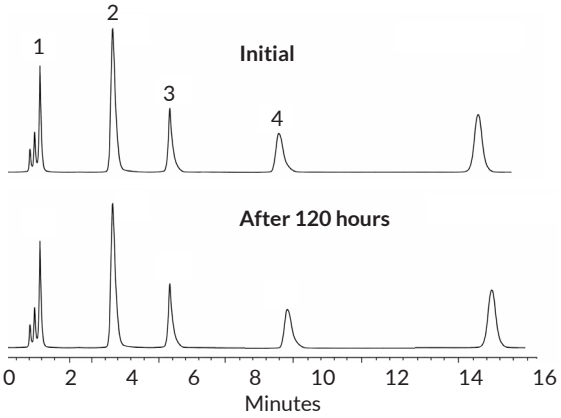
Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
C18 (H)	L1	5 & 10	100	380	Double	21	1.5 - 12.0
C18 (L)	L1	3, 5 & 10	150	200	Double	14	
C8 (H)	L7	5	100	380	Single	14	
C8 (L)	L7	3 & 5	150	200	Double	10	

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ CSH within its optimal pH range of 2.0 to 10.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

Stability Testing Under High pH Conditions

Experimental Conditions

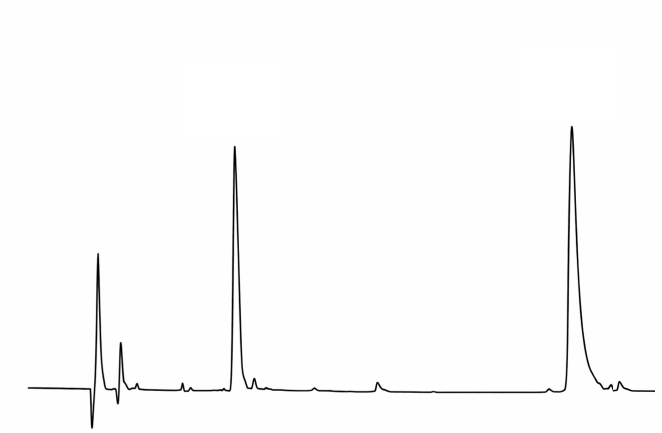
Experiment using SepaPrep™ CSH HPLC Column	
HPLC Column	SepaPrep™ CSH C18, 5 µm, 100 Å, 4.6 × 150 mm (PN: SH-230502-004X150)
Sample	(1) Doxepin, (2) Desipramine, (3) Amitriptyline, (4) Imipramine
Mobile Phase	Acetonitrile (ACN) / 0.05 M aqueous ammonia (pH 9.0), 50:50 (v/v)
Flow Rate	1.5 mL/min
Injection Volume	10 µL
Column Temp.	35°C
Wavelength	280 nm



HPLC Analysis of Active Ingredients in Reserpine Tablets

Experimental Conditions

Experiment using SepaPrep™ CSH C18 HPLC Column	
HPLC Column	SepaPrep™ CSH C18, 5 µm, 100 Å, 4.6 × 100 mm (PN: SH-230502-004X100)
Sample	(1) Vitamin B6, (2) Dihydralazine Sulfate, (3) Vitamin B1
Mobile Phase	Methanol: 0.092 % phosphoric acid solution (containing 0.04 % triethylamine and 0.02 % di-n-butylamine), 1.5:98.5 (v/v)
Flow Rate	1 mL/min
Injection Volume	10 µL
Column Temp.	35°C
Wavelength	210 nm



SepaPrep™ XDB Series

High-Density Bonded Phases for Strong Hydrophobic Retention and Robust Performance

Series Overview

The SepaPrep™ XDB Series features a high-density bonded, double end-capped surface, with XDB referring to eXtra Densely Bonded, that provides strong hydrophobic retention, high inertness, and excellent stability in acidic to moderately basic mobile phases.

Designed for non-polar to weakly polar compounds, the SepaPrep™ XDB Series is available in C18, C8, Amino (NH_2), Cyano (CN), Phenyl, and Silica phases, offering broad selectivity within a consistent surface chemistry.

Key Features

- **High Bonding Density and Elevated Carbon Load**
  Provides strong hydrophobic retention for non-polar and weakly polar compounds.
- **Enhanced Inertness Through Double Endcapping**
  Controlled silica selection and packing procedures ensure consistent performance and reliable method transfer.
- **Broad Selectivity Options Within One Series**
  Available in C18, C8, Amino (NH_2), Cyano (CN), Phenyl, and Silica phases for selectivity tuning.

Silica Characteristics

Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
C18	L1	5 & 10	100	380	Double	18	1.5 - 9.0
C18 (H)	L1	5 & 10			Double	22	1.5 - 10.0
C8	L7	5			Single	14	1.5 - 8.5
Amino (NH_2)	L8	5			Non-endcapped	6	2.0 - 8.5
Cyano (CN)	L10	5			Single	5	2.0 - 9.0
Phenyl	L11	5			Single	12	1.5 - 9.0
Silica	L3	5			Non-endcapped	-	1.0 - 7.0

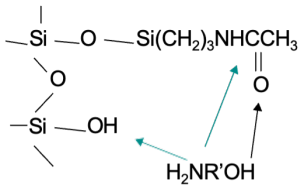
Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.

SepaPrep™ HILIC

Hydrophilic Interaction Chromatography for Highly Polar and Water-Soluble Compounds

Series Overview

The SepaPrep™ HILIC is designed for separations where reversed-phase chromatography provides insufficient retention. Operating in hydrophilic interaction chromatography (HILIC) mode, analytes are separated based on increasing hydrophilicity using mobile phases composed of acetonitrile mixed with water and volatile buffer salts, with acetonitrile content typically ranging from 40 to 97 %.



The SepaPrep™ HILIC stationary phase is based on a chemically bonded amide functionality, providing strong and reproducible hydrophilic interactions while maintaining excellent stability. This chemistry delivers selectivity that complements reversed-phase methods and supports the use of highly volatile, MS-friendly mobile phases, making the series particularly well suited for LC-MS applications.

Key Features

- **Wide Operational Range in HILIC Mode**
  Provides stable retention and selectivity across a broad organic solvent composition window, providing excellent flexibility during method development and optimization.
- **Amide-Bonded Stationary Phase for Polar Analytes**
  Optimized for highly polar and water-soluble compounds with improved reproducibility versus amino and bare silica phases.
- **Robust, MS-Friendly Alternative to Amino and Bare Silica Phases**
  Offers enhanced chemical stability, reduced moisture sensitivity, and longer service life, while enabling the use of volatile mobile phases for LC-MS workflows.

Silica Characteristics

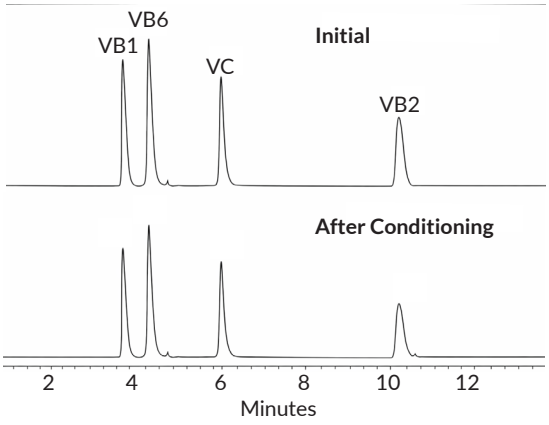
Phase	USP Code	Particle Size (µm)	Pore Size (Å)	Specific Surface Area (m^2/g)	Endcapping	Carbon Load (%)	pH Range
HILIC	-	5 & 10	100	380	Non-endcapped	8	2.0 - 8.0

** To maintain consistent performance and extend the working life of the column, it is recommended to operate the SepaPrep™ HILIC within its optimal pH range of 2.0 to 6.0. | Note: The maximum operating temperature is 60°C and the maximum pressure rating is 5,800 psi (40 MPa). For routine operation, pressure below 2,900 psi (20 MPa) is recommended.*

Analysis of Water-Soluble Vitamins

Experimental Conditions

Experiment using SepaPrep™ HILIC HPLC Column	
HPLC Column	SepaPrep™ HILIC, 5 µm, 100 Å, 4.6 × 150 mm (PN: SH-650505-004X150)
Sample	Vitamin B1, Vitamin B6, Vitamin C, and Vitamin B2
Conditioning Cdn	Methanol / 20 mM NaH_2PO_4 (pH 7.0), 40:60 (v/v)
Mobile Phase	0.1 % Trifluoroacetic acid (TFA, aqueous) / Acetonitrile (ACN), 90:10 (v/v)
Flow Rate	1 mL/min
Injection Volume	2 µL
Column Temp.	Conditioning: 40°C , Purification: 30°C
Wavelength	280 nm



Ordering Information

This section will guide you in building your SepaPrep™ HPLC Column product number. Each number follows the structure outlined below.

[Column Type Code]-[Stationary Phase Code]-[Column Dimension Code]

Ex: SepaPrep™ UNI C18 HPLC Column, 5 µm, 120 Å, 4.6 x 150 mm: **SH-2000503-004X150**

[Column Type Code]

Column Type	Code
Analytical	SH
Preparative	SH
Guard	SG

[Column Dimension Code]

ID x Length	Code
Analytical Columns	
4.6 x 150 mm	004X150
4.6 x 250 mm	004X250
Preparative Columns	
10 x 150 mm	010X150
10 x 250 mm	010X250
21.2 x 150 mm	021X150
21.2 x 250 mm	021X250
30 x 150 mm	030X150
30 x 250 mm	030X250
50 x 150 mm	050X150
50 x 250 mm	050X250
Guard Columns	
4.6 x 10 mm*	004X10N
10 x 10 mm	010X10D
21.2 x 10 mm	021X10N

** Add "N" at the end of the product number for non-direct connection or "D" for direct connection.*

[Stationary Phase Code]

Stationary Phase	Code
SepaPrep™ UNI Series	
C18 3 µm, 120 Å	200303
C18 5 µm, 120 Å	200503
SepaPrep™ AQT Series	
C18, 3 µm, 100 Å	180302
C18, 5 µm, 100 Å	180502
C18, 10 µm, 100 Å	181002
C8 5 µm, 100 Å	080502
SepaPrep™ LPS Series	
C18, 3 µm, 150 Å	220305
C18, 5 µm, 150 Å	220505
C18, 10 µm, 150 Å	221005
C18 (WP), 5 µm, 300 Å	220507
C8, 5 µm, 150 Å	110505
SepaPrep™ STR Series	
C18, 5 µm, 150 Å	210505
C8, 5 µm, 150 Å	090505
SepaPrep™ CSH Series	
C18 (H), 5 µm, 100 Å	230502
C18 (H), 10 µm, 100 Å	231002

Stationary Phase	Code
SepaPrep™ CSH Series (cont'd)	
C18 (L), 3 µm, 150 Å	230305
C18 (L), 5 µm, 150 Å	230505
C18 (L), 10 µm, 150 Å	231005
C8 (H), 5 µm, 100 Å	120502
C8 (L), 3 µm, 150 Å	120305
C8 (L), 5 µm, 150 Å	120505
SepaPrep™ XDB Series	
C18, 5 µm, 100 Å	190502
C18, 10 µm, 100 Å	191002
C18 (H), 5 µm, 100 Å	190502(H)*
C18 (H), 10 µm, 100 Å	191002*(H)*
C8, 5 µm, 100 Å	090502
Amino (NH_2), 5 µm, 100 Å	400502
Cyano (CN), 5 µm, 100 Å	450502
Phenyl, 5 µm, 100 Å	340502
Silica, 5 µm, 100 Å	000502
SepaPrep™ HILIC	
HILIC, 5 µm, 100 Å	650502
HILIC, 10 µm, 100 Å	651002

** Add "(H)" at the end of the product number.*

The table below outlines the available column formats by stationary phase series and particle size, covering analytical, preparative, and guard columns.

ID x Length (mm)	UNI		AQT			LPS			STR	CSH			XDB		HILIC	
	3 µm	5 µm	3 µm	5 µm*	10 µm	3 µm	5 µm	10 µm	5 µm	3 µm	5 µm**	10 µm	5 µm	10 µm	5 µm	10 µm
Analytical Columns																
4.6 x 150	√	√	√	√	√	√	√		√	√	√	√	√		√	√
4.6 x 250	√	√	√	√	√	√	√		√	√	√	√	√		√	√
Preparative Columns																
10 x 150		√		√	√		√	√	√		√	√	√	√	√	√
10 x 250		√		√	√		√	√	√		√	√	√	√	√	√
21.2 x 150		√		√	√		√	√	√		√	√	√	√	√	√
21.2 x 250		√		√	√		√	√	√		√	√	√	v	√	√
30 x 150		√		√	√		√	√	√		√	√	√	√	√	√
30 x 250		√		√	√		√	√	√		√	√	√	√	√	√
50 x 150												√				
50 x 250								√				√		√		√
Guard Columns																
4.6 x 10	√	√	√	√					√		√		√		√	
10 x 10		√		√	√				√		√		√	√	√	√
21.2 x 10		√		√					√		√		√	√	√	√

** Preparative columns are available in C18 phase only. ** Preparative columns are available in C18, C8, and Silica phases only.*

SepaPrep™ HPLC Accessories

The Importance of HPLC Guard Columns

Guard columns offer a simple, cost-effective way to protect analytical, semi-preparative, and preparative HPLC columns. By trapping particulates and strongly retained contaminants before they reach the main column, guard columns help preserve separation efficiency, maintain peak quality, and improve run-to-run reproducibility.

Over time, HPLC columns often show increased backpressure and reduced performance. In many cases, this is caused by contamination concentrated at the column inlet, while the remainder of the packed bed remains largely intact. Adding a guard column creates a sacrificial packed section upstream of the main column, helping prevent irreversible inlet damage, reducing downtime, and lowering replacement costs.

Non-Direct-Connection Guard Column Holder

The non-direct-connection guard column holder is installed between the injector and the HPLC column using standard tubing and fittings. Its traditional design offers broad compatibility with most commercial HPLC systems and column configurations.

Guard Type	Description	Part Number
Analytical	Suitable for 4.6 × 10 mm guard column	NH-100
Semi-Preparative	Suitable for 10 × 10 mm guard column	NH-150
Preparative	Suitable for 21.2 × 10 mm guard column	NH-200

NH-100

NH-150

NH-200

Direct-Connection Guard Column Holder

The direct-connection guard column holder is a reusable solution designed to connect directly to the inlet of the analytical column. Its hand-tight, tool-free installation eliminates the need for additional tubing and fittings, reduces dead volume, and helps maintain optimal chromatographic performance while simplifying installation and maintenance.

- Direct-connection design with no additional connectors
- Fast, tool-free, hand-tight installation

Guard Type	Description	Part Number
Analytical	Suitable for 4.6 × 10 mm guard column	NH-100
Semi-Preparative	Suitable for 10 × 10 mm guard column	NH-150

Universal Direct-Connection Guard Column Kit

TEXT TO BE ADDED

Guard Type	Description	Part Number
Analytical	Direct-connection Guard Column Holder, Model NH-100, 1 piece; C18 Guard Column, 4.6 × 10 mm, 2 pieces	DH-100KT

Method Development and Scale-Up Guide

This section is designed to help scientists make efficient, informed decisions when selecting SepaPrep™ HPLC columns, developing methods, and scaling separations from analytical to preparative scale.

The SepaPrep™ portfolio is built around consistency: consistent silica quality, consistent surface chemistry, and consistent chromatographic behavior across column dimensions. This design philosophy allows methods to be transferred and scaled with confidence, minimizing unnecessary re-optimization and keeping the focus on separation objectives rather than hardware limitations.

1. Designing an Effective Separation with SepaPrep™ Columns

A successful HPLC purification strategy starts with a clear definition of the sample properties and the purification objective. While operating parameters and column dimensions can be optimized later, stationary phase chemistry should always be selected first, as it governs selectivity and retention behavior.

Establishing the right chemistry at the outset ensures that subsequent adjustments such as gradient optimization, particle size selection, or column scaling remain meaningful, reproducible, and transferable across scales.

1.1 Selecting the Stationary Phase: Defining Selectivity First

Stationary phase chemistry controls the nature and strength of interactions between analytes and the column packing material. Selecting an appropriate chemistry early in method development significantly reduces trial-and-error and shortens development time.

General guidance within the SepaPrep™ HPLC portfolio:

Analyte Characteristics	Recommended Chemistry Type	Key Benefit
Hydrophobic or moderately polar compounds	Standard reversed-phase (e.g., UNI or XDB Series)	Broad applicability, predictable retention
Polar compounds or high-aqueous mobile phases	Aqueous-compatible RP phases (e.g., AQT or LPS Series)	Stable retention under highly aqueous conditions
Basic compounds or elevated-pH methods	Hybrid or surface-modified phases (e.g., CSH Series)	Improved peak shape and column durability
Highly polar or water-soluble analytes	HILIC	Complementary selectivity to reversed-phase

By prioritizing stationary phase selection, later method refinements become more efficient and easier to scale.

1.2 Selecting Pore Size: Matching Molecular Dimensions

Pore size determines whether analytes can effectively access the internal surface area of the stationary phase. Insufficient pore accessibility can result in poor recovery, distorted peak shapes, and limited loading capacity.

Pore size selection guidelines:

Pore Size	Best For	Typical Applications
100 - 120 Å	Small molecules (< 1,000 Dalton)	Pharmaceuticals, organic compounds, small drug molecules, alkaloids, and flavonoids
150 Å	Medium-sized molecules (1,000 - 10,000 Da)	Peptides, lipids, small proteins, oligonucleotides, steroids, and dye molecules
300 Å	Large biomolecules (> 10,000 Da)	Large proteins, antibodies, nucleotides, polysaccharides, and synthetic polymers

Selecting an appropriate pore size based on molecular dimensions improves both separation efficiency and performance.

1.3 Particle Size: Optimizing Efficiency and Robustness

Particle size influences resolution, backpressure, and practical usability.

- Smaller particles improve efficiency and resolution but increase system pressure requirements.
- Larger particles reduce backpressure and often allow higher sample loading, which is advantageous in purification workflows.

Practical particle size selection:

Particle Size	Typical Use
3 µm	High-resolution analytical separations
5 µm	Balances choice for analytical and preparative HPLC
10 µm	Preparative purification with higher loading and lower pressure

In most cases, 5 µm particles offer the best compromise between performance, robustness, and system compatibility.

2. Choosing Column Dimensions Based on Purification Objectives

Once stationary phase chemistry, pore size, and particle size have been established, column dimensions can be selected to match the intended scale, throughput, and resolution requirements.

2.1 Internal Diameter: Controlling Sample Load and Throughput

Column internal diameter primarily determines sample capacity and throughput.

Internal Diameter	Column Type	Best For
4.6 mm	Analytical	Method development and routine analysis
10 mm	Semi-preparative	Milligram-scale purification
≥ 21.2 mm	Preparative	Preparative isolation and higher throughput

Larger diameters enable higher sample loading and throughput, while smaller diameters reduce solvent consumption and improve sensitivity.

2.2 Column Length: Adjusting Resolution and Run Time

SepaPrep™ columns are available in 150 mm and 250 mm lengths, covering the majority of analytical and preparative HPLC purification needs.

- **150 mm columns** offer an excellent balance between resolution, analysis time, and backpressure, making them well suited for routine separations and method development.
- **250 mm columns** provide increased resolving power and are recommended when additional separation is required for closely eluting compounds or more complex samples.

In practice, separations are typically developed using 150 mm columns and extended to 250 mm only when higher resolution is necessary.

Column Length	Typical Use	Key Benefit
150 mm	Routine separations and method development	Balanced resolution, run time, and backpressure
250 mm	Challenging separations and complex samples	Increased resolving power

Selecting the appropriate column length allows resolution to be adjusted without changing separation chemistry, ensuring efficient method development and reliable performance across applications.

3. Transitioning From Analytical to Preparative Scale

Method transfer from analytical to preparative chromatography can be achieved in a structured and predictable manner. When the stationary phase chemistry, particle size, and column geometry are kept consistent, separations can be reliably scaled without altering selectivity. Rather than redeveloping a method, scaling relies on preserving comparable chromatographic conditions across column dimensions.

3.1 Scaling Fundamentals

In preparative chromatography, scaling is primarily driven by column diameter, which directly determines sample capacity and flow rate requirements. As column diameter increases:

- Sample loading capacity increases proportionally
- Volumetric flow rate must be increased to maintain similar linear velocity
- Chromatographic selectivity remains unchanged when linear velocity is preserved

Maintaining comparable mobile phase linear velocity is essential to ensure consistent retention behavior and peak shape across scales. Before scaling, the following system parameters should always be verified:

- Maximum allowable system pressure
- Pump flow-rate capability
- Detector suitability and flow cell volume

3.2 Practical Expectations During Scale-Up and Scale-Down

During scale transitions:

- Flow rate must be adjusted according to column diameter
- Sample load should be increased progressively rather than maximized immediately
- Gradient steepness may require fine tuning as column volume increases

Gradual optimization at each scale helps preserve resolution, minimize the risk of co-elution, and ensure robust, reproducible performance. The table below offers practical guidance on typical sample loading ranges across column lengths and diameters, supporting efficient and predictable scale-up or scale-down in preparative HPLC.

Column Length	Internal Diameter (Typical Flow Rate)				
	4.6 mm (0.8 - 2.0 mL/min)	10 mm (3 - 10 mL/min)	21.2 mm (15 - 35 mL/min)	30 mm (30 - 75 mL/min)	50 mm (100 - 250 mL/min)
150 mm	1.5 - 8 mg	8 - 40 mg	28 - 175 mg	65 - 310 mg	200 - 875 mg
250 mm	3 - 11 mg	11 - 48 mg	55 - 240 mg	115 - 450 mg	300 - 1,350 mg

Note: Values are indicative and may vary depending on particle size, stationary phase chemistry, sample complexity, solubility, and system pressure limits. Progressive optimization is recommended during scale transitions.

Tips for Scale-Up and Scale-Down

- **Keep the chemistry constant:** Use the same stationary phase and particle size across all column sizes.
- **Column diameter defines scale:** Larger diameters allow higher sample loads and require higher flow rates.
- **Column length adjusts resolution:** Longer columns generally improve resolution but increase run time and backpressure.
- **Preserve comparable flow conditions:** Adjust flow rate to maintain similar mobile phase velocity across scales.
- **Increase loading stepwise:** Start below the estimated maximum load and increase gradually to protect resolution.
- **Respect system limits:** Always confirm pressure, pump capacity, and detector compatibility.

By following these guidelines, method transfer across HPLC scales becomes straightforward and reliable, ensuring robust separations and predictable performance.

SepaPrep™ HPLC Column Guidelines

The following guidelines outline best practices for the proper installation, use, and maintenance of SepaPrep™ HPLC columns to ensure reliable performance and long column lifetime.

Column Installation

Proper column installation is essential to ensure optimal chromatographic performance and to maximize column lifetime.

Installation recommendations

- Upon receipt, verify that the column type and configuration match your application requirements.
- Remove the protective caps from both ends of the column before use and retain them for future storage or shipment.
- Ensure that the flow direction indicated by the arrow on the column corresponds to the direction of the HPLC mobile phase flow.
- Install the column using appropriate fittings, such as finger-tight PEEK fittings or stainless steel fittings, depending on operating pressure and application needs.
- Minimize system dead volume by using connection tubing with a small internal diameter. For analytical columns, tubing with an internal diameter of 0.25 mm or less is recommended.
- Keep tubing lengths between the injector, column, and detector as short as possible to reduce band broadening and maintain chromatographic efficiency.

Column Activation

Before first use, HPLC columns must be properly activated to ensure optimal performance and stable retention behavior.

Recommended activation

- Initial flow rate: 0.2 mL/min
- Reversed-phase and ion-exchange columns should be flushed with 20 - 30 column volumes of methanol or acetonitrile.
- Normal-phase, HILIC, and bare silica columns should be flushed with 20 - 30 column volumes of isopropanol

After activation, gradually transition to the intended mobile phase before beginning runs.

Sample Handling

Proper sample preparation is essential to maintain column performance and extend column lifetime.

Recommendations

- All samples and mobile phases should be filtered using 0.20 to 0.45 µm filters prior to injection.
- To obtain symmetrical peak shapes and stable baselines, it is recommended to dissolve samples in the initial mobile phase composition.
- Avoid injecting samples dissolved in strong solvents that differ significantly from the starting mobile phase, as this may cause peak distortion or retention shifts.

Mobile Phases and pH Considerations

- If non-volatile buffers have been used, ensure complete removal before switching to incompatible solvents.
- Elevated pH can gradually dissolve silica, leading to efficiency loss and retention shifts.
- To extend lifetime, operate SepaPrep™ columns within their specified pH ranges.
- Above pH 9, avoid phosphate buffers. Organic amines or ammonia are generally preferred, especially for LC-MS methods.

Always refer to the recommended pH range of the specific SepaPrep™ stationary phase in use.

Pressure Limits

SepaPrep™ HPLC columns are designed to tolerate high operating pressures, but prolonged operation at extreme pressures should be avoided.

- Maximum pressure tolerance: up to 400 bar
- Recommended normal operating pressure: below 200 bar

Temperature Limits

The standard maximum operating temperature is 60°C. However, continuous operation above 45°C may reduce column lifetime, particularly under elevated pH conditions. For silica-based bonded phases, an operating temperature range of 25 to 35°C is recommended to ensure optimal column longevity.

Storage Conditions

For long-term storage, avoid leaving highly aqueous or high-salt mobile phases inside the column. Residual aqueous buffers should be removed by flushing the column with 20 - 30 column volumes of a salt-free eluent, followed by 20 - 30 column volumes of an organic solvent such as methanol or acetonitrile.

After flushing, securely install the end fittings on both sides of the column to prevent drying. The table below summarizes the recommended storage solvents according to column type.

Chemistry Type	Stationary Phase	Recommended Storage Solvent
Reversed-Phase	C18, C8, Amine (NH_2)*, Cyano (CN)*, Phenyl, etc.	Methanol
Normal Phase	Silica, Cyano (CN)*	Hexane or Isooctane:Ethanol
	Amino (NH_2)*	Acetonitrile, Hexane, Acetonitrile:Water or Butyl chloride:Methanol
HILIC	HILIC	Methanol

** Phases marked with an asterisk should be flushed with a fully miscible solvent, such as isopropanol, before first use if an aqueous mobile phase is applied.*

Use of Guard Columns

For complex sample matrices, direct injection onto the column should be avoided whenever possible.

- The use of a guard column is strongly recommended to protect the column from particulate contamination and strongly retained impurities.
- Alternatively, sample pre-treatment techniques such as solid-phase extraction (SPE) may be used to remove matrix interferences.

Proper use of guard columns significantly extends column lifetime and maintains chromatographic performance.

Column Regeneration

A gradual increase in backpressure over time is normal. A sudden increase usually indicates inlet contamination or partial blockage. Cleaning or regeneration may help restore column performance.

The table below provides general guidelines for column cleaning and regeneration, depending on column chemistry.

Chemistry Type	Cleaning Procedure	Regeneration Procedure
Reversed-Phase (C18, C8, Amine (NH_2), Cyano (CN), Phenyl, etc.)	• Set the flow rate to 20 - 50 % of the normal operating flow rate. • Flush the column with 2 - 3 column volumes of appropriate solvents, starting with a water/methanol (50/50) mixture to remove buffers and polar contaminants, followed by 100 % methanol, and finally the mobile phase used during the separation.	• Reverse the flow direction (backflush) and reduce the flow rate to a very low value. • Regenerate the column by sequentially flushing with at least 10 - 15 column volumes of commonly used solvents, progressing from aqueous/organic mixtures (e.g., water/methanol 90/10 or 70/30 for Amine or Cyano phases) to pure organic solvents, such as methanol, acetonitrile, and isopropanol. If required, non-polar solvents including dichloromethane or hexane may be used before returning to the mobile phase applied during the separation. **Note:** If dichloromethane or hexane is used, isopropanol must be used as a transition solvent before returning to reversed-phase mobile conditions.
Normal Phase (Silica Amine (NH_2), Cyano (CN), etc.)	• Set the flow rate to 20 - 50 % of the normal operating flow rate. • Clean the column by flushing with 2 - 3 column volumes of isopropanol, followed by hexane, and then re-equilibrate with the mobile phase used during the separation. **Note:** Water should not be used with normal-phase columns.	• Reverse the flow direction (backflush) and reduce the flow rate to a very low value. • Regenerate the column by sequentially flushing with at least 10 - 15 column volumes of a polar organic solvent compatible with the stationary phase (such as isopropanol or methanol), followed by hexane, and then re-equilibrate with the normal-phase mobile phase used during the separation. **Note:** Alternative compatible solvents may be used at the user's discretion.
HILIC	• Set the flow rate to 20 - 50 % of the normal operating flow rate. • Flush the column with 2 - 3 column volumes of acetonitrile/water (80/20) to remove polar contaminants, followed by 100 % acetonitrile, then re-equilibrate with the HILIC mobile phase used during the separation	• Maintain a low flow rate. • Regenerate the column by flushing 2 - 3 column volumes of acetonitrile/water mixtures of increasing water content, followed by 100 % acetonitrile, then re-equilibrate with the initial HILIC mobile phase. **Note:** Ensure full solvent miscibility and avoid abrupt transitions between high-aqueous and high-organic conditions.

Important Notes

- Always ensure solvent miscibility before switching solvents to avoid phase separation or column damage.
- When using dichloromethane or hexane, isopropanol must be used as a transition solvent before returning to reversed-phase mobile conditions.
- For HILIC columns, avoid abrupt changes between high-organic and high-aqueous mobile phases; gradual solvent transitions are recommended to maintain stable retention and column performance.
- Do not exceed the maximum pressure rating of the column.
- Maintain reduced flow rates during cleaning and regeneration procedures to minimize mechanical stress on the packed bed.

HPLC Troubleshooting Guide

HPLC column troubleshooting involves identifying common symptoms such as high backpressure, poor peak shape, or retention time changes. These issues are most often caused by contamination, blockage, buffer precipitation, or operation outside recommended limits. In many cases, performance can be restored through proper cleaning, flushing, and preventive practices.

Issue	Possible Cause	Solution
High Backpressure	Plugged inlet frit, contaminated column, or precipitated sample or buffer	Reverse flush the column using approximately 5 to 10 column volumes of a compatible solvent at low flow. Wash with strong solvents, replace the guard column, or replace the column if the frit cannot be cleared.
Sudden pressure increase	Particulate contamination or buffer precipitation	Inspect fittings and mobile phase filtration. Flush the column with 5 to 10 column volumes of a strong compatible solvent.
Poor peak shape (tailing or fronting)	Column contamination, pH mismatch causing analyte ionization, secondary interactions with active sites	Clean the column using 10 to 20 column volumes of appropriate solvents. Verify mobile phase pH, reduce injection volume, or consider a different stationary phase if the issue persists.
Retention time variation (decreasing or increasing)	Loss of bonded phase, column overloading, temperature fluctuations, or system leaks	Check for leaks, verify column oven temperature stability, reduce sample concentration, or replace the column if bonded phase degradation is suspected.
Loss of resolution	Column aging, excessive temperature, or operation outside recommended pH range	Confirm operating conditions and mobile phase composition. Flush with 10 to 20 column volumes of compatible solvents or replace the column if performance does not recover.
Extra or ghost peaks	Carryover from previous injections or sample contamination	Flush the system and column thoroughly with 10 to 15 column volumes, use a guard column, and ensure the use of high-purity solvents.
Baseline noise or drift	Mobile phase impurities or insufficient equilibration	Prepare fresh, high-purity mobile phases and allow adequate equilibration of 5 to 10 column volumes before analysis.

Routine Maintenance and Best Practices

- **Preventive care**
  Filter samples and mobile phases using filters smaller than 0.45 µm. The use of a guard column is strongly recommended to protect the analytical column.

- **Cleaning**
  Periodically flush the column using a sequence of compatible solvents, typically 2 to 3 column volumes per solvent, to remove retained contaminants.

- **Storage**
  Never allow the column to dry out. Store the column in an appropriate solvent, typically 60 to 100 % organic, free of buffers to prevent salt precipitation.

- **Method verification**
  Ensure mobile phase pH and temperature remain within the column's specified operating limits.

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Simplify your purification, maximize your efficiency!

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Why Choose Santai

At Santai Science, we are committed to empowering your success with our global reach, innovative technologies, and unwavering support. Here's why partnering with us is the right choice for your chromatography needs:

- **Global presence:** Santai Science seamlessly delivers world-class chromatography solutions to customers worldwide, ensuring quality and reliability no matter where you are. No matter where you are, our global presence ensures you receive the quality and reliability you deserve.
- **Innovative solutions for excellence:** elevate your scientific pursuits with our cutting-edge chromatography technologies. Designed with precision and innovation, our solutions empower you to achieve unparalleled results in your research and applications.
- **Unwavering customer support:** your success is our priority. At Santai Science, we go beyond boundaries to provide dedicated, personalized support. Wherever you are, you can count on us to be your trusted partner every step of the way.

Choose Santai Science - because your success drives our innovation.

SepaBean™ Family

machine U
(entry-level)

machine T
(best-seller)

machine
(standard version)

machine 2
(medium pressure)

machine L
(scale-up)

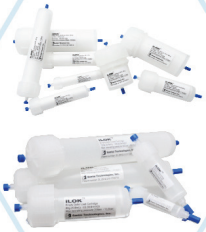
SepaFlash™ Columns

Standard Series

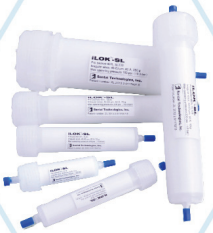
Large Size Series

HP, Bio & Bonded Series

iLOK™ Series
(empty & pre-packed)



iLOK™ - SL Series
(Solid-load cartridges)



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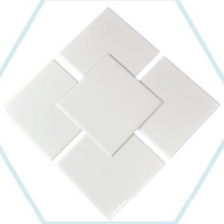

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