CARE AND USE MANUAL

Ultisil Amino Acid HPLC Column Care and Use Manual

Welch

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Ultisil Amino Acid 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.

The Ultisil Amino Acid column is a dedicated analytical column specifically designed for amino acid analysis. It employs ultra-high-purity fully porous spherical silica as the matrix and utilizes proprietary bonding technology combined with advanced end-capping processes to ensure superior performance. This unique design delivers excellent peak shape and high-resolution separation for amino acids, meeting the stringent demands of modern chromatographic analysis.

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.

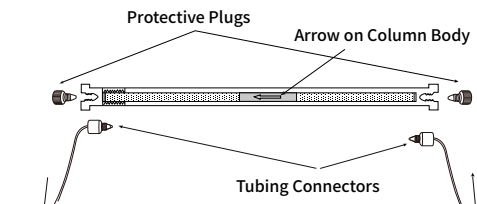


Figure 1. Column Installation

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	Ultisil Amino Acid
Pore Size	120 Å
Specific Surface Area	320 m^2/g
Carbon Loading	17 %
pH Range	2.0-8.0
Max. Temperature	60 °C
Max. Pressure Tolerance	40 MPa

Proper Column Use:

Ultisil Amino Acid columns are shipped in a solution of 75% methanol in water. Equilibration of new columns should follow these steps:

Step 1: Flush with 80% methanol-in-water or 80% acetonitrile-in-water at a flow rate of 0.5 mL/min for 4 hours.

Step 2: Flush with a mobile phase compatible with method mobile phase for 30 column volumes.

Step 3: Stabilize the system with the method mobile phase until a steady baseline is achieved.

Direction of Column Use

The arrow on the label of Welch Materials HPLC columns indicates the column flow direction. Install and operate the column following this arrow; do not use the column in both directions, as bidirectional use can contaminate the packing at both ends and impede effective column regeneration and maintenance.

Keep Mobile Phase and Samples Clean

Since fine particles suspended in samples or the mobile phase can clog the frits at the ends of the column, use HPLC-grade solvents and reagents whenever possible; reagents used in small quantities should be at least analytical grade (⩾99.7%). Water should be ultrapure or high-quality commercial purified water. Prior to use, filter solvents through a 0.45 μm membrane; filter sample solutions with a 0.45 μm syringe filter.

Sample Impurities and Compatibility

Impurities in the sample are a primary cause of column contamination and reduced column efficiency. For complex matrices, perform sample cleanup using SPE cartridges; if that is not feasible, employ a guard column with a matched stationary phase. Ensure the sample solvent is compatible with the mobile phase-avoid immiscible solvents or solvents of greatly different polarity-since such mismatches can produce artifacts like distorted peak shapes or ghost peaks. Dissolving the sample in the mobile phase is an effective measure to prevent these issues.

Routine Column Washing

No buffer salts involved:
Backflush the column with 80% methanol or 80% acetonitrile for 10–20 column volumes. Store the column in this solvent.

Buffer salts involved:
Step 1: Backflush the column with transition mobile phase or low-organic phase for 10–20 column volumes to remove buffer salts.
Step 2: Backflush the column with 80% methanol or 80% acetonitrile for 10–20 column volumes. Store the column in this solvent.

Ion-pairing reagents involved:
Step 1: Backflush the column with transition mobile phase or low-organic phase for 10–20 column volumes to remove buffer salts.
Step 2: Backflush the column with 50% methanol for 10 column volumes.
Step 3: Backflush the column with 80% methanol for 10–20 column volumes. Store the column in this solvent.

Column Regeneration:

If the column exhibits significantly reduced efficiency or abnormally high backpressure, it is often considered near the end of its service life. To prolong its usability, proper column regeneration can be an effective solution. Follow these steps using 20–30 column volumes of each solvent:

100% Methanol

→ 100% Acetonitrile

→ 100% Isopropanol

→ 100% Acetonitrile