CARE AND USE MANUAL

Xtimate PS/DVB HPLC Column Care and Use Manual

Welch

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Xtimate PS/DVB HPLC Column
Care and Use Manual

Dear User:

Thank you for choosing our liquid chromatography column products! This manual is designed to help you use our products under optimal conditions and maximize column lifespan. Please read the usage instructions carefully before operation.

Xtimate PS/DVB column utilizes polystyrene-divinylbenzene (PS/DVB) matrix, offering exceptional mechanical strength with a porous structure. Unlike traditional silica-based reversed-phase columns, this column has the distinct advantage of withstanding extreme pH conditions (1–14). It is particularly well-suited for the separation and purification of proteins, peptides, oligonucleotides, antibiotics, and small-molecule pharmaceuticals.

Preparation Before Use

Column Identification

To ensure the quality of every column, each column sold by Welch Materials is assigned a unique identification code. This code allows us to trace quality-related issues. Upon receiving your column, please follow these steps:

1. Verify that the packaging is intact and matches the ordered column model.
2. Ensure the package contains a COA report with the inspector's signature.
3. Check the column surface for any damage and confirm that the protective plugs on both ends are intact.
4. Verify that the column body bears a Welch Materials identification label. Confirm that the model and serial number on the box match those on the column label.

Note:

The packing material inside the column is composed of fine particles. Do not attempt to open the column arbitrarily, as the material may become airborne and pose a health risk. If opening is necessary, use appropriate protective measures.

Installation

To achieve optimal column efficiency, use narrow-diameter tubing for connections. The connections to the column inlet and outlet must be tightly sealed, with the tubing ends polished and free of burrs or bevels. Use professional tools to cut and trim tubing.

1. Remove the column from its packaging. Check the direction of the eluent flow indicated by the arrow on the column body. Unscrew the protective plugs at both ends of the column. Position the column so that the eluent flow aligns with the direction indicated, as shown in Figure 1.

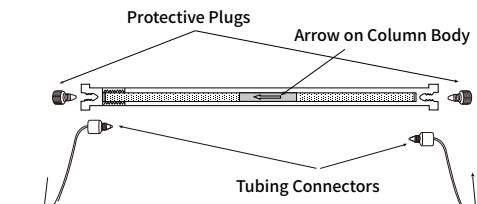


Figure 1. Column Installation

2. Carefully screw stainless steel or other compatible material fittings into both ends of the column. Ensure tight, zero-dead-volume connections to prevent leakage during operation.

Product Specifications

Column	Xtimate PS/DVB
USP Code	L21
Pore Size	300 Å
Specific Surface Area	450 m^2/g
pH Range	1.0-14.0
Max. Temperature	75 °C
Max. Pressure Tolerance	27 MPa

Precautions:

1. The Xtimate PS/DVB column operates within a pH range of 1.0–14.0 and can be used for both isocratic and gradient elution. It is compatible with common reversed-phase organic solvents such as isopropanol, methanol, ethanol, and acetonitrile, as well as water. Additionally, ion-pairing reagents like TFA can be used to enhance separation performance and peak shape.
2. Although the Xtimate PS/DVB column exhibits minimal swelling, it is recommended to maintain at least 5% organic solvent in the mobile phase during sample loading, elution, and column cleaning. The column should not be used with 100% aqueous solutions.

Column Activation

(Recommended for new columns or those unused for over a month)
Xtimate PS/DVB columns are shipped in a solution of 80% acetonitrile in water. Activation should follow these steps:

Step 1: Activation

Activation Procedure		
Specification	ID≤4.6 mm	ID>4.6 mm
Flow Rate	0.2 mL/min	0.5 mL/min
Mobile Phase	80% Acetonitrile	
Time	5 hours	
Temperature	30 °C	

Step 2: Transition

Transition Procedure		
Specification	ID≤4.6 mm	ID>4.6 mm
Flow Rate	0.2 mL/min	1 mL/min
Mobile Phase	10% Acetonitrile	
Time	1 hour	
Temperature	Method Column Temperature	

Routine Column Washing (Backflush is Recommended):

Washing Mobile Phase	10% → 80% Acetonitrile
Flow Rate	Method Flow Rate
Time	30 mins each (Column Length ⩽100mm)
	40 mins each (Column Length ＞100mm)
Storage	Store the column in 80% acetonitrile in water, and place in a cool, dry place.

Column Regeneration:

If the column exhibits increased pressure, abnormal peak shapes, reduced efficiency, or decreased resolution, please wash as follows:

Flow Rate	Method Flow Rate
Mobile Phase	10% Methanol → 100% Methanol → 100% Acetonitrile → 100% Isopropanol → 100% Acetonitrile → 80% Acetonitrile
Time	60 mins each (Column Length ⩽100mm)
	120 mins each (Column Length ＞100mm)
Temperature	30 °C
Note	Isopropanol's high viscosity increases pressure; adjust flow rate within range.

Glossary of Terms:

pH Range: The pH range tolerable for the column's mobile phase and sample solutions.

Specific Surface Area: The surface area per gram of silica.

Pore Size: The diameter of pores within silica particles, selected based on analyte molecular weight.

Carbon Loading: The percentage of carbon content in bonded functional groups relative to the total silica mass.

USP Code: Universal code for bonded phases in the USP chromatography column database.

Transition Procedure: A procedure to ensure miscibility between activation mobile phase and method mobile phases using transition mobile phase.

Maximum Pressure Tolerance: The upper pressure limit the column can withstand. Long-term use is recommended at pressures below 30 MPa. Monitor the instrument's pressure for safe operation.

Storage Solvent: Solvent used during storage or transport to maintain the activity of packing material. Handle with appropriate protective measures.