

Care & use of Avantor® ACE® Excel® UHPLC columns

Thank you for purchasing this Avantor® ACE® Excel® UHPLC column.

Every Avantor® ACE® Excel® UHPLC column is individually manufactured and validated to exceed stringent specifications. The following measures will enhance its performance and lifetime.

COLUMN INSTALLATION

System compatibility

Avantor ACE Excel UHPLC columns are compatible with UHPLC instrumentation offered by all leading manufacturers. Avantor ACE Excel UHPLC columns are compatible for use on HPLC systems, provided that system pressure limits are not exceeded when using smaller particles and/or elevated flow rates.

For improved compatibility with a Waters Acquity UHPLC system (containing a 1/16" Waters Acquity fitting and ferrule on the inlet tubing), the use of a pre-column filter incorporating the unique Waters Acquity column port profile (P/N EXL-PCF10/ACQ, 10 pack) is additionally recommended.

System dead volume

Always ensure that the autosampler and flow cell introduce the smallest possible dead volume. Connections between injector, column and detector should be kept as short as possible, preferably using tubing with an internal diameter of 0.005" (0.127 mm) or less.

Column connection

For UHPLC applications up to 15,000 psi (1000 bar), the use of Avantor ACE Excel UHPLC Column Connectors (P/N EXL-CC10, 10 pack) are recommended. At the outlet end of the UHPLC column (where pressure demands are lower but a correct connection remains important), or for HPLC applications, Avantor ACE Fingertight HPLC Column Connectors (P/N ACE-CC10, 10 pack) may alternatively be used.

For improved compatibility with a Waters Acquity UHPLC system (containing a 1/16" Waters Acquity fitting and ferrule on the inlet tubing), the use of a pre-column filter incorporating the unique Waters Acquity column port profile (P/N EXL-PCF10/ACQ, 10 pack) is additionally recommended. The direction of flow is marked on the column.

Mechanical damage

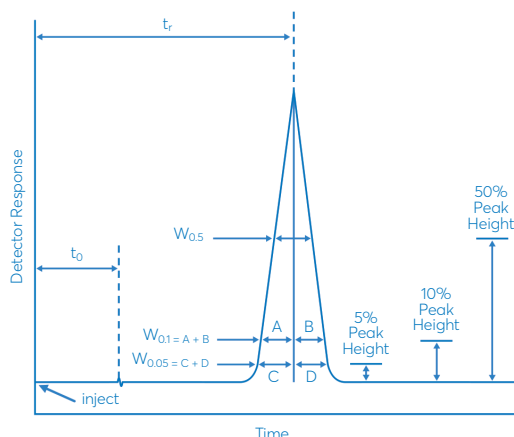
Protect the column from mechanical shock. A flow rate ramp is recommended. Dropping a column can impair its performance.

Equilibration

Flush onto the desired mobile phase (ensure that precipitation does not occur). Ensure that the column is fully equilibrated prior to starting an analysis.

Performance testing

It is recommended that the performance of columns is tested on arrival and periodically during use. Performance parameters are as defined below.



Performance – At 50% peak height $N_{0.5} = 5.54 (t_r / W_{0.5})^2$
– At 10% peak height $N_{0.1} = 18.55 (t_r / W_{0.1})^2$

Peak Shape – Overlap to a perfect Gaussian peak $\% = N_{0.1} / N_{0.5}$
– Peak asymmetry (measured at 10% peak height) $As_{0.1} = B/A$
– US Pharmacopeia Tailing Factor (measured at 5% peak height) $T = W_{0.05}/2C$

Selectivity – Retention factor $k = (t_r - t_0) / t_0$

Precolumn filters

The use of a precolumn filter is strongly recommended to prevent inlet frit blockage. Avantor ACE Excel UHPLC precolumn filters (P/N EXL-PCF or EXL-PCF10/ACQ for Waters Acquity systems) can operate at pressures up to 15,000 psi (1000 bar) without affecting column performance or retention, due to their ultra low dispersion design.

Guard Cartridges

The use of guard cartridges is recommended to prevent both inlet frit blockage and irreversible sample adsorption onto the top of the column. Guard cartridges are available for most Avantor ACE Excel UHPLC columns - for assistance identifying the correct guard cartridge for this column, please contact our Technical Support Department at chromsupport@avantorsciences.com

OPERATIONAL GUIDELINES

Solvents

Use only HPLC grade solvents and freshly prepared aqueous buffer solutions to minimise bacterial growth. A slip-on pump filter will remove extraneous particles.

Mobile phase pH

To ensure maximum column lifetime, a pH range of 2.0 - 8.0 should be maintained. To increase column lifetime at high pH, organic buffers, buffer concentration, % organic solvent and temperature must be considered. For further information request a FREE copy of "A Guide to HPLC and LC-MS Buffer Selection".

Avantor ACE Excel SuperC18 columns, which provide an extended pH range of 1.5 - 11.5 when used with LC-MS compatible buffers, are available.

Pressure

Exposure to rapid changes in pressure, or to pressures > 15,000 psi (1000 bar), may reduce column lifetime.

The following flow rate limitations additionally apply:

2.1 mm I.D – maximum flow rate 1.0 ml/min

3.0 mm I.D – maximum flow rate 2.0 ml/min

4.6 mm I.D – maximum flow rate 5.0 ml/min

Temperature

Avantor ACE Excel UHPLC columns may be operated at temperatures up to 100 °C. Temperatures > 60 °C may reduce column lifetime, dependent upon the mobile phase conditions selected.

Column warranty

All columns are warranted to meet the specifications stated on the Test Chromatogram. Removal of an end fitting to replace a frit or top-up the packing material should be regarded as a last resort to prolonging column lifetime. Removal of the column end fittings will automatically invalidate the column warranty.

Storage

Wash out any buffer (ensure that precipitation does not occur) and flush onto the storage solvent defined overleaf.

Replace the end-stops to prevent the packing bed drying out and store in a cool area.

Safety and disposal

This column contains amorphous silica which may be hazardous to health if the column is unpacked and the silica allowed to dry. The silica presents no hazard whilst contained within the column. When the column has reached the end of its useful life, dispose of it in a similar manner to the samples that have been injected onto it. Alternatively, please contact our Technical Support Department at chromsupport@avantorsciences.com for details of our column disposal program.