



CHROMSHELL® Column Care & Protection Guide

Introduction

Thank you for purchasing your CHROMSHELL® HPLC column.

Every CHROMSHELL® HPLC column is a precision product which will provide excellent performance, reproducibility and column lifetime if cared for properly. The information and recommendations contained in this manual are designed to guide you in the care and use of your column. **Please follow the instructions herein to maximize column performance and lifetime. If you have any questions, please contact our technical department.**

Upon receipt of the column

- Verify the column you received is the column you ordered
- Check the column for physical damage which may have occurred during shipping
- All columns are shipped in the testing solvent, unless otherwise specified

Each CHROMSHELL® HPLC column is individually packed and tested to ensure high column quality. Every column is supplied with its Test Chromatogram. The warranty period is 3 months and begins upon receipt of the column.



SPECIFICATION

CHROMSHELL phases	Particle size (µm)	Por Size (Å)	Surface area (m ² /g)	Carbon load (%)	pH stability	Endcapping	100% aqueous mobile phase stability
C18 Plus	2.6	85	130	9	1.5 to 7.5	Single-step	No
C18-XB	2.6	85	130	8	1.5 to 8	Single-step	No
C18 Plus AD	1,7	100	90	9	2.0 to 10.0	Proprietary	No
	2,6	100	130	7	2.0 to 10.0	Proprietary	No
C18-Polar	2.6	85	130	6.5	1.5 to 7	Mixed	Yes
C8	1.7	100	90	5	2.0 to 10.0	Proprietary	No
	2.6	100	130	7	2.0 to 10.0	Proprietary	No
C4	1.7	100	90	4	2.0 to 10.0	Proprietary	No
	2.6	100	130	5	2.0 to 10.0	Proprietary	No
HILIC Plus	2.6	85	130	-	1.5 to 7	Proprietary	No
Phenyl-Hexyl	1.7	100	90	5	2.0 to 10.0	Proprietary	No
	2.6	100	130	6	2.0 to 10.0	Proprietary	No
PPF	1.7	100	90	5	2.0 to 10.0	Proprietary	No
	2.6	100	130	4	2.0 to 10.0	Proprietary	No
Biphenyl	1.7	100	90	5	2.0 to 10.0	Proprietary	No
	2.6	100	130	6	2.0 to 10.0	Proprietary	No
Cyano	1.7	100	90	4	2.0 to 10.0	Proprietary	No
	2.6	100	130	3	2.0 to 10.0	Proprietary	No



Mobile phase consideration

- The correct direction of the solvent flow is indicated by an arrow on the column identification label.
- Use only HPLC or LC/MS grade solvents and water
- Use only highest purity chemicals and reagents
- Filter and degas all mobile phases and sample prior to use through suitable membrane filter (recommended porosity is 0.2 μm)
- Repetitive replacement among solvents with a large difference in polarities might degrade the column performance
- In general, organic solvents like acetonitrile, methanol and tetrahydrofuran (THF) are recommended for regular use. When using THF as a mobile phase, be mindful of the solvent resistance of your system or tubing (PEEK parts are especially unsuitable for use with THF).
- Recommendations of pH stability of the column are shown in the specification table. When using the column at pH near the upper or lower limit, the column life time may be shortened under certain conditions by temperature and mobile phase composition.

Shipping solvent and column storage

- The shipping solvent is specified on the "Certificate of Analysis", which is enclosed with each column
- Make sure solvents are miscible - **using solvents that are immiscible with the solvent in the column can permanently damage the column.**
- **Salt and buffer precipitation from the mobile phase can permanently damage the column.**
- **Never store columns containing buffers or ion-pairing reagents.**
- Flush with 10 column volumes of mobile phase without buffer to remove any buffers or salts

- **Use storage solvent:**

65% Acetonitrile/35% Water
Ethanol

for C18 column stationary phase
for Normal Phase Silica column stationary phase

80% Acetonitrile/20% Water
30% Acetonitrile/80% Water

for HILIC column stationary phase
for Biphenyl column stationary phase



Column cleaning

ChromShell® HPLC/UHPLC columns mostly use different frits on the stainless-steel tube end, which means that using the **reversed flow to clean columns is NOT recommended.**

Before starting any kind of cleaning procedure, make sure your in-column solvent or mobile phase is miscible with the recommended cleaning solvent. Flow rates should be 1/5 – 1/2 of the typical flow rate.

Method for reversed phase (C18)

Rinse with 10 Column Volumes each of:

- 95 % Water/5 % Acetonitrile (for buffer removal)
- IPA (THF)
- 95 % Acetonitrile/5 % Water
- Mobile Phase

Method for unbonded silica (Si)

Rinse with 10 Column Volumes each of:

- Hexane
- Methylene Chloride
- Isopropanol
- Methylene Chloride
- Mobile Phase

Water removal procedure:

Flush column with 30 mL 2.5 % 2,2-dimethoxy-propane and 2.5 % glacial acetic acid in Hexane

Method for HILIC

Rinse with 10 Column Volumes each of:

- 95 % Water/5 % Acetonitrile (for buffer removal)
- 95 % 100 mM Ammonium Acetate, pH 5.8/5 % Acetonitrile
- 95 % Water/5 % Acetonitrile
- Mobile Phase

Method for Biphenyl phase

Rinse with 10 Column Volumes each of:

- 95 % Dimethylformamide or 95 % Dimethyl sulfoxide / 5 % Methanol (for strong contamination removal)

Reversed phase:



Start cleaning procedure with rinsing the column with 10 Volumes of 5 % Acetonitrile/95 % Water and start gradient with raising concentration of Acetonitrile step by step:

- 20 % Acetonitrile/80 % Water – 10 volumes
- 50 % Acetonitrile/50 % Water – 10 volumes
- 95 % Acetonitrile/5 % Water – 10 volumes

Column Protection = ARION® Guard System (AGS)

CHROMSHELL® UHPLC columns can be protected by means of a guard system or by using an appropriate guard column filter (in-line filter).

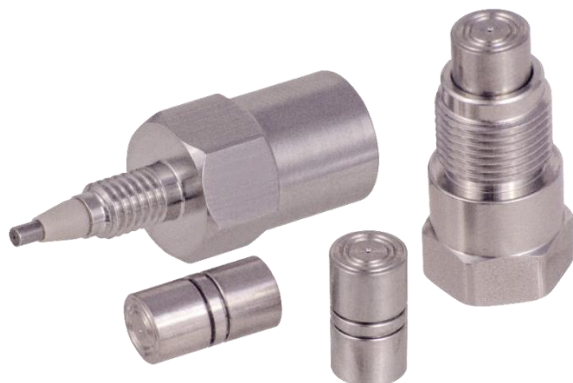
The **Arion® Guard System (AGS)** is ideal for the protection of CHROMSHELL® UHPLC columns.

AGS is a universal guard system, which can be connected to almost any column hardware on the market. It is easy to use and it offers the shortest retention time shift of analytes in comparison with other major manufacturers. The AGS consists of a guard holder and guard cartridge, which is offered with various silica materials according to the stationary phase in the HPLC column used. As the AGS is not Finger Tight, it is necessary to tighten the holder with a wrench by approx. 90 °, which then seals the AGS. It is possible to use wrench no. 11, or it can also be used 7/16.

We recommend it as an easy and less expensive solution in comparison with high pressure guard systems. The AGS can be used with pressures of up to 900 bars.

Main features and benefits:

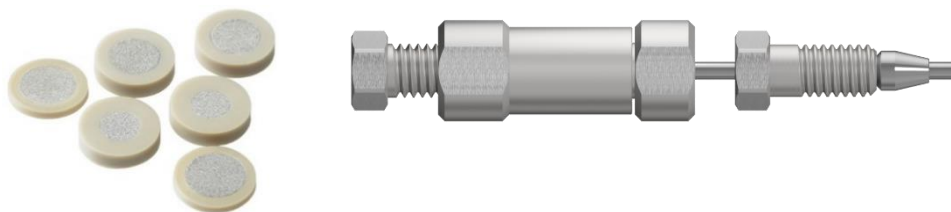
- Universal - fits virtually any column
- The lowest influence on retention times compared with other guard systems
- Small size for easier installation in the column oven
- Any orientation of the cartridge
- Pressure rating up to **900 bars**



Protection can be perfectly ensured by installing a pre-column filter holder with a 0.2µm or 0.5µm frit. This in-line filter can withstand pressures of up to 1375 bars and is easy to use. The filter holder consists of a two-piece body and replaceable filter – a metal frit.

Main features and benefits:

- Minimized dead-volume.
- Easy installation and use.
- Pressure rating up to **1375 bars**.
- Works with 1/16inch column connections from all manufacturers.
- Spare frits with various porosities.



Other environments

- **2.6 µm** core-shell particles have a pressure resistance of up to **700 bars**
- **1,7 µm** Biphenyl core-shell particles have a pressure resistance of up to **1000 bars**
- Here are typical flow and pressure values for CHROMSHELL UHPLC columns. These numbers are not precise values and can vary based on the LC system used, parameters of the method, sample preparation and analytes/matrix. The values given in the table are assumed for the mobile phase water / acetonitrile.



COLUMN CARE GUIDE

Particle Size	Internal Diameter	Recommended Flow	Expected Pressure (bars)	Particle Size
<i>μm</i>	<i>mm</i>	<i>mL/min</i>	<i>50 mm</i>	<i>150 mm</i>
2.6	2.1	0.3 - 0.5	200	470
2.6	3.0	0.7 - 1.0	160	400
2.6	4.6	1.2 - 1.7	180	350

- Avoid using a column repeatedly near the pressure limit or abrupt changes in pressure to prevent shortening of the column life.
- We recommend using a pre-column filter to prevent the column frit from being clogged with samples.
- Suggested maximum temperature for CHROMSHELL® LC columns is 100°C, however temperature limits are dependent on your running parameters.
- Similar Phases:

Accucore C18, Accucore RP-MS, ACE UltraCore Super C18, Ascentis Express C18, Cortecs C18, Halo 2.7 C18, Kinetex C18, Nucleoshell RP 18, Poroshell EC-C18, Sunshell C18

Ordering information

Complete ordering information is available at www.arionchromatography.com