CARE AND USE MANUAL

Ultisil Cellu-DR HPLC Column Care and Use Manual

Welch

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Ultisil Cellu-DR 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.

Ultisil Cellu-DR is a modified version of Ultisil Cellu-D chiral column, designed for use with reversed-phase mobile phases. It is particularly suitable for the chiral separation of amino acid enantiomers.

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.

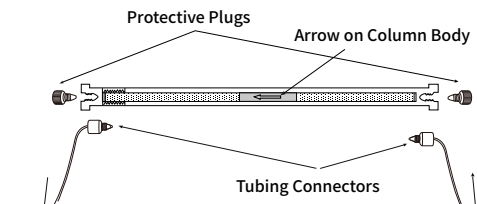


Figure 1. Column Installation

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 Cellu-DR
USP Code	L93
Pore Size	120 Å
Specific Surface Area	320 m^2/g
pH Range	2.0-9.0
Max. Temperature	5°C–40°C
Max. Pressure Tolerance	7 MPa
	5 MPa (for long-term use)

Note:

When using silica-based columns at pH ＞7, use buffers with concentrations not exceeding 20 mM and temperatures ranging from 5°C to 25°C to maximize column lifespan. Extreme pH or temperature conditions can significantly reduce column durability.

Column Activation

(Recommended for new columns or those unused for over a month)
Ultisil Cellu-DR columns are shipped in a solution of 100% methanol.

Activation should follow these steps:

Activation Procedure		
Specification	ID≤3 mm	ID>3 mm
Flow Rate	0.1 mL/min	0.2 mL/min
Mobile Phase	100% Methanol	
Time	4 hours	
Temperature	25 °C	

Operating Conditions

Column Dimension	150 × 4.6 mm	250 × 4.6 mm	250 × 10 mm
Typical Flow Rate	1.0 mL/min	1.0 mL/min	5.0 mL/min
Maximum Flow Rate	1.5 mL/min	1.5 mL/min	7.0 mL/min

Recommended Mobile Phases

(A)

	Acidic	Neutral	Alkaline
Aqueous Phase	Phosphate buffer solution or KPF_6 solution	Water	Borate buffer solution or phosphate buffer solution
Organic Phase	Acetonitrile, methanol, ethanol, or isopropanol		

(B)

Aqueous Phase/Organic Phase Ratio	Buffer Salt Solution/Organic Phase Ratio
90/10 to 0/100	90/10 to 15/85

Prohibited Solvents

Avoid the following solvents as they may damage the column:

Tetrahydrofuran (THF), acetone,

dichloromethane, chloroform,

ethyl acetate, dimethyl sulfoxide (DMSO),

dimethylformamide (DMF),

methyl tert-butyl ether (MTBE),

dimethylacetamide (DMAC).

When in doubt, consult the manufacturer.

Routine Cleaning and Storage

Post-Buffer Use

• Flush the column with a salt-free mobile phase for 30 column volumes.

• Follow with 30 column volumes of 100% methanol for storage.

Troubleshooting for High Backpressure or Reduced Resolution

1. Flush with 10% methanol in water at a low flow rate (as specified in the activation procedure) for 20–30 column volumes.
2. Gradually increase the methanol proportion using a linear gradient to 100% methanol; flush for 20–30 column volumes.
3. Gradually reduce the methanol proportion back to 90% water; flush for 20–30 column volumes.
4. If issues persist, add 0.1% trifluoroacetic acid (TFA) to water and repeat the above steps.

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.

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.