welch

Thank you for purchasing and using UHPLC column manufactured by Welch Materials, Inc.

HPLC columns are expensive chromatographic consumables. It has strict production standards and test procedure. Please read this guide carefully before using the column, in order to maintain performance and achieve longer column life.

Identification of Welch Column

Each Welch column has a unique serial number, by which, the column can be traced back to each production procedure if any problem occurs. So when customer receives the column, please check:

1. Ensure that the packaging box is intact and that the labels match the column.

Verify that the box contains a CoA report with the inspector's signature.
Inspect the column surface for any collision marks and check that

the protective plugs on both ends of the column are intact.

4. Confirm that the column has a Welch identification label. Carefully compare the model and serial numbers on the packaging box with those on the column label to ensure they match.

Structure and Installation

Structure:

Welch HPLC column uses 316L stainless steel tube, as shown in Figure below.



Installation:

To ensure highest column efficiency, use connection tubes with matched diameter. The connection of both ends must be highly fitted. The tube ends must be smooth, without any burrs or slants. Use professional tools to cut the tubes.

1. Find an arrow on the column identification label which indicates the correct direction of solvent flow. Unscrew the plugs of each ends and place it in the right direction.



2. Use your hands to screw the "stainless steel or other material fittings" of the connection tubing into both ends of the column. Ensure that the tubing fittings are tightly connected to the column ports to

Welch UHPLC Column Care and Use Manual

achieve a zero dead volume connection and prevent any leakage when the chromatograph is operating normally.

Glossary of Terms

pH Range: the pH range of mobile phase and sample solution, which is within the tolerance of the column.

Specific Surface Area: the surface area of 1g silica.

Pore Size: diameter of pores inside silica spheres (choose pore size according to target molecule weight).

Carbon load: a parameter shows the quantity of bonded functional groups on silica sphere.

USP Code: general code for phases in United States Pharmacopeia Convention.

Transition Mobile Phase: with same or lower ratio of organic phase and water as mobile phase, but without additives like buffer salt, acid and alkali etc.

Specification of UHPLC column

Column	USP Code	Carbon Load(%)	Pore Size(Å)	Surface Area	pH Range	Max Temp.	Max. Pressure
Xtimate UHPLC C18	L1	14%	120 Å	320 m²/g	1.0-12.5	70°C (pH<6.5) 40°C (pH>6.5)	15000 psi
Ultisil UHPLC XB-C18	L1	17%	120 Å	320 m ² /g	1.5-10.0	60°C(pH<6.5) 40°C(pH>6.5)	15000 psi
Ultisil UHPLC AQ-C18	L1	12%	120 Å	320 m ² /g	1.5-10.0	60°C (pH<6.5) 40°C (pH>6.5)	15000 psi
Ultisil UHPLC LP-C18	L1	10%	120 Å	320 m²/g	0.5-0.8	60°C (pH<6.5) 40°C (pH>6.5)	15000 psi
Ultisil UHPLC Polar RP	L1	18%	120 Å	320 m²/g	1.5-10.0	60°C (pH<6.5) 40°C (pH>6.5)	15000 psi
Ultisil UHPLC HILIC	L3	/	120 Å	320 m ² /g	2.0-8.0	60°C(pH<6.5) 40°C(pH>6.5)	15000 psi
Ultisil UHPLC XB-C8	L7	12%	120 Å	320 m ² /g	1.5-10.0	60°C (pH<6.5) 40°C (pH>6.5)	15000 psi
Ultisil UHPLC XB-Phenyl	L11	13%	120 Å	320 m²/g	1.5-10.0	60 C (pH<6.5) 40 C (pH>6.5)	15000 psi
Ultisil UHPLC Amide	L68	6%	120 Å	320 m²/g	2.0-8.0	60 °C	8700 psi
Ultisil UHPLC HILIC Amphion II	/	5%	120 Å	320 m ² /g	2.0-8.0	60 °C	8700 psi
Xtimate UHPLC Phenyl-hexyl	L11	12%	120 Å	320 m²/g	1.5-10.0	60 C (pH<6.5) 40 C (pH>6.5)	15000 psi
Ultisil UHPLC PFP	L43	10%	120 Å	320 m²/g	1.5-10.0	60 C (pH<6.5) 40 C (pH>6.5)	15000 psi
Ultisil UHPLC XB-CN	L10	8%	120 Å	$320 \text{ m}^2/\text{g}$	1.5-9.0	60 °C	15000 psi

Activation of New Column

	Xtimate UHPLC C18, Ultisil UHPLC XB-C18,
DI	Ultisil UHPLC AQ-C18, Ultisil UHPLC LP-C18,
Phases	Ultisil UHPLC XB-C8, Ultisil UHPLC XB-Phenyl,
	Xtimate UHPLC Phenyl-hexyl, Ultisil UHPLC PFP

(Storage solvent: acetonitrile/water)

	Activation		Transition		Note
Column ID	<3mm	≥3mm	<3mm	≥3mm	
Flow Rate	0.1ml/min	0.2ml/min	Analysis flow rate	Analysis flow rate	No transition required for
Mobile Phase	80% acetonitrile		10% ac	etonitrile	analysis mobile
Time	4h		1h		buffer salt
Temperature	30	30°C		30 °C	

Column Daily Flushing

Back flushing recommended (reverse to the normal flow direction)

Analysis	Without acid,	Containing acid,	Containing	
Mobile Phase	alkali or salts	alkali or salts	ion-pair reagents	
Flow Rate		Analysis flow rate		
Flushing Mobile Phase	80% methanol	10% methanol – 80% methanol	10% methanol – 50% methanol – 80% methanol	
T	Column length<100mm, 30min each step			
Time	Column length≥100mm, 40min each step			
Storage	Store in the final flushing solvent, kept in cool dry places			
Note	The methanol in mobile phase can be changed into acetonitrile			

Abnormal Column Flushing

In the circumstances of high column pressure, abnormal peak shape, low column efficiency and low resolution etc, first flush off the buffer salts in column using transition mobile phase, then flush as follows; If mobile phase contains ion-pair reagents, first flush off buffer salts as above, then flush with 50% methanol, and flush as follows (back flushing recommended):

Flow Rate	1/4 analysis flow rate
Mobile Phase	100% methanol – 100% acetonitrile – 100% isopropanol – 100% acetonitrile
Timo	Column length<100mm, 100min each step
Time	Column length≥100mm, 120min each step
Note	Isopropanol has high viscosity, causing high pressure. Please adjust the flow rate as needed.

Activation of New Column

Phases	Ultisil UHPLC Polar RP. Ultisil UHPLC HILIC
1 110.000	Onish Oni Le i olui Ri, Onish Oni Le mere

(Storage solvent: acetonitrile)

Activation			Transition		Note
Column ID	<3mm	≥3mm	<3mm	≥3mm	
Flow Rate	0.1ml/min	0.2ml/min	Analysis flow rate	Analysis flow rate	No transition required for
Mobile Phase	90% acetonitrile		Transition mobile phase		phases without
Time	4h		1h		buffer salt
Temperature	30 °C		30 °C		

Column Daily Flushing

Back flushing recommended (reverse to the normal flow direction)

Analysis Mobile phase	Without acid alkali or salts	Containing acid, alkali or salts	
Flow Rate	Analysis flow rate		
Flushing	100% acetonitrile	Transition mobile phase	
Mobile Phase		-100% acetonitrile	
T:	Column length<100mm,	30min each step	
Time	Column length≥100mm,	40min each step	
Storage	Store in the final flushing solvent, kept in cool dry places		
Note			

Abnormal Column Flushing

In the circumstances of high column pressure, abnormal peak shape, low column efficiency and low resolution etc, first flush off the buffer salts in column using transition mobile phase, then flush as follows; If mobile phase contains ion-pair reagents, first flush off buffer salts as above, then flush with 50% methanol, and flush as follows (back flushing recommended):

Flow Rate	1/4 analysis flow rate		
Mobile Phase	100% methanol-100% acetonitrile- 100% isopropanol-100% acetonitrile		
Time	Column length<100mm, 100min each step		
TIME	Column length≥100mm, 120min each step		
Note	Isopropanol has high viscosity, causing high pressure. Please adjust the flow rate as needed.		

Activation of New Column

Phases	Ultisil UHPLC Amide, Ultisil XB-CN,
	Ultisil UHPLC HILIC Amphion II

(Storage solvent: acetonitrile)

	Activ	vation	Tran	Note	
Column ID	<3mm	≥3mm	<3mm	≥3mm	
Flow Rate	0.1ml/min	0.2ml/min	Analysis flow rate	Analysis flow rate	No transition required for
Mobile Phase	100% acetonitrile		Transition 1	nobile phase	analysis mobile
Time	4h		1h		buffer salt
Temperature	30	Ĉ	30	D.C	

Column Daily Flushing

Back flushing recommended (reverse to the normal flow direction)

Analysis Mobile phase	Without acid alkali or salts	Containing acid, alkali or salts	
Flow Rate	Analysis flow rate		
Flushing Mobile Phase	100% acetonitrile	Transition mobile phase -100% acetonitrile	
Time	Column length<100mn	n, 30min each step	
Time	Column length≥100mm, 40min each step		
Storage	Store in the final flushing solvent, kept in cool dry places		
Note			

Welch Materials, Inc.

www.welch-us.com info@welchmat.com